



## **INCEPTION REPORT**

**Implementation of the indicator “Impacts of marine litter on sea turtles and biota” in RSC and MSFD areas**

**Indicator Impact Taxa  
(INDICIT-II)**

**31<sup>th</sup> March 2019**

<b>Project Full Title</b>	Implementation of the indicator “Impacts of marine litter on sea turtles and biota” in RSC and MSFD areas (Indicator Impact Taxa)		
<b>Project Acronym</b>	INDICIT II		
<b>Grant Agreement n°</b>	11.0661/2018/794561/SUB/ENV.C2		
<b>Coordinator, institution</b>	Claude MIAUD & Gaëlle DARMON EPHE		
<b>Start date, duration</b>	2 <sup>nd</sup> of February 2019, 24 months		
<b>Project website</b>	Being updated		
<b>Deliverable n°</b>	D1.1	<b>Deliverable Date</b>	31/03/2019
<b>Activity n°</b>	1		
<b>Activity Title</b>	Management, coordination and communication		
<b>Responsible</b>	Leader: EPHE Co-lead: UNEXE		
<b>Authors, institute acronym</b>	Claude MIAUD & Gaëlle DARMON EPHE		
<b>Status:</b>	<b>Final (F)</b>		F
	<b>Draft (D)</b>		D
<b>Y</b>	<b>Revised draft (RV)</b>		
<b>Dissemination level:</b>	<b>Public (PU)</b>		
	<b>Restricted to other program participants (PP)</b>		
	<b>Restricted to a group specified by the consortium (RE)</b>		
	<b>Confidential, only for members of the consortium (CO)</b>		(CO)

## Contents

Contents	p.4
Abbreviations and Acronyms	p.5
<b>General objectives and approach of INDICIT-II</b>	p.5
<b>Activity 1</b> Management, coordination and communication	p.7
<b>Activity 2</b> Applying the indicator “Litter ingested by sea turtles” to quantify the Programs of Measures at the OSPAR and Barcelona RSCs and MSFD areas	p. 14
<b>Activity 3</b> Implementation of the indicator “Entanglement in floating debris by sea turtles, birds and cetaceans” at the OSPAR and Barcelona RSCs and MSFD areas	p.20
<b>Activity 4</b> Implementation of the indicator “Micro-debris ingested by fish and sea turtles” at the OSPAR and Barcelona RSCs and MSFD areas	p.28
<b>Activity 5</b> Synergies with other (inter)national programs	p. 34

## **Abbreviations and Acronyms**

CNR : Consiglio Nazionale de la Richerce

CO: Coordinator

DGSCM-SGPM: Dirección General de Sostenibilidad de la Costa y del Mar- Subdirección General para la Protección del Mar

EAB: External Advisory board

EPHE: Ecole Pratique des Hautes Etudes (France)

EU: European Union

FCPCT: Fundación Canaria Parque Científico Tecnológico

FRCT: Fundo Regional para a Ciência e Tecnologia (Regional Fund for Science and Technology)

GES: Good Environmental Status (article 9(1) of the MSFD)

HCMR: Hellenic Centre for Marine Research

INDICIT: Implementation of the indicator “Impacts of marine litter on sea turtles and biota” in RSC and MSFD areas (Indicator Impact Turtle)

INDICIT-II: Implementation of the indicator “Impacts of marine litter on sea turtles and biota” in RSC and MSFD areas (Indicator Impact Taxa)

INSTM: Institut National des Sciences et Technologies de la Mer

ISPRA: Italian National Institut for Environmental Protection and Research

MSFD: Marine Strategy Framework Directive

MTES: Ministère de la transition écologique et solidaire

PAU-DEKAMER: Pamukkale University-Sea Turtle Research and Rehabilitation Centre

PoC: Plan of communication

PoD: Plan of dissemination

PoMs: Programs of measures

RSC: Regional Sea Convention

StC: Steering committee

ULPGC: University of Las Palmas de Gran Canaria (Spain)

UNEXE: University of EXETER (UK)

UVEG: University of Valencia (Spain)

## General objective and approach of INDICIT-II

The INDICIT-II project is a follow-up of the INDICIT project (2017-2019). The project aims at capitalizing the INDICIT results concerning the networking, the elaboration of standard guidelines, the collection of large standard data set and the evaluation of GES scenario for the indicator “Litter ingested by sea turtles”, as well as the identification of the key elements for the implementation of two other indicators for the monitoring of litter impacts “Entanglement of biota in debris” and “Micro-plastic ingestion by fish and sea turtle”.

