Capstone Report

Improving Capacity of Governments and the Fisheries Sector to Conserve Marine Biodiversity Through the Use of "Other Effective Area-based Conservation Measures"

By

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Abstract
Following the adoption of Aichi Biodiversity Target 11 by the Parties to the Convention on Biological Diversity in 2010, the potential for area based management tools (ABMTs) to contribute to biodiversity goals through the use of other effective area-based conservation measures (OECMs) was recognized. Currently, States are unsure how to interpret or apply the OECM concept due to a lack of formal guidance. To assist in building State capacity to identify and designate fisheries OECMs, we conducted a literature review examining case studies of fisheries ABMTs and their compatibility with the OECM criteria, and thus their ability to contribute to biodiversity conservation. We examined 463 publications describing 446 unique fisheries ABMT areas. The literature review helps build a common understanding and interpretation of which fisheries ABMTs are likely to fit the OECM criteria. It also will support States' ability to meet new and higher biodiversity targets as it will become necessary to report a combination of both protected areas and OECMs in order to meet these targets. This report describes the dataset we created during our review. Specifically, we document the purpose, methods, content, processing steps, quality control, completeness, and constraints of the dataset.

Key Words
Convention on Biological Diversity, OECM, fisheries, area-based management, spatial management, biodiversity conservation

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Purpose of Dataset

The literature review was intended to identify fisheries ABMTs that may meet some or all of the OECM criteria.

Several global and regional instruments promote the use of ABMTs in marine and coastal zones. For example, Parties to the Convention on Biological Diversity (CBD) recognized the role of ABMTs through the adoption of Aichi Biodiversity Target 11 in 2010. Target 11, under Strategic Goal C of the Strategic Plan for Biodiversity 2011-2020, called for 10 percent of coastal and marine areas to be conserved in protected areas and OECMs by 2020. In 2015, the UN General Assembly reinforced this in the 2030 Sustainable Development Agenda through the adoption of Sustainable Development Goal 14.5: "By 2020, conserve at least 10 percent of coastal and marine areas, consistent with national and international law and based on best available scientific information." The Parties to the CBD are currently negotiating the Post-2020 Global Biodiversity Framework, which includes a draft target proposing increases in marine protected areas (MPAs) and OECMs so that 30% of the oceans are conserved by 2030. This Post-2020 Framework is set to be adopted in early 2022.

Progress towards the global area-based management goals is slow and uneven, with many States falling below 10 percent or even 5 percent. Up until now, States have almost exclusively been attempting to meet

Target 11 via MPAs. However, with States' concern over their ability to achieve the proposed 30% conservation target, global attention has turned to Target 11's reference to "other effective area-based conservation measures."

In November 2018, 14th Conference of Parties (COP) to the CBD formally adopted a definition, criterion, and recommendations for OECMs[1]. This Decision (Decision 14/8) defines OECMs by the outcomes produced by the area:

> a geographically defined area other than a Protected Area, which is governed and managed in ways that achieve positive and sustained long-term outcomes for the in-situ conservation of biodiversity, with associated ecosystem functions and services and where applicable, cultural, spiritual, socio-economic, and other locally relevant values.[1]

Annex III of Decision 14/8 provides 13 Guiding Principles that describe characteristics that OECMs should have. In addition, it outlines 4 criteria and 10 sub-criteria that ABMTs should meet to be considered OECMs (see Appendix I). However, the Parties did not develop and adopt official guidance on how to assess what could or could not be recognized as an OECM under Target 11. Even with the official OECM definition and criteria, States are unsure how to interpret and apply the OECM concept in order to meet their CBD commitments. In order for OECMs to help achieve these biodiversity targets, our literature review is indeed to help build a common understanding and interpretation of which fisheries ABMTs could count as OECMs. It is also intended to help guide States in interpreting and applying the OECM criteria in the fisheries sector.

Data Collection Methods

Through our literature review, we identified case studies of existing fishery ABMTs within each of the following categories: vulnerable marine ecosystem; reserve, sanctuary; fishery restricted area; benthic protected area; ring fencing; moratorium; locally managed marine area; rotational closure; closed season; move-on rule; real time incentive, real time special management; gear ban; and territorial use rights in fishing. Search criteria encompassed each of the fisheries ABMT categories with "AND fish* AND (biodiversity OR conservation)." The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) statement was followed as a guide for this review[2].

For each search criteria, we conducted the literature review of the first 1,000 publications highlighted by Google Scholar in order to capture a wide variety of publication types. We conducted the search in mid-April 2021 and included all publications that included the search criteria for all years prior to the search. Through this method, we captured 8,972 publications to be screened. We excluded all publications that were not in English and removed all duplicates. We reviewed the title and abstract for the remaining 8,872 publications and only retained publications where the title or abstract gave some indication that a specific ABMT or group of ABMTs were discussed in the publication. This resulted in 1,071 publications identified for a full text review. Through this second selection, we reviewed the full text of each of these publications. We were unable to locate the full text of 60 publications. For the remaining, we only

[1] CBD, 2018. Decision Adopted by the Conference of the Parties to the Convention on Biological Diversity: Protected Areas and Other Effective Area-based Measures. Sharm El-Sheikh, Egypt, pp. 1–19.

[2] Moher, D., Hopewell, S., Schulz, K.F., Montori, V., Gøtzsche, P.C., Devereaux, P.J., Elbourne, D., Egger, M. and Altman, D.G., 2010. CONSORT 2010 Explanation and Elaboration: updated guidelines for reporting parallel group randomised trials (Chinese version). *Journal of Chinese Integrative Medicine*, *8*(8), pp.701-741.

included publications in the final selection if they reported on specific marine ABMT case studies. To limit the extent of the review, we excluded all publications focused on freshwater ABMTs. We also excluded all publications for which the full text was not in English. This resulted in 463 retained publications.

For each of the publications retained in the final selection, we filled in a Google Form (see Appendix II) with questions pertaining to the following: demographic information (author affiliation type, type of literature, main objective/goal of paper); basic case study information (type of ABMT, region/country, FAO fishing area, fishery being addressed, stated management objectives, identified species/habitats/ecosystems for conservation, year established); and information documented in the paper related to each of the 4 OECM criteria, 10 sub-criteria and 26 indicators agreed upon in Decision 14/8. Answers to submitted forms were compiled in a Google Sheets file.

