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Sixteenth meeting
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Item 6.1 of the provisional agenda*

REPORT OF THE WIDER CARIBBEAN AND WESTERN MID-ATLANTIC REGIONAL WORKSHOP TO FACILITATE THE DESCRIPTION OF ECOLOGICALLY OR BIOLOGICALLY SIGNIFICANT MARINE AREAS[1]

INTRODUCTION

1. At its tenth meeting, the Conference of the Parties to the Convention on Biological Diversity (COP 10) requested, in decision X/29 (paragraph 36), the Executive Secretary to work with Parties and other Governments as well as competent organizations and regional initiatives, such as the Food and Agriculture Organization of the United Nations (FAO), regional seas conventions and action plans, and, where appropriate, regional fisheries management organizations (RFMOs), with regard to fisheries management, to organize, including the setting of terms of reference, a series of regional workshops, with a primary objective to facilitate the description of ecologically or biologically significant marine areas through the application of scientific criteria in annex I of decision IX/20 as well as other relevant compatible and complementary nationally and intergovernmentally agreed scientific criteria, as well as the scientific guidance on the identification of marine areas beyond national jurisdiction, which meet the scientific criteria in annex I to decision IX/20.

2. In the same decision (paragraph 41), the Conference of the Parties requested that the Executive Secretary make available the scientific and technical data and information and results collated through the workshops referred to above to participating Parties, other Governments, intergovernmental agencies and the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) for their use according to their competencies.

3. The Conference of the Parties at its tenth meeting also requested the Executive Secretary, in collaboration with Parties and other Governments, the Food and Agriculture Organization of the United Nations (FAO), United Nations Division for Ocean Affairs and the Law of the Sea, the United Nations Educational, Scientific and Cultural Organization–Intergovernmental Oceanographic Commission (UNESCO–IOC), in particular the Ocean Biogeographic Information System, and other competent organizations, the World Conservation Monitoring Centre of the United Nations Environment

* UNEP/CBD/SBSTTA/16/1.

[1] The designations employed and the presentation of material in this note do not imply the expression of any opinion whatsoever on the part of the Secretariat concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

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Programme (UNEP-WCMC) and the Global Ocean Biodiversity Initiative (GOBI), to establish a repository for scientific and technical information and experience related to the application of the scientific criteria on the identification of EBSAs in annex I of decision IX/20, as well as other relevant compatible and complementary nationally and intergovernmentally agreed scientific criteria that shares information and harmonizes with similar initiatives, and to develop an information-sharing mechanism with similar initiatives, such as FAO's work on vulnerable marine ecosystems (VMEs) (paragraph 39, decision X/29).

4. The Conference of the Parties at its tenth meeting requested the Subsidiary Body to prepare reports based on scientific and technical evaluation of information from the workshops, setting out details of areas that meet the criteria in annex I to decision IX/20 for consideration and endorsement in a transparent manner by the Conference of the Parties to the Convention, with a view to including the endorsed reports in the repository referred to in paragraph 39 of decision X/29 and to submit them to the United Nations General Assembly and particularly its Ad Hoc Open-ended Informal Working Group, as well as relevant international organizations, Parties and other Governments (paragraph 42, decision X/29).

5. Pursuant to the above request and with financial support from the European Commission and the Government of Brazil, the Executive Secretary convened, in collaboration with the United Nations Environment Programme – Caribbean Environment Programme (UNEP-CEP) and hosted by the Government of Brazil, the Wider Caribbean and Western Mid-Atlantic Regional Workshop to Facilitate the Description of Ecologically or Biologically Significant Marine Areas, in Recife, Brazil, from 28 February to 2 March 2012.

6. Technical support was engaged by the CBD Secretariat, with the financial support from the Government of Japan through the Japan Biodiversity Fund, for the collection, compilation, analysis, synthesis and mapping of the relevant scientific information in order to facilitate the deliberation of the workshop in describing areas meeting scientific criteria for ecologically or biologically significant marine areas (EBSAs). The results of this technical preparation were made available in the meeting document UNEP/CBD/RW/EBSA/WCAR/1/2.

7. The meeting was attended by experts from Barbados, Belize, Bermuda/United Kingdom, Brazil, Colombia, Costa Rica, Cuba, Dominican Republic, French Guiana/France, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Netherlands, Nicaragua, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Bolivarian Republic of Venezuela, United States of America, Food and Agriculture Organization of the United Nations (FAO), United Nations Environment Programme – Caribbean Environment Programme (UNEP-CEP), Ocean Biogeographic Information System (OBIS)/IOC-UNESCO, OBIS-SEAMAP, Global Ocean Biodiversity Initiative (GOBI), BirdLife International, Caribbean Community (CARICOM) Secretariat, Caribbean Marine Protected Areas Network and Forum – Gulf and Caribbean Fisheries Institute, Caribbean Regional Fisheries Mechanism Secretariat (CRFM), Corporation for the Sustainable Development of the Archipelago of San Andres, Old Providence and Santa Catalina (CORALINA), Institute of Marine Affairs in Trinidad and Tobago, Sargasso Sea Alliance, Universidad Federal de Pernambuco, University of the West Indies, and the Wider Caribbean Sea Turtle Conservation Trust (WIDECAST). The full list of participants is attached as annex I.

ITEM 1. OPENING OF THE MEETING

8. On behalf of the Environment Minister of Brazil, Ms. Izabella Teixeira, Ms. Ana Paula Prates delivered an opening statement at 9 a.m. on Tuesday, 28 February 2012. She welcomed participants to Recife and wished them a pleasant stay in Brazil. Ms. Teixeira indicated that Brazil was delighted to host this workshop, whose goals were of paramount national and international importance. She indicated that the process of describing EBSAs should lead to international initiatives for recognizing the importance of and promoting the conservation of marine biodiversity, and should strengthen national policies for gaining knowledge of and protecting this immense natural asset. She explained that Brazil had made a

significant effort to identify priority areas for conservation in all biomes and in its marine and coastal areas, and that these initiatives had enhanced the quality of her Ministry's environmental negotiations with other governmental sectors towards the conservation of biodiversity. She indicated that Brazil had closely met its main terrestrial conservation goals, with almost 17% of the country protected. However, she explained that the country continued to struggle in coastal and marine areas, having protected just 1.6% of the territorial sea and EEZ. As a result, she indicated that this workshop was extremely important to national and regional efforts to expand marine protected areas. She outlined recent initiatives for establishing and supporting a representative and effectively managed network of coastal and marine protected areas, including a GEF/World Bank project in partnership with a national oil company. Ms. Prates said that she was honoured and proud that her friend and former boss, Mr. Braulio Dias, had recently been appointed as the new Executive Secretary of the Convention. Finally, she thanked the team of 50 experts who developed the Brazilian proposals describing areas meeting EBSA criteria, presented at the workshop, as well as her colleagues for their dedicated effort to ensure the success of this workshop. She concluded by wishing participants an excellent workshop and stay in Recife.

9. On behalf of the Executive Secretary, Mr. Braulio Dias, Ms. Jihyun Lee (Environmental Affairs Officer for marine and coastal biodiversity at the CBD Secretariat) delivered the opening statement. In the statement, Mr. Dias welcomed participants and expressed his thanks to them for participating in this important workshop, the second regional EBSA workshop convened by the CBD Secretariat. He thanked Government of Brazil for hosting and co-funding this workshop. He acknowledged with appreciation the European Commission for providing financial support for the participation of experts from developing countries. He also thanked the Regional Coordinating Unit of the United Nations Environment Programme – Caribbean Environment Programme (UNEP-CEP) for closely collaborating with the CBD Secretariat in convening the workshop. Mr. Dias highlighted that COP 10 adopted a Strategic Plan for Biodiversity 2011-2020, which included a target to conserve 10% of coastal and marine areas in protected areas. He also mentioned COP-10 guidance that the application of the EBSA criteria was a scientific and technical exercise, and that areas identified as such may require enhanced conservation and management measures selected by States and competent intergovernmental organizations. He informed participants that the results of this workshop would be submitted to the forthcoming meetings of the Convention's scientific body (SBSTTA 16) and of the Conference of the Parties to the Convention (COP 11), in April and October 2012, respectively. He added that the EBSA reports endorsed by COP would be transmitted to the relevant United Nations General Assembly Process on marine biodiversity conservation in areas beyond national jurisdiction. He concluded by emphasizing that marine and coastal biodiversity was the theme of the 2012 International Day for Biodiversity, which would bring opportunities to highlight the complex challenges it faced. He expressed his wish for active participation by all in this workshop to ensure such a global collaboration benefits the region's efforts for marine conservation.

10. On behalf of Mr. Nelson Andrade Colmenares, Coordinator of the Caribbean Environment Programme of the United Nations Environment Programme (UNEP-CEP), Ms. Alessandra Vanzella-Khouri (Programme Officer, UNEP-CEP) delivered opening remark. Mr. Colmenares thanked the Government of Brazil for hosting the workshop and the CBD Secretariat for inviting UNEP-CEP to partner with them for this workshop. He indicated that CEP welcomed this initiative as it met many of the objectives of the Cartagena Convention, particularly its Protocol on Specially Protected Areas and Wildlife (SPAW). Noting the memorandum of understanding between CEP and the CBD, he indicated that this partnership was timely and synergistic, as CEP was currently participating in the implementation of the Caribbean Large Marine Ecosystem Project (CLME) and in broad-scale marine spatial planning for the identification of marine corridors important for the conservation of key migratory species, such as marine mammals. He noted that CEP was supporting CBD Parties with their efforts under the "Caribbean Challenge" initiative. Finally, he expressed his hope for open exchanges between marine managers and scientists towards the identification of areas of special significance for marine biodiversity. He wished participants productive deliberations.

ITEM 2. ELECTION OF THE CO-CHAIRS, ADOPTION OF THE AGENDA AND ORGANIZATION OF WORK

11. After brief self-introductions by all participants, Ms. Ana Paula Prates (Brazil) and Ms. Angelique Brathwaite (Barbados) were elected as meeting co-chairs based on proposals from the hosting government, Brazil, in consultation with the Secretariat and the Regional Coordinating Unit of the UNEP-CEP, which were seconded by Guatemala and Jamaica.

12. Participants were then invited to consider the provisional agenda (UNEP/CBD/RW/EBSA/WCAR/1/1) and the proposed organization of work as contained in annex II to the annotations to the provisional agenda (UNEP/CBD/RW/EBSA/WCAR/1/1/Add.1) and adopted them without any amendments.

13. The meeting was organized in plenary session and break-out group sessions. The meeting Co-Chairs nominated as below rapporteurs for the plenary sessions, taking into consideration the expertise and experience of the meeting participants and in consultation with the Secretariat of the Convention on Biological Diversity and the Regional Coordinating Unit of the UNEP-CEP:

- Agenda item 3 : Ms. Alessandra Vanzella-Khouri (UNEP-CEP)
- Agenda item 4: Pat Halpin (OBIS/SEAMAP)
- Agenda item 5: Jesse Cleary (SCBD Resource Person)
- Agenda item 6: Alessandra Vanzella-Khouri (UNEP-CEP)/ Jeff Ardron (GOBI)

ITEM 3. WORKSHOP BACKGROUND, SCOPE AND OUTPUT

14. On behalf of the CBD Secretariat, Ms. Jihyun Lee gave an overview of the objectives and expected outcomes of the workshop.

15. Mr. Ricardo Santos (GOBI) and Mr. Jeff Ardron (GOBI) provided a presentation on scientific criteria for identifying ecologically or biologically significant marine areas (EBSAs), and scientific guidance of for the application of EBSA criteria.

16. Mr. Pat Halpin (OBIS-SEAMAP) delivered a presentation on “Regional overview of biogeographic information on open ocean water and deep-sea habitats and geographic scope of the workshop”.

17. Ms. Alessandra Vanzella-Khouri (UNEP-CEP) provided an overview of relevant scientific and management programmes at the regional scale.

18. Summaries of the above presentations are provided in annex II.

19. The workshop participants then exchanged and discussed possible issues, concerns and/or opportunities in relation to the global process for describing EBSAs within the regional context of marine biodiversity conservation and sustainable use. The participants noted:

- The Workshop is tasked to describe areas meeting the scientific criteria for ecologically or biologically significant areas (EBSAs) or other relevant criteria based on best available scientific information. As such, the experts at the workshop are not expected to discuss any management issues, including threats to the areas; the EBSA descriptions proposed at the workshop do not entail any obligations or commitments at this stage from any of the countries.
- The identification of ecologically or biologically significant areas and the selection of conservation and management measures is a matter for States and competent intergovernmental organizations, in accordance with international law, including the United Nations Convention on the Law of the Sea (paragraph 26, decision X/29);
- Description of EBSAs can provide useful scientific information/data that can contribute to the work of FAO, regional fisheries management organizations and flag States on vulnerable marine ecosystems, and vice versa;

- The EBSA description process facilitates scientific collaboration and information-sharing at national, subregional and regional levels, as was demonstrated in the national preparatory meeting for description of EBSAs convened in Brazil, with the participation of more than 50 inter-disciplinary marine experts.

20. The workshop participants agreed on the following scope for the workshop, as contained in the map in annex VI, in consideration of the following:

- GOODS biogeographic classification system;
- Unique oceanographic and geological characteristics in the Wider Caribbean region, which require the consideration of coastal waters;
- Ecological connectivity between coastal waters and open-ocean /deep-sea habitats;
- Marine waters within and beyond national jurisdiction of CEP-member countries (except for United States of America, where separate national processes are underway) and Brazil

21. The participants also noted that some Parties invited were not represented at the workshop, and the Secretariat clarified that this was due to lack of nominations or cancellation of travel after their respective experts were selected. As a result, the workshop's description of areas meeting the scientific criteria for EBSAs contains some geographical gaps.

ITEM 4. REVIEW OF RELEVANT SCIENTIFIC DATA/INFORMATION/MAPS COMPILED THROUGH THE CONVENTION'S ECOLOGICALLY OR BIOLOGICALLY SIGNIFICANT MARINE AREA (EBSA) REPOSITORY SYSTEM AND OTHER CREDIBLE, QUALITY-CONTROLLED SOURCES

22. For the consideration of this item, the workshop had before it an information note by the Executive Secretary (UNEP/CBD/RW/EBSA/WCAR/1/2) containing a compilation of the submissions of scientific information to describe ecologically or biologically significant marine areas in the Wider Caribbean and Western Mid-Atlantic region provided by Parties, other Governments and relevant organizations in response to the Secretariat's notification (Ref No. 2012-001, 3 January 2012). The documents/references submitted prior to the workshop were made available for the information of workshop participants on the meeting website (http://www.cbd.int/doc/?meeting=RWEBSA-WCAR-01).

23. Mr. Pat Halpin (OBIS-SEAMPA) provided a presentation on "Review of relevant scientific data/information/maps compiled to facilitate the description of EBSAs in the Wider Caribbean and Western Mid-Atlantic region".

24. Mr. Ben Lascelles (BirdLife International) provided a presentation on "Marine Important Bird Areas (IBAs) and relevant scientific information on sea birds in the Wider Caribbean and Western Mid-Atlantic region".

25. Mr. Fabio Carocci (FAO) presented on "Current and Future FAO Activities on Deep-Sea Fisheries and VMEs in the Wider Caribbean and Western Mid-Atlantic Region".

26. Summaries of the above presentations are provided in annex II.

27. Workshop participants who had submitted scientific information prior to the workshop, as well as those who prepared information during the workshop, using the template provided by the CBD Secretariat in the above notification (Ref No. 2012-001, 3 January 2012) to describe areas meeting EBSA criteria were invited to present the information at the plenary. Presentations were made by Ms. Monica Brick Peres (Brazil), Ms. Joanna Pitt (Bermuda/UK), Ms. Martha Prada (CORALINA), Ms. Raquel Siguenza (Guatemala), Mr. Erik Meesters (Netherlands), Mr. Melvin Miranda (Nicaragua), Ms. Loureene Jones Smith (Jamaica), Mr. David Alonso (Colombia), Mr. Omar Reynoso Morales (Dominican Republic), Mr. Marco Quesada Alpizar (Costa Rica), Mr. Oscar Alvarez Gil (Mexico, on behalf of experts from Honduras, Guatemala and Belize), Mr. Jean Wiener (Haiti), and Ms. Angelique Brathwaite (Barbados, on behalf of experts from St. Lucia, St. Vincent and the Grenadines, St. Kitts and Nevis, and Institute of Marine Affairs of Trinidad and Tobago).

28. Each presentation describing areas meeting EBSAs criteria provided an overview of the areas considered, the assessment of the area against EBSA criteria, scientific data/information available as well as any other relevant information.

29. Mr. Robert Brock informed the meeting of the scientific information made available for the meeting. The workshop participants noted, with appreciation, that the National Oceanic and Atmospheric Administration of the United States of America provided various scientific information from their open-ocean / deep-sea research using the template provided by the CBD Secretariat in the above notification (Ref No. 2012-001, 3 January 2012), which can be readily used by experts from relevant countries when they find them useful for describing areas meeting EBSA criteria.

ITEM 5. DESCRIPTION OF ECOLOGICALLY OR BIOLOGICALLY SIGNIFICANT MARINE AREAS THROUGH APPLICATION OF THE SCIENTIFIC CRITERIA FOR EBSAs (DECISION IX/20, ANNEX I) AND OTHER RELEVANT COMPATIBLE AND COMPLEMENTARY NATIONALLY AND INTERGOVERNMENTALLY AGREED SCIENTIFIC CRITERIA, AS WELL AS THE SCIENTIFIC GUIDANCE ON THE IDENTIFICATION OF EBSAs

30. For the consideration of this item, based on the compilation of scientific information presented under agenda item 4 and building on the presentations describing specific areas meeting EBSA criteria as well as deliberations of the workshop in plenary session, the workshop participants were then split into three sub-regional break-out groups (refer to map in annex VI for the division of sub-regions) to consider the description of EBSAs through the application of the scientific criteria.

- Group 1. Western and Eastern Caribbean (Facilitator: Ms. Georgina Bustamante; Technical support: Mr. Pat Halpin; Rapporteur: Alessandra Vanzella-Khouri)
- Group 2. Southern Caribbean and Brazil (Facilitator: Mr. Eduardo Klein; Technical support: Jesse Cleary; Rapporteur: Judith Gobin)
- Group 3. Northern Caribbean and Sargasso Sea (Facilitator: Ms. Joanna Pitt; Technical support: Mr. Ben Donnelly; Rapporteur: Mr. Jeff Ardron)

Participants were assisted by the technical support team, including GIS operators, who made hard/electronic copies of the maps available for the deliberation of the break-out group discussion.

31. During its break-out group discussion, participants drew approximate boundaries of areas meeting EBSA criteria on a central map as they were completed to keep track of opportunities to extend or merge areas for EBSAs description and to identify areas that had yet to be considered. This process was found to be time-consuming but productive, with country experts increasing their understanding of the data available.

32. Workshop participants decided the following in describing EBSAs:

- areas where description against EBSA criteria was not provided due to lack of sufficient scientific data or analysis but considered by the workshop as important for future consideration, are included in annex V;
- Nesting smaller areas meeting EBSAs criteria is acceptable within larger regional areas meeting EBSAs criteria;
- Categorization of areas meeting EBSAs criteria into different types can be useful for future description of EBSAs;
- Improved connections between EBSA descriptions with surrounding regions outside of the study area are necessary;
- Transboundary proposals can be developed in consideration of the integrity of ecological and biological features;

33. The results of the break-out groups were reported at the plenary for consideration. Workshop participants at the plenary session reviewed the description of areas meeting EBSA criteria proposed by

the break-out group sessions and considered them for inclusion in the final list describing areas meeting EBSA criteria.

34. The workshop participants agreed on descriptions of 22 areas meeting EBSA criteria. The detailed descriptions, as agreed by the plenary, are listed in annex IV and described in its appendix. The map of described areas is contained in annex VI.

35. The workshop acknowledged the description of areas meeting EBSA criteria was based on expert knowledge available at the meeting as well as data compiled prior to the workshop. It was recognized that this description of areas meeting EBSA criteria was a first attempt at the process, and it was recommended that the Secretariat consider ways for organizing future workshops to further consider potential areas meeting EBSA criteria as scientific information and expert knowledge are updated and expanded, as described in annex VII.

ITEM 6. IDENTIFICATION OF GAPS AND NEEDS FOR FURTHER ELABORATION IN DESCRIBING ECOLOGICALLY OR BIOLOGICALLY SIGNIFICANT MARINE AREAS, INCLUDING THE NEED FOR THE DEVELOPMENT OF SCIENTIFIC CAPACITY AND A PROPOSAL FOR FUTURE SCIENTIFIC COLLABORATION

36. Building on the workshop deliberation on describing areas meeting EBSA criteria, the workshop participants were invited to identify, through sub-regional break-out group sessions and open plenary discussion, gaps and needs for further elaboration in describing areas meeting EBSA criteria, including the need for the development of scientific capacity and a proposal for future scientific collaboration.

37. The results of the group discussions, which were presented at the plenary, are contained in annex VII.

ITEM 7. OTHER MATTERS

38. No other matters were discussed.

ITEM 8. ADOPTION OF THE REPORT

39. Participants considered and adopted the workshop report on the basis of a draft report prepared and presented by the Co-Chairs with some changes.

40. Participants agreed that any additional scientific information and scientific references could be provided to the CBD Secretariat by workshop participants within two weeks of the closing of the workshop in order to further refine the description of areas meeting EBSA criteria contained in annex IV and its appendix and annex V.

ITEM 9. CLOSURE OF THE MEETING

41. In closing the workshop, the Co-Chairs thanked the workshop participants for their valuable contributions to the workshop deliberations. The workshop participants thanked the Government of Brazil for their great hospitality and essential support for successfully convening the workshop, the CBD Secretariat for their hard work and efficient support in servicing the workshop, UNEP-CEP for collaborating with the CBD Secretariat in convening the workshop, and the group facilitators, technical support team and rapporteurs for their excellent scientific and technical support. Workshop participants also thanked the European Commission and the Government of Brazil for their financial support in convening the workshop, and the Government of Japan through the Japan Biodiversity Fund for supporting the technical preparation for the workshop. Workshop participants expressed their sincere appreciation to the Co-Chairs for their excellent leadership and guidance in steering the workshop deliberation in a very effective and efficient manner.

42. The workshop was closed at 5:00 p.m. on Friday, 2 March 2012.

Annex I

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Annex II

SUMMARY OF THEME PRESENTATIONS

Annex Item 3

Jihyun Lee (CBD Secretariat)

Ms Jihyun Lee introduced the Convention on Biological Diversity (CBD) as a whole and the programme of work on marine and coastal biodiversity in particular. She outlined the process for describing ecologically or biologically significant marine areas (EBSAs), through which COP 10 called for regional EBSA workshops as well as the process through SBSTTA 16 and COP 11 to which the outcomes of the workshops will be submitted for their consideration and endorsement. She noted the challenges of the diverse, large-scale data, but reiterated the importance of the process in relation to the Aichi Biodiversity Targets, in particular Target 11. She then highlighted the potential benefits of the EBSA process in further strengthening the region's efforts toward marine biodiversity conservation goals, by facilitating scientific collaboration, increasing the awareness, and encouraging countries to apply necessary conservation measures related to EBSAs. She informed the participants of the activities in support of EBSA regional workshops, such as the EBSA global repository and information sharing mechanism, EBSA training manual and materials, and a study on social and cultural criteria for EBSAs. She also provided some examples of previous regional workshops on EBSAs and explained the scale of data compilation undertaken.

Jeff Ardron (GOBI) and Ricardo Serrão Santos (GOBI)

Mr. Ardron explained that the impetus for EBSA development dates back to 1998 and the adoption of the CBD programme of work on marine biodiversity (decision IV/5; operational objective 3.2.b), but that work did not really begin until 2005, culminating in the 2007 Azores workshop where the EBSA criteria were developed, as was MPA network guidance (decision IX/20; annexes I & II). In arriving at these criteria, about 25 different criteria systems were considered, including national systems, regional seas agreements, and international bodies. Mr. Ardron pointed out that the seven EBSA criteria are compatible with the FAO vulnerable marine ecosystem (VME) criteria, except that there is one VME criterion, "structural complexity" which has no EBSA equivalent. Hence identification of benthic EBSAs is likely to be relevant to VME identification as well.

Subsequent to the EBSA and MPA network criteria being adopted by CBD COP 10, Canada and Germany co-financed a workshop in 2009 in Ottawa to develop preliminary guidance on how to operationalize the EBSA criteria. Additionally, in the same year the Global Ocean Biodiversity Initiative (GOBI) produced illustrations of how each criterion could be considered. Other work by GOBI in 2010 and 2011 respectively focussed on an example of seamount EBSA development, and on how dynamic pelagic EBSAs could be identified. Also in 2011, the CBD Secretariat with the financial support of Germany, produced the EBSA prototype repository and EBSA identification training modules.

Patrick Halpin (OBIS-SEAMAP)

Mr. Halpin delivered a regional overview of biogeographic information on open-ocean water and deep-sea habitats and the proposed geographic scope of the workshop, on behalf of himself, Jesse Cleary, Ben Donnelly and Eduardo Klein. This presentation reviewed the general workshop process and the criteria used to define the boundary of the region to be considered by the workshop. Mr. Halpin indicated that the workshop considers two general types of inputs: submissions of potential areas meeting EBSA criteria, and compilation of scientific data and information. The presentation reviewed the criteria and requirements for the workshop boundary, which was designed to cover three distinct ecoregional areas: (1) the Wider Caribbean; (2) the Western Mid-Atlantic; and (3) the Sargasso Sea. The workshop boundaries were related to widely used biogeographic classification systems (GOODS, MEOW, and

LMEs). In addition to biogeographic classification systems, the Western Central Atlantic Fishery Commission (WECAFC) regional fishery body boundary was also assessed in relationship to the criteria for the region.

Alessandra Vanzella-Khouri (Regional Coordinating Unit of UNEP-CEP)

Ms. Vanzella-Khouri provided an overview of the work of the Caribbean Environment Programme, the Cartagena Convention and its Protocols and their relevance to the EBSA process. She outlined the objectives of the Convention for the Protection and Development of the Wider Caribbean (Cartagena Convention) and in particular its biodiversity Protocol on Specially Protected Areas and Wildlife (SPAW). She highlighted that the Convention, the only regional legally binding environmental treaty for the Wider Caribbean, and its Protocols on oils spills, land-based sources of pollution and biodiversity have entered into force. She noted that a number of projects and activities of the SPAW Programme could be very useful for the EBSA process, in particular those producing information on management and status of important habitats and protected species. Also of importance for EBSA could be the SPAW Scientific and Technical Advisory Committee, which meets at least biannually, and the synergies which have been developed with other treaties and initiatives relevant to biodiversity conservation in the Wider Caribbean. Likewise, she noted that information, data and discussions emanating from the EBSA process could be very useful for the objectives of CEP.

She highlighted the following as some of the UNEP-CEP/SPAW activities and programmes that are potentially important for capacity-building, as well as data- and information-sharing for the purposes of EBSAs: the national species recovery plans, such as those developed for sea turtles with WIDECAST; the work of the Caribbean Marine Protected Areas Management Network and Forum (CaMPAM), which includes, *inter alia*, a comprehensive Training of Trainers Programme, a detailed MPA database and grants for strengthening of MPAs management; the coral reef status reports and coral reef valuation studies with the World Resources Institute; the broad-scale marine spatial planning to identify essential habitats, threats and regional-scale migration routes for marine mammals in the Caribbean and provide tools for cross-sectoral spatial planning (under the LifeWeb UNEP-Spain partnership). This includes data and maps on distribution and abundance of 23 species of marine mammals in the Wider Caribbean, which has already been provided to this EBSA process; and the Caribbean Large Marine Ecosystem Project (CLME) (GEF/UNDP/IOC and UNEP) to improve governance of shared living marine resources, initially focusing on five priority trans-boundary fisheries (spiny lobster, shrimp, flying fish, large pelagics, and reef fisheries). This provides an opportunity for the EBSA process to influence and provide inputs to the information management system (IMS) and monitoring & environmental framework that are being developed under the CLME.

<u>Annex Item 4</u>

Patrick Halpin (OBIS-SEAMAP)

This presentation reviewed the compilation of scientific data and information prepared for the workshop. The baseline data layers developed for this workshop closely follow the data types prepared for the Western South Pacific EBSA workshop (Nadi, Fiji, 22-25 November, 2011) to provide consistency between regional efforts. More than 40 data layers were prepared for this workshop. The presentation covered three general types of data: (1) biogeographic data; (2) biological data; and (3) physical data. The biogeographic data focused on major biogeographic classification systems (GOODS, MEOW and LMEs). The biological data portion of the presentation covered a variety of data sources to include data and statistical indices compiled by the Ocean Biogeographic Information System (OBIS). The physical data layers included bathymetric and physical substrate data; oceanographic features and remotely sensed data. Specific information on the data layers is provided in detail in the workshop background document (UNEP/CBD/RW/EBSA/WCAR/1/2).

Ben Lascelles (BirdLife International)

Mr. Lascelles provided a presentation on "Marine Important Bird Areas". He explained that BirdLife International Important Bird Areas (IBA) Programme has for more than 30 years identified priority sites for conservation using standardized, comparable criteria and thresholds. There is considerable overlap between the IBA criteria and EBSA criteria, particularly those related to threatened species, important areas for life-history stages, vulnerability and diversity. He indicated that more details can be found in the background document submitted to the workshop by BirdLife International: "Designing networks of marine protected areas: exploring the linkages between Important Bird Areas and ecologically or biologically significant marine areas".

Marine IBAs (defined on the basis of seabird data) are likely to be strong candidates for the description of, or inclusion within, EBSAs. BirdLife has submitted three kinds of sites to the workshop, all of which would meet one or more of the EBSA criteria: terrestrial seabird breeding colonies – 190 sites of global and regional importance, used by over 5 million birds from 30 species; coastal sites around breeding colonies – 120 sites of global importance, used by 2.5 million birds from 28 species; and pelagic sites for feeding areas and migratory species – 12 sites based on analysis of tracking data held at www.seabirdtracking.org

Mr. Lascelles highlighted that while some sites are used year-round, many are seasonal, being particularly important during the breeding, migration or non-breeding season, making them examples of temporal EBSAs.

Fabio Carocci (FAO)

Mr. Carocci presented on "Current and Future FAO Activities on Deep-Sea Fisheries and VMEs in High Seas". After a short introduction to the process that led the development of the International Guidelines on Deep-sea Fisheries in the High-seas and the establishment of criteria for the definition of Vulnerable Marine Ecosystems (VMEs), three main activities currently under development by FAO and the Western Central Atlantic Fisheries Commission (WECAFC) were introduced: a) the development by FAO of a database to collect, harmonize and disseminate location and information on VME in areas beyond national jurisdiction (ABNJ), with the involvement of regional fisheries management organizations (RFMOs), the fishing industry and the scientific community, with the aim of providing a first version by end of 2012; b) the activities as part of the programme of work of WECAFC, including the establishment of a working group on the management of deep-sea fisheries and the organization of a regional workshop to ensure the long-term sustainability of deep-sea fish stocks in the high seas of the WECAFC competence area; c) the current development of the GEF-funded ABNJ programme, including its component on sustainable fisheries management and biodiversity conservation of deep-sea ecosystems in ABNJ that will complement and further support the application of the Ecosystem Approach.

Mr. Carocci also highlighted the need for synergies in developing the VME database and the EBSA repository and the need to create opportunities for collaboration between FAO and CBD Secretariat. A good example could be the possibility of organizing back-to-back regional workshops in the Indian Ocean in mid-2012.

Annex III

SUMMARY OF THE WORKSHOP DISCUSSION ON REVIEW OF RELEVANT SCIENTIFIC DATA/INFORMATION/MAPS COMPILED FOR THE WORKSHOP

Workshop participants noted with appreciation the technical support engaged through the financial support of the Japan Biodiversity Fund, in providing technical advice and support to the CBD Secretariat and UNEP-CEP in convening this workshop, for data collection, compilation, collation, synthesis and mapping, recognizing the importance of using the best available data to describe and justify areas meeting EBSA criteria. Data includes direct biological data as well as physical data as proxies. Some layers are raw data and some are combined or synthetic. The results of this compilation are contained in the workshop background document (UNEP/CBD/RW/EBSA/WCAR/1/2).

Biological data includes: (1) Distribution of coral reefs, seagrasses and mangroves, (2) Historical whale captures, (3) Catches on commercial pelagic species, (4) Turtle tagging data aggregated by OBIS-SEAMAP, (5) SWOT/WIDECAST nesting beaching, (6) OBIS data (all species, mammals, turtles, shallow species, deep species and IUCN Red List species), (7) Predictions of deep-sea corals, and (8) Important Bird Areas.

Physical data includes: (1) seamounts, (2) vents and seeps, (3) bathymetry (GEBCO), (4) distribution of large submarine canyons, (5) total sediment thickness of the world's oceans and marginal seas, (6) global seascapes, (7) physical ocean climatologies (temperature climatology, salinity climatology, oxygen climatology, nitrate climatology, silicate climatology, phosphate climatology, mixed layer depth climatology, sea surface height, VGPM global ocean productivity, SeaWiFS chlorophyll-a concentration, eddy kinetic energy, sea surface temperature front probability, and summary of currents).

The three sub-regional groups reviewed: (1) the information compiled in the document (UNEP/CBD/RW/EBSA/WCAR/1/2); (2) the submission of proposals on areas meeting EBSAs criteria; and (3) other relevant scientific information submitted. Following are summaries of the sub-regional group discussion:

Group 1. Western and Eastern Caribbean

The group considered all proposals describing areas meeting EBSA criteria, based on scientific information submitted prior to the workshop, as well as a number of areas not originally included in the submission but proposed by participants from a country or a group of countries during the workshop. All the proposed descriptions of areas meeting EBSA criteria were reviewed, mapped, presented and discussed at the plenary. Following are some salient points of the discussion; the full lists of areas considered appear in annexes IV and V.

The participants from the countries of the Mesoamerican Barrier Reef System (MBRS) agreed to describe an area meeting EBSA criteria, which includes the MBRS coral reef system expanded to the oceanic waters of influence, on the basis of an existing boundary already documented by the MBRS initiative (area no. 1).

The participant from Nicaragua proposed that Cayo Miskitos and surrounding waters (area no. 2) be included within the MBRS area. He also proposed to include a triangular area meeting EBSAs criteria, known as Corn Island-Paralelo 82 (area no. 3) in the southern waters of Nicaragua, bordering to the east Seaflower (area no. 10), proposed by Colombia.

The participant from Costa Rica provided the scientific basis for two proposed areas for EBSA descriptions, which are important habitats, one to the north as the largest nesting site for green turtles in the Caribbean (Tortuguero – Barra del Colorado, area no. 4) and a second one to the south (Cahuita-Gandoca, area no. 5), with important coral reefs, mangroves and seagrass beds.

There were four separate proposals to expand and/or combine the proposed areas meeting EBSA criteria for Pedro Bank (Jamaica) and Seaflower (Colombia) (areas no. 6 and 10). One of the proposals included a large transboundary polygon including areas under the jurisdiction of Colombia, Jamaica, Honduras and Nicaragua. There was also a proposal to include the Morant Bank as an individual area or as part of the larger Pedro Bank area. After further discussions the final proposal for the broader Pedro Bank area description did not include the Seaflower but included waters under the jurisdiction of Colombia, Nicaragua, Honduras and Jamaica.

There was also a proposal for Navassa Island and a 12-mile radius to be included as an area meeting EBSA criteria (area no. 7). It was further proposed to extend this area to Parque Jaragua in the Dominican Republic, but this was not agreed by the group given the insufficient scientific information available to support the need to connect both areas.

Description of areas meeting EBSA criteria for the Eastern Caribbean islands (from British Virgin Islands and Anguilla to Tobago) generated many inputs from participants. The group agreed to make the area described larger than originally considered, based on existing information on the presence of important seamounts and cold corals in the eastern boundary, as well as recognized International Bird Areas (IBAs) in some of the islands (area no. 11). The country participants and experts who prepared this proposal recognized the need to consult with those country experts who were not represented at the workshop (i.e., Anguilla, British Virgin Islands, Dominica and Grenada). An attempt was made to contact relevant counterparts and experts from these countries during the workshop but replies were not received. Therefore the group agreed to include the description of this area, noting that further consultation would be required in the ensuing days to receive scientific views for this EBSA description from all countries concerned. It was further agreed that the description of the Saba Bank (area no. 11) would also be included under this larger transboundary area, in addition to being included as a separate area.

A number of proposals were discussed relevant to the biological and ecological importance of the deep habitats of the Cayman trench (including seamounts and hydrothermal vents), based on the scientific information contained in the information presented to the workshop by NOAA. These features, the results of the collision of the Caribbean plate with the North American plate, are the only examples of this type in the entire Caribbean basin. Its depth reaches down to 6000m, and generates habitats along the trench to the east to “Fosa de Oriente” in between Cuba and Jamaica. In addition, an area comprising the oceanic waters of the Cuban EEZ and the Cayman Islands was proposed as an area meeting EBSA criteria: the Cuba-Cayman Oceanic Gyre (area for future consideration no. 1). This type of gyre, although not unique to the Caribbean (there is another large one, the Panama-Colombia Gyre (area for future consideration no. 6), is rare and greatly influences fish and invertebrate larval retention and recruitment to their places of origin and other countries nearby. Both are separated by the Nicaragua Rise and belong to different eco regions, thus having separate roles in larval dispersal and recruitment to coastal populations. Therefore the oceanic waters defined by this gyre, and the entire Cayman trench/trough (area for future consideration no. 5) were considered separate large areas meeting EBSA criteria. They overlap in the map, but should be considered separate areas as they occupy different layers of the ocean realm (the pelagic environment and the sea floor). However, the connection between both is probable, but not yet proven.

The expert from Cuba stated that Cuba would not be prepared at this stage to support any areas for EBSA description in marine areas within their national jurisdiction and EEZ.

Other experts also noted the important morphological and ecological elements in the Jagua Canyon and recommended this also to be further studied for future consideration and eventual description at a later date (area for future consideration no. 13).

The absence of proposed areas meeting EBSA criteria in the Gulf of Mexico was noted as an important gap, considering the known ecological value of areas within it(area for future consideration no. 12). In this context, the participant from Mexico provided the background information for consideration of two areas for EBSA descriptions: the the Laguna Madre estuarine system (area for future consideration no. 3) and the Veracruz Reef System (area for future consideration no. 4).

The areas proposed by BirdLife within Parque Nacional Jaragua in Dominican Republic were also considered by the group. It was proposed that this area for potential EBSA, currently an IBA, should be part of a much larger area for EBSA description that would include the entire Jaragua National Park and the Santuario Marino Arrecifes del Suroeste (area for future consideration, no. 7). The biological significance of this proposal, in particular for bird species, was noted by the representative from the Dominican Republic, who explained he was not yet ready to submit a description of an area meeting EBSA criteria at this stage.

At least two more important areas were discussed as potential areas meeting EBSA criteria. Given the insufficient information at the workshop, however, it was agreed these were priorities for consideration at a later time: 1) the Mona Island Channel, between Hispaniola and Puerto Rico (area for future consideration no. 8), 2) the Cayman trench (area for future consideration no. 5) and the Panama-Colombia gyre (area for future consideration no. 6) in the south-western Caribbean. The latter two potential areas for EBSA description were identified as part of the spatial gaps within the region that need to be further explored.

The expert from Cuba stated that Cuba would not be prepared at this stage to support any areas for EBSA description in marine areas within their national jurisdiction and EEZ. All proposals on areas meeting EBSA criteria agreed by the group were presented and considered by the plenary following the work of the group.

<u>Group 2. Southern Caribbean and Brazil</u>

The group considered all proposals describing areas meeting EBSA criteria, based on scientific information submitted prior to the workshop, as well as a number of areas not originally included in the submission but proposed by participants from a country or a group of countries during the workshop. All the proposed descriptions of areas meeting EBSA criteria were reviewed, mapped, presented and discussed at the plenary. Following are some salient points of the discussion; the full lists of areas considered appear in annexes IV and V.

Región Talud Continental Superior del Sinú (area no. 14) and Región Talud Continental Superior del Magdalena (area no. 15):
The proposed area comprises two separate sections: 1) Sinú upper continental shelf break and 2) Magdalena upper continental shelf brake. The areas meeting EBSA criteria extend from 180m to 3000m depth in the continental break of the north-east Colombian Sea. They are characterized by channels, canyons and seamounts with a high associated biodiversity. Also, communities of deep-sea corals have been registered in both areas. A methane cold-seep exists in the first part of the area. The high naturalness supports the description of both sections as two areas meeting EBSA criteria.

Amazonian – Orinoco Influence zone (area no. 16): The Orinoco River drains an area of 1.1 x 10 6 km^2 within Venezuela (70%) and Colombia (30%) (Lewis 1988). Together with the Amazon, these two major rivers play an extremely important role in transporting dissolved and particulate matter from terrestrial areas to the coasts and open ocean. Their impact is evidenced by the overall extremely high productivity associated with the marine area extending from northern Brazil, through French Guiana, Suriname, Guyana, all the way to Trinidad and Tobago. Associated with this high productivity are high levels of biodiversity inclusive of endangered, threatened and endemic species of sea turtles, marine mammals, invertebrates, fishes and birds. Based on this obvious productivity but also the presence of the longest mangrove stretch along the coast, the group proposes an “Amazonian/Orinoco” run-off along countries north of Brazil: French Guiana, Guyana, Suriname and Trinidad (east coast) in view of its biodiversity, biological ecosystems and productivity.

In regards to the inshore limit, it was proposed to test the feasibility of using either the limit of 2 km from the shoreline or the 10 m depth contour. Detailed discussion took place on whether to incorporate in this large area one of the three northern Brazilian sites described (the Parcel do Manuel Luiz area). However the group decided to keep it separate as it is not a typical "Amazonian" site. There is a distinct and large coral/calcareous algae reef formation in the area, which, is different from the Amazonian area as it is not under a heavy sediment regime. Therefore the group decided to keep the Parcel do Manuel Luiz a distinct area meeting EBSA criteria, as it lies outside of the Amazonian – Orinoco influence zone. Based on the discussions above, the group agreed to omit features in the Venezuelan national seas at this time.

Parcel do Manuel Luiz e Banco do Alvaro (area no. 17)
The group decided not to merge this area with the nearby Amazonian – Orinoco Influence zone (area no. 16) because they considered it very different. It is the least-studied coral/calcareous algae reef environment and in need of geological, oceanographic and population studies. This area harbours many endemic species. It is a stepping stone for Brazilian coral reef species, whose connectivity with southern and Caribbean reefs as well as with sponge bottoms under the Orinoco and Amazon river plumes acts as stepping stones between Caribbean and Brazilian fish fauna. There is also the influence of global warming on coral species, as this area has been affected by El Niño events, perhaps more severely than other areas in Brazil.

Banks Chain of Northern Brazil and Fernando de Noronha (area no. 18)
The Banks Chain of North Brazil and Fernando de Noronha comprises islands and seamounts of different depths. Chains are located within an oligotrophic environment and Fernando de Noronha and Rocas Atoll are seen as a "hotspot" due to the high biodiversity and endemism. The Rocas Atoll has the highest rate of endemism in the region, and Fernando de Noronha has the highest species richness when compared to other Brazilian oceanic islands. The group suggested that coral reefs need to be included in the description of this area. Seamounts and connectivity issues are also to be considered, including the only atoll in southern Caribbean. The group decided to use the 4000m isobath to improve the definition of the area, and this led to the inclusion of other oceanic seamounts. There is also an important turtle area and an important bird breeding area to be considered. The group agreed to extend the boundary to include the feeding areas of breeding birds on Fernando de Noronha, as proposed to cover seamounts and include the coral reef data.

Northeastern Brazil Shelf-Edge Zone (area no. 19)
Considerations were discussed to expand the proposed area to include the canyons (approx. 2000 m depth) and also to include the coastal area (even to extend to the shoreline areas). This is to include the mangroves in terms of their importance in connectivity issues. The coastal bird location is within the mangrove area also. The group decided to extend the boundary in the areas which are proximal to the mangrove areas, i.e. corridors of connectivity.

Atlantic Equatorial Fracture Zone and high productivity system (area no. 20)
The group noted that this area includes a combination of important features such as: (a) the Equatorial Fracture Zone, a prominent geological feature that offsets the Mid-Atlantic ridge central axis, affects deep-water circulation patterns and connects deep habitats of the North and South Atlantic, and east-west Atlantic margins; (b) the seasonal East Equatorial Bloom, which has an "oases" effect on pelagic biota of the central Atlantic and may be a critical source of energy to the deep habitats of the Equatorial Fracture Zone; (c) the St. Peters and St. Paul's Archipelago, whose coastal fauna and flora have high levels of endemism and play a significant role in the fauna dispersal processes in the Atlantic; (d) "hot spots" for life-history stages of different marine organisms, including an array of endangered species; (e) a recently mapped hydrothermal vent field; and (f) benthic habitats heavilydisturbed by human activities but historical pelagic fishing pressure with well documented effects on the abundance of commercially important stocks and large nektonic fauna. The eastern boundary of the area extends beyond the borders defined for this workshop. Therefore this area should be considered for discussion during a future workshop proposed for the southeast Atlantic with a possible redefinition of this boundary. The group

agreed that the Eastern limit should be increased (beyond the geographic extent of the workshop). It was recommended that representatives of this workshop should also attend an EBSA workshop on the other side of the Atlantic in order to continue the discussion.

Abrolhos Bank and Vitória-Trindade Chain (area no. 21)
The group noted the importance of this area in terms of seamounts, coral reefs, fish, and as a hotspot of diversity. Its boundary is well defined, corresponding to the chain of islands. Bird-tracking data shows a big overlap. Trindade petrel feeding areas extend further south, as are those of whales, but there is currently not enough data available on other taxa and habitats to make a complete assessment to extend south. It was noted that the original proposal included the Laminaria Bank, which was missing from the shape file that was extended south to include it. Boundary issues were discussed in terms of depth and consideration of the 4000 m depth limit as the criteria. It was agreed that the limit should extend to the shoreline and include those seamounts that were left out (1 north and 1 south). Some changes were made to the "shape" of the area to include the North Charlotte Bank. Changes were based on the bathymetry (4000 m contour). The group agreed to adjust the boundaries as described above.

Southern Brazilian Sea (area no. 22)
This area is an oceanographic feature that continues south, through Uruguayan waters but the group was limited by the boundaries of the workshop and State of Brazil. The group calls attention to CBD Secretariat to the need to organize another regional workshop in the future together with Uruguay and Argentina to share information to define the southern boundary for this EBSA.
It was noted that Rio Grande Rise (area for future consideration no. 9), a highly ecologically important site, was not considered here because there will be good scientific data to define its boundary during the next few years. The group decided to leave it out until there is more systematic collection of data. This was considered an information gap.

Reference was made to the OBIS map, which also reflects greater diversity here. Expansion to the north was discussed. Considerations were made about the possible correlation of bird occurrences and oceanographic features in order to refine the description of the proposed area.
The issue of using some sort of threshold to apply EBSA criteria was also discussed in order to provide some justifications to the decision to expand/extend one area. Where there were multi-layers of data, the group agreed that "intersection" of the spatial data could be preferred to the union of the data. The group agreed to extend the boundary south.

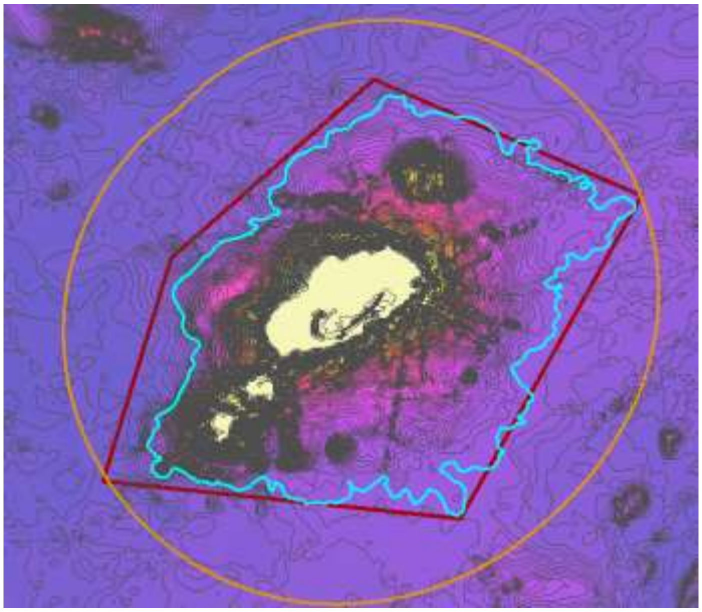
Atlantic Equatorial
The group noted a need to refine the definition of the area. Bird patterns overlap with the area, and the bird sites within it are important (60% world population of great shearwaters passing through area over two months) and therefore critical. the group discussed the possibility of describing the existing IBA as an area for EBSA description. Turtle and shark migrations also occur here. This idea was presented at the plenary and discussed in the sub-regional group. It was concluded that there was difficulty in finding an acceptable way of linking this IBA, which primarily involves the air space, with the oceanic processes below. Hence this site was not taken forward as an area meeting EBSA criteria since air space is not included within the EBSA process.

South-eastern Caribbean Upwelling System (area for future consideration no. 2)
This area is characterized by high biodiversity, with a trench located here, and acts as a carbon sink. Some areas are unique and have an anoxic environment. Much scientific data is available (e.g., oceanography, fisheries) for this area. There are also three national parks within the area. The expert from the Bolivarian Republic of Venezuela proposed that this area be placed on the list of areas for future consideration, as his country was not yet ready to describe this as an area meeting EBSA criteria.

Group 3. Northern Caribbean and Sargasso Sea

The key issue was to describe the inner boundary of the proposed Sargasso Sea area meeting the EBSA criteria. Whilst the outer boundary had been defined through extensive mapping processes and information analysis it became evident that for the purposes of this workshop an inner boundary was required based on ecological factors. Through the group discussions, it was agreed to use the base of the Bermuda Rise, approximated by the 4350 m isobath (blue inner contour, figure 1 below). The rise and the Bermuda Platform are viewed as being ecologically distinct from the Sargasso Sea itself, though clearly they are connected. Simplifying this isobath resulted in a five-sided polygon enclosing the inshore waters and the island of Bermuda. The group agreed that the proposed boundary can provide a good ecological inshore definition to the proposed area for EBSA description.

Figure 1. Inner boundary of the Sargasso Sea area meeting EBSA criteria (red polygon). This was a simplification of the 4350 isobath (light blue) at the base of the rise to the Bermuda Platform. Previously a 50 nm buffer around Bermuda had been used as a provisional inner boundary (orange).



Annex IV

DESCRIPTION OF AREAS MEETING EBSAs CRITERIA IN THE WIDER CARIBBEAN AND WESTERN MID-ATLANTIC REGION AS AGREED BY THE WORKSHOP PLENARY

Number	Areas meeting EBSA criteria (See the detailed description of compiled EBSAs in appendix to Annex IV)
1	Mesoamerican Barrier Reef
2	Cayos Miskitos
3	Corn Island
4	Tortuguero – Barra del Colorado
5	Cahuita – Gandoca
6	Pedro Bank, Southern Channel and Morant
7	Navassa Island
8	Caracol/Ft. Liberté/Monte Cristi (Northern Hispaniola Binational Area)
9	Marine Mammal Sanctuary Banco de la Plata y Banco de la Navidad
10	Seaflower
11	Saba Bank
12	Eastern Caribbean
13	Sargasso Sea
14	La Región Talud Continental Superior del Sinú
15	La Región Talud Continental Superior del Magdalena
16	Amazonian – Orinoco Influence Zone
17	Parcel do Manuel Luiz e Banco do Alvaro
18	Banks Chain of Northern Brazil and Fernando de Noronha
19	Northeastern Brazil Shelf-Edge Zone
20	Atlantic Equatorial Fracture Zone and high productivity system
21	Abrolhos Bank and Vitória-Trindade Chain
22	Southern Brazilian Sea

APPENDIX

AREA NO. 1: MESOAMERICAN BARRIER REEF

Abstract

The Mesoamerican Caribbean Ecoregion extends over 1,000 km along the coastlines of Yucatán Mexico, Belize, Guatemala and Honduras, and supports the second-longest barrier reef in the world, a diverse array of fauna and flora, numerous rich nursery/feeding grounds and oceanic waters important for larval transport and dispersion. The rich resources in the region have important ecological, aesthetic, and cultural value to its inhabitants. Productive fishing grounds support valuable commercial and artisanal fisheries. Millions of tourists, attracted to the sandy beaches and teeming reefs, provide important economic revenue to the people and their governments.

Introduction

The Mesoamerican Reef region comprises over 1000 km of continuous barrier reef considered to be the second-largest in the western Hemisphere. It runs parallel to the coast starting in the northernmost Yucatán peninsula in Mexico, through Belize and Guatemala all the way up to the Bay Islands in Honduras. It is characterized by diverse reef types, including four atolls, thousands of patch reefs, extensive seagrass beds and associated ecosystems. The reef supports a high diversity of corals and fish along with many threatened and endangered species, such as marine turtles, groupers, and manatees.

The northern portion in Yucatan consists of partially submerged fringing reefs and well developed spur and groove formations all the way to Xcalak and Belize. Offshore are three banks/islands: Arrowsmith Bank, Cozumel and Banko Chincorro. In Belize the reef forms the most continuous stretch all along the country up to the Sapodilla Cayes. Guatemala has limited reef development and is dominated by the sediment-resistant coral *Siderastrea siderea*. Honduras has well developed reefs in the Bay Islands and Cayos Cochinos (Wilkinson 2008)

These coastal ecosystems provide invaluable environmental services, such as coastal protection and nursery grounds for juvenile fish and invertebrates. Furthermore, they represent an important natural asset for the fishing and tourism industries.

In 1997 the Tulum Declaration was signed by the governments of the four corresponding countries to jointly conserve and develop sustainable practices on the reef and coastal ecosystem. This initiative focused exclusively on marine protected areas. Later, NGOs developed additional initiatives to include areas that were not legally protected. This allowed oceanic water to be included within the area of influence.

Location

The Mesoamerican Reef is defined by several natural physiographic boundaries that separate it from other areas of the Caribbean. Bordering the western and southern ecoregion boundaries are coastal zones, consisting of white sandy beaches and wetlands. Strong ocean currents between the Yucatán peninsula and the southwest coast of Cuba create a natural boundary that is believed to inhibit larval exchange along the northeastern edge.

Shallow waters of the Campeche bank off the northern tip of the Yucatán peninsula and the Nicaraguan rise off eastern Honduras complete the northern and southeastern boundaries of this area. Within the coastal areas of the Mesoamerican Reef lie an array of distinctive community types, organisms, currents, and ecological processes that interact as a single functional unit. While some marine environmental factors (such as temperature and, to a lesser degree, salinity) are similar within the ecoregion, differences in terrestrial factors, such as rainfall and geology, create several distinct subregions within the area.

Feature description of the proposed area

Subregion I: Northern Quintana Roo

This area includes the northeastern portion of the Yucatán peninsula from Ría Lagartos south to the Tulum coast, including the offshore islands of Cozumel, Isla Mujeres, Contoy, and Arrowsmith Bank Atoll. The northeastern tip of the Yucatán peninsula is an important transitional area between the Caribbean Sea and the Gulf of Mexico, and upwelling produced by the Yucatán Upwelling Zone has a dominant influence in the area.

Seabirds are prolific, and coastal mangrove lagoons (Yalahau, Contoy Island and Chacmochuc) provide ample foraging and nursery areas. Coral reefs are the only locally developed and interesting hard-bottom communities; there are alsodeep-water ahermatypic communities. The resort city of Cancun, including Holbox to the north and Playa del Carmen to south, continues to grow at a phenomenal pace, putting many coastal areas at risk.

Subregion II: Sian Ka'an to Ambergris

This area extends along the eastern Yucatán coast from Tulum south to the southern tip of Ambergris Cay in Belize and includes the large bays of Bahías de la Ascención, Espíritu Santo, and Chetumal. The flat, dry, paleokarst Yucatán coast features magnificent white sandy beaches interspersed with coastal lagoons and an almost continuous fringing reef. Impressive shallow reefs dominated with *Acropora palmata* and *Millepora complanata* are found on the narrow shelf and on the offshore atoll of Chinchorro. The Sian Ka'an bays support some of the largest spiny lobster (*Panulirus argus*) populations remaining in the region. The area supports critical habitat for the endangered West Indian manatee, which thrive in shallow waters around Chetumal Bay.

Historically low human usage has preserved many of the coastal habitats and fishing grounds; however, the current fast pace of development threatens wetlands, beach areas, and coral reef habitats.

Subregion III: Belize Barrier Reef

This area spans nearly the entire Belize shelf from the southern end of Ambergris Cay to the terminus of the barrier reef at the Sapodilla Cays, including the mainland coast and offshore atolls.

The wide Belize shelf contains an impressive assemblage of inshore, mid-shelf, shelf-edge, and offshore coral reef, seagrass, and mangrove habitats, all of which contribute to the region’s high biodiversity. The most unique feature is the barrier reef, the second-longest in the world and the best-developed example of this reef type in the western Atlantic. Also exceptional are the offshore atolls of Lighthouse, Turneffe, and Glovers, which contain pristine shallow lagoons encircled by a halo of reef.

Numerous patch reefs are found throughout the coastal lagoon, as well as rhomboidal-shaped reefs (faroes) and drowned reefs in the deeper southern lagoon where the influence of coastal mountains and rivers becomes more evident.

Subregion IV: Gulf of Honduras

This area extends from Río Grande, Belize across the southern end of the Barrier Reef to the Ulúa River in northern Honduras and includes most of the Gulf of Honduras. The influences of a Caribbean and North American plate boundary are evident through this area, with mountainous terrain and a steeply dipping shelf margin that drops off quickly into the abyssal Cayman Trench. Several large rivers supply significant seasonal pulses of fresh water and support numerous estuarine fishes and invertebrates. Excellent seagrass habitats are found around the Bay of Amatique and luxuriant old growth mangroves line the lower reaches of the Dulce, Temash, and Sarstoon rivers. Deforestation and large-scale farming in the rich alluvial Motagua and Ulúa basins threaten the region by contaminating waterways with sediment, pesticides, and fertilizers.

Subregion V: Northern Honduras Coast

This area spans much of the northern coast of Honduras from the Ulúa River to the Patuca River and includes the offshore Bay Islands.

Located at the “headwaters” of the Mesoamerican Reef, the mountainous northern Honduran coast is characterized by long expanses of sandy beaches interspersed with large rivers, bays, and coastal lagoons. The turbid water near the coast, particularly sediment-laden water from the Aguán River, prevents substantial coral reef development. Significant reef development is only found on the Bay Islands, an archipelago of approximately 200 minor islands and several larger islands (Utila, Roatán, Barbareta, Guanaja, and Cayos Cochinos) that are fringed by well-developed reefs.

Subregion VI: Open Ocean

This large region includes the pelagic waters from the 1000 m contour out to the submerged banks of Rosaria and Misteriosa, and the Swan Islands. Strong westerly currents associated with the Caribbean Current dominate the oceanic areas. This large conveyor belt brings larvae into the region from upstream sources in the central and southern Caribbean and eventually carries larvae out to the downstream Gulf of Mexico and Florida Keys.

The current is mainly west near the Swan islands to coastal areas off central Belize and southern Yucatán, at which point it veers north, reaching a maximum velocity near Cozumel. South of Glovers Reef Atoll, much weaker and more variable currents prevail, leading to much higher residence times and less exchange in the Gulf of Honduras. The submerged platforms of Rosario and Misteriosa Banks as well as the Swan Islands are the only shallow water features in this large area, and their resources are largely unknown.

Feature condition and future outlook of the proposed area

Biodiversity has changed significantly over the past several decades. Manatee populations have drastically declined along the Guatemalan coastal waters due to a long history of commercial and subsistence hunting. Established nesting sites for rare birds like roseate and least terns have disappeared off many of the offshore cays due to human encroachment. The Mesoamerican Reef has a long history as a traditional source of food for subsistence fishing and productive commercial and sport fishing. The intensity and frequency of fishing have increased at an astonishing rate, resulting in the overexploitation of numerous species, including spiny lobster, queen conch, shrimp, grouper, and snapper. Over the last several years, marine fish captures have steadily increased in Guatemala, while there is an overall decline in landings in Mexico, Belize, and Honduras. Declining fisheries are attributed to declining fish populations, overfishing, changing economic circumstances, illegal fishing, destructive fishing methods like gill nets, and lack of enforcement.

The Mesoamerican Reef sustains nearly 2 million people from four neighbouring countries, Mexico, Belize, Guatemala, and Honduras, a large proportion of whom live along the coasts and islands. Millions of tourists, attracted to the sandy beaches and teeming reefs, provide important economic revenue to the people and their governments. (Kramer, P.A. and Kramer, P.R. 2002)

Assessment of the area against CBD EBSA Criteria

<table>
<tr><td rowspan="2">CBD EBSA Criteria
(Annex I to decision IX/20)</td><td rowspan="2">Description
(Annex I to decision IX/20)</td><td colspan="4">Ranking of criterion relevance
(please mark one column with an X)</td></tr>
<tr><td>Don't Know</td><td>Low</td><td>Medium</td><td>High</td></tr>
<tr><td>Uniqueness or rarity</td><td>Area contains either (i) unique ("the only one of its kind"), rare (occurs only in few locations) or endemic species, populations or communities, and/or (ii) unique, rare or distinct, habitats or ecosystems; and/or (iii) unique or unusual geomorphological or oceanographic features.</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td colspan="6">Explanation for ranking
- Largest barrier reef in the Western Hemisphere
- 4 offshore atolls.
- Many fish-spawning aggregation sites for many species, including snapper and grouper
- Threatened and endangered marine turtles (nesting and feeding) and manatees in coastal waters.
- The presence of whale shark in the Mesoamerican Reef ecoregion is associated with their feeding in some of the most productive areas. These areas include the gyre off the coast of Utila island, Honduras, where 35 sharks have been observed; the spawning aggregation site in Gladden Spit, Belize, where 25 individuals have been identified; and lastly the up-welling zone in Holbox, Mexico, which has the largest population of whale shark documented in the world, with 500 individuals recorded to date (Arrivillaga, A. and Windevoxhel, N. 2008).</td></tr>
<tr><td>Special importance for life-history stages of species</td><td>Areas that are required for a population to survive and thrive.</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td colspan="6">Explanation for ranking
- Approximately 22 species of reef fish are known to aggregate in 76 spawning aggregation sites (Arrivillaga, A. and Windevoxhel, N. 2008)
- Coral reef ecosystems are important habitats, nurseries and reproductive areas for many fish, marine mammals and invertebrate species.
- Migration, feeding and nesting sites of 4 species of marine sea turtles (Loggerhead, Green, Leatherback and Hawksbill).
- Distribution of migratory sharks, particularly vulnerable to overexploitation and unregulated trade.
- Extensive seagrass meadows.
- Migration and nesting colonies of several bird species. The coast in this region includes 7 areas recognised as BirdLife Important Bird Areas (IBAs). These sites include around 50,000 breeding individuals of 7 species of seabirds. The EBSA area would incorporate all the key marine feeding grounds for species breeding at these IBAs and would qualify as high for both diversity and importance for life-history stages EBSA criteria on the basis of the seabirds present.
- Larval transport and dispersal through oceanic currents.
- Considered a distinct ecoregion because it conforms to the following general criteria: "a characteristic set of communities that share a large majority of their species, dynamics, and environmental conditions, and interact ecologically in ways that are critical for their long-term persistence" (Dinerstein et al., 1995).</td></tr>
<tr><td>Importance for threatened, endangered or declining</td><td>Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.</td><td></td><td></td><td></td><td>X</td></tr>
</table>

<table>
<tr><td>species and/or habitats</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="6">Explanation for ranking
• Coral such as Acroporids: White band disease decimated huge expanses of Acroporas in the region
• Nassua groupers: A commercial important species, it is now threatened by overfishing.
• Parrot fish: Commercially targeted and threatened by overfishing
• Queen conch: Commercially targeted and threatened by overfishing
• Spiny lobster: Commercially targeted and threatened by overfishing
• West Indian manatees: Habitat loss and food source (illegal hunting) and boat traffic.
- Marine turtles: Habitat loss, eggs harvesting and hunting</td></tr>
<tr><td>Vulnerability, fragility, sensitivity, or slow recovery</td><td>Areas that contain a relatively high proportion of sensitive habitats, biotopes or species that are functionally fragile (highly susceptible to degradation or depletion by human activity or by natural events) or with slow recovery.</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td colspan="6">Explanation for ranking
Coral reefs are very fragile and sensitive to human disturbance, including overfishing, recreation and pollution.
Coral bleaching has affected reefs throughout the Mesoamerican region. In 1998 the most extensive bleaching event was recorded, causing 50 declines in coral cover (Macfield M. Et. al 2005).
Urban expansion is a major threat and a main source of non-point source pollution. Alteration and destruction of wetland due to poor coastal planning practices.</td></tr>
<tr><td>Biological productivity</td><td>Area containing species, populations or communities with comparatively higher natural biological productivity.</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td colspan="6">Explanation for ranking
- Fixation of inorganic carbon by over 300,000 ha of seagrass meadows (Arrivillaga and Windevoxhel 2008). Seven species of segrasses are found in the region (Salgado 2008)
- One of the most important upwelling areas in the Caribbean.
- \in the Gulf of Honduras there are important river drainage systems that add to the productivity of the area.</td></tr>
<tr><td>Biological diversity</td><td>Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td colspan="6">Explanation for ranking
Coral reefs are some of the most diverse ecosystem in the oceans. The Mesoamerican Reef region covers approximately 133,000 ha of coral reef with over 70 species corals and approximately 500 species of fish (Arrivillaga and Windevoxhel 2008).</td></tr>
<tr><td>Naturalness</td><td>Area with a comparatively higher degree of naturalness as a result of the lack of or low level of human-induced disturbance or degradation.</td><td></td><td></td><td>X</td><td></td></tr>
<tr><td colspan="6">Explanation for ranking
Coral cover throughout the region has remained moderately low, with slow or no recovery since the 1998 bleaching event (Mcfield 2005).</td></tr>
</table>

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Maps and Figures

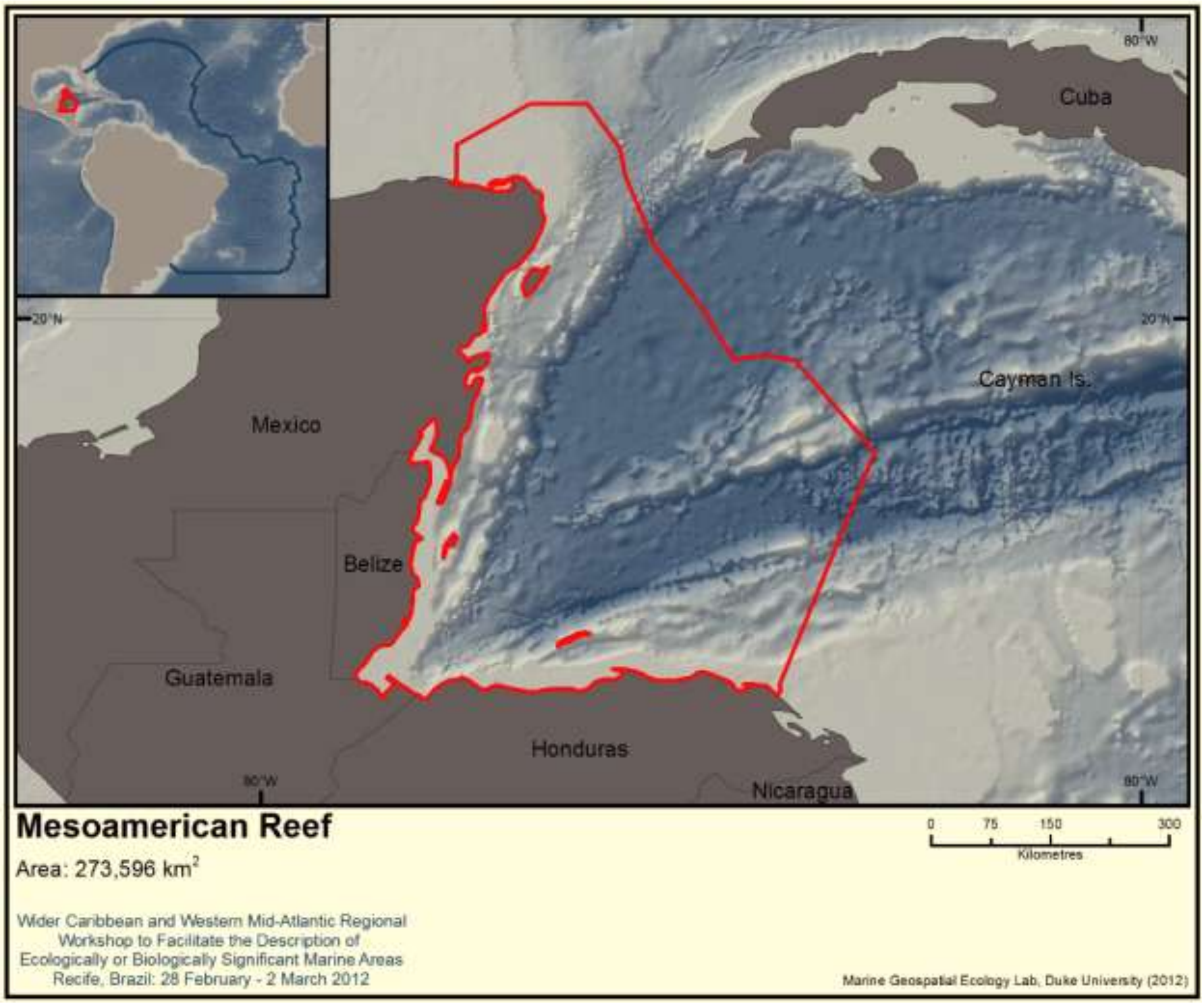

Figure 1. Area meeting EBSA criteria (no. 1)

AREA NO. 2: CAYOS MISKITOS

Abstract

Nicaragua dentro del proceso de definición de Áreas biológicas /ecológicas importantes dentro del CBD-EBSA, ha considerado importante presentar sus áreas marinas cómo áreas biológicas marinas, en este sentido Nicaragua considera importante examinar estas áreas reconocidas mundialmente como conectores de vida marina y áreas de reproducción de especies de importancia ecológica y económica dentro del mar caribe en aguas jurisdiccionales del país.

Nicaragua tiene dentro de su sistema todo un proceso de reconocimiento de estas áreas de importancia biológica y ecológica, no obstante, aun no se conocen los potenciales en zonas de mar afuera, existen datos generales de las importancias de estas zonas y que serán recopilados y presentados en estas descripciones de zonas que cumplan los criterios de EBSA, con apoyo de los expertos internacionales que proveerán datos específicos de las zonas descritas

Otro aspecto que promueve Nicaragua es que las áreas son complementarias con la parte del Sistema Arrecifal de Mesoamérica (México, Guatemala, Belice, Honduras), y por la parte Sur-Este que conecta la zona 2 con los países como Colombia que han desarrollado sus descripciones sobre áreas marinas.

De manera que las presentes descripciones están sustentadas en base a los criterios definidos por el CBD y sugieren las áreas en Nicaragua que son parte de esa conexión natural de especies y condiciones ecológicas de estas áreas.

De manera que las descripciones de Nicaragua están basadas en condiciones naturales y conectividad bilógica y ecológicas de las áreas descritas, con áreas de países vecinos o definidos dentro de sistemas de manejo y que cumplan con los criterios de EBSA.

Location

Lat: 14°25'42.14"N
Long: 82°47'6.72"O

Feature description of the area which meets the EBSA criteria.

Área bajo esta dentro del Sistema de Áreas Protegidas de Nicaragua, cuenta con reconocimiento por parte de RAMSAR, y es reconocido como IBA´s(bird life internacional) definiendo el área de cayos Miskitos y paisajes terrestres en 512 has. cuenta con áreas naturales de pastos marinos(Thalassia testudinum), que son el alimento de Tortugas Marinas y brindan protección a especies en etapa larvaria y juveniles Peces Se estima que hay por lo menos 300 especies de peces (Anexo 2), esqualiformes y rayas que habitan las aguas de las Regiones Autónomas(Herrera,1984; PAANIC, 1993). Además, se han identificado unos 120 peces que habitan los arrecifes de coral .Actualmente, se explotan menos de 5% de esas especies. Entre estas especies tenemos los pargos (Lutjanidae), meros (Serranidae), róbalo (Centropomidae) y los tiburones (Charcharhinidae).

