D7.3
DATA MANAGEMENT PLAN

Project name: Promoting WEFE Nexus-based adaptation and mitigation solutions and landscape resilience to climate change in the Mediterranean Biosphere Reserves

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CO - Confidential: Only for members of the Consortium and the PRIMA Services

Document history

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Version 2			
Version 3			

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Abbreviations

Abbreviation	Meaning / Full text
BR	Biosphere Reserve
CC	Climate Change
CTFC	Forest Science and Technology Centre of Catalonia
DIR	Data Inventory Register (DIR)
DMP	Data Management Plan
DOI	Digital Object Identifier
FAIR	Findable, Accessible, Interoperable, Reusable
FAO	Food and Agriculture Organization of the United Nations
GA	Grant Agreement
IPR	Intellectual Property Resources
PI	Principal investigator
WP	Work Package

Introduction

The RES-MAB project implements a cross-sectoral integrative landscape approach in seven Biosphere Reserves (BRs) of the UNESCO's Mediterranean Thematic Network of Biosphere Reserves (MedMaB Network) to simultaneously address current global challenges by promoting: (a) the development of cooperation initiatives and exchange of experiences; (b) the promotion of research on socio-environmental issues and challenges for Mediterranean BRs; and (c) the strengthening of links between BR managers, academia, local communities, policy makers, and the industrial sector.

The project is structured into a set of work packages (WP) (Fig. 1) to i) develop and implement a WEFE-Nexus Socioecological Modelling Tool (WEFE-SEM Tool) to enhance adaptation to climate change (CC) of ecosystems and local populations; ii) integrate the WEFE-SEM Tool into cross-sectoral policies and action plans to provide medium- and long-term actionable information and capacity building for decision-makers; iii) assess and monitor the environmental and socio-economic impacts in the BRs in order to co-create and develop eight climate-resilient and transformative WEFE Nexus-based adaptation and mitigation solutions (WEFE Nexus solutions) towards a more resilient Mediterranean BRs in the face of CC; and iv) promote sustainable market solutions and the engagement of the private sector by developing innovative business models (BMs) targeting WEFE Nexus solutions while enhancing inclusive economic development and resilience of vulnerable communities.
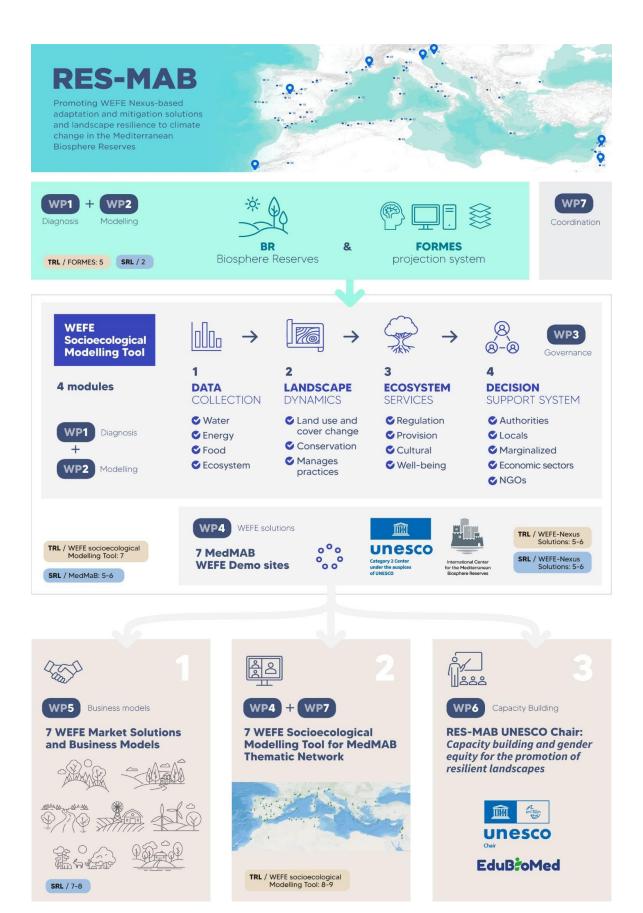
Figure 1. Methodological rationale of the RES-MAB project

Data summary

Deliverable 7.3 is the RES-MAB **Data Management Plan** (DMP) and is designed to set out key operational procedures to handle and manage research data, to ensure data security and quality as well as to foster data exchange and cooperation following the FAIR principles (Findable, Accessible, Interoperable, and Re-usable).

