STUDY PROTOCOL

REVISED Assessing the potential of Other Effective area-based Conservation Measures (OECMs) for contributing to conservation targets: A global scoping review protocol [version 3; peer review: 2 approved, 1 approved with reservations]

Dimitra Petza[1], Eva Amorim[2], Emma Ben Lamine[3], Francesco Colloca[4], Esther Dominguez Crisóstomo[5,6], Erika Fabbrizzi[6], Simonetta Fraschetti[6], Ibon Galparsoro[7], Sylvaine Giakoumi[8], Maren Kruse[9], Vanessa Stelzenmüller[9], Stelios Katsanevakis[1]

[1]Department of Marine Sciences, University of the Aegean, Mytilene, Lesvos, Greece
[2]International Estuarine & Coastal Specialists (IECS) Ltd, Leven, UK
[3]Centre National de la Recherche Scientifique (CNRS), Université Côte d'Azur, Nice, France
[4]Integrative Marine Ecology Department, Stazione Zoologica Anton Dohrn, Rome, Italy
[5]Department of Biology, University of Algarve, Faro, Portugal
[6]Department of Biology, University of Naples Federico II, Naples, Italy
[7]Marine Research Division, AZTI, Pasaia, Spain
[8]Sicily Marine Centre, Stazione Zoologica Anton Dohrn, Palermo, Italy
[9]Thünen Institute of Sea Fisheries, Bremerhaven, Germany

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Abstract

This scoping review (ScR) protocol aims to establish the methodological approach for identifying and mapping the evidence regarding the actual contribution of Other Effective area-based Conservation Measures (OECMs) to spatial conservation targets. Emphasis will be placed on examining the research conducted, including the methodologies applied. OECMs, introduced by the Convention on Biological Diversity (CBD) in 2010, refer to areas outside of protected areas, such as fisheries restricted areas, archaeological sites, and military areas, that effectively conserve biodiversity in-situ over the long term. OECMs are recognized rather than designated. Many countries currently endeavor to identify,

Open Peer Review

Approval Status ✓ ? ✓

	1	2	3
version 3 (revision) 10 Jan 2024			✓ view
version 2 (revision) 06 Dec 2023			? view
version 1 21 Jul 2023	✓ view	? view	? view

1. **Jansen Smith**, University of Minnesota

recognize and report OECMs to the CBD for formal acceptance to support the implementation of spatial conservation targets. Studies that assess the contribution of OECMs to spatial conservation targets will be considered. Potential OECMs with primary, secondary or ancillary conservation objectives established by all sectors in the terrestrial, freshwater and marine realm worldwide will be considered. Peer-reviewed and grey literature will be considered without imposing limitations based on publication year, stage, subject area and source type. Both experimental and observational studies in English, French, German, Greek, Italian, and Spanish will be reviewed. The ScR will follow the Joanna Briggs Institute (JBI) methodology. The protocol will be guided by the PRISMA-ScR (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) extension for scoping reviews. The search will encompass bibliographic databases such as Scopus, Web of Science and Google Scholar. Grey literature sources will include databases, pre-print archives and organizational websites. The Covidence platform will be utilized for data management and extraction.

Keywords
Other Effective area-based Conservation Measures, conservation targets, scoping review, JBI methodology, PRISMA statement, Kunming-Montreal Global Biodiversity Framework, biodiversity conservation, EU Biodiversity Strategy

Duluth, Duluth, USA

2. **Matthew James Grainger**, Norwegian Institute for Nature Research, Trondheim, Norway

3. **Siyuan He**, Chinese Academy of Sciences Beijing, Beijing, China

Any reports and responses or comments on the article can be found at the end of the article.

Corresponding author: Dimitra Petza (d.petza@marine.aegean.gr)

Author roles: Petza D: Conceptualization, Investigation, Methodology, Supervision, Writing – Original Draft Preparation, Writing – Review & Editing; **Amorim E**: Investigation, Writing – Original Draft Preparation, Writing – Review & Editing; **Ben Lamine E**: Investigation, Writing – Original Draft Preparation, Writing – Review & Editing; **Colloca F**: Investigation, Writing – Original Draft Preparation, Writing – Review & Editing; **Dominguez Crisóstomo E**: Investigation, Writing – Original Draft Preparation, Writing – Review & Editing; **Fabbrizzi E**: Investigation, Writing – Original Draft Preparation, Writing – Review & Editing; **Fraschetti S**: Investigation, Writing – Original Draft Preparation, Writing – Review & Editing; **Galparsoro I**: Investigation, Writing – Original Draft Preparation, Writing – Review & Editing; **Giakoumi S**: Investigation, Writing – Original Draft Preparation, Writing – Review & Editing; **Kruse M**: Investigation, Writing – Original Draft Preparation, Writing – Review & Editing; **Stelzenmüller V**: Investigation, Writing – Original Draft Preparation, Writing – Review & Editing; **Katsanevakis S**: Conceptualization, Funding Acquisition, Investigation, Methodology, Supervision, Writing – Original Draft Preparation, Writing – Review & Editing

Competing interests: No competing interests were disclosed.

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REVISED **Amendments from Version 2**

The revised version of the manuscript has one minor change following the Reviewer's 3 comments. Specifically, the only difference between version 2 (revision 1) and version 3 (revision 2) of the manuscript is the following:

Review question: the following 5th review sub-question has been added.