Los invertebrados representan el grupo que tiene el valor económico y ecológico más alto en las Regiones Autónomas. Otras especies que tienen un alto valor económico son los camarones de la familia Penaedae (Penaeus schmitii, P. duorarum, P. aztecus), la langosta (Panulrus argus), cangrejos (Callinectes spp), caracol (Strombus gigas), y los cefalopodos (Lolliguncula brevis, Doryteuthis plei, Loligo pealei). Tortugas Hay 4 especies de tortuga marina que frecuentan las aguas de la plataforma continental. Aunque la tortuga verde (Chelonia mydas) la tora (Dermochelys coreacea), la tortuga carey (Eretmochelis Imbricata) y la tortuga hicatee (Pseudemy sp). está seriamente amenazada, se estima que de todos (aproximadamente 70,000) los quelonios en el océano Atlántico y el mar Caribe, aproximadamente 80% viven en la plataforma Nicaragüense (Carr et al,1984), alimentándose en las abundantes praderas de Thalassia, Aves En recientes estudios realizados por el proyecto GEF, recopilaron un listado total de 673 especies de aves a nivel nacional, las cuales se encuentran distribuida en 59 familias.

La plataforma continental Nicaragüense tiene una extensión desde la desembocadura del río San Juan en el sur, hasta la del río Coco en el Norte, proyectándose al este con aproximadamente 54,000 km^2 de superficie en una sucesión de bancos y cayos.

Assessment of the area against CBD EBSA Criteria

<table>
<tr><td>CBD EBSA Criteria</td><td>Description</td><td colspan="4">Ranking of criterion relevance
(please mark one column with an X)</td></tr>
<tr><td>(Annex I to decision IX/20)</td><td>(Annex I to decision IX/20)</td><td>Don’t Know</td><td>Low</td><td>Med-ium</td><td>High</td></tr>
<tr><td>Uniqueness or rarity</td><td>Area contains either (i) unique (“the only one of its kind”), rare (occurs only in few locations) or endemic species, populations or communities, and/or (ii) unique, rare or distinct, habitats or ecosystems; and/or (iii) unique or unusual geomorphological or oceanographic features.</td><td></td><td></td><td>x</td><td></td></tr>
<tr><td colspan="6">Explanation for ranking
Las zonas cayos Miskitos con sus cayos arrecifes, manglares y ambientes lagunares albergan especies endémicas, y especies migratorias muy importantes para la diversidad ecológica y biológica del Caribe, son zonas de anidación de especies importantes y en peligro de extinción.
Esta región marítima, famosa por la extensión de sus arrecifes coralinos y por poseer una de las áreas más importantes para la alimentación de la Tortuga Verde Chelonia mydas, no ha sido explorada todavía.</td></tr>
<tr><td>Special importance for life-history stages of species</td><td>Areas that are required for a population to survive and thrive.</td><td></td><td></td><td>x</td><td></td></tr>
<tr><td colspan="6">Explanation for ranking
Explicación para la clasificación: La zona marino costera que cumple con los criterios de EBSA- Cayos Miskitos son áreas de importancia en la etapa de reproducción, anidación y alimentación de especies de importancia biológicas.
Sustenta un conjunto/ensamble apreciable de especies o subespecies de fauna o flora raras, vulnerables o amenazadas, o una cantidad apreciable de individuos de una o más de estas especies. Es de valor especial para mantener la diversidad genética y ecológica de una región a causa de la calidad y peculiaridades de su flora y fauna. Es de valor especial como hábitat de plantas o animales en un periodo critico de sus ciclos biológicos.</td></tr>
<tr><td>Importance for threatened, endangered or declining species and/or habitats</td><td>Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.</td><td></td><td></td><td>x</td><td></td></tr>
<tr><td colspan="6">Explanation for ranking
Es un ejemplo representativo especialmente bueno de un humedal natural o casi natural, característico de la región biogeográfica en donde se encuentra; Es un ejemplo representativo especialmente bueno de un humedal natural o casi natural, común a más de una región biogeográfica. Es un ejemplo representativo especialmente bueno de un humedal que desempeña un papel hidrológico, biológico o ecológico significativo en el funcionamiento natural de una cuenca hidrográfica o sistema costero extensos, especialmente si es Transfronterizo.</td></tr>
</table>

<table>
<tr><td>Vulnerability, fragility, sensitivity, or slow recovery</td><td>Areas that contain a relatively high proportion of sensitive habitats, biotopes or species that are functionally fragile (highly susceptible to degradation or depletion by human activity or by natural events) or with slow recovery.</td><td></td><td></td><td>x</td><td></td></tr>
<tr><td colspan="6">Explanation for ranking
Esta Zona está constituida por una mezcla de ecosistemas marinos y costeros con sistemas de humedales continentales costeros, lo que genera un ámbito de ecosistemas sumamente diverso. Esta alta biodiversidad tiene gran importancia local al mismo tiempo por ubicarse en un extremo de un sistema de corrientes de la sub-cuenca del caribe sur de Centroamérica. Es un ecosistema clave para la repoblación y salud genéticas de innumerables especies marinas.</td></tr>
<tr><td>Biological productivity</td><td>Area containing species, populations or communities with comparatively higher natural biological productivity.</td><td></td><td></td><td>x</td><td></td></tr>
<tr><td colspan="6">Explanation for ranking
El Humedal Cayos Miskitos y Franja Costera Inmediata, conserva numerosas especies en peligro y amenazadas de extinción como la tortuga marina (Chelonia mydas), el caimán de la costa (Crocodilus acutus), el pavón (Crax rubra) el tigrillo (Felis pardalis), El tigre rojo (Felis onca), el perro de agua (Lutra longicauda) el manatí (Trichechus manatus), Pancho galán (Jabiru mycteria), la lapa verde (Ara ambigua). Debido a lo cual se aplica el criterio.
Además, ofrece un hábitat importante para la reproducción y desarrollo de numerosas especies de importancia ecológica y económica tanto local como internacionalmente.
La zona de Cayos Miskitos incluye dos especies de delfines de agua dulce (mamíferos marinos del género Sotalia pluviatilis) que son de gran importancia por su distribución interrumpida en La región. Además, la zona es de gran importancia para peces de valor comercial del género Ludjanus spp. (Pargos), así como Meros (Epinephelus spp.), Robalos (Centropomus spp.) cuyas poblaciones se cree son migratorias, se supone que desovan en las lagunas de la zona.
Especies de arrecifes de coral con valor comercial potencial asociado, por ser las lagunas costeras, los arrecifes de coral y las praderas de fanerógamas marinas además de los manglares, todas éstas, se consideran áreas importantes de reproducción.</td></tr>
<tr><td>Biological diversity</td><td>Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.</td><td></td><td></td><td></td><td>x</td></tr>
<tr><td colspan="6">Explanation for ranking
Dentro de la zona marino Costera, descrita existe una diversidad de ambientes costeros marinos que se intercalan entre sí; 10 de los 11 tipos descritos para humedales
Marinos, 8 tipos de humedales de aguas dulces y un tipo de humedal artificial. Estos en la actualidad al no estar frecuentemente intervenidos por el hombre mantienen un equilibrio natural casi inalterado, lo que lo ubica entre las áreas costeras y marinas biológicamente más rica en la América Tropical.</td></tr>
<tr><td>Naturalness</td><td>Area with a comparatively higher degree of naturalness as a result of the lack of or low level of human-induced disturbance or degradation.</td><td></td><td></td><td></td><td>x</td></tr>
<tr><td colspan="6">Explanation for ranking
El área aun presenta características aun naturales, es poca la presión sobre el mangle y especies</td></tr>
</table>

de flora marino costero, las acciones de las comunidades indígenas están teniendo presión sobre los ecosistemas marinos y especies de alto valor comercial, los demás elementos del sistema arrecifal se encuentran en un estado optimo y que aun podemos desarrollar acciones de conservación orientados a la sostenibilidad del área en mención.					
Other Criteria					
Añadir criteriospertinentes	Territorios Indígenas con reconocimientos del territorios por parte del estado				x

Maps and Figures

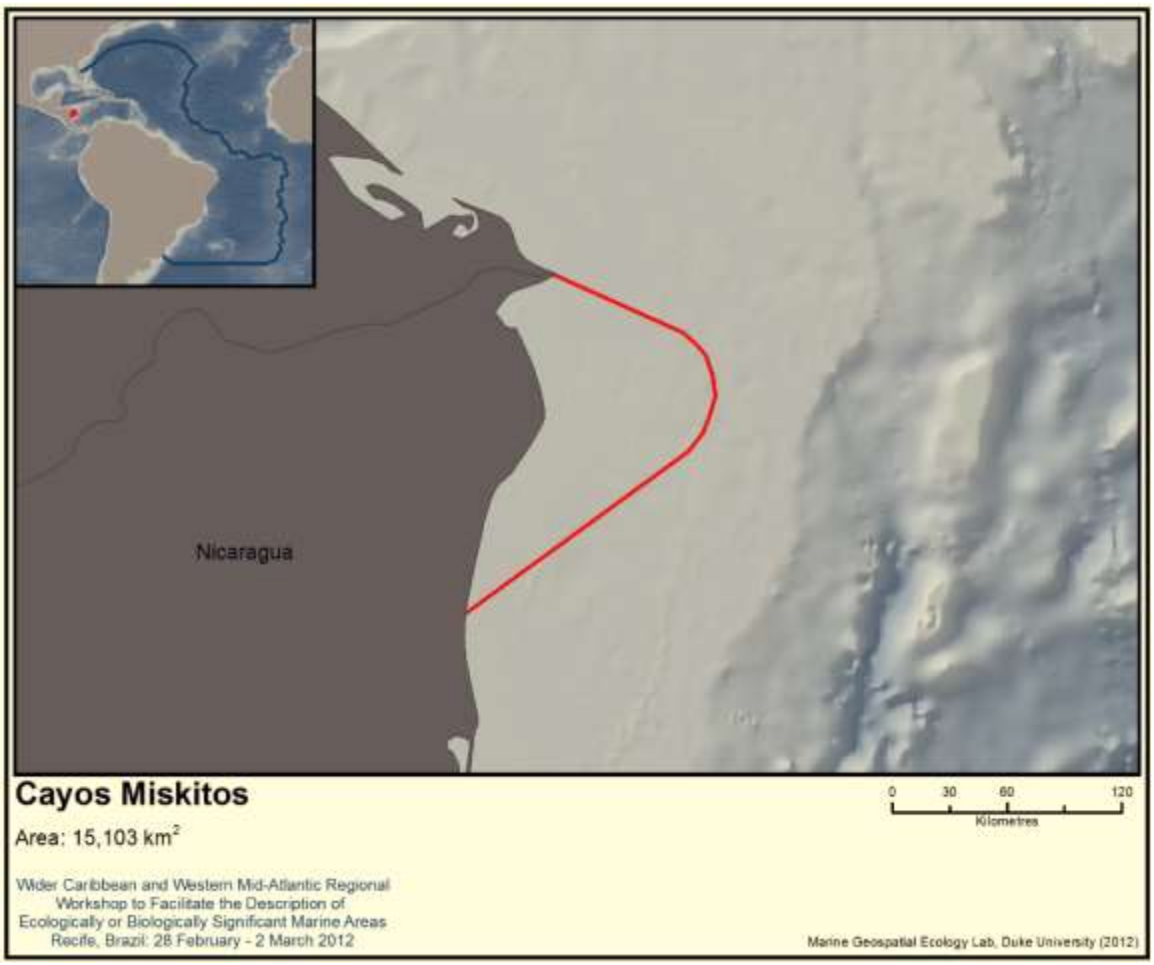

Figure 1. Area meeting EBSA criteria (no. 2)

AREA NO. 3: CORN ISLAND

Abstract

La zona que cumple con los criterios de EBSA —Corn Island —viene articulado a la idea de conexión biológica y ecológicas de áreas en Nicaragua y que siguen un patrón similar al presentado por países vecinos, en función de la características naturales del área en mención.

Moviéndose hacia el mar, la plataforma desciende bruscamente a profundidades de más de 1.000 m., donde hay varios volcanes salpicados en las planicies del abismo (Kjerfve 2001). Sin embargo, pocos de estos volcanes llegan a la superficie del Mar Caribe.

La temperatura de la superficie del mar a lo largo de la plataforma continental de Nicaragua es generalmente constante en diferentes lugares y varía temporalmente sólo de 2 a 3º C.

Debajo de la superficie, la estructura del agua está altamente estratificada en los 1.200 m. superiores; débilmente estratificados entre los 1.200 y 2.000 m. y uniforme debajo de los 2.000 m. Esta estratificación está directamente relacionada a la poca profundidad de los pasajes entre las Antillas Menores, que funcionan como umbrales e impiden el flujo de aguas profundas al Caribe (Gordon 1967; Gyory et al., 2005a).

Durante un estudio de campo de las características oceanográficas de la plataforma de Nicaragua, realizado en 1976, Robert & Murray (1983) midieron perfiles de temperatura y salinidad a través de la plataforma desde Punta Perlas hacia el este hasta el margen de la plataforma, La distribución de temperaturas a través de la plataforma muestra una estratificación significativa.

Corrientes del Caribe:

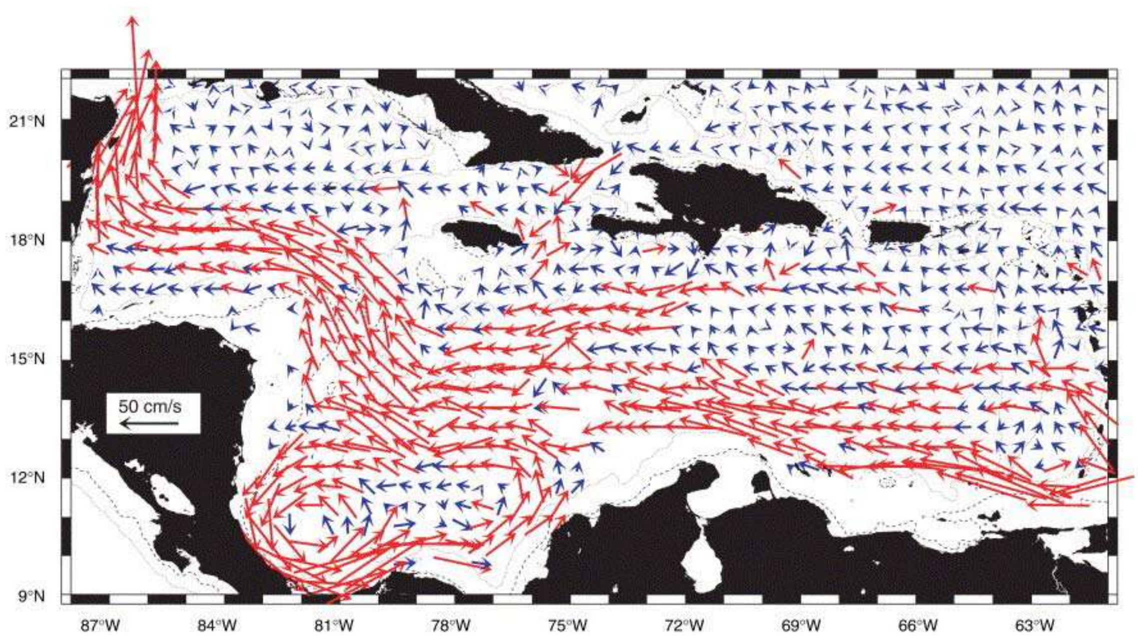

Figure 1.

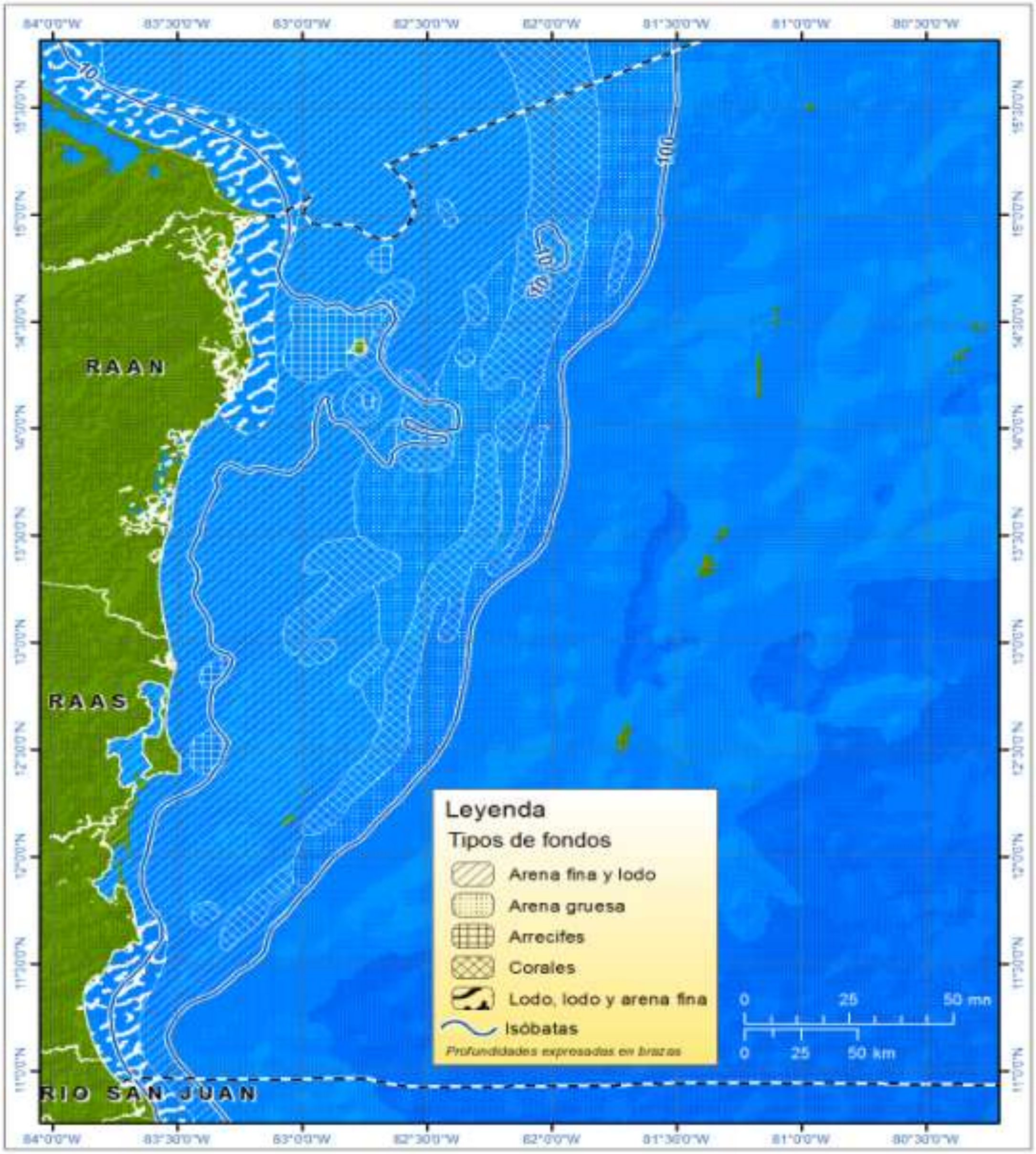

Figure 2. Grafica Inpesca 2010

El Caribe, incluida la plataforma continental de Nicaragua y las aguas de pendiente, están dominadas por los vientos alisios hacia el noreste. Los vientos típicos soplan del este al noroeste a velocidades que van de 6-9 m./s, persistentemente más fuertes de diciembre a marzo y menos persistentes y fuertes en abril a marzo y octubre a noviembre (Figura 5-19; Murray et al. 1982). Sin embargo, los vientos más fuertes en la zona suroeste del Caribe ocurren durante el paso de los huracanes desde Agosto a Octubre. Los huracanes se propagan regularmente del este al oeste a lo largo de la plataforma continental y tocan tierra a lo largo de la costa caribeña de Nicaragua (Figura 5-20).

Durante los huracanes los vientos pueden llegar a velocidades de más de 70m/s, en el caso del Huracán Félix, tocó tierra ligeramente al sur de la frontera entre Honduras y Nicaragua con una categoría máxima de 5 en la escala de huracanes de Saffir-Simpson con vientos sostenidos de 72 m/s. La frecuencia de tormentas tropicales/huracanes es de menos de 20 por siglo para la zona entre Corn Island y Little Corn Island y la frontera entre Nicaragua y Honduras (Gentry 1971).

Hay información general sobre la biología de aproximadamente 300 especies de peces que viven en el medio ambiente poco profundo del Caribe de Nicaragua (INPESCA 2004, Ryan 2003); La información sobre peces de aguas profundas fue Recopilada recientemente (Pasenic-INPESCA 2008) a lo largo de la

pendiente de la plataforma continental especies de pargo (lutjanidae) especies de mero Contribuyeron al segundo grupo más grande de peces de aguas profundas capturados. Todas las especies se encuentran a través del Caribe todas las especies están relacionadas con un sustrato de aguas profundas específico (hábitat) y cada especie aparentemente tiene una relación estrecha con su hábitat, en lugar de peces que nadan constantemente, como los pelágicos.
Especies características de la zona:

Principales Especies:

No.	1. SNAPPERS	NOMBRE COMUN	Longitud Total (cm) Minima	Promedio	Maxima
1	*Lutjanus vivanus*	Silk snapper (Yelloweye)	18.5	34.10	90.0
2	*Ocyurus chrysurus*	Yellowtail snapper	21.0	35.2	62.0
3	*Rhomboplites aurorubens*	Vermillion snapper (Liner)	18.0	28.7	72.0
4	*Lutjanus buccanella*	Blackfin snapper	19.0	31.5	65.5
5	*Lutjanus synagris*	Lane snapper (Path)	17.0	27.4	44.0
6	*Lutjanus analis*	Mutton snapper	27.0	51.1	78.0
7	*Lutjanus jocu*	Dog snapper	30.5	59.6	83.0
8	*Lutjanus purpureus*	Red snapper	25.0	58.4	88.0
9	*Lutjanus apodus*	Yellow snapper	26.5	35.9	75.0
10	*Lutjanus cyanopterus*	Cubera snapper	27.0	73.9	126.0
11	*Lutjanus griseus*	Gray snapper	29.0	57.2	84.5
12	*Etelis oculatus*	Queen snapper	35.0	55.0	70.0

No.	2. GROUPERS	NOMBRE LOCAL	NOMBRE COMUN	Lt Min	Lt Prom	Lt Max
1	*Epinephelus niveatus*	Snowy	Snowy grouper	16.0	53.0	78.0
2	*Mycteroperca bonaci*	Rockfish / Black grouper	Black grouper	34.0	82.0	128.0
3	*Epinephelus morio*	Red grouper	Red grouper	27.5	55.0	82.0
4	*Mycteroperca venenosa*	Fireback	Yellowfin grouper	29.0	59.4	80.0
5	*Epinephelus adscensionis*	Rock Hind	Rock Hind	25.5	36.0	50.0
6	*Cephalopholis fulva*	Butter fish	Coney Seabass	20.0	27.9	42.0
7	*Epinephelus striatus*	Nassau	Nasssau grouper	22.0	65.9	91.0
8	*Mycteroperca interstitialis*	Yellow mouth grouper	Yellow mouth grouper	28.0	47.2	68.0
9	*Epinephelus mystacinus*	Misty grouper	Misty grouper	16.0	49.0	83.0
10	*Epinephelus flavolimbatus*	Yellowedge	Yelllowtail edge grouper	17.0	49.8	92.5
11	*Epinephelus itajara*	June fish	Jew fish	102.0	126.6	152.0
12	*Epinephelus guttatus*	Red hind	Red hind	39.0	39.0	39.0
13	*Epinephelus nigritus*	Warsaw	Warsaw grouper	107.0	116.5	126.0

No.	3. GRUNT	NOMBRE LOCAL	NOMBRE COMUN	Lt Min	Lt Prom	Lt Max
1	Haemulon plumieri	Grunt	White Grunt	16.5	24.9	33.5
2	Haemulon album	Margate	White Margate	26.0	40.9	72.5
3	Haemulon flavolineatum	Yellow grunt	French grunt	22.0	24.2	26.5

4	Haemulon aurolineatum	Ronco	Tomtate grunt	21.0	23.4	25.0
5	Haemulon macrostomum	Ronco bocon	Spanish grunt	26.5	26.5	26.5

No.	4. JACKS	NOMBRE LOCAL	NOMBRE COMUN	Lt Min	Lt Prom	Lt Max
1	Seriola rivoliana	Amberjack	Almaco jack	31.0	66.5	112.5
2	Caranx bartholomei	Jack	Yellow jack	28.5	46.6	94.0
3	Caranx ruber	Jack	Bar jack	34.0	44.8	65.5
4	Seriola zonata	Amberjack	Amberjack	80.0	84.8	93.0
5	Caranx hippos	Jack	Jack Horse head	46.5	66.2	88.0
6	Caranx lugubris	Black jack	Jurel negro	55.0	65.0	72.5
7	Caranx crysos	Jack	Blue runner	26.5	27.0	27.5
8	Seriola dumerlii	Amberjack	Amberjack	83.0	92.4	104.0
9	Elegatis bipinnulata	Jack	Rainbow runner	61.0	61.0	61.0

Treinta y cuatro especies de mamíferos marinos, que comprenden tres órdenes (cetacea, sirenia y carnívora), migran durante las estaciones a través de la Región del Gran Caribe (WCR) (UNEP, 2001) camino a áreas más frías de alimentación en los mares polares.
Existe poca información sobre la distribución de corales de aguas profundas en las aguas nicaragüenses y la poca información recopilada de los buzos de langosta y corales negros indica que los corales negros amenazados son abundantes ("como árboles en un bosque") en aguas entre 30 y 60 metros de profundidad.

Location
Lat: 12° 6'37.61"N
Long: 82°20'28.77"O

Assessment of the area against CBD EBSA Criteria

CBD EBSA Criteria	**Description**	**Ranking of criterion relevance** (please mark one column with an X)			
(Annex I to decision IX/20)	(Annex I to decision IX/20)	**Don't Know**	**Low**	**Med-ium**	**High**
Uniqueness or rarity	Area contains either (i) unique ("the only one of its kind"), rare (occurs only in few locations) or endemic species, populations or communities, and/or (ii) unique, rare or distinct, habitats or ecosystems; and/or (iii) unique or unusual geomorphological or oceanographic features.			**X**	
Explanation for ranking Se considera que estas áreas tienen información básica en el Instituto Nacional de Pesca y Acuicultura (INPESCA) de datos obtenidos y que por lo tanto no se podría descartar su					

<table>
<tr><td colspan="6">importancia biológica o ecológica para especies identificadas en el área descrita sin embargo se reconoce que el hábitat de especies en esta zona coinciden con especies del caribe para especies dentro del fin del talud continental en las mismas condiciones y hábitat.</td></tr>
<tr><td>Special importance for life-history stages of species</td><td>Areas that are required for a population to survive and thrive.</td><td></td><td></td><td>X</td><td></td></tr>
<tr><td colspan="6">Explanation for ranking
La presencia de especies que son consideradas de aguas profundas son aspectos a considerar en el proceso de descripción del Área ya que interactúan diferentes especies de peces bentónicos y demersales.
Las aguas del Caribe se caracterizan por poseer una elevada diversidad en lo referente a fauna marina, hasta la fecha se han encontrado 1,830 especies de peces, de los cuales 786 son considerados comerciales, o sea, aptos para consumo, de estos, en nuestro país se tienen identificados y clasificados 308 peces, de los cuales se han seleccionado los más abundantes tanto en las capturas como en los viajes de investigación que habitan en su gran mayoría en la zona de manglares, zona costera y en el área de la plataforma continental.(guía de identificación de peces marinos de Nicaragua, Mar caribe).

el área en general del Gran Caribe, presenta características muy similares en su zona costera y marina, al igual que en la distribución de sus recursos pesqueros, tanto pelágicos como demersales, lo cual implica una mayor concentración de actividades sobre los mismos.</td></tr>
<tr><td>Importance for threatened, endangered or declining species and/or habitats</td><td>Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.</td><td></td><td>x</td><td></td><td></td></tr>
<tr><td colspan="6">Explanation for ranking
Aun no se conocen datos de situaciones de las especies que habitan en esta zona, pero el incremento de la pesca constituye un elemento a tomar en cuenta en el momento de determinar áreas con peligro en sus hábitat o a especies sobre capturadas.
En el caso de los recursos pelágicos, Venezuela desembarco más de 5 millones de
Kilogramos, seguida por Nicaragua y Quintana Roo con 729 mil y 461 mil kilogramos respectivamente.
En todo caso, la información local, nacional y regional disponible sobre labiología y dinámica de los recursos, al igual que la distribución en laplataforma es un vacío que habrá que llenar en su momento, haciendo uso dela información que países como México y Colombia disponen al respecto.
Sin embargo, su importancia radica en la potencialidad que estos representan como stocks aprovechables y la significancia social y económica que tienen para las poblaciones ribereñas, las cuales no tiene acceso a los mismos por falta de la tecnología adecuada y el conocimiento de los métodos de captura.
Esto puede ser considerado un caso especial por la alta migratoriedad de estos recursos es una causa natural para que existe una conexión con las actividades y problemas Transfronterizos de otros países continentales e insulares, en donde la fuerte explotación de especies pelágicas ha repercutido en las tallas y abundancia de los stocks pescables, afectando – muy probablemente - la abundancia y disponibilidad de estas especies en los
Países que menos los aprovechan.</td></tr>
<tr><td>Vulnerability, fragility, sensitivity, or slow recovery</td><td>Areas that contain a relatively high proportion of sensitive habitats, biotopes or species that are functionally fragile (highly susceptible to</td><td></td><td></td><td>X</td><td></td></tr>
</table>

	degradation or depletion by human activity or by natural events) or with slow recovery.				
Explanation for ranking Aun no se conoce el comportamiento de especies y hábitat después de huracanes y eventos relacionados al cambio climático se podría tomar en cuenta al momento de su análisis,. El tema de Cambio Climático sobre especies marinas esta comprobado que tienen efectos negativos sobre su biología y condiciones ecológicas de las especies, es necesario que las áreas de ZEE de los países definan de acuerdo a las recomendaciones científicas definan acciones para esta zonas. Los cambios de temperatura en el mar están generando impacto a la biología de especies y los ecosistemas están siendo modificados.					
Biological productivity	Area containing species, populations or communities with comparatively higher natural biological productivity.			**x**	
Explanation for ranking Estudios revelan que estas áreas de profundidades albergan vida marina de importancia para el caribe y constituyen elementos económicos importantes por su conexión biológica y ecológica. De manera que constituye un área de interés científico para el país y se están comenzando a realizar estudios que están siendo desarrollados por el instituto de la pesca y están proponiendo acciones puntuales en aras incidir en zonas de aguas profundas.					
Biological diversity	Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.			**X**	
Explanation for ranking Aun no se conocen a detalles datos de diversidad biológica y que este podría ser un elemento de estudio de estas áreas donde confluyen elementos como corrientes marinas y la conexión de especies de ambos lados del caribe y el atlántico. Las condiciones físicas propias de la zona costera de la Sub-Región Centro/Sur América, caracterizada por una costa de alta energía, en donde los vientos del norte y del noreste se mantienen durante todo el año, hace que las pesquerías costeras sean ejecutadas principalmente por flotas industriales, sobre las especies de mayor valor; la pesca artesanal es realizada principalmente en las lagunas costeras y en las zonas bajas de los arrecifes de coral.					
Naturalness	Area with a comparatively higher degree of naturalness as a result of the lack of or low level of human-induced disturbance or degradation.			**x**	
Explanation for ranking Consideramos que la parte de naturalidad de la zona descrita es relativamente alta, ya que la presencia de humanos es baja en comparación a zonas marino costeras, pero constituye áreas de pesca de especies biológicas importantes para la industria pesquera.					
Other Criteria					
Añadir criterios pertinentes	Áreas de interconexión oceánicas				x
Es importante destacar que el área descrita contiene las mismas características de las zonas protegidas por países vecinos y que se podrían articular esfuerzos en función de las condiciones naturales, biológicas y ecológicas de la zona que cumpla con los criterios de EBSA donde se podrían articular esfuerzos en función de datos y acciones de conservación coordinada de las					

áreas descritas.
De manera que es importante Explorar el rango de profundidad de Las embarcaciones deben realizar sus operaciones de pesca en profundidades mínimas 60 metros sin interactuar con otras pesquerías establecidas hasta los 800 metros (talúd de la plataforma) Iniciando en los 11º 00´ 00” Norte 83º 30´00” Oeste en parte sur hasta la altura de los 15º 00´00” Norte 82º 00´00” Oeste.

Tensores Ambientales de la pesquería:
Destrucción de la biodiversidad marina, provocada por el uso irracional del sistema de pesca de arrastre que practica la pesca industrial. Esto implica captura irracional de especies.

- Destrucción de manglares para el cultivo de Camarón.
- Desequilibrio de sistemas de reproducción de especies en peligro de extinción por tener ciclos de vida muy largo y su reproducción es lenta.

Por incumplimiento de vedas para diferentes especies, sumado a la falta de estudios técnico científicos y normativas que orienten los permisos/licencias de operaciones y al mismo tiempo contribuyan al efectivo control para asegurar la conservación y el desarrollo sostenible de los recursos hidrobiológicos.

- Contaminación del recurso suelo y agua con derivados de petróleo utilizados en las embarcaciones.
- Contaminación de cuerpos de agua con desechos sólidos y líquidos del proceso productivo de la actividad pesquera.
- Contaminación del recurso suelo en alrededores de la playa y muelles, con residuos de las diferentes especies procesadas.
- Pesca ilegal de países vecinos.

Maps and Figures

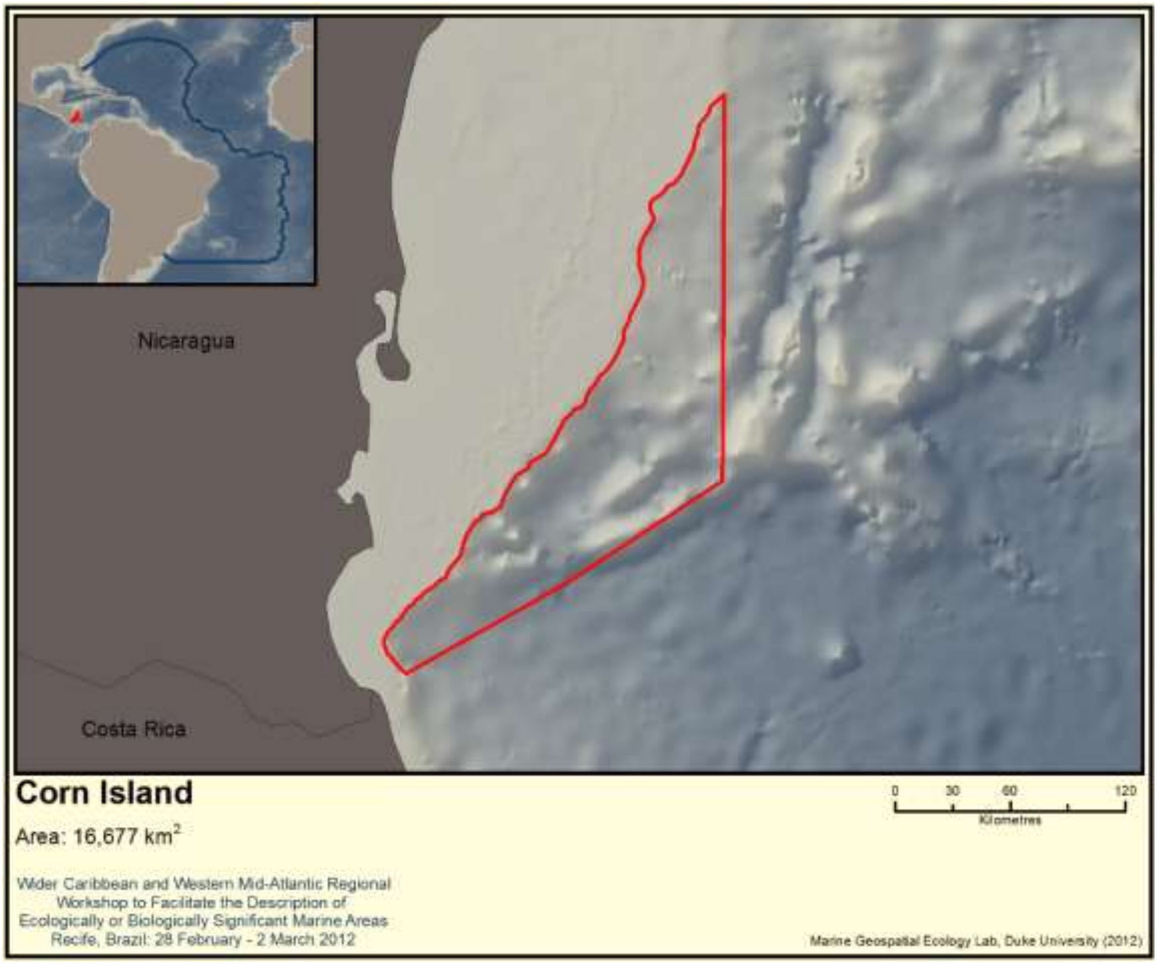

Figure 3. Area meeting EBSA criteria (no. 3)

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- hftp://ftp.fao.org/docrep/fao/010/i0027s/i0027s00.pdf.
- http://www.inpesca.gob.ni/index.php?view=article&catid=45%3Aimage-news&id=102%3Afao&format=pdf&option=com_content.
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- http://www.inpesca.gob.ni/images/doc%20cipa/otros%20documentos/guiaindicativa.pdf
- http://www.inpesca.gob.ni/images/guiaidenticartiburoneinformes/CIATSemanal-IATTCWeekly2010-51.pdf
- http://www.ipcc.ch/pdf/technical-papers/climate-changes-biodiversity-sp.pdf.
- http://www.cavehill.uwi.edu/cermes/CLMEPub/ESP/Informe_de_%20la_Sub_Regi%C3%B3n_Centro_Sur_Am%C3%A9rica.pdf

Anexos:

Figure 4. Fronteras de las subregiones

Area No 4: Tortuguero – Barra del Colorado

Abstract

The Barra del Colorado – Tortuguero Area is proposed as an area meeting EBSA criteria by Costa Rica given its regional importance for the nesting of Endangered and Critically Endangered species of sea turtles, respectively the green turtle and the leatherback and hawksbill turtles. In addition, the area holds a very fragile manatee population and presents significant productivity and biodiversity characteristics associated with its coastal lagoons, sand bars, sandy and rocky beaches and river mouths.

Introduction

Costa Rica's Caribbean coast is morphologically regular and relatively short, extending 212 km with a narrow continental platform of only 232 km^2. The country has more than 6700 marine species reported (3.5% of the global marine biodiversity) of which approximately 2300 species have been reported for the Caribbean (Wehrtmann & Cortés 2009).
In 2009, Costa Rica finalized a marine conservation gap assessment (called GRUAS) that identified and analyzed all relevant peer-reviewed published information as well as expert criteria. The resulting document identifies all ecologically significant areas in the country and compares those areas to the existing MPAs. This allowed for the identification of all marine conservation gaps and to guide future conservation efforts of the country. Of these areas, two main regions are described as areas meeting EBSA criteria. The northern Caribbean coast of Costa Rica, starting with Tortuguero National Park and extending north to Barra del Colorado (area no 4, the Tortuguero-Barra del Colorado area, described below) and the southern Caribbean coast, starting in Cahuita National Park and extending south to the mouth of the Sixaola river (area no. 5, the Cahuita-Gandoca area, which follows).

Location

This area is extends north from Tortuguero National park to Barra del Colorado on the border with Nicaragua. The area is fully within Costa Rican jurisdictional waters and is partly protected by Tortuguero National Park (see map 1).

Feature description of the proposed area

The Tortuguero-Barra del Colorado area has been broadly studied for more than five decades (since 1955) due to its significance for the natural history of marine turtles, especially green turtles (*Chelonia mydas*). Tortuguero beach is one of the most important nesting beaches for this species in the world, and it has the largest remaining green turtle rookery in the Atlantic (Troeng 2005). Additionally, this area is the most important nesting site, as the main feeding and mating areas for this population occur in Caribbean coastal waters from Nicaragua to Panamá (Troamá & Rankin 2005). The area is also important for the nesting of leatherback turtles (*Dermochelys coriacea*) and represents the most important nesting site for a very vulnerable population of hawksbills turtles (*Eretmochelys imbricata*). The marine area and wetlands of Tortuguero are also inhabited by what is thought to be a small and fragile population of manatees (*Trichechus manatus manatus*). This population was resident of an extended area that included the Parismina and Estrella rivers and associated coastal lagoons. However, its habitat has been resduced.

With more than 55 years of nesting and hatching monitoring and scientific data from Tortuguero, a series of guidelines and regulations has been established to protect the green sea turtle, starting with the consolidation of the area as a national park in 1970. This was done at a time when the threats to green turtles in the Caribbean were extremely high. The national park secured the preservation of nesting beaches and a marine area of 526.81 km^2. Barra del Colorado is a wildlife refuge established in 1985 and is known for its highly diverse ecosystems, including 78 km^2 of rivers, island, swamps, and wetland vegetation that protect not only manatees but a great number of fish species (including the tropical gar

Atractosteus tropicus) and resident and migratory birds. The Tortuguero-Barra del Colorado area also includes coastal lagoons, rocky beaches, marine bird nesting and feeding areas, manatee concentration areas and sea turtle aggregation and nesting areas. The area meeting EBSA criteria includes areas that turtles use during the nesting season to move and concentrate.

Feature condition and future outlook of the proposed area

Part of the Tortuguero-Barra del Colorado area is a national park (Tortuguero NP) and falls under the administration of the Ministry of Environment, MINAET. Sea turtle research has been continuous in this area since 1955. Tortuguero NP area is relatively better conserved than the area outside the park although the isolation of the Costa Rican north Caribbean prevents significant threats. Barra Colorado WR protects very vulnerable habitats (wetlands) and highly fragile species like manatee and the tropical jar. Main threats identified are illegal fishing, habitat destruction, sea turtle poaching, water pollution and incidental death of threatened species due to fishing activities. The area considers data on the movement and concentration of sea turtles during the nesting season in Tortuguero.

Assessment of the area against CBD EBSA Criteria

<table>
<tr><td rowspan="2">CBD EBSA Criteria
(Annex I to decision IX/20)</td><td rowspan="2">Description
(Annex I to decision IX/20)</td><td colspan="4">Ranking of criterion relevance
(please mark one column with an X)</td></tr>
<tr><td>Don’t Know</td><td>Low</td><td>Some</td><td>High</td></tr>
<tr><td>Uniqueness or rarity</td><td>Area contains either (i) unique (“the only one of its kind”), rare (occurs only in few locations) or endemic species, populations or communities, and/or (ii) unique, rare or distinct, habitats or ecosystems; and/or (iii) unique or unusual geomorphological or oceanographic features</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td colspan="6">Explanation for ranking
The Tortuguero-Barra del Colorado area is critical habitat for three species of sea turtles, one listed as Endangered (green) and two as Critically Endangered (leatherback and hawksbill) by IUCN’s Red List. It also provides habitat for a population of manatees (Vulnerable), and is feeding habitat for marine seabirds.</td></tr>
<tr><td>Special importance for life-history stages of species</td><td>Areas that are required for a population to survive and thrive.</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td colspan="6">Explanation for ranking
The Tortuguero-Barra del Colorado area is critical habitat for the nesting of three species of sea turtles, one listed as Endangered (green) and two as Critically Endangered (leatherback and hawksbill) by IUCN’s Red List. In fact, Tortuguero beach is the most important nesting beach for green turtles in the Atlantic, and the marine area meeting EBSA criteria is a critical gathering zone for sea turtles during the nesting season. The area also provides habitat for a population of manatees (Vulnerable).</td></tr>
<tr><td>Importance for threatened, endangered or declining species and/or habitats</td><td>Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.</td><td></td><td></td><td></td><td>X</td></tr>
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</table>

<table>
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<tr><td>Vulnerability, fragility, sensitivity, or slow recovery</td><td>Areas that contain a relatively high proportion of sensitive habitats, biotopes or species that are functionally fragile (highly susceptible to degradation or depletion by human activity or by natural events) or with slow recovery.</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td colspan="6">Explanation for ranking
The Tortuguero-Barra del Colorado area is critical habitat for the nesting of three species of sea turtles, one listed as Endangered (green) and two as Critically Endangered (leatherback and hawksbill) by IUCN's Red List. Tortuguero beach is the most important nesting beach for green turtles in the Atlantic. It also provides habitat for a population of manatees (Vulnerable). Critical habitats include coastal lagoons, sand bars, sandy and rocky beaches and a marine area used for transit and gathering of sea turtles.</td></tr>
<tr><td>Biological productivity</td><td>Area containing species, populations or communities with comparatively higher natural biological productivity.</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td colspan="6">Explanation for ranking
Productivity in this area is considered high given the significant seasonal productivity associated with the green turtle nesting beaches. The Tortuguero-Barra del Colorado area is critical habitat for the nesting of three species of sea turtles, one listed as Endangered (green) and two as Critically Endangered (leatherback and hawksbill) by IUCN's Red List. Tortuguero beach is the most important nesting beach for green turtles in the Atlantic. It also provides habitat for a population of manatees (Vulnerable) as well as habitat for commercial species such as the spiny lobster and tarpon. In addition, the area is influenced by the nutrient discharge from the San Juan and Tortuguero rivers.</td></tr>
<tr><td>Biological diversity</td><td>Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td colspan="6">Explanation for ranking
Diversity in this area is considered high thanks to the confluence of coastal lagoons, river mouths and sandy and rocky beaches. The Tortuguero-Barra del Colorado area is critical habitat for the nesting of three species of sea turtles, one listed as Endangered (green) and two as Critically Endangered (leatherback and hawksbill) by IUCN's Red List. It also provides habitat for a population of manatees, spiny lobster and commercial fish species such as snook and tarpon.</td></tr>
<tr><td>Naturalness</td><td>Area with a comparatively higher degree of naturalness as a result of the lack of or low level of human-induced disturbance or degradation.</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td colspan="6">Explanation for ranking
The area presents very low human population density as well as human-induced disturbances and degradation. Poaching of sea turtles for eggs and/or meat and illegal fishing together with pollution and coastal development are all minor threats.</td></tr>
</table>

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** A significant body of literature on sea-turtle nesting and conservation has been published and is available for Tortuguero. The references above only consider a very small portion of this body of literature. Online databases can corroborate this fact. See published literature for authors such as Carr and/or Troeng.

Map

Figure 1. Area meeting EBSA criteria (no. 4)

AREA NO. 5: CAHUITA – GANDOCA

Abstract

The Cahuita – Gandoca Area is proposed as an area meeting EBSA criteria by Costa Rica given its regional importance for the nesting of Endangered and Critically endangered species of sea turtles, respectively the green turtle and the leatherback and hawksbill turtles. In addition, the area presents significant productivity and biodiversity associated with its coastal lagoons, coral reefs, mangrove areas, seagrasses, sandy and rocky beaches and river mouths.

Introduction

Costa Rica's Caribbean coast is morphologically regular and relatively short, extending 212 km with a narrow continental platform of only 232 km^2. The country has more than 6700 marine species reported (3.5% of the global marine biodiversity) of which approximately 2300 species have been reported for the Caribbean (Wehrtmann & Cortés 2009).

In 2009, Costa Rica finalized a marine conservation gap assessment (called GRUAS) that identified and analyzed all relevant peer-reviewed published information as well as expert criteria. The resulting document identifies all ecologically significant areas in the country and compares those areas to the existing MPAs. This allowed for the identification of all marine conservation gaps and to guide future conservation efforts of the country. Of these areas, two main regions are described by Costa Rica as areas meeting EBSA criteria. The northern Caribbean coast of Costa Rica, starting with Tortuguero National Park and extending north to Barra del Colorado (area no. 4, Tortuguero-Barra del Colorado) and the southern Caribbean coast, starting in Cahuita National Park and extending south to the mouth of the Sixaola river (area no. 5, the Cahuita-Gandoca area, described below).

Location

The Cahuita-Gandoca area extends south from Cahuita National Park to the mouth of the Sixaola River in the border with Panama. The area is fully within Costa Rican jurisdictional waters and is partly protected by Cahuita National Park and Gandoca-Manzanillo National Wildlife Refuge (see map 1).

Feature description of the proposed area

The areas of Cahuita and Gandoca-Manzanillo contain extended seagrass beds (*Thalassia testudinum*, mainly) as well as the most important coral reef areas on the Caribbean coast of Costa Rica. The four species of seagrasses found in the country occur on the Caribbean coast, representing complex ecosystems with high productivity (Nielsen 2006). Cahuita is the site with the highest reef-building diversity in Costa Rica (31 species) as well as a high diversity of octocorals (19 species) associated with a great fish and invertebrate diversity, constituting the largest fringing reef on the country's Caribbean coast (Cortés et al. 2010) Gandoca, declared a RAMSAR value wetland, is the most important mangrove area on the Costa Rican Caribbean, associated with a coastal lagoon. The main mangrove species is the red mangrove (*Rhizophora mangle*), which reaches up to 15m tall (Fonseca *et al* 2007). The tarpon (*Megalops atlanticus)* uses the coastal lagoon as a nursery (Chacón 1993). Gandoca also presents important leatherback (*Dermochelys coriacea*) and hawksbill (*Eretmochelys imbricata*) sea turtle nesting areas. In the coastal waters of Gandoca- Manzanillo WR exists a well-known resident population of the bottlenose dolphin (*Tursiops truncatus)* (Gamboa-Poveda and May-Collado 2006). The tucuxi dolphin (*Sotalia guianensis)* is also frequent in this area, which is the only Latin-America endemic dolphin that occurs in Costa Rica. Mixed groups of these two species are commonly seen throughout the year in this area sharing social and feeding activities (Acevedo-Gutierrez *et al*. 2005, Forestell *et al*. 1999, Gamboa-Poveda and May-Collado 2006). In Gandoca Manzanillo, 29 species of reef-building corals have been described, and it is the only site in CentralAmerica where the coral *Meandrina meandrites* occurs (besides Panama). Finally, the proposed area also presents aggregation areas for the spiny lobster (nursery and resident populations on coral reefs), conch, and marine bird feeding and nesting areas. In terms of ecosystem services, it is estimated that the existence and preservation of coral reefs in Cahuita National Park provide the country with almost US$ 30millon per year in goods and services (Blair 1996).

Feature condition and future outlook of the proposed area

Parts of the Cahuita-Gandoca area is protected in Cahuita National Park and as the Gandoca-Manzanillo Wildlife Refuge. Both areas fall under the administration of the Ministry of Environment, MINAET. Research efforts in this area have focused on coral reefs, invertebrates, seagrasses and seaturtle nesting areas. The reefs from Cahuita NP and Gandoca-Manzanillo WR present some signs of degradation, including coral bleaching. However, both areas have benefited from their MPA category, as coastal development in these areas is very low in some areas (Cahuita) and moderate in others (Puerto Viejo and Manzanillo). For this protection, Gandoca-Manzanillo WR, is now one of the only two last mangroves in the country that retains a stable forest-mangrove-ocean connection. The main threats identified are illegal fishing, coastal development, habitat destruction and degradation, water pollution, sedimentation, bad tourism practices and climate change.

Assessment of the area against CBD EBSA Criteria

<table>
<tr><th rowspan="2">CBD EBSA Criteria
(Annex I to decision IX/20)</th><th rowspan="2">Description
(Annex I to decision IX/20)</th><th colspan="4">Ranking of criterion relevance
(please mark one column with an X)</th></tr>
<tr><th>Don’t Know</th><th>Low</th><th>Some</th><th>High</th></tr>
<tr><td>Uniqueness or rarity</td><td>Area contains either (i) unique (“the only one of its kind”), rare (occurs only in few locations) or endemic species, populations or communities, and/or (ii) unique, rare or distinct, habitats or ecosystems; and/or (iii) unique or unusual geomorphological or oceanographic features</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td colspan="6">Explanation for ranking
The area contains the most important coral reef, seagrass habitats and mangrove forest on the Costa Rican Caribbean coast. It also provides habitat for a population of manatees (Vulnerable) and of the rare tucuxi dolphin (Sotalia guianensis), concentrations of spiny lobsters and conch.</td></tr>
<tr><td>Special importance for life-history stages of species</td><td>Areas that are required for a population to survive and thrive.</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td colspan="6">Explanation for ranking
Having the most important coral reef and seagrass habitats as well as the only important patch of mangrove forest on the Costa Rican Caribbean coast, this area is an important habitat, nursery and reproduction area for multiple marine species, e.g., spiny lobster, conch and snapper. It also provides habitat for a population of manatees (Vulnerable) and for the rare tucuxi dolphin (Sotalia guianensis).</td></tr>
<tr><td>Importance for threatened, endangered or declining species and/or habitats</td><td>Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td colspan="6">Explanation for ranking
Coral reef habitats and species in the Costa Rican Caribbean are under increasing threats such as pollution, habitat degradation and illegal fishing. Costa Rica has very limited coral reef and sea grass habitats on its Caribbean coast and most are concentrated in the southern Caribbean, so this area holds particular importance. Finally, Gandoca is a nesting area for leatherback and hawksbill seaturtles (both listed as Critically Endangered) and provides habitat for a population of manatees (Vulnerable) and for the rare tucuxi dolphin (Sotalia guianensis).</td></tr>
<tr><td>Vulnerability,</td><td>Areas that contain a relatively high proportion</td><td></td><td></td><td></td><td>X</td></tr>
</table>

fragility, sensitivity, or slow recovery	of sensitive habitats, biotopes or species that are functionally fragile (highly susceptible to degradation or depletion by human activity or by natural events) or with slow recovery.				
Explanation for ranking Coral reef habitats and species in the Costa Rican Caribbean are increasingly threatened by pollution, habitat degradation and illegal fishing. Costa Rica has very limited coral reef and seagrass habitats on its Caribbean coast, and most are concentrated in the southern Caribbean, so this area holds particular importance. Finally, Gandoca is a nesting area for leatherback and hawksbill seaturtles and provides habitat for a population of manatees (Vulnerable) and for the rare tucuxi dolphin (*Sotalia guianensis*).					
Biological productivity	Area containing species, populations or communities with comparatively higher natural biological productivity.				**X**
Explanation for ranking Coral reef, mangrove and seagrass habitats are among the most productive marine habitats in the world and play important roles as nursery areas for multiple marine species. The latter two are also demonstrating increased importance for Carbon sequestration and storage (Blue Carbon). Hence, this area is considered highly productive.					
Biological diversity	Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.				**X**
Explanation for ranking Diversity in this area is considered high thanks to the confluence of coastal lagoons, coral reef platforms, seagrass beds, mangrove areas, river mouths and sandy and rocky beaches. All these habitats favour the aggregation and reproduction of multiple marine species.					
Naturalness	Area with a comparatively higher degree of naturalness as a result of the lack of or low level of human-induced disturbance or degradation.			**X**	
Explanation for ranking There is low to moderate human population density in the area, especially in the communities of Cahuita, Puerto Viejo, Manzanillo and Gandoca. There are also human-induced disturbances and a low-level of habitat degradation.					

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Map

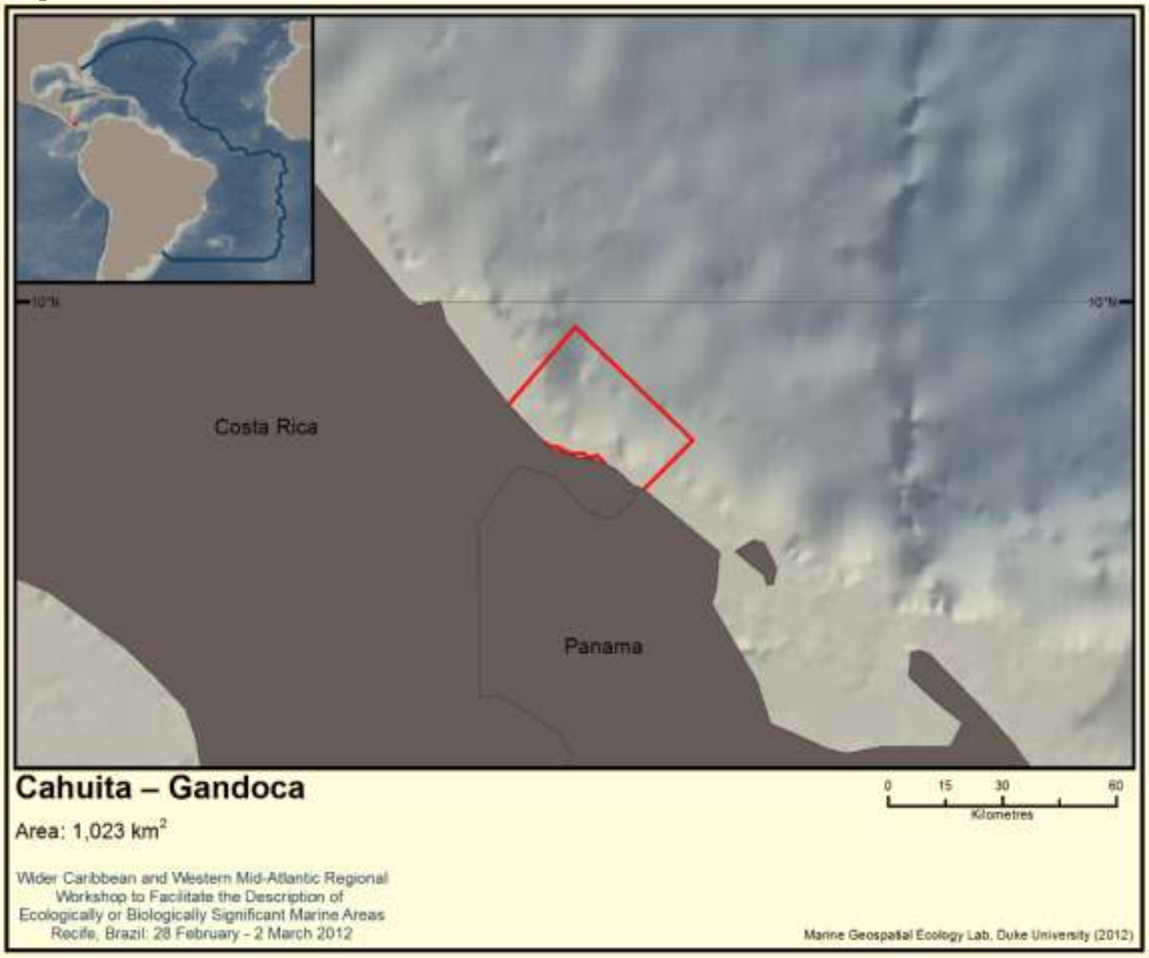

Figure 1. Area meeting EBSA criteria (no. 5)

AREA NO. 6: PEDRO BANK, SOUTHERN CHANNEL AND MORANT

Abstract

The proposed area contains remote atolls with their associated banks and deep-sea areas under the jurisdiction of four countries. The area appears to share common oceanic dynamics, which might be relative to its high biological diversity and productivity developed within an array of complex structured benthic habitats and complex bathymetry. At present, the entire area provides substantial queen conch, spiny lobster and reef fish fisheries which are not being managed under common principles, and therefore stocks may be threatened by the lack of regional considerations for its sustainable use.

Introduction

The area extends from the Morant Banks and Cays in the east to the Rosalind Bank in the west. The area encompasses the Pedro Banks and Cays, including the deep-sea areas of Morant Ridge and Pedro Channel, and then extends further south to the oceanic waters of the Jamaica-Colombia joint regime area. It also extends west along the Nicaraguan Rise to include the Rosalind Bank, which is located in the EEZs of both Honduras and Nicaragua. The Morant Cays are located 64km south-east of mainlaind Jamaica, while the Pedro Banks are 158km south-west of Kingston. Both the Morant and Pedro Cays are important seabird colonies as well as nesting sites for endangered sea turtles.
The Pedro Channel separates the Pedro Banks and Cays from mainland Jamaica, while the Morant Ridge lies between the Morant Cays and mainland Jamaica. Maximum depths of 1625m with soft sediment bottom were recorded in the Pedro Channel while in the Morant Ridge depths between 250m and 1500m were detected with primarily hard rock bottom. The early collections from the Pedro Channel and Morant Ridge comprise some 1500 species and are housed in the Life Sciences Department at UWI Mona. Pedro Channel collections comprise the only example of Jamaican deep sea benthos from largely soft substrata, sampled from 75-1800m deep (Goodbody and Goodbody,unpublished).

Location

The identified area is located in oceanic waters south-east to south-west of Jamaica and encompasses the Pedro Bank and Cays in Jamaica (16° 43’ N and 17 35 N and 77° 20’ and 79° 02’ W); the Morant Cays and deep channels around; the Rosalind Bank (16°26′N 80°31′W16.433°N 80.517°W. It) in Honduras and Nicaragua; the Serranilla Bank (15° 41´- 16°04’N and 80°03’ - 79° 40´W), Alice Bank (15° 57´- 16° 10´N and 79° 28´ - 79° 16´W) and New Bank (15° 47´ - 15° 56´N and 78° 49´ - 78° 31´W) in Colombia and Jamaica (see map). The boundaries of the area proposed are along depth contours and oceanography features.

Feature description of the proposed area

<u>*Pedro and Morant Banks and Cays*</u>
The Pedro Bank is an expansive submerged bank south-west of Jamaica. It is approximately three-quarters the size of mainland Jamaica, covering a total area of 8,040 km^2. This unique geologic structure is one of the biggest offshore banks in the Caribbean Basin and has high biological, cultural and economic significance (Kramer, 2006). The Pedro Banks is Jamaica’s largest offshore fishery, while the Morant Cays is the second-largest (Pears and Sary, 1997). The area makes an important contribution to the total national catch. Like the Pedro Banks, it is believed that the marine life of the Morant Banks is relatively undisturbed by human activities and is considered to be an important marine conservation site.
The Pedro Bank’s rich waters support a variety of fishes, mammals, and invertebrates, while the Cays are regionally important seabird and sea turtle nesting areas. It may also be a potential refuge and source of larvae for the threatened Acropora coral species. The Bank was declared an underwater cultural heritage

site by the Jamaica National Heritage Trust in 2004 due to its historic importance as a shipping passage and the presence of over 300 shipwrecks dating back to the colonial period. Today, Pedro Bank is the most important fishing ground for conch, lobster, and fish in Jamaica and is one of the largest queen conch producers in the Caribbean and the world.

Explorations of the deep waters of the Pedro Channel and the Morant Ridge by Goodbody in the 1970s revealed that the Pedro Channel consists of soft bottom, from which several species were collected. It was noted that 143 genera with species richness generally decreasing in deeper water was found in the Channel. The dominant groups included hexactinellid sponges, ahermatypic corals, caridean shrimps, holothurians, fishes and bivalve mollusks.

Morant Cays and Pedro Cays together house one of the top 10 largest seabird breeding colony within the Caribbean. Both are recognised as Birdlife Important Bird Areas and together are used as nesting sites for over 100,000 seabirds. These areas incorporate the majority of key feeding grounds for species breeding on these cays.

Morant Cays holds greater than 1% of the world populations of both sooty and bridled terns, as well as greater than 1% of the Caribbean populations of royal tern and brown noddy. It also meets Ramsar criteria for congregations of waterbird species (>20,000 individuals). Magnificent frigatebird *Fregata magnificens*, laughing gull *Larus atricilla*, and brown pelican *Pelcanus occidentalis* also breed, though in less significant numbers. Similarly, the Pedro Cays hold greater than 1% of the world populations of magnificent frigatebirds *Fregata magnificens*, brown boobies *Sula leucogaster* and masked boobies *S. dactylatra* as well as greater than 1% of the Caribbean populations of laughing gull, sooty tern, royal tern, and brown noddy. Roseate tern *Sterna dougallii* also breed, though in less significant numbers.

Currents

Pedro Bank lies in the middle of the zone of north-easterly trade winds, and average wind speeds are in the region of 15 to 20 knots (8–10 m sec-1) although wind speeds of over 30 knots (15m sec-1) are commonly experienced (Edwards, 2001).

According to Bustamante and Vanzella-Khouri (2011), the Caribbean Current moves up off the coast of Central America funneling first through the passage between the north-wet end of the Honduras shelf and Pedro Bank (SW Jamaica), and then through the Yucatan Channel. These waters pass through the deep-sea channels on either side of Pedro Bank. Over the east of the Bank, the general set of the current is north-west, attaining its greatest rate when the trade wind is strongest, but seldom exceeding the rate of 1knot. There are also tentative units of biological connectivity between the area and the Colombian archipelago.

Jamaica-Colombia Joint Regime and the Colombia exclusive zone

According to Howard et al. (2010) New Bank represents the majority of coral environments in the atolls in the Jamaica- Colombia Joint Regime and the Colombian exclusive zone, accounting on average for 30-60% of live coral formations, much higher than majority of Caribbean reefs, while in Serranilla Bank habitats were dominated by sandy areas covered by macro-algae with sparse corals. The corals in Serranilla Bank can be found in coral patches within the lagoon and in the reef crest. A recent comprenhensive study on the spatial distribution of benthic habitats on these three atolls (Prada et al., 2010), showed that Serranilla Bank and New Bank present all types of geomorphological units expected in true atolls, such as reef crest, reef lagoon, reef channels, fore reef and leeward reefs and emerge from areas 2 to 3 km deep. In contrast, Alice Bank is a deep area (shallowest sections are around 15m) dominated by well developed and abundant sponges, with corals found mainly along the slopes.

Recent visual census studies of the reef fish community (Howard et al., 2010), reported a total of 154 species in New Bank, 106 species in Serranilla Bank and 74 species in Alice Bank. Among the most common species seen were: *Acanthurus coeruleus, Chromis cyanea, Balistes vetula, Holocentrus rufus, Halichoeres garnoti, H. maculipinna, Stegastes partitus, Sparisoma aurofrenatum, A. bahianus, and Thalassoma bifasciatum*. However, several species were considered rare and are currently being analyzed. Sharks and parrot fishes were common in all three areas. Plankton studies conducted in 2010 (Rojas, 2010), confirmed the abundance of fish larvae, New Bank again accounting for the highest diversity and abundance, with a different community in Alice Bank compared to New Bank , and Serranilla Bank sharing a higher order of taxa, including the presence of queen conch larvae in all three banks.

The five oceanic cays seen in Serranilla Bank and three non-permanent sandy cays seen in New Bank hold important seabird populations, with the presence of at least 14 species and more than 400 individuals counted in only couple of days (Garcia et al., 2010). The most common one was *Sterna antillarum* followed by *Riparia riparia, Sterna hirundo, Arenaria Interpres, Hirundo rustica, Anas discor, Sterna máxima, Larus atricilla, L. argentatus Charadrius* sp, *Pandion halieutus* and the residents *Fregata magnificens and Sula dactylatra.* New Bank was again the bank with highest seabird populations. Few seabirds were observed in Alice Bank, which has no emerged areas.

These cays are also important nesting areas for several sea turtles, despite thelimited availability of quantitative information. In fact, tracking information from WIDECAST identifies the area as being frequently used by species of sea turtles.

Dedicated studies to determine the abundance of queen conch populations in these remote atolls found Serranilla Bank with the lowest abundances, with an overall 11.1 ind/ha and majority of them juveniles; Alice Bank had 98.5 ind/ha with a higher proportions of adults; and New Bank had 40 ind/ha again a population dominated by adult individuals (Castro et al., 2010). None of these areas were considered capable of sustaining a commercial fishery, following criteria defined by Colombia standards. The queen conch is listed in the CITES appendix II and is a Caribbean endemic species, threatened in the majority of its distribution range.

Rosalind Bank

Very little is currently known about this important atoll, with the exception of scientific studies conducted to explore the natural populations of queen conch between 2006 and 2011, from which data confirmed that this bank by itself accounts for more than 80% of the Honduras conch production. However, the 2011 report identified a significant reduction of relative conch abundance in most Honduras fished areas, including Rosalind Bank, although relative abundance within this large bank may vary across the years. In fact, the report found a reduction of the relative abundance of conch in the deeper areas of the atoll. Part of the reduction has been related to fishing conducted by Nicaraguan fishers. Queen conch densities declined in 2011 to 133.9 ind/ha, indicating a 46.11% reduction between 2010-2011.

Feature condition and future outlook of the proposed area

In this area the main east-west Caribbean flow diverges into two branches. The mean current velocities may be estimated at 85-90 cm/s, but the southern branch is formed by mesoscale eddies that originate in the region (Andrade and Barton, 2000) and are of critical importance for passive larvae drift. Existing oceanic current and queen conch larval modeling showed that, in contrast to what happens within the nearby Seaflower MPA, where the Colombia-Panama gyre dominates, the dynamics within Serranilla, Alice and New Banks have a predominant movement towards the Cayman Basin (Lonin et al., 2010). Genetic studies using microsatellite markers conducted on queen conch from these three atolls completely match this pattern, exhibiting populations from the most northern areas (Serranilla, Alice and New), diverging from relatively closer northern atolls (Quitasueño, Serrana and Roncador) or the central (Providence) or southern atolls (San Andres, East-South-East, South-South-West) within the San Andres Archipelago (Marquez Edna, Universidad Nacional – Sede Medellin, personal communication).