For publications that reported on more than one specific ABMT (118 papers, 20% of papers retained for the full assessment), data was collected for each individual ABMT separately where possible. In instances where a publication discussed a geographically connected network of ABMTs without separately reporting on the individual measures, we collected data about the network as a whole. The review resulted in information collected on a total of 669 case studies in the database, including 306 individual ABMTs and 363 ABMT networks.

Digital content

By the end of the literature review, we had created four Google Sheets [ABMT review next phase, Fisheries ABMT typology lit review (Responses), Data processing ABMT lit review - all papers full data CLEANED, and Super master ID tracking - duplicate case studies combined], one R file (ABMT Locations map), and one Microsoft Excel file (Conservation Outcomes).

ABMT review next phase

This file includes all papers that passed the first phase of screening (review of abstracts and titles). The first sheet entitled “paper numbers” shows how many papers for each ABMT were retained and removed during each phase of the literature review. The rest of the sheets are divided by the type of ABMT the publication focuses on. All of these remaining sheets include, for all publications, the title, authors, year published, URL, reviewer, date reviewed, whether it was kept, why it was discarded, whether the Google Form is submitted, general comments, how likely the ABMT is to meet the OECM criteria, and comments on the clarity of the Google Form.

Fisheries ABMT typology lit review (Responses)

This file includes all responses to the Google Form.

Data processing ABMT lit review - all papers full data CLEANED

Most sheets in this file are intended to analyze a single question from the google form. Thus, they have a column with responses to a question from the Google Form and a column for corrected answers. Most sheets also have a pivot table to summarize the data and many have a data visual.

“Descrip mgmt system” sheet

This sheet indicates the dimensions constrained (time, space, and activities) for each ABMT case study. Each dimension characteristic corresponds with a column in the sheet (columns M-Y).

The dimension of time refers to the period during which the ABMT is in place and fulfilling its purpose. We characterize the time dimension in five ways: permanent, temporary, seasonal, real-time and periodic.

- A permanent ABMT is in effect year-round and without a particular end date. An ABMT can also be permanent if, at the end of its duration period, it is subjected to a review with the intent that it will be renewed. For example, a TURF concession that can be renewed after a set number of years can be de facto permanent unless the conditions for its renewal are not met.
- A temporary ABMT is in place for a set period of time. It can be implemented again or not after its period of implementation is finished; however, it is not subject to review and renewal at the end of the defined period. For example, a non-permanent closure to recover stocks.
- A seasonal ABMT goes into effect every year for a duration inferior to one year, and occurs every year during the same months/seasons. For instance, closures during spawning seasons.
- Real-time ABMTs are triggered by a specific rule, such as meeting a set threshold, and last for a predetermined amount of time. For example, move-on rules where there is a specific rule that triggers the closure of the area.
- A rotational ABMT is in place in a regularly recurring order and does not follow a seasonal pattern. For example, rotational closures where part of the fishing ground is closed to specific fisheries or gears and then reopened again.
- A periodic ABMT is implemented or relaxed when desired, but is not done so seasonally or only in a regularly recurring order. There still may be rules during the "relaxed period." An example of a periodic ABMT is a tabu that is lifted for ceremonies.

The dimension of space refers to the physical space that is regulated by an ABMT. We characterize the space dimension in five ways: high seas, State, high seas and State, full and partial. The first three categories are dependent on the ABMT's geographical location, while the latter two are dependent on the geographical location of the species the ABMT is intended to conserve.

- High seas ABMTs are located entirely or partially in the high seas and outside of national jurisdiction.
- State ABMTs are located entirely shoreward of one or multiple States' EEZ outer boundary lines.
- High seas and State ABMTs are located in the high seas and within the outer boundary line of at least one State's EEZ.
- Full ABMTs have fishing restrictions that apply to the entire geographical range of the species the ABMT is intended to conserve, which is within the outer boundary line of the relevant State's EEZ.
- Partial ABMTs have fishing restrictions that do not apply to the entire geographical range of the species the ABMT is intended to conserve which is within the outer boundary line of the relevant State's EEZ. Since the full and partial ABMT categories are only concerned with species' ranges within States' EEZs, high seas ABMTs are excluded from this category.

The dimension of activities refers to limitations that are placed on harvesting activities regarding the types of activities allowed in the ABMT. Here, we adopt the definition of fishing/harvesting used in Article 1 of the Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing: "searching for, attracting, locating, catching, taking or harvesting fish or any activity which can reasonably be expected to result in the attracting, locating, catching, taking or harvesting of fish." We characterized the activities dimension in two ways: total closure and partial closure.

- Total closure ABMTs prohibit all harvesting of marine species.

- Partial closure ABMTs prohibit only certain harvesting activities. For example, they may limit certain gear, methods, target species, or socio-economic categories.

In addition to the dimensions constrained, column Z ("No longer in place") indicates whether the paper specified if the ABMT was still in place.

The answer for each column (M-Z) can be Yes, (Yes), No, (No), Unknown, or N/A. Yes and No responses without parentheses indicate a very high level of certainty in the answer. On the other hand, Yes and No responses inside parentheses indicate that there is some uncertainty and the answer is assumed but is not explicitly stated within the paper. Unknown indicates that there is a high level of uncertainty and the answer cannot be assumed based on the provided information. If an ABMT was no longer in place at the time of writing and the ABMT did not classify as temporary, an N/A would be put for all dimension categories. Answers were provided for the fisheries management regime at the time the publication was written, even if management was expected to change. If the fisheries management at the time of writing was not provided, then the management regime described by the author(s) was used regardless of whether or not it was in effect at the time of writing.

If there were multiple correct answers for any category, "Yes" would be chosen first, "Unknown" second, and "No" third. This sometimes occurred, for example, when a network of ABMTs was being evaluated and the fisheries management differed among the areas. If an ABMT had been designated but the fisheries management was yet to be determined, "No" was provided as the answer for all categories except for the already determined space dimensions. For the time dimension, if the paper provided no indication that the ABMT met a category's definition, the answer for that category would be "No." However, if no information was provided about the fisheries regulations of the ABMT, then all of the time dimension categories would be filled out as "Unknown." For the activities dimension, if a paper specified that fishing was prohibited, it was assumed that all harvesting of marine species was prohibited.