5. *"What are the main outcomes of the studies that have assessed potential OECMs regarding key findings, effectiveness of potential OECMs, gaps of knowledge and policy recommendations?"*

Any further responses from the reviewers can be found at the end of the article

Introduction

Other Effective area-based Conservation Measures (OECMs) were introduced in 2010 by the Convention on Biological Diversity (CBD) as areas that achieve long-term and effective *in-situ* biodiversity conservation outside of protected areas (CBD, 2010). Consequently, OECMs represent a novel conservation approach where conservation outcomes are incidental to existing spatial management practices. In other words, OECMs are identified and recognized rather than specifically designated. The definition, guiding principles, common characteristics and criteria for identifying OECMs were agreed upon by CBD parties in 2018 (CBD, 2018). According to CBD Decision 14/8 (CBD, 2018), key criteria for an area to be identified as an OECM include geographic definition, governance and management, achieving positive and sustained long-term outcomes for biodiversity conservation, including associated ecosystem functions, services and locally relevant values such as cultural, spiritual, and socioeconomic aspects where applicable. Subsequently, additional guidance has been developed by the International Union for the Conservation of Nature (IUCN), the Food and Agriculture Organisation (FAO) and other global organizations to facilitate the identification, recognition and reporting of OECMs[1] (FAO, 2019; FAO, 2022; Garcia *et al.,* 2021; ICES, 2021; IUCN-WCPA, 2019) to contribute to the attainment of Target 14.5 of the 2030 Agenda for Sustainable Development of the United Nations (UN, 2015) and Action Target 3 of the Kunming-Montreal Global Biodiversity Framework (CBD, 2010; CBD, 2022). The latter emphasizes the need to conserve at least 30% of terrestrial and marine areas globally by 2030 through ecologically representative, effectively and equitably managed, and well-connected networks of protected areas and OECMs (CBD, 2022).

[1] According to the guidance provided by the IUCN and the FAO (FAO, 2022; IUCN, 2019) for the implementation of the CBD Decision 14/8 (CBD, 2018) the terms identifying, recognizing and reporting OECMs are defined as follows: *Identifying OECMs* is the selection process of areas potentially qualifying as OECMs. These areas are further evaluated on a case-by-case basis to determine whether they meet the CBD OECMs criteria. *Recognizing OECMs* is when the governing body of the area formally approves the OECM identification and evaluation outcomes. *Reporting OECM* is the process of sending the OECMs data to national or international databases (e.g., the databases held by the CBD Secretariat and the WD-OECM).

In recent years there has been increasing research and policy interest in OECMs and numerous countries worldwide have made significant efforts to identify and recognize OECMs to support the implementation of spatially-explicit conservation targets. According to the most recent update of the World Database on Protected Areas (May 2023; WDPA, 2023), 671 OECMs have been recognized by only nine countries worldwide (none in Europe).

This protocol aims to establish the methodological approach for a Scoping Review (ScR) with the following objectives:

- identify and map the available evidence on assessing the potential of OECMs to contribute to spatial conservation targets,
- examine the methodologies employed in research on assessing potential OECMs,
- identify the actual spatial contribution of potential OECMs to conservation targets,
- provide insights into the evidence-based knowledge about OECMs and information on how potential OECMs contribute to the spatial targets set by CBD.

Review question

The overall research question that will guide the ScR is: What is the current knowledge regarding the contribution of OECMs to biodiversity conservation targets? The ScR will aim to address the following sub-questions:

1. What is the geographical distribution of studies that have assessed potential OECMs and their contribution to biodiversity conservation?
2. What are the characteristics of the potential OECMs studied in terms of governance type, sector, realm, conservation objectives, and rationale?
3. What methodologies have been employed to assess the potential of OECMs in contributing to biodiversity conservation?
4. What is the spatial contribution (percentage of area covered) of the potential OECMs?
5. What are the main outcomes of the studies that have assessed potential OECMs regarding key findings, effectiveness of potential OECMs, gaps of knowledge and policy recommendations?

Inclusion/exclusion criteria

The inclusion criteria of the ScR, which serve as the basis for determining the sources to be considered for inclusion in the review, will be developed in accordance with the "Participants, Concept and Context (PCC)" mnemonic (Table 1).

Participants

The ScR will consider potential OECMs, established by any sector, such as transport, offshore energy, fisheries, aquaculture, maritime, tourism, defense and archaeological heritages. These potential OECMs may have primary, secondary or ancillary conservation objectives and can be governed by different entities, including governments (at various levels), private individuals, organizations or companies, indigenous peoples

Table 1. Inclusion and exclusion criteria for the Scoping Review in correspondence with the "Participants, Concept and Context, PCC" mnemonic and evidence types and sources.

	Inclusion criteria	Exclusion criteria
PARTICIPANTS ***Potential other effective area-based conservation measures (OECMs)***	Potential OECMs governed under a range of governance types i.e., by governments (at various levels), private individuals, organizations or companies, indigenous peoples and local communities and shared governance (i.e., governance by various rights holders and stakeholders together). Potential OECMs established by all sectors (e.g., transport, offshore energy, fisheries, aquaculture, maritime, tourism, defence, archaeological heritages, etc.). Potential OECMs with primary, secondary or ancillary conservation objectives.	---
CONCEPT ***Assessing potential OECMs***	All studies that assess potential OECMs. All types of methodologies and metrics applied to assess the effectiveness of potential OECMs to deliver biodiversity conservation outcomes and contribute to spatial conservation targets.	---
CONTEXT ***Global terrestrial, freshwater and marine realm***	Studies in: - terrestrial, freshwater and marine realms, - globally	---
EVIDENCE TYPES & SOURCES	- peer-review literature - grey literature - all years of publication - all publication stages, subject areas, and source types - experimental and observational studies - studies published in languages competent to the researchers' team (e.g., English, French, German, Greek, Italian, Spanish, etc.)	Evidence synthesis such as systematic, scoping, rapid, and narrative reviews

and/or local communities, as well as shared governance involving multiple rights holders and stakeholders.