Assessment of the area against CBD EBSA Criteria

CBD EBSA Criteria (Annex I to decision IX/20)	**Description** (Annex I to decision IX/20)	**Ranking of criterion relevance** (please mark one column with an X)			
		Don't Know	**Low**	**Medium**	**High**
Uniqueness or rarity	Area contains either (i) unique ("the only one of its kind"), rare (occurs only in few locations) or endemic species, populations or				X

	communities, and/or (ii) unique, rare or distinct, habitats or ecosystems; and/or (iii) unique or unusual geomorphological or oceanographic features.				
Explanation for ranking • The Pedro Bank reefs are unique because of their geographic isolation and association with one of the largest submerged banks in the central Caribbean. • Deep-water oceanic features – Pedro Channel =1625m; Morant Ridge = 1500m • New Bank presents exuberant coral ecosystems with unique reef types and development • Abundance of reef channels proved critical for increased recruitment of key species, such as queen conch and spiny lobster. • Presence of abundant seamounts about which very little is currently known					
Special importance for life-history stages of species	Areas that are required for a population to survive and thrive.				X
Explanation for ranking • It is thought that larval circulation for the region occurs in and around the Pedro Cays, i.e., transboundary larval dispersal of lobster, conch and reef organisms • proven genetic connectivity for queen conch in some of the atolls. • Possible refuge and source of larvae for the threatened Acropora coral species • Cays used by nesting turtles • Important nesting site, used by migrant bird species and resident seabird populations • Nesting sites on the Morant and Pedro cays are ranked in the top 10 IBAs of the region • Tentative units of biological connectivity between Jamaica and Colombian archipelago, which may influence marine organism species abundance and diversity Unsure of species present in deep channels					
Importance for threatened, endangered or declining species and/or habitats	Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.			X	
Explanation for ranking • Masked booby bird regarded as regionally endangered; colony on the Cays is believed to be the largest in the Caribbean • Presence of critically endangered Acroporids and queen conch (*Strombus gigas)* • Nesting sites for endangered sea turtlesUnsure of species present in deep channels					
Vulnerability, fragility, sensitivity, or slow recovery	Areas that contain a relatively high proportion of sensitive habitats, biotopes or species that are functionally fragile (highly susceptible to degradation or depletion by human activity or by natural events) or with slow recovery.			X	
Explanation for ranking • Important fishing ground, both for artisanal and commercial purposes; • Supplies over 95% of Jamaica, Colombia and more than 80% of Honduras conch exports. A highly valuable fishery regulated by CITES. • Rosalind Banks provide over 80% of Honduras's conch production • Lobster and conch fisheries have potential to be over-exploited therefore susceptible to collapse • Rosalind Bank recorded a 46% decline in conch densities in 2010-2011assessments					

<table>
<tr><td colspan="6">• Deep-sea species present, which are restricted by depth</td></tr>
<tr><td>Biological productivity</td><td>Area containing species, populations or communities with comparatively higher natural biological productivity.</td><td></td><td></td><td>X</td><td></td></tr>
<tr><td colspan="6">Explanation for ranking
• Important biological area, both regionally and nationally
• Large pelagics in area of interest: blue marlin, yellowfin tuna, swordfish, blackfin tuna, wahoo
• Largest managed conch fishery; important for lobster and fin fish
• 2005 AGRRA report - greatest abundance in the Caribbean of parrotfishes and surgeonfishes</td></tr>
<tr><td>Biological diversity</td><td>Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td colspan="6">Explanation for ranking
• The Pedro Channel collections comprise the only example of Jamaican deep-sea benthos from largely soft substrata, sampled from 75 to 1800m deep
• 143 gener,a with species richness generally decreasing in deeper water, were found in the Pedro Channel.
• The dominant groups included hexactinellid sponges, ahermatypic corals, caridean shrimps, holothurians, fishes and bivalve molluscs.
• High zooplankton diversity (~ 40 spp)
• 80 spp. fish – 30 if which are regularly fished
• 2005 bird assessment - 62 bird spp observed on 3 cays
• Small shark and other deep-water species collected in deep water on the Morant Ridge and Pedro Channel
• Pedro and Morant Cays incorporate the majority of key feeding grounds for species breeding on these cays
• Migratory dolphins and whales
• High fish species diversity in the Joint Regime area and recent data on deep-sea biodiversity currently under analysis.</td></tr>
<tr><td>Naturalness</td><td>Area with a comparatively higher degree of naturalness as a result of the lack of or low level of human-induced disturbance or degradation.</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td colspan="6">Explanation for ranking
• Small spatial variation around Pedro Bank - within expected ranges of pristine water except water closest to cays.
• Reduction in water quality closest to inhabited cays, but clean in unpopulated ones.
• Harbours some of Jamaica’s better-preserved coral reefs and is relatively intact due to distance from mainland.
• Mimimun infrastructure on Colombian atolls.
• Several banks with no emerged land.
• Absence of eutrophication indicators (Lucifer faxoni, Penilia avirostris) indicates a pristine environment on the Pedro Bank
• Deep-water environment with depth-specific indigenous species present
• Presence of deep oceanic waters far from the impacts associated with human activities.</td></tr>
</table>

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Poster presentation of Goodbody and Goodbody unpublished data as a part of the Official Launch of the 30th Anniversary of the Opening for Signature of the UN Convention on the Law of the Sea held at the Jamaica Pegasus on Wednesday, 29th February from 9:00 am to 12:00 midday

Morant Cays IBA - http://www.birdlife.org/datazone/sitefactsheet.php?id=18736

Pedro Cays IBA - http://www.birdlife.org/datazone/sitefactsheet.php?id=18737

Seabird Foraging range information - http://seabird.wikispaces.com/

Pedro Bank Management Project Brief: http://conserveonline.org/workspaces/pedro.bank.workspace

Maps and Figures

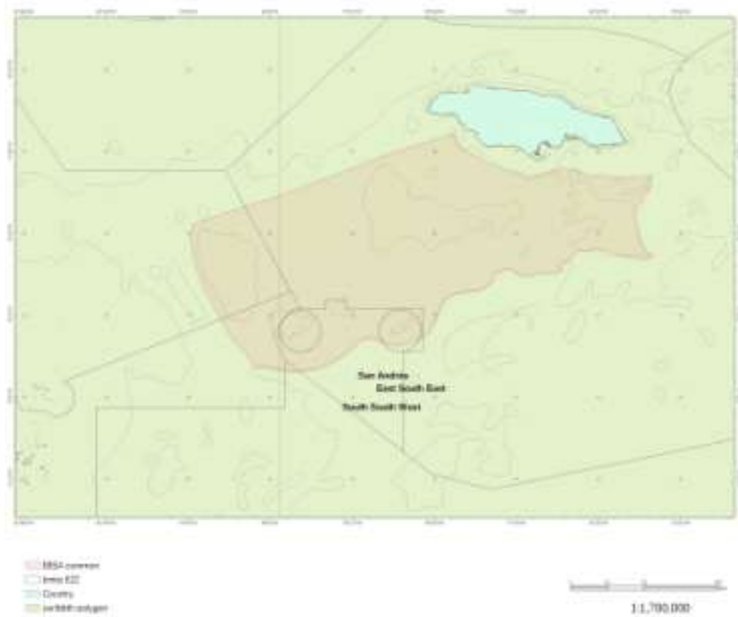

Figure 1. Preliminary outline of the area meeting EBSA criteria

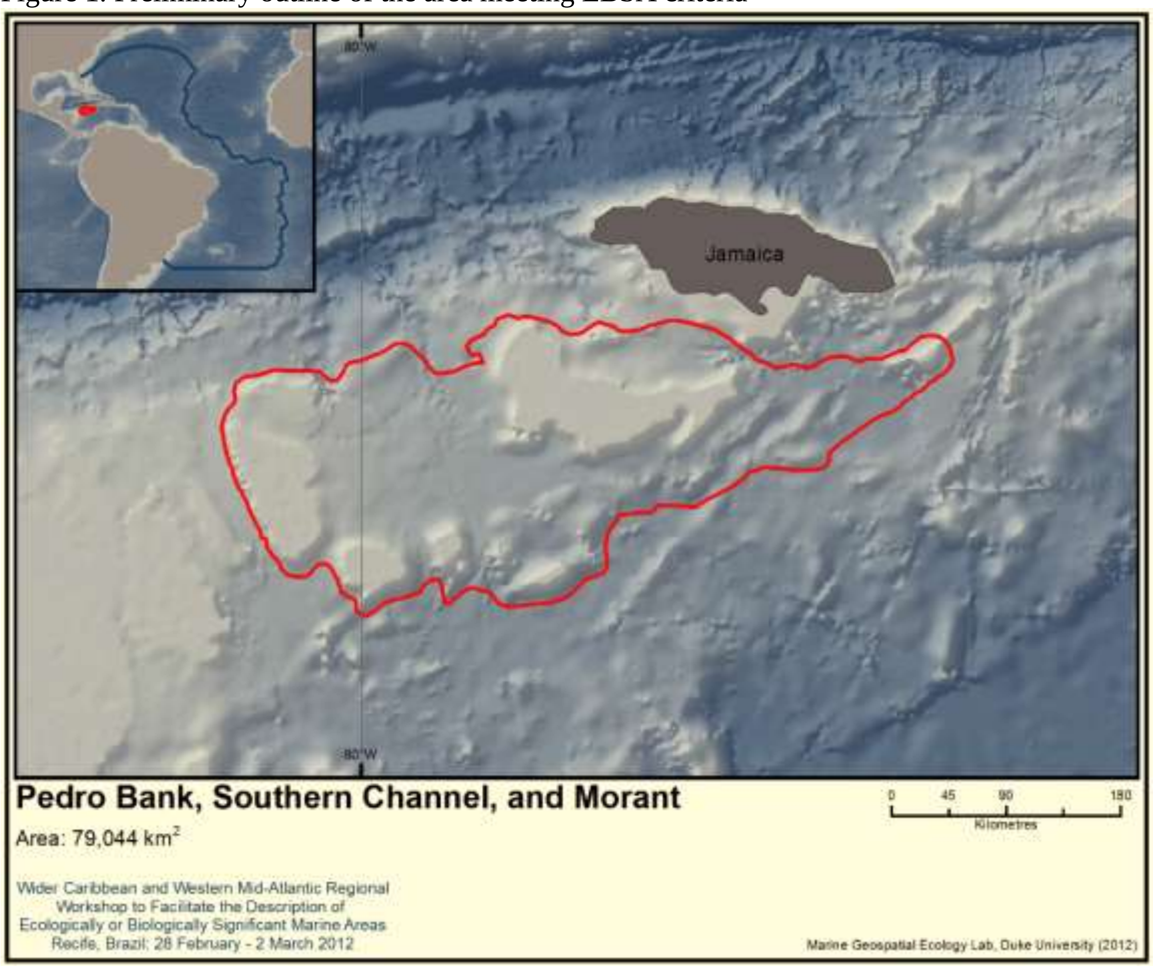

Figure 2. Area meeting EBSA criteria (no. 6)

AREA NO. 7: NAVASSA ISLAND

Location

35 miles west of Haiti; 80 miles east of Jamaica. $18^0$24'00.00"N, $75^0$00'39.79"W
Jurisdiction: claimed by both the United States of America and Haiti.

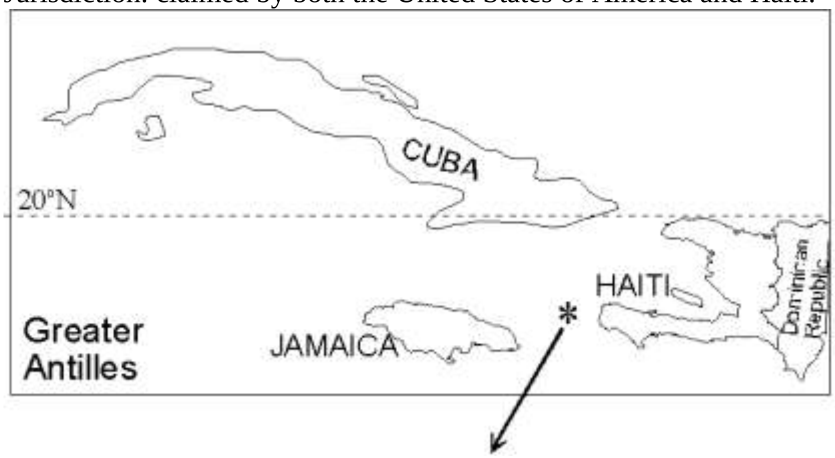

Figure 1. Approximate location of Navassa Island

Feature description of the proposed area

Navassa Island, associated shallow shelf (~30m) communities, and surrounding deeper shelf including Navassa Knoll (400m feature to the southeast). Proposed area would include a 12nm radius around the island.

Fairly extensive scientific information is available regarding marine resources at Navassa along the coast and 30m shelf. Much less is known about the abyssal shelf or Navassa Knoll. The important characteristics of the shallow shelf (largely coral reef and associated hard bottoms) including robust, genetically distinct population of endangered elkhorn coral, lack of human habitation and current land-based development, and natural (physiographically determined) lack of adjacent seagrass and coastal mangrove systems.

Navassa Island is the only emergent portion of the submarine extension of the southwestern peninsula of Hispaniola, known as the Navassa ridge, resulting from folding along the southern edge of the Gonave microplate (Miller et al. 2008).

Assessment of the area against CBD EBSA Criteria

CBD EBSA Criteria (Annex I to decision IX/20)	**Description** (Annex I to decision IX/20)	**Ranking of criterion relevance** (please mark one column with an X)			
		Don't Know	**Low**	**Some**	**High**
Uniqueness or rarity	Area contains either (i) unique ("the only one of its kind"), rare (occurs only in few locations) or endemic species, populations or communities, and/or (ii) unique, rare or distinct, habitats or ecosystems; and/or (iii) unique or unusual geomorphological or oceanographic features.				**X**
Navassa contains populations of elkhorn coral (*Acropora palmata*; IUCN Red List rCitically Endangered, US-ESA threatened species) that are unique in having exceeding high genotypic diversity indicating very high rates of larval (sexual) recruitment success (Baums et al. 2006). It is also relatively rare in the Caribbean region as an oceanic island with coral reef resources and no permanent human population.					

Special importance for life-history stages of species	Areas that are required for a population to survive and thrive.	**X**			
As above, Navassa appears to be unique in facilitating effective larval recruitment of A.palmata. It is not known to what degree this area is "required" or contributes to species-wide survival and recovery.					
Importance for threatened, endangered or declining species and/or habitats	Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.				**X**
See above.					
Vulnerability, fragility, sensitivity, or slow recovery	Areas that contain a relatively high proportion of sensitive habitats, biotopes or species that are functionally fragile (highly susceptible to degradation or depletion by human activity or by natural events) or with slow recovery.			**X**	
Significant effects of fishing (Karnauskas et al. 2011), coral disease (Miller and Williams 2006) and coral bleaching (Miller et al. 2011) have been documented in reef communities of Navassa. Also, the coral reef communities at Navassa exist in the absence of standard habitat mosaics of seagrass and coastal habitat types (beaches, mangroves). Consequences include somewhat depauperate fish assemblages (lacking groups requiring these ontogenic habitats, such as grunts) and reduced buffering of terrestrial nutrient runoff to the reef.					
Biological productivity	Area containing species, populations or communities with comparatively higher natural biological productivity.	**X**			
Explanation for ranking					
Biological diversity	Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.		**X**		
Diversity levels appear somewhat comparable to reef areas throughout the Caribbean although the lack of common habitat types such as seagrass beds and mangrove shores clearly affects the nearshore fish assemblage However, aspects of genetic diversity of endangered elkhorn coral is uniquely high (see above).					
Naturalness	Area with a comparatively higher degree of naturalness as a result of the lack of or low level of human-induced disturbance or degradation.			**X**	
Lack of human land-based development and oceanic environment suggest relatively high "naturalness". However, there was historical land-based development (mining) and current itinerant fishing activity.					

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Maps and Figures

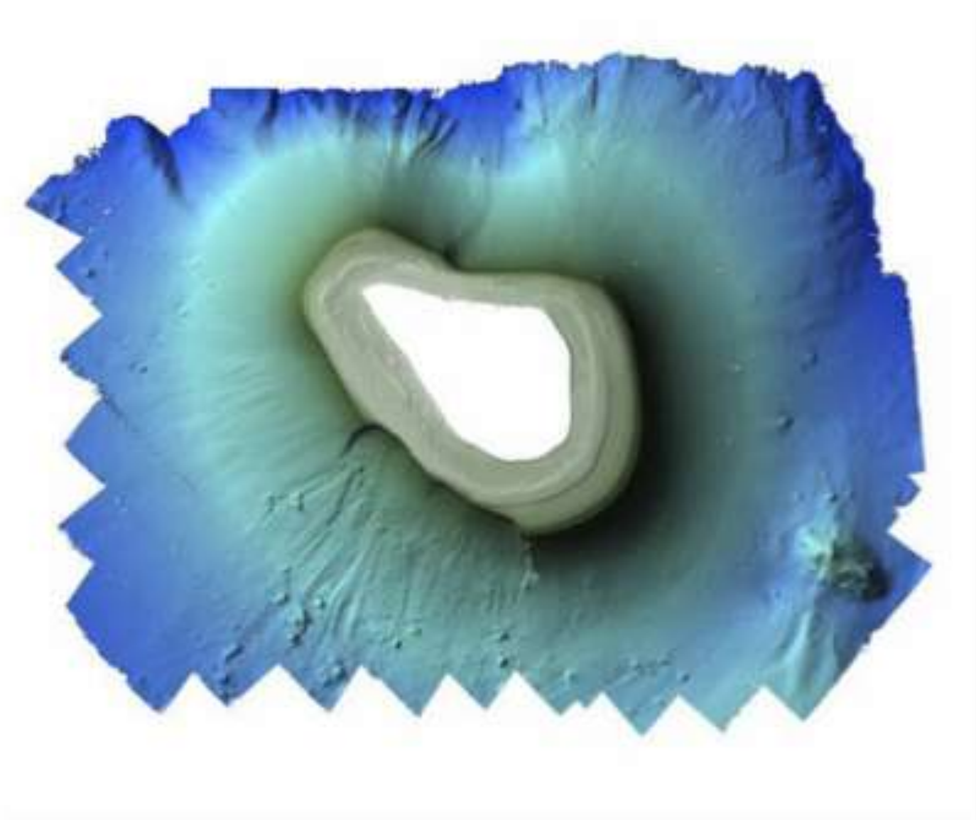

Figure 2. Deep-water bathymetry around Navassa Island, from shoreline to ~1000 m (pixel resolution = 5m). Image by Mike Stecher, Solmar Hydro.

Figure 3. Area meeting EBSA criteria (no. 7)

AREA NO. 8: CARACOL/FT. LIBERTÉ/MONTE CRISTI (NORTHERN HISPANIOLA BINATIONAL AREA)

Location
Northeastern Haiti

Feature description of the proposed area

Fringing/barrier reef, mangrove forests, seagrass beds

Feature condition and future outlook of the proposed area

All resources in nearshore areas are under heavy exploitation. The development of a new industrial park near the village of Caracol will pose serious increased pressures on resources.

Assessment of the area against CBD EBSA Criteria

CBD EBSA Criteria (Annex I to decision IX/20)	**Description** (Annex I to decision IX/20)	**Ranking of criterion relevance** (please mark one column with an X)			
		Don't Know	**Low**	**Medium**	**High**
Uniqueness or rarity	Area contains either (i) unique ("the only one of its kind"), rare (occurs only in few locations) or endemic species, populations or communities, and/or (ii) unique, rare or distinct, habitats or ecosystems; and/or (iii) unique or unusual geomorphological or oceanographic features.		**X**		
Explanation for ranking					
Special importance for life-history stages of species	Areas that are required for a population to survive and thrive.			**X**	
Explanation for ranking Mangrove and coral reef fish nurseries and sea turtle nesting beaches					
Importance for threatened, endangered or declining species and/or habitats	Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.			**X**	
Explanation for ranking Habitat for coral, mangroves, sea turtles, manatees					
Vulnerability, fragility, sensitivity, or slow recovery	Areas that contain a relatively high proportion of sensitive habitats, biotopes or species that are functionally fragile (highly susceptible to degradation or depletion by human activity or by natural events) or with slow recovery.				**X**
Explanation for ranking Coral reefs and mangroves under high threat from exploitation for construction materials and fuel wood/charcoal.					

Biological productivity	Area containing species, populations or communities with comparatively higher natural biological productivity.			**X**	
Explanation for ranking The inter-linking of estuarian systems, mangrove forests, coral reefs and seagrass flats provides for a fairly high productivity.					
Biological diversity	Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.		**X**		
Explanation for ranking Contains inter-linked coral reefs, seagrass beds, mangroves and estuarian systems.					
Naturalness	Area with a comparatively higher degree of naturalness as a result of the lack of or low level of human-induced disturbance or degradation.		**X**		
Explanation for ranking Development of salt pans, heavy exploitation of mangroves and fisheries, including marine turtles					

References

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Maps and Figures

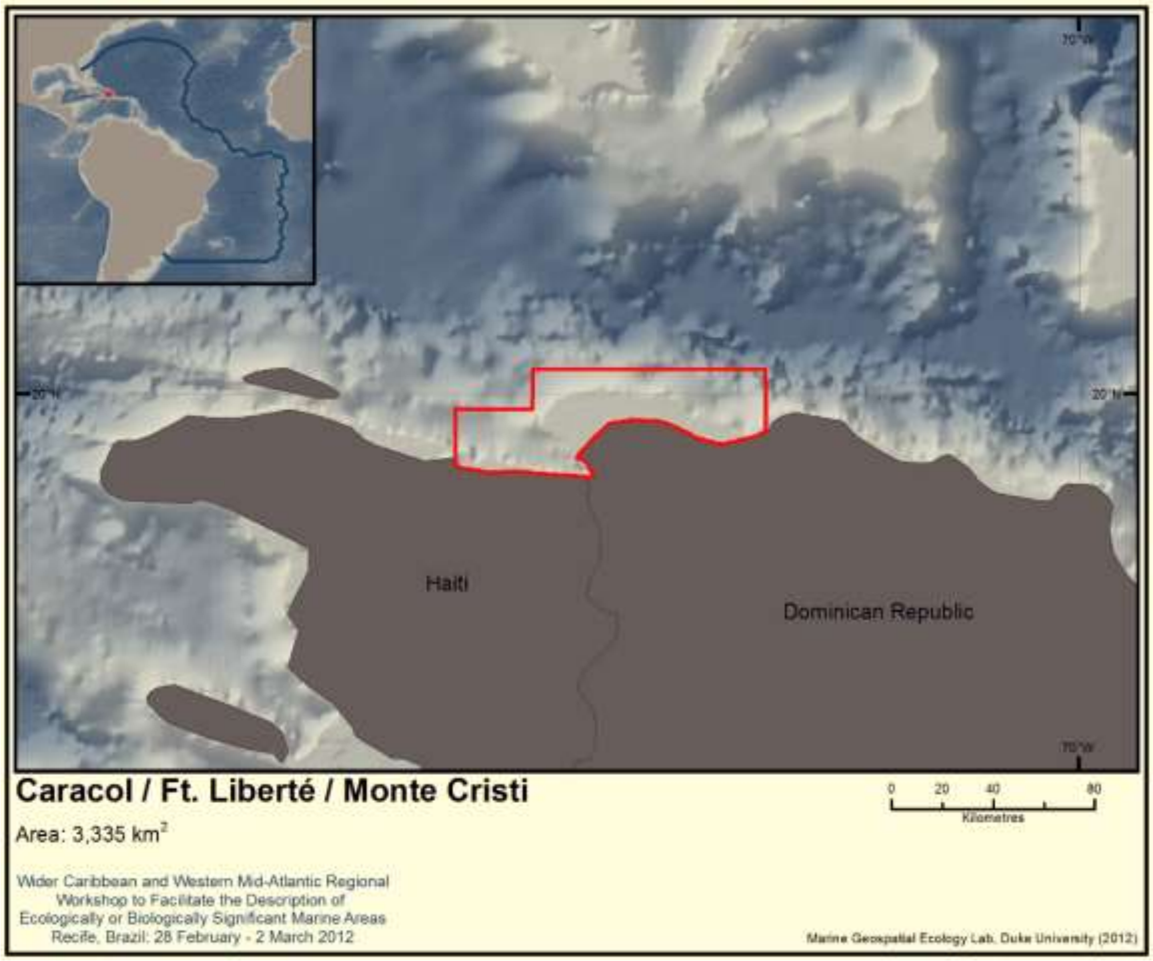
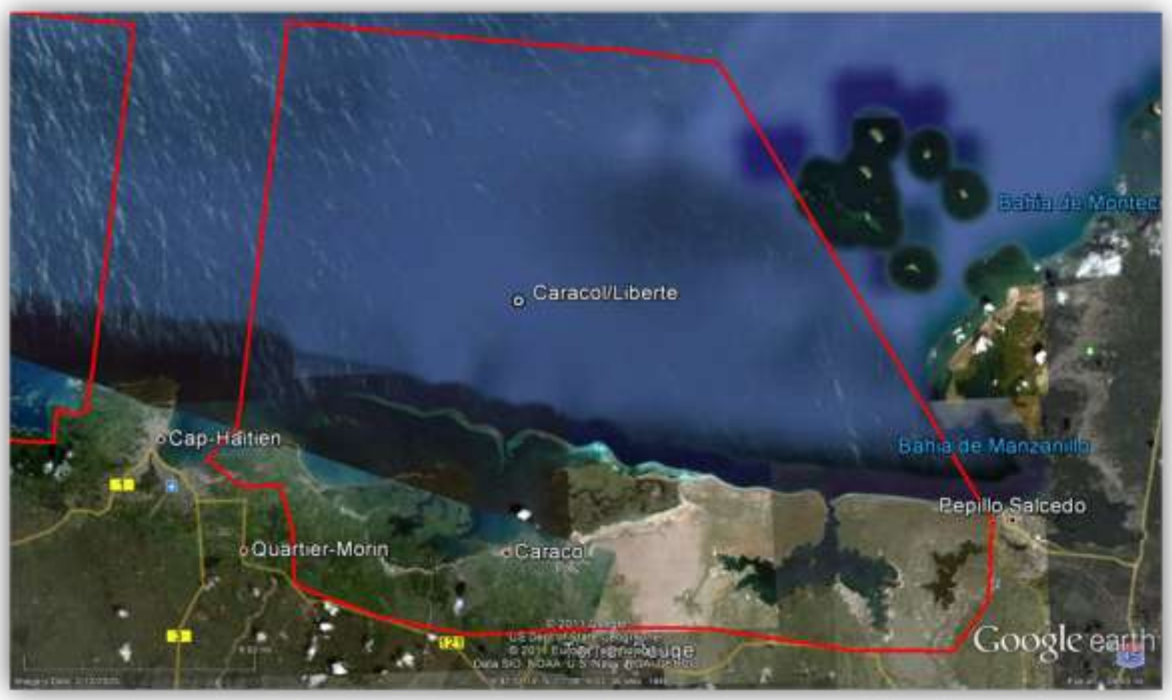


Figure 1. Area meeting EBSA criteria (no. 8)



AREA NO. 9: MARINE MAMMAL SANCTUARY BANCO DE LA PLATA Y BANCO DE LA NAVIDAD

Abstract

Humpback whales (*Megaptera novaeangliae*) come from the high latitudes of the North Atlantic (Massachusetts and Maine in the United States of America, Newfoundland in Canada, Greenland, Iceland and northern Europe), to the waters of the Dominican Republic to reproduce between December and April each year. Of all the whales that make this migration, 85% visit the areas offshore of the banks of the Banco de la Plata and Banco de la Navidad and Samana Bay, leaving only 15% for all other islands of the Caribbean. Therefore, the waters of the Dominican Republic represent a unique environment for the reproduction of this species, and it is here that the highest density of this species of North Atlantic humpbacks whales occurs.

Introduction

The population of North Atlantic humpback whales from at least five areas migrate to the Caribbean (Martin et al. 1984, Katona 1986; Clapham & Mattila 1988). The Banco de la Plata, the Bank of Christmas and the Bay of Samaná (in order of importance) stand out as the most visited by whales in the entire Caribbean region (Mattila et al 1994). These three areas are in the Dominican Republic's EEZ. Of these, Samana Bay is the most-visited whale- watching destination in the Caribbean andone of the best areas for whale watching in the world (Hoyt 1999).

In this geographical context, Samana Bay is ranked the most important, not only by the greater abundance of humpback whales, but also by the high frequency of sightings of whales and active groups, the long residence time of mothers and calves, which suggests that Samana Bay has a value qualitatively superior to other areas of the Caribbean, both as a mating space and breeding ground (Mattila 1994). This important breeding ground is now a marine protected area of 32,915 km², making it the largest protected area in the Dominican Republic (Marine Mammal Sanctuary of the Dominican Republic) and one of the most important areas for whale watching in the Caribbean (Hoyt, 1999).

Location

Located about 80 nautical miles off the northern coast of the Dominican Republic, the area extends from the western boundary of the Silver Bank of Bank of Christmas to the Bay of Samana from Punta Balandra and Miches.

The polygon describing these limits is as follows: The area starts in Punta Gorda 46° 69' 53.25" E and latitude 21° 22' 106.24" N UTM length, whence it continues to Punta La Matica, located at latitude 21° 01' 812.92" and longitude 47° 90' 52.34" E N, then following the oastline, to the point located at latitude 19 ° 02 '00" N and longitude 068 ° 31' 30" W, where the boundaries are directed straight toward the north to a point 19° 41' 44" N, 068° 31' 00" W, where it meets the sea altitude of 400 fathoms south-east of Banco de la Navidad, then heads north-west along to the point 20° 17' 38" N and 068° 45' 53" W, where it meets the sea altitude of 200 fathoms north-west of Banco de la Navidad, hence passes the point 20° 54' 44" N and 069°39' 45" W, north of Banco de la Plata, from there to the west to 20° 54' 47" N and 070° 01' 45" W, from which is passed to northern Banco Pañuelo at the point located at 21° 05' 30" N and 070° 30' 00" W, then on to the west of Banco Pañuelo to touch the point located at latitude 20° 55' 00" N and 071° 07' 16" W, from where it headsstraight to the coastline in Punta Preciosa located at latitude 19° 40' 40" N and longitude 070° 02' 30" W, whence it follows the coastline to the point of departure of the polygon.

Feature description of the proposed area

The Banco de la Plata, at 20º12'N and 69º21'W and 140 km north of Puerto Plata in the Dominican Republic, has an area of 3,740 km^2. In the northern portion of this bank a barrier is composed of a series of patch reefs bound together near the surface. This area is shallower and shaped like a triangle. This reef extends 30 km to the south-east; it is exposed at low tide, and on its ocean side descends to great depth over a distance of less than 100 m. The coral patches are pillars of cemented coral skeletons ascending from the rubble and sandy bottom 15 to 25 m up the surface.

The living coral species found here follow the zonation patterns described by Goreau (1959). *Acropora palmata* is found occupying the top portion of the reef down to the 6 m depth contour. Below that zone, most corals are typical of the lower palmata and buttress zones. The substrate of the Silver Banks is mainly sand and coral gravel. At the southern portion of the breaker zone, the mean depth is 40 m, and corals grow only where suitable substrate is present. The turbidity of the water tends to increase to the south and away from the reef crest. A reduction of coraline columns or pillars is obvious to the south of the reef crest. The mean coral cover in the Silver Bank is 40%. There is a low density of sponges (2.0%). Turf algae covers 51% of the sampled substrate. The rugosity of this reef is relatively high (1.3%) due to the magnitude of the coral columns or pillars, some of which reach the surface of the water.

Assessment of the area against CBD EBSA Criteria

CBD EBSA Criteria (Annex I to decision IX/20)	**Description** (Annex I to decision IX/20)	**Ranking of criterion relevance** (please mark one column with an X)			
		Don't Know	**Low**	**Medium**	**High**
Uniqueness or rarity	Area contains either (i) unique ("the only one of its kind"), rare (occurs only in few locations) or endemic species, populations or communities, and/or (ii) unique, rare or distinct, habitats or ecosystems; and/or (iii) unique or unusual geomorphological or oceanographic features.				**X**
Explanation for ranking The most important breeding grounds for the North Atlantic humpback whale					
Special importance for life-history stages of species	Areas those are required for a population to survive and thrive.				**X**
Explanation for ranking Over 85% of the population of North Atlantic humpback whales mate in this area. Local communities are economically dependent on the sustainable use (whale watching) of these resources.					
Importance for threatened, endangered or declining species and/or habitats	Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.				**X**
Explanation for ranking Sound of the boats, shipping lines, increasing levels of sediment, the problem of entanglement in fishing nets and potential impacts caused by climate change undetermined.					
Vulnerability, fragility, sensitivity, or slow recovery	Areas that contain a relatively high proportion of sensitive habitats, biotopes or species that are functionally fragile (highly susceptible to degradation or depletion by human activity or by natural events) or with slow recovery.				**X**
Explanation for ranking The recent lifting of the moratorium on whaling North Atlantic humpback threatens to reduce the population again.					
Biological productivity	Area containing species, populations or communities with comparatively higher natural biological productivity.		**X**		
Explanation for ranking The Caribbean basin is not very productive of biomass.					
Biological diversity	Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.				**X**
Explanation for ranking The various coastal ecosystems (mangroves, seagrass) bordering the sanctuary and coral reef in the EEZ provide a high diversity of species.					

Naturalness	Area with a comparatively higher degree of naturalness as a result of the lack of or low level of human-induced disturbance or degradation.		**X**		
Explanation for ranking Silver Bank and Bank of Christmas have been heavily fished.. Even though the humpback whales in DR are protected, hunting in the feeding grounds in the North Atlantic can lead to disturbance or degradation.					

Sharing experiences and information applying other criteria (Optional)

Other Criteria	**Description**	**Ranking of criterion relevance** (please mark one column with an X)			
		Don't Know	**Low**	**Medium**	**High**
Add relevant criteria	Connectivity				**X**
Explanation for ranking As a migratory species, the species has no political boundaries and is shared by several nations.					

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Maps and Figures

Figure 1. Area meeting EBSA criteria (no. 9)

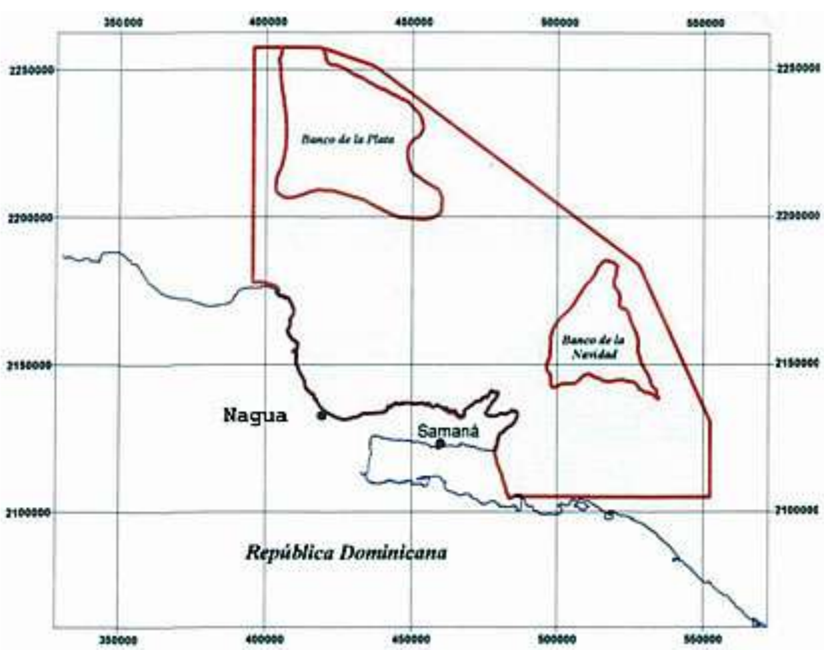

Figure 2. Banco de la Plata and Banco de la Navidad

/...

AREA NO. 10: SEAFLOWER

Abstract

The Seaflower is located in the Southwestern Caribbean eco-region, in the most northerly part of Colombia. It comprises diverse coastal and marine ecosystems of the Archipelago of San Andres, Old Providence and Santa Catalina. The area contains one of the largest and most productive open-ocean coral reefs in the Caribbean; provides rare, unique and unusual reef environments; contains remote areas demonstrating high integrity and little anthropogenic influence; and displays a continuum of habitats that support significant levels of marine biodiversity. With the presence of 192 Red List species, it is an important site for the conservation of endangered and threatened species of global concern. The Seaflower was recognized by UNESCO as a Biosphere Reserve, and preselected as a potential World Heritage Site by Colombia, which is zoning it as a multiple-use area with five zoning types. The Seaflower provides an exceptional example of marine habitat diversity, complexity, and inter-connectivity.

Introduction

The Seaflower contains one of the largest and most productive open-ocean coral reefs in the Caribbean; provides rare, unique and unusual reef environments; contains remote areas demonstrating high integrity and little anthropogenic influence; and displays a continuum of habitats that support significant levels of marine biodiversity. With the presence of 192 Red List species, it is an important site for the conservation of endangered and threatened species of global concern. As much of the area remains unexplored, the site's intrinsic conservation value will increase even further with additional scientific study, particularly in complex deep habitats and pelagic environments. Featuring barrier reefs, reef lagoons, reef slopes, fore-reefs, deep coral plateaus, seamounts, deep coral reefs, mangroves, seagrass and algal beds, soft and hard bottoms, beaches, and open ocean, the Seaflower area provides an exceptional example of marine habitat diversity, complexity, and inter-connectivity on a regional basis. The low-lying cays of the atolls are Holocene in origin, ranging in diameter from less than 100 m to several hundred metres.

Location

Seaflower is an open-ocean area surrounding the inhabited islands and including the coastal and oceanic coral reefs of the San Andres Archipelago, which is a Colombian administrative department in the south-western Caribbean.

The Seaflower is divided into three administrative sections, with only 0.01% of the area as a terrestrial surface, comprissing several tiny cays located in the midst of atolls.

The reef atolls of the San Andres Archipelago is a region of complex bathymetry and may play an important role in the Caribbean's oceanic circulation patterns, as current velocities increase when water flow meets elevations of the sea floor. In fact, the south-east current commonly known as the Panama-Colombia gyre, which is formed by anticyclonic meso-scale eddies (100 to 500 km) (Andrade and Barton 2000) has been associated with high larval retention areas and increased production of hydrobiological resources. The Panama-Colombia gyre is considered unique because of its year-round presence and broad area of influence (Mooers and Maul 1998), and is composed of an intense cyclone flanked by an anticyclone and cyclone, all embedded in a larger, weaker cyclonic circulation (Andrade and Barton 2000). Richardson (2005) suggests that this gyre is quasi-permanent, which is uncommon for cyclonic gyres, and that its internal speed can reach 100 cm s_{-1}. Deepwater circulation in the Caribbean Sea is also poorly understood, though it is considered to be dominated by eddies. In the central Caribbean Sea, the deep flow is linked to a cyclonic circulation (Joyce et al. 2001), while it is thought that there is a deep eastward flow along the southern boundary of the Caribbean Sea (Andrade et al. 2003).

The climate is warm and humid and is influenced both by the islands' geographical location and physiography. The islands are in the path of the Northeast Trade Winds, with mean monthly velocities of between 4 and 7 m/s and occasional storms with winds over 20 m/s in the latter half of the year (Geister and Diaz 1997). Mean annual air temperature in the Seaflower is 27°C, with a 10°C seasonal range. Average relative humidity is over 80%. Average annual rainfall is 1,900 mm with a dry season from January through May and a rainy season from June through December. Precipitation, however, fluctuates considerably within and between rainy seasons.

Feature description of the proposed area

The Seaflower's islands and atolls, volcanic in origin and closely linked to the formation of the Nicaraguan Rise and the Caribbean Sea, are strategically placed with respect to regional water circulation. The archipelago comprises a series of atolls and coral banks lined up in a NNE direction that extend for over 500 km.

The Seaflower exhibits complete and inter-connected ecosystems, displaying a highly diverse range of important habitats and ecological niches from the open-ocean and complex weathered coral reef formations, including rare tall pinnacles and coral cave systems, to coastal mangroves and beaches. They are valued locally for fisheries, tourism, and shoreline protection, and by tradition, but are also important for national and global conservation.

Although the Seaflower has not been subject to a high leves of scientific study and remains largely unexplored, information gathered to date indicates outstanding biological value and significant marine biodiversity, with actual levels of species richness likely to be much higher than currently known. The coastal and marine ecosystems and wealth of biodiversity were recognized in UNESCO's declaration of the San Andres Archipelago as the Seaflower Biosphere Reserve in 2000 and its designation as an Important Bird Area by BirdLife International in 2004. The MPA is also found within the Western Caribbean Coral Reef Hotspot, identified by Conservation International, and is a Secondary Endemic Bird Area on the edge of the western flyway. Overall, the area contains more than 200,000 ha of significant corals, mangroves and seagrass beds that provide feeding and breeding grounds for birds, reptiles, fish and invertebrates, including many endemic, vulnerable, threatened and endangered species. Of an estimated 60-70 scleractinian coral species (often referred to as hard or stony corals) found in the Caribbean Sea, at least 48 species are known to occur in the Seaflower and represent more than 80% of Colombia's coral reefs extension. At least 54 species of octocorals are known to occur in the Seaflower MPA, including 3 black coral species and 11 undescribed species, with possible high endemism. Zea (2002) documented total of 96 sponge species within the Seaflower MPA, but the inventory has recently been updated to 130 species.

The beaches of the islands and atolls of the Seaflower area are crucial habitats for nesting populations of 4 IUCN RedList sea turtle species: the loggerhead turtle (*Caretta caretta,* Endangered), hawksbill turtle (*Eretmochelys imbricata*,Critical), green turtle (*Chelonia mydas,* Endangered) and leatherback turtle (*Dermochelys coriacea,* Critical). The San Andres Archipelago is at the edge of the western flyway, and to date 126 migrant bird species have been documented in the MPA, of which it has been estimated that at least 85 migrant species belonging to 25 families specifically use the mangroves, wetlands and cays as stopover sites. There are an additional 31 resident bird species including 2 introductions. The St Andrew vireo (*Vireo caribaeus,*Vulnerable) is endemic, and there are 12 endemic sub-species.

The Seaflower also supports important commercial fish populations, such as queen conch, spiny and spotted spiny lobster, snappers and groupers. Of an estimated 500-600 fish found in the Greater Caribbean region, 407 species have been recorded from the Seaflower; of these, 52 species (13%) are on the IUCN Red List.

The Seaflower is home to 192 IUCN Red List species, including 5 marine mammal species, 4 marine turtle species that take advantage of excellent nesting beaches, 52 fish species, 43 scleractinian coral species, 2 hydrocorals, and 86 bird species, including the endemic St. Andrew Virio and at least 12 endemic sub-species. It has been confirmed that at least 7 seabird species breed in the Seaflower area. The area has the highest octocoral species diversity in the Western Caribbean, with possible high levels of endemism, and poriferan species diversity on a par with Caribbean continental shelf reef areas.

Within the area, studies over the past decade are beginning to highlight the area's importance in connectivity. Pizarro (2006), using local and Caribbean hydrodynamic models combined with biological studies of coral larvae, studied the potential connectivity between the coral reefs of the area and other Caribbean reefs, focusing on the larvae of the hard corals *Montastraea annualris*, *M. faveolata* and *M. franksi*. Local hydrodynamic measurements demonstrated retention of larvae on parental and nearshore reefs within the area, facilitated by weak current velocities within the SAI lagoon. Pizarro (2006) also highlights that the area reefs are a potential source of larvae for the reefs of Central America (Nicaragua, Costa Rica and Panama) and the coast of Colombia. Regional modeling suggested a larval flow of approximately 4%. Similar results have been found in the case of queen larvae with a potential to provide larvae up north of the archipelago, while providing most of the potential production to local reefs (Lonin et al, 2010), as well as for the zoanthid (*Palythoa caribaeorum*), accordingly to Acosta et al. 2008.

Feature condition and future outlook of the proposed area

Results of research and monitoring since 1999-2003 reveal that coral conditions appear to be stable, with a mean 20% of live coral tissue and more than 40% of the substrate covered by macroalgae, however there is spatial variation that affects reef conditions especially in deeper areas. The main fishery is the spiny lobster, a highly regulated one that exploits a stable and recovering stocks, associated in part with the reduction in fishing efforts due to the global economic crisis. In another case, the queen conch fishery, an appendix II CITES species, unlike in many other Caribbean sites, is still present in the larger and remote atolls from where high densities are being reported. This fishery, as a CITES species, is subjected to heavily regulated fishery management. There is little data regarding the presence and abundance of the reef fish, however there are coarse indicators that suggest those stocks are in decline. There is ongoing illegal fishing, mostly by neighbouring countries, which is being estimated and utilized for allocation of the TAC (total allowed capture) in the case of spiny lobster and queen conch.

Around the inhabitated islands and nearby atolls, the major local driver of the anthropogenic threats to marine conservation in the Seaflower is population pressure on resources and ecosystems. Despite illegal foreign fishing activities in these areas, their fishing pressure is lower compared to remote and unpopulated ones. Global climate change with expected sea level rise and ocean acidification, as well as increase in severe climate conditions is also crucial in areas dominated by small islands and vast coral extensions. Tourism development is increasing, and although it is not yet causing massive habitat destruction, it requires a better regulatory framework to avoid unsustainable use.

In the last decade, significant progress has been made in resource management, and community participation in the decision-making process isincreasing, thus there are high expectations for improvement of overall ecosystem services. Many of the decisions are based on dedicated scientific studies.

Assessment of the area against CBD EBSA Criteria

CBD EBSA Criteria	**Description**	**Ranking of criterion relevance** (please mark one column with an X)			
(Annex I to decision IX/20)	(Annex I to decision IX/20)	**Don't Know**	**Low**	**Med-ium**	**High**
Uniqueness or rarity	Area contains either (i) unique ("the only one of its kind"), rare (occurs only in few locations) or endemic species, populations or communities, and/or (ii) unique, rare or distinct, habitats or				**x**

	ecosystems; and/or (iii) unique or unusual geomorphological or oceanographic features.				
Explanation for ranking Complexity of benthic habitats that encompass true atolls and generatecomplex oceanic dynamics prone to regional connectivity. Good quality habitat provides home for rare and unique marine species, There are unique coral reef features, such as coral pinnacles and reef channels that significantly improve larval retention and connectivity. Presence of well developed deep coral reefs, seamounts, deep trenches generating a complex structure and bathymetry capable of generating a unique, strong gyre of great local and regional relevance.					
Special importance for life-history stages of species	Areas that are required for a population to survive and thrive.				**x**
Explanation for ranking Continuum of habitats that provide shelter and food for a high number of marine species within an area considered a hotspot for Caribbean biodiversity. Very small islands sustaining a local human population that has been recognized as an ethnic minority in national constitution.					
Importance for threatened, endangered or declining species and/or habitats	Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.				**x**
Explanation for ranking Existing areas that sustain at least 192 Red List species, many of them important ecologically and culturally. Development of training and participative restoration programmes dedicated to queen conch (*Strombus gigas*), *Acropora* reefs, and increasing reef fish recruitment.					
Vulnerability, fragility, sensitivity, or slow recovery	Areas that contain a relatively high proportion of sensitive habitats, biotopes or species that are functionally fragile (highly susceptible to degradation or depletion by human activity or by natural events) or with slow recovery.				**x**
Explanation for ranking Due to coral dominance in the area, the minimal land and the exposure to natural disasters, including global climate change, the area is considered fragile. The existence of illegal fishing practices, the use of prohibited fishing gear, such as scuba tanks, hookahs or gill nets, might alter the deepwater population dynamics, although there is no data to calculate the level of this pressure.					
Biological productivity	Area containing species, populations or communities with comparatively higher natural biological productivity.				**X**
Explanation for ranking The dominance of coral reefs (shallow and deep) within the area makes this an area of high natural biological productivity. The presence of the Colombia-Panama gyre has the potential to maintain areas of high					

productivity year round. The complex bathymetry in the area prone the high nutrient areas from deep environments to be available to pelagic communities.					
Biological diversity	Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.				**X**
Explanation for ranking Despite the limited availability of knowledge on deep zones, there is extensive information about the high biodersity existing in shallow areas. The results of recent studies currently under analysis will provide additional information on marine communities up to 1000m in depth with the potential to increase knowledge aboutbiodiversity.					
Naturalness	Area with a comparatively higher degree of naturalness as a result of the lack of or low level of human-induced disturbance or degradation.				**x**
Explanation for ranking The area encompasses extensive areas that have little human disturbance, thus denoting mostly impacts from natural forces. Illegal fishing has occurred in particular areas, leaving wide spaces with high naturalness.					

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AREA NO. 11: SABA BANK

Abstract
The Saba Bank is a unique and highly significant area for the entire region. Biophysically it is a submerged atoll, the largest actively growing atoll in the Caribbean, and one of the largest atolls in the world, measuring 1,850km^2 above the 50m depth contour. The area is significant in terms of its unique ecological, socio-economic, scientific and cultural characteristics. Its extensive coral reefs, fishing grounds and algae beds are among the most diverse and pristine in the Caribbean.The Saba Bank has been declared a protected area by the Dutch Government (15 Dec 2010) to protect its biodiversity and prohibit anchoring. Additionally an application to IMO has been submitted requesting Particularly Sensitive Sea Area (PSSA) status for the Bank to regulate ship traffic.

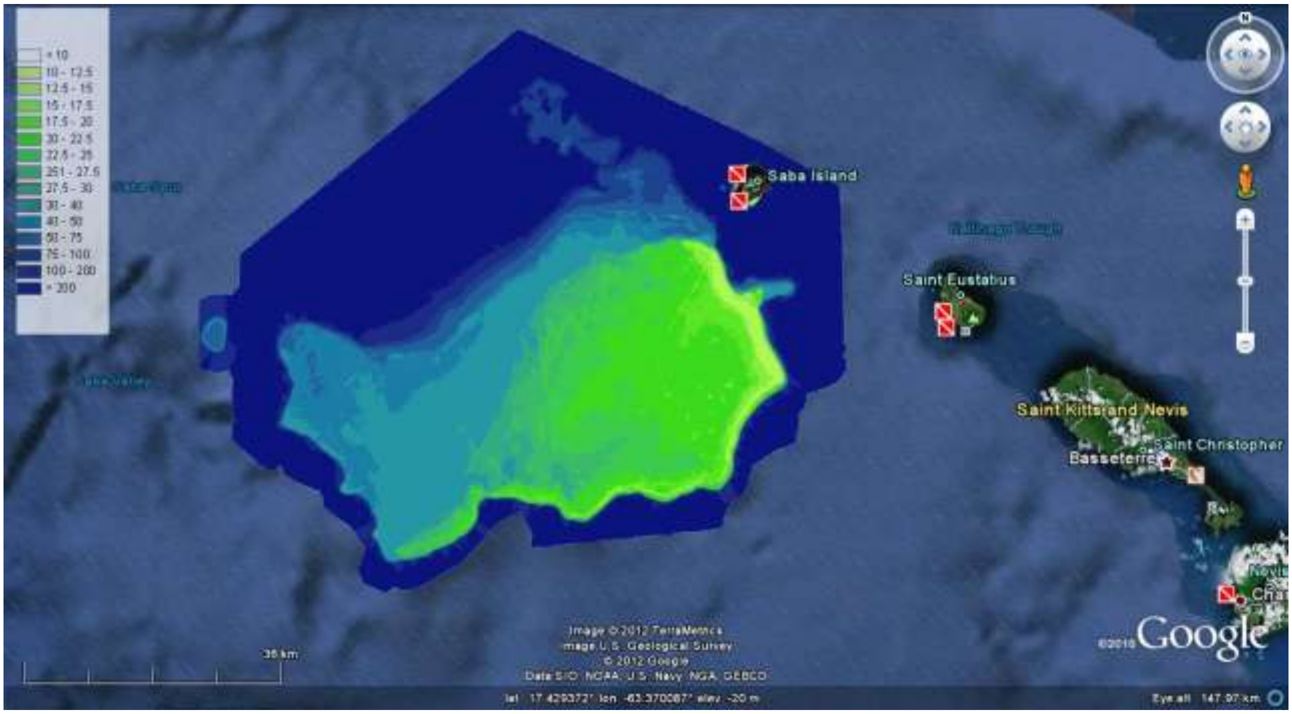

Figure 1. Saba Bank bathymetry.

Introduction
The Saba Bank (17°25' N, 63°30' W) is an undersea elevation with a flattened top—a bank—3 to 5km south-west of the island of Saba and 25km west of St. Eustatius (Figure 1). It is raised about 1000m above the general depth of the surrounding sea floor, and its shape is approximately square or slightly elliptical, the long axis trending ENE-WSW. With a length of 60 to 65km and a width of 30 to 40km, the total surface area is approximately 2200km^2 (measured to the 200m isobath). The platform is somewhat tilted, with the north-western part of the surface being deeper than the south-eastern part. The largest part of the bank is between 20 and 50m depth, but a substantial eastern part (app. 225km^2) is between 10 and 20m depth. On its western rim, depths are around 50m, while on the eastern and south-eastern edges, where a prominent coral ridge system (55km long) runs along the platform, depths vary between 7 and 15m (Van der Land 1974, MacIntyre et al. 1975). Saba Bank is a classic sub-surface atoll consisting of a submerged mountain with a margin or ring of actively growing coral reefs. As such it constitutes the largest atoll in the Atlantic Ocean Basin and one of the largest atolls on Earth (Land 1977, Purdy & Winterer 2001).
For generations Saba Bank has been fished by the Sabans. This fishery was first documented early in the twentieth century by Boeke (1907) who also mentioned the existence of extensive coral growth. The Bank has intrigued a number of scientists since the early twentieth century who studied and debated its geology

(Spencer 1904, Vaughan 1919, Davis 1926, Macintyre et al. 1975), but otherwise little attention was given to Saba Bank until the 1970s, when many Caribbean nations declared Exclusive Economic Zones (EEZ) and started to control their fisheries.

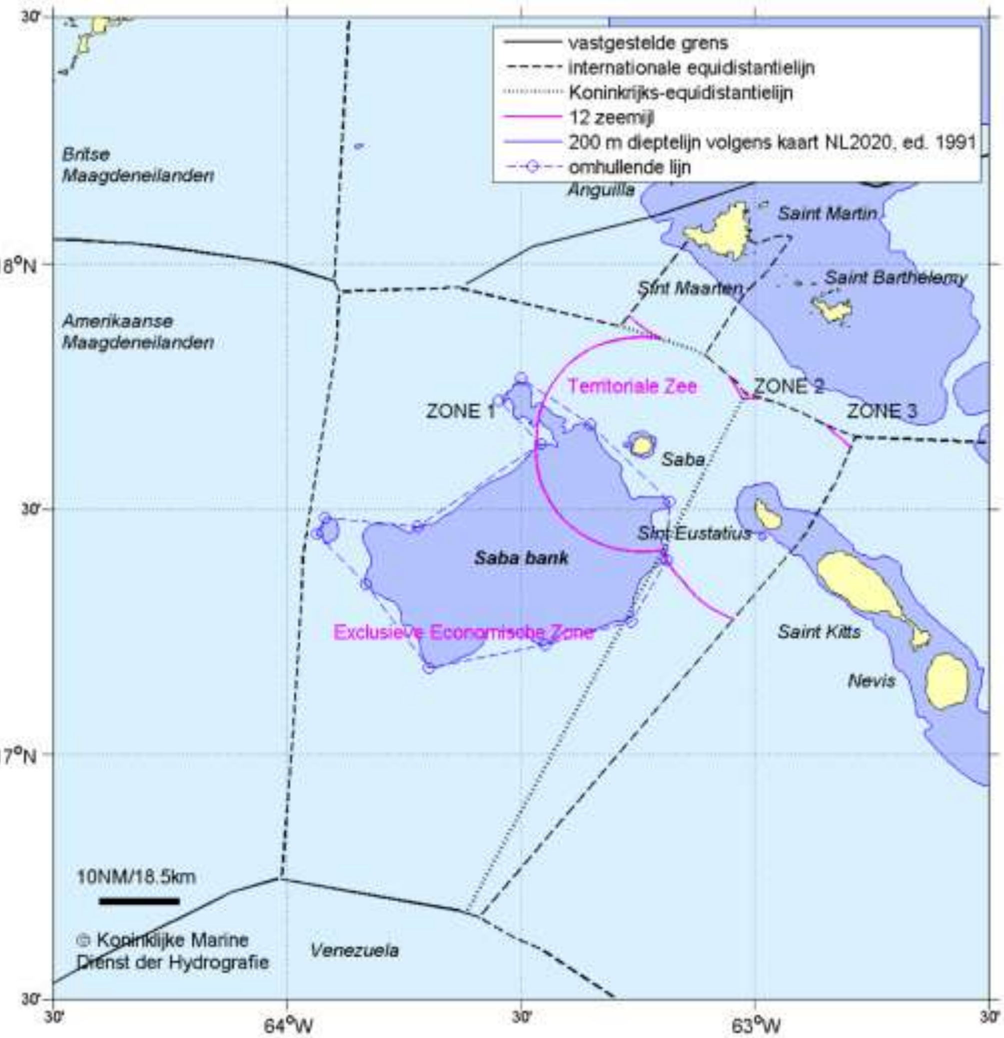

Figure 2. Protected area designation. The dashed line closely following the outline of the bank indicates the protected area.

Location

The Saba Bank is completely within the Exclusive Economic Zone of the Netherlands. Part of the Bank is within island authority (within 12nm) but the Netherlands is responsible for issues related to international treaties such as the CBD. The Dutch government declared the bank a protected area on 15 December 2010 (see provided official declaration map in Figure *2*) and is now actively patrolled by the Dutch coast guard. The Royal Netherlands Hydrographical Survey carried out extensive acoustic surveys using the collected data to create a high-resolution bathymetric map (Figure *1*). The Bank is not part of a submission to the Commission on the Limits of the Continental Shelf.

Feature description of the proposed area

At present the Saba Bank is increasingly being investigated by the scientific community, and Hoetjes and Carpenter (2010) present an overview of biodiversity research that has taken place on the Bank. The area is difficult to access by the scientific community due to its distance to the nearest harbour, the high waves, and the depth. Below a summary is given with respect to the different taxa that have been studied for the Saba Bank (Table 1). Research to date has been mainly focused on species diversity, and little is known about the functioning of the Bank. In 2011 a research programme was started to gain more knowledge on the ecological processes to better understand the Bank and protect it effectively. Included in this programme is research related to the carrying capacity for lobster and reef fish. Below the different species groups (in alphabetic order) are briefly discussed. The total number of species that were found in the references in Table 1 represent a sample of what is present and is limited by sampling effort. Generally, the higher the effort the more species will be found, although this increase will gradually level off to an asymptote. Most studies to date did not, however, reach this asymptote.

Seabirds. Postma and Nijkamp (1996) found that seabird densities on the Saba Bank averaged two times higher than off the Bank. On the Saba Bank most seabirds appear to be concentrated around the 200 m isobath. The most common species recorded (April-May) were red-billed tropicbird (*Phaeton aethereus)* with 5% of the world population breeding on nearby Saba (www.birdlife.org), magnificent frigatebird (*Fregata magnificens)*, sooty tern (*Sterna fuscata)*, and bridled tern (*S. aneaetheus)*. Other species were pomerine skua (*Stercorarius pomarinus)*, and Wilson's storm petrel (*Oceanites oceanites)*. In the pelagic areas adjacent to the bank, the brown noddy (*Anous stolidus)*, and Audubon's shearwater (*Puffinus lherminieri)* were most common.

Hard corals. Coral reefs are present along the eastern and south-eastern edges of the Bank and are rich in terms of cover and diversity of hard and soft corals. There is a lot of structural complexity (Figure *3*) from thousands of years of growth of stony corals, which created a large array of different habitats (e.g., fore reef, back reef, lagoon) for other species (Toller et al. 2010). Individual coral colonies can be found over the whole Bank. The coral reef area can be quite broad, up to 2 km wide with a double reef in certain areas (e.g., Figure *3*). This means that the total reef area of the Bank is very large and likely constitutes the largest coral reef area within the Dutch Caribbean.

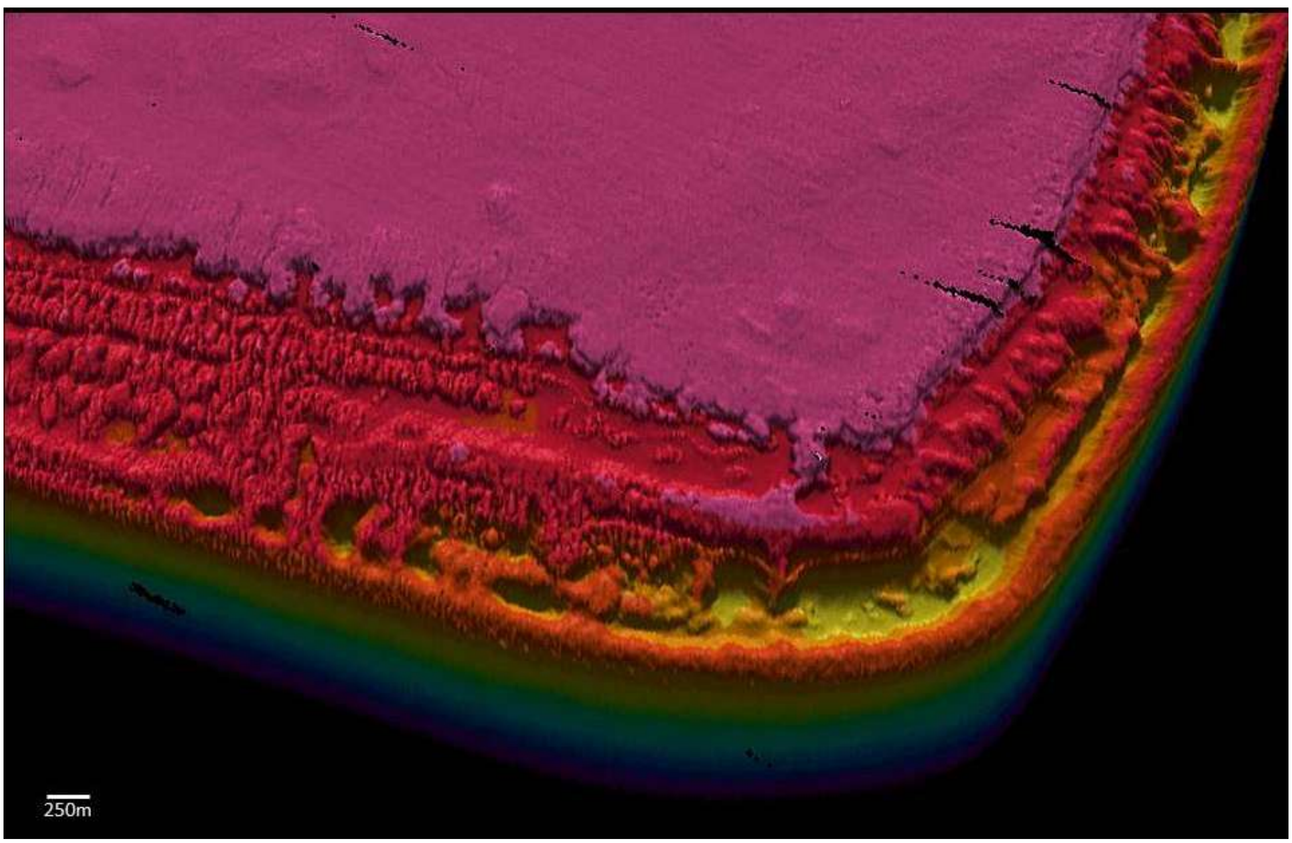

Figure 3. Example of structural complexity of the Saba Bank (approximately at 17.385365°, -63.201199°) showing a double reef along the western edge of the Bank. Courtesy of Royal Netherlands Hydrographical Survey.

Fish. Some habitat types, such as mangroves and seagrass beds, are not present on the Saba Bank. Therefore fish species that occur solely in these habitats are absent from the Bank. Despite this, the Bank ranks 8th in terms of fish diversity in the Greater Caribbean, with an estimated number of fish species between 320 and 400 (Williams et al. 2010). Sharks and other predatory fish are quite common and seem to indicate an intact food chain.

Mammals. Mammals have been sighted many times (Hoetjes and Carpenter 2010), but little effort has been made to carry out bias-free surveys from which population densities can be calculated. It is likely that a shallow area as large as the Saba Bank plays an important role in a mostly much deeper region. In 2012 the Dutch government is financially supporting cooperation with the French in sea mammal surveys in the area. The intention is to come to more regular monitoring of sea mammals in the region through international cooperation, and one of the intentions of the government is to establish an international whale sanctuary together with France, UK, and US, including the Saba Bank.

Table 1. An overview of published literature with respect to the diversity of the Saba Bank including reports and peer-reviewed articles.

Taxonomic group	**Publication**	**Number of different species found**	**Remarks**
Fish	McKenna 2006	200	
Fish	Toller et al. 2010	97	High abundance of predatory fish indicates healthy system in contrast to other areas in the Caribbean.
Fish	Williams et al. 2010	270	Expected number of species between 320 and 410. Six possible new species found.
Hard corals	Meesters et al. 1996	28	
Hard corals	McKenna 2006	40	
Hard corals	McKenna and Etnoyer 2010	43	
Mammals	McKenna 2006	One female humpback whale with a calf	
Mammals	Lundvall 2008	Humpback whales, sperm whales, spinner dolphins, bottlenose dolphins	
Marine marco algae	McKenna 2006, Littler et al. 2010	Estimated species richness between 150 and 200.	Diversity is extremely high. Possibly 12 new species. All species can be viewed at http://sweetgum.nybg.org/saba/algae.html
Seabirds	Lundvall 2008	Frigate birds, red billed tropicbirds, brown pelicans, Audubon's shearwater	Saba island contains approximately 5% of the world population of red billed tropicbirds.
Sea turtles	Lundvall 2008	Green turtles, leatherbacks, and loggerheads have been observed	
Soft corals	McKenna 2006	20	
Soft corals	Etnoyer 2007, Etnoyer et al. 2010	48	Exceptionally high diversity. Two new species
Sponges	McKenna 2006, Thacker et al. 2010	45-50 new and 39 from previous expeditions, totalling 84 species.	Probably only 45-82% of all species.
Sponges	Thacker et al. 2010	84	Underestimation and new species are expected

Marine macroalgae. Littler et al. (2010) remark "Prior to this survey, the two most diverse areas for algae reported in the Caribbean had been Diamond Rock, Martinique and Pelican Cays, Belize, a mangrove, sea grass, and coral complex. Habitats on Saba Bank have far exceeded both of these places for species diversity. A major reason for this uniqueness and richness is the sheer size and habitat range of the seamount/atoll." Thus, the Saba Bank appears exceptionally rich in marine algae. The algal fields of the bank are a source of food for many organisms.

Sea turtles. The enormous diversity and abundance of marine algae and sponges means that there is ample food for these animals. Therefore it is assumed that the area is important as a feeding area for turtles. There were several confirmed sightings of hawksbills (*Eretmochelys imbricata*) during a survey in 2007. Leatherbacks (*Dermochelys coriacea*) and loggerheads (*Caretta caretta*) have also been seen on the Bank (Lundvall 2008).

Sharks. Sharks appear to be reasonably common on the bank (Lundvall 2008). In 2010 a small expedition to the bank encountered several sharks on every dive. During dedicated surveys in 2006 and 2007 (Williams et al 2010), nurse shark (*Ginglymostoma cirratum*),Cuban dogfish (*Squalus cubensis)*, reef shark (*Carcharhinus perezii*), tiger shark (*Galeocerdo cuvier*), and lined lantern shark (*Etmopterus bullisi)* were found.

Soft corals. The species diversity of soft corals appears to be exceptionally high (Etnoyer 2007, Etnoyer et al. 2010), and already two new species have been found. Soft corals may benefit from the high-energy environment of the Bank, which makes it an excellent environment to develop local endemism. Forty eight species were found, but species-area accumulation curves suggest more than 50 species.

Sponges. Many sponge species were found with a comparably small sampling effort (Thacker et al. 2010). The large area and wide variety of Saba Bank's reef habitats suggest that the Saba Bank provides an important reservoir of sponge biodiversity for the Caribbean. Sponge community health appeared to be very good compared to other localities in the Caribbean. Unique and potentially endemic sponge species were collected from each site, thus further exploration of Saba Bank might reveal additional species that are new to science. The widespread Caribbean reefs indicate that the sponge fauna of Saba Bank is broadly representative of the Caribbean as a whole. A robust population of giant barrel sponge (*Xestospongia muta*) is abundant on the Bank and appeared healthy with none of the signs of disease or bleaching reported from other Caribbean reefs. This species can grow for hundreds of years and has been called the "redwood of the sea" (McMurray et al 2008). Anchor chain damage to these sponges has occurred in the past, but is now prevented through a ban on anchoring.

Feature condition and future outlook of the proposed area

The Saba Bank has a unique position in terms of geomorphology and biodiversity. The Bank is relatively isolated from land-based influences and intensive fisheries. Therefore, the chances of disruption of the ecosystem and its services by common sources of reef degradation, such as eutrophication, sediment runoff, and overfishing, may be small or even absent. Damage caused by other agents, such as temperature increases as a consequence of climate change, diseases, the sea urchin (*Diadema antillarum*) die-off in 1983, hurricanes, and the introduction of invasive species such as the lion fish (*Pterois volitans/miles*),have occurred on the Saba Bank as well. There is growing scientific support that resilience of coral reef ecosystems to these region-wide disturbances may be better in areas that are relatively free from anthropogenic pressures (Mumby et al. 2007, Smith et al. 2008, Carilli et al. 2009). One of the biggest direct threats to the Saba Bank ecosystem is probably the anchoring of large tankers and cargo vessels. Their anchors and heavy chains may flatten large extensions of reef area that may require decades or longer to regenerate. With the designation of the area as a protected area (2010), anchoring has been forbidden.

The Saba Bank still offers some of the most pristine coral reefs of the Caribbean. A research programme was started in 2011 by the Dutch Government (commissioned to the Institute of Marine Research and Ecosystem Studies, IMARES) to provide more knowledge on the ecological functioning of the Bank.

Information that is still missing

It is still not clear how important the Bank is for seabirds and sea mammals, as there is no regular monitoring programme. Also, the carrying capacity for the lobster fishery is as yet unknown, but research has been started. Another point of attention is the biodiversity of the mesophotic reefs (40-150m). More research in this area has been planned for the near future.

The Netherlands is taking steps to collect more information by stimulating monitoring and research, including the organization of a large international expedition to the area to collect relevant oceanographic and biological data.

Other relevant information

In view of the possible importance of the Saba Bank for other island reefs in the region (connectivity) it may well be possible to include the Saba Bank into a larger area meeting EBSA criteria. Because of its well documented biodiversity and protected status it is believed that it at this point in time may also be considered a separate area meeting EBSA criteria.

Assessment of the area against CBD EBSA Criteria

<table>
<tr><td rowspan="2">CBD EBSA Criteria
(Annex I to decision IX/20)</td><td rowspan="2">Description
(Annex I to decision IX/20)</td><td colspan="4">Ranking of criterion relevance
(please mark one column with an X)</td></tr>
<tr><td>Don’t Know</td><td>Low</td><td>Some</td><td>High</td></tr>
<tr><td>Uniqueness or rarity</td><td>Area contains either (i) unique (“the only one of its kind”), rare (occurs only in few locations) or endemic species, populations or communities, and/or (ii) unique, rare or distinct, habitats or ecosystems; and/or (iii) unique or unusual geomorphological or oceanographic features.</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td colspan="6">Explanation for ranking:
The Saba Bank is the largest atoll in the Caribbean and among the 10 largest of the world.
The Bank is unique in that it is far away from larger landmasses that cause many human-related stressors such as eutrophication and run-off.
Recently, new species have been discovered that may be unique to the area:
• Six possible fish species (Williams et al. 2010)
• Possibly 12 new marine macro algal species (Littler et al. 2010)
• Two new species of soft corals (Etnoyer et al. 2010)
• New sponge species are expected (Thacker et al. 2010)</td></tr>
<tr><td>Special importance for life-history stages of species</td><td>Areas that are required for a population to survive and thrive.</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td colspan="6">Explanation for ranking:
The area is important for the survival of local fish populations, as several fish spawning aggregations have been observed along the edge of the Bank (Lundvall 2008). Size and geographic position of the Bank indicates that it has an important function as a source of larvae from fish and invertebrates (connectivity). The area is used as feeding ground for turtles, and sea mammals and several shark species have been observed.</td></tr>
<tr><td>Importance for threatened, endangered or declining species and/or habitats</td><td>Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td colspan="6">Explanation for ranking:
The area is very large (app. 2200 km^2) and provides substrate and food for corals, sponges, algae, fish, turtles, seabirds, and possibly whales, which have been observed over the Bank. It is an important feeding ground for red billed tropicbirds from Saba and harbours approximately 5% of the world population (www.Birdlife.org). Whales have been observed in the area, and sharks were encountered on each dive during a 2010 expedition. A large and healthy population of a sponge species that can grow to the age of hundreds, possibly thousands, of years (McMurray et al. 2008), is also present.</td></tr>
</table>

<table>
<tr><td>Vulnerability, fragility, sensitivity, or slow recovery</td><td>Areas that contain a relatively high proportion of sensitive habitats, biotopes or species that are functionally fragile (highly susceptible to degradation or depletion by human activity or by natural events) or with slow recovery.</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td colspan="6">Explanation for ranking:
Coral reefs are very sensitive to human impact (nutrients, run-off, overfishing, anchoring) and harbour many protected species. Recovery of damaged areas may take decades or longer. The total reef area is very large (more than 60km long and in places more than 1km wide). The non-reefal area forms an important habitat for one of the richest areas of marine macro algae in the Caribbean (Littler et al. 2010), and a large and exceptionally healthy population of barrel sponges (Thacker et al. 2010). The whole area is important as a feeding area for threatened species such as turtles and, indirectly, sharks.</td></tr>
<tr><td>Biological productivity</td><td>Area containing species, populations or communities with comparatively higher natural biological productivity.</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td colspan="6">Explanation for ranking:
The area has been known as an important source of reef fish, conch, and lobster already since the early 20th century (Boeke 1907) and is still well known by fishers from Saba, St. Eustatius, and other islands for its exceptionally high productivity (Dilrosun 2000). Coral reefs are also among the most productive ecosystems on Earth.</td></tr>
<tr><td>Biological diversity</td><td>Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td colspan="6">Explanation for ranking:
The Bank's biodiversity has been studied very recently by a team of researchers, and a number of new species were found. The area was cited as one of the richest in the Caribbean in terms of biodiversity containing:
• at least 150-200 macro algae species, among which possibly 12 new species (Littler et al. 2010),
• between 320 and 410 fish species with possibly 6 new species (Williams et al. 2010),
• at least 43 coral species (McKenna and Etnoyer 2010),
• at least 48 soft coral species with 2 new species (Etnoyer et al 2010),
• more than 84 sponges (Thacker et al. 2010), including a large, healthy population of large barrel sponges that can grow for hundreds of years.</td></tr>
<tr><td>Naturalness</td><td>Area with a comparatively higher degree of naturalness as a result of the lack of or low level ofhuman induced disturbance or degradation.</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td colspan="6">Explanation for ranking:
The area is surrounded by very deep water and is far away from larger land masses, thus hardly influenced by well-known disturbances, such as excess of nutrients, runoff, coastal development, and overfishing. In comparison with other Caribbean areas, the Bank stands out because of its naturalness and pristinity.</td></tr>
</table>

Other Criteria	**Description**	**Ranking of criterion relevance** (please mark one column with an X)			
		Don't Know	**Low**	**Some**	**High**
Connectivity	Based on its sheer size the area is likely to be a source for larvae of coral and fish species and therefore important for the biological diversity of other reef areas downcurrent of the Saba Bank.				X

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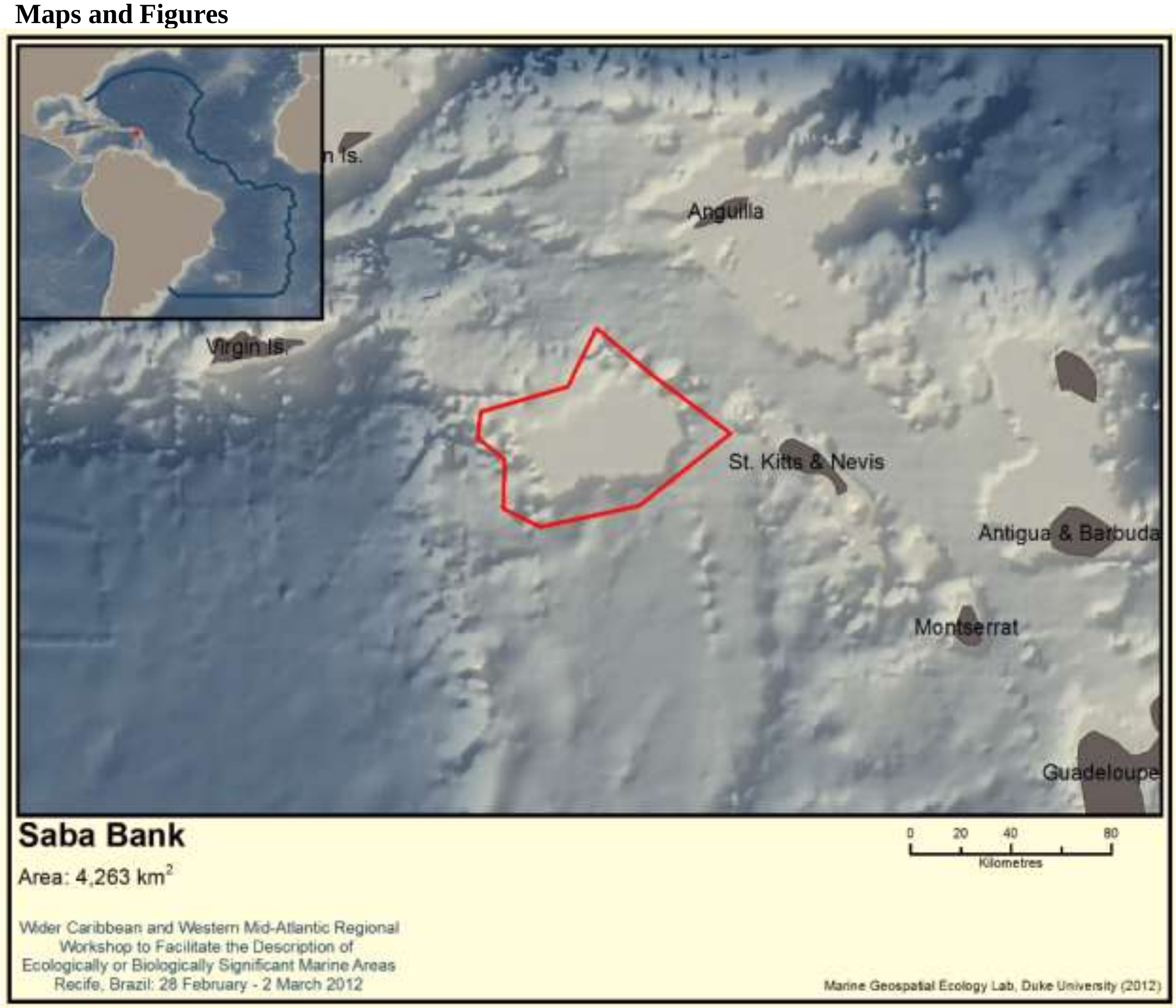

Figure 4. Area meeting EBSA criteria (no. 11)

Figure 5. Underwater photograph of Saba Bank.