The purpose of the DMP is to support the data management life cycle for all data that will be collected, processed, or generated by the project. Indeed, the DMP describes the policy and the procedures concerning the acquisition, storage, classification, management, protection, and distribution of project data.

The document is structured according to European Commission guidelines in the following way: *Section 1* is the Data Summary and describes the purpose behind data collection, process and generation, and their relation to RES-MAB objectives; *Section 2* explains how the FAIR principles are applied to the project, including tools, methodology and licenses adopted; *Section 3* presents how the project resources are allocated for data management; *Section 4* is dedicated to data security and storage. The final sections (5-6) are dealing with the ethical and legal aspects, and further issues that may arise.

The DMP will evolve during the project lifetime. Next versions will refine the data policy aspects and will present the datasets collected and generated by the RES-MAB project in more detail. It is worth specifying that the RES-MAB Data Management Plan does not replace by any means the contractual obligations among partners, and between partners and the European Commission.

Data management turns out to be very important for the successful achievement of the RES-MAB goals. At this early stage, it is important to assess the nature and extent of the datasets the project will collect, process, and generate, even if in a preliminary way. This initial version of the DMP and metadata catalogue serves as fundamental step for model setup and integration for all the involved partners, to foster discussions and implementation, to then timely and successfully fulfil the project tasks.

Data Inventory Register

The Data Inventory Register (DIR) aims to collect information about the datasets collected or produced during the project. The DMP manager is the person responsible for maintaining the DIR, while the completion of the information for each dataset is the responsibility of the partner involved in the collection and use of each dataset. The information provided must be as rich as possible, and metadata fields must be filled where applicable. The metadata elements (Table 1) are included in the DIR and some of the information collected can then be used when publishing the datasets. The data generated by the project (Table 2) includes the list and the descriptive information for specific datasets and will be updated with each release of the DMP.

Table 1. RES-MAB Data Inventory Register metadata elements

Metadata elements	Description
Partner name	The name of the partner
Task-Subtask number	The identification number at the task or subtask level
Responsible party	The person(s) responsible for the creation and maintenance of the dataset.
Dataset name	A descriptive relative short name for the dataset.
Data Type	Example: experimental, observational, simulation Data from surveys, climate, biophysical data, etc.
Personal data	If the dataset contains information relating to an identified or identifiable natural person. Yes or No.
Sensitive data	Any data reveals a subject's information. Namely, racial, or ethnic origin, political and religious beliefs, biometric data, sexual orientation, and others. Yes or No.
Date	Date of creation of the dataset
Number of data files	The total number of files that make up the dataset
Source	Where the data originates. If data are reuse, best practice is to identify the related resource.
Format	The file formats.
Size	The total weight of the dataset (when applicable)
Dataset duration	The extent or time taken to play or execute the dataset, when applicable.
Mode of data collection	The method(s) used to collect data
Data collection instrument	The instruments used to generate and or process the data.
Support documentation	Whether documents have been created to provide context for the data (readme file)
Update frequency	The frequency with which the data will be updated
Storage location	Place where the data is stored
Preservation	Backup periodicity and for how long the dataset need to be preserved
Availability	Private, consortium or open
Rights and restrictions	Data licence CC BY-SA 4.0 is recommended for data sharing.