Concept

The ScR will focus on the assessment of potential OECMs and how their contribution to spatial conservation targets has been addressed in the existing scientific literature. All studies that assess potential OECMs, along with the various methodologies and metrics applied to evaluate their effectiveness in delivering biodiversity conservation outcomes and contributing to spatial conservation targets will be reviewed.

Context

The ScR will consider studies conducted in the terrestrial, freshwater, and marine realms worldwide.

Types of sources

This ScR will encompass both scientific (e.g., articles, book chapters, letters, editorials, books, data papers) and grey literature (e.g., non-published academic research, theses, policy papers, organizational papers and reports, conference abstracts and papers). Scientific literature will be sourced from online databases and grey literature from pre-print archives, organizational websites, and web-based search engines, and suggestions from topic experts. There will be no restrictions on publication year, publication stage (final or in press), subject area, or source type. All document types will be considered, except for evidence synthesis such as systematic, scoping, rapid, and narrative reviews. To align with language competence of the authors, only studies written in English, French, German, Greek, Italian, and Spanish will be included in the ScR.

Methodology

The proposed ScR will follow the methodology outlined by Arksey and O'Malley (2005), as further developed by Levac *et al.* (2010) and the Joanna Briggs Institute (JBI) methodology (Peters *et al.*, 2020). The ScR encompass the following nine stages, as recommended by the JBI methodology: 1. Defining and aligning the objectives and questions; 2. Developing and aligning the inclusion criteria with the objectives and questions; 3. Describing the planned approach for evidence searching, selection, data extraction and presentation of the evidence; 4. Conducting the evidence search; 5. Selecting the relevant evidence; 6. Extracting the evidence; 7. Analyzing the evidence; 8. Presenting the results; 9. Summarizing the evidence, drawing conclusions and identifying any implications of the findings (Peters *et al.*, 2020).

The ScR protocol and final review paper will adhere to the Preferred Reporting for Systematic Reviews and Meta-Analyses

extension for scoping reviews (PRISMA-ScR) developed by Tricco *et al.* (2018). The SUMARI Protocol Template for Scoping Reviews in Word format (https://sumari.jbi.global/) was used to guide the development of this ScR protocol.

Search strategy

The bibliographic search will be conducted in three databases/platforms, namely: (a) Scopus, (b) Web of Science – Core Collection, and (c) Google Scholar. A combination of keywords will be used in the search, adapted to meet the specific search specifications of each database. The search will be conducted within the title, abstract and keywords of the documents (Table 2). For the Scopus and Web of Science databases, all documents retrieved from the search will be considered for eligibility. In the case of the web-based search using the Google Scholar database, only the first 100 hits will be considered (Haddaway *et al.*, 2015). Eligible documents will also be sought in other sources such as organizational libraries and websites, preprint archives, documents repositories, reference lists of the included documents from the databases search and documents suggested by topic experts and stakeholders.

Study/source of evidence selection

Following the search, all identified citations will be uploaded to Covidence, a web-based collaboration software platform designed to streamline the production of systematic and other literature reviews. Any duplicate citations will be removed during this stage. The document selection process will be conducted using a team approach, as recommended by Levac *et al.* (2010). Twelve independent reviewers will be involved in the selection process. Two reviewers will initially screen each title and abstract of the identified papers against the predefined inclusion criteria (Table 1). Papers that meet the inclusion criteria will proceed to the next stage. The full text of the initially selected documents will be carefully assessed by the reviewers against the inclusion criteria. Any sources that do not meet the inclusion criteria will be excluded from the review. Detailed records will be kept of the reasons for excluding specific sources, and this information will be reported in the final ScR paper. In case of any disagreements between the reviewers during any stage of the selection process, a third independent reviewer will be consulted to resolve the conflicts. The results of the search and the document selection process will be reported comprehensively in the final ScR paper. A flow diagram following the Preferred Reporting Items for Systematic Reviews and Meta-analyses extension for scoping review (PRISMA-ScR) guidelines (Tricco *et al.*, 2018) will be presented to illustrate the search and selection process.

Data extraction

Data extraction from the documents included in the ScR will be carried out by two independent reviewers using a data extraction tool, i.e., a charting table aligned to the objective and the questions of the ScR (see Extended data (Petza *et al.*, 2023)). The data extracted will include specific details related to the participants, concept, context, study methods and key findings relevant to the review objective. To ensure consistency and facilitate collaboration and interaction among reviewers, the data extraction tool will be integrated into the Covidence systematic review management software. This software will help maintain consistency in the extraction process, allow for seamless cooperation between the reviewers, and ensure that the extracted data is consistent and aligned with the objectives and questions of the ScR.

Table 2. Details of Scoping Review search strategy per database, i.e., name of the database, date of search, search query, and results (as the number of documents returned by the search).

Database 1:	**Scopus**
Date of search:	March 19, 2023
Query:	TITLE-ABS-KEY (“other effective area-based conservation measure*” OR “other effective area based conservation measure*” OR “other conservation measure*” OR “OECM*” OR “OEABCM*”)
Results:	351 documents
Database 2:	**Web of Science – Core Collection**
Date of search:	March 19, 2023
Query:	TS=(“other effective area-based conservation measure*” OR “other effective area based conservation measure*” OR “other conservation measure*” OR “OECM*” OR “OEABCM*”)
Results 1:	229 documents
Database 3	**Scholar Google**
Date of search:	March 19, 2023
Query	conservation (“other effective area-based conservation measure*” OR “other effective area based conservation measure*” OR “other conservation measure*” OR “OECM*” OR “OEABCM*”)
Results:	996 documents (only the first 100 hits were considered)