AREA NO 12: EASTERN CARIBBEAN

Abstract

An area encompassing the Eastern Caribbean arc of islands and surrounding waters is proposed as an area meetingEBSA criteria. The region's small island masses harbour a variety of rich ecosystems, such as coral reefs, seagrass beds and mangrove swamps, which are extremely high in terms of productivity. The region is also is home to unusual features, such as a major underwater volcano called Kick 'Em Jenny (Grenada), as well as hydrothermal vents and seamounts. The contribution of these ecosystems and underwater features to biological productivity and ecological stability extends beyond the limits of the Eastern Caribbean. For instance, it is possible that larvae produced by stocks of the commercially important Caribbean species of spiny lobster, and queen conch, the latter species being listed in Appendix II of CITES, in the Eastern Caribbean are transported by currents to parts of the Western Caribbean, where they are believed to settle and become part of the adult stocks in that part of the Caribbean The Eastern Caribbean area also provides nesting, nursing, and feeding conditions, without which the survival of several globally significant migratory species, such as billfishes, whales, sea turtles, and seabirds could be negatively impacted.

Introduction

The Eastern Caribbean consists of an arc of approximately 15 small islands separating the Caribbean Sea from the Atlantic Ocean and lying just north of the continental shelf off the northeast coast of South America. Many of these islands are volcanic in origin, with volcanic activity continuing in some islands (MacDonald et al. 2000; Roman et al. 2008). Moreover, within the area are also three known hydrothermal vents distributed along the arc, and a submarine volcano located 9 km off the north coast of Grenada (Devine and Sigurdsson, 1995). Few of the islands are limestone in origin, either entirely or in part, such as Barbados, Anguilla, Antigua and Barbuda and Tobago (of Trinidad and Tobago).

While the primary productivity of the open ocean areas surrounding the island arc is low (MODIS AQUA database and SeaWIFS database), a complex network of highly productive island coastal ecosystems exist, the most important of which are coral reefs, seagrass beds, and mangroves (Gollock et al. 2011, CARSEA, 2007). These systems harbour a high diversity of flora and fauna (OBIS database), including commercially important ones, such as the queen conch, Caribbean spiny lobster and many reef and pelagic fish species. As such, the high productivity of these ecosystems provides critical goods and services for supporting human life and livelihoods in the area (CARSEA, 2007). Although ecologically and economically important, these ecosystems are vulnerable to both anthropogenic and natural forces (Wilkinson and Souter, 2005, CARSEA, 2007). Additionally, the area is characterized by several island masses, often separated by deep water trenches/submarine canyons (Harris and Whiteway, 2011) and influenced by flow disturbances to currents caused by the island masses themselves that may strongly affect the retention and dispersal of larvae of coral reef fish species (Harlan et al. 2002). In view of this, (and in the absence of adequate information on biological connectivity), the ecosystems at both the island and sub-regional levels potentially support a number of distinct resident species stocks and so arguably, possesses their own local genetic biodiversity.

In terms of more mobile resources, such as pelagic fishes, cetaceans and sea turtles, the island arc is believed to lie along key migratory routes for several such species, including top predator species such as tunas (*Thunnus spp.*) and billfishes (Family: Istiophoridae); for some of these migrants, the area provides desirable conditions for nesting (sea turtles), calving and nursing (cetaceans) (FAO, 2008), and feeding (billfishes and other large tuna species) (Mohammed et al., 2008; Orbesen et al., 2009; Gomes et al., 1998; CRFM, 2008).

All the islands harbour seabird colonies, the most important ones being located in Anguilla and St. Vincent and the Grenadines (IBA database). Additionally, several seamounts exist on both sides of the island arc (Yesson et al., 2011). While little else is known about these seamounts, research in other areas suggests that these features are potentially areas of high productivity, due to the possibility of localized upwelling and ocean current effects.

A study, which predicted the occurrence of cold water coral habitat for *Solenosmillia variabilis* and *Enallopsammia rostrata*, indicated potentially suitable habitat for important and productive ecosystems occurring in the Eastern Caribbean (Davies and Guinotte, 2011).

In terms of data, information and knowledge on the Eastern Caribbean, some aspects of ecosystem structure and function are generally understood, especially for the coastal areas that are routinely monitored through government-supported programmes (e.g., CRFM, 2010, CRFM 2011a). However, gaps in information and knowledge include biological connectivity among ecosystems at the island and sub-regional levels (Harlan et al. 2002), ecosystem resilience (Mohammed et al. 2008), and deep-sea ecosystems. This issue will need to be addressed to better inform management approaches for the area described as an EBSA.

Location

The islands of the Eastern Caribbean include Anguilla, Antigua, St. Kitts & Nevis, Guadeloupe, Saba, Martinique, Dominica, St. Lucia, Barbados, St. Vincent and the Grenadines, Grenada and Trinidad and Tobago. The islands arc from Anguilla, located at 18°12.8^{0}N and 63°03.0^{0}W, and curve around to Tobago, located at 10° 2' to 11° 12' N and 60° 30' to 61° 56' W.

Feature description of the proposed area

A variety of marine ecosystems, such as the more coastal coral reefs, seagrass beds and mangrove swamps, characterize the area; additionally, there exist less studied ecosystems further off shore, associated with several seamounts and hydrothermal vents. The OBIS Hurlbert's biodiversity index has listed the region as high for both shallow-water and deep-sea species. A unique feature of the region is the large, underwater volcano, Kick 'em-Jenny, located off the island of Grenada. Many of the coastal ecosystems, which are in various stages of health, and which are impacted by a range of anthropogenic and natural phenomena, support a plethora of flora and fauna. Some of these organisms are endangered, such as three species of sea turtle (Dow et al. 2007) and two hard-coral species (www.iucnredlist.org). In addition to providing habitat, the ecosystems serve as spawning grounds and nursery areas for organisms ranging from reef fish to some species of cetaceans.

Stocks of the commercially important Caribbean species of spiny lobster and queen conch, the latter species being listed in Appendix II of CITES, in the Eastern Caribbean are transported by currents to parts of the Western Caribbean, where they are believed to settle and become part of the adult stocks in that part of the Caribbean (FAO, 2006).

The predictions of suitable habitat for two species of framework forming cold-water corals (*Solenosmillia variabilis* and *Enallopsammia rostrata*) are high for the region (Dataset-ChEss Base 2010).

In terms of pelagic species, the region supports both resident and migrant species (Mohammed et al., 2008). Tagging and genetic studies suggest that a distinct stock of flyingfish (*Hirundichthys affinis*) occurs in the Eastern Caribbean (e.g. Gomes et al. 1999), while the body of water between Grenada and Tobago yields the highest concentration of flying fish in the Eastern Caribbean region. There is low abundance of this species north and south of this area. Studies indicate that this body of water possesses the necessary current and oceanographic attributes and right conditions for breeding of the flying fish, which has great significance for fisheries in that part of the Caribbean.

A small resident population of sperm whales, *Physeter catodon,* occurs within the marine waters of Dominica and is of great biological and ecological significance (Guiste, Fisheries Division, pers comm.). Other marine mammals, such as pigmy killer whales (*Feresa attenuata*), Cuvier's beaked whale (*Ziphius cavirostris*), false killer whale (*Pseudorca crassidens*) and whale sharks (*Rhincodon typus*) among many others, occur regularly off some of the islands, notably Dominica; and migrant mammals, including the humpback whale (*Megaptera novaeangliae*), sperm whale (*Physeter catodon*), common bottlenose dolphin (*Tursiops truncatus*), rough-toothed dolphin (*Steno bredanensis*), and spinner dolphin (*Stenella longirostris*) are consistently present on an annual basis around islands such as St. Kitts and Nevis (Agostini et al., 2010).

Fifty two (52) BirdLife-designated Important Bird Areas (IBAs) are included within the area, of course with seabirds as a qualifying feature. Thirty-six of these are globally important, while the other 16 are of Caribbean regional importance. Together, they are home to over half a million individuals of 16 species of seabirds. Dog Island (Anguilla) holds a colony of more than 100,000 breeding pairs of sooty tern alone; six sites meet the Ramsar criteria for presence of >20,000 waterbirds, nine sites hold >10,000 individuals, and 23 sites hold >1000 individuals. . The EBSA proposed here would incorporate the majority of key marine feeding grounds for seabird species breeding at these IBAs and would qualify as high for both diversity and importance for life-history stages EBSA criteria on the basis of the seabirds present.

The coastal ecosystems have been intensively studied by a variety of local and international universities. However, the deep-sea areas are far less studied and understood. As a result, there are numerous gaps in the information on deep sea benthic features and their associated flora and fauna. However, data submitted by ChEss Base and Deep Sea Research suggests that hydrothermal vents and sea mounts exist in the area.

Feature condition and future outlook of the proposed area

All the islands of the Eastern Caribbean have narrow continental shelves, which support numerous coral reefs, on which the majority of their economies are heavily based. Seagrass beds and mangrove swamps are also common and though the areas are not as extensive, these ecosystems are critical for supporting goods and services for human and social well-being in the area (Burke et al, 2011). A range of pelagic fishes and cetaceans also form an important part of the ocean community in this region, and because they are important food sources, many of the pelagic fish speciesare more intensively studied. The lesser-studied hydrothermal vents, seamounts and upwelling areas are believed also to be highly productive areas and will have to be intensely studied in the future to improve understanding and to safeguard their role and contribution to overall biological productivity and diversity within the area and beyond.

Coral reefs and other coastal ecosystems of the Eastern Caribbean, and thus associated flora and fauna, are under threat from many sources, including: fishing pressure, coastal development, habitat degradation, pollution and most recently, global environmental change, including climate change (Reefs at Risk Revisited, 2011)—the same is occurring globally. Of the many climate change threats for corals, temperature-induced coral bleaching, ocean acidification, sea-level rise and the increased frequency and intensity of hurricanes and storms are some of the greatest threats. On average, hard coral cover in the Caribbean decreased by approximately 80% over a 30-year period (Gardner et al. 2003), while in Barbados, hard coral abundance decreased by approximately 50% over a decade (Hunte et al. 2005). It is expected that negative impacts from global climate change in particular will continue, but it is hoped and expected that with the recognition of the importance of areas such as this, more efforts, local, regional and international, will be focused on protecting and conserving these important ecosystems and their associated flora and fauna. The area is vulnerable to fishing pressure and is ecologically sensitive because it is a breeding ground for the flying fish—a commercially important species for the Eastern Caribbean Islands, and an important transit point for other highly mobile, globally significant species undertaking migrations associated with nesting, calving and nursing, and feeding. Fishing activities in the area are generally limited to the coastal areas, focused on reef fish, and pelagic species when they venture in the coastal waters. Moreover, fishing directed at small, pelagic species, such as flying fish and jacks, typically targets fish schools; as such, these activities could lead to the depletion of local resource pools and associated genetic uniqueness.

Habitat monitoring has tended to be sporadic and inconsistent across many of the islands. However, it is agreed that the region’s marine habitats and species are highly vulnerable to natural and anthropogenic effects, which can potentially negatively affect the region’s biodiversity and biological productivity and, in so doing, also impact adversely industries such as fisheries and tourism, both of which guarantee human and social well-being.

In view of this, many Eastern Caribbean governments are pursuing opportunities to engage local, regional and international agencies and universities to undertake required research on the exact status of their ecosystems, and to improve the governance of these ecosystems within the context of good ocean governance at the level of the Caribbean Large Marine Ecosystem (www.clmeproject.org). The CLME project is investigating options for promoting the ecosystem approach to fisheries management of several major resources occurring in the Caribbean, including the Eastern Caribbean flying fish (CRFM, 2011b). In addition, many regional governments have established or further expanded their networks of marine protected areas (MPAs).

Assessment of the area against CBD EBSA Criteria

CBD EBSA Criteria (Annex I to decision IX/20)	**Description** (Annex I to decision IX/20)	**Ranking of criterion relevance** (please mark one column with an X)			
		Don't Know	**Low**	**Medium**	**High**
Uniqueness or rarity	Area contains either (i) unique ("the only one of its kind"), rare (occurs only in few locations) or endemic species, populations or communities, and/or (ii) unique, rare or distinct, habitats or ecosystems; and/or (iii) unique or unusual geomorphological or oceanographic features.			**X**	

Explanation for ranking

The region is characterized by rare features and species, which are listed below.

Kick 'Em-Jenny is the only active underwater volcano in the Caribbean. It is found off the north coast of the island of Grenada.
Montserrat lava-covered reefs – as a result of recent and ongoing volcanic activity, there is now potential habitat for coral-reef related species.
Cold-water upwelling (west coast)- Saint Lucia
Three Evolutionarily Distinct and Globally Endangered (EDGE) hard coral species (*Dendrogyra cylindrus*, *Dichocoenia stokesii*, and *Acropora palmata*) that were recently observed off the south coast of the Grenadine island of Canouan (Gollock et al., 2011) and are found throughout the region. These species are listed as Vulnerable under the EDGE classification.
Acropora palmata and *A. cervicornis* were historically key reef-building corals in the Caribbean region, but are now rarely seen as a result of white band disease (Aronson and Precht, 2001). They are both listed as Critically Endangered on the IUCN Red List (www.iucnredlist.org).
Deep-water corals, hydrothermal vents, seamounts and cold-water seeps occur along the Eastern Caribbean island chain (see map)
Sponge-dominated coral reefs, Tobago

Special importance for life-history stages of species	Areas that are required for a population to survive and thrive.			**X**	

Explanation for ranking
The region is an important spawning area for many species (coastal and pelagic) both within the Eastern Caribbean and potentially also further afield.

The area includes the feeding sites of 16 species of seabird and over half a million individuals breeding at 52 BirdLife-designated Important Bird Areas (IBAs). These feeding sites are of critical importance for these birds during all breeding life-history stages and directly affect the productivity and health of these populations.

- Potential source of larvae for at least some Western Caribbean stocks of spiny lobster (*Panulirus argus*) and queen conch (*Strombus gigas*)
- A distinct Eastern Caribbean flying fish stock exists, with all life stages believed to be supported within the area.
- Nesting and foraging zones for three globally significant, migrant and endangered sea turtle species; green turtle (*Chelonia mydas*), hawksbill turtle (*Eretmochelys imbricata*) and leatherback turtle (*Dermochelys coriacea*).

- Coral reefs, seagrass beds and mangroves are important nursery grounds for reef and pelagic species and are therefore inter-connected in terms of their roles and contributions to the general biological productivity and biodiversity in the area that consists of a network of islands often separated by deep water channels.
- Important calving and nursing area along the migratory route for the humpback whale in the north Atlantic, especially in the coastal waters of Dominica
- Historically an important breeding area for hammerhead sharks

Importance for threatened, endangered or declining species and/or habitats	Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.				X

Explanation for ranking

The region is characterized by coral reefs, which are perhaps some of the most threatened ecosystems globally. Additionally, the region supports several migrant species, the stocks of which are considered to be endangered or in decline.

The region provides important nesting and foraging zones for endangered sea turtles,hawksbill (*Eretmochelys imbricata*), green (*Chelonia mydas*) and leatherback (*Dermochelys coriacea*) sea turtle species (Brautigam and Eckert 2006, Dow et al. 2007).

Specifically, the south-east coast of Barbados is home to the largest density of hawksbill-turtle nesting zones in the Wider Caribbean (Walcott et al, 2011)

Coral reefs, seagrass beds and mangroves thrive throughout the region. These are highly productive, threatened areas that support the majority of coastal flora and fauna, which support human life and social and economic well-being. These habitats are threatened primarily by anthropogenic and global climate change impacts

The Eastern Caribbean island chain lies north of the north-east coast and continental shelf of South America, which enjoys high primary productivity as a result of upwelling and the influence of river outflow. The prevailing currents are known to take the Orinoco and Amazon river outflowalong in a west-northwest direction and for a short way up along the island chain, Hence, it is to be expected that at least some of the primary production associated with river outflow from the north-east coast of South America contributes to secondary production as the water mass moves along with the currents, and this secondary production itself forms the basis of the existing pelagic ecosystem of the Eastern Caribbean. Probably because of this, the area has important commercial, as well as recreational, fisheries for a number of globally significant and depleted large tuna species and billfish species that carry out specific migrations involving passage through the Eastern Caribbean (Jones and Prince, 1998; Peel et al., 1998). Fishing activities often take place in coastal waters and in more recent times, around fish aggregating devices. The ready availability and accessibility of these large pelagic species in the islands' coastal waters are an indication of the importance of the island masses and coastal areas to the foraging activities of these globally significant migrant species.

Vulnerability, fragility, sensitivity, or slow recovery	Areas that contain a relatively high proportion of sensitive habitats, biotopes or species that are functionally fragile (highly susceptible to degradation or depletion by human activity or by natural events) or with slow recovery of marine ecosytems.				X

Explanation for ranking

The area contains a relatively high proportion of sensitive habitats, biotopes and species that are functionally fragile. Coral reef ecosystems, for example, exist within very narrow environmental parameters (Buddemeier et al. 2004). Seagrass beds and mangrove ecosystems are more resilient in terms of environmental parameters, but they too are slow to recover from natural events such as hurricanes and storms. In the area, the vulnerability aspects relate mostly to the fact that the productivity and biodiversity of the area occur in coastal waters where human traffic and activity are high. In addition, the area has a comparatively high population density, which means that the coastal ecosystems are impacted easily by human activities on the land. In addition, global environmental change, including construction in coastal areas and climate change-associated impacts such as increase in sea surface temperature, increased storm activity and sea level rise, jointly pose a significant threat to the surrounding coastal ecosystems (Nurse et al. 2001). Loss of these surrounding ecosystems will further exacerbate the vulnerability of the islands to the effects of global environmental change. Given that these islands are positioned strategically between the Atlantic Ocean and the Caribbean Sea, the productivity of the entire region could potentially be affected in one way or another.

Biological productivity	Area containing species, populations or communities with comparatively higher natural biological productivity.			**X**	

Explanation for ranking
Although primary productivity in the surrounding open ocean area is generally low, specific coastal ecosystems, particularly coral reefs, provide pockets of significantly higher levels of productivity. Additionally, tidal currents interact with the island shelves to create localized areas of upwelling in which organisms at lower trophic levels, including small, pelagic fishes, concentrate in coastal areas and are believed to provide a valuable source of food for large migrant pelagic fish species, such as tunas, billfishes, sharks and dolphinfish (Renton and Renton 2007).

Biological diversity	Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.			**X**	

Explanation for ranking
The region is characterized by highly productive ecosystemsthat support a plethora of species, such as coral reefs, mangrove and seagrass ecosystems, hence the high rating for biological diversity. The biological diversity is further enhanced by the temporary residence of many migrant species of fish, cetaceans, sea turtles, sharks, and seabirds. Examples of such are shown below:

Coral reef ecosystems – e.g., corals, sponges, reef fish, crustaceans
Seagrass beds – turtle grass and manatee grass being most common
Mangrove ecosystems- red (*Rhizophora mangle*), black (*Avicennia germinans*) and white (*Laguncularia racemosa*), mangrove being most common, along with other salt-tolerant species.
Sea turtles- hawksbill (*Eretmochelys imbricata*), green (*Chelonia mydas*) and leatherback (*Dermochelys coriacea*) sea turtles. Other endangered sea turtles; loggerhead (*Caretta caretta*) and olive ridley (*Lepidochelys olivacea*) are occasionally found in the waters of some Eastern Caribbean islands such as Trinidad and Tobago (Dow et al. 2007, Forestry Division (Government of the Republic of Trinidad and Tobago) 2010).

Seabirds – 16 species are known to breed in internationally or regionally significant numbers at the IBAs. The seabird species that are qualifying features of the IBAs are: Audubon's Shearwater (*Puffinus lherminieri*), Bridled Tern (*Sterna anaethetus*), Brown Booby (*Sula leucogaster*), Brown Noddy (*Anous stolidus*), Brown Pelican (*Pelecanus occidentalis*), Common Tern (*Sterna hirundo)*, Laughing Gull (*Larus atricilla*), Least Tern (*Sterna antillarum*), Magnificent Frigatebird (*Fregata magnificens*), Masked Booby (*Sula dactylatra*), Red-billed Tropicbird (*Phaethon aethereus*), Red-footed Booby (*Sula sula*), Roseate Tern (*Sterna dougallii)*, Royal Tern (*Sterna maxima)*, Sandwich Tern (*Sterna sandvicensis*), Sooty Tern (*Sterna fuscata*).
Table showing cetacean species which may be encountered in Trinidad and Tobago waters.

Common Name	Scientific/Latin Name	Confirmed Locally

Mysticete/Baleen Whales		
Blue whale	*Balaenopterus musculus*	Possible (not likely)
Bryde's whale	*Balaenopterus edeni*	Confirmed
Fin whale	*Balaenopterus physalus*	Expected
Humpback whale	*Megaptera novaeangliae*	Confirmed
Sei whale	*Balaenopterus borealis*	Expected
Odontoceti/ Toothed Whales		
Atlantic spotted dolphin	*Stenella frontalis*	Confirmed
Bottlenose dolphin	*Tursiops truncatus*	Confirmed
Clymene dolphin	*Stenella clymene*	Expected
Cuvier's beaked whale	*Ziphius cavirostris*	Expected
Dwarf sperm whale	*Kogia sima*	Expected *
False killer whale	*Pseudorca crassidens*	Confirmed
Fraser's dolphin	*Largenodelphis hosei*	Expected
Gervais' beaked whale	*Mesoplodon europaeus*	Confirmed
Guiana dolphin	*Sotalis guianensis*	Confirmed
Killer whale	*Orcinus orca*	Confirmed
Long-beaked common dolphin	*Delphinus capensis*	Confirmed
Melon-headed whale	*Peponocephala electra*	Confirmed
Pan-tropical spotted dolphin	*Stenella attenuata*	Confirmed
Pygmy killer whale	*Feresa attenuata*	Expected
Pygmy sperm whale	*Kogia breviceps*	Expected *
Risso's dolphin	*Grampus griseus*	Confirmed
Rough-toothed dolphin	*Steno bredanensis*	Confirmed
Short-beaked common dolphin	*Delphinus delphis*	Expected
Short-finned pilot whale	*Globicephala macrorhynchus*	Confirmed
Sperm whale	*Physeter macrocephalus*	Confirmed
Spinner dolphin	*Stenella longirostris*	Confirmed
Striped dolphin	*Stenella coeruleoalba*	Confirmed

*The genus *Kogia* has been confirmed for local waters but has not yet been identified to species level.

CCARO, 2012 unpub.

Naturalness	Area with a comparatively higher degree of naturalness as a result of the lack of or low level of human-induced disturbance or degradation.			*X*	

Explanation for ranking

While the majority of the Eastern Caribbean region is well traversed by humans, especially as a result of a high dependence on tourism; there are still some areas which can be considered relatively pristine. These include parts of The Grenadines islands of St. Vincent and The Grenadines and Anguilla.

The Grenadines - Horseshoe reef, Mayreau gardens

Anguilla – Anguilla Dog Island IBA

Tobago- Speyside reefs, St. Giles and Marble islands

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Maps and Figures

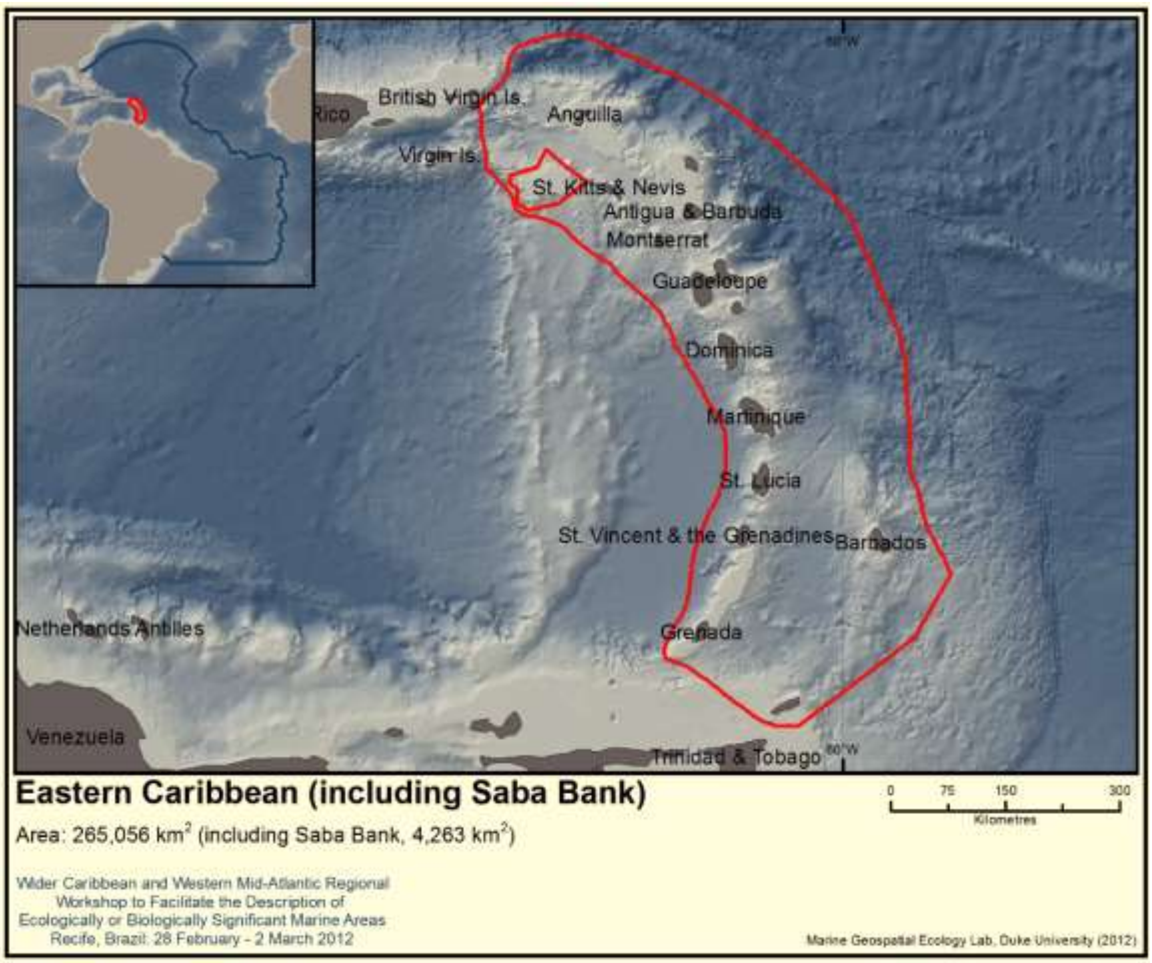

Figure 1. Area meeting EBSA criteria (no. 12)

Area No. 13: The Sargasso Sea

Abstract

The Sargasso Sea is a fundamentally important part of the world ocean, located within the North Atlantic sub-tropical gyre with its boundaries defined by the surrounding currents. Its importance derives from a combination of physical and oceanographic structure, complex pelagic ecosystems, and its role in global ocean and earth system processes. The Sargasso Sea is home to an iconic pelagic ecosystem with the floating *Sargassum* seaweeds, the world's only holopelagic algae, as its cornerstone. It hosts a diverse community of associated organisms that includes ten endemic species, and provides essential habitat for key life stages of a wide diversity of species, many of which are endangered or threatened. The Sargasso Sea is the only breeding location for European and American eels, the former being listed as critically endangered, and is on the migration route of numerous other iconic and endangered species. A variety of oceanographic processes impact productivity and species diversity, and the area plays a disproportionately large role in global ocean processes of oxygen production and carbon sequestration. The sea floor has two large seamount chains, home to specialized, fragile and endemic communities, and models predict the presence of numerous other isolated seamounts. Both pelagic and benthic ecosystems are impacted by a range of human activities, and the currents of the gyre act to concentrate pollutants. The portion of the Sargasso Sea described here meets all of the criteria for ecologically orbiologically significant areas (EBSAs) under the Convention on Biological Diversity.

Introduction

First recorded by Columbus and named after the characteristic floating brown algae, *Sargassum spp.*, the Sargasso Sea is an area of open-ocean within the North Atlantic Subtropical Gyre, bounded on all sides by the clockwise flow of major ocean currents. It is one of the best known areas of the world's ocean, studied since the 1870s and home to Hydrostation S, the longest running time series of oceanographic measurements, begun in 1954. Data from the Sargasso Sea are critical to our understanding of global ocean processes and global change. Water retention within the North Atlantic gyre is estimated to be up to 50 years (Maximenko et al. 2011), and a variety of oceanographic features and processes influence the ecology and biology of the Sargasso Sea on different spatial and temporal scales.

Cyclonic or anticyclonic rings and eddies spun off the Gulf Stream may persist as distinct entities for many months to years (Richardson et al. 1978, Cornillon et al. 1986, McGillicuddy et al. 1999). There are also smaller mode water eddies that form in mid-water. The different types of eddies create localised upwelling and downwelling and impact the upper layers of the Sargasso Sea by mixing surface and deeper waters. This affects nutrients, heat and salinity which together create localised areas of high or low productivity (Volk and Hoffert 1985, Maurino-Carballido and McGillicuddy 2006, Glover et al 2008). The eddies impact biodiversity by "capturing" and bringing "foreign species" into the area, creating relic populations which may persist for months or, conversely, by spinning species out into the Gulf Stream (Boyd et al. 1978, Wiebe and Boyd 1978, Ring Group 1981).

The Subtropical Convergence Zone (STCZ) occurs between 20° and 30°N in the western Sargasso Sea, where warm and cold water masses meet and create distinct thermal fronts in the upper 150 m of the ocean from fall through spring (Katz 1969, Weller 1991). *Sargassum* weed accumulates in this area, along with other organisms, so the fronts are important feeding areas for predatory pelagic fishes and migratory marine mammals in the Sargasso Sea. These fronts are also zoogeographic boundaries between warm and cold water masses (Backus et al 1969, Miller and McCleave 1994), and the presence of organisms from different biogeographic provinces enhances diversity in the area.

Conventionally regarded as an area of low nutrients and low productivity enhanced by localized upwellings, the Sargasso Sea, per unit area, has a surprisingly high net annual primary production rate that matches levels found in some of the most productive regions in the global ocean (Steinberg et al. 2001, Rho and Whitledge 2007, Lomas et al. 2012). This is due to a complex combination of factors—the production of carbon in the surface waters by photosynthesis, the location of the Sargasso Sea in the sub-tropics, which results in a deep euphotic layer, and differences in phytoplankton communities and associated nitrogen fixation (Chisholm et al. 1988). The difference is that in the Sargasso Sea most of the production is recycled by bacteria in the so-called microbial loop rather than channelled into biomass of larger, harvestable organisms (Carlson et al. 1996, Steinberg et al. 2001). As a result of this high primary productivity, to which must be added the annual production of *Sargassum* weed, which is now being estimated from satellite measurements (Gower and King 2008, 2011), the Sargasso Sea plays a key role in both global oxygen production and ocean sequestration of carbon (IPCC 1996, 2001 and 2007, Ullman et al. 2009, Lomas et al. 2011 unpub).

The bathymetry of the Sargasso Sea from west to east passes from the continental rise of the North American continental margin at around 2000m depth, descends gently into part of the Hatters, Nares and Sohm abyssal plains, with depths reaching over 4500m, then becomes progressively shallower toward the mid-Atlantic Ridge, where water depth is less than 2500m. This regional relief is modified dramatically by extinct volcanoes that form the Bermuda Islands, seamounts and associated Bermuda Rise, the Muir seamount chain, and the New England and Corner Rise seamount chains further north (Figure 1). Modelling also indicates that there are numerous smaller isolated seamounts distributed across the eastern part of this area. Several major fracture zones, the Atlantis, Northern, Kane and Blake Spur, cross the area (Figure 1). (See Uchupi et al. 1970, Vogt and Jung 2007, Parson and Edwards 2011 unpub, Yesson et al. 2011, Halpin et al. 2012 unpub).

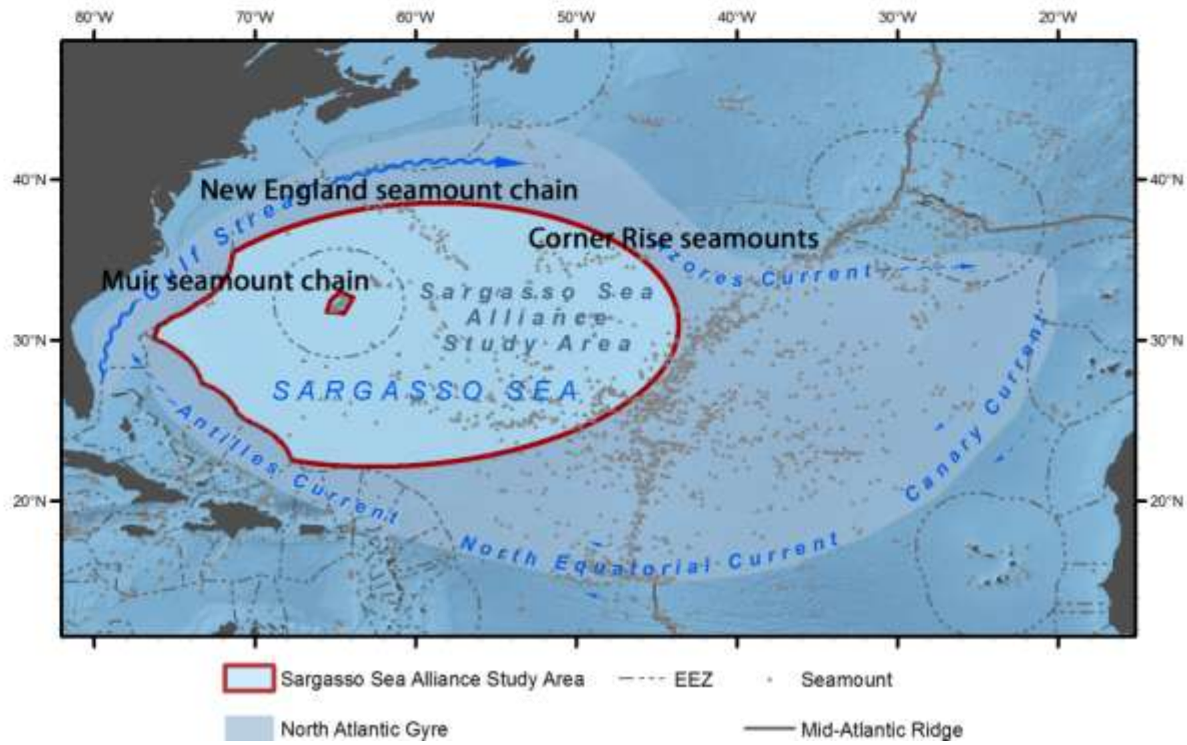

Figure 1. Known and predicted seamounts beneath the Sargasso Sea (using data from Yesson et al. 2011) in relation to the proposed area meeting EBSA criteria.

Location

The Sargasso Sea is surrounded by the Gulf Stream to the west, the North Atlantic Drift to the north, the more diffuse Canary Current to the east, and the North Equatorial Current and the Antilles Current to the south (Figure 1). These currents vary, however, particularly the Canary Current, so the precise boundaries of the Sargasso Sea also vary (Ryther 1956, Butler et al. 1983, Coston-Clements et al. 1991). A map of the Sargasso Sea showing characteristics such as ocean current and eddy occurrence, remote sensing of *Sargassum* weed distributions and seabed topography (Ardron et al 2011, unpub) was commissioned by the Sargasso Sea Alliance in order to refine the area under consideration in a variety of proposals including the present one. It accounts for the variable eastern boundary current and the EEZs of adjacent countries, while ensuring that the full range of ecologically important features is included. For pragmatic reasons, the eastern boundary is considered to lie to the west of the mid-Atlantic Ridge in the western basin of the Atlantic Ocean, and boundaries were placed outside the current EEZs of all adjacent countries except for Bermuda. For the purposes of describing this area meeting EBSA criteria, the Sargasso Sea ecosystem is deemed to officially transition into the shallow water habitats associated with the Bermuda platform at the base of the Bermuda Rise. The resultant map agrees broadly with the overlap of previous delineations and is shown in Figure 2, with the area described in this proposal outlined in red at both its outer and inner limits. The area of the Sargasso Sea considered here occupies ~ 4,163,499 km^2 and extends from 22° to 38°N and 76° to 43°W, centred on 30°N and 60°W.

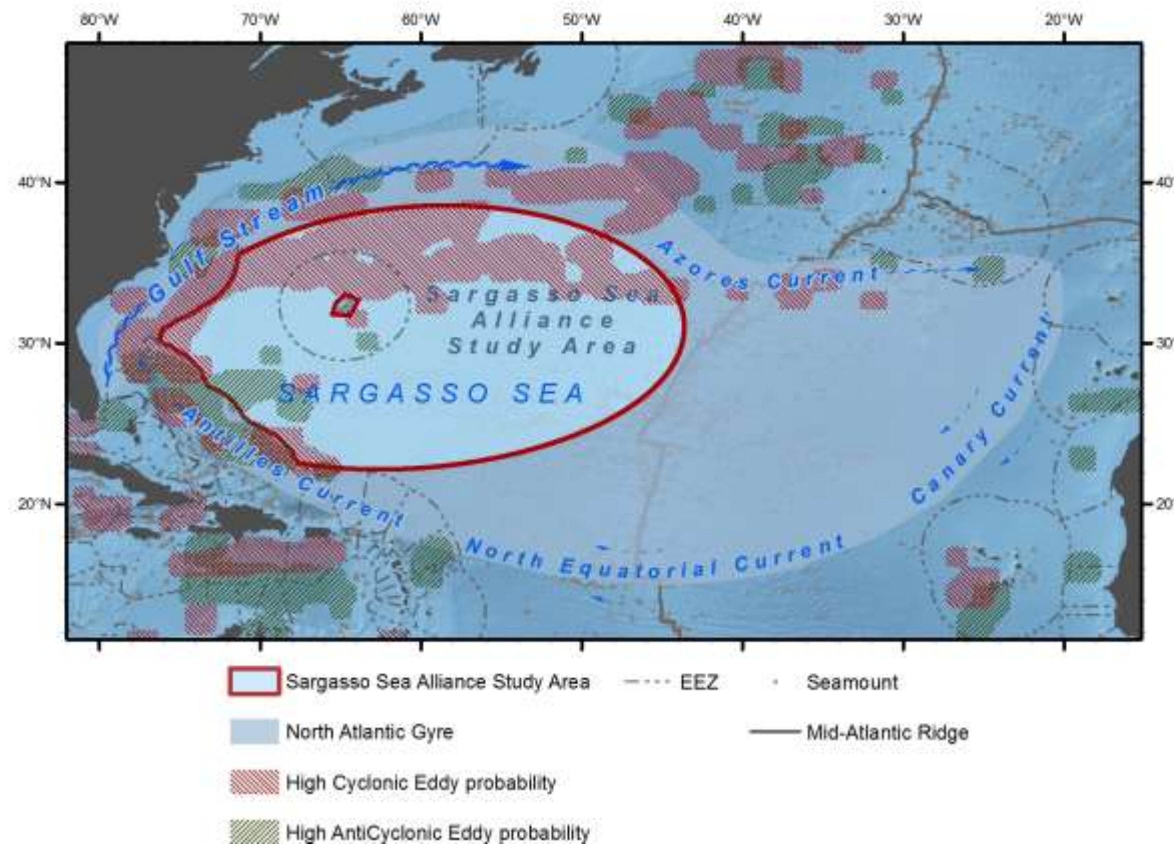

Figure 2. The proposed Sargasso Sea area meeting EBSA criteria, including some of the major features that influence overall boundary definition and location. (Ardron et al. 2011, unpub)

Feature description of the proposed area

The features proposed here for international recognition are the diverse pelagic communities dependant on the *Sargassum spp.*, the iconic and threatened pelagic species that migrates into or through the area, the lesser known mid-water communities and the specialised benthic communities that live on the seamounts. Together, these communities and species occupy the Sargasso Sea from the surface to the sea floor.

Sargassum and *Sargassum* communities

The Sargasso Sea has a characteristic surface ecosystem based upon *Sargassum*, which hosts its own unique communities, acts as a nursery and feeding area for many species, and serves as a migration route for others. It is a vital habitat for many species of economic importance to Bermuda and to countries on both sides of the Atlantic – the Sargasso Sea is the ecological cross-roads of the Atlantic Ocean.

The surface ecosystem is based upon two species of floating *Sargassum*, both of which reproduce solely by fragmentation and are thus holopelagic and distinct from all other seaweeds (Deacon 1942, Stoner 1983). There is an estimated biomass of one million tonnes of *Sargassum* in the Sargasso Sea (Gower and King 2008, 2011), making it the only area of significant distribution for these species in the deep open-ocean, where they provide a rare and valuable structurally complex habitat. Although it is part of a broader tropical western Atlantic distribution of *Sargassum*, the Sargasso Sea contains the most northerly persistent ecosystem formed around this floating seaweed.

Together with its persistence, it is the great area and thickness of the floating *Sargassum*, which in turn attracts a great density and diversity of associated organisms, that distinguishes this floating ecosystem from that of any other drift algae (Coston-Clements et al. 1991, Moser et al. 1998, Casazza and Ross 2008). As the *Sargassum* drifts round it collects “passengers” which increases the diversity of attached invertebrates that settle upon it; this biodiversity varies seasonally, as well as with location in the gyre and the age of the algae (Stoner and Greening 1984).

Ten species are known to be endemic to floating *Sargassum*, most of which have quite specific adaptions and are camouflaged in some way. Perhaps the most iconic of these is the *Sargassum* angler fish (*Histrio histrio*) (Coston-Clements et al. 1991, South Atlantic Fishery Management Council 2002, Trott et al 2011). More than 145 invertebrate species have been recorded in association with floating *Sargassum* (Fine 1970, Morris and Mogelberg 1973, Butler et al. 1983, Coston-Clements et al. 1991, Sterrer 1992, Calder 1995, South Atlantic Fishery Management Council 2002, Trott et al. 2011), and it also provides a habitat for over 100 species of fish (Dooley 1972, Fedoryako 1980, Coston-Clements et al 1991, South Atlantic Fishery Management Council 2002, Casazza and Ross 2008, Sutton et al 2010). This diverse community of organisms living at the surface also interacts with the oceanic fauna, many of which migrate vertically up at night and down during the day, thus providing connectivity between the surface community and the deep-sea. The overall importance of *Sargassum* for fish has led the USA to recognise it as essential fish habitat (NMFS 2003). ICCAT has also recognized the importance of *Sargassum* as fish habitat and has requested that Contracting Parties assess the ecological status of *Sargassum* as habitat for tuna, billfish and sharks (ICCAT 2005, ICCAT 2011b).

Sargassum and the Sargasso Sea as a resource for key life stages

Oceanic fish that spawn in the *Sargassum* include flying fish (Exocoetidae) that build bubble nests for their eggs within the weed and have eggs with long extensions for attaching to the weed (Dooley 1972, Sterrer 1992). Other fish that spawn in the Sargasso Sea include white marlin (*Tetrapturus albidus*), blue marlin (*Makaira nigricans*) (South Atlantic Fishery Management Council 2002, Luckhurst et al 2006, White Marlin Biological Review Team 2007) and various species of eels, of which the European and American eels are the most iconic (Schmidt 1922, Schoth and Tesch 1982, Kleckner and McCleave 1988, McCleave and Miller 1994, Miller and McCleave 1994, Miller 2002, Miller and McCleave 2007).

Juveniles of many fish species live within the *Sargassum* canopy (Fedoryako 1980, Coston-Clements et al 1991, South Atlantic Fishery Management Council 2002, Casazza and Ross 2008, Rudershausen et al 2010). Larger predatory species that feed in association with *Sargassum* include jacks (*Caranx* spp.), amberjacks (*Seriola* spp.), rainbow runners (*Elagatis bipinnulata*), dolphins (*Coryphaenus* spp.), barracudas (Sphyraenidae), various mackerels, wahoo and tunas (Scombridae), and billfishes (Istiophoridae) (Gibbs and Collette 1959, Stephens 1965, Dooley 1972, Fedoryako 1980, Manooch and Hogarth 1983, Manooch and Mason 1983, Manooch et al 1984, Manooch et al 1985, Coston-Clements et al 1991, South Atlantic Fishery Management Council 2002, Casazza and Ross 2008, Rudershausen et al 2010,Trott et al 2011).

Green turtles (*Chelonia mydas*), hawksbill turtles (*Eretmochelys imbricate*), loggerhead turtles (*Caretta caretta*), and Kemp’s Ridley turtles (*Lepidochelys kempii*), all of which are threatened or endangered, use *Sargassum* as a nursery habitat (Carr and Meylan 1980, Carr 1987, Schwartz 1988, Manzella and Williams 1991, Luschi et al 2003). Hatchlings swim hundreds of miles to the Sargasso Sea, where they hide in the *Sargassum* to feed and grow in relative safety, spending their so called “lost years” amongst the weed (Carr and Meylan 1980, Carr 1987, Schwartz 1988, Luschi et al 2003).

Haney (1986) observed seabirds foraging in association with *Sargassum* mats to the west of the Gulf Stream off the Georgia coast and recorded 26 different species, with bird densities being 32 to 43 times greater in areas with *Sargassum* than in areas without. Further offshore the diversity of bird species is lower, and this is reflected in Table 1, which combines Haney’s observations (1986) with those of Thomas (2005), who examined the oceanic bird habitat further from land. The endangered endemic

Bermuda petrel, the cahow (*Pterodroma cahow*), protected under Appendix 1 of the Convention on Migratory Species (http://www.cms.int/documents/appendix/cms_app1.htm) travels across the northern Sargasso Sea and beyond (Hallett 2011, unpub). Tracking data from Birdlife International show that the western Sargasso Sea is an important feeding area for Audubon's shearwater (*Puffinus lherminieri*) and white-tailed tropic birds, (*Phaethon lepturus*) from the Bahamas (B. Lascelles, pers. comm., www.seabirdtracking.org).

The Sargasso Sea as a migration area

A number of species of sharks and rays inhabit or migrate through the Sargasso Sea, including whale sharks, tiger sharks, manta rays and spotted eagle rays (Hallett 2011, unpub). New satellite tagging data has revealed that the Sargasso Sea is important habitat for several shark species that have only recently been reported to occur there. For instance, basking sharks (*Cetorhinus maximus*) make regular seasonal movements to the Sargasso Sea during winter months at depths of 200 to 1000m metres (Skomal et al 2009). Satellite tagging has also recently shown that large female porbeagle sharks (*Lamna nasus*) migrate over 2,000 km at depths of up to 500m from Canadian waters to the Sargasso Sea where they may be pupping (Dulvy et al 2008, Campana et al 2010). Most recently, a large female white shark (*Carcharodon carcharias*) was tracked from coastal Massachusetts to Sable Island on the Scotian Shelf and then down into the Sargasso Sea during winter months of 2010/2011 (G. Skomal and S. Thorrold 2011, pers. comm.). The observation of large, potentially pregnant females of several threatened shark species in the Sargasso Sea raises the intriguing possibility that this area represents critical nursery habitat for these species.

Eastern and western populations of Atlantic bluefin tuna (*Thunnus thynnus*) migrate through or to the Sargasso Sea (Lutcavage et al 1999, Block et al 2001, Block et al 2005, Wilson and Block 2009). Both populations are in decline and are below 15% of the unfished, historical baseline (ICCAT 2008). Lutcavage et al (1999) noted that some of the giant bluefin tuna tagged in their study were in the Sargasso Sea at the same time as other giants were located in a known spawning ground in the Gulf of Mexico. This evidence suggested that the Sargasso Sea was, and may still be, a spawning location for bluefin tuna in the western Atlantic Ocean.

Several other tuna species, including yellowfin (*Thunnus albacares*) and bigeye tuna (*Thunnus obesus*), also move through the Sargasso Sea, and further west into coastal U.S. waters, from spawning grounds in the eastern tropical Atlantic (ICCAT 2010). Yellowfin tuna appear to migrate through the Sargasso Sea to frontal boundaries along the Gulf Stream. Bigeye tuna may be residing for some time in the Sargasso Sea based on tagging and depth distribution data. Albacore tuna (*Thunnus alalunga*) are also regular visitors to the Sargasso Sea, and are believed to spawn in the Sargasso Sea (ICCAT 2010 and 2011a).

The Sargasso Sea is also important habitat for Atlantic swordfish (*Xiphias gladius*), moving through the Sargasso Sea as part of a seasonal migration from the tropical Atlantic to temperate northwest Atlantic waters. They make diurnal vertical movements spanning at least 1,000m (Loefer et al 2007) that mirror those of mesopelagic fishes. These fishes undoubtedly transfer a significant fraction of primary production from the epipelagic (near-surface) zone of the Sargasso Sea to mesopelagic depths.

In addition to the movements of the other turtle species within the Sargasso Sea, adult leatherback turtles (*Dermochelys coriacea*) migrate north through the Sargasso Sea from nesting sites in the Caribbean Sea (Ferraroli et al 2004, Hays et al 2004), and seasonally to the Sargasso Sea from foraging locations in coastal waters of New England and Nova Scotia (James et al 2005).

Thirty cetacean species (whales and dolphins) have been recorded from the Sargasso Sea (Kaschner et al 2011). Of particular note are humpback whales (*Megaptera novaeangliae*) that pass through the Sargasso Sea during their annual migrations between the Caribbean and the northern North Atlantic (Martin et al 1984, Stone et al 1987, G. Donovan and R. Reeves 2011, pers. comm.). Adults are often seen within sight of the south shore of Bermuda during March and April with their newborn calves. The same individuals are seen year after year at Bermuda and further north in the Stellwagen Bank Marine Sanctuary off the east coast of the USA (Stevenson 2011, unpub). The importance of this connectivity was recognised in 2011 by the signing of a collaboration arrangement between the Government of Bermuda and the

Stellwagen Bank National Marine Sanctuary. Some of these individuals have also been recorded at another area meeting EBSA criteria, the Marine Mammal Sanctuary – Banco de la Plata y Banco de la Navidad, off the Dominican Republic (Omar Reynoso, pers. comm., http://www.intec.edu.do/ballenas). The other large whale seen regularly in the Sargasso Sea is the sperm whale *(Physeter catodon*). Groups including calves are commonly seen (Antunes 2009), and it is likely that they feed in the frontal convergence, around the boundaries of Gulf Stream rings and above the seamounts (National Marine Fisheries Service 2010).

Tracking data from Birdlife International show eight species of seabirds migrating through the Sargasso Sea in significant numbers (B. Lascelles, pers. comm., www.seabirdtracking.org). *Sargassum* patches can be dense enough for some birds, notably bridled and sooty terns (*Sterna anaethetus* and *Sterna fuscata*) to roost upon (Haney 1986).

Threatened species

Many of the species utilising the Sargasso Sea are of considerable global conservation interest, appearing on the International Union for the Conservation of Nature (IUCN) Red List of endangered species, and/or under the Convention on International Trade in Endangered Species (CITES) (Hallett 2011, unpub) (see Table 2). They feature in the annexes of the 1990 Specially Protected Areas and Wildlife Protocol to the Convention on the Protection and Development of the Marine Environment of the Wider Caribbean Region (SPAW Protocol, http://www.cep.unep.org/cartagena-convention/spaw-protocol). Although the geographical area of the Protocol does not extend to the Sargasso Sea, the Protocol does require countries in the Caribbean region to implement conservation measures to protect and recover and, where relevant, to maintain populations of these species at optimal levels. Species of relevance to the Sargasso Sea include seabirds in the air above, turtles in the floating *Sargassum*, large pelagic fishes and cetaceans in the waters below, and a wide variety of corals on seamounts rising from the seabed (Table 3). Tables 2 and 3 list examples of threatened species, but they are only an indication of the numbers of endangered species that occur in the Sargasso Sea.

European and American eels (*Anguilla spp*)

The Sargasso Sea is of considerable international importance for the economically valuable American and European eels, *Anguilla rostrata* and *A. anguilla*, which spend their adult lives in freshwater and migrate thousands of miles to the Sargasso Sea to spawn (Schmidt 1922, Kleckner et al 1983, Friedland et al 2007). The larvae of both species develop in the Sargasso Sea and then take seven to 24 months to follow the Gulf Stream back to their respective freshwater habitats in North America and Europe, where they metamorphose into juvenile “glass eels” (ICES 2010). Both species of eel are the subjects of important fisheries, as both “glass eels” and as adults (Wirth and Bernatchez 2003). The exact location and circumstances of eel spawning in the SW Sargasso Sea remain unknown although there is evidence that oceanographic features such as thermal fronts may direct eels to spawning locations (Kleckner and McCleave 1988). The small larvae, or leptocephali, of both species have broad distributions in overlapping areas of the Sargasso Sea.

Recruitment and populations of both species are in significant decline, with the European eel listed by CITES and classified by IUCN as Critically Endangered and at increasing risk of global extinction. Tentative links have been proposed between changes in the Sargasso Sea and the decline of both American and European eel species (Friedland et al 2007). These include changes in location of their spawning areas, changes in wind-driven currents that transport eel larvae to adult habitats in Europe and North America, and potential changes to feeding success for eel larvae (Miller et al 2009). A range of other causes has been suggested to affect the juveniles and adults, including pollution (particularly substances like PCBs) (Robinett and Feunteun 2002, Pierron et al 2007), the effects of the swimbladder parasite (*Anguillicoloides crassus*) (Gollock et al 2005, Gollock 2011, unpub), the poor condition of migrating silver eels (Svedäng and Wickström 1997), and the destruction of their freshwater habitat (Haro et al 2000). The evidence for some of these factors is greater than others (often varying with region), but it is unlikely that there is one single cause.

In 2007 the European Union adopted an eel recovery plan (EC 2007). This plan directs European member states to reduce eel fishing efforts by at least 50% relative to average efforts deployed from 2004 to 2006. Similarly in Canada, the American eel has been identified as an Endangered Species under Ontario's Endangered Species Act of 2007. Quebec and Newfoundland and Labrador have also introduced measures to regulate eel fishing and eel escapement back to the sea. Recognising the importance of the Sargasso Sea is a first step towards international measures to complement these regulations.

Deep water pelagic species

Beneath the *Sargassum* layer, the Sargasso Sea descends to depths of around 4500m and is populated throughout by deep ocean animals. *Sargassum*, once it sinks, contributes to the food webs of these deepwater communities, as well as providing up to 10% of the energy inputs to communities on the seabed (Schoener and Rowe 1970, Rowe and Staresinic 1979 in Angel and Boxshall 1990, Butler et al 1983). The Sargasso Sea has been sampled intensively by deep-sea biologists and oceanographers for over a century, and numerous accounts show that Sargasso Sea assemblages of species are generally similar to those found throughout the subtropical Atlantic (e.g. Marshall 1979, Herring 2002).

However, a study of the bathypelagic fish family Stomiidae found a suite of sub-tropical endemic species in the northern Sargasso Sea, primarily from the genus *Eustomias* but also in the genera *Photonectes* and *Bathophilus*, and determined that the area exhibited higher levels of endemicity for this group than other North Atlantic biogeographic provinces (Porteiro 2005). Other recent studies have focused on fish during the 2006 Census of Marine Life Programme (Sutton et al 2010), amphipod crustaceans (Gasca 2007), and chaetognaths (Pierrot-Bults and Nair 2010), whilst a selection of older work includes decapod crustacean (Donaldson 1975), general zooplankton (Deevey 1971), biomass profiles (Angel and Baker 1982, Angel and Hargreaves 1992), and ostracod crustaceans (Angel 1979). Gelatinous zooplankton are well-represented in the Sargasso Sea, being a heterogeneous assemblage of generally large-bodied, jellyfish-like species including medusae, siphonophores, ctenophores, thaliaceans and some polychaetes and pteropods. Salps are diverse and frequently abundant in the vicinity of Bermuda (Madin et al 1996). *Pyrosoma*, a colonial thaliacean, also migrates over similar distances. The only really different feature of deep-sea animals in the Sargasso Sea is the impact of Gulf Stream rings and mesoscale eddies upon their distribution described earlier. The impact of Gulf Stream rings on groups ranging from protozoa to fish has been well documented (Weibe and Boyd 1978, Fairbanks et al 1980, Backus and Craddock 1982, Wiebe and Flierl 1983). In addition to these conventional studies, the Sargasso Sea is one of the few ocean areas that has been studied using cutting edge intensive DNA barcoding efforts to document the biodiversity of its inhabitants at all different depths (Bucklin et al 2010; Sutton et al 2010).

Despite the apparent overall similarity between the midwater communities in the Sargasso Sea and elsewhere, an inventory of planktonic ostracods for the Atlantic Ocean found that 10% of the species caught below 2000m were new to science and speculated that, if the sampling had reached the benthopelagic zone near the seabed, the novel component would have soared (Angel 2010). The ostracods are likely to be an indicator of the potential numbers of new invertebrate species yet to be discovered in the deep ocean.

Benthic communities

The biology of the abyssal plains is best known through work done on a repeated transect between Bermuda and Gay Head in the USA in the 1960s and 70s (Sanders et al 1965)—work that remains a milestone in our knowledge of deep-ocean bottom faunas. Very recently a new observational programme on the larger bottom fauna has started using baited cameras (MBARI Sargasso Sea Expedition 2011 www.mbari.org).

The best known seamounts below the Sargasso Sea are the New England Seamount chain and the Corner Rise seamounts, with peaks rising as much as 4000m from the abyssal plain. These seamounts support complex coral and sponge communities, including numerous endemics, which provide habitat for diverse invertebrate communities that include some highly dependent commensal species (Watling 2007, Watling et al 2007, Cho 2008, Simpson and Watling 2011, Pante and Watling 2011, ICES 2011, Shank 2010). These seamounts also host abundant populations of deep-water fish, which have been heavily exploited commercially since 1976 (Vinnichenko 1997), but despite this they remain important as aggregating and spawning areas for the alfonsino (*Beryx splendens).* Deep-sea and seamount fish stocks are particularly vulnerable to exploitation because the fish are very long lived, take many years to reach sexual maturity, and have very low fecundities (Norse et al 2012). Limited observations of the Muir seamount chain within the Bermuda EEZ show that its surface is covered with abundant hydroids, sponges, calcareous algae, and rubble (Pratt 1962).

Feature condition and future outlook of the proposed area

Despite its remote location, the Sargasso Sea does not remain totally natural. A recent global analysis of human impacts of marine ecosystems concluded that the area has sustained moderate to high impacts over time (Halpern et al 2008).

Fisheries landings for many species in the North Central Atlantic have declined significantly in the last 50 years, indicative of impacts on those populations (Sumaila et al 2011, unpub, Pauly and Watson 2005, Pauly et al 2005). Regulatory actions by ICCAT aim to address this. Bottom trawling between 1976 and 1995 on the Corner Rise seamounts caused extensive destruction of the benthic fauna (Vinnichenko 1997, Waller et al 2007, Shank 2010). As a precautionary management measure, 13 fishable seamounts, including 25 peaks shallower than 2,000 m on the New England and Corner Rise seamounts were closed to demersal fishing by the Northwest Atlantic Fishery Organization (NAFO) from 1 January 2007. This closure was recently extended until 31 December 2014 (NAFO 2011). The recovery of these habitats in the coming years should be monitored.

Floating plastic particles were reported in the Sargasso Sea as early as 1972 (Carpenter and Smith 1972), and today the currents of the North Atlantic gyre have trapped floating debris on a scale similar to the more infamous North Pacific garbage patch with concentrations of plastic particles reaching in excess of 100,000 pieces km^{-2} in some places (Law et al 2010). This clearly impacts the naturalness of the area, and the negative impacts of plastic debris on organisms such as turtles and seabirds are well documented (Witherington 1994, Rios et al 2007). There are also numerous submarine communications cables that have a minor effect on the naturalness of the seabed (Telegeography 2011), and this is likely to be an ongoing issue.

The Sargasso Sea lies within one of the world's busiest international shipping areas and is crossed by a large number of vessels each year (Roberts 2011, unpub). This affects the naturalness of the area, but impacts on condition are unclear as appropriate research is lacking (GESAMP 2009). Areas of concern include the possible introduction of "foreign" organisms via ballast water (South Atlantic Fishery Management Council 2002, Halpern et al 2008, Roberts 2011, unpub), the potential impact of underwater noise generated by ships on marine mammals (Wright et al 2009), and the risk of collision with whales, dolphins and turtles (Laist et al 2001, Jensen and Silber 2003, Panigada et al 2008). Shipping transiting the Sargasso Sea may also have a direct physical impact on the *Sargassum* mats, destroying the integrity of the floating community. Research is clearly needed to quantify the degree of pressure that shipping exerts on the Sargasso Sea.

Despite these concerns regarding the condition of the Sargasso Sea, the ecological and biological functionality of the ecosystem remain intact, allowing this unique area to still fulfil its role as a home and an essential resource for a great diversity of species, many of which are of considerable conservation interest. Actions to address some of these concerns can only serve to improve the future outlook for the area. Concerns for the future include the potential for commercial extraction of *Sargassum* seaweed and seabed mining activities (Parson and Edwards 2011, UN, 2009). Application of the precautionary approach is vital to ensure the continued ecological and biological importance of this area into the future.

Assessment of the area against CBD EBSA Criteria

<table>
<tr><td rowspan="2">CBD EBSA Criteria (Annex I to decision IX/20)</td><td rowspan="2">Description
(Annex I to decision IX/20)</td><td colspan="4">Ranking of criterion relevance
(please mark one column with an X)</td></tr>
<tr><td>Don’t Know</td><td>Low</td><td>Medium</td><td>High</td></tr>
<tr><td>Uniqueness or rarity</td><td>Area contains either (i) unique (“the only one of its kind”), rare (occurs only in few locations) or endemic species, populations or communities, and/or (ii) unique, rare or distinct, habitats or ecosystems; and/or (iii) unique or unusual geomorphological or oceanographic features.</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td colspan="6">The two species of floating Sargassum are the world’s only holopelagic macroalgae, distinct from all other complex seaweeds in not having an attached benthic stage (Deacon 1942, Stoner 1983). Although these species occur in the Gulf of Mexico and Caribbean, the extent of their occurrence in the Sargasso Sea provides a unique and valuable structurally complex habitat in deep, open- ocean waters. Here, the areal extent of the Sargassum and the thickness of the mats it forms, along with their persistence, attract and retain a great density and diversity of associated organisms, distinguishing the Sargasso Sea ecosystem from other drift algal habitats (Stoner and Greening 1984, Coston-Clements et al 1991, Moser et al 1998, Casazza and Ross 2008). The Sargasso Sea is also the northerly limit of persistent Sargassum presence.
The Sargasso Sea is home to numerous endemic species that are, by definition, rare. The floating Sargassum community hosts ten endemic species from a broad range of taxa (Coston-Clements et al 1991, SAFMC 2002). The mid-water fish community of the Sargasso Sea includes a suite of sub-tropical endemics from three genera in the family Stomiidae (Porteiro 2005). On the sea floor, the New England seamount chain and the Corner Sea Rise seamounts are known to host endemic species and specialised communities, and models indicate that other isolated seamounts occur throughout the area (Figure 1).</td></tr>
<tr><td>Special importance for life-history stages of species</td><td>Areas that are required for a population to survive and thrive.</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td colspan="6">The Sargasso Sea is of considerable international importance as the only spawning area for American and European eels, Anguilla rostrata and A.anguilla. Both species spend their adult lives in freshwater but migrate thousands of miles to the Sargasso Sea to spawn (Schmidt 1922, Kleckner et al 1983, Friedland et al 2007). The larvae of both species develop in the Sargasso Sea and migrate along the Gulf Stream back to their respective freshwater habitats in North America and Europe. Satellite tagging has also recently shown that large female porbeagle sharks (Lamna nasus) migrate over 2,000 km at depths of up to 500m from Canadian waters to the Sargasso Sea, where they may be pupping (Dulvy et al 2008, Campana et al 2010).
The Sargassum anglerfish (Histrio histrio) and pipefish (Syngnathus pelagicus) lay their eggs in the Sargassum mats, and oceanic flying fish (Exocoetidae) build bubble nests for their eggs within the weed and have eggs with long extensions for attaching to the weed (Dooley 1972, Sterrer 1992). Other fish that spawn in the Sargasso Sea include white marlin (Tetrapturus albidus) and blue marlin (Makaira nigricans) (South Atlantic Fishery Management Council 2002, Luckhurst et al 2006, White Marlin Biological Review Team 2007) and various additional species of eels (Schoth and Tesch 1982, McCleave and Miller 1994, Miller and McCleave 1994, Miller 2002, Miller and McCleave 2007). Albacore tuna are also believed to spawn in the Sargasso Sea (ICCAT 2011a).
The Corner Rise and New England Seamounts host abundant populations of deep-water fish and, despite heavy commercial exploitation, remain important as aggregating and spawning areas for the alfonsino (Beryx splendens).</td></tr>
</table>

The mats of *Sargassum* and their associated communities are essential as nursery habitats and feeding areas for many species of fish, seabirds, and turtles. Fish living within the *Sargassum* canopy include juvenile swordfish (*Xiphius gladius*), juvenile and sub-adult jacks (Carangidae), juvenile and sub-adult dolphinfish (Coryphaenidae), filefish and triggerfish (Balistidae) of all life stages, and driftfish (Stromateidae) (Fedoryako 1980, Coston-Clements et al 1991, South Atlantic Fishery Management Council 2002, Casazza and Ross 2008, Rudershausen et al 2010). These fish are in turn a food resource for larger predatory species.

Green turtles (*Chelonia mydas*), hawksbill turtles (*Eretmochelys imbricate*), loggerhead turtles (*Caretta caretta*), and Kemp's ridley turtles (*Lepidochelys kempii*), all of which are threatened or endangered, use *Sargassum* as a nursery habitat (Carr and Meylan 1980, Carr 1987, Schwartz 1988, Manzella and Williams 1991, Luschi et al 2003). Hatchlings swim hundreds of miles to the Sargasso Sea, where they hide in the *Sargassum* to feed and grow in relative safety, spending their so called "lost years" amongst the weed (Carr and Meylan 1980, Carr 1987, Schwartz 1988, Luschi et al 2003).

A variety of seabirds feed in association with *Sargassum* in the Sargasso Sea (Table 1) (Haney 1986, Thomas 2005). Tracking data from Birdlife International show that the western Sargasso Sea is an important feeding area for Audubon's shearwater (*Puffinus lherminieri*) and white-tailed tropic birds (*Phaethon lepturus*) from the Bahamas (B. Lascelles, pers. comm., www.seabirdtracking.org).

The Sargasso Sea provides critical food and shelter for a variety of organisms on migratory routes between the tropical and temperate Atlantic. Nearly all the large tunas and tuna-like species managed by ICCAT, including the bluefin tuna (*Thunnus thynnus*), migrate through the Sargasso Sea (Lutcavage et al 1999, Block et al 2001, Block et al 2005, Wilson and Block 2009, ICCAT 2010). Basking sharks (*Cetorhinus maximus*) make regular seasonal movements to the Sargasso Sea during winter months at depths of 200-1000m metres (Skomal et al 2009). Adult leatherback turtles (*Dermochelys coriacea*) migrate north through the Sargasso Sea from nesting sites in the Caribbean Sea (Ferraroli et al 2004, Hays et al 2004), and seasonally to the Sargasso Sea from foraging locations in coastal waters of New England and Nova Scotia (James et al 2005). Humpback whales (*Megaptera novaeangliae*) pass through the Sargasso Sea during their annual migrations between the Caribbean and the northern North Atlantic (Martin et al 1984, Stone et al 1987, G. Donovan and R. Reeves 2011, pers. comm.). The same individuals are seen year after year off Bermuda and further north in the Stellwagen Bank Marine Sanctuary off the east coast of the USA (Stevenson 2011, unpub). Some of these individuals have also been recorded at another area meeting EBSA criteria, the Marine Mammal Sanctuary – Banco de la Plata y Banco de la Navidad, off the Dominican Republic (Omar Reynoso, pers. comm., http://www.intec.edu.do/ballenas).

Tracking data from Birdlife International show eight species of seabirds migrating through the Sargasso Sea in significant numbers (B. Lascelles, pers. comm., www.seabirdtracking.org). *Sargassum* patches can be dense enough for some birds, notably bridled and sooty terns (*Sterna anaethetus* and *Sterna fuscata*) to roost upon (Haney 1986).

Importance for threatened, endangered or declining species and/or habitats	Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.				X

Many of the species utilising the Sargasso Sea are of considerable global conservation interest, appearing on the IUCN Red List of endangered species, and/or under CITES (Hallett 2011, unpub) (see Table 2). They feature in the annexes of the 1990 SPAW Protocol of the Cartagena Convention (http://www.cep.unep.org/cartagena-convention/spaw-protocol), which requires countries in the Caribbean region to implement conservation measures for these species (Table 3). Tables 2 and 3 list examples of threatened species, but they are only an indication of the numbers of endangered species that occur in the Sargasso Sea.