Table 2. RES-MAB Data Inventory Register *(ongoing updated)*

Work Package	Dataset code	Descriptive information	Metadata elements	
			Partner name: Task-Subtask number: Responsible party: Dataset name: Data Type: Personal data: Sensitive data: Date: Number of data files: Source: Format:	Size: Dataset duration: Mode of data collection: Data collection instrument: Support documentation: Update frequency: Storage location: Preservation: Availability: Rights and restrictions:

Fair data

This section describes practices on how the project intends to make data findable, accessible, interoperable and reusable. It focuses on the approach to adopt for the project data than can be openly shared without restrictions, although the solutions described enable data protection measures.

Making data findable

RES-MAB will manage data through the RES-MAB Intranet (Microsoft Teams workspace), hosted by CTFC, where all technical information (officially released documents, contractual information, templates, meeting minutes, etc.) about the project will be stored in a structured way. Data are also stored and exchanged among project partners using the same server. The access to the project's intranet is password-protected and restricted to designated project partners. In case of need of higher storage space, a cloud service external to the project (Dropbox Business) can be made available by CTFC.

The project's scientific publications will be published on the RES-MAB website and on Repositori UdL (Universitat de Lleida), on which will be automatically become visible on *Recolecta*, the national aggregator of open access repositories. In addition, RES-MAB will adopt the CORA.RDR repository to publish the datasets. Using this repository, all the public data of the project will be provided with a Digital Object Identifier (DOI) and a common dataset of metadata (based on Dublin Core). Versions of each dataset would be numbered and report main and minor changes.

Not all data needs to be deposited for sharing and preservation purposes, so it is up to the PC jointly with each beneficiary that act as main data responsible to select which data, and at what point in its life cycle, should be deposited. Moreover, datasets can be deposited with "private" visibility, in order to respect eventual embargo periods. It will be internally discussed

whether to store some data in open access on CORA.RDR as well and to which extent, leaving the final decision to the members of each WP.

Making data openly accessible

Data generated in RES-MAB could be published in the CORA.RDR repository, together with associated metadata, if applicable and agreed among the involved institutions, and if relevant for validation of scientific publications and/or deliverables. Unique identifiers, such as the Digital Object Identifier (DOI), will be assigned providing a stable and consistent way to locate both the data and the metadata. The DOI for the data that will be deposited in the CORA.RDR data repository will be generated by the service.

Making data interoperable

Data sharing within and outside the project must include metadata, along with the needed documentation for others to understand and reuse the data. The RES-MAB project covers several disciplines and scientific areas; therefore, it is of highest priority to find a common language between partners and stakeholders, to integrate data and information from the different domains.

For this purpose, it is suggested to use AGROVOC, the multilingual, structured and controlled vocabulary coordinated by the Food and Agriculture Organization of the United Nations (FAO) to cover the terminology of all FAO's areas of interest. AGROVOC is a valuable tool for data to be classified homogeneously, facilitating interoperability and reuse. AGROVOC uses semantic web technologies, linking to other multilingual knowledge organization systems and building bridges between datasets.

CORA.RDR repository follows appropriate metadata standards, specifically Dublin Core. Metadata records based on Dublin Core standard ensure that project data is more easily findable and interoperable. For the deposit of a dataset in CORA.RDR a metadata template will made available, by the DMP manager, to project partners of RES-MAB. This template is to be filled by the data responsible before the deposit (Table 3):

Table 3. Metadata elements in the CORA.RDR data repository

Repository field	Definition	Notes
Host Dataverse	Name of the instance where the dataset is deposited.	By default
Dataset template	Institutional template with metadata already established	If your institution has a predefined template, select it to automatically fill in some fields.
Title	Name by which the resource is known	When the title of the dataset matches the title of the related publication add the expression: "Replication data for" in front of the title.
Author	Principal investigators involved in the production of the data in order of priority. It can be a personal or corporate/institutional name.	Repeatable