Data analysis and presentation

The evidence synthesized through the ScR will be presented in alignment with the review objective and specific questions at the final review paper. The full set of the raw data that will be collected by this ScR will be available open-access as a supplementary to the final review paper. The data collected will be analyzed by applying descriptive statistics methods. The summarized data will be presented using a combination of graphical and tabular formats, utilizing appropriate software packages and tools (e.g., Miscosoft Excel, Flourish Studio, Datawrapper Plotly etc.). Graphical representations, such as bar charts, line graphs, donut charts, sankey, chord and network diagrams, choropleth maps, word clouds etc., will be used to visually display relevant information and trends identified in the included studies. These visuals can help convey patterns, relationships, and key findings effectively. For example, the number of documents included in the ScR by year of publication will be presented using bar charts. Choropleth maps will be used to present the geographical distribution of the various case studies reviewed. The different types of OECMs will be depicted using word clouds. Sankey diagrams will be constructed to visualize the flow of information between multiple entities (e.g., conservation objective, realm and sector), while network and chord diagrams will be used to depict the connections between the different methodologies applied for the assessment of potential OECMs. In addition to the graphical and tabular presentations, a narrative summary will be included. This summary will provide a coherent and comprehensive description of the findings, explaining how the results align with the review's objective and specific questions. It will offer a synthesis of the key themes, trends, and patterns identified in the included studies.

Data availability

Underlying data

No data is associated with this article.

Extended data

Open Science Framework (OSF): Assessing the potential of other effective area-based conservation measures for contributing to conservation targets: a global scoping review protocol – PRISMA-ScR Checklist and Data Extraction Tool. https://doi.org/10.17605/OSF.IO/3WK5H (Petza *et al.*, 2023).

This project contains the following extended data:

- Data Extraction Tool.pdf (Data extraction tool of the Scoping Review (ScR))

Reporting guidelines

Open Science Framework (OSF): PRISMA-ScR checklist for 'Assessing the potential of Other Effective area-based Conservation Measures for contributing to conservation targets: A global scoping review protocol'. https://doi.org/10.17605/OSF.IO/3WK5H (Petza *et al.*, 2023).

References

Arksey H, O'Malley L: **Scoping studies: towards a methodological framework.** *Int J Soc Res Methodol.* 2005; **8**(1): 19–32.
Publisher Full Text

CBD: **The Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets.** UNEP/CBD/COP/DEC/X/2. Convention on Biological Diversity, 2010.
Reference Source

CBD: **Protected areas and other effective area-based conservation measures.** CBD/COP/DEC/14/8. Convention on Biological Diversity, 2018.
Reference Source

CBD: **Kunming-Montreal Global biodiversity framework.** Decision CBD/COP/15/L.25. 2022.
Reference Source

FAO: **Expert Meeting on Other Effective Area-Based Conservation Measures in the marine capture fishery sector.** FAO Fisheries and Aquaculture Report No 1301, Rome, 2019.
Reference Source

FAO: **A handbook for identifying, evaluating and reporting other effective area-based conservation measures in marine fisheries.** Rome, 2022.
Reference Source

Garcia SM, Rice J, Charles A, *et al.*: **OECMs in marine capture fisheries Systematic approach to identification, use and performance assessment in marine capture fisheries (Version 2).** Fisheries Expert Group of the IUCN Commission on Ecosystem Management, Gland, Switzerland. European Bureau of Conservation and Development, Brussels, Belgium, 2021; 87.
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Haddaway NR, Collins AM, Coughlin D, *et al.*: **The Role of Google Scholar in Evidence Reviews and Its Applicability to Grey Literature Searching.** *PLoS One.* 2015; **10**(9): e0138237.
PubMed Abstract | **Publisher Full Text** | **Free Full Text**

ICES: **ICES/IUCN-CEM FEG Workshop on Testing OECM Practices and Strategies (WKTOPS).** *ICES Scientific Reports.* 2021; **3**(42): 195.
Publisher Full Text

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Reference Source

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Publisher Full Text

Petza D, Amorim E, Ben Lamine E, *et al.*: **Assessing the Potential of Other Effective Area-based Conservation Measures for Contributing to Conservation Targets: A Global Scoping Review Protocol - Prisma-scr Checklist and Data Extraction Tool.** [Dataset], *OSF.* 2023.
http://www.doi.org/10.17605/OSF.IO/3WK5H

Tricco AC, Lillie E, Zarin W, *et al.*: **PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation.** *Ann Intern Med.* 2018; **169**(7): 467–473.
PubMed Abstract | **Publisher Full Text**

UN: **Transforming our world: the 2030 Agenda for Sustainable Development.** United Nations General Assembly A/RES/70/1. 2015.
Reference Source

WDPA: **The World Database on Protected Areas**. 2023.
Reference Source

Open Peer Review

Current Peer Review Status: ✔ ? ✔

Version 3

Reviewer Report 15 January 2024

https://doi.org/10.21956/openreseurope.18491.r37383

✔ **Siyuan He**
Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences Beijing, Beijing, China

I think the authors have made appropriate modifications.

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: My area of expertise is community-based conservation and sustainable livelihoods in protected areas. One concern is the potential contribution of traditional agrosystems to the protected area management.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Version 2

Reviewer Report 03 January 2024

https://doi.org/10.21956/openreseurope.18290.r36633

? **Siyuan He**
Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences Beijing, Beijing, China

Since the goal of assessing the potential of OECMs to achieve "conservation targets" is confined to "spatial conservation" in this review protocol, my first and second concerns do not matter anymore. My third comment was replied by deleting question 5 about good practice and failure. It seems the entire review protocol focused more on the "outcome", but some information on factors that deliver these outcomes can be extracted from Asking Question Five differently. As I think exploring the extent of evidence and mapping it is important for a scoping review, I was wondering if there can be such kind of question.