The proposal INDICIT II involves 12 partners from the public sector (7 EU countries and 2 non-EU countries), all contracting parties to the OSPAR (Atlantic) and/or Barcelona (Mediterranean) conventions.

The general objectives are:

- (1) to capitalize the practical outcomes related to networking, development of standardized tools, gathering of standard data and GES assessments for the Indicator “Litter ingested by sea turtles”,
- (2) to support the implementation of the indicators “Entanglement of sea turtles, birds, cetaceans in floating debris” and “Micro-plastic ingestion by fish and sea turtles”,
- (3) to support the next 6-year cycle of MSFD implementation by testing the indicators (especially the more advanced “Litter ingested by sea turtles”) in response to National PoMs in several pilot areas.

By developing standardized knowledge for several fauna taxa at an extended spatial level, the project will contribute to develop integrative tools aiming to assess anthropogenic risks and distance to GES especially in the framework of the Descriptor 10. The knowledge acquired on species’ biology and anthropogenic impacts will also be shared to contribute to Descriptors 1 and 4. Finally, the project also aims to foster synergies with other UE programs and the transfer to competent authorities in 3 of the regional priorities targeted by the call, i.e. the North-East Atlantic Ocean, the Macaronesia and the Mediterranean.

For the indicator “Litter ingested by sea turtles”, the more specific objectives are:

- to promote its operationalization and evaluate its ability to quantify the effect of the PoMs in pilot areas, defined thanks to INDICIT results and external expertise,
- to reinforce and extend the networks by considering the lessons learned during the INDICIT project on the stakeholders’ conditions for involvement and data sharing,
- to fill the gaps in data on litter ingestion identified especially in the OSPAR area (e.g. Macaronesia and Mainland Portugal and Spain, etc.) and East and South Mediterranean, in order to better be in line with GES Decision requirements and support the development of measures integrated into the MSFD,
- to promote harmonization (e.g. standardization of protocols and data collection) especially with Eastern and Southern countries in the Mediterranean area and mainland Portugal and Spain in the Atlantic area,
- to test and adjust the GES scenarios, the spatial and temporal units of the indicator and the sample size, by collecting more standard data, and by considering other parameters related to individual health, in respect of the New Decision Commission 2017/848 and applying the indicator in pilot areas.

The INDICIT-II specific objectives for supporting the MSFD and OSPAR, HELCOM and Barcelona RSCs for the implementation of the indicators “Entanglement of sea turtles, birds, cetaceans in floating debris” and “Micro-plastic ingestion by fish and sea turtles” are:

- to develop the standard monitoring procedures,
- to establish or pursue the networking and offer training sessions to stakeholders for the collection of standard data,
- to collect and standard data for evaluating the bio indicators’ constraints, which are (i) the most relevant taxa / species, (ii) the biological constraints (e.g., individual size), (iii) the temporal and spatial unit, (iv) the sampling size, and for proposing GES scenarios.

INDICIT-II also devotes an activity for fostering the collaboration with other programs for a better harmonization and effort mutualisation. The specific objectives are:

- to share expertise, tools, and when agreed with collaborators, the standard data.
- to participate in the production of ecosystem-based and integrated approaches and standardized tools,
- to work hand-in-hand with policy-makers by integrating them directly into the reflections and the work with stakeholders,
- to disseminate the tools and better allow their appropriation by other stakeholders on a wide scale.

The implementation of these coordinated practical monitoring will provide a greater coherence within and between marine (sub)regions as at a larger scale (beyond the MSFD Member states) thanks to the dissemination of INDICIT-II’s outcomes. Finally, INDICIT-II will also aim at communicating its main results to the large audience. Appendix 1 provides a more detailed presentation of the project.

