Workshop on "AN ALIEN SPECIES DATABASE FOR THE CANARY CURRENT LARGE MARINE ECOSYSTEM"

5 May 2022 – On-line meeting

Meeting report

Third meeting of the project *Invasive alien species and other ocean stressors: Furthering the scientific knowledge and capacity basis in the Canary Current Large Marine Ecosystem*

A project implemented by the IOC of UNESCO,
in partnership with the Instituto Español de Oceanografia (IEO), and funded by the Spanish Agency for International Development Cooperation (AECID)

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1. Context of the meeting

The Intergovernmental Oceanographic Commission (IOC) of UNESCO is currently implementing the project *Invasive alien species and other ocean stressors: Furthering the scientific knowledge and capacity basis in the Canary Current Large Marine Ecosystem* (CCLME), which is funded by the Spanish Agency for International Development Cooperation (AECID). The project is implemented in collaboration with the Instituto Español de Oceanografía (IEO, Spain). This is the fourth of a series of projects implemented in the CCLME region - the first one started in 2013.

The project aims at furthering the scientific knowledge and capacity basis in the countries in the region − Cabo Verde, Gambia, Guinea, Guinea-Bissau, Mauritania, Morocco, Senegal and Spain (Canary Islands) − by adding a focus on the effects of multiple ocean stressors to the knowledge base of the Canary Current system. This new focus will include a collaborative approach to the question of invasive alien species (IAS), its connection with other ocean stressors, and an assessment of IAS and other ocean stressors in the region.

The kick-off meeting of the project was held 24 February 2022, counting with the participation of 46 experts. The presentations and the meeting report are available in the dedicated meeting page. A total of 32 experts participated in the second meeting, held on 24 March 2022. The presentations and the meeting report are available in the dedicated meeting page. These meetings are aimed at facilitating the scientific discussions and count with the participation of experts from all the above-mentioned countries in the region, as well as of experts from other countries.

2. Summary of the meeting, discussion and conclusions

The third project meeting was shaped as a Workshop to discuss on the Invasive Alien Species database for the CCLME that will be compiled under the framework of this project, and in support to the assessment to be elaborated in a collaborative manner and published as part of the IOC Technical Series reports. The agenda for the meeting is presented as Annex 1.

A total of 32 experts participated in the meeting. The list of participants is presented as Annex 2, and a screenshot taken during the meeting is presented in Annex 3.

2.1 Brief introduction to the project

Itahisa Déniz González, IOC Project Coordinator, reminded the scope of current fourth phase of the project with a focus on IAS activities, as well as the intended outputs in relation to the topic of invasive alien species. To sum up, the final objective of these collaborative effort is the elaboration of an assessment on IAS and other stressors in the region, to be published as IOC Technical Series report. The presentation is available in the meeting dedicated page.

2.2 Learning from existing publications and databases

2.2.1 A Non-native Species Database for the Macaronesia: Methodology employed and main issues confronted.

Nuno Castro, researcher at MARE-Madeira, introduced the database elaborated for Castro et al. (2022), with a focus on the methodology used, including the literature research, criteria used for the validation of records and the data analysis. Nuno also shared the main issues faced while accomplishing this task. The presentation is available in the meeting page.

Some guidance was extracted from this experience and shared to support our exercise, being highlighted: (i) the need to describe well the methodology; (ii) the importance of defining

impacts/effects of the species (biological, economic, etc.); (iii) the importance of seeking the source to avoid perpetuating mistakes, such as typos in the names of a species.

This article was presented as the baseline for the discussion on the database to be developed within the project, and several clarifications were provided by Nuno to the questions and doubts expressed by the participants in the meeting.

- In what regards the keywords used for the bibliographic research, other toponymies were used although not specified in the article, such as "Cape Verde" (considered nowadays as an incorrect country name) or the "Canaries".
- Some factors may have had an impact on the publication's results, such as the research effort in a studied group (i.e. tunicates in Madeira and Azores), or the bias in the capacities in the different archipelagos under consideration (i.e. European countries are obliged to have non-invasive species -NIS- lists).
- Microorganisms were not considered in this study (this could result in a potential source of bias as research effort might not be the same in all the archipelagos).
- European NIS definition implies that species arrive by anthropogenic vectors. Others, such as oceanic circulation, were not considered. However, when referring to range expansions, we do not know if they are arriving by anthropogenic vectors or ocean currents.
- The article addresses marine species only, due to the fact that rivers and estuaries do not exist in the archipelagos under study.
- There was not a minimum number of criteria met for validating a species for the analyses; usually several criteria come together.
- The start year of the bibliographic period under analysis (i.e. 1880) corresponds to the first register found in the references (the date the specimen was collected).

In relation with the above, some clarifications were provided by Ward Appeltans in what regards the elaboration of the project database and its compatibility with OBIS database:

- OBIS includes data on brackish species, if the water body is connected with the ocean, e.g. the species enter the ecosystem through ports.