Important examples include European and American eels, porbeagle sharks and four species of turtle—

<table>
<tr><td colspan="6">Kemp’s ridley, hawksbill, loggerhead and green—which are heavily dependent on the Sargasso Sea and/or Sargassum. Some 30 cetacean species live in or migrate through the Sargasso Sea, as do several species of endangered or threatened tuna and sharks. Leatherback turtles also migrate through the area.
The distinct seamount communities are rare habitats that are home to a variety of endemic species with very limited distribution that are thus at high risk of extinction.
Threatened and endangered species utilising the Sargasso Sea include seabirds in the air above, turtles in the floating Sargassum, large pelagic fishes and cetaceans in the waters below, and a wide variety of corals on seamounts rising from the seabed.</td></tr>
<tr><td>Vulnerability, fragility, sensitivity, or slow recovery</td><td>Areas that contain a relatively high proportion of sensitive habitats, biotopes or species that are functionally fragile (highly susceptible to degradation or depletion by human activity or by natural events) or with slow recovery.</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td colspan="6">Deep-sea organisms and their communities are considered extremely vulnerable because such species are generally long-lived, slow to mature and have low reproductive rates, leading to slow recovery times if their populations are perturbed (Norse et al 2012). In addition, many organisms in the deep sea are physically fragile and easily damaged. The benthic communities on seamounts are particularly vulnerable as they may be isolated from external sources of replenishment and they often contain endemic species with very limited distributions.
Within this area meeting EBSA criteria, the Corner Rise, New England and Muir seamount chains support complex coral and sponge communities, including numerous endemics, which provide habitat for diverse invertebrate communities that include some highly dependent commensal species (2007, Watling et al 2007, Cho 2008, Simpson and Watling 2011, Pante and Watling 2011, ICES 2011, Shank 2010). These seamounts also host abundant populations of deep-water fish. Deep-sea and seamount fish stocks are particularly vulnerable to exploitation because the fish are very long-lived, take many years to reach sexual maturity, and have very low fecundities (Norse et al 2012). These fish stocks have been heavily exploited commercially since 1976 (Vinnichenko 1997), and the fragile seamount ecosystems of the Corner Rise and New England chains have already sustained considered damage from these deep-sea trawling activities. Nevertheless, the seamounts remain important as aggregating and spawning areas for the alfonsino (Beryx splendens).
The communities dependent on the Sargassum mats are also vulnerable, although to a lesser degree, as their existence relies on the presence of the complex physical structure provided by the seaweed.</td></tr>
<tr><td>Biological productivity</td><td>Area containing species, populations or communities with comparatively higher natural biological productivity.</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td colspan="6">The discovery of Prochlorococcus and the development of techniques able to evaluate the role of picoplankton in primary production measurements have revolutionized our perceptions of productivity in the Sargasso Sea and subsequently of the global ocean (Chisholm et al 1988). Conventionally the Sargasso Sea was regarded as an area of low nutrients and low productivity, enhanced by localized upwellings. Yet despite having low nutrient levels and therefore being officially classed as oligotrophic, the Sargasso Sea, per unit area, has a surprisingly high net annual primary production rate that matches levels found in some of the most productive regions in the global ocean (Steinberg et al 2001, Rho and Whitledge 2007, Lomas et al 2012). This is due to a complex combination of factors—the production of carbon in the surface waters by photosynthesis, the location of the Sargasso Sea in the sub-tropics which results in a deep euphotic layer, and differences in phytoplankton communities and associated nitrogen fixation.
Integrated over the entire area of the Sargasso Sea the annual net primary production, the balance of primary production and plankton respiration, is estimated to be some three times higher than in the Bering Sea (Steinberg et al 2001, Lomas et al 2012), conventionally regarded as one of the world’s most productive seas. The difference is that in the Sargasso Sea most of the production is recycled by bacteria in the so-called microbial loop rather than channelled into biomass of larger, harvestable organisms (Carlson et al 1996, Steinberg et al 2001).</td></tr>
</table>

<table>
<tr><td colspan="6">As a result of this high primary productivity, to which must be added the annual production of Sargassum weed, which is now being estimated from satellite measurements (Gower and King 2008, 2011), the Sargasso Sea plays a key role in both global oxygen production and ocean sequestration of carbon (IPCC1996, 2001 and 2007, Ullman et al 2009, Lomas et al 2011 unpub).
Production in the upper ocean, particularly of Sargassum, contributes to food webs in mid-water and benthic regions, providing up to 10% of the energy inputs to communities on the seabed (Schoener and Rowe 1970, Rowe and Staresinic 1979 in Angel and Boxshall 1990, Butler et al 1983).</td></tr>
<tr><td>Biological diversity</td><td>Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td colspan="6">The biodiversity of the Sargasso Sea is exemplified by the diverse population of species that live on or amongst the Sargassum. More than 145 species of invertebrates have been recorded, including a variety of gastropod and nudibranch molluscs, portunid and amphipod crustaceans, pycnogonids, serpulid and nereid polychaetes, flatworms, bryozoans and hydroids (Fine 1970, Morris and Mogelberg 1973, Butler et al 1983, Coston-Clements et al 1991, Sterrer 1992, Calder 1995, South Atlantic Fishery Management Council 2002, Trott et al 2011). In addition, over 100 species of fish associate with floating Sargassum offshore (Dooley 1972, Fedoryako 1980, Coston-Clements et al 1991, Casazza and Ross 2008, Sutton et al 2010). Most of these species would not live in the open ocean without the floating algae. Ten of these species are endemic to floating Sargassum: the Sargassum anglerfish (Histrio histrio), Sargassum pipefish (Syngnathus pelagicus), Sargassum slug (Scyllea pelagica), Sargassum snail (Litiopa melanostoma), Sargassum crab (Planes minutes), Sargassum shrimp (Latreutes fucorum), the amphipods Sunampithoe pelagica and Biancolina brassicacephala, the platyhelminth Hoploplana grubei and the Sargassum anemone (Anemonia sargassensis).
The diversity of oceanic plankton and micronekton within the Sargasso Sea is enhanced as species are drawn in from the surrounding currents via rings and eddies (Boyd et al 1978, Wiebe and Boyd 1978, Ring Group 1981).
Overall, mesopelagic diversity is not considered to be higher than other similar locations, but a variety of species from a wide range of taxa have been documented from this deeper part of the ocean. A study of the bathypelagic fish family Stomiidae found a suite of sub-tropical endemic species in the northern Sargasso Sea, primarily from the genus Eustomias but also in the genera Photonectes and Bathophilus, and determined that the area exhibited higher levels of endemicity for this group than other North Atlantic biogeographic provinces (Porteiro 2005). In addition, it is worth noting that Angel (2010), in drawing up an inventory of planktonic ostracods for the Atlantic Ocean, observed that 10% of the species caught below 2000m were new to science and that if the sampling had reached the benthopelagic zone within a few metres of the seabed the novel component would have soared. The ostracods are likely to be an indicator of the potential numbers of new species yet to be discovered in the deep ocean.
Benthic diversity is very high on the Corner Rise and New England seamount chains, where there are numerous endemic and novel species of coral that host specific commensal invertebrates, and some 670 species have been found (Watling 2007, Watling et al 2007, Cho 2008, Simpson and Watling 2011, Pante and Watling 2011, ICES 2011, Shank 2010). Less is known about the Muir seamount chain, but limited observations have shown it is covered with abundant hydroids, sponges, calcareous algae and rubble (Pratt 1962). The diversity of fauna living on and within the abyssal plain of the Sargasso Sea may well be amongst the highest on the planet (Sanders et al 1965, MBARI Sargasso Sea Expedition 2011 www.mbari.org).</td></tr>
<tr><td>Naturalness</td><td>Area with a comparatively higher degree of naturalness as a result of the lack of or low level of human-induced disturbance or degradation.</td><td></td><td></td><td>X</td><td></td></tr>
<tr><td colspan="6">Despite its remote location, the Sargasso Sea does not remain totally natural. A recent global analysis of human impacts of marine ecosystems concluded that the area has sustained moderate to high impacts over time (Halpern et al 2008).
Fisheries landings for many species in the North Central Atlantic have declined significantly in the last 50</td></tr>
</table>

years, indicative of impacts on those populations (Sumaila et al 2011, unpub, Pauly and Watson 2005, Pauly et al 2005). Deep pelagic and bottom trawling between 1976 and 1995 on the Corner Rise seamounts caused extensive destruction of the benthic fauna (Vinnichenko, 1997, Waller et al 2007, Shank 2010). As a precautionary management measure, 13 fishable seamounts, including 25 peaks shallower than 2,000 m on the New England and Corner Rise seamounts were closed to demersal fishing by the Northwest Atlantic Fishery Organization (NAFO] from 1 January 2007. This closure was recently extended until 31 December 2014 (NAFO 2011). The recovery of these habitats in the coming years should be monitored.

Floating plastic particles were reported in the Sargasso Sea as early as 1972 (Carpenter and Smith 1972), and today the North Atlantic gyre has a patch of floating debris akin to the more famous North Pacific garbage patch with concentrations of plastic particles reaching in excess of 100,000 pieces km^{-2} in some places (Law et al 2010). This clearly impacts the naturalness of the area, and the negative impacts of plastic debris on organisms such as turtles and seabirds, are well documented (Witherington 1994, Rios et al 2007). There are also numerous submarine communications cables that have a minor effect on the naturalness of the seabed (Telegeography 2011).

The Sargasso Sea lies within one of the world's busiest international shipping areas and is crossed by a large number of vessels each year (Roberts 2011, unpub). This affects the naturalness of the area, but precise impacts are unclear as appropriate research is lacking (GESAMP 2009) and this absence of data should be addressed.

Despite these impacts, the ecological and biological functionality of the Sargasso Sea ecosystem remain intact, allowing this unique area to fulfil its role as a home and an essential resource for a great diversity of species.

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Table 1. Seabird species known to be associated with *Sargassum* and the Sargasso Sea (composite list developed from Haney 1986 and Thomas 2005).

Species	Common Name
Pterodroma hasitata	Black-capped petrel
Calonectris diomedea	Cory's shearwater
Puffinus gravis	Greater shearwater
Puffinus Iherminieri	Audubon's shearwater
Oceanites oceanicus	Wilson's storm-petrel
Oceanodroma leucorhoa	Leach's storm-petrel
Puffinus griseus	Sooty shearwater
Phaethon lepturus	White-tailed tropicbird
Phaethon aethereus	Red-billed tropicbird
Sula dactylatra	Masked booby
Sula leucogaster	Brown booby
Phalaropus lobatus	Red-necked phalarope
Phalaropus fulicaria	Red phalarope
Phalaropus sp.	Phalarope sp.
Stercorarius pomarinus	Pomarine jaeger
Stercorarius parasiticus	Parasitic jaeger
Stercorarius longicaudis	Long-tailed jaeger sp.
Larus argentatus	Herring gull
Sterna maxima	Royal tern
Sterna hirundo	Common tern
Sterna paradisaea	Arctic tern
Sterna antillarum	Least tern
Sterna anaethetus	Bridled tern
Sterna fuscata	Sooty tern

Table 2. Oceanic species using the Sargasso Sea and Bermuda's EEZ that are on the IUCN Red List of threatened or endangered species and listed under CITES.

Species	**Common Name**	**IUCN Status**	**CITES Status**
Megaptera novaeangliae	Humpback whale	n/a	Appendix 1
Physeter macrocephalus	Sperm whale	Vulnerable	Appendix 1
Thunnus thynnus	Bluefin tuna	Endangered	Not listed
T. albacores	Yellowfin tuna	Near Threatened	Not listed
T. alalunga	Albacore tuna	Near Threatened	Not listed
T. obesus	Bigeye tuna	Vulnerable	Not listed
Makaira nigricans	Blue marlin	Near Threatened	Not listed
Tetrapterus albidus	White marlin	Near Threatened	Not listed
Anguilla anguilla	European eel	Critically Endangered	Appendix 2
Rhincodon typus	Whale shark	Vulnerable	Appendix 2
Cetorhinus maximus	Basking shark	Vulnerable	Appendix 2
Carcharodon carcharius	White shark	Vulnerable	Appendix 2
Carcharhinus longimanus	Oceanic whitetip shark	Vulnerable	Not listed
Carcharhinus falciformis	Silky shark	Near Threatened	Not listed
Carcharinus galapagensis	Galapagos shark	Near Threatened	Not Listed
Lamna nasus	Porbeagle shark	Vulnerable	Not listed
Isurus oxyrinchus	Shortfin mako shark	Vulnerable	Not listed
Prionace glauca	Blue shark	Near Threatened	Not listed
Sphyrna lewini	Scalloped hammerhead	Endangered	Not listed
Galeocerdo cuvier	Tiger shark	Near Threatened	Not listed
Caretta caretta	Loggerhead turtle	Endangered	Appendix 1
Chelonia mydas	Green turtle	Endangered	Appendix 1
Eretmochelys imbricata	Hawksbill turtle	Critically Endangered	Appendix 1
Lepidochelys kempi	Kemp's ridley turtle	Critically Endangered	Appendix 1
Dermochelys coriacea	Leatherback turtle	Critically Endangered	Appendix 1
Pterodroma cahow	Cahow	Endangered	Not listed

Table 3. Endangered and threatened species commonly associated with the Sargasso Sea and waters around Bermuda requiring conservation measures in the wider Caribbean region to protect and recover and, where relevant, to maintain their populations at optimal levels. These species are examples taken from the annexes of the Convention on the Protection and Development of the Marine Environment of the Wider Caribbean Region (SPAW Protocol). For a comprehensive list of all species covered by the SPAW Protocol, please see http://www.cep.unep.org/cartagena-convention/spaw-protocol.

Species	**Common name**	**SPAW status**
Puffinus lherminieri	Audubon's shearwater	Annex II (Article 11(1)(b))
Cetacea – all spp.	Whales and dolphins	Annex II (Article 11(1)(b))
Caretta caretta	Loggerhead turtle	Annex II (Article 11(1)(b))

Chelonia mydas	Green turtle	Annex II (Article 11(1)(b))
Eretmochelys imbricate	Hawksbill turtle	Annex II (Article 11(1)(b))
Lepidochelys kempi	Kemp's ridley turtle	Annex II (Article 11(1)(b))
Dermochelys coriacea	Leatherback turtle	Annex II (Article 11(1)(b))
Phaethon lepturus	White-tailed tropicbird	For inclusion in Annex II
Phaethon aethereus	Red-billed tropicbird	For inclusion in Annex II
Sula dactylatra	Masked booby	For inclusion in Annex II
Sula leucogaster	Brown booby	For inclusion in Annex II
Sterna maxima	Royal tern	For inclusion in Annex II
Sterna hirundo	Common tern	For inclusion in Annex II
Sterna anaethetus	Bridled tern	For inclusion in Annex II
Sterna fuscata	Sooty tern	For inclusion in Annex II

Maps and Figures

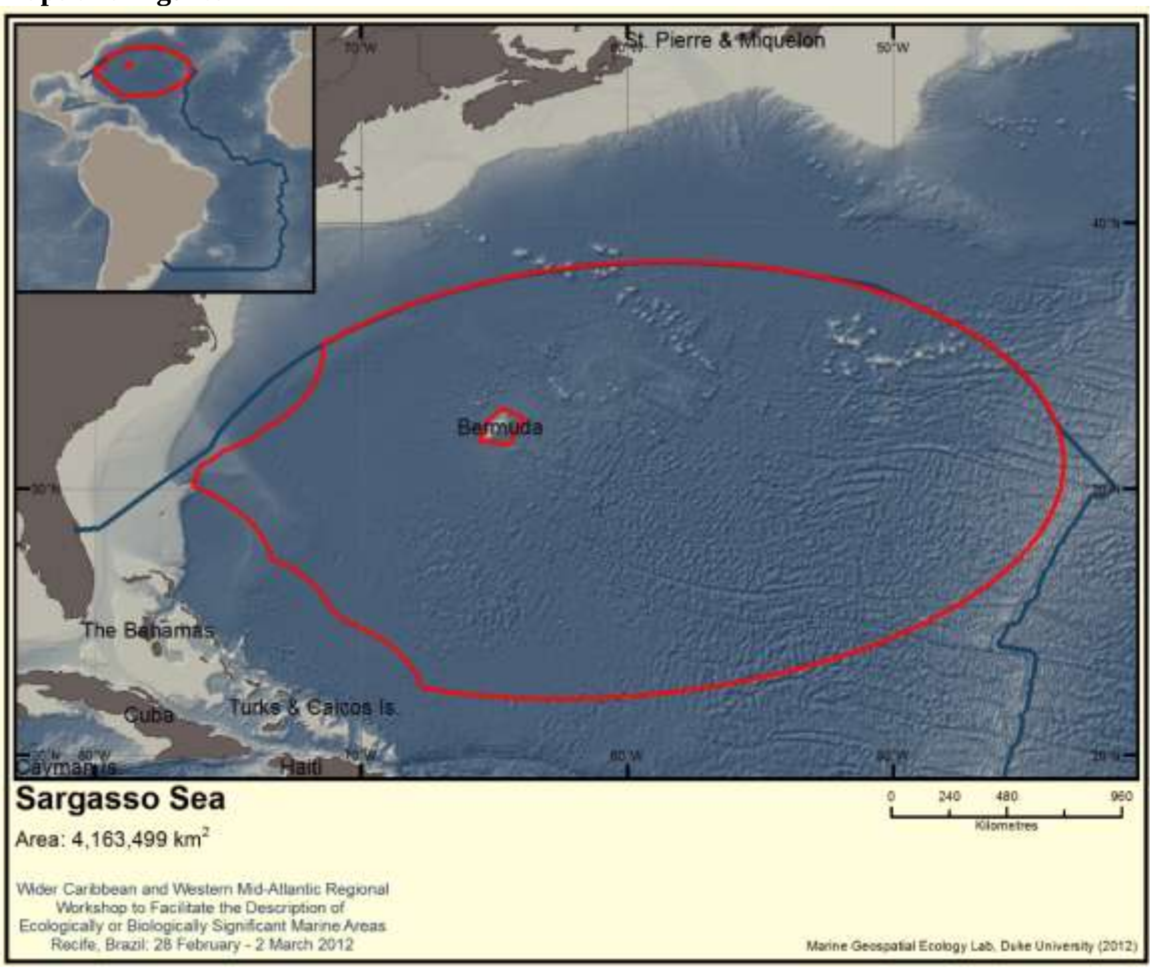

Figure 3. Area meeting EBSA criteria (no. 13)

AREA NO 14: LA REGIÓN TALUD CONTINENTAL SUPERIOR DEL SINÚ

Abstract

The Región Talud Continental Superior del Sinú (Sinu continental margin) is located in the south part of the Colombian Caribbean in a depth range from 150 to 1750 m. It is characterized by the presence of geological formations common to flow systems such as channels, canyons and slopes, and to structural forms such as hills, steeps, domes and depressions, with which a high biodiversity can be associated. Also, records of the presence of deep-water corals, especially *Madracis myriaster*, and the presence of reduced environments (methane cold seeps) increase its ecological importance. The natural status of these areas allows them to be described as areas meeting EBSA criteria that are important for the south Caribbean region. They are also vulnerable to future hydrocarbon explorations and the practice of trawl fishing, which is occurring progressively deeper.

Introduction

The Sinu continental margin is found in the south of the Colombian Caribbean in a depth range from 150 to 1750 m. This region is formed by geoforms common to the flow system such as channels, canyons and continental slopes, and to structural forms such as hills, steeps, domes and depressions. Toward the platform boundaries (150 m depth) the positive morphology, such as reliefs, steeps and fluid emanation areas give way to an area where the channels are associated with turbidity currents (Rangel-Buitrago and Idárraga-García, 2010). These channels allow the transportation of deposits down the slopes toward the continental rise that for this area corresponds to the Sinu accretion prism (Toto and Kellogg, 1992). On the other side, the strong tectonic activity in the area is manifested with the presence of steeps and crests associated with folds (Figure 1). The morphology described promotes the presence of unique, fragile and important biological communities, as are the deep water corals with a high diversity of invertebrates associated with them (Reyes et al., 2005) as well as the presence of threatened species and reduced environments (methane seep ecosystems) (Gracia et al., 2011).

This area presents a good bathymetric information coverage due to the seismic studies performed by private hydrocarbon companies in Colombia. Also, it has the biological information gathered by different investigation campaigns of the Instituto de Investigaciones Marinas and Costeras –INVEMAR since 1995 (INVEMAR, 2010).

Lastly, this area groups three areas significant for biodiversity (ASB) (No. 4, 5 and 7) recently identified in Colombia (Alonso et al., 2010).

Location

The Sinu continental margin includes places that extend from9º 12'14"N to 10º 4'38"N and from 76º 34'30"W to 76º 6'59"W, an area that is located entirely within national jurisdiction in the Colombian Caribbean area.

Feature description of the proposed area

The Sinu continental margin belongs to the Sinu accretionary prism that extends between the isobaths of 150 and 1750 m with many areas where slopes vary between 9° and 30°. The main geological formations associated with this prism include drainage systems (channels and canyons), continental slopes, steeps, hills, basins, mass flow areas, avalanches deposits of rocks and domes. Toward the west border the diversity and complexity of the geological formations give way to a large area of abyssal valley plain to slightly undulated that limits with elongated hills oriented toward the north-east (Toto and Kellogg, 1992).

In the more shallow areas (between 100 and 300 m depth) there isevidence of the presence of deep-water coral communities, which have approximately 40% of the Colombian Caribbean biodiversity of the continental shelf (Reyes et al., 2005), however, its deepest range, where these communities inhabit, could be even deeper. A total of 43 scleractinian coral species have been registered, the dominant species being *Madracis myriaster,* which seems to be the main structuring one (Santodomingo et al., 2006). This quality makes this coral community an "uncommon" habitat in the Caribbean region and the world (Lutz & Ginsburg, 2007). In this locality, three forms of scleractinian coral growths have been found: recumbent (*Thalamohyllia riisei* and *Eguchipsammia cornucopia*), bushy (*M. myriaster* and *A Anomocora fecunda*) and solitary (*Caryophyllia berteriana* and *Coenocyathus parvulus*), each of which offers different habitat options and settlement substratum for other fauna. A total of 115 invertebrate and fish species associated with these coral communities have been registered, with a particularly high diversity of echinoderms (38 species) (Reyes *et al.*, 2005). Regarding fish, the most abundant are the scorpions, flatfish and small serranids. Additionally, according to biological and geological evidence, some bivalve species of the families Vesicomyidae (*Calyptogena ponderosa, Vesicomya caribbea, Ectenagena modioliforma*), Lucinidae and Solemyidae (*Acharax caribbaea*) and tube worms of Vertimentifera (*Lamellibrachia* sp.) have been identified; also authigenic rocks have been found, which confirm the presence of reducing environments in this sector of the Colombian Caribbean (Gracia *et al.*, 2011).

Feature condition and future outlook of the proposed area

Currently in waters more or less deep, this area presents known low impacts; however, due to the over-exploitation and depletion of the shallow-water shrimp stock, explorations have been carried out in deeper waters to determine the potential of fishing resources. Preliminary research indicates that along the Colombian Caribbean, between 100 and 600 m depth, there is a high abundance of three shrimp species (giant red, pink specked and royal red shrimps) (Paramo *et al.*, 2011). Also, in Colombia "offshore" hydrocarbon exploration constitutes one of the five main strategies of the current economic development of the country. That is why there has been more seismic exploration in the Colombian territory during the last three years than in the last three decades, and areas farther from the coast are being licensed for exploration at an unprecedented speed. As part of the strategy for identifying ecologically sensitive areas for future hydrocarbon exploration and exploitation, it has been agreed with the hydrocarbon companies to carry out some research campaigns to better describe these areas from the physical, biological and geological point of view to better understand its functioning. It is also expected that in the immediate future the Colombian Government will initiate the process of declaring marine protected areas (MPAs) in the most vulnerable parts of this area meeting EBSA criteria.

Assessment of the area against CBD EBSA Criteria

CBD EBSA Criteria (Annex I to decision IX/20)	**Description** (Annex I to decision IX/20)	**Ranking of criterion relevance** (please mark one column with an X)			
		Don't Know	**Low**	**Some**	**High**
Uniqueness or rarity	Area contains either (i) unique ("the only one of its kind"), rare (occurs only in few locations) or endemic species, populations or communities, and/or (ii) unique, rare or distinct, habitats or ecosystems; and/or (iii) unique or unusual geomorphological or				**X**

	oceanographic features				
Explanation for ranking The species *Madracis myriaster* is the main framework azooxanthellate coral in the Colombian Caribbean deep-sea communities. This species has not been reported previously in the Caribbean region nor in other places in the world as main structuring species of the deep corals waters (Lutz & Ginsberg 2007). This characteristic makes it a unique habitat not only in the Caribbean region, but also in the world.					
Special importance for life-history stages of species	Areas that are required for a population to survive and thrive.	**X**			
Explanation for ranking					
Importance for threatened, endangered or declining species and/or habitats	Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.				**X**
Explanation for ranking Due to their value for jewelry, several species of the order Anthipatharia (black corals) are threatened or endangered. On the other hand, all the species of the order Scleractinia are reported in the CITES Appendix II. Of the antipatharians found, nine are included in the CITES Identification Manual of Marine Invertebrates of Colombia (Reyes and Santodomingo, 2002), seven of them are present in the deep coral formations of the Colombian Caribbean, and there are reports of Colombia as an exporter country before CITES of this type of organisms, though the exploitation places and depths of this resource are unknown.					
Vulnerability, fragility, sensitivity, or slow recovery	Areas that contain a relatively high proportion of sensitive habitats, biotopes or species that are functionally fragile (highly susceptible to degradation or depletion by human activity or by natural events) or with slow recovery.				**X**
Explanation for ranking There is an association to some elements of the geological formations and the biological communities. That is how it has been identified that the branched corals of the genus *Madracis* could develop on soft (sand and muddy) bottoms, while the octocorals (soft corals), antipatharians (black corals) and hard corals of the genus *Madrepora* prefer hard bottoms. Also, the growth of sponge communities over dead fragments of the calcareous *Halimeda* alage has been observed (Santodomingo *et al.*, 2007). These communities are present in areas with tectonic activity and diapiric intrusion, which could promote the environmental conditions for the development and growth of coral formations and "cold seeps", recently identified in this area.					
Biological productivity	Area containing species, populations or communities with comparatively higher natural biological productivity.			**X**	
Explanation for ranking The presence of "cold seeps" recently identified in this area exhibit a high biological productivity, and it is known that they host a high proportion of endemic species.					
Biological diversity	Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.				**X**
Explanation for ranking The presence of diverse submarine landscapes defined by the morphology, depth, types of bottom (hard					

or soft) and rough texture (niche complexity), constitutes the greater biological diversity in this area. A total of 115 species of invertebrates and fishes have been recorded, with a high diversity of echinoderms (38 species) (Reyes *et al.*, 2005).					
Naturalness	Area with a comparatively higher degree of naturalness as a result of the lack of or low level of human-induced disturbance or degradation.				**X**
Explanation for ranking Currently, the area is in a highly natural state, given the low intervention of anthropogenic activities.					

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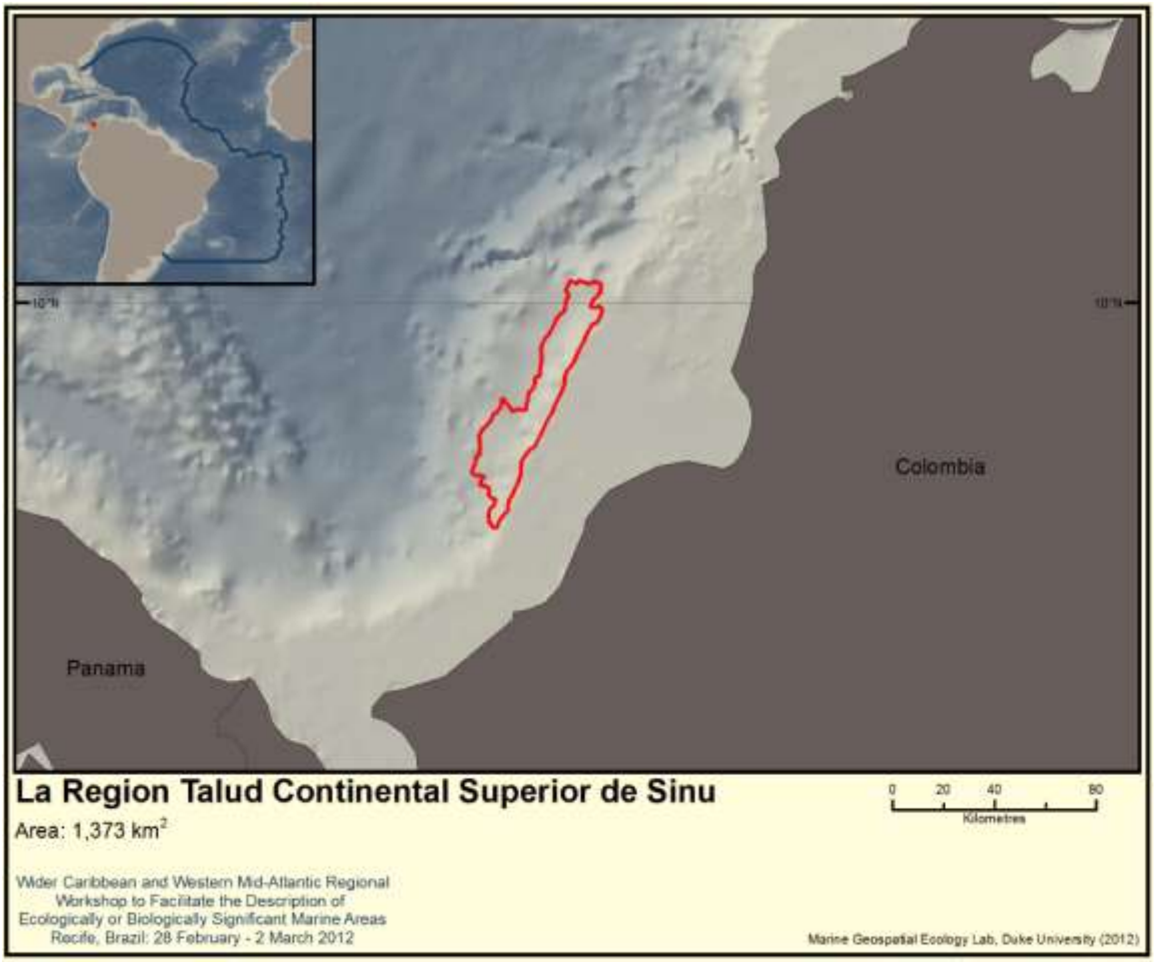

Figure 1. Area meeting EBSA criteria (no. 14)

AREA NO 15: LA REGIÓN TALUD CONTINENTAL SUPERIOR DEL MAGDALENA

Abstract

The oceanic bottoms that include the Magdalena and Tayrona areas are found in the central sector of the Colombian Caribbean in a range of depth between 200 and 3000 m, and are characterized by the presence of submarine canyons and hills that provide the habitat with a high species biodiversity.

Preliminary evidence is the presence of deep-water coral communities, among which is highlighted *Madracis myriaster*, a species that increases the importance of these communities from the ecological point of view through its function as biodiversity aggregator. Because of their natural state, they qualify as areas meeting EBSA criteria for the south Caribbean region.

Introduction

The studied area of the oceanic bottoms is found in the central Colombian Caribbean sector in a depth range between 200 to 3000 m (Figure 1). To the northeast of the area the submarine morphology presents a sharp slope of the bottom with the presence of the La Aguja canyon, which starts at 70 m depth reaching 3500 m depth, and it extends by approximately 100 km. Also the presence of submarine hills has been identified (Rangel-Buitrago and Idárraga-García, 2010). The deltaic valley of the Magdalena River mainly influences this region. Toward the central area of the delta the dominant morphology is channels, up to a 2000 m deep, which combine with hills of a southwest – northeast tendency, where the Turipana canyon is present. The channels are the product of the recent sedimentation of the fluvial systems of the western foothills of the Sierra Nevada of Santa Marta and the rivers associated with the Cienaga Grande of Santa Marta (CGSM) (Rangel-Buitrago and Idárraga-García, 2010). The previous morphology provides the deep-water habitat as well as shallow communities, allowing the presence of unique, fragile and important biological communities; these deep-water coral communities host a high diversity of invertebrates (Reyes et al., 2005), as well as other species that are listed in CITES. On the other hand, there is preliminary evidence of the loss of species associated with the CGSM.

There is strong bathymetric information about the area due to the seismic studies conducted by private oil and gas companies in Colombia. Also, there is biological information as a result of investigation campaigns conducted by the Instituto de Investigaciones Marinas and Costeras –INVEMAR since 1995 (INVEMAR, 2010).

Finally, this area meeting EBSA criteria groups eight significant areas for biodiversity – ASB (Nº 16 to 24), recently identified in Colombia (Alonso et al., 2010).

Location

The area under study includes places that extend between 11º 3'34"N and 11º 55'40"N, and between 75º 33'3"W and 74º 2'28"W, an area located entirely within national jurisdiction in the Colombian Caribbean area.

Feature description of the proposed area

The oceanic bottoms that comprise the Magdalena area exhibit multiple ruptures along the slope, gradients of which decrease from 4º to 0.5º. The lower part of the slope extends up to a depth greater than 3700 m In this area the geological morphology of the bottom is represented by leeves, channels, canyons, structural heights, mass flow deposits and scarped zones (Figure 1). The frontal area of the current delta of the Magdalena River exhibits a high dynamism and instability, so that all the sediments (in their majority of terrigenous origin) are linked to constant movement; the central part of the are is dominated by a series of hills positioned south-west – north-east of more than 50 km longitude and 8 km width that rise 500 m above the oceanic bottom (Rangel-Buitrago and Idárraga-García, 2010). The west sector corresponds to the Magdalena fan, which is characterized by the presence of numerous submarine meandric channels that radiate slope down in a typical fan pattern. The mass flow areas and channel-dam complexes can be differentiated in it (Ercilla *et al.*, 2002).

The deep-water coral community found in this area is atypical, since the main structuring species was *Madracis myriaster* (Reyes *et al.,* 2005; Santodomingo *et al*., 2006), which has not being commonly identified as habitat forming in other regions of the world (Freiwald *et al*., 2004; Lutz & Ginsburg, 2007); however, species such as the *Coenosmilia arbuscula* and *Anomocora fecunda* have accomplished that role, and though they were not the most dominant, their bushy colonies, together with the *M. myriaster*, contributed to the habitat formation; additionally, the solitary species *Polymices fragilis* and *Javania cailleti* (which form individual polyps) were also catalogued as potentially habitat formers that accomplished their function by the strong basal disks that attach them to the rock. Also in these communities 102 species were recorded among fishes, echinoderms, mollusks, crustaceans and other cnidarians; several of them were the first recorded species for Colombia and the South Caribbean (Reyes *et al.,* 2005).

Feature condition and future outlook of the proposed area

Currently this area exhibits low impacts known in deep waters (>100 m); however, due to the over exploitation and depletion of the shallow water shrimp stock, the explorations have been carried out in deeper waters to determine the potential of the fishing resources in deeper waters. Preliminary research indicates that along the Colombian Caribbean, between 100 and 600 m depth, there is high abundance of three shrimp species (giant red, pink specked and royal red shrimps) (Paramo *et al*., 2011). Also, in Colombia "offshore" hydrocarbon exploration constitutes one of the five main strategies of the current economic development of the country. That is why there has been more seismic exploration in the Colombian territory during the last three years than in the last three decades, and areas farther from the coast are being licensed for exploration at an unprecedented speed. It is expected that in the immediate future the Colombian Government will initiate the process of declaring marine protected areas (MPAs) in the most vulnerable parts of this area meeting EBSA criteria.

Assessment of the area against CBD EBSA Criteria

CBD EBSA Criteria (Annex I to decision IX/20)	**Description** (Annex I to decision IX/20)	**Ranking of criterion relevance** (please mark one column with an X)			
		Don't Know	**Low**	**Some**	**High**
Uniqueness or rarity	Area contains either (i) unique ("the only one of its kind"), rare (occurs only in few locations) or endemic species, populations or communities, and/or (ii) unique, rare or distinct, habitats or ecosystems; and/or (iii) unique or unusual geomorphological or oceanographic features				**X**
Explanation for ranking High richness, diversity and endemic species are associated with submarine canyons and seamount geoforms according to other international studies (CBD 2008). The species *Madracis myriaster* is the main framework azooxanthellate coral in the Colombian Caribbean deep-sea communities. This species is					

not reported previously in the Caribbean region nor in other places in the world as main structuring specie of the deep corals waters (Lutz & Ginsberg 2007). This characteristic turns it in a unique habitat in the Caribbean region as well as in the world.					
Special importance for life-history stages of species	Areas that are required for a population to survive and thrive.	**X**			
Explanation for ranking					
Importance for threatened, endangered or declining species and/or habitats	Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.				**X**
Explanation for ranking Due to their value for jewelry several species of the order Anthipatharia (black corals) are threatened and endangered. On the other hand all the species of the order Scleractinia are reported in the CITES Appendix II. Nine of the antipatharians found, are included in the CITES Identification Manual of Marine Invertebrates of Colombia (Reyes and Santodomingo, 2002), seven of them are present in the deep coral formations of the Colombian Caribbean, and there are reports of Colombia as an exporter country before CITES of this type of organisms, though the exploitation places and depths of this resource are unknown.					
Vulnerability, fragility, sensitivity, or slow recovery	Areas that contain a relatively high proportion of sensitive habitats, biotopes or species that are functionally fragile (highly susceptible to degradation or depletion by human activity or by natural events) or with slow recovery.				**X**
Explanation for ranking There is an association with some geoforms such submarine canyons and seamounts with communities sustained by deep water azooxantelated corals where octocorals (soft corals) and antipatharians (black corals) inhabit.					
Biological productivity	Area containing species, populations or communities with comparatively higher natural biological productivity.	**X**			
Explanation for ranking					
Biological diversity	Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.				**X**
Explanation for ranking The presence of diverse submarine landscapes defined by the morphology, depth, types of bottom (hard or soft) and rough texture (niche complexity), constitutes the greater biological diversity in this area. A total of 102 species of fishes, echinoderms, mollusks, crustaceous, cnidarians and bryozoans have been recorded, several of them first recorded for Colombia and the South Caribbean (Reyes *et al.*, 2005).					
Naturalness	Area with a comparatively higher degree of naturalness as a result of the lack of or low level of human-induced disturbance or degradation.				**X**
Explanation for ranking Currently, the area is in a high naturality status given the low intervention of anthropogenic activities.					

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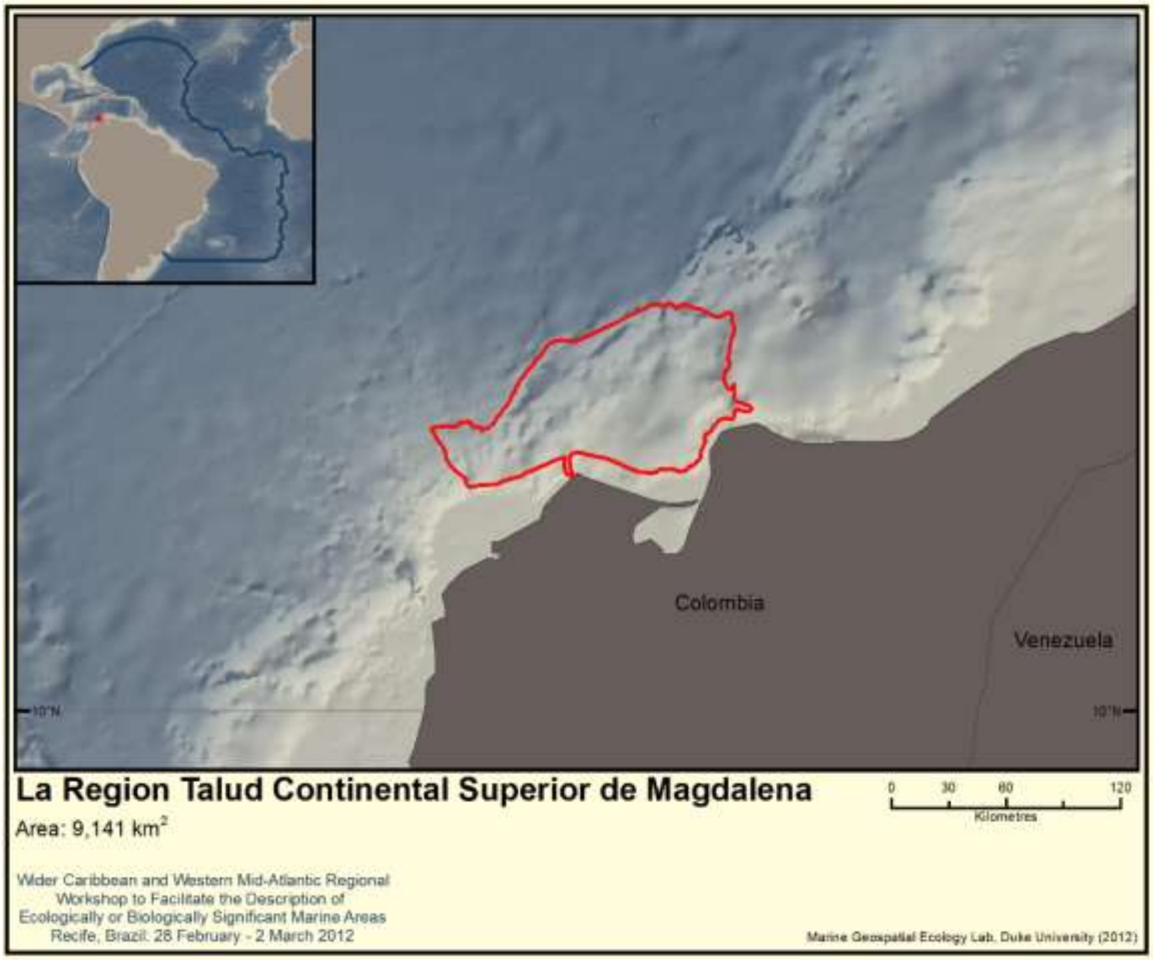

Figure 6. Area meeting EBSA criteria (no. 15)

AREA NO 16: AMAZONIAN-ORINOCO INFLUENCE ZONE

Abstract

The Orinoco River drains an area of 1.1 x 10 6 km^2 within Venezuela (70%) and Colombia (30%) (Lewis 1988). Together with the Amazon, these two major rivers play an extremely important role in transporting dissolved and particulate material from terrestrial areas to the coasts and open ocean. Their impact is evidenced by the overall extremely high productivity associated with the marine area extending from northern Brazil, to French Guiana, Suriname and Guyana, all the way to Trinidad and Tobago. Associated with this high productivity are high levels of biodiversity inclusive of endangered, threatened and endemic species of turtles, mammals, invertebrates, fishes and birds.

Introduction

The Amazonian-Orinoco Influence Zone as an area meeting EBSA criteria, encompasses Guyana, Suriname, French Guiana, Northern Brazil and coastal eastern Trinidad. The hydrographic influence of the proposed area encompasses the North Brazil Current (NBC) and the Guiana Current. The warm NBC is a well-established western boundary current that carries warm water of South Atlantic origin north-west along the coast of Brazil, across the equator and into the northern hemisphere, reaching French Guiana. Here, the NBC separates from the coast and retroflects to join the North Equatorial Counter Current. The rest of the NBC continues flowing north-westward to form the Guiana Current. The section joining the NBC and the Guiana Current along the coast is marked by a relatively constant flow of 10 Sv (see Bischof et al, 2003; Gyory et al, 2003). Approximately 219,000 cubic metres (7,740,000 cubic feet) of water flow from the river into the Atlantic Ocean every second. The Amazon River plume is a highly seasonal feature that can reach more than 3000 km across the tropical Atlantic Ocean, and cover 2 million km^2 (Smith and Demaster, 1996). The huge influx of nutrients has an enormous impact on life in the Atlantic Ocean, creating high primary productivity. Nutrients from this Amazonian plume feed microscopic, surface-dwelling, ocean plants (phytoplankton), which in turn feed a diverse population of fish, invertebrate, marine mammals and turtles.

Location

The proposed area encompasses the productivity flow from Northern Brazil, French Guiana, Suriname, Guyana and Eastern Trinidad. The inner continental shelf runs along the coastal shelf to capture key mangrove habitats.

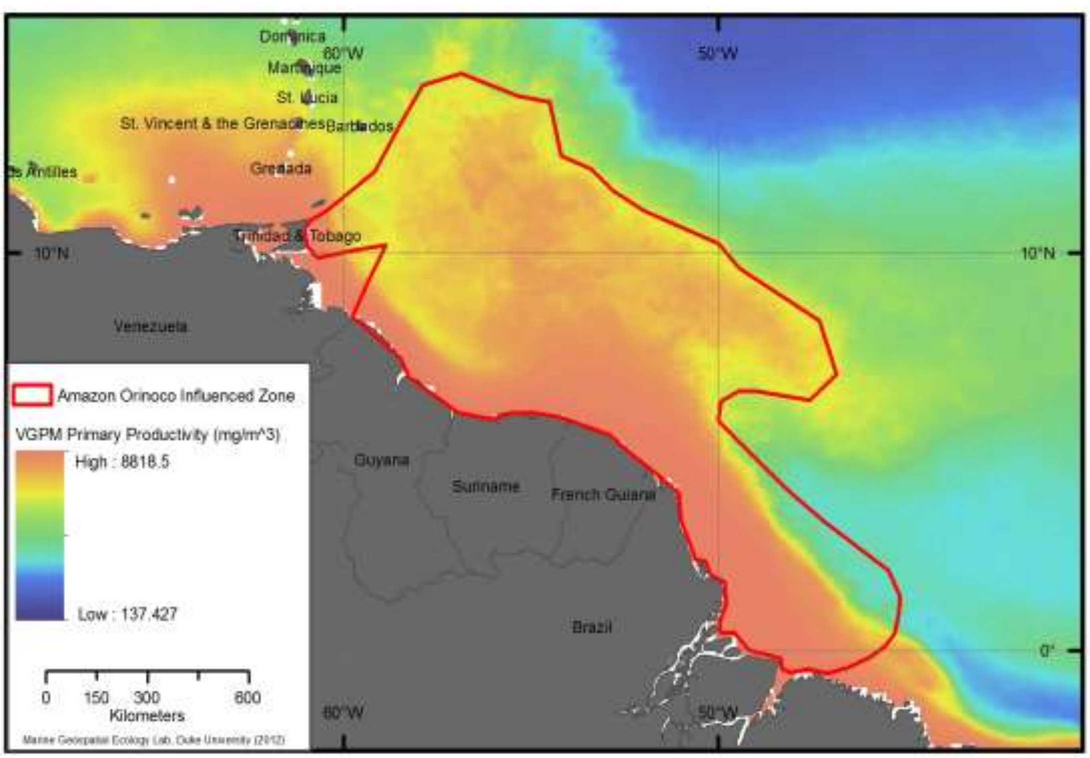

Figure 1: Amazonian-Orinoco Influence Zone showing primary productivity The boundaries

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of the area are (in degrees):

- N: 14.517
- E: -45.144
- S: -0.565
- W: -60.981

Feature description of the proposed area

The Amazonian-Orinoco Influence Zone has been classified as muddy because immense volumes of argillaceous mud (pelite) are being deposited along what could be called world's longest continuous mud coastline (the Guiana Coast). The source of the pelite, including fine sands, is the Amazon Basin. Rivers from French Guiana and the Marowijne River (between Suriname and French Guiana) supply coarser sandy material. The proposed marine environment lies within the area bounded by the Orinoco and Amazon rivers, and during the rainy season is greatly influenced by the heavy sediment load and great discharge of fresh water from these huge rivers, and its own large rivers of Essequibo, Demerara and Berbice (Guyana) and Para (Brazil). The fresh water affects the salinity, while the sediments and nutrients create a series of shifting sand bars and mud flats that cover the shelf out to about the 40-m isobath. Sand gradually becomes dominant beyond this depth and is replaced by coral at about 100 m depth. The mud supports a rich invertebrate fauna that nourishes a variety of demersal species.

The Amazon River mouth has a complex mosaic of geological and geomorphological features, comprising shelf-edge reefs, canyons, ravines and seamounts. Its adjacent coastal area is influenced by the Amazon River, a unique region that encompasses two geomorphological world records: the largest mangrove continuous system and the largest river in length, water and sediment discharge. This area contains endemic species, important areas for the life-history stages of fish and crustaceans (nursery, feeding and breeding), including threatened species and is also a migratory route for various species of fish and birds. This area has one of highest values of chlorophyll biomass and primary productivity in the world, which leads to high biological secondary and fisheries production, in particular if demersal species are considered (fishes and shrimp). Within this region, around 20 species of elasmobranchs and four species of mammals are threatened. Massive presence of declining and overexploited species, due to high fishery pressure is also reported. The area serves as a connection between the south-western Atlantic and the Caribbean zoogeographical provinces. Although virtually unknown, area surveys have revealed a diverse fish and octocoral fauna.

The coast in this region is home to the largest seabird colonies in northern South America. Nine colonies are recognised by BirdLife International as Important Bird Areas (IBAs) and are thought to hold over 100,000 seabirds and waterbirds (see IBA criteria and Individual IBA Fact Sheets). The area meeting EBSA criteria would incorporate the majority of key marine feeding grounds for species breeding at these IBAs and would qualify as high for both diversity and importance for life-history stages EBSA criteria on the basis of the seabirds present.

1. French Guiana - Amana
    a. Ramsar >20,000 waterbirds
    b. >1% of biogeographic population of least tern *(Sterna antillarum)*
    c. >1% of biogeographic population of sandwich tern *(Sterna sandvicensis)*
2. French Guiana – Connétable
    a. Ramsar >20,000 waterbirds
    b. >1% of global population of magnificent frigatebird *(Fregata magnificens*)
    c. >1% of biogeographic population of laughing gull *(Larus atricilla)*
    d. >1% of biogeographic population of royal tern *(Sterna maxima)*
    e. >1% of biogeographic population of sandwich tern *(Sterna sandvicensis)*
3. French Guiana – Littoral
    a. Ramsar >20,000 waterbirds
    b. >1% of biogeographic population of least tern (*Sterna antillarum)*
4. Suriname - Bigi Pan

    a. Ramsar >20,000 waterbirds
5. Suriname - Noord Commewijne / Marowijne
    a. Ramsar >20,000 waterbirds
6. Suriname - Noord Coronie
    a. Ramsar >20,000 waterbirds
7. Suriname - Noord Saramacca
    a. Ramsar >20,000 waterbirds
8. French Guiana - Plaine Kaw et Pointe Béhague
    a. Ramsar >20,000 waterbirds
    b. >1% of biogeographic population of laughing gull *(Larus atricilla)*
    c. >1% of biogeographic population of least tern *(Sterna antillarum)*
    d. >1% of biogeographic population of royal tern *(Sterna maxima)*
    e. >1% of biogeographic population of sandwich tern *(Sterna sandvicensis)*
9. Guyana - Shell Beach
    a. >1% of global population of Audubon's shearwater *(Puffinus lherminieri)*
    b. >1% of global population of brown booby *(Sula leucogaster)*
    c. >1% of global population of magnificent frigatebird *(Fregata magnificens)*
    d. >1% of biogeographic population of brown pelican *(Pelecanus occidentalis)*
    e. >1% of biogeographic population of common tern *(Sterna hirundo)*
    f. >1% of biogeographic population of laughing gull (*Larus atricilla)*
    g. >1% of biogeographic population of neotropic cormorant *(Phalacrocorax brasilianus)*

Feature condition and future outlook of the proposed area

The Amazonian-Orinoco Influence Zone was defined as having high priority for conservation of coastal and marine biodiversity in Brazil and Guianas (MMA, 2007). However, its their ecological and economic importance, the area is virtually unknown (geomorphology, geology, hydrodynamics and biota).

The eutrophic condition of the area due to Amazon River discharges supports high diversity of fishes, mammals, turtles and crustacean species. Related to this high productivity, increasing urban development and fishing activity through the area has been greatly affecting the area, contributing to the increasingly harmful disruption of the area.

Several individual countries have protected areas (pa) or natural reserves (nr) within the zone, inclusive of Suriname (4 pa/4nr), Guyana (1) and French Guiana (3).

In order to increase knowledge about the area, future collaboration and capacity-building within countries and across, is required.

Assessment of the area against CBD EBSA Criteria

The proposed area fulfills all the criteria of CBD EBSA. The great discharge of fluvial materials (water, solutes, particulates) directly or indirectly causes three-dimensional estuarine-like processes, very high rates of primary productivity and sediment accumulation, which makes this area a singular unit (Uniqueness or rarity). The Amazonian-Orinoco Inference Zone contains endemic and long-lived species and also is important for the life-history stages of sea turtles, marine birds (important breeding sites), fish, crustacean (nursery, feeding and breeding), including threatened species and also as migratory route for various species of fish (Special importance for life-history stages of species; Importance for threatened, endangered or declining species). The high biological productivity and the extremely high diversity of fish, shrimps, sea turtles and mammals are inherent of this area (Biological diversity). Large areas of relatively pristine mangroves are present along the area coasts (Naturalness). Finally, this region is subject to major urban influence and to an increasing fishing pressure (Vulnerability).

CBD EBSA Criteria (Annex I to decision IX/20)	**Description (Annex I to decision IX/20)**	**Ranking of criterion relevance (Please mark one column with an X)**			
		Don't Know	**Low**	**Some**	**High**

<table>
<tr><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Uniqueness or rarity</td><td>Area contains either (i) unique (“the only one of its kind”), rare (occurs only in few locations) or endemic species, populations or communities, and/or (ii) unique, rare or distinct, habitats or ecosystems; and/or (iii) unique or unusual geomorphological or oceanographic features.</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td colspan="6">Explanation for ranking

Oceanic outlet of the world’s largest hydrographic basin, with a total discharge equivalent to approximately one sixth of that of all the rivers in the world combined, containing one fifth of all the freshwater released into the planet’s oceans (Martinelli et al., 1989).
Mosaic of different types of bottoms (gravel, mud, sandstone reefs), bathymetries (ranging from 80 to 4000m), reliefs (steep slopes in canyons and flat areas outside canyons) and unique marine environments (like seamounts).
Faunal corridor of South America (Collette and Rutzler, 1977), which extends beyond the Amazon mouth area, includes the hump of Brazil and serves as a connection between cold habitats in southern Brazil, the Guianas and the Caribbean (Gilbert, 1972; Feitoza et al., 2005; Olavo et al., 2011).Endemic species of squid (Doryteuthis surinamensis) (Voss, 1974; Haimovici et al., 2009) and of elasmobranchs (Ex: Isogomphodon oxyrhinchus and Dasyatis colarensis) in Brazilian area.
Presence of the West Indian manatee (Trichechus manatus) (listed as vulnerable by IUCN) all along the area and the Amazonian manatee (Trichechus inunguis) in the Brazilian part of the area.
Presence of the dolphin species Sotalia Guianensis endemic to northeastern Latin America on coastal and estuaries areas.
Continuous stretch of mangroves on the area shoreline (Persaud, 2011; Bovell, 2010).
</td></tr>
<tr><td>Special importance for life- history stages of species</td><td>Areas that are required for a population to survive and thrive.</td><td></td><td></td><td></td><td>x</td></tr>
<tr><td colspan="6">Explanation for ranking

Major nesting sites for 5 species of sea turtles (Dermochelys coriacea, Chelonia mydas, Lepidochelys olivacea, Caretta caretta, Eretmochelys imbricata) (Fossette et al., 2008) (see figure 6).
Important breeding areas for marine birds: Fregata Magnificens, Larus atricilla, Thalasseus eurygnathus, Thalasseus maxima, Thalasseus sandvicensis, Puffinus lherminieri (see figure 6).
Important migratory route for various species of fish (ex: Brachyplatystoma vaillantii).
Important area of feeding and reproduction of elasmobranchs, including species of economic value as (Rhizoprionodon porosus) and endangered species as (Ginglymostoma cirratum) (Motta et al., 2009).
Important nursery, feeding and breeding area for many species of fishes and crustaceans.
</td></tr>
<tr><td>Importance for threatened, endangered or declining species and/or habitats</td><td>Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.</td><td></td><td></td><td></td><td>x</td></tr>
<tr><td colspan="6">Explanation for ranking</td></tr>
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- Juveniles of the declining red snapper *Lutjanus purpureus* (Souza, 2002) and more than 35 elasmobranchs species are found (Souza and Fonseca, 2008) in the Brazilian part of the area. Among elasmobranchs, at least 14 species are under some sort of threat (Camhi *et al*., 2007).
- Massive presence of declining (Ex: *Cynoscion acoupa)* and overexploited species (Ex: red snapper *Lutjanus purpureus*) due to high fishery pressure (Lucena Frédou & Asano-Filho, 2006).
- 4 species of mammals (according to Siciliano et al., 2008 and IUCN Red List) and 13 species of elasmobranchs classified as threatened: *Schroederichthys tenuis, Ginglymostoma cirratum, Carcharinus signatus, C. porosus, Negaprion brevirostris, Isogomphodon oxyrhinchus, Sphyrna tudes, S.tiburo, S. lewini, S.mokarraw, S. media, Pristis perotteti, Dasyatis colarensis* (http://www.sema.pa.gov.br/interna.php?idconteudocoluna=2283).
- Presence of the critically endangered Giant Grouper (*Epinephelus itajara*) around islands on the southeastern of French Guiana and Brazilian water. This species if of major concern for the area as it is still exploited by fisheries in French Guiana whereas protected elsewhere.

</td></tr>
<tr><td>Vulnerability, fragility, sensitivity, or slow recovery</td><td>Areas that contain a relatively high proportion of sensitive habitats, biotopes or species that are functionally fragile (highly susceptible to degradation or depletion by human activity or by natural events) or with slow recovery.</td><td></td><td></td><td></td><td>x</td></tr>
<tr><td colspan="6">

Explanation for ranking

It is reported that the presence of species highly susceptible to depletion due to their low recovery rates:

- A total of 27 species of mammals (Siciliano et al., 2008; AAMP, 2009);
- Several species of elasmobranchs;
- Shoreline sedimentation involving a long area of mangrove vegetation (sensitive habitat)
- The large number of elasmobranchs species, with low fecundity, long life and slow recovery recommend attention to the area, since it can be became an important place for these species future conservation.

</td></tr>
<tr><td>Biological productivity</td><td>Area containing species, populations or communities with comparatively higher natural biological productivity.</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td colspan="6">

Explanation for ranking

- The location in the Amazon River plume characterizes the area as eutrophic, with maximum chlorophyll *a* concentration of 25.5 mg.l^{-1} and primary production of 8 g.C.m^{-2}.d^{-1} (Smith and DeMaster, 1996), representing some of the highest values of these parameters recorded in ocean waters in the world.
- The enormous discharge of water, solutes and particulates leads to a high biological productivity also in terms of (see figures 1 and 3):
  ✓High productivity of diatomaceans specially in the area river-sea;
  ✓High productivity of pelagic and demersal fish (fishery production of around 15% of total national landings) (based on the official statistics);
  ✓High productivity of shrimps (larger shrimp bank in Atlantic South America)

</td></tr>
<tr><td>Biological diversity</td><td>Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity</td><td></td><td></td><td></td><td>x</td></tr>
</table>

Explanation for ranking • High diversity of fishes (Uyeno *et al.*, 1983; Camargo & Isaac, 2003; Léopold, 2004; Souza and Fonseca, 2008), shrimps and mammals (Bouillet et al., 2002; Van Canneyt et al., 2009; Siciliano *et al.*, 2008). • High diversity of habitats (mangroves, macrotidal estuaries, extensive intertidal sand-and mudflats, seamounts). • The varied topography (100 to 4000 m with abrupt slope in some areas) and seafloor composition (both hard and soft substrate) is highly likely to support a diverse array of species (based on other studies on shelf-edge reefs and canyons on the Brazilian coast).					
Naturalness	Area with a comparatively higher degree of naturalness as a result of the lack of or low level of human-induced disturbance or degradation.				x
Explanation for ranking • Due to its high productivity, fishing activity is intense in this region. The acoupa weakfish *Cynoscion acoupa*, the red snapper *Lutjanus purpureus*, Spanish mackerel *Scomberomorus brasiliensis, Macrodon ancylodon* and catfish *Brachyplatystoma vaillantii* are heavily exploited within this area. This area has the largest shrimp bank of northern part of South America. • Large areas of relatively pristine mangroves are present all along the area coasts.					

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Maps and Figures

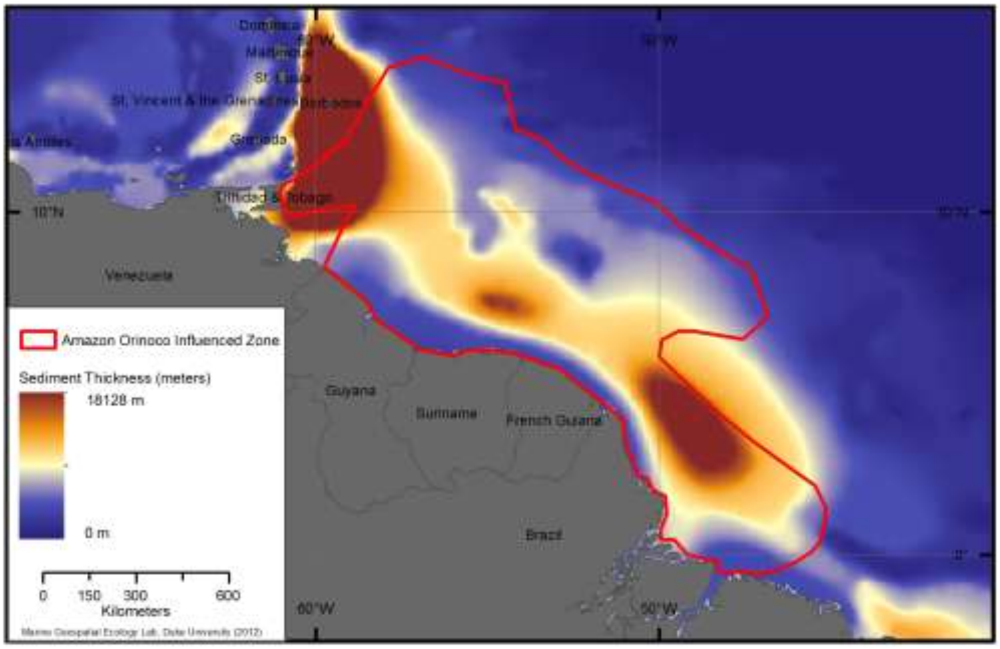

Figure 2: Amazonian-Orinoco Influence Zone showing sedimentation

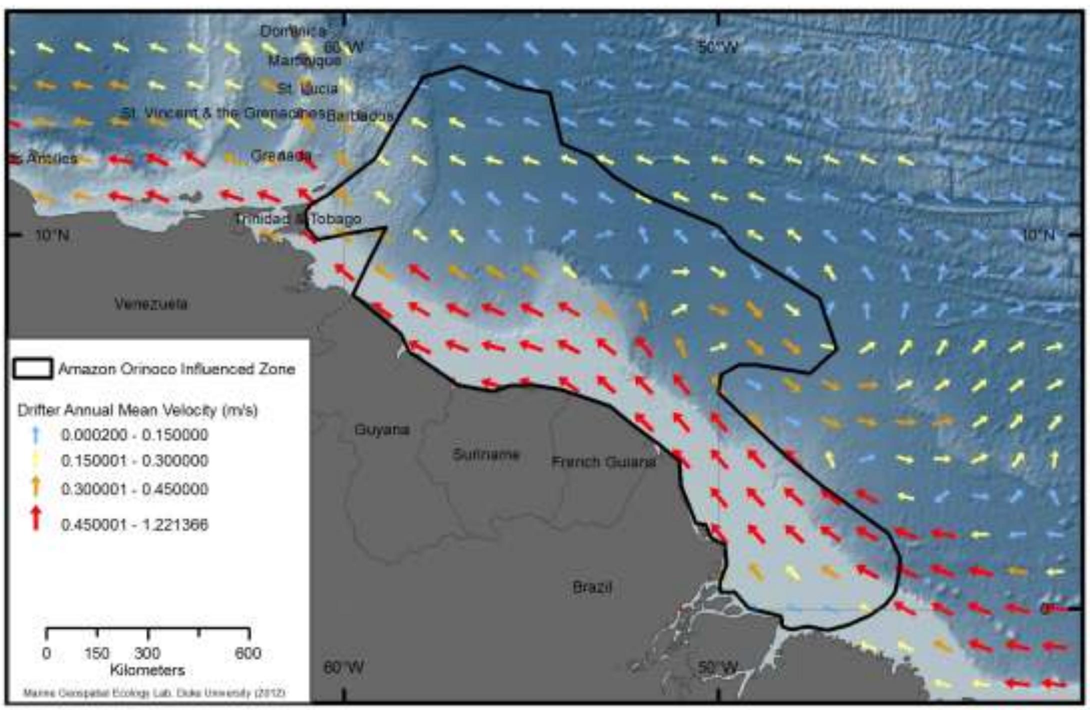

Figure 3: Amazonian-Orinoco Influence Zone showing flow

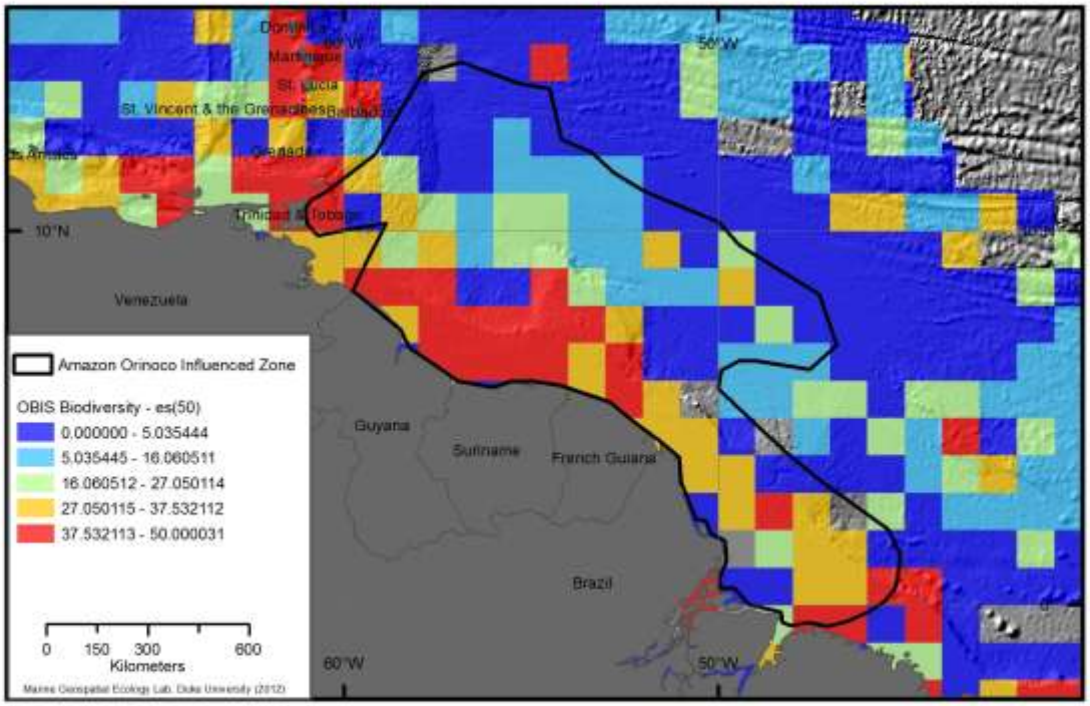

Figure 4: Amazonian-Orinoco Influence Zone showing OBIS diversity

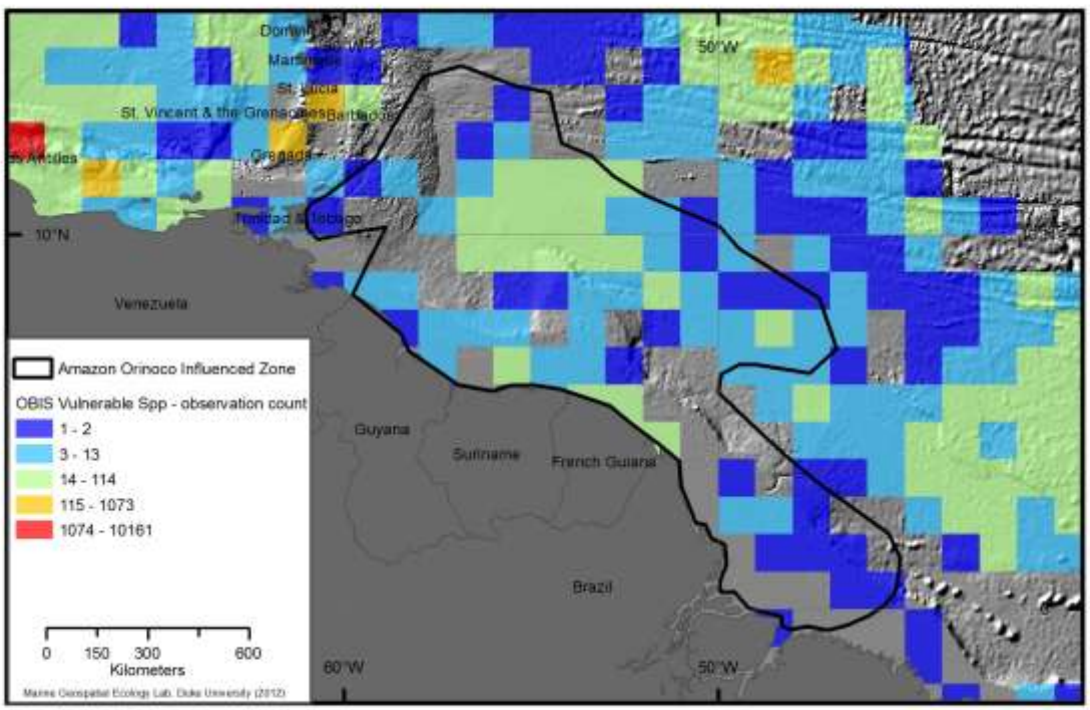

Figure 5: Amazonian-Orinoco Influence Zone showing vulnerable species (IUCN critieria)

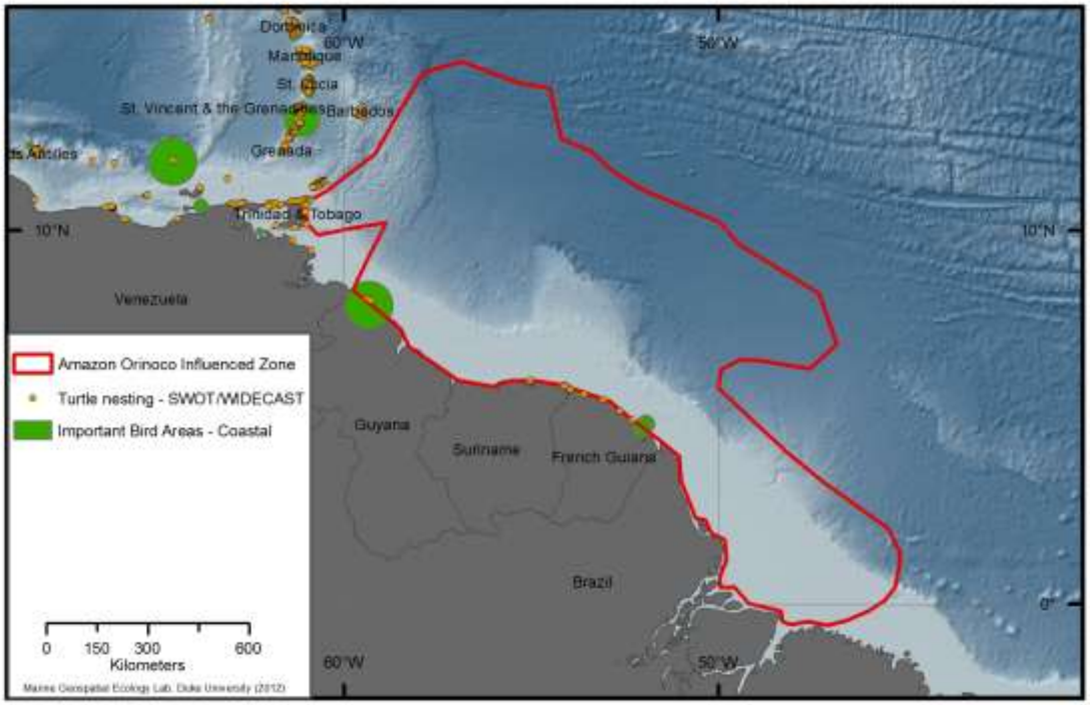

Figure 6: Amazonian-Orinoco Influence Zone showing sea turtles nesting areas and important bird areas (IBAs)

Figure 7. Area meeting EBSA criteria (no. 16)

AREA NO 17: PARCEL DO MANUEL LUIZ E BANCO DO ÁLVARO

Abstract

Parcel do Manuel Luiz is the northern-most coral community known in Brazil. In some areas milleporids predominate on the reef walls, followed by the octocoral *Phyllogorgia dilatata* (endemic to Brazil). There are records of 50% of the Brazilian hard corals species in the area, six of which were not previously reported in the north-eastern adjacent coast. The fire coral *Millepora laboreli* is endemic to the area and has been recently included as Endangered in the Brazilian List of Endangered Species. The presence and great abundance of Caribbean reef organisms, which do not occur along the eastern coast of South America, provide additional evidence that these reefs may be one of the main faunal stepping stones between the Caribbean and the Brazilian coast. The region represents an important area of feeding and reproduction of elasmobranchs. Despite its proximity to the Amazon River mouth, the west-flowing Equatorial Current provides the region with clear and saline water. A Marine State Park, covering 354 km^2 and including at least three different formations, has protected this area since 1999 and is a Ramsar site.