## **Activity 1**

**C. Miaud, G. Darmon (EPHE, France)**

**B. Godley, E. Duncan (UNEXE, UK)**

**Management, coordination and communication**



École Pratique  
des Hautes Études



## I. Introduction

The objective of this activity is to ensure the proper implementation and management of the project with respect to its objectives, time-frame and budget constraints while allowing a smooth communication between the consortium members. This activity is led by EPHE (Claude Miaud and Gaëlle Darmon as CO) and involves all the 12 members of the INDICIT-II Consortium, 3 of them being newly involved in INDICIT-II (not involved as partners in INDICIT). The Communication activity (within the project and outside) is coordinated by University of EXETER (Annette Broderick, Emily Duncan, Brendan Godley and Sarah Nelms). DGSCM-SGPM and MTES, who were members of the INDICIT External Advisory Board, now belong to the INDICIT-II partners' teams, participating to internal communication and workshops.

The partners are listed in Table 1. Changes from Annex A of the Application appear in grey.

*Table 1.1.* List of partners, scientific and administrative representatives.

Acronym	Identity	Partners' name(s)	Legal representative
EPHE	ECOLE PRATIQUE DES HAUTES ETUDES	Claude MIAUD	Jean-Pierre VERDIER
HCMR	HELLENIC CENTRE FOR MARINE RESEARCH	Helen KABERI	Spyridon MAVRAKOS
ISPRA	ISTITUTO SUPERIORE PER LA PROTEZIONE E LA RICERCA AMBIENTALE	Marco MATIDDI	Alessandro BRATTI
UNEXE	UNIVERSITY OF EXETER	Brendan GODLEY	Enda CLARKE
PAU-DEKAMER	PAMUKKALE UNIVERSITY SEA TURTLE RESEARCH AND APPLICATION CENTER	Yakup KASKA	Hüseyin BAĞ
FRCT	FUNDO REGIONAL PARA A CIÊNCIA E TECNOLOGIA (REGIONAL FUND FOR SCIENCE AND TECHNOLOGY)	Maria Luís ADRIÃO DO VALE	Bruno Miguel CORREIA PACHECO
UVEG	UNIVERSITAT DE VALÈNCIA (ESTUDI GENERAL)	Jesus TOMÁS	M. Dolores REAL GARCÍA
IAS-CNR	CONSIGLIO NAZIONALE DELLE RICERCHE	Giuseppe Andrea DE LUCIA	Crisafi ERMANNO
INSTM	INSTITUT NATIONAL DES SCIENCES ET TECHNOLOGIES DE LA MER	Olfa CHAIEB	Hechmi MISSAOUI
ULPGC	UNIVERSIDAD DE LAS PALMAS DE GRAN CANARIA	María M. GÓMEZ CABRERA	José Pablo SUÁREZ RIVERO
MTES	MINISTÈRE DE LA TRANSITION ÉCOLOGIQUE ET SOLIDAIRE	Anastasia WOLFF	Thierry VATIN
DGSCM-SGPM	DIRECCIÓN GENERAL DE SOSTENIBILIDAD DE LA COSTA Y DEL MAR- SUBDIRECCIÓN GENERAL PARA LA PROTECCIÓN DEL MAR	Marta MARTÍNEZ-GIL PARDO DE VERA	Itziar MARTÍN PARTIDA



One affiliated entity is associated to the project: FCPCT (Fundación Canaria Parque Científico Tecnológico).

## II. Methodology

### II.1. Working plan and deliverables

The activity is divided into three tasks:

#### *Task 1.1. Technical coordination of the project*

This task aims at ensuring an efficient technical coordination of the project thanks to the organization of meetings and workshops for the smooth and effective communication among partners and ensure the production of deliverables in time. Following the lessons learned during the previous programme, each activity is now led by two partners in INDICIT-II, supported by EPHE.

EPHE is coordinating the project, and responsible of the official reporting (discussion with the Policy officer (PO) and submission of deliverables). The deliverables have to be sent to EPHE by each Activity leader two weeks before the deliverable deadline (see each specific activity time table).