Super master ID tracking - duplicate case studies combined

This sheet was created to consolidate data from multiple papers referring to the same ABMT into single lines of data. Papers were assigned a Super Master ID as described in the "Processing Steps" section below with a unique Super Master ID for each unique ABMT. Tabs from the "Data processing ABMT lit review - all papers full data CLEANED" sheet were copied over to this sheet and data was consolidated to provide only a single line of entry for each unique ABMT for each tab. After this consolidation, data related to OECM criteria and biodiversity outcomes was processed and presented in tables to be used in the final publication.

ABMT Locations Map

This file includes coordinate data that was obtained for each individual ABMT in the final paper either from the coordinates provided for the area on Wikipedia or Google Maps, or by referencing maps in papers discussing the areas cross referenced with Google Maps to obtain coordinates. These coordinates were then added as points on a world map using R.

Type of Conservation Outcomes Observed

This file contained the emergently coded responses for biodiversity outcomes observed for each ABMT. A list of biodiversity outcomes was used to categorize responses for these outcomes, then each ABMT

was binary coded to show whether or not it displayed each individual outcome. Outcomes were also grouped into three levels: Species/Population Outcomes, Habitat Outcomes, and Ecosystem Outcomes. The number of outcomes in each category was summed for each ABMT. These outcomes are described in Appendix III.

Processing Steps

Data processing ABMT lit review - all papers full data CLEANED

The "corrected" columns in this file are corrected Google Form responses. Corrections include fixing typos and inconsistent capitalization to ensure the same answers to each question were reported in the same way in the data. For some sheets, such as "Fishery Described" and "Species and Ecosystems," with typed entries instead of checked boxes, responses were emergently coded to create standardized responses for each ABMT. For instance a response of "Big blue octopus, tang, emperor, snapper, and rabbitfish. Coral and mangrove habitat" in the "Species and Ecosystem" tab was separated into "Big blue octopus, Tang, Emperor, Snapper, Rabbitfish" for species and "Coral reef, Mangrove" for ecosystem. This allows the data to be analyzed with a comma-delimited separation program to identify individual species and ecosystems for each area, allowing analysis of which species and ecosystems occur multiple times among different individual ABMTs.

Super master ID tracking - duplicate case studies combined

Super Master IDs

Super Master IDs were numerical indicators for each individual ABMT assessed in the literature review. Individual ABMTs were assigned a unique Super Master ID so that the data for each individual area could be consolidated by area rather than for each individual paper. Each paper was sorted alphabetically by name, then each named area was given a unique super master ID code. After this coding, the papers were again sorted by the super master IDs to ensure all papers on the same areas were adjacent to one another. After the Super Master IDs were sorted, areas that had multiple papers were color coded alternating Orange and Yellow to designate which papers needed to be consolidated to a single line, color alternation allowed adjacent groupings to be differentiated. After sorting the data by individual ABMT, data was consolidated for each Super Master ID to contain one row of information per Super Master ID, thereby avoiding multiple counts of information from areas that were discussed in multiple papers in the literature review.

Each tab from the "Data processing ABMT lit review - all papers full data CLEANED" sheet was copied over to the "Super master ID tracking - duplicate case studies combined" file and had data from individual entries for the same ABMT consolidated to have one set of entries for each individual ABMT using the Super Master IDs assigned.

ABMTs Fitting OECM Criteria

Each ABMT was assessed to determine whether it met each individual OECM criterion and combinations of criteria. To assess Criterion A (not a currently recognized protected area), the name of each ABMT was input into the World Database of Protected Areas and coded as declared, undeclared, or unclear whether the area was declared as a Marine Protected Area. ABMTs that were not declared MPAs or were unclear if they were declared as MPAs were counted as meeting OECM Criterion A. To assess Criterion B (geographically defined and legitimately managed), the areas were assessed on two metrics. First, the

areas were counted as having a geographically defined area if "Yes" was reported in the literature review question asking if the area was geographically defined. Second, areas were counted as having a legitimate governance authority if the "Yes" was reported in the literature review asking whether the area had a legitimate governance authority. If an area was reported to meet both of these criteria, it was recorded as meeting Criterion B. To assess Criterion C (sustained and effective *in situ* conservation of biodiversity), areas were counted as having met this criterion if they were recorded as having positive or positive and negative impacts on *in situ* biodiversity in the literature review. To assess Criterion D (associated ecosystem functions and services), areas were counted as having met this criterion if they were recorded as having management measures to support ecosystem services in the literature review. Each criterion was binary coded, with areas that met the criterion recorded as 1, and areas that did not meet the criterion recorded as 0. Areas were then assessed for each combination of OECM criteria.

Using the binary coding for OECM criteria, ABMTs were sorted by areas that met each criterion or combination of criteria. For each area that met an individual criterion, the area types associated with those ABMTs were compared against the total number of each area type in the study to assess how well each type of ABMT fared for each OECM criterion or combination of criteria. This information was recorded in a table with conditional formatting based on the percentage of areas for each area type that met the criteria.

Biodiversity Outcomes

The biodiversity outcomes for each ABMT were emergently coded to assess the types of outcomes observed at each area. These emergent codes were grouped into the broad categories of "Species/Population Outcomes," "Habitat Outcomes," and "Ecosystem Outcomes." ABMTs were binary coded with a 1 to indicate the area displayed an outcome category and with a 0 if there was no indication that an outcome was displayed in a given ABMT. ABMTs were then sorted by areas that showed any biodiversity outcomes at all, and by the three broad biodiversity outcome categories. For ABMTs that met each of these categories of biodiversity outcomes, the area types associated with these ABMTs were compared to the total number of areas for each area type to assess how each type of ABMT in the study fared in achieving biodiversity outcomes. This information was recorded in a table with conditional formatting based on the percentage of areas for each area type that displayed biodiversity outcomes.

Quality Assurance and Quality Control

While reading through and evaluating publications, a constant conversation was maintained on the meaning of literature responses and how to categorize the data to attempt to ensure the evaluation of each publication was as close to consistent as possible with multiple reviewers.

During data processing, at the completion of each project, the tab within a file containing processed data was marked in orange to note it required review. After the tab was reviewed to ensure accuracy, the tab was marked green to note it was complete. This allowed multiple people to examine each step in data processing to prevent mistakes.