Introduction

Parcel do Manuel Luiz harbours a unique coral community established on a rocky structure. It represents the northern-most coral communities known in Brazil. There are two main reef areas described: Parcel do Manuel Luiz (69 km^2 centered on 00°50′S, 044 °15′W) and Banco do Álvaro (30 km^2 centered on 00 ° 17.5′S, 044 ° 49.5′W) (Castro & Pires, 2001). The former is located some 86 km offshore, 180 km from the town of São Luís (the nearest large settlement), and 50 km from the edge of the continental shelf. The latter is located 90 km NW from the former. They are constituted by a concentration of isolated pinnacles, each up to 300 m in diameter. These pinnacles may reach the low tide level, but the top of most of them are in depths of up to14 m. Their bases usually lie on a bottom at a depth of 25–45 m. They probably form a coral community flourishing on a rocky substrate, but there have not been any drillings to confirm this. In some areas milleporids predominate on the reefs walls, followed by the octocoral *Phyllogorgia dilatata* (endemic to Brazil) (Castro & Pires, 2001). There are records of 50% of the Brazilian hard corals species in the area, six of which were not previously reported for the Northeastern coast of Brazil (Moura *et al.* 1999, Amaral *et al*., 2007). The fire coral *Millepora laboreli* (Amaral, 2008) is endemic to the Parcel do Manuel Luiz and has been recently included as Endangered in the Brazilian List of Endangered Species (D. O. Pires pers. comm.). The presence and great abundance of Caribbean reef organisms which do not occur along the eastern coast of South America, such as the purple reeffish *Chromis scotti*, provide additional evidence that the Manuel Luis Reefs may be one of the main faunal stepping stones between the Caribbean and the Brazilian coast (Moura *et al.* 1999). The region represents an important area of feeding and reproduction of sharks, including species of economic value as (*Rhizoprionodon porosus*) and endangered species (e.g., *Ginglymostoma cirratum*) (Motta *et al*., 2009). Despite its proximity to the Amazon River mouth, the west-flowing Equatorial Current provides the region with clear and saline water. The tidal range is about 6.5 m and visibility ranged between 20 and 30 m (Moura *et al.* 1999). A Marine State Park, covering 354 km^2 and including at least three different formations, has protected this area since 1999 and is a RAMSAR site.

Location

The area meeting EBSA criteria (figure 1) is situated between the following coordinates:

	Latitude	Longitude
1	0°15'S	44°48'W
2	0°15'S	44°51'W
3	0°19'S	44°51'W
4	0°59'S	44°21'W
5	0°59'S	44°8'W

6	0°50'S	44°8'W
7	0°15'S	44°48'W

There are two main reef areas in this area: Parcel do Manuel Luiz (69 km^2 centered on 00°50′S, 044 °15′W) and Banco do Álvaro (30 km^2 centered on 00 ° 17.5′S, 044 ° 49.5′W). The former is located some 86 km offshore, 180 km from the town of São Luís, Maranhão State (the nearest large settlement), and 50 km from the edge of the continental shelf. The latter is located 90 km NW from the former.

Feature description of the proposed area

The area is constituted by a concentration of isolated pinnacles, each up to 300 m in diameter. These pinnacles may reach the low-tide level, but the tops of most of them are in depths of up to 14 m. Their bases usually lie on a bottom at a depth of 25 to 45 m. They probably form a coral community flourishing on a rocky substrate, but there have not been any drillings to confirm this (Castro & Pires, 2001).

Feature condition and future outlook of the proposed area

Despite its proximity to the Amazon River mouth, the west-flowing Equatorial Current provides the region with clear and saline water. The tidal range is about 6.5 m and visibility ranged between 20 and 30 m (Moura *et al.* 1999). There are some isolated research in the area. There are no research programmes.

Assessment of the area against CBD EBSA Criteria

CBD EBSA Criteria (Annex I to decision IX/20)	**Description** (Annex I to decision IX/20)	**Ranking of criterion relevance** (please mark one column with an X)			
		Don't Know	**Low**	**Medium**	**High**
Uniqueness or rarity	Area contains either (i) unique ("the only one of its kind"), rare (occurs only in few locations) or endemic species, populations or communities, and/or (ii) unique, rare or distinct, habitats or ecosystems; and/or (iii) unique or unusual geomorphological or oceanographic features			**X**	
Explanation for ranking The area is constituted by a concentration of isolated pinnacles, each up to 300 m in diameter. These pinnacles may reach the low tide level, but the top of most of them are in depths of up to 14 m. Their bases usually lie on a bottom at a depth of 25–45 m. Coral communities occur on the pinnacles.					
Special importance for life-history stages of species	Areas that are required for a population to survive and thrive.			**X**	
Explanation for ranking This area represents an important area for feeding and reproduction of elasmobranchs, including species of economic value (*Rhizoprionodon porosus*) and endangered species (*Ginglymostoma cirratum*) (Motta *et al*., 2009).					
Importance for threatened, endangered or declining species and/or habitats	Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.				**X**
Explanation for ranking The Manuel Luis Reefs region, due to its proximity to the Amazon River, may play a major role in gene flow between northern and southern Western Atlantic reef fauna.					
Vulnerability, fragility, sensitivity, or slow recovery	Areas that contain a relatively high proportion of sensitive habitats, biotopes or species that are functionally fragile (highly susceptible to degradation or depletion by human activity or by natural events) or with slow recovery.				**X**
Explanation for ranking There are 16 species of corals and calcified hydroids. These include records of 50% of the Brazilian hard coral species in the area, six of which were not previously reported for the north-eastern coast of Brazil (Moura *et al.* 1999, Amaral *et al.*, 2007). *Favia leptophylla*, endemic to Brazil, was known only 2000 km south, on the coast of Bahia State and Espírito Santo State. Coura, M. (pers. comm.) observed that in some areas of Banco do Álvaro milleporids predominate on the reefs walls, followed by the octocoral *Phyllogorgia dilatata* (endemic to Brazil). In the south-western part of Parcel do Manuel Luiz, Coura, M. described a predominance of *P. dilatata* on top and walls in depths of up to 15 m, with corals, sponges, and algae dominating the slopes (approx. 30 m). The fire coral *Millepora laboreli* (Amaral, 2008) is endemic to the Parcel do Manuel Luiz and has been recently included as Endangeredon the Brazilian List of Endangered Species (D. O. Pires pers. comm.).					

Biological productivity	Area containing species, populations or communities with comparatively higher natural biological productivity.	**X**			
Explanation for ranking					
Biological diversity	Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.				**X**
Explanation for ranking There are 16 species of corals and calcified hydroids. These include records of 50% of the Brazilian hard coral species in the area, six of which were not previously reported for the north-eastern coast of Brazil (Moura *et al.* 1999, Amaral *et al.*, 2007). The presence and great abundance of Caribbean reef organisms which do not occur along the eastern coast of South America provide additional evidence that the Manuel Luis Reefs may be one of the main faunal stepping stones between the Caribbean and the Brazilian coast (Moura *et al.* 1999).					
Naturalness	Area with a comparatively higher degree of naturalness as a result of the lack of or low level of human-induced disturbance or degradation.				X
Explanation for ranking It is an oceanic area, far from the coast. The Parcel do Manuel Luis is located some 86 km offshore, 180 km from the town of São Luís (the nearest large settlement), Maranhão State and 50 km from the edge of the continental shelf. The "Banco do Álvaro" is located 90 km NW from the "Parcel".					

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Map

Figure 1. Area meeting EBSA criteria (no. 17)

Area No. 18: Banks Chain of Northern Brazil and Fernando de Noronha

Abstract
The North Brazilian Chain (1 ° S to 4 ° S / 37 ° W to 39 W) and Fernando de Noronha Chain (3 ° to 5 ° S / 32 º to 38 º W) are made up of islands and seamounts of different depths. The North Brazil Current interacts with the submarine topography generating upwellings that promote productivity. Chains are inserted in an oligotrophic environment and Fernando de Noronha and Rocas Atoll are seen as a "hotspot" due to the presence of coral reef formations, high biodiversity and endemism. The area is a spawning site and / or feeding site for turtles, elasmobranchs, reef fish and pelagic fish. The area is a feeding site for breeding seabirds at Fernando de Noronha and covers part of the most important seabird migration corridor in the Atlantic; both sites qualify as BirdLife Important Bird Areas (IBAs) for both threatened species and congregations. Some birds, elasmobranchs and turtles species, which are listed on the IUCN red list as threatened, occur in the area. Sharks, reef fishes and lobsters are targets for fisheries carried out in the region. Fishing exploitation is a traditional activity in the area. Sea turtles are also subject to incidental catch by pelagic longline and ghost nets. The Rocas Atoll has the highest rate of endemism in the region, and Fernando de Noronha has the highest species richness when compared to other Brazilian oceanic islands. Fernando de Noronha and Rocas Atoll fauna display great similarity, which is attributed to the presence of shallow oceanic banks that function as steps tones in the area. Larvae of coastal species suggest connectivity with the continental slope area.

Introduction

The Northern Brazilian Chain (1 ° S to 4 ° S / 37 ° W to 39 W) and the Fernando de Noronha Chain (3 ° to 5 ° S / 32 º to 38 º W) consist of several banks that emerge from 4000 m reaching 20 m to 300 m depths on the top. The Northern Brazilian Chain includes the Aracati, Continental, Mundaú banks, whereas the Rocas Atoll, the archipelago of Fernando de Noronha and seamounts named Sirius, Grande, Pequeno, Guara and Sudeste, among others, compose the Chain of Fernando de Noronha. The seamounts have a rocky and uneven topography and are arranged parallel to the base of the continental shelf stretching for 1300 km (Coutinho, 1996). The region is influenced by the North Brazilian Current (NBC), which is more intense in the winter months (July / August), and whose interactions with the submarine relief (banks and islands) generate discrete upwellings (Travassos *et al*., 1999) leading to an increase in local productivity. Islands and seamounts that are inserted in a tropical oligotrophic environment are the habitat for a large number of species.

Coral reef formations are significant in the Rocas Atoll and likely to be also in the shallower oceanic banks.

The Rocas Atoll, which is the only atoll in the South Atlantic and one of the smaller on the planet (Serafini *et al*., 2010), has the largest colony of seabirds in Brazil (143,000 birds) with five species nesting on the spot. The same species occurs in Fernando de Noronha: *Sula dactylatra, Sula leucogaster, Anous stolidus; Anous minuta* and *Sterna fuscata* (Silva *et al*., 2002, Serafini *et al*., 2010). Two species that breed in the southern hemisphere, great shearwater (*Puffinus gravis*), and sooty shearwater (*Puffinus griseus*), pass through the site during migration to and from non-breeding areas in the northern hemisphere. Over 50% of the global population of great shearwater (amounting to five million individuals) may use the site during May and June. Around 30% of the global population of sooty shearwater (listed as Near Threatened on the IUCN Red List) may use the site at the same time. Four species that breed in the northern hemisphere Fea's Petrel (*Pterodroma feae*), Zino's Petrel (*Pterodroma madeira*), Manx Shearwater (*Puffinus puffinus*) and Cory's Shearwater (*Puffinus diomedea*) also pass through the site during migration to and from non-breeding areas in the southern hemisphere. Around 10% of the global population of Zino's petrel (listed as Endangered), 40% of the global population of Fea's petrel (listed as Vulnerable), 25% of the global population of Manx shearwater, and 10% of the global population of Cory's shearwater are thought to use the site as a stop-over point during migration (www.seabirdtracking.org). As in Fernando de Noronha, the atoll is also used for nesting site for the turtle *Chelonia mydas* and feeding area to juveniles of *Chelonia mydas* and *Eretmochelys imbricata* (Marcovaldi and Marcovaldi, 1999, Grossman *et al*., 2009).

The olive turtle (*Lepidochelys olivacea*) uses this area for feeding and as a migration route (Da Silva *et al*. 2011). The benthic macrofauna, dominated by Crustacea and Polychaeta groups, is more abundant at seamounts when compared to the continental shelf, showing a strong association between areas of Fernando de Noronha Chain and Northern Brazilian Chain (Coelho *et al.*, 2009). The similarity of the fauna in both areas is attributed to the shallow oceanic banks that function as steps tones in the area (Richardson, 2003; Sampaio *et al*., 2004). The occurrence of *Octopus Isularis* (Mollusca, Cephalopoda, Octopoda), an endemic species to a restricted sector of north-eastern Brazil, was recorded at Atol das Rocas and Fernando de Noronha (Haimovici *et al*., 2009). Regarding the fishes, there was higher abundance of larvae at the Northern Brazilian Chain and around the Rocas Atoll, when compared to the break of the continental shelf and adjacent continental slope (Lessa *et al.*, 2009). The occurrence of larvae of Mugilidae, and Carangidae, Hemiramphidae on the banks area suggests connectivity between the chains and the adjacent continental slope (Lessa *et al.*, 2009). Furthermore in the neuston there were records of larvae of pelagic species of high commercial value of the families Scombridae, Istiophoridae, Coryphaenidae Xiphidae and the dominance of species of the families Exocoetidae, Myctophidae and Gobiidae, of high ecological value (Lessa *et al.*, 1999).

Fishing activity around islands and seamounts catch elasmobranchs, pelagic and reef fishes of large and medium sizes (Soto, 1997; Sampaio *et al.* 2006; Serafini *et al.*, 2010) including: *Carcharhinus perezii*, *C. falciformis*, *C. signatus*, *C. galapagensis* and *Sphyrna lewini*, five species of rays, fishes of the Serranidae family (*Epinephelus mystacinus, E. adscensionis* e *Mycteroperca venenosa*), Carangidae (*Caranx lugubris, C. latus, Elagatis bipinnulata*), billfishes (*Xiphias gladius*), dolphinfish (Coryphaena hippurus), among others (Mazzoleni and Schwingel, 2002; Serafini *et al.*, 2010). Among sharks *Carcharhinus signatus* and *Carcharhinus falciformis* have been caught in directed fisheries as they are target species (Santana *et al.,* 2009) in longline operations. However, *Negaprion brevirostris, Hexanchus griseus* and *C. longimanus* are recorded in incidental catches. Of the species caught in the area both *Rhincodon typus* and *Ginglymostoma cirratum* are listed both in the IUCN Red List as threatened species and in the Brazilian list of threatened species- Annex I (MMA, IN 05, 24/05/2004). Sea turtles are also subject to incidental catch by pelagic longline (Sales *et al*. 2008, Da Silva et al. 2011) and ghost nets (B. Armando dos Santos, Pers.Comm.) that occur in this region.

In this context, the decline of populations of top predators can lead to problems in the phenomenon known as the "cascade effect" causing an increase in the population of meso-predators and endangering the species of lower trophic levels. In national recognition of the important role they play for marine conservation, both Fernando de Noronha and Rocas Atoll are currently conservation units that have the status of "National Marine Park" and "Biological Reserve," respectively.

Location

The Northern Brazilian Chain (1º S a 4º S/ 37º W a 39º W) and the Fernando de Noronha Chain (3º a 5º S/ 32º a 38º W) consist of several banks that emerge from 4000 m reaching 20 m to 300 m depths on the top. The Northern Brazilian Chain includes the banks of Aracati, Continental, Mundaú, Meio whereas the Rocas Atoll, the archipelago of Fernando de Noronha and seamounts named Sirius, Grande, Pequeno, Guará, Drina and Sudeste, among others, compose the Chain of Fernando de Noronha. Both chains are fully inserted into the Brazilian Exclusive Economic Zone (Fig. 1).

Feature description of the proposed area

The seamounts and islands of the north-east region are located off the coast of the states of Ceará and Rio Grande do Norte making up the chains of Fernando de Noronha and the Northern Brazilian Chain (Fig. 1). The first is located between 3^o and 5^o S and the latter between 1^o and 3º S. The seamounts and islands are known due to their importance for fishing, which is the result of the enrichment caused by the interaction of the waters of the North Brazilian Current with the submarine topography (banks and islands) which enhances the local productivity (Travassos *et al.* 1999). The importance of seamounts and their islands off the north-east region in terms of fishing production is well known by local fishers, because they are associated with significant production of commercially valuable species (Lessa, 1999).

Overall, the seamounts have varying depths that range on the top from 20 to 250 m exhibiting a large number of sizes and shapes. The region has a permanent thermocline in summer and autumn that seasonally changes with depth and latitude, being shallower in the fall, a typical pattern of equatorial and tropical regions. The mixed layer is more homogeneous in summer, less thick in autumn, decreasing with the increasing latitude. The horizontal distribution of surface temperature has a higher degree of homogeneity in summer and a wider range of thermal variation in autumn (Becker, 2001). The region has three water masses: tropical surface water that occupies a very narrow range (salinity of 35.5 to 36.5 and temperature> 26^{o} C); high salinity water displaying a salinity 36 to 37 and temperature 20 to 26^{o} C; and Atlantic central water with temperature from 20 to 5^{o} salinity from 36 to 34.4. The maximum sub-surface salinity was recorded at the beginning of the depth of the thermocline, which is more enhanced in low latitudes both in summer and autumn (Becker, 2001).The North Brazilian Current, dominant in the area, moves westward, reaching the Sirus and Guara banks on average at 0.6 m.s-1 (Travassos, 1999).

The Fernando de Noronha Archipelago (03º 51'S and 32º 25'W) consists of 21 islands and islets. the major one is Fernando de Noronha, which emerges from the ocean floor about 4,000 m deep. The chain of seamounts extends to the coast of Ceará State (Serafini *et al.*, 2010).

Another important feature of this chain is the Rocas Atoll (03º 50'S and 33 º 49'W), whose origin is volcanic and related to deposits of calcareous algae and corals on extinct volcanoes (Gasparini, 2004). Its format is almost elliptical (Almeida *et al*, 2000), and its topography consists of skeletal remains of coralline algae, gastropod shells and Foraminifera (Silva *et al*., 2002).

The Rocas Atoll is a coral reef environment, with calcareous algae and the coral species *Siderastrea stellata*, *Favia gravida*, and *Montastrea cavernosa* as well as the encrusting foraminifer *Homotrema rubrum* and the vermetid gastropods as important frame builders (Kikuchi, 1995). It has a well developed algal ridge, a characteristic of the Indo-Pacific atolls. One peculiar characteristic of the Rocas Atoll is that the spur-and-groove system is little developed and found only on the lee side. The windward side has an abrupt escarpment at its base. The remaining surface of the seamount top, outside the exposed atoll ring, is covered by carbonate sand and small patch reefs (Kikuchi, 1995). Outside the edge of the atoll, where depths are around 15 metres, small pinnacles of *Montastrea cavernosa* are common. The solitary coral *Meandrina brasiliensis* have been reported in the sandy areas of the submerged ring (Maida and Ferreira, 1997). Fernando de Noronha presents nine species of hermatypic corals. Although those include species that are the main reef builders on the coast, such as *Siderastrea stellata*, *Montastrea cavernosa*, *Mussimilia hispida* and *M. hartii*, there are no true coral reef formations in the island (Maida and Ferreira, 1997). From 20 to 30 metres, however, there is an extensive zone of *Montastrea cavernosa*, with colonies that grow as large pinnacles (Maida and Ferreira, 1997).

In a national recognition to the important role they play for marine conservation, both Fernando de Noronha and Rocas Atoll are currently “Conservation Units” that have the status of "National Marine Park" and "Biological Reserve," respectively. The Archipelago Fernando the Noronha also has the status of a State Environmental Protection Area linked to Pernambuco state (Serafini *et al.*, 2010).

In recent decades these chains of seamounts and islands have been studied in the scope of the Joint Oceanography Projects–JOPS II (German Cooperation/Ministry of Science and Technology-MCT, 1995) and the Assessment Program of Living Resources of Exclusive Economic Zone-REVIZEE (MMA/SECIRM, 1995 to 2002). The existing data on banks were mostly generated from samples of scientific and commercial fishing operations. Landings of longline fisheries have been followed in Natal, in the Brazilian state of Rio Grande do Norte since the 1990s. Information on ichthyoplankton, ictioneuston, benthos, physical and chemical oceanography and meteorology were generated in the two last decades, constituting the basis for future research and management.

Also, research focusing the Rocas Atoll and Fernando de Noronha has been conductedat the Station of the Biological Reserve and the Marine National Park, respectively. In general, efforts to improve the understanding of the enrichment processes that operate in the area of seamounts, inserted in an oligotrophic tropical environment, are extremely desirable, as well as research for clearing up the connectivity between populations distributed in different banks and islands of this area, with the aim of their conservation.

Feature condition and future outlook of the proposed area

The present condition raises concerns in view of the increasing fishing pressure in the region, especially on the seamounts. This area was a traditional fishing ground for the red snapper (*Lutjanus purpureus*) until the fishery collapsed in the 1980s, and lobsters. Negative effects of this activity can be detected on exploited elasmobranch (Santana et al., 2009; Lessa *et al*., 2009). The absence of specific records of capture (Hazin *et al*, 1993) and the increase in fishing effort, which has led to the loss of productivity in fisheries for sharks (PRONABIO, 1998) and population declines, are highly worrying (Santana *et al.*, 2009). In this sense the exploitation of *C. signatus* is emblematic (Santana *et al*., 2009). The local exploitation affects migratory species that use the area in different phases of their life cycles, resulting in population declines, especially for species that have essential habitats the continental shelves and slopes of oceanic islands, as in *C. falciformis*. Also, the incidental capture of sea turtles by pelagic longline and ghost nets is highly worrying.

Apart from few areas free of fisheries, as the surroundings of Biological Reserve of Atol das Rocas and the tiny area of the Fernando de Noronha shelf (up to 50 m isobath), there is no restriction nor any effective protection of the area. Also, the incidental capture of sea turtles by pelagic longline and ghost nets is a highly worrying issue. There is solid data showing that this area is the most important seabird migration path in the Atlantic, and bycatch may be a major issue that is not yet quantified. Offshore wind farms in this area could have negative impacts for these species, specially the threatened ones.

Assessment of the area against CBD EBSA Criteria

<table>
<tr><th rowspan="2">CBD EBSA Criteria
(Annex I to decision IX/20)</th><th rowspan="2">Description
(Annex I to decision IX/20)</th><th colspan="4">Ranking of criterion relevance
(please mark one column with an X)</th></tr>
<tr><th>Don't Know</th><th>Low</th><th>Some</th><th>High</th></tr>
<tr><td>Uniqueness or rarity</td><td>Area contains either (i) unique ("the only one of its kind"), rare (occurs only in few locations) or endemic species, populations or communities, and/or (ii) unique, rare or distinct, habitats or ecosystems; and/or (iii) unique or unusual geomorphological or oceanographic features</td><td></td><td></td><td></td><td>x</td></tr>
<tr><td colspan="6">Explanation for ranking
The Chain of Fernando de Noronha encompasses the Rocas Atoll, which is the only atoll in the South Atlantic Ocean, to which the highest rate of endemism of 8.5%, when compared to Fernando de Noronha (5.9%) and Abrolhos 0.6% has been estimated (Serafini et al., 2010). The area of Fernando de Noronha and Atol das Rocas is considered a hotspot due to its high biodiversity and endemism, crucial for marine conservation in Brazil (Rocha, 2003).
The Fernando de Noronha Chain has an unequivocal ecological importance due to high biological productivity and for characterizing important key habitats that are used as nurseries, feeding, breeding and sheltering sites of various species. Overall, 34 species of sponges, 7 corals and 18 crustaceans have been recorded. Among the latter two species occurring only in oceanic islands are, the land crab (Gecarcinus lagostoma) and aratu (Grapsus grapsus). Regarding the fishes, 169 species were recorded in Fernando de Noronha and 117 in Rocas. The number of endemic species (10) highlights the importance of the region, among them the wrasse (Thalassoma noronhanum) and damselfish (Stegastes rocasensis). The area also hosts 16 species of sharks and five species of rays (Serafini et al., 2010).
The Octopus Isularis (Mollusca, Cephalopoda, Octopoda), a species endemic to a restricted sector of north-eastern Brazil, recorded at Atol das Rocas and Fernando de Noronha (Haimovici et al., 2009), also occurs in the area (Leite et al., 2008).</td></tr>
<tr><td>Special importance for life-history stages of species</td><td>Areas that are required for a population to survive and thrive.</td><td></td><td></td><td></td><td>x</td></tr>
<tr><td colspan="6">Explanation for ranking
Brazil's largest colony of seabirds (143,000 birds) is found at Rocas Atoll. Five species are the most abundant, spending all stages of their life cycle in these environments. Species nesting at the Atol das Rocas and Fernando de Noronha are: Sula dactilatra, Sula leucogaster, Anous stolidus; Anous minuta and Sterna fuscata (Silva et al., 2002, Serafini et al., 2010). The area also covers part of the most important seabird migration corridor in the Atlantic, a site which qualifies as a Birdlife Important Bird Area (IBA) for both threatened species and congregations. Six migratory seabirds pass through here in very large numbers</td></tr>
</table>

<table>
<tr><td colspan="6">(greater than 50% of the global population for some species), primarily between September and June.
As in Fernando de Noronha, turtles use the site for spawning and feeding: Chelonia mydas, Chelonia mydas and Eretmochelys imbricata (Grossman et al., 2009, Serafini et al., 2010). In these waters there are aggregations of reproductive male and female Chelonia mydas, which breed in these islands. Also Lepidochelys olivacea uses the area for feeding and migration (Fig. 2) (Sales et al. In 2008, Da Silva et al. 2011).
Invertebrates are poorly known, however, 34 species of crustaceans and 17 polychaetes were recorded (Paiva et al., 2007). The benthic macrofauna, dominated by Crustacea and Polychaeta groups, is more abundant in seamounts compared to the continental shelf, showing strong association between the areas of the Fernando de Noronha Chain and Northern Brazilian Chain (Coelho et al., 2009). A kind of octopus, Octopus insularis (Leite et al, 2008) (Mollusca, Cephalopoda, Octopoda), which is endemic to a restricted sector of north-east Brazil can be found in the area. It is used as migration routes, breeding and as a nursery of elasmobranchs, which have low recovery capacity and high vulnerability (due to low fecundity, late maturation and high longevity). The islands and seamounts are habitats for five species of rays and 16 species of sharks. Fisheries exploitation affects the elasmobranch in seamounts, Carcharhinus signatus, falciformis, Carcharhinus and Sphyrna lewini, species highly vulnerable in this area that have been targeted in directed fisheries.
The blue shark (Prionace glauca) gives birth in the area, as well as reef sharks or those associated with banks and islands (Negaprion brevirostris, Carcharhinus perezii, C. falciformis, C. signatus, C. galapagensis), as well as serranid fishes (Epinephelus mystacinus, E. adscensionis poisonous and Mycteroperca sp.) and carangid fishes (Caranx lugubris, C. latus, Elagatis bipinnulata) (Serafini et al., 2010). The Archipelago of Fernando de Noronha is used as habitat throughout the year by a population of spinner dolphin (Stenella longirostris) (Silva-Jr., 2005).</td></tr>
<tr><td>Importance for threatened, endangered or declining species and/or habitats</td><td>Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.</td><td></td><td></td><td></td><td>x</td></tr>
<tr><td colspan="6">Explanation for ranking
The area includes important coral reef formations and associated species. Threatened seabirds include sooty shearwater (Near Threatened), Zino’s petrel (Endangered), and Fea’s petrel (Vulnerable). Among the sharks, Carcharhinus signatus is listed as an over-exploited species (Normative Instruction of MMA, 05.24.2004-Annex II) and included on the IUCN Red List (2006) in the Vulnerable category. For growth and reproduction, the species uses as habitat seamounts and the break of continental shelves. This area playes an identical role for Carcharhinus falciformis and Carcharhinus signatus, both of which are caught in directed fisheries (Santana et al., 2009; PRONABIO, 1998). Incidental catches can involve the species Negaprion brevirostris, Hexanchus griseus and C. longimanus. The latter is listed on the Red List as Vulnerable (IUCN, 2006) and on the national list in Annex-II (Normative Instruction of MMA, 05.24.2004). Besides, both Rhincodon typus and Ginglymostoma cirratum are listed on the Red List as Vulnerable (IUCN, 2006) and also included on the National list of Threatened Species (MMA, IN 05, 24.5.2004, Annex I).
Sphyrna lewini and C. signatus were exploited in this area by drift gillnets, but the exploitation lost productivity after a few years (PRONABIO, 1998). Both species are currently listed under threatened categories on the Red List (IUCN, 2006) or Annex II of the National List of Threatened Species (MMA, IN 05, 24.5.2004).
A spawning aggregation of Chelonia mydas, a species that nests on islands, is recorded in the region. The area is also used as feeding ground by juveniles of Chelonia mydas and Eretmochelys imbricata (Marcovaldi and Marcovaldi, 1999, Grossman et al., 2009, Serafini et al., 2010). Further, feeding and migration by Lepidochelys olivacea was evidenced by telemetry studies (Fig. 2) (Da Silva et al, 2011). All sea turtle species are endangered (MMA 2003, IUCN, 2006; (Serafini et al., 2010; Marcovaldi et al. In 2011, Almeida et al., 2011, Castilhos et al. 2011).</td></tr>
<tr><td>Vulnerability,</td><td>Areas that contain a relatively high proportion</td><td></td><td></td><td>x</td><td></td></tr>
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<table>
<tr><td>fragility, sensitivity, or slow recovery</td><td>of sensitive habitats, biotopes or species that are functionally fragile (highly susceptible to degradation or depletion by human activity or by natural events) or with slow recovery.</td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="6">Explanation for ranking
The area includes important coral reef formations that are threatened by climate change and disease.
The region is the habitat of several species of elasmobranchs, at least 16 species of sharks and 5 of rays. This group is generally characterized by slow growth, late maturity, high rates of longevity and low rates of fertility (Holden, 1974). The area is essential for spawning and feeding of turtles Chelonia mydas and Eretmochelys imbricata (Serafini et al., 2010). The seabird species present are long-lived (up to 50 yeas for some species), have low fecundity and extended periods of parental care.</td></tr>
<tr><td>Biological productivity</td><td>Area containing species, populations or communities with comparatively higher natural biological productivity.</td><td></td><td></td><td>X</td><td></td></tr>
<tr><td colspan="6">Explanation for ranking
Upwelling events that occur at seamounts of the Fernando de Noronha Chain and Northern Brazilian Chain determine high fishing productivity in the region (Lessa et al., 1999). The maintenance of relatively high biomass and food webs is explained by the local production of eggs and larvae of several species of teleosts, and the aggregation of species promoted by local characteristics. Noteworthy was the occurrence of larvae of pelagic species of high commercial value of the families Scombridae, Istiophoridae, Coryphaenidae Xiphidae and dominant forage species of families Exocoetidae, Myctophidae and Gobiidae, of high ecological value (Lessa et al., 1999).</td></tr>
<tr><td>Biological diversity</td><td>Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.</td><td></td><td></td><td></td><td>x</td></tr>
<tr><td colspan="6">Explanation for ranking
The extended area of Fernando de Noronha and Rocas Atoll is seen as a biogeographic unit, named "Noronha hotspot" due to high endemism and biodiversity that is crucial for marine conservation in Brazil (Rocha, 2003). For fish, molluscs, corals, cnidarians, sponges and algae, Fernando de Noronha is an island that has the highest number of species, which is attributed to its large size, greater diversity of reef habitats (Serafini et al., 2010) .
Reef fishes occurring in Fernando de Noronha have the highest species richness (169) when compared to other Brazilian oceanic islands, showing great similarity with the fauna of Rocas Atoll. These two areas share all ten endemic species of fish and are the habitat for five species of rays and 16 species of sharks. The similarity of the fauna of both areas is attributed to the presence of shallow oceanic banks that serve as steps between the areas (Richardson, 2003; Sampaio et al., 2004). Fernando de Noronha and Atol das Rocas are recognized as important feeding areas of Chelonia mydas and E. imbricata (Sanches & Bellini, 1999), both endangered species (MMA 2004, IUCN, 2006).</td></tr>
<tr><td>Naturalness</td><td>Area with a comparatively higher degree of naturalness as a result of the lack of or low level of human-induced disturbance or degradation.</td><td></td><td></td><td></td><td>x</td></tr>
<tr><td colspan="6">Explanation for ranking
Anthropogenic influence due to industrial and artisanal fisheries carried out in the Archipelago of Fernando de Noronha and on various banks that are traditional fishing grounds in the region, especially shallow banks. This exploitation is traditional in the region and led to declines of several demersal and pelagic species. The area also suffers from the impact of tourism development and the presence of the human population in the archipelago of Fernando de Noronha. Moreover, Fernando de Noronha is on the merchant shipping route.</td></tr>
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Seabird Tracking Data from – www.seabirdtracking.org

IBA criteria - http://www.birdlife.org/datazone/info/ibacritglob

Maps and Figures

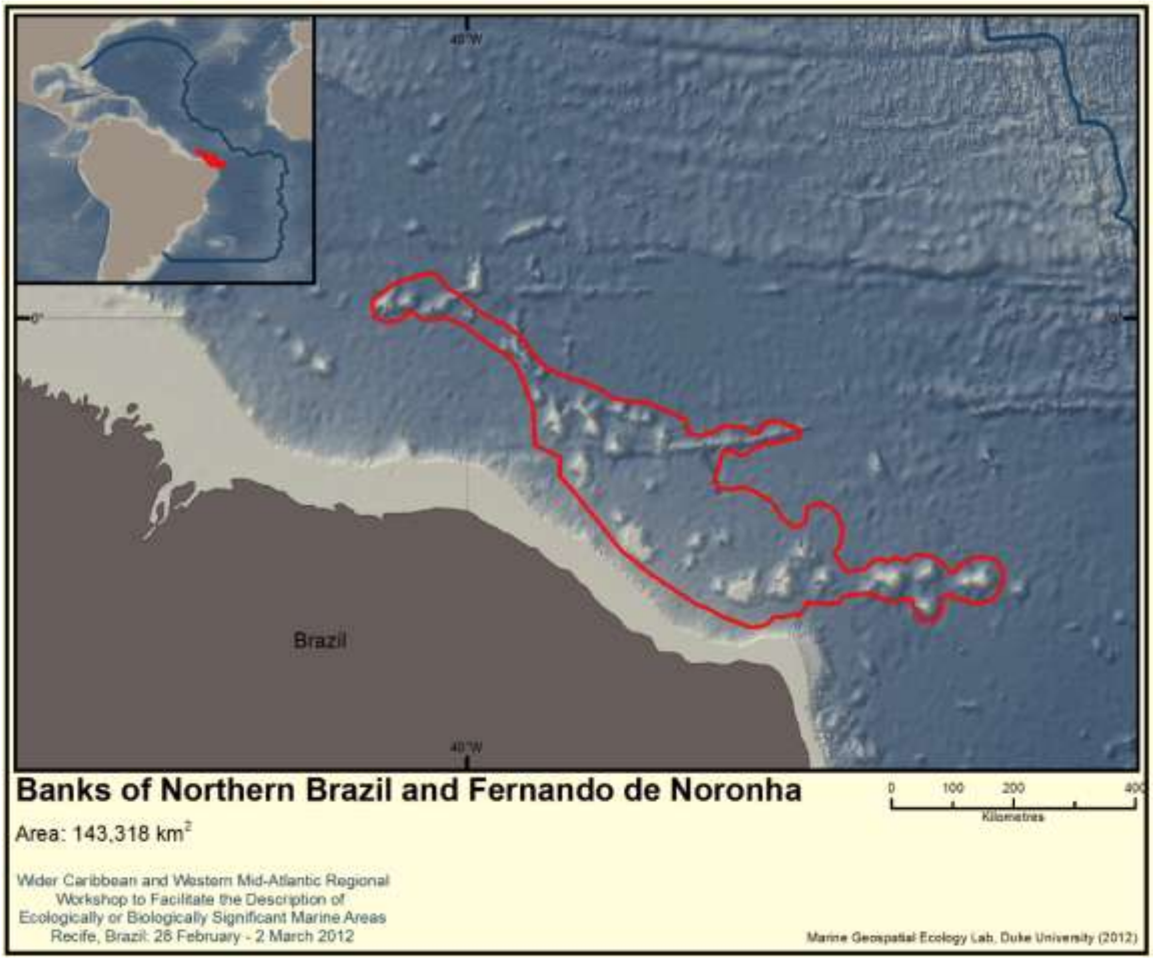

Figure 1. Area meeting EBSA criteria (no. 18)

Area No. 19: Northeastern Brazil Shelf-Edge Zone

Abstract

The northeastern shelf-edge zone extends along the Brazilian outer shelf and upper slope, from depths of 40m to 2000m and between parallels 3ºS and 16ºS, from south Bahia up to the Ceará states, where the Brazilian continental shelf is narrow and breaks abruptly at depths between 50 and 80m. The shelf width varies along the coast, reaching minimums of 8 km (off Bahia state), to over 80 km (north Ceará). The continental shelf-edge zone is a marine ecotone where different components of the demersal, benthic and benthopelagic communities of the continental shelf, upper slope and adjacent pelagic biota coexist in a narrow strip along the continental margin. This ecotone, characterized by high population densities and species richness, provides a concentration of diverse fishing resources over a relatively narrow area, easily accessible to local artisanal fleets and sustaining important traditional multispecific reef fisheries. Biogenic reef formations associated with outer shelf channels, ravines and deeper canyons represent important traditional fishing grounds. The north-eastern Brazilian shelf-edge zone contains distinct habitats and unusual geomorphological features such as shelf-edge reefs that represent a last refuge for some rare or endemic reef fishes distributed across the continental margin, including threatened (IUCN) commercial species of the snapper-grouper complex, currently depleted within the Brazilian EEZ. The shelf-edge harbours critical habitats for the life cycle of many sea turtles, whales, sharks and reef fish species, including migratory corridors and fish spawning aggregation sites that are extremely vulnerable to human pressures, such as intensive commercial and recreational fishing, shipping and offshore oil and gas exploitation, all activities currently expanding off the Brazilian coast. The area covers part of the most important seabird migration corridor in the Atlantic, a site which qualifies as a Birdlife Important Bird Area (IBA) for both threatened species and congregations. This region corresponds to a portion of the breeding ground of humpback whales (*Megaptera novaeangliae*) off the north-eastern coast of Brazil. It also corresponds to an important habitat of various relatively low-density cetacean populations, including Bryde's whales (*Balaenoptera* cf. *edeni*), dwarf minke whales (*B. acutorostrata*), and bottlenose dolphins (*Tursiops truncatus*). The Assessment of the Sustainable Yield of the Living Resources in the Brazilian Exclusive Economic Zone Program (REVIZEE Program) has extensively sampled this area meeting EBSA criteria. Results indicated great bottom heterogeneity of the shelf and slope, with the occurrence of important canyons, which provide structural complexity and varied micro-habitats, allowing a greater number of benthic species in the area. Recent studies reinforce the hypotheses of a faunal corridor for reef fish species associated with deep reef formations along the shelf-edge zone in the South American continental margin, connecting the south-western Atlantic and the Caribbean.

Introduction

The continental shelf-edge zone is a marine ecotone characterized by the coexistence of different components of the demersal, benthic and benthopelagic communities of the continental shelf, upper slope and adjacent pelagic biota, in a narrow strip along the continental margin (Briggs, 1974; Spalding et al., 2007). The depth limits of this zone are situated between the shelf break and the extension of deeper canyons around depths of 2000 metres (Harris and Whiteway 2011).

Along the north-eastern Brazilian continental margin, the shelf-edge limits may be defined from depths of 40m to 200m (Olavo et al., 2011). This ecotone, characterized by high population densities and species richness, provides a concentration of diverse fishing resources over a relatively narrow area, sustaining important multispecific reef fisheries in the Tropical Atlantic (Longhurst and Pauly, 1987; Polunin and Roberts, 1996; Costa et al., 2003, 2005; Frédou and Ferreira, 2005; Olavo et al., 2005).

Increasing attention has been given to the presence of reef formations located on the continental shelf break and upper slope, particularly in the north-western Atlantic (Parker and Mays, 1998; Sedberry et al., 2004; Martins, 2007; Olavo et al., 2007; Francini-Filho and Moura, 2008). The shelf-edge reefs harbour critical habitats for the life cycle of many sea turtles and reef fish species, including fish spawning aggregation sites that are extremely vulnerable to human pressures, such as intensive commercial and recreational fishing, shipping and offshore oil and gas exploitation, all activities currently expanding off the Brazilian coast. Many of those species recruit in shallow, costal habitats, such as mangroves, sea grasses and coral reefs, so the area is connected to those habitats.. Studies establishing those corridors of cross-shelf connectivity, which represent priority areas for conservation of species and fisheries resources, are urgently needed.

Five migratory seabirds pass through here in very large numbers, primarily between September and June. Two seabird species that breed in the southern hemisphere, great shearwater (*Puffinus gravis)* and sooty shearwater (*Puffinus griseus*), pass through the site during migration to and from non-breeding areas in the northern hemisphere. Over 60% of the global population of great shearwater (amounting to 5 million individuals) and 30% of the global population of sooty shearwater (listed as Near Threatened on the IUCN Red List) may use the site at the same time. Three seabird species that breed in the northern hemisphere, Fea’s petrel (*Pterodroma feae)*, Manx shearwater (*Puffinus puffinus)* and Cory’s shearwater (*Puffinus diomedea*), also pass through the site during migration to and from non-breeding areas in the southern hemisphere. 50% of the global population of Fea’s petrel (listed as Vulnerable), 40% of the global population of Manx shearwater, and 15% of the global population of Cory’s shearwater are thought to use the site as a stop-over point during migration.

This is an essential area for inter-nesting, foraging and migration for three species of sea turtles: *Lepidochelys olivacea*, *Caretta caretta* and *Eretmochelys imbricata* (Marcovaldi et al. 2010, Da Silva et al. 2011, Marcovaldi et al. in press).

The REVIZEE Project “Assessment of the Sustainable Yield of the Living Resources in the Exclusive Economic Zone” has extensively sampled the outer continental shelf and slope of the north-eastern and central Brazilian EEZ, in areas located in this area meeting EBSA criteria. Results of REVIZEE indicated the occurrence of a very rich benthic fauna on slope areas between 11^{o} S and 16^{o} S, mainly off Salvador City, down to 2000 m depth. It also indicated a great bottom heterogeneity of the shelf and slope, with the occurrence of canyons (close to Salvador City, municipalities of Itaparica and Camamu), which provide structural complexity and varied micro-habitats, allowing a greater number of benthic species in the area (Lavrado, 2006).

Recent studies reinforce the hypotheses of a faunal corridor for species associated with deep reef formations along the shelf-edge zone, in the South American continental margin, connecting the south-western Atlantic and the Caribbean provinces (Colette & Rutzler, 1977, Feitoza et al., 2009; Moura et al., 1999; Olavo et al., 2011).

Location

The north-eastern shelf-edge zone extends along the Brazilian outer shelf and upper slope, from depths of 40m to 200m and between parallels 3ºS and 16ºS, off the states of Bahia to Ceará (Figura 1), where the continental shelf is narrow and breaks abruptly at depths between 50 and 80m. Biogenic reef formations associated with outer shelf channels, ravines and deeper canyons represent important traditional fishing grounds. Occurrence of reef fish spawning aggregations have been assessed between parallels 7ºS and

14ºS. Aggregation sites of several species of snappers, groupers and jacks are reported by fishers. In situ verifications were successful for the cubbera snapper in six locations, at least 60 miles apart, approximately (Ferreira et al., 2012). All the area is within national EEZ.

Feature description of the proposed area

The continental shelf along the north-eastern coast of Brazil is shallow, the shelf-break occurring between depths of 40 and 80m (Franca, 1979). The shelf width varies along the coast. The narrowest sector is located between 12ºS and 15ºS, off Bahia state, reaching minimums of 8 km. The widest sector is off the north coast of the Ceara state, where it reaches over 80 km.

The Brazilian outer shelf reef formations have been characterized by Leão et al. (2003). Kikuchi and Leão (1998) includes a first reference to the marginal or shelf-edge reefs, classified as oceanic reefs and described for the northern coast of Bahia State as structures that may reach 3 km in width, with a relief of up to 35m and the top of the reefs located at depths of 50 m. These marginal reefs may have begun their growth in the Holocene period, 8000 years BP, and building up during successive phases of changes in sea level. They are currently colonized by crustose coralline algae, calcareous sponges, rhodolithes and macroalgae.

The marine biota of the area is under the influence of three distinct water masses. The Tropical Water mass (TW), warm and saline, dominates the region. The South Atlantic Central Water (SACW), cold and less saline, is found under the TW on the upper continental slope. The Coastal Water mass (CW), warm and of low salinity, predominates on the shallow continental shelf, while the shelf-edge is characterized by the TW and by events of vertical mixing between TW and SACW (Castro and Miranda, 1998).

Feitoza et al. (2005) have shown the importance of the deep outer-shelf reefs (30-70m) of north-east Brazil (at the hump of Brazil), as part of a marine corridor for the ichthyofauna on the South American continental margin, favouring connection between habitats of colder waters from the Brazilian south-east and south with the Caribbean region (Collette and Rutzler, 1977). Olavo et al. (2011) reinforce the hypothesis of a faunal corridor for species associated with deep reef formations along the shelf-edge zone (40–200m) and slope down (to 500m) of the central regions of the Brazilian EEZ.

These reef formations at the edge of the continental shelf sustain numerous local fleets dedicated to artisanal hook and line fisheries established on the north-eastern Brazilian coast, extensively studied in the area by national researchers (Fonteles-Filho, 1969; Fonteles-Filho and Ferreira, 1987; Paiva et al., 1996; Rezende et al., 1997; Costa et al., 2003; Frédou and Ferreira, 2005; Olavo et al., 2005; Martins et al., 2006).

Information from fishing surveys carried out by the REVIZEE Project is available for the outer shelf and upper slope reef fish fauna in the north-east and central Brazilian EEZ (Brasil, 2006; Costa et al., 2005, 2007; Fagundes-Netto et al., 2005; Martins et al., 2005, 2007; Olavo et al., 2007). Data from surveys employing bottom long-lines were analysed to characterize the diversity, assemblages and distribution patterns of demersal fish, between latitudes 13°S and 22°S, in depths to 500m (Martins et a., 2005; 2007; Olavo et al., 2007, 2011). Multivariate analysis indicates distinct species assemblages separated primarily by depth (the 200m isobath) and secondarily by latitude (19^{o}S), suggesting a continual transition along the depth and latitudinal gradients in the area. Species richness was negatively correlated with depth.

Spawning aggregations have been assessed on the north-eastern Brazilian shelf as part of a national effort to support management decisions and guide environmental licensing in the region (Projeto Pro-Arribada[2]). Aggregations at shelf-edge reefs, reported by fishers, include several species of snappers (*Lutjanus cyanopterus, L. jocu, L.analis, L vivanus, Ocyurus chrysurus*), jacks (*Caranx bartholomeis, C. latus, C. hippos, Seriola dumerilli*) and groupers (*Epinephelus itajare, Mycteroperca bonaci*). Evidence included UVC observations, peaks of CPUE from landings and gonadal evidences of imminent or recent spawning (Ferreira et al., 2012).

This region corresponds to a portion of the breeding ground of humpback whales (*Megaptera novaeangliae*) off the north-eastern coast of Brazil (Zerbini et al., 2004; Rossi-Santos et al., 2009). It also corresponds to an important habitat of various relatively low-density cetacean populations, including Bryde's whales (*Balaenoptera* cf. *edeni*), dwarf minke whales (*B. acutorostrata*), and bottlenose dolphins (*Tursiops truncatus*) (Andriolo et al, 2010, Danilewicz et al., unpubl. data).

Satellite telemetry was an efficient tool for defining both migratory pathways and the extent of inter-nesting and foraging areas of the tracked sea turtles. Foraging areas of loggerheads were identified along

[2] Reproductive aggregation of reef fishes in Brazil: Grant to the Environmental Licensing of Activities of E & P (Pro-Arribada Project). Program Term Commitment to Marine Seismic - Case No. 02001.003030/2001-82 IBAMA. Fauna Brazil Portfolio / FUNBIO / ICMBIO.

the continental shelf of Ceará State, where turtles remained for extended periods (2 to 3 years). Additionally turtles demonstrated fidelity to foraging areas after successive post-nesting migrations (Marcovaldi et al. 2010). Foraging areas of hawksbills and olive ridleys were located along the continental shelf and shelf-edge, between the coast of Ceará State and northern coast of Bahia State (Da Silva et al. 2011, Marcovaldi et al. in press).

During post-nesting migrations satellite-tracked females of three species (loggerheads, olive ridleys and hawksbills) utilized the north-eastern Brazilian shelf and shelf-edge as a migratory corridor (Marcovaldi et al. 2010, Da Silva et al. 2011, Marcovaldi et al. in press). Also during pre-nesting migrations loggerheads turtles used the same migratory corridor (Marcovaldi et al. 2010). Inter-nesting home range areas of olive ridleys were located along the continental shelf and shelf-edge of Sergipe State (depth: 1-420m) (Da Silva et al. 2011). Inter-nesting areas of hawksbills and loggerheads were situated on the northern coast of Bahia State, along the continental shelf and slope of main nesting beaches (Marcovaldi et al. 2010, Marcovaldi et al. in press).

Feature condition and future outlook of the proposed area

Critical habitats for the life cycle of sea turtles and and reef fish species at the shelf-edge zone, as migratory corridors and fish spawning aggregation sites, are particularly vulnerable to predatory fishing with illegal nets for lobsters, intensive unregulated recreational fisheries, and increase of oil and gas exploration offshore along the area meeting EBSA criteria.

The status of six lutjanids stocks exploited in the north-eastern and central Brazilian EEZ was assessed by the REVIZEE Project, based on data collected between 1997 and 2000, from landings of the hand line fishery (Brasil, 2006). In the central EEZ, the two main species, the yellowtail snapper (*Ocyurus chrysurus)* and the vermilion snapper (*Rhomboplites aurorubens)*, were seriously overexploited. Two species was under suitable fishing mortality levels (*Lutjanus jocu* and *L. vivanus*), and the remaining ones exhibited moderate overexploitation (*L. analis* and *L. synagris*) (Kippel at al., 2005).

Abundance declines have been perceived by fishers. The local knowledge of artisanal hand line fishers is site-specific, rich and detailed, as fishing during aggregations means exceptional catches. Spawning sites are likely to be multispecific and several commercially important species are involved. Current threats include lack of management and enforcement, increase of oil and gas prospecting, and development of technology-powered recreational fisheries.. Co-management through fisheries agreements for seasonal closures and/or protection of selected sites seems to be the better option under conditions of mounting pressure (Ferreira et al., 2012).

The north-eastern coast of Brazil hosts major breeding and nesting areas of loggerheads (*C. caretta*), olive ridleys (*L. olivacea*) and hawksbill turtles (*E. imbricata*), of the Western South Atlantic, where aggregations of these species occur during the breeding season. This area also comprises important foraging grounds for the three species. Migrations of these species between breeding and foraging grounds occur along the shelf and shelf-edge (Marcovaldi et al. 2010, Da Silva et al. 2011, Marcovaldi et al. in press).

Despite its importance as a critical ecological area, the shelf edge zone is not currently included in any marine protected area network in the tropical south-western Atlantic. Improving knowledge to implement adequate management strategies for conservation and sustainable use of fisheries resources are considered urgent needs. Studies establishing patterns of cross-shelf connectivity, which represent priority areas for conservation of species and fisheries resources, are also urgently needed.

Assessment of the area against CBD EBSA Criteria

<table>
<tr><th rowspan="2">CBD EBSA Criteria
(Annex I to decision IX/20)</th><th rowspan="2">Description
(Annex I to decision IX/20)</th><th colspan="4">Ranking of criterion relevance
(please mark one column with an X)</th></tr>
<tr><th>Don't Know</th><th>Low</th><th>Some</th><th>High</th></tr>
<tr><td>Uniqueness or rarity</td><td>Area contains either (i) unique ("the only one of its kind"), rare (occurs only in few locations) or endemic species, populations or communities, and/or (ii) unique, rare or distinct, habitats or ecosystems; and/or (iii) unique or unusual geomorphological or oceanographic features</td><td></td><td></td><td>X</td><td></td></tr>
<tr><td colspan="6">Explanation for ranking
The north-eastern Brazilian shelf-edge zone contains distinct habitats and unusual geomorphology, such as shelf-edge reefs at the scale of the East Brazil Shelf Large Marine Ecosystem. The shelf-edge reefs represents a last refuge for some rare or endemic reef fishes distributed across the continental margin, including threatened (IUCN) commercial species of the snapper-grouper complex, currently depleted in the Brazilian EEZ. Examples of rare and endemic commercial reef fishes include: Lutjanus alexandrei (endemic species), Warsaw grouper (Epinephelus nigritus), yellowedge grouper (Epinephelus flavolimbatus), tiger grouper (Mycteroperca tigris), and yellowmouth grouper (Mycteroperca interstitialis).
The REVIZEE Project results indicated a great bottom heterogeneity of the shelf and slope, with the occurrence of canyons (sampled close to Salvador City and Itaparica and Camamu), which provide structural complexity and varied micro-habitats, allowing a greater number of benthic species in the area (Lavrado, 2006). The extension of those canyons, featured in several locations along the area, go to depths of around 2000 metres (Harris and Whiteway 2011).</td></tr>
<tr><td>Special importance for life-history stages of species</td><td>Areas that are required for a population to survive and thrive.</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td colspan="6">Explanation for ranking
Area of special importance for the life cycle of significant long-lived and slow-growing commercial reef fish species, including persistent spawning aggregation sites and critical habitats for cross-shelf ontogenetic migrations.
Aggregations reported by fishers include several species of snappers (Lutjanus cyanopterus, L. jocu, L.analis, L vivanus, Ocyurus chrysurus), jacks (Caranx bartholomei, C. latus, Seriola dumerilli) and groupers (Epinephelus itajara, Mycteroperca bonaci). In-situ verifications were successful for the cubbera snapper (Lutjanus cyanopterus) in six locations. Spawning evidence includes UVC observations, peaks of CPUE from landings and gonadal evidence of imminent or recent spawning (Ferreira et al., 2012; Olavo et al, in press). Other species were observed aggregating in the same sites, especially carangids. The black grouper (M. bonaci) non-reproductive aggregation known as "correção" (Texeira et al, 2004). The intensively targeted event was recorded three times in the last 10 years (Ferreira et al., 2012).
The cubbera snapper (Lutjanus cyanopterus) is one of the largest snappers in the Atlantic Ocean. Historical decline in adult productivity seems to be due to intensive fishing during aggregations at spawning sites, and to fishing with illegal nets for lobsters during cross-shelf migrations, including breeding (local or regional) movements along the shelf-edge zone. Since 2003, persistent annual (January-March) spawning aggregations of hundreds to thousand individuals have been documented along shelf-edge reefs off Bahia state.
Many of these species recruit in shallow, costal habitats, such as mangroves, sea grasses and coral reefs, so the area is connected to those coastal habitats.
The area covers part of the most important seabird migration corridor in the Atlantic, a site which qualifies as a BirdLife Important Bird Area (IBA) for both threatened species and congregations. Five migratory seabirds pass through here in very large numbers (for some species greater than 60% of the global population), primarily between September and June.
The area is also a migratory zone for threatened sea turtles (Caretta caretta, Eretmochelys imbricata and</td></tr>
</table>

<table>
<tr><td colspan="6">Lepidochelis olivacea) connecting reproductive coastal areas and feeding areas, from Bahia to Ceará States.
This region corresponds to an important habitat of various relatively low-density cetacean populations, including Bryde’s whales (Balaenoptera cf. edeni), dwarf minke whales (B. acutorostrata), and bottlenose dolphins (Tursiops truncatus) (Andriolo et al, 2010, Danilewicz et al., unpubl. data).
The area is also a migratory zone for threatened sea turtles (Caretta caretta, Eretmochelys imbricata and Lepidochelis olivacea) connecting reproductive coastal areas and foraging grounds from Bahia to Ceará’ (Marcovaldi et al. 2010, Da Silva et al. 2011, Marcovaldi et al. in press).</td></tr>
<tr><td>Importance for threatened, endangered or declining species and/or habitats</td><td>Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td colspan="6">Explanation for ranking
Area contains critical habitats for the survival and recovery of endangered, threatened or declining sea turtles, sharks and reef fish species, particularly of significant assemblages of large species of the snapper-grouper complex. This region corresponds to a portion of the breeding ground of humpback whales (Megaptera novaeangliae) off the north-eastern coast of Brazil (Zerbini et al., 2004; Rossi-Santos et al., 2009). This species is still considered vulnerable by the government of Brazil (ICMBio, 2011).
<u>Main snapper (Lutjanidae) species include </u>(regional IUCN classification / REVIZEE assessment): Southern red snapper Lutjanus purpureus (EN, Overexploited); Cubera snapper Lutjanus cyanopterus (VU); Mutton snapper Lutjanus analis (NT, Overexploited); Silk snapper Lutjanus vivanus (NT, Threatened); Vermilion snapper Rhomboplites aurorubens (NT, Overexploited); Dog snapper Lutjanus jocu (NT, Threatened); Lane snapper Lutjanus synagris (NT, Overexploited); Yellowtail snapper Ocyurus chrysurus (NT, Overexploited)
<u>Main grouper (Serranidae) species include </u>(global IUCN classification): Warsaw grouper Epinephelus nigritus (CR); red grouper Epinephelus morio (NT); black grouper Mycteroperca bonaci (NT); tiger grouper Mycteroperca tigris (NT); yellowedge grouper Epinephelus flavolimbatus (VU); snowy grouper Epinephelus niveatus (VU); yellowmouth grouper Mycteroperca interstitialis (VU)
<u>Main sea turtles species</u> (global IUCN classification): Caretta caretta (EN); Eretmochelys imbricata (CR); Lepidochelys olivacea (VU) (IUCN 2011). National classification: Caretta caretta and Lepidochelys olivacea (EN), and Eretmochelys imbricata (CR) (Castilhos et al. 2011, Marcovaldi et al. 2011, Santos et al. 2011)
<u>Main sea sharks species:</u> Ginglimostoma cirratum; Rhincodon typus
<u>Mian seabirds species: </u>Fea’s petrel Pterodroma feae (VU) and sooty shearwater puffinus grisius (NT)</td></tr>
<tr><td>Vulnerability, fragility, sensitivity, or slow recovery</td><td>Areas that contain a relatively high proportion of sensitive habitats, biotopes or species that are functionally fragile (highly susceptible to degradation or depletion by human activity or by natural events) or with slow recovery.</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td colspan="6">Explanation for ranking
Area contains a relatively high proportion of sensitive species of large reef fishes, with slow recovery and highly susceptible to habitat degradation and depletion by human activity at the north-eastern Brazilian shelf edge. This species includes long-lived and slow-growing snappers and groupers that exhibit transient spawning aggregation behaviour (sensu Domeier & Colin, 1997). The seabird species present are long-lived (up to 50 years), have low fecundity, and extended periods of parental care.</td></tr>
</table>

<table>
<tr><td>Biological productivity</td><td>Area containing species, populations or communities with comparatively higher natural biological productivity.</td><td></td><td>X</td><td></td><td></td></tr>
<tr><td colspan="6">Explanation for ranking</td></tr>
</table>

Occurrences of events of vertical mixing between TW and SACW improving local primary production had been reported by the REVIZEE Program to the proposed area (Brasil, 2006). Evidence of local upwelling also has been observed in spawning aggregation sites identified by the Pro-Arribada Project.					
Biological diversity	Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.				X
Explanation for ranking As a marine ecotone, the continental shelf-edge zone is characterized by comparatively high population densities and species richness due to the coexistence of different components of the demersal, benthic and benthopelagic communities of the continental shelf, upper slope and adjacent pelagic biota, providing a concentration of diverse fishing resources over a relatively narrow area (Olavo et al., 2011). Results of REVIZEE indicated the occurrence of a very rich benthic fauna on slope areas between 11^{o} S and 16^{o}S, mainly off Salvador, up to 2000 m depth. It also indicated a great bottom heterogeneity of the shelf and slope, with the occurrence of canyons (close to Salvador City, Itaparica and Camamu), which provide structural complexity and varied micro-habitats, allowing a greater number of benthic species in the area (Lavrado, 2006).					
Naturalness	Area with a comparatively higher degree of naturalness as a result of the lack of or low level of human-induced disturbance or degradation.			X	
Explanation for ranking The north-eastern Brazilian continental shelf is narrow, and the access and concentration of fishing effort on reef resources in the shelf-edge zone is particularly notable in the area. The reef formations at the edge of this continental shelf sustains numerous local fleets dedicated mainly to traditional artisanal hook and line fisheries and bottom longline fishing, with thousands of boats dedicated to this activity (Fonteles-Filho and Ferreira, 1987; Paiva et al., 1996; Costa et al., 2003; Frédou and Ferreira, 2005; Olavo et al., 2005; Martins et al., 2006). The origin of historical fishing exploitation of the north-eastern Brazilian shelf-edge reefs refer to a secular development of the "Jangada do Alto" tradition of high seas fishing during colonial times in Brazil (Cascudo, 1964). Despite this historical use of north-eastern Brazilian shelf-edge reefs, the area remains with a comparatively higher degree of naturalness as a result of relatively low levels of human-induced disturbance or degradation, when comparing higher disturbance and degradation of adjacent inner continental shelf habitats. Illegal lobster fishing using long and non-selective gill nets ("rede caçoeira") upon the outer shelf reef and rubble habitats is another growing regional threat for habitat integrity. Reef fishes captured are not commercialized or consumed, but retained as bait in the nets, to attract more valuable lobsters. Lack of management and enforcement, increase of oil and gas prospecting, and development of technology-powered recreational fisheries figure among current threats.					

Sharing experiences and information applying other criteria (Optional)

Other Criteria	**Description**	**Ranking of criterion relevance** (please mark one column with an X)			
		Don't Know	**Low**	**Some**	**High**
Sociocultural importance for traditional comunities of artisanal fishers.	Areas containing habitats or natural resources required for human traditional populations to survive.				X
Explanation for ranking The area sustains important fishing grounds and ensures the material basis for the survival and cultural reproduction of thousands of fishing families and artisanal communities dedicated to hand line fisheries, particularly to traditional populations of north-eastern Brazilian "Jangadeiros" (Formman, 1967; Maldonato,					

1993).
The local knowledge of artisanal hand line fishers is site-specific, rich and detailed. Incorporating traditional knowledge and management practice with the involvement of traditional fishing communities from the planning to the implementation phases of fisheries management plans seems to be the best option to improve social inclusion and promote co-management through fisheries agreements (Diegues et al., 2008).

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Maps and Figures

Figure 1. Area meeting EBSA criteria (no. 19)

Area No. 20: Atlantic Equatorial Fracture Zone and high productivity system

Introduction

The Atlantic Ocean originated from the break-up of the supercontinent Pangea in the Mesozoic and has been regarded as the youngest of the major world oceans (Levin and Gooday, 2003). Its configuration and size are the outcomes of two independent spreading processes: one that formed the North Atlantic in the early Mesozoic nearly 200 million years ago, and another that originated the South Atlantic, 100 million years later (Fairhead & Wilson, 2004). As a consequence, northern and southern sectors of the Atlantic not only diverged in age but also in their spreading direction, connectivity with other oceans and oceanographic patterns. Yet they remained connected near the Equator by a relatively narrow area defined as the Equatorial Atlantic and characterized by (a) multiple 1000 – 6000 m deep benthic habitats formed by the Mid-Atlantic ridge and the Equatorial Fracture Zone, (b) the interference of circulation patterns of deep water masses of the Atlantic and (c) the influence of surface oceanographic processes, including a seasonal phytoplankton bloom that affect both pelagic and benthic ecosystems. These features combined differentiate the equatorial zone from the adjacent north and south oceanic basins, and particularly from their oligotrophic tropical and subtropical pelagic systems. In that sense the Equatorial Atlantic is unique in the Atlantic Ocean, as also supported by both empirically shown and modeled patterns of biodiversity. It is worth noting that the area also includes a Mid-Atlantic ridge-associated group of islets, the Saint Peter and Saint Paul Archipelago, whose coastal fauna and flora has been connected with oceanic dispersal processes among the Atlantic’s continental margins and oceanic islands (see reviews in Vianna et al., 2009 and Vaske Jr. 2010) and a recently mapped hydrothermal vent field (Devey et al., 2005).

Comprehensive descriptions of seafloor features and major oceanographic and productivity patterns are available in the literature and derive from large-scale oceanographic programmes and satellite imagery analysis (e.g., Ocean Drilling Program, InterRidge, IOC – GOOS, UK Atlantic Meridional Transect - AMT and others). Some of these programmes also include general data on diversity, distribution and abundance of zooplankton, pelagic fish and cephalopods that cover the Equatorial as well as adjacent tropical and subtropical areas of the North and South Atlantic (e.g. Gibbons, 1997; Rosa et al., 2008; Kobilianski et al., 2011). Particular data sets also derive from a long-standing research programme on the coastal areas and pelagic system in the vicinity of the Saint Peter and Saint Paul Archipelago (ProArquipelago - Vianna et al., 2009 and Vaske Jr. 2010) and from pelagic fishing for large predators (tunas, billfishes, sharks) concentrated at the International Commission for the Conservation of Atlantic Tunas (ICCAT, www.iccat.org). Other data sets on seabird and sea turtle distribution and migrations complement our understanding of the biological relevance of the Equatorial Atlantic for nekton communities (e.g. Witt et al., 2011). Finally, data on bathy- and benthopelagic as well as benthic fauna are less comprehensive. Yet recent large-scale surveys derived from the Census of Marine Life programme (e.g., MAR-ECO – http://www.mar-eco.no; ChEss –http://www.noc.soton.ac.uk/chess/) have produced novel and relevant information on the biota associated with Equatorial Atlantic deep habitats.

The Equatorial Atlantic combines a wide spectra of historical, geological, oceanographic and biodiversity features, both in the pelagic and benthic domains, that that lead to this area being described as an EBSA in the Atlantic Ocean. This area extends mostly beyond the jurisdiction of Atlantic coastal countries, and the recognition of its importance seems crucial for eventual conservation initiatives in the high seas.

Location

The proposed area extends approximately 1.9 m km^2 across the Equatorial Atlantic Ocean from the western border of the Guinea Basin (10°W) in the east to the north-east limit of the Brazilian continental margin (32°W) in the west. Parallels 2°N and 5°S are proposed as latitudinal limits which enclose three major fracture zones: St Paul’s, Romanche and Chain (Figure 1). Seasonal phytoplankton blooms of the Equatorial Atlantic normally occur within these boundaries, concentrating on the eastern side but extending their influence to western areas (Figure 2). The area proposed includes also the Saint Peter and Saint Paul Archipelago (Figure 3) (0° 55’01’’N, 29° 20’ 44’’W). After the UNCLOS convention in 1982 and its ratification in 1988, the Brazilian government, through the Interministry

Commission for Marine Resources (CIRM), developed a permanent research programme at these islets, which consolidated its rights to their 200-mile EEZ.

Feature description of the proposed area

The proposed area combines both benthic and pelagic habitats of the Equatorial Atlantic, as defined by the seafloor topography, surface and deepwater circulation patterns and the equatorial primary productivity regimes. It can also be characterized by particular pelagic and benthic biodiversity patterns. These are explained below.

Seafloor topography.

The connection between the North-South Atlantic spreading centres in the early mid-Cretaceous resulted in a shear zone, which produced the Equatorial Fracture Zone, a large geological feature 60 million years-old and 4000 m high, that offsets the Mid-Atlantic ridge central axis and largely distorts its linearity (Fairhead and Wilson, 2004). This feature is characterized by parallel ridge crests and trenches that extend in the east-west direction approaching north-east Brazilian and West African continental margins (Figure 1). These crests are normally 1000 – 2000 m deep, except at the eastern extreme where they emerge and form the Saint Peter and Saint Paul Archipelago (Figure 3) (Bonnati, 1990). They are generally characterized by a roughed topography but may also include sediment-covered relatively flat areas and gentle slopes. Steep trenches delimit the north-south width of the ridge crests and may reach 4000 – 6000 m abyssal depths. Hydrothermal activity has been described between 4° and 11° S, including some of the world’s hottest vents (Devey et al., 2005).

Circulation patterns.

The Equatorial Fracture Zone affects the Atlantic deepwater circulation, chiefly determined by the northward flow of the Antarctic Bottom Water (ABW, >4000 m) and the southward flow of the North Atlantic Deep Water (NADP, 1500 – 4000 m). In the western side these water masses flow through conduits created by the Equatorial Fracture Zone communicating the North and South Atlantic deep environments. Yet in the eastern side, the northward flow of ABW is blocked in the south by the Walvis Ridge mountain chain, and the north-south flow of the NADP predominates filling most of Southeast Atlantic basins (Huang and Jin, 2002; Bickert and Mackensen, 2003). However, at the Equatorial Fracture Zone a branch of ABW deflects to the east and penetrates into the Southeast Atlantic mostly through a particularly deep passage known as the Kane Gap. This process explains the presence of ABW in the deepest pockets of the east Atlantic basins (> 4000 m) (Stephens and Marshall, 2000). The influence of the Equatorial Fracture zone on the circulation patterns of NADP and ABW have been regarded as a key element to test the deepwater fauna dispersal hypothesis (German et al., 2011).

Above 1500 m there is a complex mostly wind-driven circulation pattern dominated by the western flow of the South Equatorial Current. From January to July such flow tends to accumulate water on the western side of the Equatorial Atlantic, which thickens the South Equatorial Current and provokes a surface and subsurface return flow driven by five currents: the South Equatorial Counter Current (0°-5°S), North Equatorial Counter Current (~5° N), Subsurface Equatorial Current (1.5° N – 1.5°S, 60 – 100 m deep), South Equatorial Subsurface Current (3° – 5°S, 200 m deep) and North Equatorial Subsurface Current (3°– 5°N, ~200 m deep) (Peterson and Stramma, 1991). The interaction of such currents, some of them established on a seasonal basis, promote an important mechanism for larval dispersal, which is critical to the distribution patterns of pelagic and benthic diversity, including the coastal habitats of the Saint Peter and Saint Paul Archipelago and the deep sea (e.g. Rudorff et al., 2009).

Primary productivity regimes

The Equatorial Atlantic is generally bathed by warm oligotrophic waters. Yet there are important phytoplankton blooms that take place seasonally in the eastern Equator which become critical for pelagic and benthic ecology in the area (Longhurst, 1993; Longhurst, 1995). Such blooms originate from the northern displacement of the Intertropical Convergence Zone during the boreal summer, which tends to intensify the southeast trade wind regime. This in turn causes deepening of the thermocline in the western side while shoaling in the eastern size of the Equatorial Atlantic zone, where nutrients are entrained above the photic zone and primary production, is enhanced (Houghton, 1983; Hastenrath and Merle, 1987; Longhurst, 1993; Pérez et al., 2005). This western productive patch tends to receive allochtonous contributions from the coastal upwelling system off Namibia and the plume produced by the Congo River runoff, and expands its influence westwards, through the flow of the South Equatorial Current, to central

Equatorial Atlantic waters (Figure 2). Bounded by major oligotrophic subtropical gyres of the North and South Atlantic, this area characterizes a seasonal "oasis" that affects the patterns of pelagic biota in the central Atlantic and may be a critical source of energy to the deep habitats of the Equatorial Fracture Zone. Considerable data has been produced in support of the ecological significance of this primary production enhancement process either by satellite-derived chlorophyll field analysis or *in situ* experiments (Pérez et al., 2005). The area is also continuously monitored by a series of moored oceanographic buoys ("Prediction and Research Moored Array in the Tropical Atlantic" - PIRATA Project), as part of the Global Ocean Observing System (IOC – GOOS).