The planning of meetings and workshops is:

- February 2019 (2 days): KOF-Belgium and workshop#1
- July 2019 (3 days) Intermediate Meeting (IM) –Tunisia,workshop #2 (Activity 2) and workshop #3 (strategies for Activities 3 and 4)
- January 2020 (3 days) IM-France and workshop #4 and workshop #5 (Note that some partners have 2 days and others 3 days in the Grant Agreement. We will try to organise 1 day workshop to discuss the Progress of the program, 1 day presentation and discussion with the EAB and 1 day workshop (or ½ day) on specific question (eg health status; microplastic protocols in fish, etc...)
- July 2020 (3 days) IM-Turkey and workshop #6 and Dissemination meeting
- January 2021 (1 day) Final Meeting -Belgium

*Table 1.2. Activity leaders and co-leaders*

Activity (Work-Package)	Leader	Co-leader
Activity 1	Claude MIAUD – Gaëlle DARMON (EPHE)	Brendan GODLEY - Emily DUNCAN (UNEXE)
Activity 2	Jesus TOMAS (UVEG)	Andrea Giuseppe DE LUCIA – Andrea CAMEDDA (IAS-CNR)
Activity 3	Ana LIRIA LOZA - Maria M. GOMEZ CABRERA (ULPGC)	Olfa CHAIEB (INSTM)
Activity 4	Marco MATIDDI – Cecilia SILVESTRI (ISPRA)	Maria Luz PARAMIO MARTIN - Maria Luís ADRIÃO DO VALE (FRCT)
Activity 5	Eleni KABERI (HCMR)	Claude MIAUD – Gaëlle DARMON (EPHE)

Several rules have been proposed during the Workshop meeting # 1 (21<sup>th</sup> February 2019, Brussels):

- The use of templates for a maximum of reporting and management tools (e.g. reports/time sheet/etc).
- A monthly skype conference among the Activity leaders and the CO.
- The composition of dedicated email lists for e.g. the EAB, the WP Leaders, all the participants, etc. The description of these lists are in discussion and will be provided to the participants the coming days (see task 1.3.).
- The composition of the EAB has been validated during the first steering Committee (21<sup>th</sup> February 2019, Table 3).
- The CO will send regular emails to the WP Leaders according to the deadline and deliveries described in the programme plan.

In term of reporting, the programme started on the 2<sup>nd</sup> February 2019 for a period of 24 months.

The **reporting period** are set as:

**RP1:** 2<sup>nd</sup> February to 31/07/2019 (M1 to M6)

**RP2:** 1<sup>st</sup> August 2019 to 31th January 2020 (M7 to M 12)

**RP3:** 1<sup>st</sup> February 2020 to 31th July 2020 (M13 to 18)

**RP4:** 1<sup>st</sup> August 2020 to 31th January 2021 (M19 to M24)

The deliverables expected dates are provided in Tables 4 and 5.

*Table 1.3. Composition of the EAB. Highlighted in grey: change from the Annex A*

Organization	EAB members
OSPAR Commission	Philip STAMP (Deputy secretary)
HELCOM/OSPAR Commission	Stefanie WERNER (UBA, German Environment Ministry)
Barcelona convention	Tatjana HEMA
Barcelona convention (RAC/SPA)	Lobna BEN NAKHLA
AFB French Biodiversity Agency	Benjamin GUICHARD
IEO (Spanish Institute of oceanography)	Jesus GAGO
IFREMER	François GALGANI
DRAM, Azores government	Marco A.R.SANTOS
European Environment Agency	Ana TEJEDOR ARCEREDILLO
UN Environment/MAP	Christos IOKEIMIDIS
Italian Ministry of Environment	Roberto GIANGRECO
Museum Nationale d'Histoire Naturelle	Françoise CLARO
DRGM, Portuguese Ministry	Sandra MOUTINHO
DRAM, Azores government	Gilberto CARREIRA

Michail Papadoyannakis, Senior Expert, Directorate General Environment, Marine Environment and Water Industry is the Policy Officer of the project INDICIT-II.

Table 1.4. Working plan for Activity 1 (new table that replaces the table in Annex A)