Data Completeness and Constraints

It is likely that our search criteria and methods failed to capture all publications on fisheries ABMT case studies. In addition, because four people contributed to analyzing the papers, there are likely slight

inconsistencies in the data. We tried to actively communicate with each other to eliminate any disparities between our work such as how we were interpreting questions and filling out the Google Form. Throughout the literature review, some inconsistencies did arise and were addressed. For example, one reviewer was discarding papers focusing on a certain type of management regime as they believed it did not classify as an ABMT. Another reviewer noticed this and shared that they had been including papers with this type of management regime. The capstone group resolved this inconsistency by discussing and agreeing on a more definitive definition of ABMT.

It is important to note that because the papers we reviewed in this study were not written with the purpose of evaluating these areas as OECMs, just because there is not evidence to support an area meeting one of the OECM criteria in our data does not necessarily mean that that area would not meet the criteria if evaluated for the purpose of OECM designation. This means it is likely that the results on the likelihood for case study areas to meet OECM guidelines reported in our research are artificially low compared to the real world numbers.

Our dataset should likely not be used to answer questions of equity. We did not record the impact that these ABMTs had on individuals or communities. For instance, we examined biodiversity but not in relation to its impact on people. Specifically, we would have recorded if the abundance of a species increased but not whether that increased abundance affected food security. In addition, we would have recorded that an ABMT prohibited fishing but not that its management measure jeopardized the livelihoods of local fishers.

<u>Future Areas of Research</u>

Below are several potential areas for future investigation.

- How equitable are ABMTs and how should OECMs address equity?
- How is “success” or “effectiveness” of an ABMT usually measured? If one way of measurement is favored, why is it favored? How would our discussions of ABMTs change if we changed our definition of success?
- How do indigenous or locally managed ABMTs differ from state managed ABMTs? How are indigenous rights incorporated into OECM designation?
- Identifying and discussing case studies of high-performing ABFM.

Appendix I

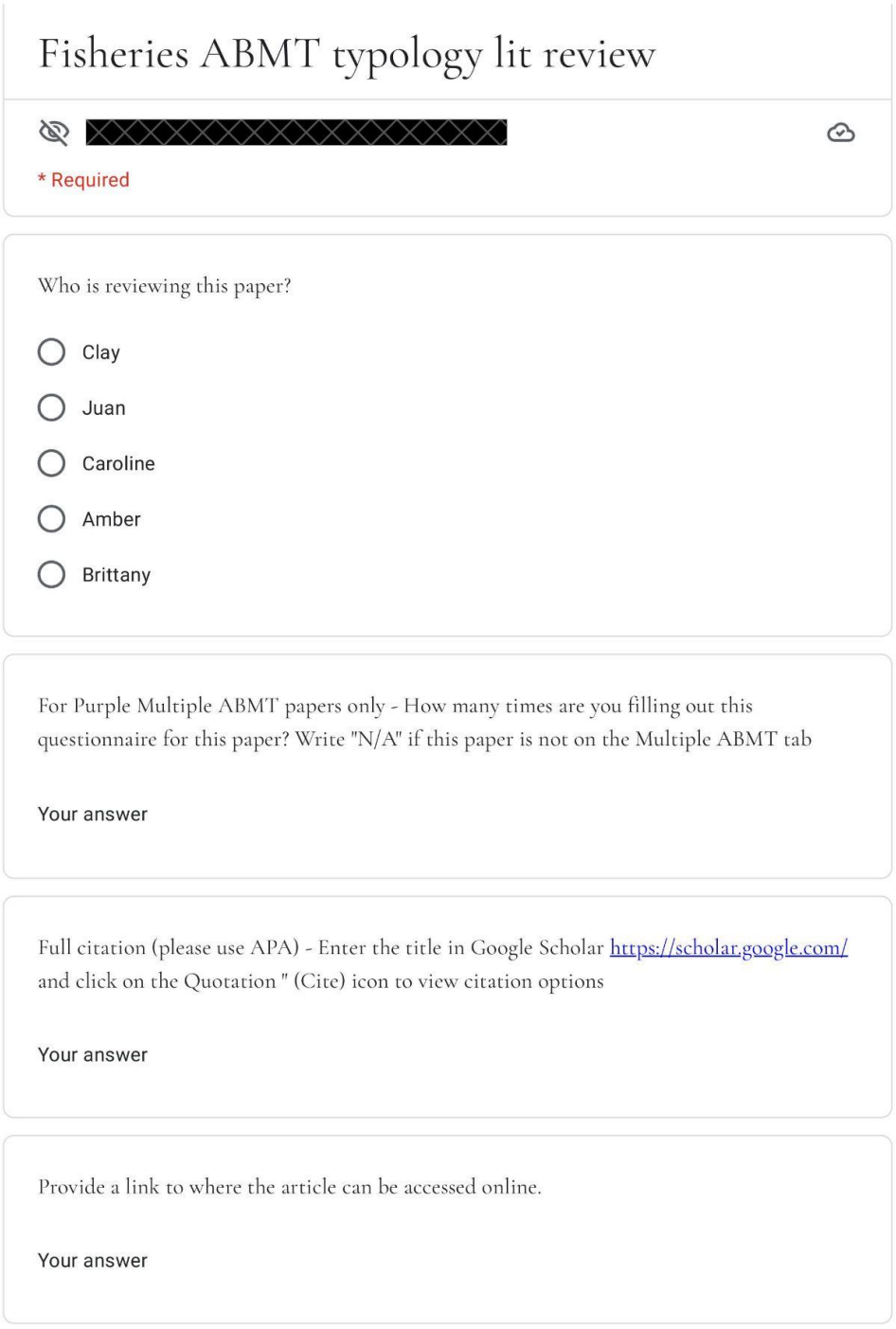
Below is the criteria for identification of OECMs included in Section B of Annex III to Decision 14/8.