Pelagic and Benthic Biodiversity patterns

The fauna and flora of the Saint Peter and Saint Paul Archipelago has been extensively described and related to Atlantic oceanic biogeography, considering its reduced size and intermediate position between South American and West African continental margins and other Atlantic oceanic islands (see reviews in Vianna, 2009 and Vaske Jr., 2010). Reef fish diversity is generally low when compared to the Brazilian and African coasts, but at least five species have been regarded as endemic to the islets' rocky shores and slopes: *Stegastes sanctipauli* (Pomacentridae), *Anthias salmopunctatus* (Serranidae), *Prognathodes obliquus* (Chaetodontidae), *Enneanectes smithi* (Tripterigiidae), *Emblemariopsis* sp. (Chaeopsidae) (Lubbock & Edwards 1980 and 1981; Floeter and Gasparini, 2000; Feitoza et al., 2003; Ferreira et al., 2009; Vaske Jr. et al., 2010). Because these coastal areas are very limited (Figure 3) (e.g. the area above 50 m isobath is less than 0.5 km^2), all endemic species a have an extremely restricted distribution area (Luiz et al., 2007) and therefore become highly vulnerable to extinctions. Also oceanic and reef sharks use the archipelago vicinity as feeding and reproductive areas and become vulnerable to the local pelagic fishing pressure. Such pressure seems to have been the main cause of the local extinction of the reef shark *Carcharhinus galapagensis* (Luiz and Edwards, 2011) and threat local populations of other targeted sharks such as *C. falciformes* and *C. longimanus* (Hazin et al., 2007; Cortés et al., 2007). Other large nektonic organisms use the archipelago during key phases of their life-histories, including three tropical seabirds, the brown booby (*Sula leucogaster*), the black noddy (*Anous minutus*) and the brown noddy (*Anous stolidus*), that nest on the islets (Vaske Jr., 2010), and a resident population of the bottlenose dolphin (*Tursiops truncatus*) (Caon et al., 2009; Moreno et al., 2009).

The Equatorial Atlantic has been characterized by an elevated diversity and abundance of pelagic organisms, when compared to the adjacent northern and southern subtropical gyres of the Atlantic. In essence that has been explained by the effect of complex surface circulation patterns, elevated temperature and productivity regimes. Data in support of these patterns are found in specific plankton and micronekton studies focusing on euphasiids (Gibbons, 1997), myctophids and other mesopelagic fish (Bakus et al., 1970; Bakus et al., 1977; Kobiliansky et al., 2010) and cephalopods (Rosa et al., 2008; Perez and Bolstad, 2011). The area also concentrates important catches of large pelagic fishes, including the yellofin tuna (*Thunnus albacares*), bigeye tuna (*Thunnus obesus*) and swordfish (*Xiphias gladius*) (www.iccat.org). These are highly migratory species with a wide distribution in the Atlantic that seem to concentrate in the equatorial areas as part of their feeding and reproductive routes (e.g. *T. albacares*, Figure 4) (Fonteneau and Sobrier, 1995). Similarly the largest known population of leatherback turtle (*Demochelis coriacea*), which nests in the coast of Gabon (West Africa), includes the west Equatorial Atlantic as one of their main feeding grounds (Figure 5). This pattern, also shared by olive ridley turtles (*Lepidochelys olivacea*), allows access to productive equatorial areas but also exposes these animals to intense tuna-oriented fishing effort (Billes et al., 2006; Fretey et al., 2007; Georges et al., 2007; Witt at al., 2011; Da Silva et al. 2011). These species are critically endangered according to IUCN criteria (www.iucn.org) which highlights the importance of this area meeting EBSA criteria.

In terms of benthic and bentho-pelagic fauna, much less is known, but models tend to predict a relatively high seafloor biomass, particularly in the western Equatorial area (Wei et al., 2010). Furthermore, new data derived from surveys conducted in the southern Mid-Atlantic ridge (MAR-ECO and ChEss initiatives, Census of Marine Life) have recently revealed a high benthic diversity (Perez et al., 2010; German et al., 2011), particularly related with the heterogeneity of seafloor habitats (ridges, trenches, flat sediment-covered surfaces, hydrothermal vents). Megabenthos sampling conducted by the first MAR-ECO expedition to the southern Mid-Atlantic Ridge, on flat surfaces of the Romanche Fracture Zone crest, produced abundant and species-rich catches that included both suspension and deposit feeders

(Figure 6), as evidence of habitat diversity and high surface-derived energy input. These samples largely contrasted with those obtained from rocky ridge habitats in latitudes under the influence, at the surface, of the South Atlantic Subtropical gyre (Gebruk, A., unpublished data; Cardoso, 2011).

In March 2005, scientists of the Biogeography of Deep-Water Chemosynthetic Ecosystems project (ChEss - CoML) identified the first hydrothermal vent in the southern Mid-Atlantic Ridge axis 4° – 5°S (Figure 6) (www.coml.org/ discoveries; Devey et al., 2005; German et al., 2008). Since then the area has been defined as part of the "Atlantic Equatorial Belt" chemosynthetic area that congregates hydrothermal vents and cold seeps from Costa Rica to the West African coast (German et al., 2011). These findings have demonstrated that the Equatorial Fracture Zone does not act as a barrier for vent species dispersal, allowing for similarities between North and South Atlantic vent faunas.

Biogeography

Taking into consideration the oceanographic structure and productivity patterns described above, Longhurst (1995, 2006) encircled the Equatorial Atlantic into two "biogeochemical provinces", the "East and West Tropical Atlantic". A single "tropical" province was more commonly defined in this area by zooplankton, mesopelagic fish and cephalopods distribution patterns (Bakus et al., 1977; Gibbons, 1997; Rosa et al., 2008). In relation to benthic fauna, the IOC Global Open Ocean and Seabed Biogeographic Classification (GOODS) has distinguished three provinces in the deep Equatorial Atlantic: the "South Atlantic" lower bathyal zone (800 – 3500 m), which includes the mid-Atlantic ridge systems and fracture zones, the "Romanche" hadal depth zone (>6000 m) defined by the Romanche trench, and the "Mid-Atlantic Ridge South" hydrothermal vent province (Vierros et al., 2009).

Feature condition and future outlook of the proposed area

The area meeting EBSA criteria is subject to intense pelagic fishing, particularly focused on tunas and billfishes (http://www.iccat.org). In the vicinity of the Saint Peter and Saint Paul Archipelago, such pressure has already led to severe consequences, such as the local extinction of the reef shark *C. galapagensis* (Luiz & Edwards 2011) and declines in concentrations of other sharks, such as *C. falciformes* and *C. longimanus* (Hazin et al., 2007; Cortés et al., 2007). The endemic reef fish *Anthias salmopunctatus* was thought to be extinct from the islets in 2003 (Feitoza et al., 2003) but rediscovered three years later (Luiz et al., 2007). The archipelago and surrounding pelagic system are regarded as very susceptible to perturbation due to its small area and isolation in the Atlantic Ocean.

In contrast, there are no significant records of demersal fishing in the area (Southeast Atlantic Fisheries Organization – SEAFO - http://www.seafo.org), which suggests that deep benthic habitats retain considerable degree of naturality. There are, however, known deposits of cobalt-bearing ferromanganese crusts (Yubko et al., 2004) and polymetallic sulphides associated with hydrothermal vent activity (International Seabed Authority http:// http://www.isa.org.jm/), both of which are of potential commercial interest for oceanic mining initiatives.

Potential impacts on the seabed, as derived from mining and fishing, do not seem to be major threats in the near future. However, much research is still needed to access the biodiversity patterns of the deep habitats within the area and fully understand their vulnerability to human perturbation. On the other hand, fishing exerts a significant impact over large pelagic organisms, which suggests that short -term spatial conservation initiatives in this area could help their conservation. Finally, it is important to take into consideration the significance of the major geologic and oceanographic features of the Equatorial Atlantic and their role in large-scale processes of the Atlantic Ocean, particularly in the light of general climate changes. That per se may justify conservation initiatives in the future.

Several scientific and ocean observation programmes currently exist and will continue in the coming years, providing data and more accurate descriptions and models of the geology and oceanography of the Atlantic Ocean. Deep-sea diversity programmes, particularly focusing on the Mid-Atlantic Ridge and fracture zones of the Atlantic are less common, mostly due to elevated costs and high technological requirements. But it is worth noting the continuity of some field projects, born under the umbrella of the Census of Marine Life, that have future plans to sample and/or coordinate research efforts focused on the South Atlantic Mid-Ocean ridge and related habitats in the near future. These include INDEEP (International network for Scientific Investigation of deep-sea ecosystems, http://www.indeep-project.org/) and the South Atlantic MAR-ECO project (http://www.mar-eco.no).

Assessment of the area against CBD EBSA Criteria

<table>
<tr><td rowspan="2">CBD EBSA Criteria
(Annex I to decision IX/20)</td><td rowspan="2">Description
(Annex I to decision IX/20)</td><td colspan="4">Ranking of criterion relevance
(please mark one column with an X)</td></tr>
<tr><td>Don't Know</td><td>Low</td><td>Some</td><td>High</td></tr>
<tr><td>Uniqueness or rarity</td><td>Area contains either (i) unique ("the only one of its kind"), rare (occurs only in few locations) or endemic species, populations or communities, and/or (ii) unique, rare or distinct, habitats or ecosystems; and/or (iii) unique or unusual geomorphological or oceanographic features</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td colspan="6">Explanation for ranking
The area is ranked as "highly unique" chiefly (but not only) because it contains the Equatorial Fracture Zone (Figure 1), a prominent geological feature ~60 m years-old that offsets the mid-Atlantic ridge central axis and connects the deep habitats of North and South Atlantic, and the South American and West African continental margins (Fairhead and Wilson, 2004). Because it is massive, elevating 4000 km from the seafloor, it affects the circulation patterns of the main deep water masses of the Atlantic, the North Atlantic Deepwater (NADW, 1500 – 4000 m) and the Antarctic Bottom Water (ABW, <4000 m), being regarded as highly significant for dispersal processes of deep fauna (Stephens and Marshall, 2000; German et al., 2011). The Equatorial fracture zone includes an array of benthic habitats 1000 – 6000 m deep, mostly formed by ridge crests and trenches. At the western extreme, such crests emerge and form the Saint Peter and Saint Paul Archipelago (Figure 3), a group of islets with an important role in the coastal fauna dispersal process in the Atlantic and an elevated level of endemism (Vaske Jr., 2010). At the southern extreme some of the hottest hydrothermal vents have been found on the southern Mid-Atlantic ridge (Figure 6) and their associated biodiversity compared with those of the North Atlantic vents (German et al., 2011).
A second remarkable feature of this area is associated with the complex South Equatorial Current system and its surface and subsurface counter-currents (Petterson and Stramma, 1991). Influenced by the oscillations of the Inter-tropical Convergence Zone and trade winds regime, this system includes, on the eastern extreme, a seasonal upwelling process that promotes an important equatorial phytoplankton bloom (Longhurst, 1993). This highly productive area in the middle of the vast oligotrophic zones of the northern and southern subtropical gyres has an "oasis" effect on both pelagic and deep biota (Figure 2), as associated with the high diversity and abundance levels of plankton and nekton communities, including large pelagic predators. In this sense it is also considered a "unique" feature similar to the one described in the Equatorial Pacific Ocean, which justified the description of an extensive area meeting EBSA criteria in that ocean.
In terms of biodiversity it is important to point out the existence of endemic organisms in the coastal areas of the Saint Peter and Saint Paul Archipelago, with particular reference to at least five reef fish species (Vaske Jr. et al., 2010). It is remarkable that these fishes may in fact have the smallest distribution areas known in marine life (see below).</td></tr>
<tr><td>Special importance for life-history stages of species</td><td>Areas that are required for a population to survive and thrive.</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td colspan="6">Explanation for ranking
The area meeting EBSA criteria encloses a limited area of the vast and highly connected pelagic system of the Atlantic Ocean. Nevertheless, the Saint Peter and Saint Paul Archipelago and the seasonal equatorial phytoplankton blooms on the western and eastern extremes, respectively, create "hotspots" for life-history stages of different marine organisms. Important examples are:
• Reef fishes and invertebrates whose populations in the middle of the Atlantic Ocean rest on the</td></tr>
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<tr><td colspan="6">existence of the coastal habitats around oceanic islands where these animals can settle, feed, reproduce and recruit. The Saint Peter and Saint Paul Archipelago is remarkable in that regard, hosting populations of species occurring on the Brazilian and African coasts, other oceanic islands of the South Atlantic and endemic species.
• Pelagic fish and seabirds also use the Saint Peter and Saint Paul Archipelago islets and surrounding waters as feeding, nursery and reproductive grounds. Flying fish species (Family Exocoetidae), for example, are widely distributed in the tropical Atlantic but require shallow hard substrates to attach their eggs, which will survive on benthic food sources. The islets provide unique habitats for this process and gather reproductive concentrations of at least one species, Cheilopogon cyanopterus. These in turn attract migratory populations of the yellowfin tuna (Thunnus albacares) that concentrate to feed on this resource and become available to local pelagic fishing activity (Lessa and Vaske Jr., 2009; Hazin et al., 2009). The area is also a spawning ground for wahoo (Acanthocybium solandri) and rainbow runner (Elagatis bipinnulata) (Hazin et al., 2009), and there is a resident population of the bottlenose dolphin (Tursiops truncatus) in the area (Caon et al., 2009; Moreno et al., 2009). The islets provide nesting sites for three seabird species: the brown booby (Sula leucogaster) and two noddies (Anous minutus and A. stolidus) (Vaske Jr., 2010)
• Highly migratory tunnids (and swordfish) of the Atlantic tend to concentrate in the equatorial areas for reproduction. That is the case of the commercially important yellofin tuna (Figure 4), which spawns in the western side of Equatorial Atlantic in association with the areas of high productivity (Fonteneau and Sobrier, 1995). The same area attracts important concentrations of the leatherback and the olive ridley turtle (Lepidochelys olivacea), which feed in the West Equatorial Atlantic (Figure 5) (Witt at al., 2011; Da Silva et al. 2011).
Similarly to observations of pelagic biota, the deep habitats of the Equatorial Atlantic are likely critical for benthic and benthopelagic invertebrates and fish life-histories. Yet much research is still needed to assess these patterns.</td></tr>
<tr><td>Importance for threatened, endangered or declining species and/or habitats</td><td>Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.</td><td></td><td></td><td>X</td><td></td></tr>
<tr><td colspan="6">Explanation for ranking
Following the elements presented on the previous criterion, it is important to notice that several organisms, both coastal and pelagic, associated with the Saint Peter and Saint Paul Archipelago islets have been classified as endangered or vulnerable to extinction either by the IUCN or Brazilian Ministry of Environment criteria (see examples cited in Vaske Jr., 2010). Particularly critical is the case of the endemic species whose essential habits are restricted to the small coastal environments of the islets and pelagic sharks whose populations in the Atlantic in declining (e.g. Carcharhinus longimanus, www.iccat.org). The leatherback and the olive ridley turtle are important examples, the former being classified as Critically Endangered by the IUCN Red List (www.iucn.org).</td></tr>
<tr><td>Vulnerability, fragility, sensitivity, or slow recovery</td><td>Areas that contain a relatively high proportion of sensitive habitats, biotopes or species that are functionally fragile (highly susceptible to degradation or depletion by human activity or by natural events) or with slow recovery.</td><td></td><td></td><td>X</td><td></td></tr>
<tr><td colspan="6">Explanation for ranking
Deepwater ecosystems have usually been characterized as fragile because many of their biotic components have life-history traits that result in a slow recovery process after perturbation (i.e., long life, slow growth, episodic recruitment). Comprehensive descriptions of such habitats in the Equatorial Fracture Zone are still scarce and inconclusive. Yet the presence of reef-forming cold-coral forms,</td></tr>
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sponges and other long-lived invertebrates in the Romanche Fracture Zone (Débora Pires, unpublished data) suggest the existence of such fragile environments within the proposed area. The hydrothermal vent field identified in the Mid-Atlantic ridge contributes to such a preliminary conclusion (Devey et al., 2005). Yet it is clear that assigning a higher rank to this criterion would involve more sampling and exploring initiatives. This criterion has often been used to classify large nektonic organisms as fragile and highly vulnerable to extinction. In that sense the concentration and elevated risks of fishing mortality of pelagic sharks, seaturtles, seabirds and cetaceans contribute to consider "some" relevance of the area meeting EBSA criteria in this criterion.					
Biological productivity	Area containing species, populations or communities with comparatively higher natural biological productivity.				**X**
Explanation for ranking Primary production in the North and South Atlantic subtropical gyres is characteristically low and uniform during most year. At west equatorial regions of the Atlantic and Pacific oceans, however, which are governed by trade wind regimes, primary production is enhanced during the boreal summer as these winds intensify and thermocline shoals produce an increased nutrient entrainment in the photic zone. In the western equatorial Atlantic productivity responds rapidly to this process and an important chlorophyll field, considerably higher than that observed in the adjacent subtropical gyres, is formed (Longhurst, 1995; Pérez et al., 2005) and represents an important energy input for pelagic and benthic biota. Wei et al. (2010) incorporate this seasonal productivity pattern into models that predict rates of energy transfer to the benthic habitats. As a result they projected an elevated benthic biomass on much of the western equatorial seafloor in contrast with poorer deep areas extending underneath the South Atlantic Subtropical gyre, for example. In that sense the area meeting EBSA critieria, which includes the geographical amplitude of the equatorial blooms, is ranked high in this criterion.					
Biological diversity	Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.				**X**
Explanation for ranking This area was ranked high in this criterion based on a comparative analysis with data available for the adjacent subtropical gyres of the Atlantic and mostly in response to the west Equatorial high productivity area described above. Empirical data produced by historical plankton and micronekton surveys across the South Atlantic have supported a general decline in abundance and richness from the equatorial "belt" to the subtropical gyres (Bakus et al., 1970; Bakus et al., 1977; Gibbons, 1997; Rosa et al., 2008; Perez and Bolstad, 2011; Kobiliansky et al., 2010). In the case of cephalopods, this pattern was attributed to a direct relationship between diversity and resource availability (Rosa et al., 2008). Less can be concluded about deep benthic biodiversity. However, results produced during the South Atlantic MAR-ECO survey support the same pattern shown for pelagic biota (Gebruk, unpub. Data; Cardoso, 2010). It was also considered, that notwithstanding that the Saint Peter and Saint Paul Archipelago is a low-diversity area when compared to the east and west Atlantic coasts and other oceanic islands, the area has a key role in the fauna dispersal processes in the Atlantic.					
Naturalness	Area with a comparatively higher degree of naturalness as a result of the lack of or low level of human-induced disturbance or degradation.			X	
Explanation for ranking A high level of naturalness can be attributed to the benthic habitats of the proposed habitats, since there are no records of significant human activities in these deep areas of the Atlantic Ocean (e.g. demersal fishing, mining) (http://www.seafo.org; http://www.isba.org). Nonetheless, an important pelagic fishing pressure has been established in the area for several decades with well documented effects on the abundance of commercially important stocks as well as large nektonic organisms non-intentionally caught by fishing operations in the Equatorial Atlantic (Cortés et al., 2010; Da Silva et al. 2011; Witt et al, 2011).					

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Maps and Figures

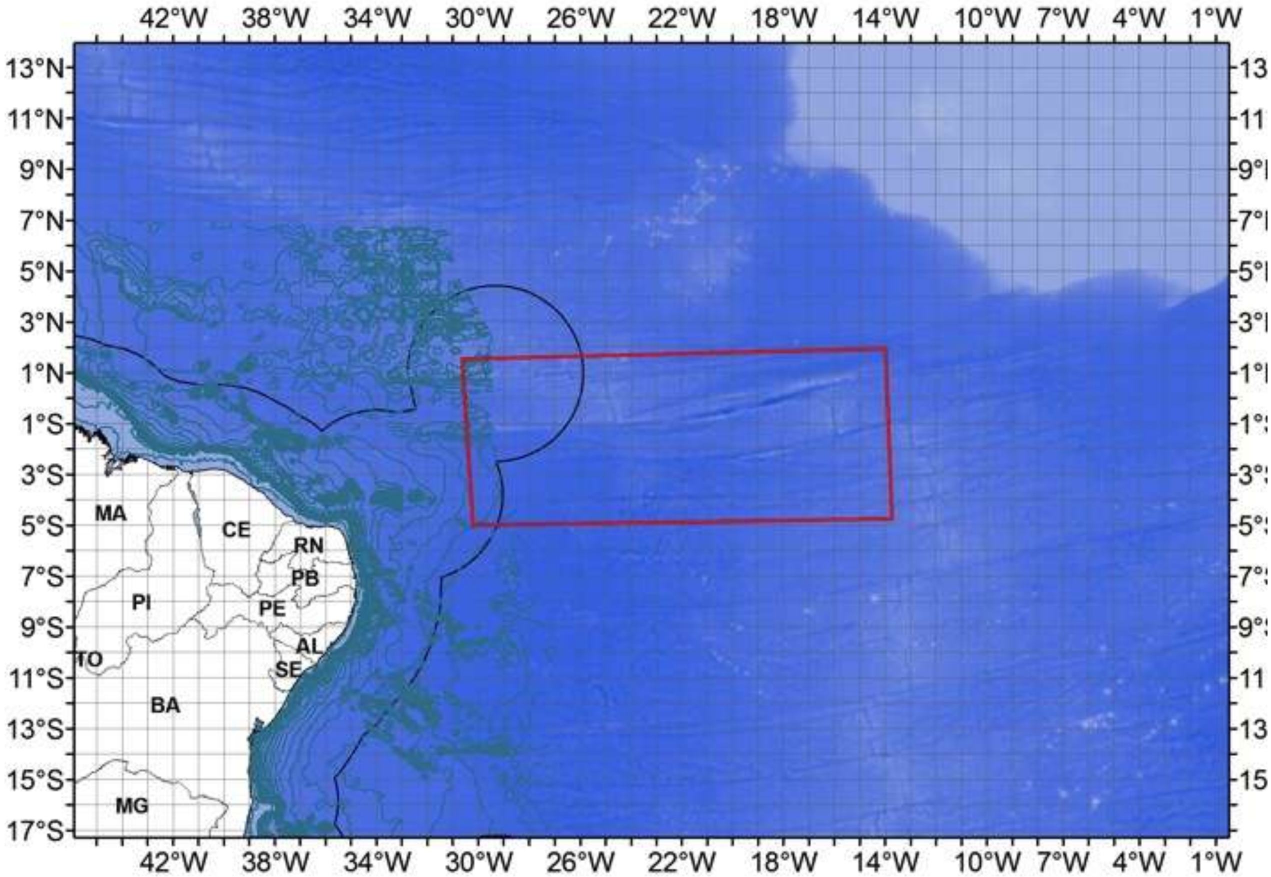

Figure 1. Equatorial Atlantic seafloor. The red line delimits the area meeting EBSA criteria.

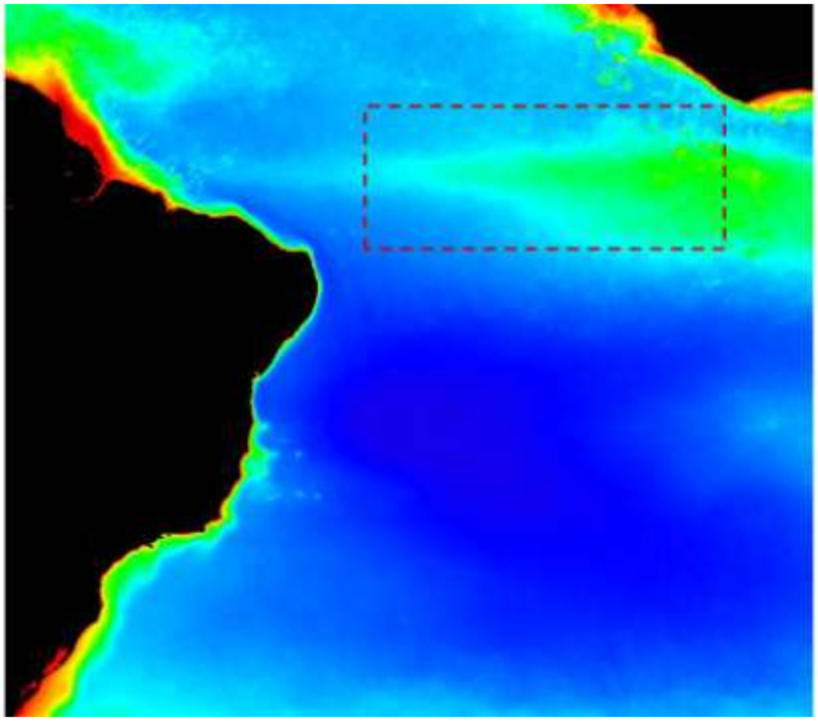

Figure 2. Chlorophyll distribution during 2002 – 2011 period extracted from sensor MODIS, 4 km resolution (http://oceancolor.gsfc.nasa.gov).

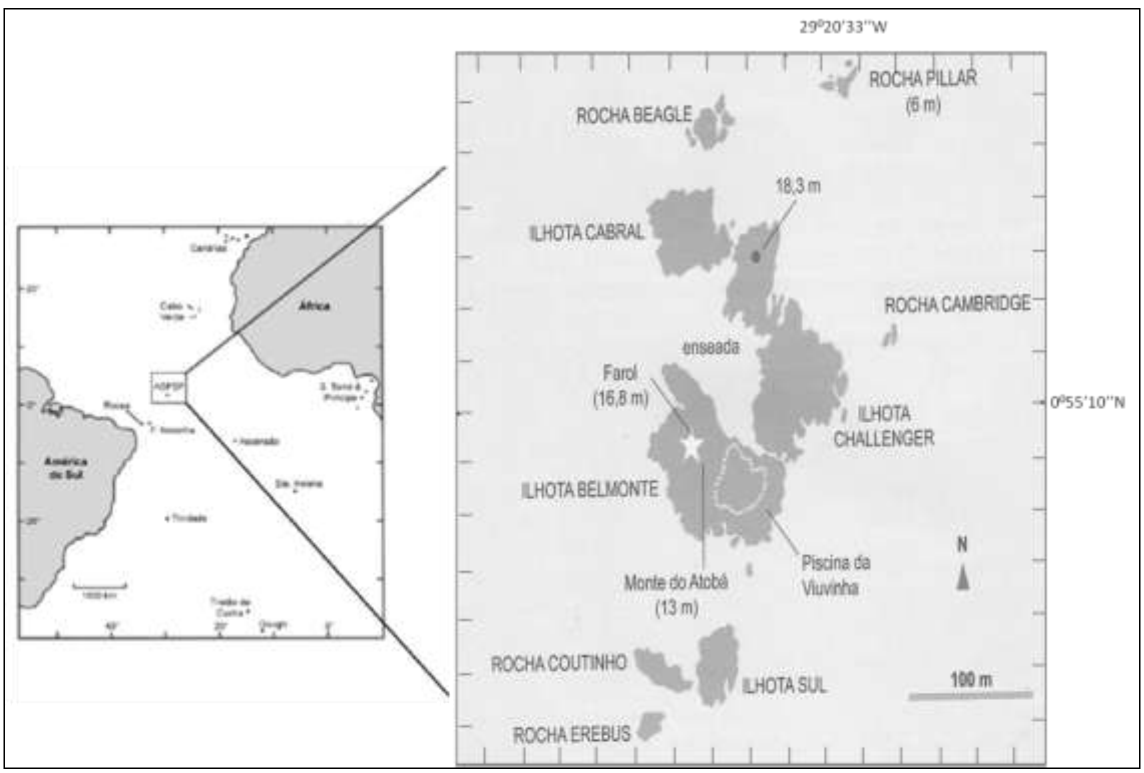

Figure 3. The Saint Peter and Saint Paul Archipelago. Reproduced from Vaske et al. (2010).

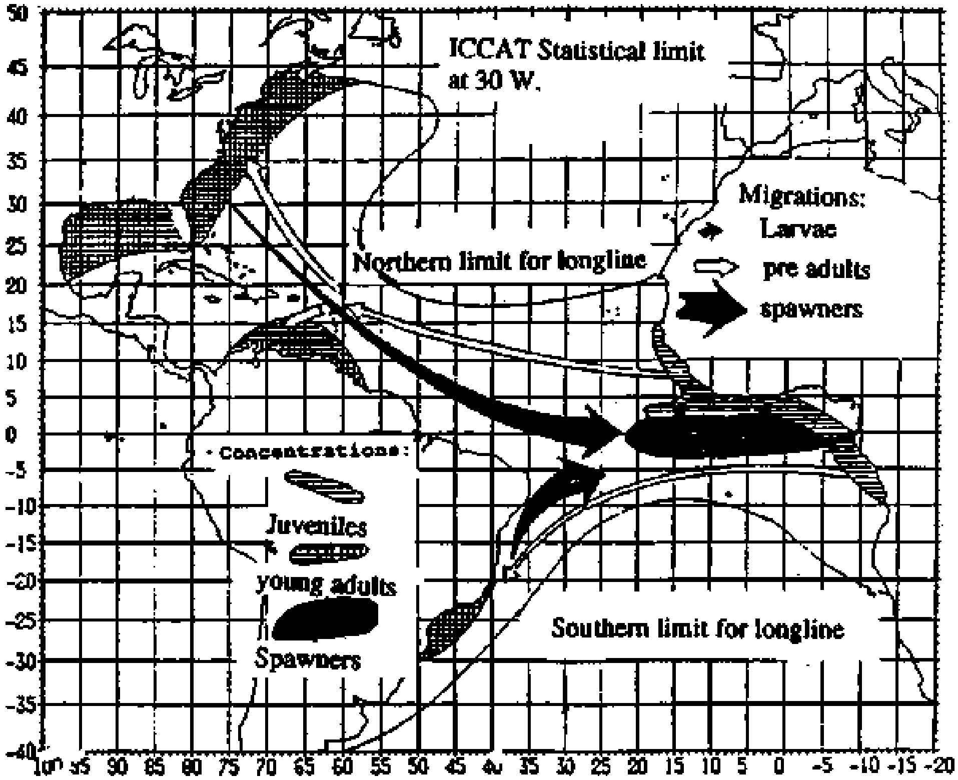

Figure 4. Distribution of different life-history phases of the yellowfin tuna (*Tunnus albacares*) in the Atlantic Ocean. Reproduced from Fonteneau and Soubrier (1995).

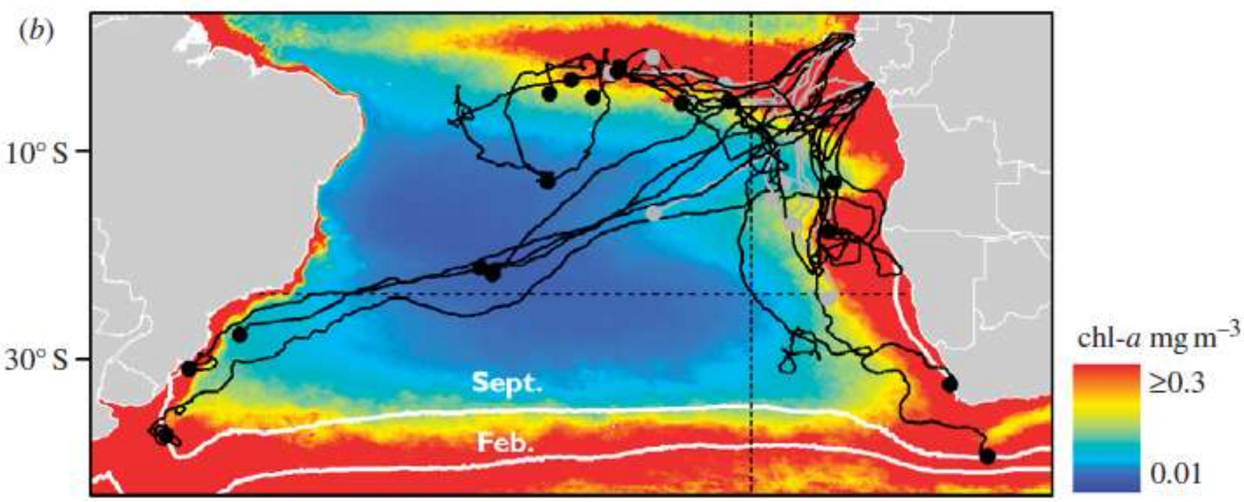

Figure 5. Movements of leatherback turtles with respect to mean annual chlorophyll-a distribution in the Atlantic Ocean. Reproduced from Witt et al. (2011).

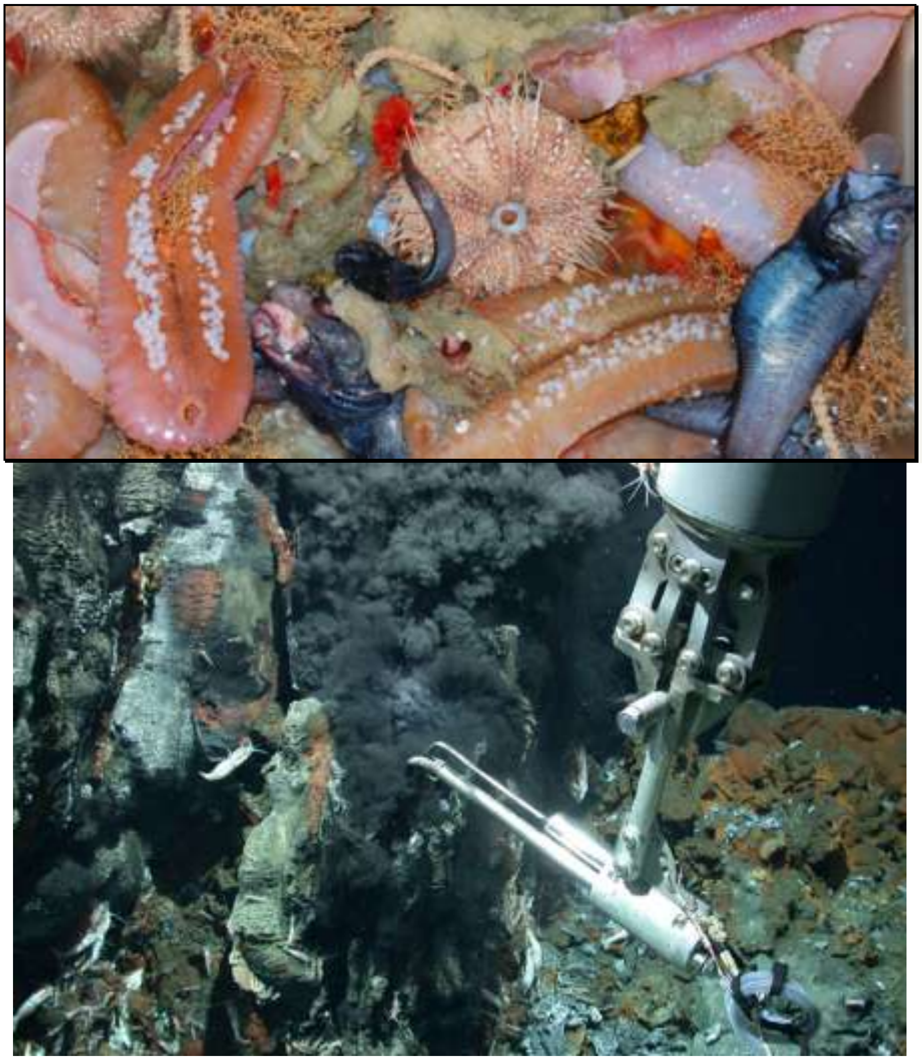

Figure 6. Megabenthos catch obtained on the Romanche Fracture Zone (upper panel) (photograph André Barreto, UNIVALI) and a black smoker from one of the world's hottest hydrothermal vents discovered in the southern Mid-Atlantic Ridge (lower panel) (from http://www.noc.soton.ac.uk/chess/, image courtesy of A. Koschinsky, Uni. Bremen)

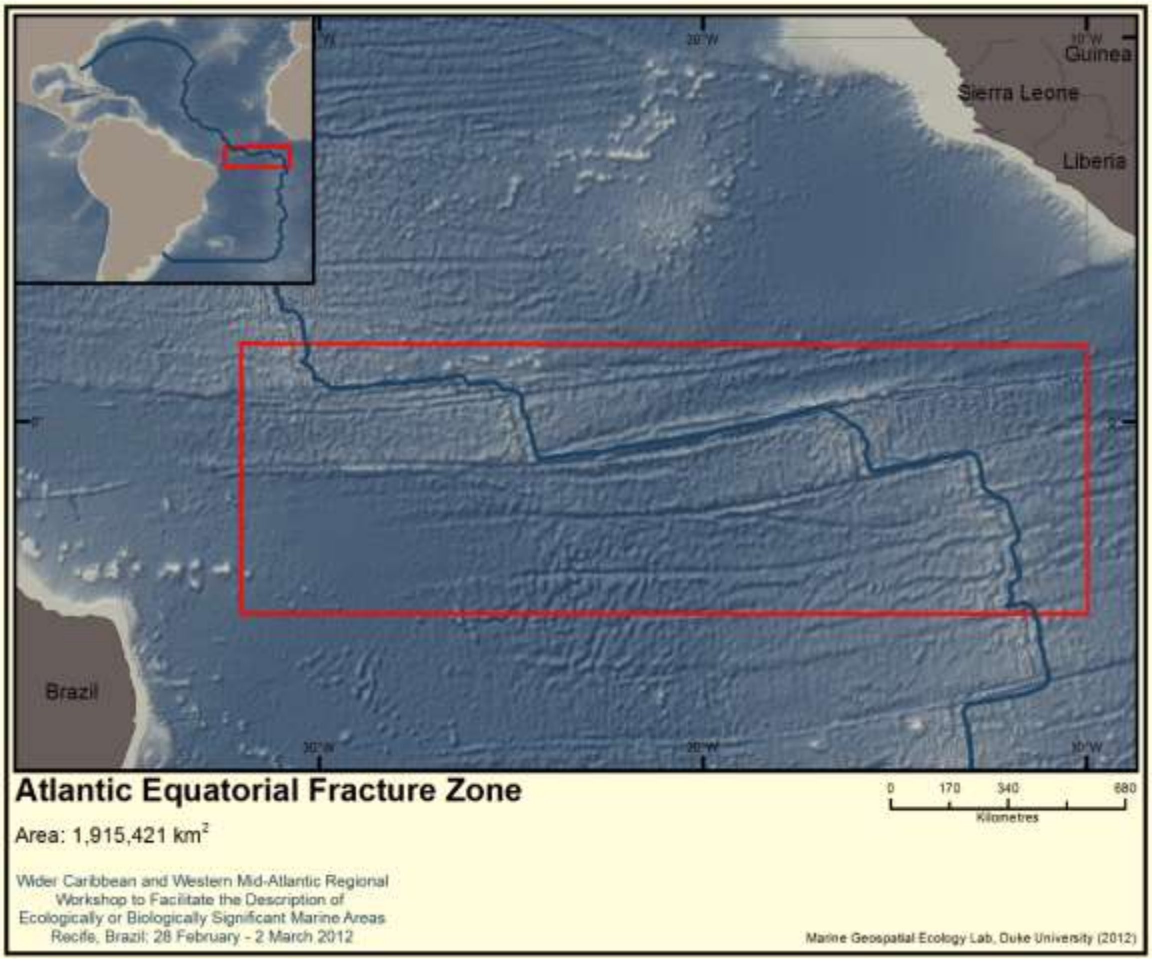

Figure 7. Area meeting EBSA criteria (no. 20)

Area No. 21: Abrolhos Bank and Vitória-Trindade Chain

Abstract

The Abrolhos Region is an enlargement of the Brazilian continental shelf located on the eastern shore of Brazil, in the southern part of Bahia and northern part of Espírito Santo states. It comprises the Abrolhos and Royal Charlotte banks, an area of 56.000 km^2. It harbours the highest marine biodiversity in the South Atlantic, the largest coral reefs in Brazil, and relatively large populations of several endemic and endangered marine species. It presents a mosaic of different habitats, like mangroves, seagrasses meadows, rhodolith beds, submerged and emergent reefs, and a group of small volcanic islands. Abrolhos also has unique biological formations, such as the large mushroom-shaped reef formations – “chapeirões”, and unique geological formations, such as the “buracas” – distinctive depressions in the shelf plain (up to 20 metres deep and 70 metres wide). The region is an important breeding and/or fishing site for several flagship species, such as humpback whales, sea turtles and seabirds. Despite the biological relevance and uniqueness of this region, only 7% of it is within effective protected areas. Several factors put this great diversity in danger, such as large projects related to oil and cellulose.

The Vitória Trindade Chain, located on the central coast of Brazil, is composed of seven seamounts and an island complex (Archipelago of Trinidad and Martin Vaz). The substrate of the mountains and ocean islands is composed of living reefs of coralline algae, on which is also observed the presence of different species of corals, sponges and algae. The mountains and islands have a fauna of reef fish that is still preserved, with a significant biomass and abundance of species, harbouring many sharks and spawning aggregation phenomena of important fishery resources. Moreover, the fish fauna of the Vitória e Trindade Chain has at least 11 endemic species on their reefs. Also, this area is the only breeding site for three endemic populations of seabirds, the Trindade Petrel (*Pterodroma arminjoniana*), the Atlantic Lesser Frigatebird (*Fregata minor nicolli*), and the Atlantic Greater Frigatebird (*Fregata ariel trinitiatis*). In the meantime, this environment can be considered high in uniqueness, importance for the life cycle of many species, important for endangered species, highly sensitive, high in biological productivity, and relatively well kept. Despite all this wealth and uniqueness, the increase in fishing effort, which has already caused extinctions of species in several other Brazilian islands and now focuses on this area, threatens sharks and other large carnivores. The threat scenario raises the need for protection of the natural environment and is recognized by the Brazilian government as an extremely important priority area for biodiversity conservation.

Introduction

The Abrolhos Region (56,000 km²) is a mosaic of marine and coastal ecosystems that encompasses the largest reef area and the highest marine biodiversity in the southern Atlantic, harbouring a wealth of endemic and IUCN Red List marine species (Dutra et al. 2005). The unique *chapeirão* reefs in Abrolhos consists of mushroom-shaped pinnacles, built predominantly by Brazilian endemic species, covered with fans of fire coral and round knobs of brain corals (Leão et al. 2003). Many commercially valuable species of reef fish can be found in the region, including several threatened fish species (Francini-Filho and Moura, 2008).

The Abrolhos Bank is the main breeding ground for humpback whales in the western South Atlantic Ocean (Martins et al., 2001; Andriolo et al. 2010). Three species of small cetaceans (guiana dolphin, rough-toothed dolphin and bottlenose dolphin) use the Abrolhos Bank for feeding and breeding throughout the year (Rossi-Santos et al. 2006). It is important to note that Abrolhos Bank constitutes the only site where the guiana dolphin occurs offshore. The southern right whale, a species listed as Endangered, also uses the Abrolhos Bank for breeding and calving (Engel et al. 1997). The Abrolhos Archipelago is also an important nesting site for marine birds, including the red-billed tropicbird (*Phaethon aethereus)*, the boobies *Sula dactylatra* and *Sula leucogaster*, the magnificient frigatebird (*Fregata magnificens)* and the migratory brown noddy (*Anous stolidus),* as well as three IUCN Red List marine turtle species: the Endangered green (*Chelonia mydas*) and loggerhead (*Caretta caretta*) turtles, and the Critically Endangered hawksbill turtle (*Eretmochelys imbricata*).

The Abrolhos ecosystems are threatened by overfishing, climate change effects, and sedimentation (a result of coastal deforestation). Shrimp farming, and oil and gas exploitation are also threats, but they are fortunately not installed in the region, due to conservation efforts. Halting of illegal fishing in the region is one key challenge, as official enforcement is compromised by a lack of continuous government funding. The endemism and diversity of Abrolhos, combined with growing environmental threats, make Abrolhos a national and global priority for marine conservation. The area is also considered by the Brazilian government to be of "Extreme Biological Importance" because of its unique coral reefs and many threatened species (MMA 2002). Due to these characteristics the Abrolhos region was included in the limits of the Atlantic Forest Biosphere Reserve, and the Abrolhos National Marine Park is now a Ramsar site, which are important international recognitions for its protection.

At 20° S latitude of the Western Atlantic is a chain of seamounts called Vitória-Trindade Chain (CVT). This chain starts 150 km from the coast and extends for 1,200 km to the islands of Trindade and Martin Vaz archipelago. In the islands, seven hills make up the chain, and all have volcanic origin, dating between 0.7 and 10 million years (Cordani, 1970, Fodor & Hanan, 2000; Almeida, 2006). The bases of the mountains and islands are up to 5,000 m deep, with some hills reaching a few metres below the surface. The chain acts as a barrier to underwater ocean currents, which contributes to the occurrence of oceanographic phenomena such as upwellings and eddies (Schimit et al., 1995). The Trindade and Martin Vaz Archipelago is a breeding site for seven species of seabirds, including the endemic trindade petrel (*Pterodroma arminjoniana),* and the endemic frigatebirds *Fregata ariel trinitiatis* and the *Fregata ariel nicolli* (Fonseca-Net 2004).

The substrate of the mountains and ocean islands is composed of calcareous algae reefs (Pereira Filho et al., 2012, Pinheiro et al., 2011) in constant growth, where the presence of different species of corals, sponges and algae are also observed. In the islands, another commonly found underwater landscape consists of rocky reefs composed of boulders and blocks of volcanic rock that broke off from the islands (Pereira Filho et al. 2011, Pinheiro et al., 2011).

The green turtle (*Chelonia mydas*) rookery on Trindade Island, is the seventh-largest nesting colony of green turtles in the Atlantic (Almeida et al. 2011).

Location

The Abrolhos Region is composed of two marine banks: Abrolhos and Royal Charlotte. The Abrolhos Bank is located in the southern part of of Bahia and the northern part of of Espírito Santo states. The continental shelf extends up to 200km off the coastline, in front of Caravelas municipality. Its northern limit is the municipality of Prado (latitude: 16◦40’S) and the southern is the Doce River (19◦40’S). It has an extension of 409km of coastline, 257 in Bahia State and 152km in Espírito Santo State.

The Royal Charlote Bank is located in the north of the Abrolhos Bank, between the municipality of Prado (16◦40’S), and the Jequitinhonha River in the north (15◦50’S). Its area is about 10,000km², and the surface a plain with some channels 30 to 40 metres deep (Marchioro et al. 2005).

Trindade Island (20°31'S, 29°19'W), along with Martin Vaz Archipelago (20°30'S, 28° 51'W) is the easternmost portion of the Brazilian territory. These points are located at the eastern end of a chain of seven seamounts, called Chain Vitoria Trindade (CVT) (Figure 1), which is more than 1000 km long (latitudes 19° and 21°S). The distances between the hills ranges from 50 to 250km from each other, achieving minimum depths around 20 and 85m from the surface. The mountains and islands are of volcanic origin, the most recent having estimated ages from 0.7 to 10 million years (Cordani, 1970, Fodor & Hanan, 2000; Almeida, 2006). The main island (Martin Vaz) is 600 m in length and 175 at its highest point, while the islands north and south are much smaller, and located 200 m and 1,200 m respectively from the main island (Luigi et al. 2009). The hills located at the ends of the chain are within the EEZ of Brazil, however, several hills are outside Brazilian jurisdiction, in international waters.

Feature description of the proposed area

Abrolhos Bank is a mosaic of different habitats, such as mangroves, coral reefs, rhodolith beds and oceanic islands, concentrating a high biodiversity, consequently very vulnerable. Abrolhos Bank is a unique reef ecosystem with relatively turbid waters, under strong coastal/riverine influence. This reef complex is considered the largest and biologically richest coral reef area in the South Atlantic Ocean (Dutra et al. 2005). The total annual $CaCO_3$ production by mesophotic Abrolhos rhodolith beds is comparable to that of the largest biogenic $CaCO_3$ deposits in the world. The gigantic $CaCO_3$ bio-factory reported from the Abrolhos Shelf accounts for approximately 5% of the world’s total carbonate banks. These gigantic rhodolith beds, of areal extent equivalent to the Great Barrier Reef, Australia are a critical, yet poorly understood component of the tropical South Atlantic Ocean (Amado Filho et al., in press).

The expansion of the continental shelf is an exception in the Brazilian coast. This region is formed by submersed banks of the Vitória-Trindade and Abrolhos chains, leading to a deviation in the Brazilian current, disturbing the vertical stratification, bringing deep water to the surface. This leads to enrichment of the water and explains the abundance of fishery resources (MMA, 2010).

The complex topography derived from the intense volcanic activity and tectonic fault line that forms a sequence of underwater mountains named Vitoria Trindade chain, represents an important geomorphological feature in the South Atlantic Ocean to maintain biodiversity and fish stocks of south-eastern Brazil. The isolation and distance from the coast provide these islands with the presence of highly abundant, endemic natural fish communities. Recent research has discovered about 12 new fish species endemic to the shallow waters of Trinidad and Martin Vaz.

The substrate of the mountains and ocean islands is composed of living reefs of coralline algae (Pereira Filho et al., 2012, Pinheiro et al., 2011), in which is also observed the presence of different species of corals, sponges and macroalgae. In the islands, another commonly found underwater landscape is rocky reefs, formed by boulders and blocks of volcanic rock that broke off the coasts of the islands (Pinheiro et al., 2011). The visibility of the water varies from around 50m and the temperature between 25 and 28°C. The fauna of reef fish on the island of Trindade is preserved and has a large biomass, a high abundance of species (Pereira Filho et al., 2011, Pinheiro et al., 2011) andlarge populations (Floeter & Gasparini, 2001; Pike et al., 2009; Simon et al., submitted).

The Vitória Trindade chain also hosts a large number of shark speciess (Repinaldo Son, 2011), related to a spawning aggregation of many commercial species (Agnaldo S. Martins, personal communication). Moreover, the fish fauna of the Vitoria Trindade chain has at least 11 endemic species on its reefs (Floeter & Gasparini, 2001, Pinheiro et al., 2009, Simon et al., Submitted), and recently described new species of parrot fish, soap fish, maidens, and others. Despite all this wealth and uniqueness, the increasing overfishing has threatened shark species and large carnivores (Pinheiro et al., 2010, Pinheiro et al., 2011) and, as occurred in other Brazilian islands, there is a risk of extintion of locally important species (Luiz & Edwards, 2011).

Feature condition and future outlook of the proposed area

There is good background information regarding the region's habitats and biodiversity, but there are still important knowledge gaps to be covered. One example is the "buracas", unique formations recently described by science (Moura et al. in prep.). In 2012 a new expedition will take place to investigate additional aspects of these areas, coordinated by Conservation International in partnership with the Rede Abrolhos research group (supported by MCT/CNPq, FAPES and Waitt Family Foundation).

Overfishing is causing general losses in fish biomass and potentially threatening biodiversity. The present MPA network and the former fisheries management approaches have not proven adequate to maintain the sustainable use of these resources. Aiming to change this scenario, an effort from the Brazilian Government in partnership with NGOs (i.e., Conservation International, Instituto Baleia Jubarte, SOS Mata Atlântica, Greenpeace) and universities (UEM, UESC, UFPB, UFES, UFRJ, JBRJ, USP) is advancing in Systematic Conservation Planning Process for expanding the Abrolhos MPA Network during the coming years.

Despite its unique characteristics, the Vitória Trindade chain is largely located outside Brazil's EEZ (200 nautical miles from shore), and has been targeted by industrial longline and bottom line fishing, without proper planning, since there are reports of an apparent decline in catches of sharks and large groupers. In addition, there are reports of foreign fishing vessels surrounding shoals and dragging the tops of seamounts, which can destroy in a few hours biogenic formations that took thousands of years to form. This type of fishing, when there is no control, can cause, in a few years, stock collapses of top predators such as sharks, which are responsible for controlling the population of other species. With this ecological balance compromised, the entire aggregate reef ecosystems and biodiversity are threatened: more opportunistic species increase, whereas species with more specific ecological niches decline. Trindade Island and mountains are considered a priority area of extremely high importance for biodiversity conservation, with a priority for the creation of spatial fishing and fishing exclusion areas (MMA, 2010).

Since 1957, the archipelago has hosted an oceanographic tour in Trindade island (POIT), staffed continuously by more than 30 military personnel. Thus, the participation of the Brazilian Navy is a key partner for the storage and maintenance of this island and is currently involved in a programme to promote research, called Pró-Trindade.

Another recent major initiative of the Board Sea Biosphere Reserve of the Atlantic Forest (RBMA) was the creation of the Working Group to connect Abrolhos and Trindade, with members from various governmental and non-governmental organizations that will focus on joint efforts to strengthen, plan and execute strategic actions aiming to increase the protection, conservation, sustainable use of the region's resources.

Assessment of the area against CBD EBSA Criteria

CBD EBSA Criteria (Annex I to decision IX/20)	**Description** (Annex I to decision IX/20)	**Ranking of criterion relevance** (please mark one column with an X)			
		Don't Know	**Low**	**Some**	**High**
Uniqueness or rarity	Area contains either (i) unique ("the only one of its kind"), rare (occurs only in few locations) or endemic species, populations or communities, and/or (ii) unique, rare or distinct, habitats or ecosystems; and/or (iii) unique or unusual geomorphological or oceanographic features				**X**

Explanation for ranking:

- The Abrolhos Region has unique mushroom-shaped reef formations (*chapeirões*) – up to 50 metres wide, and 25 metres high – Leão et al. 2003
- The Abrolhos Region has unique circular-shaped depression in the marine shelf ("buracas") – up to 70 metres wide and 20 metres deep – Moura et al. (submitted)
- Largest rhodolith (calcareous algae) in the world – (20,904 km^2 – Amado Filho et al., in press, Moura et al. submitted.)
- Largest coral reefs in the Southern Atlantic (8,844 km^2 – Moura et al.submitted)
- Large populations of endemic species: *Mussismilia braziliensis* (endemic to Bahia and Espírito Santo – Leão et al. 2003, probably more than 90% of the population in Abrolhos); and *Favia leptophylla* (endemic to Bahia State, Espírito Santo State and Parcel de Manoel Luiz – Leão at al. 2003)
- The seamounts in this region are important geomorphological features to the pattern of ocean circulation, and the point of separation of the Brazil Current, with a number of associated meso-scale oceanographic phenomena, such as upwellings and eddies.
- There are a least eleven endemic reef fish species at Vitória Trindade Chain.
- Several species of shallow-water fishes.
- Along the River Sweet is the greatest diversity of octocorals on the central coast of Brazil in all ranges of depth (100 to 1000m) (Castro et al., 2006).
- The Trindade and Martim Vaz Archipelago contains three endemic populations of seabirds: the Trindade Petrel *Pterodroma arminjoniana*, and the sub-species of Lesser Frigatebird *Fregata arieltrinitiatis* and Greater Frigatebird *Fregata minornicolli*.
- The Trindade Petrel *P. arminjonia* can be considered endemic to Trindade and Martin Vaz Archipelago (Birdlife 2012). Despite one of the Pterodroma petrels breeding on Round Island, Mauritus, in the Indian Ocean, being considered as *P. arminjoniana*, there is much uncertainty about this, given the close affinities of *P. neglecta*, *P. heraldic* and *P. arminjoniana*, three species assumed to occur on Round Island (Brooke et al. 2004). In addition, the two widely separated breeding populations may warranty specific status (Onley & Scofield 2007).
- Despite the presence of lesser and the greater frigatebirds throughout the tropical waters of the Indian and Pacific oceans, the Atlantic races *F. minor nicolli* and *F. ariel trinitatis* are definitely isolated from the indo-pacific races, and are endemic from Trindade and Martin Vaz Archipelago (Birdlife 2012, Harrison 1983). Given the strongly spatial segregation from the indo-pacific frigatebirds, the taxonomic status of the Atlantic races could change in the future from sub-species to true species (Luigi et al. 2009).

Special importance for life-history stages of species	Areas that are required for a population to survive and thrive.				X

Explanation for ranking

- The occurrence of large colonies of coral reef builders, such as *Montastraea cavernosa*, occuring up to 200 m depth, supports the hypothesis that the Vitória-Trindade Chain was a refuge area for the Tertiary shallow coral reefs builders, harbouring populations of these species during sea level regressions (Castro et al., 2006).
- The Abrolhos Bank corresponds to the main breeding concentration of humpback whales (Megaptera novaeangliae) in the western South Atlantic Ocean (Martins et al., 2001; Andriolo et al., 2010) with nearly 80%-85% of the population occurring in this region. In addition, the southern portion of the Bank and the western end of the Vitoria-Trindade chain include the only known pre-migratory habitats for humpback whales (Zerbini et al., 2006; in press a).
- The Abrolhos Bank is the only known site of occurrence of guiana dolphin (*Sotalia guianensis*) further offshore (50nm) than the typical range of the species (Rossi-Santos et al. 2006).
- Area important for commercial fish species for long life cycle
- Thus, is a very important site of fish reproductive aggregation.
- Sustain high biomass and high functional diversity of herbivorous reef fishes, key species in reef systems.
- The Archipelago of Trindade and Martin Vaz and the Abrolhos Archipelago, as a whole, represents breeding and foraging sites for ten seabird species: *Sula leucogaster*, *Sula dactylatra*, *Phaeton aethereus*, *Fregata magnificens*, *Fregata ariel*, *Fregata minor*, *Anous stolidus* and *Onychoprion fuscatus*. Of these, *Anous stolidus* and *Phaeton aethereus* have their largest colonies in Brazil at Abrolhos Archipelago (Soares et al. 2000, Fonseca-Neto 2004, Alves et al. 2004).
- This area also comprises important foraging grounds (e.g. Abrolhos Bank) and migratory paths (e.g. Vitória-trindade Seamount Chain) for adult hawksbills (Marcovaldi et al. in press). Inter-nesting and breeding habitats for adult leatherbacks (Almeida et al. 2011a), migratory paths and high-use areas for non-breeding adults (Lopez-Mendilaharsu et al. 2009, Fosette et al. 2010). Additionally the island of Trindade and adjacent waters host one of the major green turtle breeding grounds in the Atlantic (Almeida et al. 2011b).
- The Trindade and Martim Vaz archipelago and adjacent waters are crucial for the survival of the endemic Trindade Petrel as well as the Atlantic races of lesser and greater frigatebirds.
- The Trindade Petrel breeds exclusively at Trindade Island, where the breeding populations were recently estimated in 1.130 pairs (Luigi et al. 2009). As other procellariiforms, Trindade Petrels show a very pelagic habit, using Trindade Island only as breeding site. The oceanic distribution of Trindade Petrel remains poorly known. Vagrants can be found within a wide range, from Azores to South Georgia (Luigi et al. 2009), and according to Patteson & Brinkley (2004), the Trindade Petrel occurs regularly on waters off North Carolina, especially between May and September. However, the distribution maps found in field guides and species factsheets (Harrison 1983, Onley & Scofield 2007, Birdlife 2012) suggests the oceanic waters of the South-west Atlantic as the area of regular occurrence of the species. In fact, recent data provided by Leandro Bugoni available at the Birdlife Global Procellariiform Tracking Database (www.birdlife.org/community/2010/09/the-global-procellariiform-tracking-database), shows that 26 breeding Trindade Petrels tracked by geolocators forages manily south of Trindade and Martin Vaz archipelago, with great concentration of points in the Rio Grande Rise and north of it.
- The Atlantic races of lesser and greater frigatebirds occurs exclusively on Trindade Island, and both taxa are sedentary, foraging manly around the islands. Despite both species having been reported breeding on Trindade Island from the 1970s to 90s, there are no recent records of reproduction there. In 1975 there were colonies of great frigatebirds, with 15 pairs in Trindade Island, and the total

population in was estimated at 50 birds.
- The last reports of reproduction of greater and lesser frigatebirds at Trindade date from 1987 to 1992, and the sights of these species are limited to flying birds.
- The Vitória-Trindade Chain is also a passage region used by *Puffinus puffinus* and *Calonectris borealis* during their transequatorial migration (Onley & Scofield 2006).
- High diversity of malacofauna in the Abrolhos region and Vitoria-Trindade chain, with endemism estimated at 15% in this area (Absalão et al., 2006).

Importance for threatened, endangered or declining species and/or habitats	Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.				**X**

Explanation for ranking
- The Vitória-Trindade Chains harbours at least 35 fish species considered threatened by the IUCN Red List or Brazilian red list (endangered or risk of overexploitation)
- *Scarus trispinosus*: endangered following IUCN criteria: represents 28% of total fish biomass in Abrolhos, and has shown 50% decline in the past five years (Francini-Filho and Moura 2008). This reef fish species is endemic to Brazil, and the majority of its population seems to be in Abrolhos (where the majority of the Brazilian coral reefs are).
- *Megaptera novaeangliae*: the Brazilian population of the species was reduced to less than 5% of its pre-exploitation size (Zerbini et al. in press b) and despite its current recovery is still relatively low (32%) compared to the population size before whaling. According to the National Action Plan for Aquatic Mammals (ICMBIO 2011) the humpback whale is still listed as vulnerable by the government of Brazil and demands the conservation of its habitat to maintain the recovery process.
- One of the major coral reef builder endemic to Bahia and Abrolhos Bank (*Mussismilia braziliensis*) was recently included in the Brazilian Endangerous Species List and classified as Vulnerable. Other species (*Mussismilia hartttii*) also endemic to Brazil were also included on the list. The region still harbours populations of giant anemones (*Condylactis gigantea*), which are also on the list and is functionally extinct in other areas of the Brazilian coast.
- The Trindade petrel *Pterodroma arminjonianais* listed as "Vulnerable" by both Global (IUCN 2012) and National (Silveira & Straube 2006) red lists. The Trindade petrel has a very small breeding range and population on Martin Vaz. An unidentifed Pterodroma species breeding on Round Island in the Indian Ocean may refer to this species. If so, the species would require re-evaluation of its status.
- The lesser and greater frigatebirds are listed as "Least Concern" by the Global Red List (IUCN 2012), but considered "Critically Endangered" on the nactonal Red List (Silveira & Straube 2006). This discrepancy occurs because the IUCN did not consider the sub-species. These both endemic sub-species of frigatebirds, which suffered drastic population reduction and have no record of reproduction, are the two most threatened seabirds of the tropical South Atlantic (Fonseca Neto 2004)
- Occurrence (e.g. breeding and foraging grounds) of leatherbacks (*Dermochelys coriacea*), hawksbills (*Eretmochelys imbricate*) and green turtles (*Chelonia mydas*).
- *D. coriacea* and *E imbricata* listed both as Critically Endangered by global and national red lists (IUCN 2011, Almeida et al. 2011c, Marcovaldi et al. 2011), and *C. mydas* listed as Endangered by the IUCN (2011) and as Vulnerable by the national red list (Almeida et al. 2011d).

Vulnerability, fragility,	Areas that contain a relatively high proportion of sensitive habitats, biotopes or species that are				**X**

<table>
<tr><td>sensitivity, or slow recovery</td><td>functionally fragile (highly susceptible to degradation or depletion by human activity or by natural events) or with slow recovery.</td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="6">Explanation for ranking
• The coral reefs are fragile habitats, vulnerable to a range of threats, such as overfishing, sedimentation, and climate change. Recovery can be expected to be slow.
• Mangroves and coral reefs are also extremely vulnerable to oil spill effects.
• Presence of deep coral habitats
• The region has many indications of fish-spawning aggregation
• Due to their distance far from the continent, the seamounts and oceanic islands are isolated environments and haven’t had normal biological connectivity with the populations of the shore. This feature reduces the resilience of the populations, leaving them more fragile.
• The three endemic populations of seabirds from Trindade Island are very sensitivity to human perturbation, especially at the breeding sites. The deforestation of Trindade Island and the introduction of goats, which contributed to this process, plus the introduction of predators (cats and rats), are the causes of the drastic population decline of the Trindade petrel, and the lesser and greater frigatebirds, as well as many other seabirds and landbirds that inhabitTrindade Island (Fonseca Neto 2004, Silveira & Straube 2006, Luigi et al. 2009).
• For the frigate birds, the military activities, especially the helicopter activities and target practice against the cliffs, may be important causes of disturbance that affect breeding activities.</td></tr>
<tr><td>Biological productivity</td><td>Area containing species, populations or communities with comparatively higher natural biological productivity.</td><td></td><td></td><td>X</td><td></td></tr>
<tr><td colspan="6">Explanation for ranking
• Some areas of comparatively high biological productivity are described in the region, including: the northern parts of the Abrolhos and Royal Charlotte Banks, where permanent upwelling systems seem to occur, and the southern part of the Abrolhos Bank, where a seasonal upwelling system seems to occur (“Giro de Vitória”)(Gaeta et al., 1999, Campos et al., 2000;, Nonaka et al., 2000, Schimidt et al., 1995; Signorini, 1978)
• The region harbours one of the most productive fisheries in northeastern Brazil.</td></tr>
<tr><td>Biological diversity</td><td>Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td colspan="6">Explanation for ranking
• The Abrolhos Region is considered to have the highest level of marine biodiversity in the Southern Atlantic (Werner et al. 2000, Dutra et al. 2005), and diversity of habitats is one of the reasons for this. The region has a high diversity of marine and coastal habitats, including different coral reef formations (e.g.chapeirões, platform reefs, fringe reefs, mesophotic reefs), rhodolith banks, muddy and sediment bottoms, seagrasses, estuaries, mangroves, beaches.
• Area of greatest coral species richness in Brazil (shallow and deep)
• Area of bird species richness.
• Presence of many endemic species of reef fish.
• The oceanic islands (Trindade and Martin Vaz) have one of the higher levels of diversity of reef fish species of all oceanic islands of South Atlantic, and a high number of endemic species.
• High diversity of malacofauna in the Abrolhos region and Vitoria-Trindade chain, withendemism estimated at 15% in this area (Absalão et al., 2006).</td></tr>
<tr><td>Naturalness</td><td>Area with a comparatively higher degree of naturalness as a result of the lack of or low level of human-induced disturbance or degradation.</td><td></td><td></td><td>X</td><td></td></tr>
<tr><td colspan="6">Explanation for ranking
• Part of the habitats in the eastern part of the region is relatively undegraded. It can be observed by the</td></tr>
</table>

high fish biomass still observed in these areas (Francini-Filho and Moura, 2008).
Trindade and the chain have a high biomass of reef fishes, which is considered preserved. However, fishing activities already threatened its fauna, mainly sharks and big grouper species.

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Map

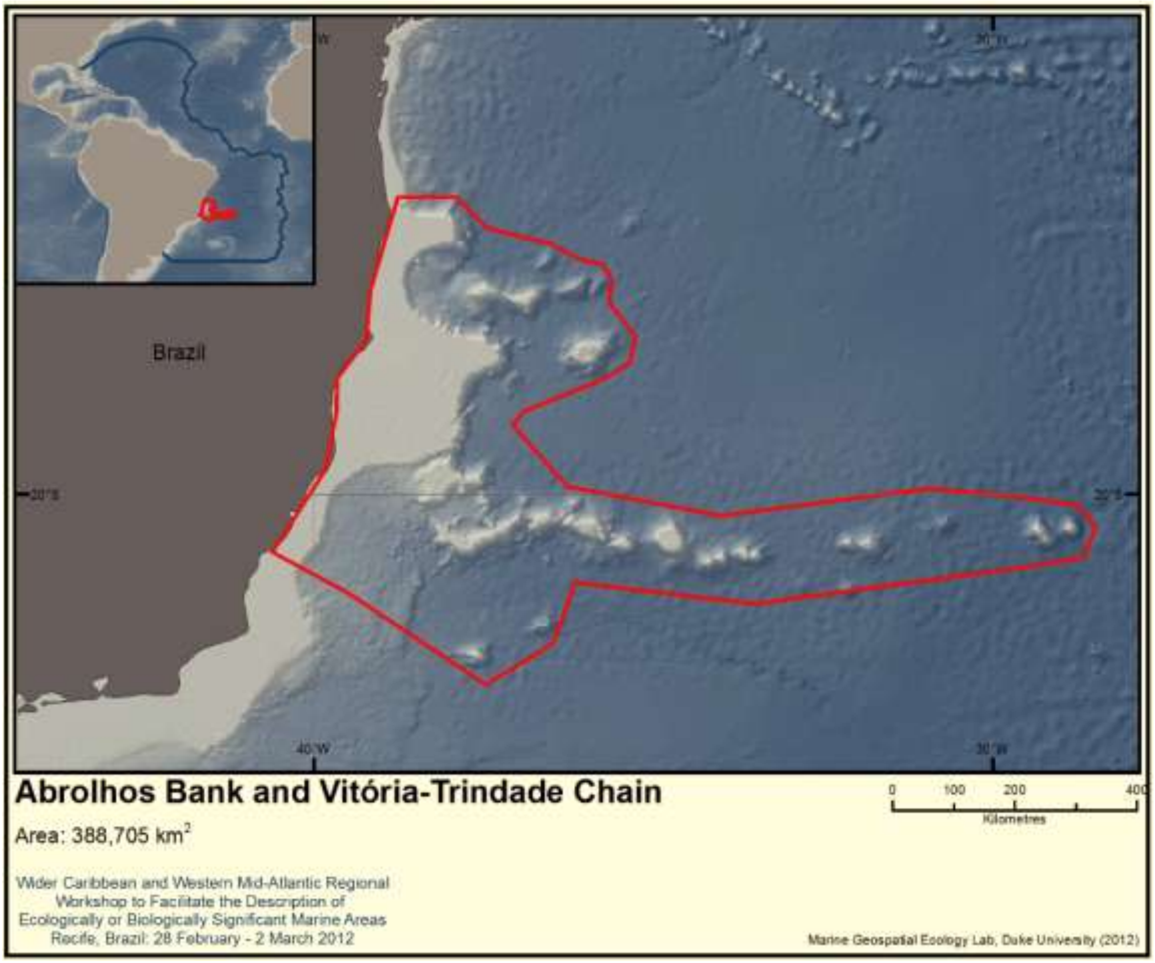

Figure 1. Area meeting EBSA criteria (no. 21)

Area No 22: Southern Brazilian Sea

Abstract

The Southern Brazilian Sea area is a region characterized by marked oceanographic complexity and high biological productivity, comprising the continental shelf, the slope and deep waters off southern Brazil, from the shoreline up to the 4000 m isobath. This area is strongly influenced by the Brazil and the Malvinas (Falklands) currents, which converge between approximately 32° and 40° S, giving rise to the Subtropical Convergence in the Southwestern Atlantic, and characterizing it as a biogeographic transition zone between the large neritic areas of Patagonia and tropical Brazil. Due to its high biological productivity, industrial fishing effort has been concentrated here, which had resulted in an overexploitation of several fisheries stocks, some of which collapsed, as well as high bycatch, including several endangered species of cetaceans, seabirds, fishes and marine turtles.

Introduction

The Southern Brazilian Sea area is a region characterized by marked oceanographic complexity and high biological productivity, comprising the continental shelf, the slope and deep waters off southern Brazil, from the shoreline up to the 4000 m isobath. This area is strongly influenced by the Brazil and the Malvinas (Falklands) currents, which converge between approximately 32° and 40° S, giving rise to the Subtropical Convergence in the Southwestern Atlantic (Seeliger & Odebrecht 1997). The marked seasonal latitudinal displacement of the Convergence characterizes the southern Brazilian continental shelf and slope regions as a biogeographic transition zone between the large neritic areas of Patagonia and tropical Brazil (Castello *et al.* 1997).

Interactions between the Subtropical Convergence, continental runoff from the La Plata River (Argentina/Uruguay) and Patos Lagoon, and topographic features favours high biological productivity and makes this region an important reproduction, nursery and feeding ground for pelagic and demersal fish stocks (Seeliger & Odebrecht 1997, Madureira et al. 2005, Rossi-Wongtschowski & Madureira 2006) and a crucial feeding ground for threatened cetacean, seabird and marine turtle species (Pinedo 1997, Neves et al. 2006, Zerbini et al. 2004, Bastida et al. 2007, Barros 2010, Proietti et al. 2012). The area is also the main breeding ground for the endangered southern right whale (*Eubalaena australis*) in Brazil (Greig et al. 2001). Due to this high biological productivity, industrial fishing effort has been concentrated here, resulting in an overexploitation of several fishery stocks, some to their collapse, as well as high bycatch, including endangered species of cetaceans (e.g. the franciscana dolphin), seabirds (e.g. wandering albatross), marine turtles (e.g. green, loggerhead and leatherback sea turtles), fishes (e.g. wreckfish) and sharks (e.g. soupfin shark, angelfish, Brazilian guitarfish) (Haimovici et al. 1997, Neves & Olmos 1998, Cornish and Peres 2003, Vooren & Klippel 2005, Cergole et al. 2006, Secchi et al. 2003, Marcovaldi et al. 2006, Neves et al. 2007, Secchi, 2010, Cardoso et al. 2011, Fiedler et al. in press).

This area has been widely studied for at least 40 years through oceanographic and fisheries research by universities and NGOs.