Number	Deliverable name	Coordinator	Month	Deliverable deadline for UE (sent by EPHE)	Deliverable deadline for partners (to EPHE)
<b>Activity 1 - Management - Communication</b>					
D1.1	Inception report	EPHE	M2	31/03/2019	15/02/2019
D1.2	Progress report RP1	EPHE	M6	15/08/2019	31/07/2019
D1.3	Progress report RP2	EPHE	M12	15/02/2020	31/01/2020
D1.4	Progress report RP3	EPHE	M18	15/08/2020	31/07/2020
D1.5	Progress report RP4	EPHE	M24	15/02/2021	31/01/2021
D1.6	Final report	EPHE	M26	31/03/2021	31/03/2021
D1.7	Minutes of KOF and Workshop#1	EPHE	M2	31/03/2019	
D1.8	Minutes of 1st intermediate meeting	INSTM	M6	15/08/2019	31/07/2019
D1.9	Minutes of 2nd intermediate meeting	EPHE	M12	15/02/2020	31/01/2020
D1.10	Minutes of 3rd intermediate meeting	PAU- DEKAMER	M18	15/08/2020	31/07/2020
D1.11	Minutes of dissemination meeting	PAU- DEKAMER	M18	15/08/2020	31/07/2020
D1.12	Minutes of Final meeting	CNRS	M24	15/02/2021	31/01/2021
D1.13	Consortium agreement	EPHE	M3	30/04/2019	
D1.14	Communication and dissemination plan	UNEXE	M2	31/03/2019	15/03/2019
D1.15	Communication Progress report RP1	UNEXE	M6	15/08/2019	31/07/2019
D1.16	Communication Progress report RP2	UNEXE	M12	15/02/2020	31/01/2020
D1.17	Communication Progress report RP3	UNEXE	M18	15/08/2020	31/07/2020
D1.18	Communication Progress report RP4	UNEXE	M24	15/02/2021	31/01/2021
D1.19	Exhibition photo	ISPRA	M12	15/02/2020	31/01/20120
D1.20	Exhibition photo + comics	ISPRA	M24	15/02/2021	31/01/2021
D1.21	Standardized and designed tool kit (protocols, etc.)	UNEXE	M22	15/01/2020	
D1.22	Slides of the programme objectives and results	EPHE	M24	15/02/2021	31/01/2021

Table 1.5. Deliverables for Activity 1 (new table that replaces the table in Annex A)

	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24	M25	M26
<b>1.1. Technical coordination of the project (EPHE, involvement of WPLs and all partners )</b>																										
Inception report		D1.1																								
Progress report						D1.2 RP1						D1.3 RP2						D1.4. RP3						D1.5 RP4		D1.6. Final report
Minutes of meetings and workshops	KOF	D1.7				D1.8						D1.9						D1.10.						D1.12		
Minutes of dissemination meeting																		D.1.11								
<b>1.2. Administrative, legal and financial management (EPHE, involvement of all partners )</b>																										
Consortium agreement			D1.13																							
Financial reports						with RP1																		All project duration		consolidated final financial report
<b>1.3. Communication UNEXE (supported by EPHE; involvement of all partners)</b>																										
Communication plan		D1.14																								
Progress report						D1.15 PR1						D1.16 PR2						D1.17 PR3						D1.18 PR4		
Exhibition												D1.19												D1.20		
Standardized tools (3 protocols)																								D1.21		

### *Task 1.2. Administrative, legal and financial management*

This task aims at ensuring an efficient administrative, legal and financial management of the project in accordance with the articles of the Grant Agreement and of the Consortium Agreement to be signed by all the project partners. During her presentation at the Kick of Meeting (20<sup>th</sup> February 2019, Brussel), Marie Thariat (EPHE), European Programme Engineer, highlighted the deadlines and deliverables which directly influence the funding. This presentation is given in Appendix 2 of this inception report.

### *Task 1.3. Communication*

This task aims at communicating about the project and its outcomes by managing the technical tools developed in INDICIT (e.g. website, private area), which will be used by partners to share data and disseminate the standardized tools to EAB and stakeholders within and outside the INDICIT-II project area. The consortium will actively contact national authorities involved in MSFD implementation and will liaise with TG ML co-chairs in advance of TG ML meetings for discussing participation of INDICIT II in TG ML. This task also includes communicating about the project context, objectives and results towards a general audience in order to raise public awareness, thanks to e.g., Facebook (tools developed during INDICIT) and specific events. All the communication tasks are listed in the communication plan for INDICIT-II (D1.14). This list will probably be updated with the opportunities which will be offered during the course of the project.

## **II.2. Mitigation measures for potential risks**

Each Beneficiary is represented by 2 people in order to substitute the representative at the Steering committee (StC) in case of absence. The StC regularly consults with and encourages strong commitment of the participants. The StC shall rely on the Consortium Agreement to ensure good relationships and amicable resolution of potential disagreements.