2.2.2 OBIS: A global open-access data and information clearing-house on marine biodiversity for science, conservation and sustainable development.

Saara Suominen, Scientific Officer at IOC of UNESCO, introduced: (i) OBIS open-access database and data standards; (ii) other terms relevant for alien species data; (iii) how to access IAS data in OBIS (including with robis R package); and (iv) current activities on non-indigenous species and eDNA under the frame of PacMAN project. The presentation is available in the meeting page.

As a conclusion, all relevant metadata on invasive alien species can be stored in OBIS, ensuring data availability in open access in the long term.

Questions related to the project's database:

- About occurenceStatus term: in our case we will be stating presence occurrence. The interest of having an "absent" option is relevant for other cases, such as studies to map a species in an area; if the species is not found in a certain station, it might be useful to indicate it.
- Need to standardize terminology related to pathways.

Some ideas and comments where shared about a potential initiative similar to PacMAN project in the CCLME region. In particular, Ward Appeltans indicated that it would be useful to know if there are sequences available in reference databases for invasive species already identified in the region, and what are the primers to detect those species. This would be a preliminary step to prepare ahead of a monitoring program, which is time consuming. It would be useful to know what the local capacity is (i.e. qPCR -quantitative polymerase chain reaction- machines). Participants in the meeting pointed out existing initiatives in the region, such as: DNA platform in the Rabat University doing sampling in the Mediterranean Sea; a barcoding project in Africa. EcoAQUA-ULPGC has a genetic robot doing eDNA, and the technicians. There is a need to build capacity in other countries such as Senegal. A basic requirement would be to have a molecular laboratory in the region doing the sampling and processing (qPCR), then sent for sequencing elsewhere (frozen), but retaining the ownership of the data. Citizen science could be used for sampling (filtering sea water), puttiing a preservation liquid into the filter before shipping.

2.3 An Alien Species Database for the CCLME: Discussion on the methodology, criteria, and next steps

Discussion was a brainstorming on:

1. Bibliographic search, addressing the search databases, keywords, and languages to be used.
2. Database: fields and terms.
3. Next steps: timeline.

1. Bibliographic search: Some experts volunteered to: (i) help in doing a bibliographic search in databases for which IOC does not have access (Web of Science and Scopus) as they have access via their universities, this possibility is to be prospected and see how can work be distributed; (ii) do a search in Arabic. Some keywords were presented. It was decided to do the search in: Arabic, English, French, Portuguese and Spanish.
2. Database: It could be completed with the registers found in OBIS. OBIS Secretariat offered to help in doing a recordings' search in OBIS and GBIF based on a list of species to be provided. The information could be extracted in different ways, e.g. by country. Therefore, OBIS would not be used only as a database for validation of registers as it was the case in Castro et al. (2022).

   As the register included in the database will be georeferenced, approximate coordinates (a central position) could be provided if required. i.e. central coordinates of the biggest port or the closest port.

   It was highlighted the need to be realistic in terms of the time available for the tasks ahead. Some options were mentioned, such as to narrow the period under analysis, or narrow down the list to include invasive species only. These might be discussed at a later stage, once the list of references will be ready and analysis is on-going.
3. Timeline: A draft timeline was introduced, including activities to carried out until the fourth meeting, which dates were also discussed and agreed.

2.4 Summary of the discussion and wrap-up

It was agreed to program the fourth project meeting for 9 June 2022, 11-14:30 h CEST. The meeting will be shaped as a Workshop to discuss the definitions to be applied, and the progress on the Alien Species database for the CCLME to be elaborated under the framework of this project. The intended focus of the project is briefly introduced in the related slides.

Follow-up required:

1. *All participants are expected to revise the last version available of the draft list of references and to indicate any references to complete the list, by 20 May 2022.*
2. *The IOC Secretariat will make sure the ideas discussed are reflected in the excel file and will provide a proposal of translation, where possible, in the different languages agreed. The file is to be distributed by 9 May 2022, together with some draft criteria, for the expert's feedback and input, at the latest by 20 May 2022.*
3. *Taking into consideration the requirements by OBIS and with their support, the IOC Secretariat will work further in the draft template for the Alien Species database and the related Darwin Core terms, to be distributed for the expert's perusal as soon as possible. Feedback is expected by 20 May 2022.*
4. *A timeline with the preliminary tasks agreed for the weeks to come will be circulated for the information of all by 9 May 2022. It is attached as Annex 4.*
5. *The fourth meeting is intended to reach agreement on the terminology and the definitions to be applied. Thus, all experts are expected to familiarize with existing terminology and definitions concerning the topic of IAS ahead of the meeting (planned for 9 June 2022). Relevant information is already available in OceanExpert: Glossary of terms of the Convention on Biological Diversity, EU Regulation No 1143/2014, related introductory presentation during the project's kick-off meeting. The fact that climate change is to be considered or not as a vector for alien species in the assessment, will depend on the definitions agreed therein.*