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: My area of expertise is community-based conservation and sustainable livelihoods in protected areas. One concern is the potential contribution of traditional agrosystems to the protected area management.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 07 Jan 2024

Dimitra Petza

We would like to thank the reviewer for the insightful comments. Our response is provided in the following text, where we tried to address all comments one by one, revising also the manuscript accordingly. **Comment 1. Since the goal of assessing the potential of OECMs to achieve "conservation targets" is confined to "spatial conservation" in this review protocol, my first and second concerns do not matter anymore. My third comment was replied by deleting question 5 about good practice and failure. It seems the entire review protocol focused more on the "outcome", but some information on factors that deliver these outcomes can be extracted from Asking Question Five differently. As I think exploring the extent of evidence and mapping it is important for a scoping review, I was wondering if there can be such kind of question.** *Thank you for your valuable feedback. Following your comment regarding research sub-question 5, we have reconsidered its content and rephrased it as follows: 5. What are the main outcomes of the studies that have assessed potential OECMs regarding key findings, effectiveness of potential OECMs, gaps of knowledge and policy recommendations? This sub-question, which aligns with fields 28-32 of the protocol's data extraction tool (see here: https://osf.io/4grke), has been added to the revised manuscript (see section "Review question").*

Competing Interests: No competing interests were disclosed.

Version 1

Reviewer Report 28 September 2023

https://doi.org/10.21956/openreseurope.17399.r34909

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Siyuan He
Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences Beijing, Beijing, China

The authors provided a protocol for a scoping review to assess the actual contribution of Other Effective Area-based Conservation Measures (OECMs) to spatial conservation targets. Although introduced as early as 2010, this novel conservation approach was detailed much later in 2018 and is now gaining increasing attention as the spatial conservation target (the so-called 3030 target) urges new actions for effective conservation management. There is now growing discussion on the possibility of identifying OECMs, as the criteria include multiple aspects from clear governance to various conservation outcomes. Meanwhile, countries such as Canada and Japan, have commenced recognising OECMs and integrating them into the protected area networks. As there is differentiated conservation responsibility among countries due to biodiversity values, socioeconomic conditions, etc., it is necessary to map the contribution of OECMs globally and provide implications for conservation practice, notably in Europe where none OECMs were registered. This proposed protocol is thus helpful to facilitate evidenced-based spatially-explicit conservation practices in future.

The protocol is generally well-written and easy to follow. The overall question about the contribution of OECMs to biodiversity conservation targets is further divided into five dimensions that should be addressed during the scoping review. The review procedure is comprehensive and robust following the agreed methodology. I would like to comment on a few points for further consideration:

1. As question three focuses on mapping the methodological approaches that assess the potential outcomes of OECMs, I was wondering if the contributions here include not only spatial extension and connectivity but also ecological functions and other relevant values.

2. Following the first comment, it may be more comprehensive to address multiple conservation outcomes besides the percentage of area covered in Question Four.

3. Question 5 addresses “good practices and failures”, however, I am not sure whether we are talking about the good or bad methods to assess potential OECMs or about the efficiency of OECM management to deliver conservation outcomes. In addition, defining “good” or “bad” according only to the authors of literature seems no practical effect. Addressing antecedents to the success or failures may be more useful.

4. I understand that there was no scanning done after the initial presentation of the database (Table 2) based on the search query, but I was wondering if the current Search Strategy, especially the keywords used, can deliver both comprehensive and targeted databases.

Is the rationale for, and objectives of, the study clearly described?

Yes

Is the study design appropriate for the research question?
Yes

Are sufficient details of the methods provided to allow replication by others?
Partly

Are the datasets clearly presented in a useable and accessible format?
Not applicable

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: My area of expertise is community-based conservation and sustainable livelihoods in protected areas. One concern is the potential contribution of traditional agrosystems to the protected area management.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 30 Nov 2023

Dimitra Petza

We would like to thank the reviewer for the insightful comments. Our responses are provided in the following text, where we tried to address all comments one by one, revising also the manuscript accordingly. **Comment 1. As question three focuses on mapping the methodological approaches that assess the potential outcomes of OECMs, I was wondering if the contributions here include not only spatial extension and connectivity but also ecological functions and other relevant values.**
Comment 2. Following the first comment, it may be more comprehensive to address multiple conservation outcomes besides the percentage of area covered in Question Four.
Question 3 is broad and concerns the review of the methodologies that have been employed worldwide to assess the contribution of OECMs to biodiversity conservation (not the assessment of OECMs' potential outcomes, spatial extension or connectivity). This question is further detailed in the "Concept" subsection where it is stated that "All studies that assess potential OECMs, along with the various methodologies and metrics applied to evaluate their effectiveness in delivering biodiversity conservation outcomes and contributing to spatial conservation targets will be reviewed.". Question 4 deals with the spatial contribution of the potential OECMs assessed by the studies included in the ScR. It will serve as a means to measure the contribution of the reviewed studies towards the attainment of the spatial conservation targets set by the Global Biodiversity Framework. We hope this clarifies your concerns raised by comments 1 and 2. **Comment 3. Question 5 addresses "good practices and failures", however, I am not sure whether we are talking about the good or bad methods to assess potential OECMs or about the efficiency of OECM management to deliver conservation outcomes. In addition, defining "good" or "bad" according only to the authors of literature seems no practical effect. Addressing antecedents to the success or failures may be more useful.**

Review question 5 has been deleted from the revised manuscript, following the reviewer's No2 second comment.