Two partners now lead each activity of INDICIT-II. These leaders are responsible for following up the involvement of participants in the Activity and to inform the Coordinator (CO) for possible raised questions and decisions taken locally.

The composition of the StC was validated during the Kick of Meeting (20/02/2019). Changes from the Annex A are highlighted in grey.

*Table 1.6. Composition of the Steering committee*

Participant short name	StC representative	Possible substitute	Voting rights
EPHE	Claude MIAUD ( <i>male</i> )	Gaëlle DARMON ( <i>female</i> )	Yes
UNEXE	Brendan GODLEY ( <i>male</i> )	Emily DUNCAN ( <i>female</i> )	Yes
ISPRA	Marco MATIDDI ( <i>male</i> )	Cecilia SILVESTRI ( <i>female</i> )	Yes
CNR	Giuseppe DE LUCIA ( <i>male</i> )	Andrea CAMEDDA ( <i>male</i> )	Yes
HCMR	Eleni KABERI ( <i>female</i> )	Catherine TSANGARIS ( <i>female</i> )	Yes
UVEG	Jesus TOMAS ( <i>male</i> )	Post-doc to be recruited	Yes
ULPGC	Ana LIRIA LOZA ( <i>female</i> )	Maria M. GOMEZ CABRERA ( <i>female</i> )	Yes
PAU-DEKAMER	Yakup KASKA ( <i>male</i> )	Dogan SOZBILLEN ( <i>male</i> )	Yes
FRCT	Maria Luz PARAMIO MARTIN ( <i>female</i> )	Maria Vale ( <i>female</i> )	Yes
INSTM	Olfa CHAIEB ( <i>female</i> )	Ahmed AFLI ( <i>male</i> )	Yes
MTES	Anastasia WOLFF ( <i>female</i> )	Sarah SANANES ( <i>female</i> )	Yes
DGSCM-SGPM	Marta MARTINEZ-GIL PARDO DE VERA ( <i>female</i> )	To be proposed	Yes

## **Activity 2**

**J. Tomás (UVEG, Spain)**

**G. A. de Lucia (CNR, Italy)**

**Applying the indicator “Litter ingested by sea turtles” to  
quantify the Programs of Measures at the OSPAR and  
Barcelona RSCs and MSFD areas**



Consiglio Nazionale  
delle Ricerche

## **I. Introduction**

The objective of this activity, which involves all partners, is to capitalize the INDICIT results. Based on all the information collected during INDICIT project, this activity aims first to proceed to the operationalization of the indicator in pilot areas in order to evaluate its capacity to quantify the effects of the Programs of Measures (PoMs). The second major goal is to provide accurate estimations of GES and indicator's characteristics (e.g., biological constraints) where standard data just started to be collected, especially in the OSPAR area. It is also to verify or adjust if necessary, the GES scenario provided in INDICIT, by assessing the impacts of the ingestion of litter on individual sea turtle's health thanks to the analysis of additional data (as those proposed as "option" in INDICIT ()).

During INDICIT project, a lot of information on litter ingestion has been collected. However, caveats and gaps have been also identified. For a better coordination among sub-regions, and in order to foster the development of accurate indicator, this activity also aims to better bridge the gaps of networks and knowledge (e.g. in the Atlantic area within the Macaronesia and between the Macaronesia and the North-East Atlantic; in the Mediterranean area between the Western and the Eastern and Southern countries). In this sense, this activity aims to reinforce the networks of stakeholders established during INDICIT for data collection, promoting the use of the protocol developed during this project. These past and new data, and the future data bases, will be used to refine the GES, especially by considering the health status of the turtles.

This Activity aims to benefit from partners and stakeholders' expertise and data, as well as experts from other international programs and competent authorities, collected in the framework of Activity 5. The output data and expertise collected from the 3 tasks of Activity 2 should also be shared with experts contacted in Activity 5 for building integrated tools considering other Descriptor 10's criteria and other Descriptors.