Criteria	
Criterion A: Area is not currently recognized as a protected area	
Not a protected area	· The area is not currently recognized or reported as a protected area or part of a protected area; it may have been established for another function.
Criterion B: Area is governed and managed	
Geographically defined space	· Size and area are described, including in three dimensions where necessary. · Boundaries are geographically delineated.
Legitimate governance authorities	· Governance has legitimate authority and is appropriate for achieving in situ conservation of biodiversity within the area; · Governance by indigenous peoples and local communities is self-identified in accordance with national legislation and applicable international obligations; · Governance reflects the equity considerations adopted in the Convention. · Governance may be by a single authority and/or organization or through collaboration among relevant authorities and provides the ability to address threats collectively.
Managed	· Managed in ways that achieve positive and sustained outcomes for the conservation of biological diversity. · Relevant authorities and stakeholders are identified and involved in management. · A management system is in place that contributes to sustaining the in situ conservation of biodiversity. · Management is consistent with the ecosystem approach with the ability to adapt to achieve expected biodiversity conservation outcomes, including long-term outcomes, and including the ability to manage a new threat.
Criterion C: Achieves sustained and effective contribution to *in situ* conservation of biodiversity	
Effective	· The area achieves, or is expected to achieve, positive and sustained outcomes for the in situ conservation of biodiversity. · Threats, existing or reasonably anticipated ones are addressed effectively by preventing, significantly reducing or eliminating them, and by restoring degraded ecosystems. · Mechanisms, such as policy frameworks and regulations, are in place to recognize and respond to new threats. · To the extent relevant and possible, management inside and outside the other effective area-based conservation measure is integrated.
Sustained over long term	· The other effective area-based conservation measures are in place for the long term or are likely to be. · “Sustained” pertains to the continuity of governance and management and “long term” pertains to the biodiversity outcome.

***In situ* conservation of biological diversity**	· Recognition of other effective area-based conservation measures is expected to include the identification of the range of biodiversity attributes for which the site is considered important (e.g. communities of rare, threatened or endangered species, representative natural ecosystems, range restricted species, key biodiversity areas, areas providing critical ecosystem functions and services, areas for ecological connectivity).
Information and monitoring	· Identification of other effective area-based conservation measures should, to the extent possible, document the known biodiversity attributes, as well as, where relevant, cultural and/or spiritual values, of the area and the governance and management in place as a baseline for assessing effectiveness. · A monitoring system informs management on the effectiveness of measures with respect to biodiversity, including the health of ecosystems. · Processes should be in place to evaluate the effectiveness of governance and management, including with respect to equity. · General data of the area such as boundaries, aim and governance are available information.
Criterion D: Associated ecosystem functions and services and cultural, spiritual, socio-economic and other locally relevant values	
Ecosystem functions and services	· Ecosystem functions and services are supported, including those of importance to indigenous peoples and local communities, for other effective area-based conservation measures concerning their territories, taking into account interactions and trade-offs among ecosystem functions and services, with a view to ensuring positive biodiversity outcomes and equity. · Management to enhance one particular ecosystem function or service does not impact negatively on the sites overall biological diversity.
Cultural, spiritual, socio-economic and other locally relevant values	· Governance and management measures identify, respect and uphold the cultural, spiritual, socioeconomic, and other locally relevant values of the area, where such values exist. · Governance and management measures respect and uphold the knowledge, practices and institutions that are fundamental for the in situ conservation of biodiversity.

Appendix II

Below is the Google Form that was filled out for each ABMT case study. Some of the columns to the question "What threats are currently impacting the area, have impacted the area in the past or have the potential to impact the area?" are cut off in the below images. These cutoff column include the following options "Current threats to the area NOT being addressed through management," "Past threats that are no longer a problem," "No threats are mentioned in the publication," "Threats are mentioned, but none of them are listed here," and "N/A."



Fisheries ABMT typology lit review

[redacted]

* Required

Who is reviewing this paper?

- Clay
- Juan
- Caroline
- Amber
- Brittany

For Purple Multiple ABMT papers only - How many times are you filling out this questionnaire for this paper? Write "N/A" if this paper is not on the Multiple ABMT tab

Your answer

Full citation (please use APA) - Enter the title in Google Scholar https://scholar.google.com/ and click on the Quotation " (Cite) icon to view citation options

Your answer

Provide a link to where the article can be accessed online.

Your answer

What is the affiliation of the authors? Select all that apply. If an option is missing, please add it under "other" *

- [ ] Academic institution
- [ ] Government agency
- [ ] NGO
- [ ] Consulting firm
- [ ] Civil Society Organization
- [ ] Other:

Copy and paste the abstract here. *

Your answer

What kind of literature is it? If an option is missing, please add it under "other" *

- [ ] Book
- [ ] Master's thesis
- [ ] Doctoral dissertation
- [ ] Bachelor's thesis
- [ ] FAO technical paper
- [ ] Flyer/pamphlet
- [ ] Information bulletin
- [ ] Peer-reviewed article
- [ ] Government report
- [ ] Technical paper
- [ ] Other:

What year was the publication published? *

Your answer

What type of paper is it? If an option is missing, please add it under "other" *

- ○ Review paper (reviews and compares papers that others have written)
- ○ Case study where an individual area-based management tool was assessed
- ○ Multiple ABMTs are being compared to each other - one google form being filled out per individual ABMT
- ○ Network of ABMTs being reviewed as a single unit - one google form filled out for the paper
- ○ Other:

What region is this publication focused on? Select all that apply. Please refer to this website when answering the question https://unstats.un.org/unsd/methodology/m49 *

- [ ] Northern Africa
- [ ] Eastern Africa
- [ ] Middle Africa
- [ ] Southern Africa
- [ ] Western Africa
- [ ] Latin America and the Caribbean
- [ ] South America
- [ ] North America
- [ ] Antarctica
- [ ] Central Asia
- [ ] Eastern Asia
- [ ] South-eastern Asia
- [ ] Southern Asia
- [ ] Western Asia
- [ ] Eastern Europe
- [ ] Northern Europe
- [ ] Southern Europe
- [ ] Western Europe
- [ ] Australia and New Zealand
- [ ] Melanesia
- [ ] Micronesia
- [ ] Polynesia
- [ ] Other:

What fishing area is this publication focused on? Select all that apply. Please refer to this website when answering the question https://www.fao.org/fishery/area/search/en *

- [ ] Arctic Sea
- [ ] Atlantic, Northwest
- [ ] Atlantic, Northeast
- [ ] Atlantic, Western Central
- [ ] Atlantic, Eastern Central
- [ ] Mediterranean and Black Sea
- [ ] Atlantic, Southwest
- [ ] Atlantic, Southeast
- [ ] Atlantic, Antarctic
- [ ] Indian Ocean, Western
- [ ] Indian Ocean, Eastern
- [ ] Indian Ocean, Antarctic and Southern
- [ ] Pacific, Northwest
- [ ] Pacific, Northeast
- [ ] Pacific, Western central
- [ ] Pacific, Eastern Centra
- [ ] Pacific, Southwest
- [ ] Pacific, Southeast
- [ ] Pacific Antarctic
- [ ] Other:

What is the main objective/goal of the publication? *

Your answer

Which category of ABMT is being reviewed?