Comment 4. I understand that there was no scanning done after the initial presentation of the database (Table 2) based on the search query, but I was wondering if the current Search Strategy, especially the keywords used, can deliver both comprehensive and targeted databases.
As the OECMs, which is the participant of this scoping review, is a new term in the literature and thus we expected to have a small number of relevant studies, we preferred to apply a broad-term approach for our search strategy to avoid losing pieces of relevant evidence. In Table 2, we present the search strategy we developed for each one of the three basic databases that we will use to perform the document search (i.e., Scopus, Web of Science Core Collection and Google Scholar), the adjustments of the queries based on the search specifications of each database, and the results of the pilot searches we ran during the development of the ScR protocol. The queries will be further adapted to the rest of the databases/ repositories that will be searched and will be documented in the final review paper.

Competing Interests: No competing interests were disclosed.

Reviewer Report 07 September 2023

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Matthew James Grainger
Norwegian Institute for Nature Research, Trondheim, Norway

The article is a protocol for a "global scoping review" addressing the primary question - "What is the current knowledge regarding the contribution of 'Other Effective area-based Conservation Measures to biodiversity targets" with 5 sub-questions - namely:
"1. What is the geographical distribution of studies that have assessed potential OECMs and their contribution to biodiversity conservation?"
"2. What are the characteristics of the potential OECMs studied in terms of governance type, sector, realm, conservation objectives, and rationale?"
"3. What methodologies have been employed to assess the potential of OECMs in contributing to biodiversity conservation?"
"4. What is the spatial contribution (percentage of area covered) by potential OECMs?"
"5. What are the good practices and failures acknowledged in the literature?"

In general, this is a well written protocol which appears to be robust and follows current guidance for Systematic Evidence Synthesis in environmental fields (although I recommend referring to the CEE guidelines (systematic map guidelines are closest to a scoping review)).

Given that this is a Scoping Review I do not understand how the authors intend to achieve objective 5 - "What are the good practices and failures acknowledged in the literature?". There is no critical appraisal of the studies included proposed and therefore it would be difficult to assess (beyond what the individual study authors suggest in each included paper) what is "good practice" (or "bad practice").

I find the structure of the protocol a bit odd - I would expect to read about the search strategy first and then read about inclusion criteria - but perhaps this is a set template.
Again there are some subheadings that appear a little redundant which might be due to a template being used - for example "Types of sources" doesn't include the actual databases (but talks about databases) and it is only when you get to the search strategy that this is mentioned. There is considerable scope for streamlining the document. Another example: "Language limitations will be applied during the literature search process to align with language competence of the authors. Consequently, studies published in languages other than English, French, German, Greek, Italian, and Spanish will be excluded from the ScR." Why not: "To align with language competence of the authors only studies written in English, French, German, Greek, Italian, and Spanish will be included".

Study/source of evidence selection - if the authors plan to do forward and backward citation chasing then I recommend using citationchaser | Evidence Synthesis Hackathon (eshackathon.org)

What is the data extraction tool? Do the authors have an example (even if not complete)? I see that the tool is linked in the data availability - but I would like to see this in the protocol explicitly.

There are some vague statements in the Data analysis section - for example "The data will be presented using a combination of graphical and tabular formats, utilizing appropriate software packages and tools. Graphical representations, such as charts, graphs, or diagrams, will be used to visually display relevant information and trends identified in the included studies. These visuals can help convey patterns, relationships, and key findings effectively."

How will data be presented using what tools and to what aims? I know there needs to be some uncertainty here but the authors can provide more specific details here as at the moment the text is generic and uninformative.

Is the rationale for, and objectives of, the study clearly described?

Yes

Is the study design appropriate for the research question?

Partly

Are sufficient details of the methods provided to allow replication by others?

Partly

Are the datasets clearly presented in a useable and accessible format?

Not applicable

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Evidence synthesis with a focus on the environment and conservation

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 30 Nov 2023

Dimitra Petza

We would like to thank the reviewer for the insightful comments. Our responses are provided in the following text, where we tried to address all comments one by one, revising also the manuscript accordingly. **Comment 1. In general, this is a well-written protocol which appears to be robust and follows current guidance for Systematic Evidence Synthesis in environmental fields (although I recommend referring to the CEE guidelines (systematic map guidelines are closest to a scoping review)).** *This protocol followed the JBI methodology for scoping reviews. We preferred to perform a scoping review (rather than a systematic map) because the aim of our study was both the exploration and the mapping of the existing evidence. Scoping reviews aim to map the existing literature on a broad topic, identify key concepts, and determine the extent and nature of the available evidence. On the other hand, systematic maps focus on identifying and cataloguing the existing evidence on a specific topic with a primary emphasis on highlighting gaps in the evidence base. Among the various available methodologies for systematic evidence synthesis, we chose to follow the JBI methodology and not for example the CEE guidelines, which are specifically designed for environmental-oriented systematic synthesis. The choice of a methodology for conducting scoping reviews over others depends on various factors, including the research question, available resources, and the preferences of the researchers. Below we list the main reasons why we preferred to follow the JBI methodology: 1. Systematic Framework: JBI provides a systematic and transparent framework for conducting scoping reviews. The step-by-step approach outlined in the JBI methodology helps ensure a rigorous and structured process from defining the research question to reporting the results.2. International Collaboration: The JBI methodology is associated with an international collaboration of researchers, educators, and clinicians. This collaborative network contributes to the development and refinement of methodologies, ensuring a global perspective on evidence synthesis.3. Evidence-Based Practice: JBI is known for its commitment to evidence-based practice. The methodology emphasizes a systematic and evidence-based approach to literature synthesis, which can be appealing to researchers who prioritize a robust and rigorous review process. 4. Clear Guidelines: JBI provides clear and detailed guidelines for each step of the scoping review process. This can be particularly helpful for researchers who are new to conducting scoping reviews or those who appreciate a structured and methodical approach.5. Adaptability: The JBI methodology is designed to be adaptable to various research questions and topics. It allows for flexibility in study selection, data extraction, and synthesis, making it applicable to a wide range of disciplines and research areas. 6. Recognition and Endorsement: The JBI methodology is recognized and endorsed by the Joanna Briggs Institute, a reputable organization in the field of evidence-based healthcare. Researchers and practitioners may find comfort in using a*