Annex 1. Agenda for the meeting

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WORKSHOP ON "AN ALIEN SPECIES DATABASE FOR THE CANARY CURRENT LARGE MARINE ECOSYSTEM"

VENUE: ON-LINE MEETING (GOTOMEETING)
DATE: 5 MAY 2022
TIMES INDICATED IN CET (UTC+1)

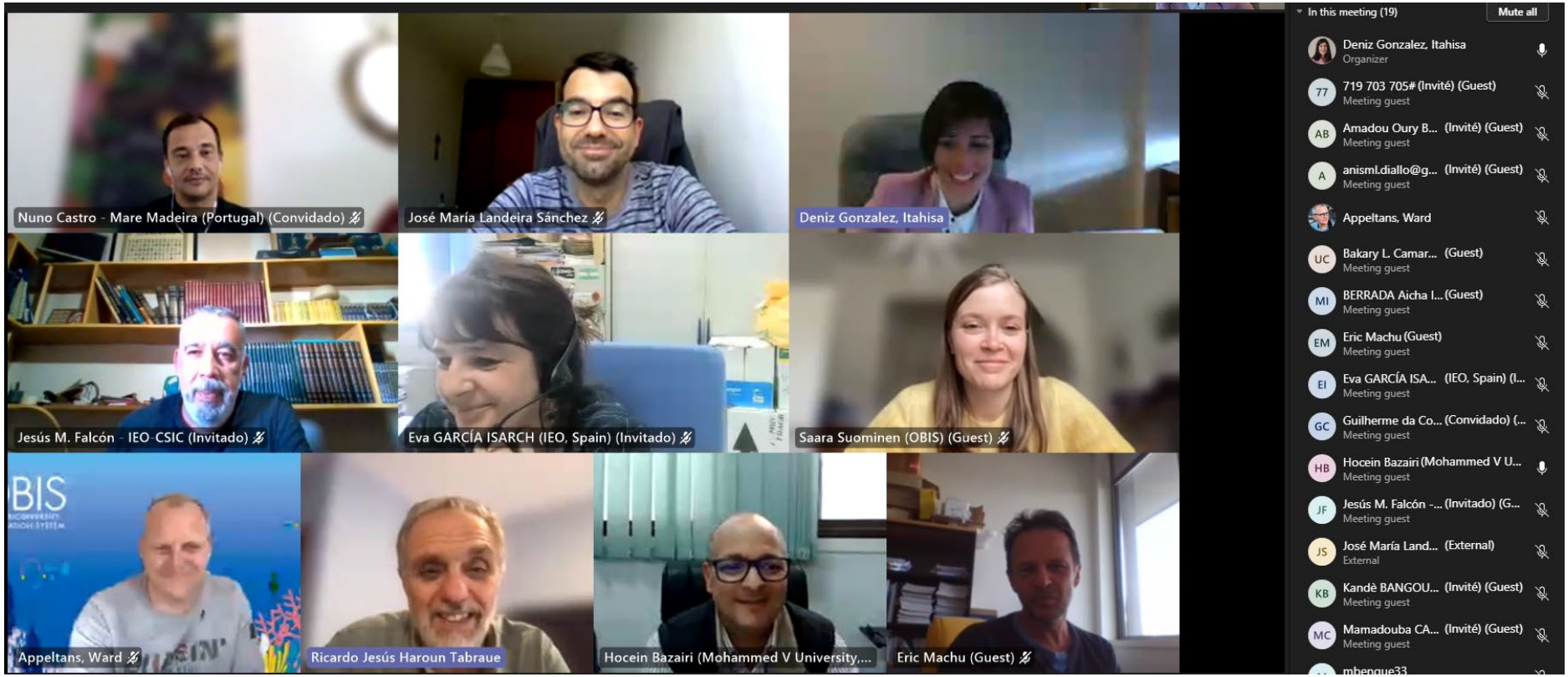
AGENDA

TIME	
14:00-14:15	**WELCOME, MEETING AGENDA AND BRIEF INTRODUCTION** Itahisa Déniz González (IOC-UNESCO)
14:15-15:15	**LEARNING FROM EXISTING PUBLICATIONS AND DATABASES** Moderators: Hocein Bazairi (Mohammed V University in Rabat, Morocco) and Itahisa Déniz-González (IOC-UNESCO, France) *A NON-NATIVE SPECIES DATABASE FOR THE MACARONESIA: METHODOLOGY EMPLOYED AND MAIN ISSUES CONFRONTED* Nuno Castro (MARE-Madeira, Portugal) *DISCUSSION*
15:15-15:30	HEALTH BREAK
15:30-16:30	*OBIS: A GLOBAL OPEN-ACCESS DATA AND INFORMATION CLEARING-HOUSE ON MARINE BIODIVERSITY FOR SCIENCE, CONSERVATION AND SUSTAINABLE DEVELOPMENT* Saara Suominen (IOC-UNESCO, Belgium) *DISCUSSION*
16:30-17:20	**AN ALIEN SPECIES DATABASE FOR THE CCLME: DISCUSSION ON THE METHODOLOGY, CRITERIA, AND NEXT STEPS** *DISCUSSION*
17:20-17:30	SUMMARY OF THE DISCUSSION AND WRAP UP