Location

The Southern Brazilian Sea area extends from Chuí (Brazil-Uruguay boundary) (*ca*. 34°S) to the proximity of the Santa Marta Grande Cape (Santa Catarina State) (ca. 29°S). The western and eastern limits are the shoreline (ca. 53°W) and the 4000 m isobath (ca. 39°W), respectively. Approximately half of this area falls within the Brazilian EEZ, and part of it is subject to a submission to the Commission on the Limits of the Continental Shelf (Figure 1).

Feature description of the proposed area

The gently sloping continental shelf between Santa Marta Grande Cape and Chuí is 100 to180 km wide and reaches its largest extension between 31° and 33° S. Remnant valleys of ancient channels typically cut the shelf in this region. The transition between shelf and upper slope starts at 160 to 190 m deep. The slope is considerably wide—up to 250 km near Santa Marta Grande Cape. In some areas it drops gradually to approximately 3000 m, while in others the break is more abrupt. Canyons and seamounts occur in some sectors of the slope (Calliari 1997, Figueiredo Jr. & Madureira 2006). The sedimentation pattern of the shelf and slope is predominantly terrigenous, based on sand/silt/clay components (Calliari 1997, Figueiredo Jr. & Madureira, 2006).

Coastal and shelf break upwelling of deep subtropical water is frequent in the spring/summer and winter/spring, respectively. The influence of subantarctic waters is greatest in the winter, and of the tropical waters in the summer. However, waters of subantacrtic origin may also rise during the summer along the southernmost shelf break regions. Freshwater runoff from the La Plata River and the Patos Lagoon become important in the winter and spring (Castello et al. 1997, Garcia 1997). Interactions between the oligotrophic Brazil Current, the nutrient-rich waters of the Malvinas (Falklands) Current, and continental runoff make the region important nursery and feeding areas as well as reproduction grounds for fishery stocks of subtropical and antarctic origin, which utilize the Brazil and Malvinas (Falklands) currents for long-distance transport (Seeliger & Odebrecht 1997).

The high productivity results in a considerable biomass of small pelagic fishes, and also highly productive, but now overexploited, demersal fish resources. On the slope and adjacent oceanic waters, during most of the year, the thermal front on the western side of the Subtropical Convergence provides suitable habitat for pelagic sharks, tuna and tuna-like fish (Castello et al. 1997), while on the bottom, between the 400 and 900 m isobath, there are continuous deep-sea coral reefs (Pires 2007).

Feature condition and future outlook of the proposed area

The Southern Brazilian Sea area is subjected to intense fishing pressure. In this region, around 700 industrial fishing vessels from Rio Grande (RS) and Itajaí (SC) provide 85% of the southern Brazil landings (Perez et al. 2001), accounting for approximately 26% of the total Brazilian catches (IBAMA/MMA, 2002). The remaining catches are provided by approximately 8,000 artisanal boats operating on coastal shallow waters or estuaries (Castello et al. 2011).

Trawl and gillnet fisheries on the continental shelf represent the major fishing effort in southern Brazil (Klippel et al. 2005). Demersal teleosts and elasmobranchs stocks were affected as a whole, and thus their abundance and diversity are at risk as a result of intense and unmanaged fishing (Haimovici et al. 1997). This scenario led to catches of most demersal stocks at unsustainable levels (Haimovici et al. 1997, Vasconcellos & Gasalla 2001, Castello et al. 2011) as well as several species threatened to extinction, such as the critically endangered elasmobranches *Rhinobatos horkelli* and *Mustelus fasciatus* (Vooren et al. 2005, Vooren & Klippel 2005, IUCN 2011).

Motivated by the overfishing of the main coastal resources, the Brazilian government induced a vessel-chartering programme in order to exploit the deep water of the shelf break (100-250 m) and slope (250-1000 m), centered between 19° and 34° S (Perez et al. 2003, 2009a). Foreign-chartered and national longliners, gillnetters, potters, and trawlers started to operate in Brazilian waters through the 2000s, mostly targeting demersal teleosts (*Lophyus gastrophysus*, *Merluccius hubbsi*, *Urophycis mystacea*, *Polyprion americanus*), squids (*Illex argentinus*), crabs (*Chaceon notialis, Chaceon ramosae*) and deep-water shrimps (family Aristeidae) (Perez et al. 2003, 2009a,b). Despite intensive data collection, the availability of timely stock assessments, and a formal participatory process for the discussion of management plans, deep-water stocks are already considered to be overexploited due to limitations of governance (Perez et al. 2009a).

Pelagic longliners, targeting swordfish, tunas and sharks, operate from the slope to the high seas off southern Brazil, including waters beyond the national jurisdiction, where Uruguayan pelagic longline fleets strongly increase the fishing effort (Neves et al. 2007, Jiménez et al. 2009). This extensive fishing effort has caused high bycatches of several endangered species of seabirds and turtles during the last twenty years (Bugoni et al. 2008, Bugoni et al. 2009, Bugoni et al. 2011, Marcovaldi et al. 2006, Sales et al. 2008, Pons et al. 2010)

The intense and unmanaged fishing effort on the coast and off southern Brazil is responsible for the high bycatch of magellanic penguins, as well as endangered albatrosses and petrels, marine turtles, and small cetacean species or populations (Neves & Olmos 1998, Secchi et al. 2003, Marcovaldi et al. 2006, Neves et al. 2007, Jiménez et al. 2009, Fruet et al. 2010, Secchi 2010, Cardoso et al. 2011, Fiedler et al. in press).

Assessment of the area against CBD EBSA Criteria

<table>
<tr><td>CBD EBSA Criteria
(Annex I to decision IX/20)</td><td>Description
(Annex I to decision IX/20)</td><td colspan="4">Ranking of criterion relevance
(please mark one column with an X)</td></tr>
<tr><td></td><td></td><td>Don’t Know</td><td>Low</td><td>Some</td><td>High</td></tr>
<tr><td>Uniqueness or rarity</td><td>Area contains either (i) unique (“the only one of its kind”), rare (occurs only in few locations) or endemic species, populations or communities, and/or (ii) unique, rare or distinct, habitats or ecosystems; and/or (iii) unique or unusual geomorphological or oceanographic features</td><td></td><td></td><td>x</td><td></td></tr>
<tr><td colspan="6">Explanation for ranking
The proposed area is characterized by marked and unique oceanographic complexity and high biological productivity. This area is strongly influenced by the Subtropical Convergence and is characterized as biogeographic transition zone between the large neritic areas of Patagonia and tropical Brazil (Castello et al. 1997, Seeliger & Odebrecht 1997).
Interactions between the Subtropical Convergence, continental runoff from the La Plata River (Argentina/Uruguay) and Patos Lagoon, topographic features, such as canyons and seamounts on the slope, and coastal and shelf break upwelling enhance the oceanographic complexity and the uniqueness of this area (Calliari 1997, Castello et al. 1997, Garcia 1997, Madureira et al. 2005, Figueiredo Jr. & Madureira 2006).</td></tr>
<tr><td>Special importance for life-history stages of species</td><td>Areas that are required for a population to survive and thrive.</td><td></td><td></td><td></td><td>x</td></tr>
<tr><td colspan="6">Explanation for ranking
The Southern Brazil Sea area, because of its high biological productivity, supplies food for many species. It is an important foraging ground for breeding and non-breeding Procellariiformes, such as wandering albatross (Diomedea exulans), tristan albatross (Diomedea dabbenena), Atlantic yellow-nosed albatross (Thalassarche chlororhynchos), spectacled petrel (Procellaria conspicillata), and white-chinned petrel (Procellaria aequinoctilalis). In addition, several species forage in the area only during non-breeding periods, such as black-browed albatross (Thalassarche melanophris), northern royal albatross (Diomedea sanfordi), southern royal albatross (Diomedea epomophora) and shy-type albatross (Thalassarche cauta/steady) (Neves et al. 2006, Olmos et al. 2006, Gianuca et al. 2011). The area is also the main breeding ground in Brazil for the endangered southern right whale (Eubalaena australis) (Greig et al. 2001, Groch et al. 2005). At least 35 cetacean species also utilize the area as a feeding and breeding ground or as a migratory corridor for baleen whales from their wintering habitat in Brazil to foraging grounds in subantarctic and antarctic waters (Zerbini et al. 1996, 1997, Bastida et al. 2007, Ott et al. 2009) This area comprises migratory and foraging habitats for adult leatherbacks (Dermochelys coriacea) (Almeida et al. 2011) and also as foraging for both small and large immature loggerhead turtles (Caretta caretta) as well as juvenile green turtles (Bugoni et al. 2003, Barros 2010, Barros et al. 2010, Barceló 2011). The shelf waters of southern Brazil also are essential habitat for 26 elasmobranchs species, of which, 21 utilize the coastal waters as reproductive and nursery grounds (Vooren & Klippel 2005).
This area includes the only known spawning aggregation sites for the Southwestern Atlantic wreckfish, Polyprion americanus, population (Peres and Klippel, 2003) and although it occurs from Rio de Janeiro, Brazil, to Argentina, the highest abundance is off Southern Brazil (200-600m deep) (Peres and Haimovici, 1998; Haimovici and Peres, 2005). The southern Brazilian slope is also an important reproductive area for the important ecologically Illex argentinus from the Patagonian shelf stock (Perez et al. 2009b).</td></tr>
</table>

<table>
<tr><td>Importance for threatened, endangered or declining species and/or habitats</td><td>Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.</td><td></td><td></td><td></td><td>x</td></tr>
<tr><td colspan="6">Explanation for ranking
Because this area is very important and has been subjected to intense fishing pressure in recent decades, there are now many endangered or declining species, populations or ecosystems dependent on this area meeting EBSA criteria.
Among the Procellariiforms that regularly use the area, one is Critically Endangered (Tristan albatross), three are Endangered (northern royal, black-browed and Atlantic yellow-nosed albatrosses), four are Vulnerable (wandering and southern royal albatrosses, white-chinned, spectacled and Tristan petrels) and one is classified as Near Threatened (white-capped/shy albatross) (IUCN 2011).
The the three sea turtle species that regularly use the area are either Critically Endangered (Dermochelys coriacea) or Endangered (Caretta caretta and Chelonia mydas) species (IUCN 2011, Almeida et al. 2011, Santos et al. 2011). The franciscana dolphin (Pontoporia blainvillei) occurs year around in the coastal portion of this area. This species was recently listed as Vulnerable on the IUCN Red List (IUCN, 2011) due mainly to unsustainable bycatch in gillnet fishery and is, perhaps, the most endangered cetacean species in the western South Atlantic (Secchi et al., 2003, Secchi, 2010). Of the 37 elasmobranch species recorded in southern Brazil, 14 are overexploited (IN 05, MMA, 24/05/2004) due to catches by the artisanal and industrial fisheries, either as target or as bycatch (Vooren & Klipel 2005). According to the IUCN (2011), two are Critically Endangered (Mustelus fasciatus, Rhinobatos horkelli), five Endangered (Mustelus schmitti, Squatina argentina, Squatina guggeinheim, Sphyrna lewini, Rhinoptera brasiliensis) and 14 Vulnerable (Alopias superciliosus, Alopias vulpinus, Carcharhinus plumbeus, Carcharhinus signatus, Gymnura altavela, Rioraja agassi, Sympterygia acuta, Sphryna zigaena, Carcharias taurus, Galeorhinus galeus, Zapteryx brevirostris, Isurus oxyrinchus, Isurus paucus, Lamna nasus).
This area includes the only known spawning aggregation sites (Peres & Klippel, 2003) for the Critically Endangered Southwestern Atlantic wreckfish population (Cornish & Peres, 2003) and although it occurs from Rio de Janeiro, Brazil, to Argentina, the highest abundance is off Southern Brazil (200-600m deep) (Peres & Haimovici, 1998; Haimovici & Peres, 2005).</td></tr>
<tr><td>Vulnerability, fragility, sensitivity, or slow recovery</td><td>Areas that contain a relatively high proportion of sensitive habitats, biotopes or species that are functionally fragile (highly susceptible to degradation or depletion by human activity or by natural events) or with slow recovery.</td><td></td><td></td><td>x</td><td></td></tr>
<tr><td colspan="6">Explanation for ranking
Several endangered species of long-lived and slow reproducing seabirds, marine mammals and turtles have been strongly impacted by the bycatch that result from the intense and unmanaged fishing activities in southern Brazil (Neves & Olmos 1998, Secchi et al. 2003, Marcovaldi et al. 2006, Neves et al. 2007, Jiménez et al. 2009, Secchi 2010, Cardoso et al. 2011, Fiedler et al. in press).
Several species of elasmobrabchs concentrate in shallow coastal waters during the reproduction period, when it becames highly vulnerable to coastal fisheries (Vooren & Klippel 2005).
In the slope, between 400 and 900 m deep, there are vast and continuous fragile deep-sea coral reefs, composed of the five most important deep sea reef-building species: Lophelia pertusa, Solenosmilia variabilis, Enallopsmmia rostrata, Madrepora oculata, Dendrophyllia alternate (Pires 2007).
The Southwestern Atlantic wreckfish (Polyprion americanus) population is especially vulnerable to intensive fisheries because it is long-lived (more than 80 years), late maturing (10-15 years), and forms spawning aggregations at specific sites and seasons (Peres and Haimovici, 2004; Peres and Klippel, 2003; Peres, 2000). In 2004, recognizing this vulnerability, the Brazilian government declared a fishery closure</td></tr>
</table>

(moratorium) for ten years, but after about eight years, there are no recorded signs of population recovery off southern Brazil.					
Biological productivity	Area containing species, populations or communities with comparatively higher natural biological productivity.				**x**
Explanation for ranking Interactions between the Subtropical Convergence, continental runoff from the La Plata River (Argentina/Uruguay) and Patos Lagoon, and topographic features favour high biological productivity and make this region an important reproduction, nursery and feeding ground for pelagic and demersal fish stocks, which presents relatively high biomass in all trophic levels (Castello et al. 1997, Seeliger & Odebrecht 1997, Zerbini et al. 2004, Madureira et al. 2005, Rossi-Wongtschowski & Madureira 2006, Olmos et al. 2006, Bastida et al. 2007, Secchi 2009).					
Biological diversity	Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.			**x**	
Explanation for ranking The marked seasonal latitudinal displacement of the Convergence characterizes the southern Brazilian continental shelf and slope regions as a biogeographic transition zone between the large neritic areas of Patagonia and tropical Brazil, containing elements of fauna and flora from both areas as well as typical species from the mixture zone (Castello *et al.* 1997, Seeliger and Odebrecht 1997, Zerbini et al. 2004, Olmos et al. 2006, Bastida et al. 2007, Ott et al. 2009).					
Naturalness	Area with a comparatively higher degree of naturalness as a result of the lack of or low level of human-induced disturbance or degradation.		X		
Explanation for ranking The Southern Brazilian Sea is an area under intense fishing effort by longliners, gillnetters, potters, and trawlers from coastal areas to high seas (Haimovici *et al*. 1997, Perez *et al*. 2003, Klippel *et al*. 2005, Perez 2009a,b, Vasconcellos & Gasalla 2001, Castello *et al.* 2011).					

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Maps and Figures

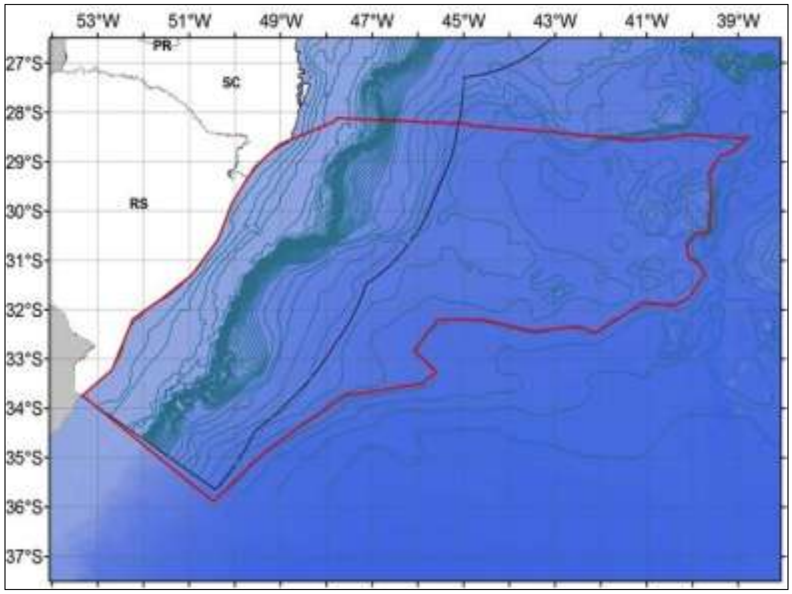

Figure 1: Contours of the proposed area meeting EBSA criteria, Southern Brazilian Sea (red line, extending to the right) and of the Brazilian EEZ (black line)

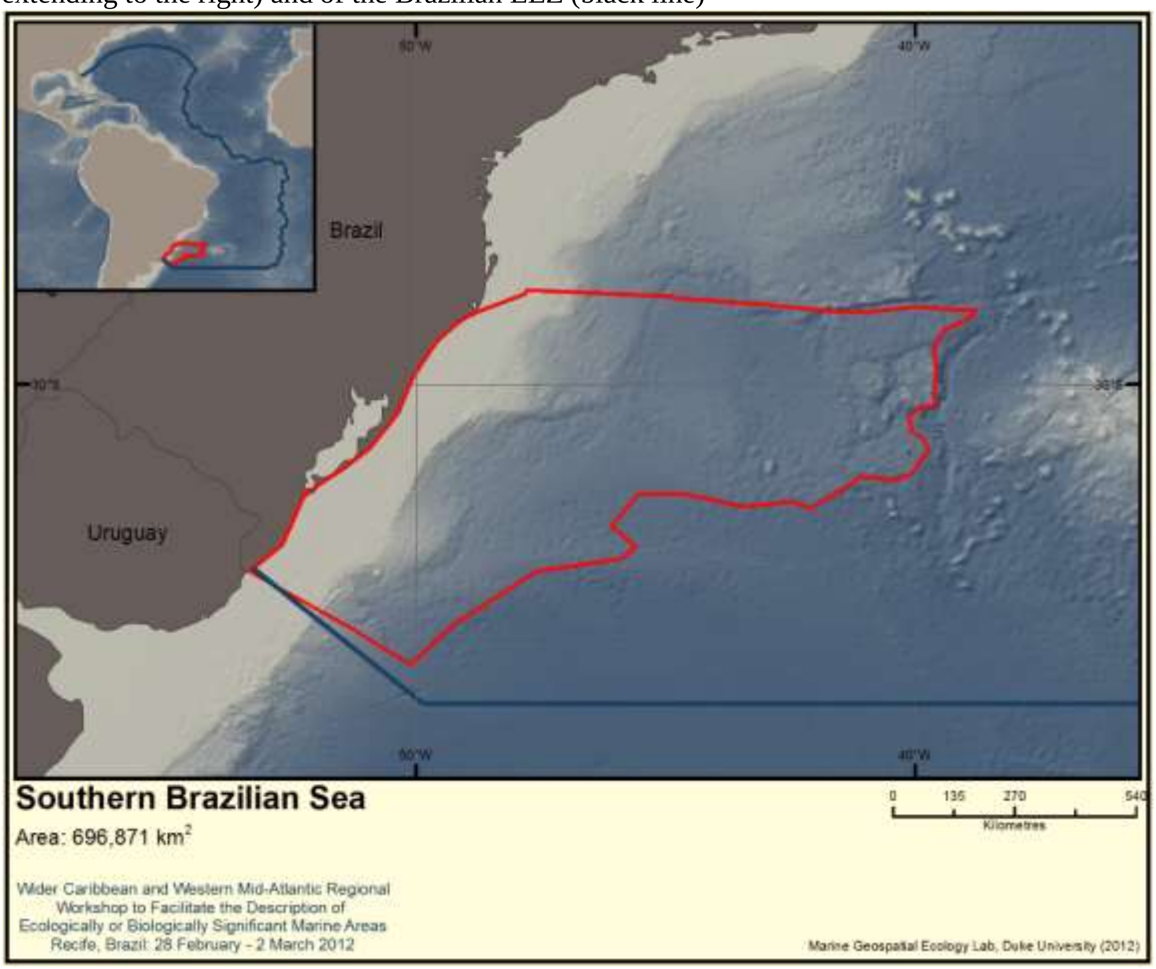

Figure 2. Area meeting EBSA criteria (no. 22)

Areas for Future Consideration

No.	Areas for Future Consideration
1	Cuba – Cayman Oceanic Gyre (Details of scientific information are provided below)
2	South Eastern Caribbean Upwelling System (Details of scientific information are provided below)
3	Laguna Madre
4	Veracruz Reef System
5	Cayman Trench
6	Panama – Colombia Gyre
7	Jaragua National Park and Parque Sobmarino Arrecife del Suroueste
8	Mona Island Channel
9	Rio Grande Rise
10	Bahamas Seabird
11	British Virgin Islands Seabird
12	Gulf of Mexico
13	Jagua Canyon

Area for future consideration: Cuba-Cayman Oceanic Gyre

Introduction

The existence of curving currents (gyres or loops) of finer scale or meso-scale may contribute to species endemism and influence the patterns of organism dispersal, particularly of the earlier stages (egg and larvae), and subsequently the recruitment of larvae and juveniles in shallow water areas. They are important for conserving species and habitat biodiversity in the surrounding coastal areas

Ocean gyres are particularly interesting. They are dynamic systems characterized by a quasi- circular ocean movement. A great proportion of larvae produced by coastal fishes and invertebrates that spawn in their vicinity and are dispersed into the ocean, get retained in the gyre so many can recruit back to the parental populations. This has enormous implications for the replenishment of the species populations and the management of the resources that they constitute (fisheries resources)

Location and description of the proposed area

The Caribbean is the largest marginal sea of the Atlantic Ocean. It is closed off by the continental masses of South America and Central America to the south and west, and is connected to the North Atlantic Ocean via the Lesser Antilles and the Windward Passages to the east and the Gulf of Mexico via the Yucatan Strait to the north. It consists of a succession of five basins: Grenada, Venezuelan, Colombian, Cayman, and Yucatan (Figure 1). In the western Caribbean, the Cayman Basin, located between the Nicaragua Rise and the Cayman Ridge, has depths of more than 5000 m, while the Gulf of Honduras is 2000 m deep within close proximity of the Mesoamerican Barrier Reef system (MBRS) stretching for more than 1000 km from the northeastern region of the Yucatan (Mexico) to the Bay Islands (Honduras). The Yucatan Basin lies between the Cayman Ridge and the Yucatan Channel. The variable bathymetry is an important factor in the formation of eddies that move the water mass through the western Caribbean Sea (Bustamante and Paris, 2008, see Figure 2).

The general geological structure of the Caribbean Basin generates a wide array of marine environments that include deep troughs and oceanic tongues, gulfs and bays, and shallow-water areas at shelves and banks. The submarine shelves are generally wider in some continental countries (e.g., Belize, northern Yucatan of Mexico, Honduras, and Nicaragua), and in the large archipelagoes of Cuba and the Bahamas, while in the Lesser Antilles they are very narrow and drop off a few hundred metres away from the coast.

The overall circulation pattern is shaped by dominant winds, coastal orientation, and sea bottom topography that combine to form meanders, eddies and gyres and nearshore counter-currents. The complex circulation influences the way propagules are dispersed from the places they originate to the place they settle. However, connections of species populations and ecosystems across the region are also influenced by biological interactions with the environment and are still the subject of investigations (Paris et al. 2008).

Cyclonic eddies in the Gulf of Honduras originated near the Nicaraguan Rise propagate westward along the coast of Honduras. These eddies may play an important role in the connectivity processes and associated biological transports. On average, an eddy takes approximately 10 months to transit from the Lesser Antilles to the Yucatan Channel, with values as short as seven months and as long as 17 months.

Another eddie passes through the Windward Passage and travels along the Cayman Sea, exiting via the Yucatan Strait six month later. Almost all eddies dissipate at the Nicaragua Rise as they collide against the shoals and banks.

In the Western Caribbean Sea (from the Mesoamerican Reef system to Western Cuba) the mean flow is characterized by a southeast-northwest flow accompanied by as many as five cyclonic gyres along the Honduran coast in the Gulf of Honduras, each with diameter of 50 to 150 km, and by the propagation of an anticyclonic eddy with a 300 km diameter southeast of the Yucatan Channel (see Bustamante and Paris, 2006). A cyclone-anticyclone pair south-west of Cuba has been observed to slowly (~ 2 cm/sec) translate westward into the Yucatan Current. The cyclone was tracked for 10.5 months with four drifters, making it the longest-tracked of the Caribbean eddies (Richardson et al., 2005). This is the Cuba-Cayman Oceanic Gyre.

The Cuba-Cayman Oceanic Gyre is a dynamic system that covers an area from close to the Mexican EEZ boundary off northern Quintana Roo eastward to the southern Cuban EEZ waters, with a southern extension close to 18° N (including the Cayman Islands and EEZ waters (Figure 1). This gyre is part of the unit of connectivity of biological populations "NW-S Cuba & Cayman Islands" proposed by Bustamante and Paris (2008) (Figure 3)

There is only one other large gyre in the Caribbean Basin, the Panama-Colombian Gyre, several hundreds of kilometres south (Figure 4).

The complex circulation of the Caribbean Basin influences the way propagules are dispersed from the places they originate to the places they settle in the Western Caribbean Sea (from the Mesoamerican Reef system to southwestern Cuba). Larval modeling suggests that there are considerable levels of self-recruitment in Cuban snapper populations, in particular, those from the southern and north-central regions (Paris et al. 2005). Alfonso et al (2007) stated that the gyre allows for the lobster larvae to spend the entire larval stage (6-8 moths) close to southern Cuba.

Feature condition and future outlook of the proposed area

The current and future conditions are considered good, provided that no major pollution occurs.

Assessment of the area against CBD EBSA Criteria

CBD EBSA Criteria	**Description**	**Ranking of criterion relevance** (please mark one column with an X)			
(Annex I to decision IX/20)	(Annex I to decision IX/20)	**Don't Know**	**Low**	**Med-ium**	**High**
Uniqueness or rarity	Area contains either (i) unique ("the only one of its kind"), rare (occurs only in few locations) or endemic species, populations or communities, and/or (ii) unique, rare or distinct, habitats or ecosystems; and/or (iii) unique or unusual geomorphological or oceanographic features.			**x**	
Explanation for ranking This is the only ocean gyre that serves as a retainment system for larvae produced by fishes and invertebrates in southern Cuba and the northern portion of the Mexican Caribbean reef.					
Special importance for life-history stages of species	Areas that are required for a population to survive and thrive.				**x**
Explanation for ranking The gyre may have contributed significantly to the development of diverse and productive biological communities in the reef, mangrove, and seagrass areas of the surrounding countries. Fish and lobster larvae are retained in this system, allowing for the self-recruitment of the populations of southern Cuba and other nearby areas (Perez de los Reyes et al. 2009). From 36 to 80% of the estimated total recruitment generated by the snapper spawning aggregations of the Cuban archipelago is of local origin. In the populations of the southern coast, part of this self-recruitment is due to the retainment of larvae in this gyre. This phenomenon facilitates resource management since most of the recruits are generated by local populations					

versus coming from upstream spawners residing in other countries (Bustamante and Paris, 2008). It is unknown to what extent this gyre benefits recruitment in the Mexican Caribbean populations since the research did not include this area, however, it is expected that it does.					
Importance for threatened, endangered or declining species and/or habitats	Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.				x
Explanation for ranking The high score is explained by the high number of species whose larvae may be retained by this system; their high ecological and commercial value; and the fishing pressure over them.					
Vulnerability, fragility, sensitivity, or slow recovery	Areas that contain a relatively high proportion of sensitive habitats, biotopes or species that are functionally fragile (highly susceptible to degradation or depletion by human activity or by natural events) or with slow recovery.	x			
Explanation for ranking The natural fragility of this habitat for larval stages is unknown.					
Biological productivity	Area containing species, populations or communities with comparatively higher natural biological productivity.			x	
Explanation for ranking The system's biological productivity is unknown, but 50 years ago, the production of snapper and grouper fishes in Cuba was largely greater than the current production due to excessive fishing. Lane snapper (*Lutjanus synagris*), the most important fishery species in southwestern Cuba, was severely over-fished in the 1970s. In 1969, 4200 tonnes were caught and stayed at more than 3000 tonnes up until 1977, when catastrophic over-fishing of the species was identified (Claro et al., 2009). These most spectacular reproductive aggregations of lane snapper known in Cuba were located in the south-west region of the country. Primary productivity varies seasonally and provides phytoplankton for certain lobster larval stages.					
Biological diversity	Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.			x	
Explanation for ranking The area contains a high diversity of species in their larval stages.					
Naturalness	Area with a comparatively higher degree of naturalness as a result of the lack of or low level of human-induced disturbance or degradation.				x
Explanation for ranking There is no pollution in the oceanic area.					

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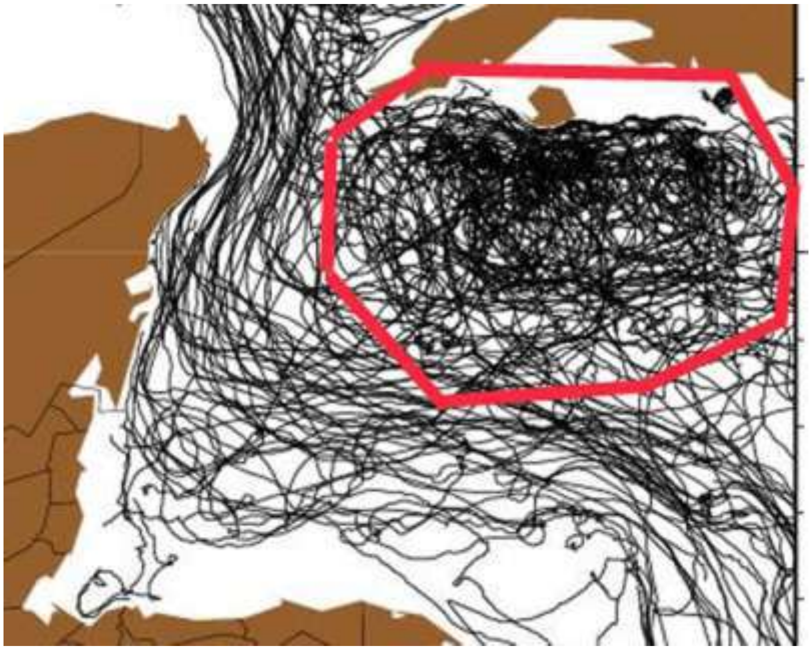


Figure 1. Cuba-Cayman Gyre (taken from Colin, 2004)

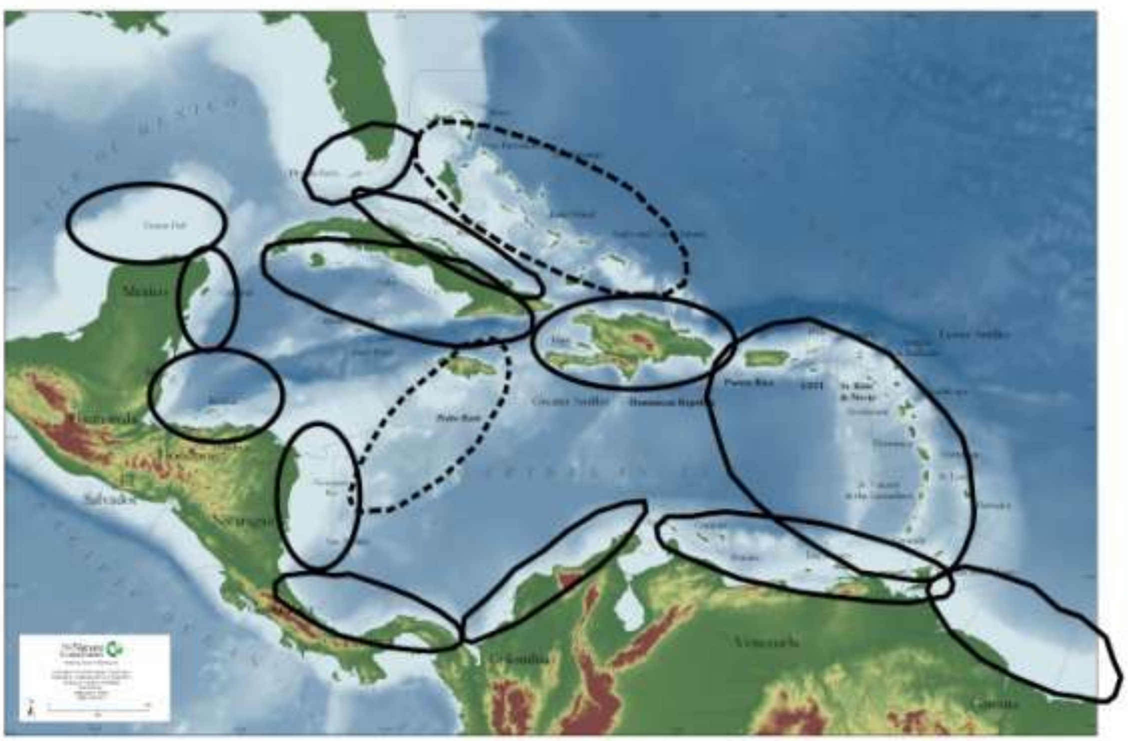


Figure 2. Tentative units of biological connectivity (enclaves or marine ecoregions) of the Wider Caribbean, or Tropical Northwest Atlantic Coastal Biogeographic Province (see Bustamante and Paris, 2006 for more information). Ovals with dotted lines depict less documented or potential additional division.

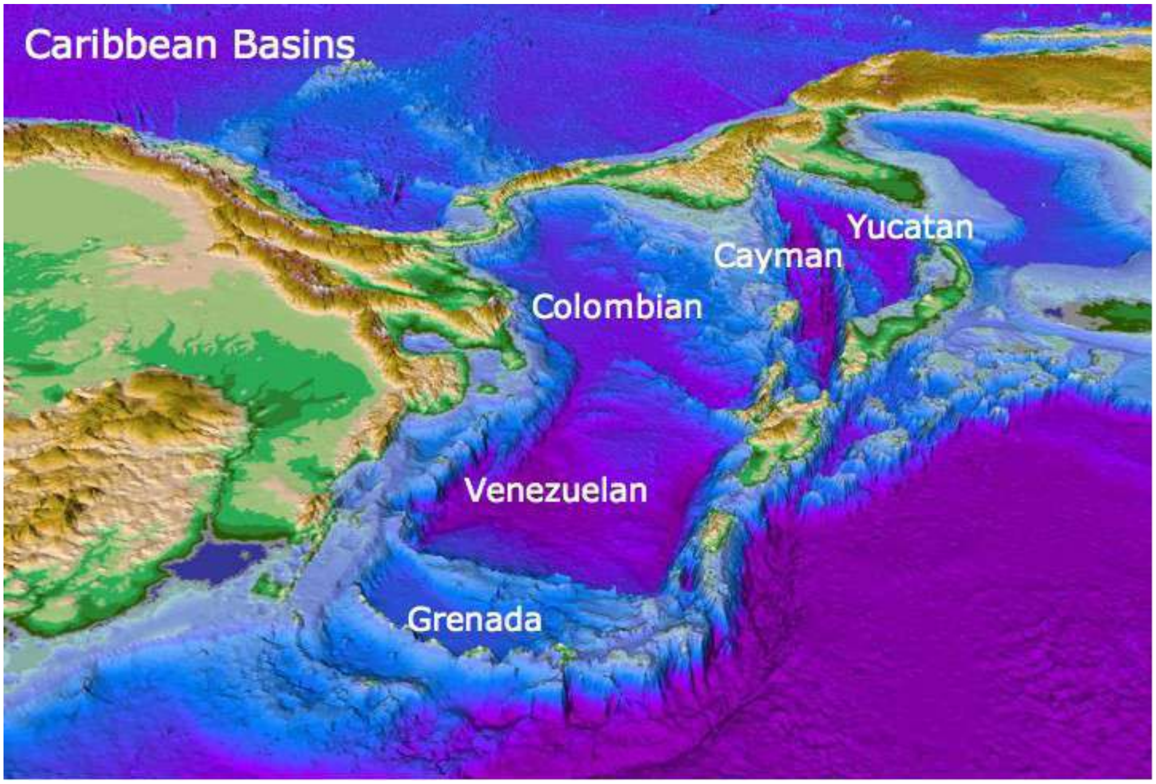
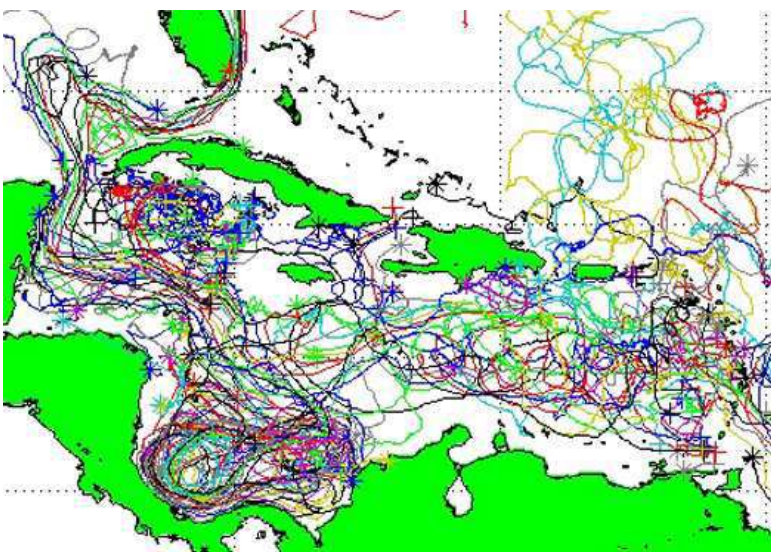


Figure 3. The Caribbean basins: Topography of the Wider Caribbean region derived from satellite data. The Cayman Basin has depths of more than 5000 m, while the Gulf of Honduras, located where the Yucatan and Cayman basins merge, has waters as deep as 2000 m just within 15 km of the Mesoamerican Barrier Reef System stretching for more than 1000 km from Mexico to the Bay Islands in Honduras. North is to the right.



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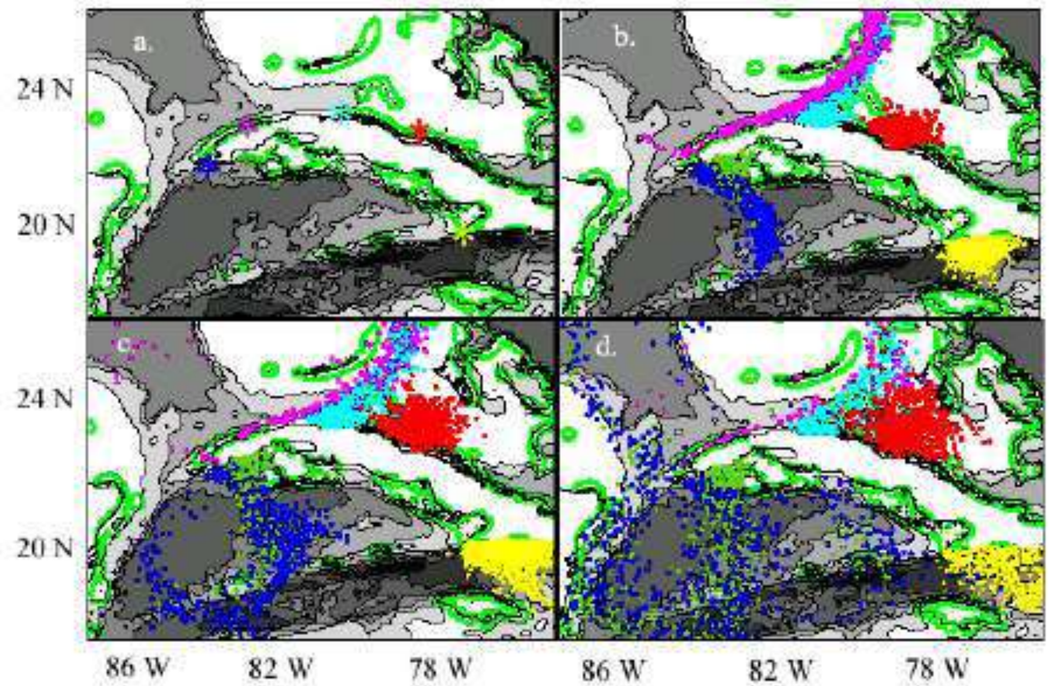

Figure 5. Spatial distribution of Lutjanus analis. virtual larvae at (a) Day 1, (b) Day 7, (c) Day 14, and (d) Day 30 after the first day of simulated spawning events of mutton snapper from the 4 Cuban ecoregions: SW: Cabo Corrientes (blue) and Cayos San Felipe (green). The dispersal of blue and green dots indicate the existence of the gyre (In these images, larval transport is passive and the retention zone for snapper larvae is set within 9 km of suitable settlement habitat (delineated in light green) (Figure taken from Paris et al. 2005)

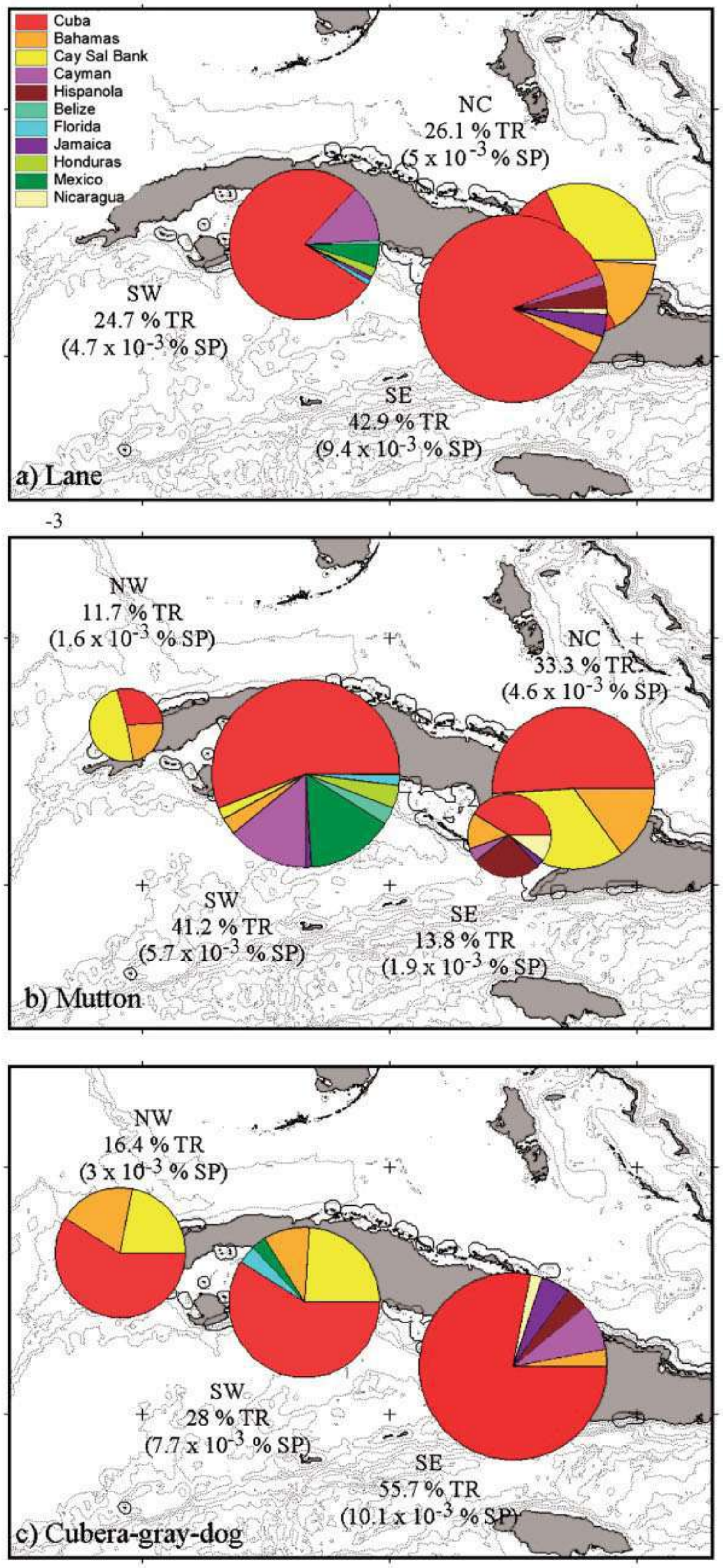

Figure 6. Total recruitment (TR = within Cuba + export) of Lutjanus spp. produced from spawning aggregations of (a) lane, (b) mutton, and (c) cubera–gray–dog complex snappers grouped by the 4

primary shelf regions of Cuba. Each pie represents a region and its fraction of recruits to Cuba and receiving countries; the size of the pie is proportional to its contribution to TR. TR is also indicated in parentheses as the fraction of the simulated spawning production (% SP); TR from all regions for lane, mutton, and cubera–gray–dog complex snappers is 29.3 10–3, 13.9 10–3, and 27.3 10–3%, respectively (Table 2). Onset of larval behaviour is set at Day 14. (taken from Paris et al. 2005).

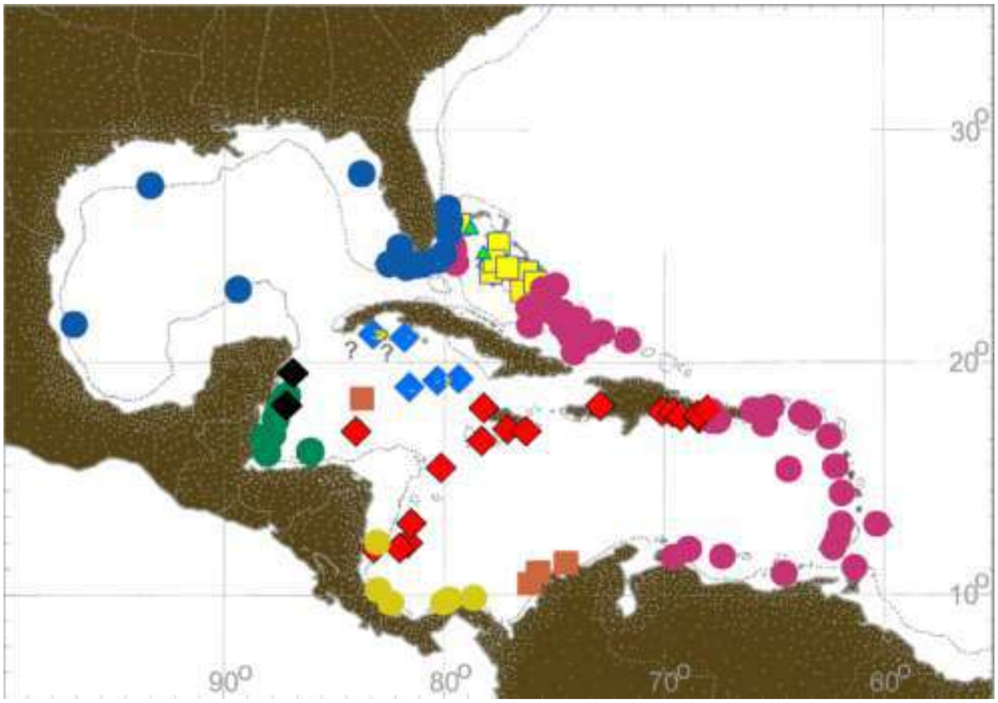

Figure 7. Distribution of different fish goby species (Elactinus spp.) in the NW Tropical NW Atlantic Marine Biogeographic Province. (Colin, 2004). The distribution of one of the species is restricted to the SW Cuba and Cayman Is., demonstrating the strong connectivity between these areas, and separation from the more southern ones.

AREA FOR FUTURE CONSIDERATION: SOUTH EASTERN CARIBBEAN UPWELLING SYSTEM

Abstract

South Eastern Caribbean Upwelling System is a very dynamic area with a very large and strong upwelling phenomenon that supports a high level of primary productivity and secondary production. The area also contains the Cariaco Trench, a continental platform depression (~1450m) which is permanently anoxic below ~250. The trench preserves an undisturbed record of marine sediments and serves as an efficient carbon sink during some periods of the year. It has high diversity of emblematic Caribbean ecosystems and species, and also supports Venezuela's most important fishery industry. Some major threats have been identified. It contains four national parks and seven sites proposed for the conservation of marine biodiversity. Several research initiatives are ongoing in the area, and there are many data sets that support its importance as an area meeting EBSA criteria.

Introduction

The South Eastern Caribbean Upwelling System is a very dynamic area dominated by a regular seasonal upwelling process, variable in intensity that can cover 50,000 to 90,000 km². During the main upwelling period (Dec-Apr), a high level of primary productivity is registered. Field observations show annual primary production rates exceed 500 gC/m²y, of which over 15-20% can be accounted for by events lasting one month or less. This high productivity supports high biomass of planktonic, pelagic and benthic species, many of them of commercial interest for local and regional human populations. The proposed area includes the Cariaco Trench, a depression embedded in the continental platform. This peculiar basin is anoxic below ~250 m, due to its restricted circulation and high primary production.

The proposed area contains four declared national parks and seven areas to be considered as priority sites for the conservation of marine biodiversity. There is also a very robust research initiative in the area and hydrographic time series in one point of the area, reporting data and publications of the scientific results since 1996 (http://cariaco.ws).

Location

The proposed area covers the sea floor and the water column from the 200m depth to the shore, and it is bounded into a polygon that could be embedded in a rectangle between the following coordinates: lower right corner -61.8, 10.8, upper left -66.1, 12.1.

It comprises an area of ~52.000 km² and is located completely in Venezuela's national maritime territory.

Feature description of the proposed area

Over the past years, the zonal wind has shown marked seasonality, with values ranging from 4 m/s, between August and January, to 10 m/s between February and June. The meridional (north-south) component of the wind is weaker (0-1 m/s) than the zonal (east-west) component, and shows cyclic hifts with a period of about 3 months. Wind speed has a seasonal cycle that is generally coincident with that of temperature. A cross-correlation analysis between satellite-derived SST and scalar wind intensity (Figure 2) shows maximum correlation at a positive lag of 1-2 weeks, demonstrating that changes in the wind preceded changes in SST by a few days (Astor et al., 2003). In the past four years wind intensity has decreased, and this has impacted both the intensity of primary and secondary production in the Cariaco Basin.

Peak sea surface temperatures of ~29.0°C are reached in September, and a minimum of about 23.0°C occurs in March. Low sea surface temperatures during the first months of the year are related to the surfacing of the cold, nutrient rich Subtropical Underwater (SUW) near and inside the Cariaco Basin. Nutrient distributions in oxic waters of the Cariaco Basin vary seasonally with fluctuations in rates of upwelling and primary productivity (Scranton et al., 2006). Within the SUW, nitrate concentration is 5-10 mM, and as this water is brought to the surface it provides nutrients that stimulate phytoplankton growth (Walsh et al., 1999). Variations in the intensity of ventilations, intrusion of oxygenate water at depths greater than 150 m (Scranton et al., 2001; Astor et al., 2003), also affect the distribution of nutrients in the suboxic zone. Intrusions of oxygenated water into deep, sulfidic layers occur intermittently, influencing distributions of nitrite and phosphate (Scranton et al., 2006).

The upwellings seen during the winter-spring of 1997 and 2001 are considered anomalously strong events in which the surface temperatures were lowered to 21.5°C, and the average primary production during upwelling exceeded 2000 mg/C/m². The upwelling event in 1998 was a shorter and weaker event, which is thought to have been caused by teleconnection to the strong El Niño-Southern Oscillation in the first part of that year. The upwelling events during 1996, 1999, and 2000, are considered normal periods in which the surface temperatures are lowered to 23°C and the average primary production was 1700-1800 mg/C/m². The upwelling seasons of 2002 and 2003 showed a return to normal conditions after the anomalously strong upwelling of 2001, yet during the past three years, weak upwelling strengths have prevailed, with average integrated primary production of 1.7 gC/m²d during the upwelling season. 2008 seems to have indicated a return to normal upwelling intensity. The weakening of the upwelling and lowered primary production rates have affected the regional sardine fisheries in the region. Fisheries decline has economically impacted the region severely, and several fisheries have closed. Eastern Venezuela sardine harvests constitute the most important fishing industry in the country and the Caribbean Sea. In general, annual production is estimated to be between 540-600 gC/m²y, depending on the strength of short-lived upwelling events, except in 1998 when a rate of <300 gC/m²y was estimated. Average annual production for 2004-2006 was ~440 gC/m²y. A summer upwelling, or a secondary upwelling, has been identified occurring every year in the months of June-July. Its occurrence has been linked to the seasonal increases in the cyclonic curl of the wind in the southern Caribbean and a concurrent increased frequency of anticyclonic eddies in the Venezuelan basin, which could cause dynamic uplifting of isotherms in the south along the continental shelf (Rueda et al., in prep)

Features noted in the temperature data are evident in the other hydrographic parameters, such as salinity. Surface salinity between August and October are fresher (<36.5), coincident with the rainy season. Salinity in the Cariaco Basin is also affected by local phenomena, such as hurricanes. In late 2007, the region experienced a large rainfall event caused by hurricane Felix, which passed close to the Venezuelan coast. The heavy rains effectively decreased the sea surface salinity at the CARIACO time-series station to the lowest recorded during 2007 (35.8) or during previous years. This decrease in salinity also affected the TCO^2, lowering it to ~1990 M/Kg (average surface TCO^2 ~ 2070 M/Kg).

Regarding biodiversity information, the OBIS database contains, as of February 2012, 7825 registries of marine fauna, including 1207 different taxa. An integrated research carried out between 2004-2009 to identify priority areas for marine biodiversity conservation identify the major marine ecosystems inside the region: coral reefs, mangrove forest, seagrass bed, bird nesting and feeding areas, soft bottom benthic communities, litoral rocky shores, deep corals and sandy beaches (PDVSA, 2008). The Census of Marine Life project NaGISA had several site stations in the rocky shores of the areas, and there is also an ongoing research initiative to continue the study of the rocky shore communities in the area (SARCE project http://sarce.cbm.usb.ve).

Feature condition and future outlook of the proposed area

The area supports the largest fisheries of Venezuela, comprising small pelagics, large pelagics and demersal fishes, as well as shellfish. Important populations of cetaceans also use the area. Several important threats have been identified: intense maritime traffic, fisheries and tourism. There is also a large project of off shore oil and gas exploration inside the area.

The coastal area contains four national parks and seven proposed sites for marine biodiversity. It is expected that in the short term several of these areas should be proposed as new formal protected areas (national parks or similar) due to a GEF-supported initiative for enhancing the national network of marine protected areas.

Thanks to a large amount of temporal data available, a seawater temperature increase has been detected, as well as probably decadal variations in the upwelling patterns (extension and intensity) (Rueda et al., in prep). There are at least two major research initiatives running in the area: the Cariaco project (http://cariaco.ws) and the SARCE project (http://sarce.cbm.usb.ve).

The first is an ongoing hydrographic time series. The research team visits one station in the Cariaco Trench area monthly since 1996 and has a policy of openly sharing the basic data on their web sites.

SARCE programme is a continuation of the CoML NaGISA project, which address questions about the biodiversity of nearshore communities in rocky shores and seagrass beds.

The evidence collected suggest that the area is a very ecologically and biologically important area that is probably sensitive to major threats.

Assessment of the area against CBD EBSA Criteria

CBD EBSA Criteria (Annex I to decision IX/20)	**Description** (Annex I to decision IX/20)	**Ranking of criterion relevance** (please mark one column with an X)			
		Don't Know	**Low**	**Medium**	**High**
Uniqueness or rarity	Area contains either (i) unique ("the only one of its kind"), rare (occurs only in few locations) or endemic species, populations or communities, and/or (ii) unique, rare or distinct, habitats or ecosystems; and/or (iii) unique or unusual geomorphological or oceanographic features.				**X**
Explanation for ranking The area comprises the Cariaco Trench, a depression in the continental platform that is the only place in continental seas that is permanently anoxic below ~250m. This condition preserves the bottom sediment in undisturbed layers that permit paleoclimate evaluation back to ~600.000 years. It also has a very rich bacterial community living at the oxic-anoxic layer, with many species described only in there, and with an important contribution to the carbon cycle. The Cariaco Trench is an effective carbon trap.					
Special importance for life-history stages of species	Areas that are required for a population to survive and thrive.				**X**
Explanation for ranking The upwelling system provides seasonal high productivity waters that allow the development of many fish species of commercial interest, support bird nesting and feeding areas, and turtle feeding areas. Inside the area there is a documented bank ("Bajo Cumberland"), which is recognized as a site of of fish production. The area also supports the spawning of several coastal fishes that further migrate and populate the shallow areas in the Venezuelan coast.					
Importance for threatened, endangered or declining species and/or habitats	Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.		**X**		
Explanation for ranking The area provides habitat for nesting and feeding of seabirds and marine turtles.					
Vulnerability, fragility, sensitivity, or slow recovery	Areas that contain a relatively high proportion of sensitive habitats, biotopes or species that are functionally fragile (highly susceptible to degradation or depletion by human activity or by natural events) or with slow recovery.		**X**		
Explanation for ranking The area includes fishing grounds that are relatively important on the national scale and also shellfish banks where by-catch species are probably over-exploited.					
Biological productivity	Area containing species, populations or communities with comparatively higher natural biological productivity.				**X**

Explanation for ranking The upwelling system sustains 400-600 gC/m^3/y from phytoplankton. Very large biomass of fisheries resources.					
Biological diversity	Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.			**X**	
Explanation for ranking High diversity of bird, fish, and mollusc species; emerging research shows a very rich bacterial community in the oxic-anoxyc layer of the Cariaco trench.					
Naturalness	Area with a comparatively higher degree of naturalness as a result of the lack of or low level of human-induced disturbance or degradation.			**X**	
Explanation for ranking This area includes moderately highly populated places, and threats from the shipping and oil industries. However, the deep part of the trench is almost unperturbed by any human activity.					

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Maps and Figur

Annex V

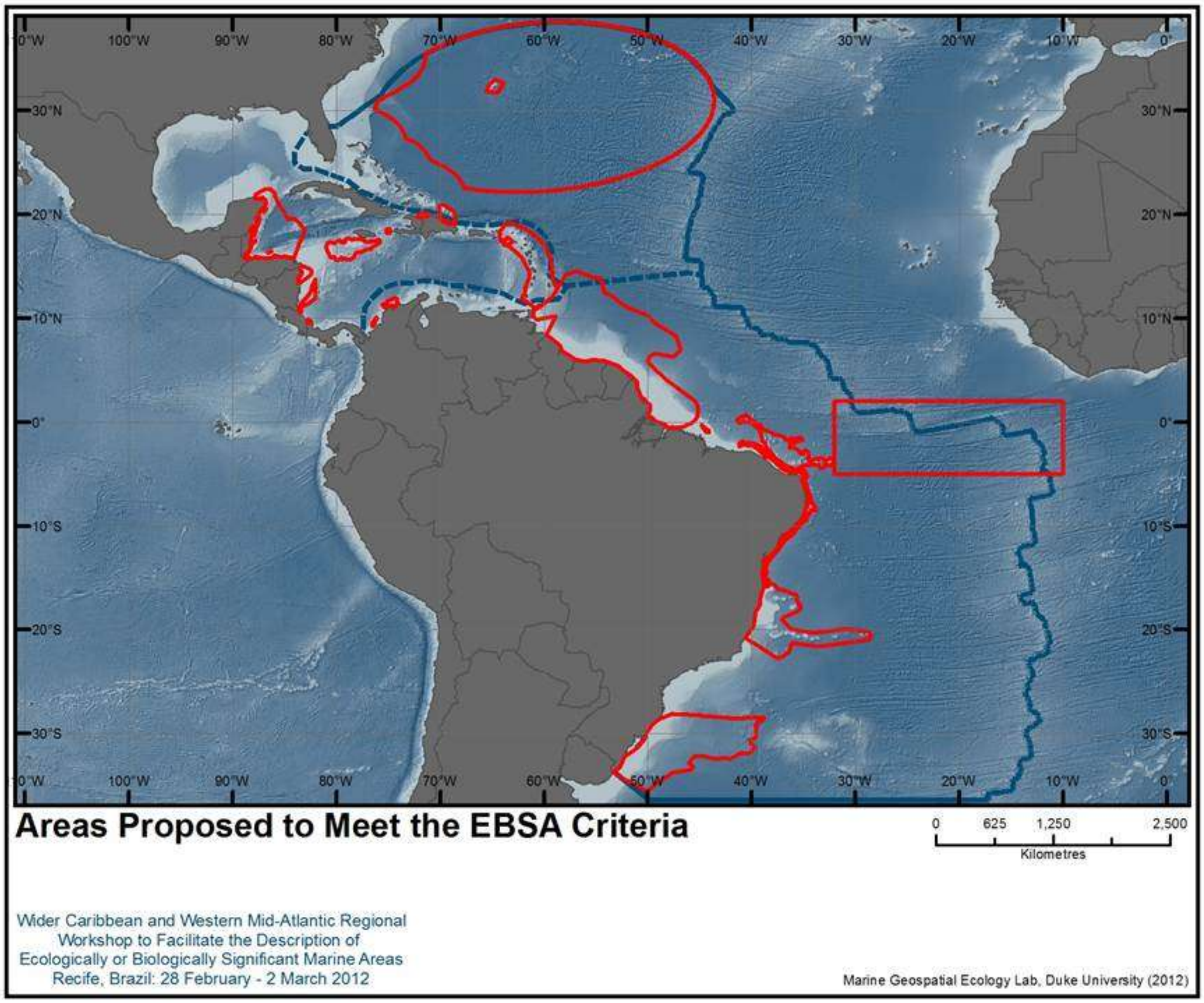
AREAS CONSIDERED DURING THE WORKSHOP BUT NOT DESCRIBED FOR EBSA CRITERIA DUE TO DATA PAUCITY AND LACK OF ANALYSIS

No.	Area for Future Consideration
1	Cuba – Cayman Oceanic Gyre
2	South Eastern Caribbean Upwelling System
3	Laguna Madre
4	Veracruz Reef System
5	Cayman Trench
6	Panama – Colombia Gyre
7	Jaragua National Park and Santuario Marino Arrecifes del Suroeste
8	Mona Island Channel
9	Rio Grande Rise
10	Bahamas Seabird
11	British Virgin Islands Seabird
12	Gulf of Mexico
13	Jagua Canyon[3]

3 Description of areas using the template (as used in Appendix to Annex IV) was not provided for areas for future consideration nos. 3 to 13 as insufficient information was available at the time of the workshop.

Annex VI

MAP DESCRIBING WORKSHOP GEOGRAPHIC SCOPE AND EBSAs IN THE WIDER CARIBBEAN AND WESTERN MID-ATLANTIC REGION AS AGREED BY THE WORKSHOP PLENARY



Note: The solid blue line represents the workshop's geographic scope; the dotted blue line represents the sub-regional scope; and the solid red line represents the areas meeting EBSA criteria as described in the appendix to annex IV.

Annex VII

SUMMARY OF THE WORKSHOP DISCUSSION ON IDENTIFICATION OF GAPS AND NEEDS FOR FURTHER ELABORATION IN DESCRIBING ECOLOGICALLY OR BIOLOGICALLY SIGNIFICANT MARINE AREAS, INCLUDING THE NEED FOR THE DEVELOPMENT OF SCIENTIFIC CAPACITY AND A PROPOSAL FOR FUTURE SCIENTIFIC COLLABORATION

Group 1. Western and Eastern Caribbean

Different levels of gaps and needs were considered by the group.

In general, the following scientific gaps were considered as priorities for more research and information gathering: i) deep-sea biology and oceanography in the Eastern Caribbean, including deep-sea corals; ii) further biological and oceanographic connectivity studies for better understanding of larval recruitment and dispersal; iii) targeted research on key large species and their routes and habitats, such as sharks and marine mammals; iv) how habitats contribute to the different life stages of different taxa, in particular migratory species (e.g., mating, feeding and flying routes); and v) to further study remote areas, such as the Rosalinda Bank, remote atolls in Seaflower and the Cayman Trench.

Gaps in coverage or spatial gaps for the Western Caribbean were also considered by the group. It was noted that within central Caribbean, for example, the ecological value of Aves Island is recognized and that it should be further considered as a possible area for EBSA description in the future. Likewise, the ocean gyre between Colombia and Panama (area for future consideration no. 6) was identified as another notable spatial gap within this region, together with the Mona island channel (area for future consideration no. 8) and Cayman Trench (area for future consideration no. 5). Seabird breeding colonies that qualify as IBAs (at the global and/or regional level) in the Bahamas, as well as the foraging areas around these colonies, were flagged as a gap for which no areas meeting EBSA criteria were described during the workshop (area for future consideration no. 10). Gaps in the Gulf of Mexico (area for future consideration no. 12) included a significant known spawning aggregation site for the western stock of Atlantic bluefin tuna.

Additionally, the group identified a number of general needs in order to further develop the EBSA process in the region. The need for more coordinated research and monitoring among countries was highlighted as a priority need. Ongoing collaborative research between the Netherlands and France on marine mammals was provided as an example worth noting and emulating.

Joint expeditions by experts from different countries, especially those concerned with proposed areas meeting EBSAs criteria, should be promoted and coordinated. For example, the representative from the Netherlands informed the meeting about a planned oceanographic and biological expedition by his country to the Saba Bank and the possibility to expand the area to contain the whole area described for the EBSA in that region and inviting scientists and experts from other countries to participate.

It was also highlighted to consider including young scientists from the various countries to build their capacity and contribute to the formation of a new cadre of experts. Similarly, participants noted the importance of starting to build a network of interested experts in this EBSA process to promote and facilitate more discussion and information exchange. In this context, the existing network of Caribbean managers, scientists and practitioners on marine protected area management, known as the Caribbean Marine Protected Areas Network and Forum (CaMPAM), coordinated by UNEP-CEP, was identified as a suitable platform. The CaMPAM annual meetings and suite of activities could assist in this regard. Upcoming meetings of CaMPAM could be used to further advance the EBSA process. The CBD

Secretariat informed the group that EBSA training materials and experts could be made available for this purpose, subject to availability of financial resources.

In the context of marine mammals, the ongoing UNEP-CEP project, supported by the Government of Spain under the LifeWeb initiative, was identified as a major opportunity to further enhance scientific knowledge and information on these species, their routes and habitats. The UNEP-CEP representative informed participants that maps and information from this project are being made available to this workshop.

Other relevant regional initiatives identified as important for exploring synergies and collaboration on information-sharing were: i) the deep-sea fisheries Working Group recently established under the FAO-WECAFC, ii) the Caribbean Regional Fisheries Mechanism (CRFM); and iii) the Caribbean Large Marine Ecosystem Project (CLME) project, in particular its Information Management System (IMS) and Regional Environmental Programme (REMP) currently being designed and developed.

There was difficulty in finding an acceptable way of linking IBAs covering parts of seabird migration routes, which primarily involve the air space, with the oceanic processes below. This meant that such IBAs were not included in the areas meeting EBSA criteria. Further clarification was made that air space is not included in the description of areas meeting EBSAs criteria.

Finally, it was noted that this workshop was the first regional attempt to describe areas meeting EBSA criteria based on the available information. Participants recognized that there could be additional scientific approaches for describing areas meeting EBSA criteria, for example based on grouping those with the greatest rarity or most unique features.

Group 2. Southern Caribbean and Brazil

For this region, the gaps to further describe areas meeting EBSA criteria were subdivided into four categories: 1) scientific research; 2) scientific collaboration; 3) data/information exchange; and 4) capacity-building.

Scientific research

Further scientific information on species diversity (benthic, pelagic and fisheries etc.) is needed in some areas, as well as information on species ecology, abundance, seasonality and reason of presence (e.g. for feeding, breeding, migration). Other gaps include hydrodynamics and geomorphological information for some areas, with some areas generally understudied. It was noted that in some areas, there were not enough marine scientists (see also capacity gaps).

Regarding deep-water biota, understanding is generally poor (e.g. diversity patterns, community structure and distribution of deep fauna) and less comprehensive than that of the overlaying pelagic system. Increasing sampling effort on the ridge and fracture zone habitats is critical to ensure a better description of the area for EBSA description. There is a major lack of information in the southern Caribbean on the continental break and deep sea.

Connectivity is poorly understood, and since it influences many of the ecosystems discussed, it is important to acquire information about ecological connectivity at different levels (e.g., oceanographic, genetic). This will allow better description of the boundaries of the areas meeting EBSA criteria or suggest new areas that could be incorporated or defined for description of EBSAs.

Scientific collaboration

The group stressed the importance of scientific collaboration in areas beyond national jurisdiction (ABNJ). In this respect, the work of FAO on deep-sea fisheries in ABNJ is very relevant: VME identification and related issues in support of the implementation of the international guidelines for the management of deep-sea fisheries in ABNJ. There is opportunity for sharing scientific information and collaborating on relevant activities with the SCBD and its work on EBSAs in ABNJ. The information being gathered for the VME database and the EBSA repository is one of the potential areas for collaboration as well as the identification of gaps and data needs at the regional level and the need for capacity-building. The programme of work currently under definition at WECAFC can also provide opportunities for collaboration. Finally, the coming Global Environmental Facility (GEF) funded project on marine areas beyond national jurisdiction (ABNJ) will also provide a platform for collaborative initiatives in this regard.

Monitoring and protection/conservation action plans for many marine groups are well developed in each country of the area. Collaboration is needed among countries/island states in order to better collate some data and harmonize approaches.

Multi-national scientific collaboration and scientific capacity, including sampling platforms and technology, for deep-water research in the Atlantic have greatly improved during the development of the Census of Marine Life field projects. Today, most of these research initiatives are still active but limited by the lack of funding opportunities, which are required to maintain their collaborative network and support the expansion of sampling efforts.

Data/information exchange

In general, countries and island States need to be encouraged to better share scientific information. Beyond scientists, it is necessary to promote the information-sharing to the level of policy makers, industry and local stakeholders. Overall, it is necessary to consolidate a collaborative culture in the context of regional marine science. A regional scientific data-sharing programme, using the internet as a way to store and show the information, could help bring researchers together on this issue. Further collaboration should be especially encouraged where areas meeting EBSA criteria overlap or cross territorial boundaries (e.g., the southern Brazilian areas described for EBSAs and the eastern African coastal area).

Capacity-building

To address the issue of regional under-capacity, training at the regional level should be promoted in the areas of deep-sea oceanographic exploration, open sea biology, oceanographic and geographic data analysis methods and tools. Further expertise is required in taxonomy, which has been a particular constraint in deep-water diversity studies. Capacity to sample the deep sea (e.g., research vessels, modern sampling equipments) and to apply new technological approaches, such as genetic and tracking studies, is needed. The group encouraged the promotion, use and development of open and free data analysis tools.

Group 3. Northern Caribbean and Sargasso Sea

This group focussed on the substantial submission of scientific information on the Sargasso Sea for EBSA description, which is based on a significant investment in science and evidence collation and analysis. Still, whilst many areas already have substantial scientific evidence and analysis underlying the EBSA description, some gaps remain. With this in mind, the precautionary approach makes sense but also needs to address these unknowns in the future. Key questions were identified to focus future data gathering and analysis in the Sargasso Sea:

- Birds: What is the importance of Sargassum for foraging birds (facultative or obligate)?
- Sharks: In addition to porbeagle, do other shark species use the Sargasso Sea as critical nursery habitat?
- Tuna: How important is the Sargasso Sea as a spawning area for tuna?
- Sargassum: Better understanding the life history of Sargassum, including possible sources outside of the Gulf of Mexico, whether it reproduces in the Sargasso Sea, and its fate when it dies. Does it provide a significant link between the pelagic and benthic communities?

- Eels: Why are eels in significant decline and what role does the Sargasso Sea play in this decline? How and where exactly in the south-west Sargasso Sea does eel spawning occur?
- Naturalness: What is the correlation between ship traffic and noise impacts on marine life in the Sargasso Sea? What is the direct impact of shipping and other human activities on Sargassum mats? What is the impact of underwater cables on benthic habitat in the Sargasso Sea?
- Health: Developing indicators for the health of Sargasso Sea ecological communities and strengthening the understanding of relationships of climatic and anthropogenic stressors on the ecological health of the Sargasso Sea.
- Monitoring: there is a great need to improve biological monitoring as well as the surveillance of human activities to better understand the interplay between the Sargasso Sea and outside influences.

The group also discussed the fact that there were other islands within the area discussed by this group, i.e., the Bahamas, and Turks and Caicos, but did not feel that it was appropriate to have further discussion regarding potential areas meeting EBSA criteria within these jurisdictions without the presence of any of their representatives (area for future consideration no. 10)