Name	Full name of the creator	Personal names must follow the form: *Surname, Name*. For institutions, indicate the developed name of the institution.
Affiliation	Organization with which the author is affiliated	Use the developed name of the institution. When there is a double affiliation, the different institutions must be separated by commas. Note: Many institutions have their own regulations for institutional affiliation.
Identifier Scheme	Name identifier scheme (ORCID, ISNI, DAI, etc.)	If the *Identifier field* is used, the *Identifier Scheme* field is required.
Identifier	Unique identifiers of natural or legal persons, according to various schemes.	Format depends on the scheme. For ORCID, use the form XXX-XXX-XXXX-XXX
Contact	Person/s or institution responsible for the dataset with whom users can contact.	Repeatable
Name	Full name of the contact	Personal names must follow the form: *Surname, Name*. For institutions, indicate the developed name of the institution.
Affiliation	Contact affiliation	Use the developed name of the institution. When there is a double affiliation, the different institutions must be separated by commas. Note: Many institutions have their own regulations for institutional affiliation.
Email	Email address of the contact (this data will not be accessible to users)	This field is not exported in any schema.
Description	Abstract describing the purpose, nature and scope of the dataset.	Repeatable
Text	Abstract that explains the contents of the dataset, as well as the purpose, nature and scope of the dataset.	In case there is a related publication, the description of the dataset must not be the same as the summary of that publication. A good description is one that identifies the content of the dataset and help the user determine whether it can be used. HTML tags can be used.
Date	Date of description	YYYY-MM-DD.
Subject	Dataset knowledge area	Repeatable
Keyword	Keywords that describe important aspects of the dataset.	Repeatable
Term	Keyword that is indexed and ranked for the purpose of retrieving the dataset.	
Vocabulary	Keyword that is indexed and ranked for the purpose of retrieving the dataset.	It is recommended that the first letter of the word be capitalized. For expressions with more than one word, capitalize only the first word. You should use controlled vocabularies of your discipline or general ones.
Vocabulary URL	Link to general vocabulary	Fill in this field when using keywords from controlled vocabularies.
Related publication	Publications related to dataset data	Repeatable
Citation	Full citation of the publication	Follow the citation style of each discipline. In case the related article is not yet published, fill in the field with this information.
ID Type	Type of identifier used in the publication	DOI, handle, etc.

ID Number	Identifier of the publication	In the case of DOIs, indicate only the prefix and suffix.
URL	Link to the publication	Include the entire URL
Notes	Important additional information about the dataset that did not appear in the description.	Free text. HTML tags can be used.
Depositor	Person or Organization that deposited the dataset in the repository.	Personal names must follow the form: *Surname, Name*. For institutions, indicate the developed name of the institution.
Deposit date	Dataset deposit date in the repository	This field will be automatically filled with the current date (YYYY-MM-DD)
Kind of data	Description of the resource type.	Lists of controlled values.

Making data reusable

The Consortium Agreement (CA) (D7.1) will include all the necessary provisions to establish the working basis of the RES-MAB's Intellectual Property Resources Strategy (D7.4), defining the background contributed by each partner and the foreground expected. The partners who own a particular result are allowed to use, sell, or publish it, but always ensuring that other partners retain access rights to conduct the project or to release their own results. The results that are not selected for Intellectual Property Resources (IPR) protection – because the knowledge/tech does not present the minimum requirements or RES-MAB partners do not consider the need to register them via intellectual or industrial property – will have specific plans and strategies to be exploited.

Research data and software are owned by the PI (beneficiary) that generates them (Art. 26.1 of the GA). In case of joint ownership of results, each PI must agree on the allocation and terms of exercise of their joint ownership, stipulating a joint ownership agreement, to ensure compliance with their obligations (Art. 26.2 of the GA). The PRIMA Foundation may assume ownership of results to protect them (Art. 26.4.1of GA for further details). Notwithstanding the above, owners of open results arising from the RES-MAB project are encouraged to release their work under a Creative Commons license, preferably Creative Commons Attribution 4.0 CC-BY-4.0 license.