Annex 2. List of participants

- Ward Appeltans (Intergovernmental Oceanographic Commission of UNESCO, Belgium)
- Kandè BANGOURA Centre de Recherche Scientifique de Conakry Rogbanè, Guinea)
- Hocein BAZAIRI (Mohammed V University in Rabat, Morocco)
- Aicha BERRADA (Institut Agronomique et Vétérinaire Hassan II, Morocco)
- Tijani BOJANG (Ministry of Fisheries and Water Resources, Gambia)
- Bakary CAMARA (University of The Gambia, Gambia)
- Mamadouba CAMARA (Centre de Recherche Scientifique de Conakry Rogbanè, Guinea)
- Nuno CASTRO (MARE, Portugal)
- Guilherme DA COSTA (Ministério do Ambiente e da Biodiversidade, Guinea-Bissau)
- Mamadou DIA (Institut Mauritanien de Recherche Océanographique et des Pêches Mauritania)
- Anis DIALLO (ENVOCEAN SARL, Senegal)
- Bintou DIBBA (University of The Gambia, Gambia)
- Sam DUPONT (University of Gothenburg, Sweden)
- Khalid EL KHALIDI (Université Chouaib Doukkali, Morocco)
- Hassan EL OUIZGANI (Université Ibn Zohr, Morocco)
- Jesús FALCÓN (Instituto Español de Oceanografía-CSIC, Spain)
- Eva GARCÍA-ISARCH (Instituto Español de Oceanografía-CSIC, Spain)
- María GELADO-CABALLERO (Universidad de Las Palmas de Gran Canaria, Spain)
- Ricardo HAROUN (Universidad de Las Palmas de Gran Canaria, Spain)
- Cheikh INEJIH (DDECOMAR, Mauritania)
- Amadou JALLOW (Ministry of Fisheries & Water Resources, Gambia)
- Jose LANDEIRA (Instituto de Oceanografía y Cambio Global – Universidad de Las Palmas de Gran Canaria, Spain)
- Eric MACHU (Institut de Recherche pour le Développement, France)
- Samir MARTINS (BIOS.CV - Associação para a Conservação do Ambiente e Promoção do Desenvolvimento Sustentável, Cabo Verde)
- Bouya M'BENGUE (Institut Mauritanien de Recherche Océanographique et des Pêches, Mauritania)
- Oscar MONTERROSSO (CIMARCANARIAS, Spain)
- Birane NDOM (Université Assane Seck de Ziguinchor, Senegal)
- Ismaïla NDOUR (Centre de Recherches Océanographiques Dakar-Thiaroye, Institut Sénégalais de Recherches Agricoles, Senegal)
- Mika ODIDO (Intergovernmental Oceanographic Commission of UNESCO, Kenya)
- Amadou OURY BARRY (Centre de Recherche Scientifique de Conakry Rogbanè, Guinea)
- Saara SOUMINEN (Intergovernmental Oceanographic Commission of UNESCO, Belgium)
- Itahisa DÉNIZ GONZÁLEZ (Intergovernmental Oceanographic Commission of UNESCO, France)

Annex 3. Screenshot of the meeting



Annex 4. Next steps until fourth project meeting

IOC-UNESCO

Legend: All | IOC Secretariat (centralised by Itahisa) | Experts engaged in the assessment

Activity	Assigned to	Comments	Start	End
PRELIMINARY TASKS				
3rd project meeting: Workshop on an alien species database for the CCLME	All		05/05/2022	
Review of the database template and keywords	All	OBIS Secretariat offered to revise the table before circulation. Send any comments and proposals to Itahisa, for integration and later circulation of the final template	09/05/2022	20/05/2022
Complete the list of references	All	Send any additional references to Itahisa	09/05/2022	20/05/2022
Bibliographic search by keywords in the different languages using Google Scholar	Itahisa		23/05/2022	03/06/2022
Prospecting the willigness to share data owned by the experts in the group using the database template	Itahisa	Itahisa to liaise with IAS experts in the group	23/05/2022	03/06/2022
4th project meeting: Definitions and follow up on the database and the related list of references	All	Itahisa to organize the meeting, and all to confirm attendance and check the materials to be discussed ahead of the meeting	09/06/2022