- ○ VME
- ○ Reserve
- ○ Sanctuary
- ○ Fishery Restricted Areas
- ○ Benthic Protected Areas
- ○ Ring Fencing
- ○ Moratorium
- ○ Marine Managed areas
- ○ Locally-Managed Marine Areas
- ○ Community Conserved Areas
- ○ Rotational closures
- ○ Closed seasons
- ○ Real time closures
- ○ Move on rule for fishing
- ○ Real time incenitives
- ○ Gear ban
- ○ TURFs
- ○ Other:

What is the name of the ABMT or tools being reported on? BE SPECIFIC AND GIVE THE EXACT NAME OF THE ABMT AND NOT JUST THE CATEGORY - FOR EXAMPLE "LOPHELIA REEF CONSERVATION AREA". If the paper focuses on more than one ABMT, please describe all of the ABMTs that are discussed in the paper. For example, a paper might focus on a TURF, but within the TURF there might be rotational closures or reserves. Please describe all ABMT happening in the same area. If the paper talks about a large group of ABMT (e.g., all TURFs in Chile), indicate that clearly here. *

Your answer

What country or countries is this ABMT(s) located in? *

Your answer

What specific fishery is this publication related to? BE SPECIFIC AND GIVE THE EXACT NAME OF THE FISHERY AND NOT JUST THE TYPE OF FISHING - FOR EXAMPLE INSTEAD OF "LONG LINE" YOU WOULD PUT "CALIFORNIA SWORDFISH LONG LINE FISHERY" OR "PORTUGUESE SARDINE FISHERY" INSTEAD OF JUST "SARDINES". If the paper focuses on more than one fishery, please describe to the best of your ability the fisheries focused on. *

Your answer

How many ABMT does the publication report on? *

- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5
- ○ The paper discusses a functional network in the same geographic area
- ○ Other:

What are the stated management objectives of the ABMT(s) being reported on? If no management objectives are mentioned, please state so in the answer. *

Your answer

Describe the species, habitats and/or ecosystems that the ABMT is designed to manage and conserve. If nothing relevant is described, type N/A. *

Your answer

What year was the ABMT put into place? Add as much information as needed regarding when the ABMT was first implemented if it is not possible to simply put a single year. If the publication discusses multiple ABMTs, please describe as completely as possible when the areas were put into place. If nothing relevant is described, type N/A. *

Your answer

OECM Scoping questions

If the publication refers to more than one ABMT, please answer the OECM scoping questions about the group of ABMTs.

Criteria B: Is the area a geographically defined space? Size and area are described, including a description of the characteristics of relevant depths within the water column if possible. Boundaries are geographically delineated with coordinates that can be mapped *

- ○ Yes
- ○ No
- ○ The publication doesn't mention this
- ○ Other:

Copy and paste relevant text in the publication related to Criteria B: Is the area a geographically defined space? If nothing relevant is described, type N/A. *

Your answer

Criteria B: Does the area have a legitimate governance authority? The area is under the authority of a specified entity or an agreed upon combination of entities that has or have the formal governance mandate and powers to achieve in-situ conservation of biodiversity in the area. This includes (1) Governance by a government agency (from central to local); (2) Governance by private individuals, organizations or companies (e.g., fishers associations); (3) Governance by indigenous peoples and/or local communities (e.g., territories and areas conserved by indigenous peoples and local communities (ICCAs)); and (4) Shared governance (i.e., governance by various rights holders and stakeholders together, such as between indigenous peoples and local communities and Governments or between private individuals or civil society organizations and Governments.). *

- ◯ Yes
- ◯ No
- ◯ The publication doesn't mention this
- ◯ Other:

Copy and paste relevant text in the publication related to Criteria B: Does the area have a legitimate governance authority? If nothing relevant is described, type N/A. *

Your answer

Criteria B: Who is in charge of managing the ABMT? Name all entities and authorities that are in charge of management and governance for the area. If nothing relevant is described, type N/A. *

Your answer

Criteria B: Are indigenous peoples and local communities involved in managing the area or making decisions about how to manage it? Please add comments under "Other *

- [ ] Yes
- [ ] No
- [ ] The publication doesn't mention this
- [ ] Other:

Criteria B: Is there a written management plan in place that describes how the ABMT should be governed and managed? Describe any nuances in the "other" field *

- [ ] Yes there is a management plan, but the authors note that it isn't being implemented.
- [ ] Yes there is a management plan and the authors note that it is being implemented
- [ ] Yes there is a management plan but the authors don't mention if it is being implemented or not
- [ ] No there is no management plan
- [ ] The authors do not mention the existence of a management plan.
- [ ] Other:

Criteria B: Describe the larger management system in place. (e.g., How is the management of the ABMT set up? Does it have a person in charge of it? Perhaps a specific group in the Ministry of Fisheries? What types of rules and restrictions govern the use of resources? Any other intricacies regarding the management of the area, etc). Copy and paste relevant text in the publication *

Your answer

Criteria B: Is the area being managed in a manner consistent with the ecosystem approach and likely to achieve long-term biodiversity conservation outcomes? FAO defines the ecosystem approach to fisheries as an approach that "strives to balance diverse societal objectives, by taking account of the knowledge and uncertainties of biotic, abiotic and human components of ecosystems and their interactions and applying an integrated approach to fisheries within ecologically meaningful boundaries." The area could be considered as managed in a way consistent with the ecosystem approach to fisheries when the management system addresses threats to harvested, dependent and associated species, as well as critical habitats and ecosystems for conserving native biodiversity and the ecosystem processes that support biodiversity. *

- ◯ Yes
- ◯ No
- ◯ The publication doesn't mention this
- ◯ Other:

Copy and paste relevant text in the publication related to Criteria B: Is the area being managed in a manner consistent with the ecosystem approach and likely to achieve long-term biodiversity conservation outcomes? If nothing relevant is described, type N/A. *