Concerning the dissemination and exploitation of results, each PI must 'disseminate' its results by disclosing them to the public by appropriate means (i.e., peer-reviewed journal articles) and ensure open access – free of charge, online access for any user. Further, any dissemination of results must indicate that it reflects only the author's view, and that the PRIMA Foundation is not responsible for any use that may be made of the information it contains.

Regarding research data and results ownership, each PI may transfer ownership of its results (Art. 30.1 of the GA). Nevertheless, the PRIMA Foundation has the right to object to any transfers or licensing (Art. 30.3 of the GA). Quality assurance concerning accuracy and completeness of metadata will be performed with mandatory participation and collaboration by the other partners, since they are responsible for data collection, process, and generation within their tasks – in agreement with the project ethical obligations. Any update concerning data collection and/or generation within the RES-MAB project will be promptly communicated to the Project Coordinator and to the principal investigators.

Allocation of resources

Costs are included in the tasks related to data collection and generation and cannot be listed separately. Costs of the project's intranet are covered by internal CTFC resources. As already mentioned, Dropbox Business accounts will also be activated if needed, in order to have more space where to store and share raw datasets and simulation outputs. Eventual costs related to these accounts will be changing according to the numbers of accounts and disk space needed for each of them and they will be covered by project budget.

Data security

The internal project repository on the CTFC server is protected by firewall and institutional security policies. In detail:

- The project's intranet is relying on CTFC storage facilities and accessibility is reserved, protected by username and password known only by the selected users (PIs), for both upload and download functionalities.

- All datasets maintained on the CTFC server will be periodically subject to incremental backup in order to avoid data loss.

CORA.RDR repository is hosted by Consorci de Serveis Universitaris de Catalunya (CSUC) and it is subject to its rules for data security as reported at CORA.RDR Technical Features. CORA.RDR uses an open-source software called Dataverse, developed by Harvard's Institute for Quantitative Social Science. It allows you to store datasets and display descriptive metadata and downloading the corresponding files.

Finally, in regard to security, RES-MAB does not involve any activity raising security issues and does not handle EU classified information, neither as background nor as result.

Ethical aspects

RES-MAB will involve stakeholders that will participate in a series of meetings both in person and online. The purpose is to bring their local and regional expertise into the project and to share knowledge and develop capacity in the approaches and tools used in the project.

Confidentiality will be assured, in that:

- No personal information will be collected from participant stakeholders other than contact information and a brief description of their work, and this information will not be shared beyond the limits of the project without the explicit written consent of the stakeholders.

- No quotes made by the stakeholders in the online discussion of the workshops will be published in print or on the internet without their explicit written consent.

- No further ethical issues are anticipated, but should they arise, the project consortium will ensure that EU legislation, international guidelines and the ethical and legal requirements of the countries involved in the project are adhered to.

Ethical aspects related to data management are following the obligation to comply with ethical and research integrity principles. In this sense, the PIs must follow the ethical principles (including the highest standards of research integrity) and the applicable international, EU and national law. The PIs must ensure that the activities, also the data-related ones, under the action have an exclusive focus on civil applications. In addition, the PIs must respect the fundamental principle of research integrity:

- Reliability in ensuring the quality of research data.
- Honesty in developing, undertaking, reviewing, reporting, and communicating research data in a transparent, fair, and unbiased way.
- Respect for colleagues, research participants, society, ecosystems, cultural heritage, and the environment.
- Accountability for the research data from idea to publication, for data management and organisation, and well as for their wider impacts meaning that the PIs must ensure that persons carrying out research tasks and processing data follow the good research practices and refrain from the research integrity violations.

Finally, informed consent will come along with data sharing and long-term preservation, in case of questionnaires dealing with personal data implemented within the project.

Other issues

At the time of the DMP deployment, the RES-MAB project does not make use of any other national/funder/sectorial/departmental procedures for data management. This will be reported in case of occurrence on a later stage of the project (further versions of the DMP).

This DMP has been created with eiNa DMP, a specific tool provided by the Consortium of University Services of Catalonia.