methodology associated with a well-regarded institution.7. Education and Training: JBI offers education and training programs for researchers interested in using their methodologies. This support can be beneficial for researchers seeking guidance and expertise in conducting scoping reviews. Based on the above mentioned, we believe it is best to keep using the term "scoping review" as the type of evidence synthesis we performed and the" JBI methodology" throughout the text, instead of the "Systematic map" and the "CEE guidelines" respectively, that you propose.
Comment 2. Given that this is a Scoping Review I do not understand how the authors intend to achieve objective 5 - "What are the good practices and failures acknowledged in the literature?". There is no critical appraisal of the studies included proposed and therefore it would be difficult to assess (beyond what the individual study authors suggest in each included paper) what is "good practice" (or "bad practice"). *Thank you for this important comment. As critical appraisal in scoping reviews is not mandatory, we have not planned to perform it. Thus, following your comment, we delete objective no 4 and review question no 5 from the revised manuscript (see Introduction and Review question sections).* **Comment 3. I find the structure of the protocol a bit odd - I would expect to read about the search strategy first and then read about inclusion criteria - but perhaps this is a set template.** *The structure followed for this scoping review protocol is set by the JBI methodology and the SUMARI Protocol Template for Scoping Reviews in Word format (https://sumari.jbi.global/), which was used to guide the protocol development.*
Comment 4. There are some subheadings that appear a little redundant which might be due to a template being used - for example "Types of sources" doesn't include the actual databases (but talks about databases) and it is only when you get to the search strategy that this is mentioned. *Again, this has to do with the JBI methodology and the SUMARI Protocol Template for Scoping Reviews that was used. According to the SUMARI protocol template guidelines Based on the JBI methodology manual (available here: https://jbi-global-wiki.refined.site/space/MANUAL), within the "Inclusion/ exclusion criteria" section you need to include a subsection entitled "Types of evidence sources", where the following information advice is given: "For the purposes of a scoping review, the "source" of information can include any existing literature, e.g. primary research studies, systematic reviews, meta-analyses, letters, guidelines, websites, blogs, etc. Reviewers may wish to leave the source of information "open" to allow for the inclusion of any and all types of evidence. Otherwise, the reviewers may wish to impose limits on the types of sources they wish to include. This may be done on the basis of having some knowledge of the types of sources that would be most useful and appropriate for a particular topic. For example, the scoping review example on quality of life questionnaires available for pediatric patients following tonsillectomies with or without adenoidectomies for chronic infection or sleep-disordered breathing sought quantitative studies, specifically; experimental and epidemiological study designs including randomized controlled trials, non-randomized controlled trials, quasi-experimental, before and after studies, prospective and retrospective cohort studies, case-control studies, and analytical cross-sectional studies. Qualitative studies, reviews, and conference abstracts were excluded.". Also, the methodology proposes that the databases that will be searched for eligible documents should be acknowledged in the Search strategy subsection. So as the guidelines of the JBI methodology are fully respected, we prefer not to perform any changes at the subheadings and the content of the respective subsections.* **Comment 5. There is considerable scope for streamlining the document. Another example: "Language limitations will be applied during the literature search process to align with language competence of the authors. Consequently, studies published in languages other than English, French, German,**

Greek, Italian, and Spanish will be excluded from the ScR." Why not: "To align with language competence of the authors only studies written in English, French, German, Greek, Italian, and Spanish will be included". *The text was revised as suggested (see sentence of the "Types of sources" subsection of the revised manuscript).* **Comment 6. Study/source of evidence selection - if the authors plan to do forward and backward citation chasing then I recommend using citation chaser | Evidence Synthesis Hackathon (eshackathon.org)** *Thank you for this recommendation, it will be seriously considered, and if used, it will be cited in the final review paper.* **Comment 7. What is the data extraction tool? Do the authors have an example (even if not complete)? I see that the tool is linked in the data availability - but I would like to see this in the protocol explicitly.** *A data extraction tool is a structured form/template designed to systematically collect relevant information from each included study in a systematic review. The purpose of a data extraction tool is to ensure consistency in the extraction process, facilitate data synthesis, and minimize bias by clearly documenting key details from each study. There are various tools available, and researchers may choose or develop one based on their specific needs. We preferred using a Microsoft Excel spreadsheet to create our own customized data extraction form as it allows for flexibility in design, it is customizable and widely accessible. As it is described in the manuscript (see "Data extraction" subsection), this tool will be integrated into the Covidence systematic review management software, to ensure consistency and facilitate collaboration and interaction among reviewers. The data extraction tool was initially included as one of the protocol's tables, but it was then linked to the data availability section of the manuscript following the suggestion of the editorial team during the editorial check process of the manuscript prior to its publication. If you wish to have a look at the data extraction tool you can find it available open-access here: https://doi.org/10.17605/OSF.IO/3WK5H. The link was included in the submitted manuscript (see Data availability/ Extended data subsection of the manuscript).* **Comment 8. There are some vague statements in the Data analysis section - for example "The data will be presented using a combination of graphical and tabular formats, utilizing appropriate software packages and tools. Graphical representations, such as charts, graphs, or diagrams, will be used to visually display relevant information and trends identified in the included studies. These visuals can help convey patterns, relationships, and key findings effectively.". How will data be presented using what tools and to what aims? I know there needs to be some uncertainty here but the authors can provide more specific details here as at the moment the text is generic and uninformative.** *More details on how the data will be presented, the tools that will be used and the aim of the visualizations that will be produced and presented in the final review paper were added (see "Data analysis and presentation" section of the revised manuscript).*

Competing Interests: No competing interests were disclosed.