Your answer

Is the ABMT positively or negatively affecting biodiversity? *

- ◯ The ABMT is having a POSITIVE effect on biodiversity
- ◯ The ABMT is having a NEGATIVE effect on biodiversity
- ◯ The ABMT is having BOTH POSITIVE and NEGATIVE effects on biodiversity
- ◯ The authors note that the ABMT has NOT had an impact on biodiversity (either positive or negative)
- ◯ The paper does not talk about the effect the ABMT has on biodiversity

Criteria C: What biodiversity conservation outcomes does the ABMT provide or has it had in the past? Include a description of what species, habitats and/or ecosystems and how they are being affected (either negatively or positively) by the ABMT's existence. If nothing relevant is described, type N/A. *

Your answer

Criteria C: Does the paper describe biodiversity conservation outcomes that are expected to be achieved in the future? If yes, please describe them. If no, please type N/A *

Your answer

What threats are currently impacting the area, have impacted the area in the past or have the potential to impact the area? All types of threats to local biodiversity should be included. *

	Potential threat that is being pre-emptively addressed through management	Current threats to the area being addressed through management	Past threats that have been addressed through management	Potential threat that is NOT being pre-emptively addressed through management	Cu thre the ar be addr thr mana
No threats are mentioned in the publication	☐	☐	☐	☐	[
Threats are mentioned, but none of them are listed here	☐	☐	☐	☐	[
Aquaculture	☐	☐	☐	☐	[
Boat grounding	☐	☐	☐	☐	[
Bycatch	☐	☐	☐	☐	[
Catching spawning adults	☐	☐	☐	☐	[
Catching juveniles	☐	☐	☐	☐	[
Climate change	☐	☐	☐	☐	[
Coastal development	☐	☐	☐	☐	[
Conflict between fishers and authorities	☐	☐	☐	☐	[
Coral bleaching	☐	☐	☐	☐	[
Corruption	☐	☐	☐	☐	[
Deep sea mining	☐	☐	☐	☐	[

Deforestation	☐	☐	☐	☐	[
Destructive fishing practices	☐	☐	☐	☐	[
Development of more efficient gear	☐	☐	☐	☐	[
Disease	☐	☐	☐	☐	[
Environmental effects (changes in atmospheric and oceanic conditions)	☐	☐	☐	☐	[
Erosion	☐	☐	☐	☐	[
Eutrophication/Nutrient enrichment	☐	☐	☐	☐	[
Fishing by foreign vessels	☐	☐	☐	☐	[
Fishing by outsiders and non-locals	☐	☐	☐	☐	[
Guano mining	☐	☐	☐	☐	[
Habitat degradation	☐	☐	☐	☐	[
Habitat loss	☐	☐	☐	☐	[
High consumer demand for seafood products	☐	☐	☐	☐	[
Hurricanes and storms	☐	☐	☐	☐	[
Illegal fishing	☐	☐	☐	☐	[
Illegal fishing during closed seasons	☐	☐	☐	☐	[
Increased	☐	☐	☐	☐	[

effort/exploitation					
Increased human population and building in coastal areas	☐	☐	☐	☐	☐
Increased salinity	☐	☐	☐	☐	☐
Increased sedimentation/siltation	☐	☐	☐	☐	☐
Lack of alternative livelihoods for fishers	☐	☐	☐	☐	☐
Lack of education	☐	☐	☐	☐	☐
Lack of funds	☐	☐	☐	☐	☐
Lack of involvement of local communities	☐	☐	☐	☐	☐
Lack of trust in management	☐	☐	☐	☐	☐
Land reclamation	☐	☐	☐	☐	☐
Low compliance with rules and regulations	☐	☐	☐	☐	☐
Oil and gas exploration	☐	☐	☐	☐	☐
Overcapacity	☐	☐	☐	☐	☐
Overexploitation of resources	☐	☐	☐	☐	☐
Poaching	☐	☐	☐	☐	☐
Pollution - chemical and light	☐	☐	☐	☐	☐
Pollution - discharge from commercial activities	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐

Pollution - dumping					
Pollution - general runoff	☐	☐	☐	☐	[
Pollution - industrial	☐	☐	☐	☐	[
Pollution - litter	☐	☐	☐	☐	[
Pollution - plastic	☐	☐	☐	☐	[
Pollution - sewage/waste	☐	☐	☐	☐	[
Presences of exotic and invasive species	☐	☐	☐	☐	[
Restricted migration of fish during spawning season	☐	☐	☐	☐	[
River obstruction (e.g., dams)	☐	☐	☐	☐	[
Sand mining	☐	☐	☐	☐	[
Shipping	☐	☐	☐	☐	[
Shoreline construction	☐	☐	☐	☐	[
Telecommunication and power cables	☐	☐	☐	☐	[
Tourism	☐	☐	☐	☐	[
Unsustainable fishing	☐	☐	☐	☐	[
Use of legal fishing gear affecting non-target species and environment	☐	☐	☐	☐	[
Weak enforcement of rules	☐	☐	☐	☐	[

Weak monitoring of rules and landings	☐	☐	☐	☐	[
Wind farms	☐	☐	☐	☐	[

Criteria C: Does the publication mention any threats to the area that are not included in the previous question? If so, please indicate them and whether they have or are being addressed with management. If there are no additional threats mentioned, write N/A *

Your answer

Criteria C: Describe any mechanisms currently in place to recognize and respond to existing or potential threats to the area. If nothing relevant is described, type N/A. *

Your answer

Criteria C: Describe any mechanisms that were put in place in the past to address threats to the area. If nothing relevant is described, type N/A. *

Your answer

Criteria C: Describe any ABMTs in place in the same geographical area that are managed by or for other sectors (e.g., shipping, wind farms, cultural sites, defense, etc). If nothing relevant is described, type N/A. *

Your answer

Criteria C: Is the ABMT permanent or only in place for a set number of years? *

- ○ The ABMT is in place permanently
- ○ The ABMT is in place for a set number of years.
- ○ The paper does not mention how long the ABMT is in place
- ○ Other:

Criteria C: If the ABMT is not in place permanently, describe the timeframe that it is in place for and whether it is expected to be evaluated for renewal. If nothing relevant is described, type N/A. *