Reviewer Report 07 September 2023

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Jansen Smith
Earth and Environmental Sciences, University of Minnesota Duluth, Duluth, MN, USA

Petza *et al.* detail a study protocol for a future Scoping Review to evaluate Other Effective area-based Conservation Measures (OECMs). OECMs represent a potentially large contribution to conserving biodiversity, especially with respect to targets related to spatial coverage and connectivity. OECMs are an intriguing and somewhat non-traditional component to conservation as they tend to be in land-use areas that are not designated for conservation but nonetheless function to conserve various aspects of biodiversity. A scoping review on OECMs is timely, as the reality of the biodiversity crisis necessitates creative and outside-the-box solutions. The assembled, multi-national and multi-lingual team has put forth a sound protocol that is well aligned with their research objectives and questions. The proposed review should provide a strong basis for integrating OECMs into ongoing and future conservation strategies, and may serve to facilitate the recognition of OECMS in Europe where none are currently recognized.

A few additional comments for the authors to consider:

1. The main text includes German as a search language but the abstract does not. Given the inclusion of an author with a German affiliation, I assume this language should be included in the abstract.

2. There are no data in this Study Protocol, which is logical given the article type. Still, it may be worth including a brief description of how the data collected in the Scoping Review will be shared, if at all. The "Data analysis and presentation" section mentions the presentation of data in a variety of formats, including "tabular formats" but it is not clear if this would be the raw data or summarized data. A clearer statement on the future data availability would be well aligned with this publication venue.

3. The authors may wish to provide more detail in the "Data analysis and presentation" section, in general. Whereas I appreciate that data visualization will be shaped by the data that are collected, the current description is vague to the point that it is not particularly worthwhile (e.g., "Graphical representations, such as charts, graphs, or diagrams, will be used..."). Perhaps the authors could point to some good examples from other published works that represent their intended outputs? This is a very minor issue but would provide more clarity to a future reader.

4. I greatly appreciated the "Data Extraction Tool." This provided concrete, detailed information that would make this protocol reproducible.

5. In Table 1, it seemed somewhat unnecessary to include the column "Exclusion criteria," as it was entirely empty. Will this be filled during the course of the review? It would seem that an exclusion for the Concept row was included in the text: "...except for evidence synthesis such as systematic, scoping, rapid, and narrative reviews."

This will be a large and valuable undertaking and I look forward to seeing the finished product when it is available.

Is the rationale for, and objectives of, the study clearly described?
Yes

Is the study design appropriate for the research question?
Yes

Are sufficient details of the methods provided to allow replication by others?
Yes

Are the datasets clearly presented in a useable and accessible format?
Not applicable

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: My main area of expertise is in a subfield of conservation science called conservation paleobiology. Through research in this area, and through projects in related areas of study in biological sciences, I have conducted scoping reviews, including using similar methods to those described herein.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Author Response 30 Nov 2023

Dimitra Petza

We would like to thank the reviewer for the insightful comments. Our responses are provided in the following text, where we tried to address all comments one by one, revising also the manuscript accordingly. **Comment 1: The main text includes German as a search language, but the abstract does not. Given the inclusion of an author with a German affiliation, I assume this language should be included in the abstract.** *The German language has been included in the abstract of the revised manuscript.* **Comment 2. There are no data in this Study Protocol, which is logical given the article type. Still, it may be worth including a brief description of how the data collected in the Scoping Review will be shared, if at all. The "Data analysis and presentation" section mentions the presentation of data in a variety of formats, including "tabular formats" but it is not clear if this would be the raw data or summarized data. A clearer statement on the future data availability would be well aligned with this publication venue.** *In fact, there is data of this Study Protocol available open-access via Open Science Framework (DOI 10.17605/OSF.IO/SEJ84), the Data Extraction Tool and the Scoping Review PRISMA Checklist. The full set of the raw data that will be collected will be also available open-access as a supplementary to the final review paper. The text was revised accordingly (see "Data Analysis and Presentation" section of the revised manuscript).* **Comment 3. The authors may wish to provide more detail in the "Data analysis and presentation" section, in general.**

Whereas I appreciate that data visualization will be shaped by the data that are collected, the current description is vague to the point that it is not particularly worthwhile (e.g., "Graphical representations, such as charts, graphs, or diagrams, will be used..."). Perhaps the authors could point to some good examples from other published works that represent their intended outputs? This is a very minor issue but would provide more clarity to a future reader. *The text was revised based on this comment. More details on the types of graphs and visualizations that will be used along with some examples of the available tools that might be used for data presentation were added to the revised manuscript (see "Data Analysis and Presentation" section of the revised manuscript).* **Comment 4. I greatly appreciated the "Data Extraction Tool." This provided concrete, detailed information that would make this protocol reproducible.** *The authors wish to thank you for this comment.* **Comment 5. In Table 1, it seemed somewhat unnecessary to include the column "Exclusion criteria," as it was entirely empty. Will this be filled during the course of the review? It would seem that an exclusion for the Concept row was included in the text: "...except for evidence synthesis such as systematic, scoping, rapid, and narrative reviews."** *This exception of evidence synthesis such as systematic, scoping, rapid, and narrative reviews is indeed an exclusion criterion of this scoping review, which has been overlooked by Table 1. Thank you for this comment. This has been added in the exclusion criteria column of Table 1 in the last row" Evidence types and sources" (see Table 1 of the revised manuscript).*

Competing Interests: No competing interests were disclosed.