Your answer

Criteria C: Who is collecting data about the species, habitats and/or ecosystems being managed for and conserved by this ABMT? Check all that apply *

- ☐ No data is being collected
- ☐ The authors of this paper
- ☐ Academic institutions
- ☐ Government agency
- ☐ The publication doesn't mention this
- ☐ Other:

Criteria C: Is any type of monitoring being conducted that could be used to assess the effectiveness of the current management measures with respect to their effect on biodiversity conservation in the area? Undertaking monitoring activities in an area implies that data and information on how local species and ecosystems are used and impacted by fisheries activities is regularly collected. This could include the use of indicators for measuring change. Monitoring can also include, as an example, the incorporation of traditional knowledge and community-based monitoring, integrating public/community participation in the collection, analysis and interpretation of data and changes or trends in the natural environment. *

- ○ Yes
- ○ No
- ○ The publication doesn't mention this
- ○ Other:

Copy and paste relevant text in the publication related to Criteria C: Is any type of monitoring being conducted that could be used to assess the effectiveness of the current management measures with respect to their effect on biodiversity conservation in the area? If there is none, type N/A. *

Your answer

Criteria D: Which ecosystem functions and services are EXPLICITLY mentioned in the publication as being associated with the area being covered by the ABMT? Check all that apply. *

- [ ] The publication doesn't mention any ecosystem services or functions
- [ ] Provisioning services (e.g., food, fisheries/aquaculture, fiber, natural medicines, water, shells, decoration)
- [ ] Regulating services (e.g., air quality, climate regulation, water quality, coastline protection, erosion reduction, natural hazards, pollination)
- [ ] Supporting services (e.g., nursery habitats, nutrient cycling, water cycling, photosynthesis)
- [ ] Cultural services (e.g., coastal heritage) ethical values, existence value, aesthetic value, recreation, ecotourism, education)
- [ ] Other:

Criteria D: Which ecosystem functions and services are likely to be associated with the area being covered by the ABMT but are NOT EXPLICITLY mentioned by the author? Check all that apply. *

- [ ] The publication doesn't mention any ecosystem services or functions
- [ ] Provisioning services (e.g., food, fisheries/aquaculture, fiber, natural medicines, water, shells, decoration)
- [ ] Regulating services (e.g., air quality, climate regulation, water quality, coastline protection, erosion reduction, natural hazards, pollination)
- [ ] Supporting services (e.g., nursery habitats, nutrient cycling, water cycling, photosynthesis)
- [ ] Cultural services (e.g., coastal heritage) ethical values, existence value, aesthetic value, recreation, ecotourism, education)
- [ ] Other:

Criteria D: Does the management system in place include measures to support the area's associated ecosystem functions and services? In the case of marine environments, ecosystem services might include (1) Provisioning services (energy, food and feed, materials and assistance, medicinal, biochemical and genetic resources); (2) Regulating services (habitat creation and maintenance, regulation of air quality, regulation of climate, regulation of ocean acidification, regulation of freshwater and coastal water quality, regulation of hazards and extreme events, regulation of organisms detrimental to humans); (3) Supporting services (habitat for aquatic species, biomass production, nutrient cycling, water cycling); (4) Cultural, recreational and educational services (learning and inspiration, physical and psychological experiences, supporting identities, maintenance options). *

- ○ Yes
- ○ No
- ○ The publication doesn't mention this
- ○ Other:

Copy and paste relevant text in the publication related to Criteria D: Does the management system in place include measures to support the area's associated ecosystem functions and services? If there is none, type N/A. *

Your answer

If the author(s) cite other papers discussing this ABMT that are relevant for assessing achievement of the OECM criteria, please include the citations here. If there are none, type N/A. *

Your answer

If the author(s) cite other papers discussing OTHER ABMTs that could be relevant to our review, please include the citations here. If there are none, type N/A. *

Your answer

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Appendix III

Below are the biodiversity outcomes used for emergent coding of ABMT outcomes described in literature review papers, these outcomes were provided by FAO.

Population	Measured by
Maintain or enhance abundance/density	Higher catch rates, counts, sampling
Population age structure	length-frequency distribution with several modal classes
Increased body length and weight	Increased shell sizes, sampling
Conservation of rare/threatened/endangered species	
Conservation of marine priority species	
Conservation of juveniles	
Increased biomass	
Increased reproductive output	count of new recruits, spawning potential ratio
Improved evenness index	
Maintain or increase species richness	
Improved diversity index	Shannon's diversity index, dissimilarity
Increased overall species diversity	
Maintain or increase genetic diversity	
Documented species recovery	
Spillover	OFTEN INFERRED IF CASE TALKS ABOUT

	HIGHER NUMBERS OF FISH IN AREAS ADJACENT
Protection of vulnerable life stages	includes juveniles and reproductive adults
Increased food availability for key species	
Species and sites identified on the IUCN Red List of Threatened Species	
Conservation of important species aggregations (including during migration or spawning)	
Conservation of species that are important for traditional human uses/cultural values	
Improve connectivity of populations	
Improved stock conditions	
Reduction of fishing effort	
Increase in CPUE	
Habitat	
Increase in habitat restoration	Replanting of mangrove, increase in coral cover
Slowed habitat degradation	
Improve habitat continuity	
Conserve nursery grounds	
Improve habitat suitability	Habitat suitability models
Improve habitat quality	
Improve conservation of critical habitats/essential fish habitat	

Protection of vulnerable/endangered habitat	VMEs, coral, sponge
Protection of habitats especially important for species life stages/feeding/resting/moulting/breeding	
Conservation of habitats that are important for traditional human uses/cultural values	Tabooed/sacred species protected
Ecosystem	
Improve ecosystem resilience	
Improve ecosystem structure and function	
Insurance against negative environmental impacts	
Representative natural ecosystems conserved	
More cohesive community structure	
Ecological processes supported	
Conserve full range of species	
Sites identified on the IUCN Red List of Ecosystems	
Conservation of ecological integrity or ecological processes of large ecosystems	
Conserve pelagic/water column communities	
Conserve benthic communities	coral, sponge, other benthic communities mentioned
Conserve demersal communities	
Ecosystem growth and development	total system throughput
Improved food web/trophic structure	total number of trophic pathways and mean length of pathways

Decrease destructive activities