## **II. Methodology**

### **II.1. Working plan and deliverables**

The activity is divided into three tasks:

#### *- Task 2.1 Support the quantification of the effects of programs of measures*

This task aims at assessing the capacity of the indicator to evaluate the effect of PoMs in specific pilot areas selected in various partners' countries, by comparing the amount and categories of ingested litter and litter in the environment. Various hypotheses will be tested according to different scenarios of litter reduction, which are supposed to be induced by specific PoMs. Pilot areas (suitable for the study) will be selected according to the information collected during the first 6 months of the project. After this phase of information collection (selection criteria, and data collection), the first list will be provided to the EAB and other experts in September 2019 for validation in order to produce the D.2.7 (M9).

*- Task 2.2 Strengthening the implementation of the indicator*

This task aims at strengthening the networks and their capacity to set up the standardized procedures for the monitoring of litter impacts. The efforts will especially concern the OSPAR-Macaronesia area in which the networking established within the INDICIT project faces more difficulty, due both to the configuration of the zone and to the specific conditions required by stakeholders to collect and gather their data (e.g., financial assistance, more training sessions, involvement in meetings with partners, requirements related to data access and privacy...). As the indicator “ingestion in sea turtle” is now changing from “Candidate” to a “Common” indicator, INDICIT-II has a great challenge to improve data collection and GES assessment in this RSC. The constituted Mediterranean networks will pursue the collect of standard data, and the networks will be extended to Southern and Eastern countries in order to precise the spatial accuracy of the GES and indicator’s characteristics. Other data will be collected, especially concerning the individuals’ body condition and health status.

*- Task 2.3 Updating indicator’s GES, units and constraints at the RSCs scale*

In this task, we will validate and update the GES scenario and the indicator’s characteristics (e.g., biological constraints) evaluated in the INDICIT project and precise the spatial and temporal units. For this, we will consider the responses of the tests performed in pilot areas within the Task 2.1, and the standard data on ingested litter and individuals’ biometric measures and health status within Task 2.2. The consideration of expert knowledge and data collected within Activity 5 will benefit to this Task. As this task is a very important deliverable (D.2.10, GES and indicators' units and constraints) which has to be produced for M24, a special session will be proposed during the workshop # 3 (Turkey, M18) to consolidate the GES proposal. A preliminary draft will be provided with the minutes of the meeting.

Similarly, the deliverable (D2.11, Report on assessment in pilot areas) is also important and planned to be delivered at M24. As for D2.10, the work on D2.11 will start in month M18, during the 3rd intermediate meeting (M18). A preliminary draft will be provided with the minutes of the meeting.



Table 2.1: working plan for Activity 2 (new table that replaces the table in Annex A)

	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24
Inception report		D2.1																						
Progress report						D2.2						D2.3						D2.4						D2.5
Training session												D2.6												
List of pilot area/PoM									D2.7															
List of stakeholders+map												D2.8												D2.9
GES, units & constraints																								D2.10
Assessment in pilot area																								D2.11
Final database																								D2.12

Table 2.2: deliverables for Activity 2 (new table that replaces the table in Annex A)

D2.1	Inception report	UVEG/CNR	M2	31/03/2019	15/02/2019	
D2.2	Progress report RP1	UVEG/CNR	M6	15/08/2019	31/07/2019	
D2.3	Progress report RP2	UVEG/CNR	M12	15/02/2020	31/01/2020	
D2.4	Progress report RP3	UVEG/CNR	M18	15/08/2020	31/07/2020	
D2.5	Progress report RP4	UVEG/CNR	M24	15/02/2021	31/01/2021	
D2.6	Training session (workshop with stakeholders involved in implementation)	UVEG/CNR	M12	15/02/2020	31/01/2020	
D2.7	List Pilot areas/tested POMs	UVEG/CNR	M9	15/11/2019	31/10/2019	
D2.8	List of stakeholders + google map	UVEG/CNR	M12	15/02/2020	31/01/2020	in collaboration with Activity 1 (UNEXE)
D2.9	Final list of stakeholders + google map	UVEG/CNR	M24	15/02/2021	31/01/2021	in collaboration with Activity 1 (UNEXE)
D2.10	GES and indicators's units and constraints	UVEG/CNR	M24	15/02/2021	31/01/2021	
D2.11	Report on assessment in pilot areas	UVEG/CNR	M24	15/02/2021	31/01/2021	
D2.12	Final common database	UVEG/CNR	M24	15/02/2021	31/01/2021	

D2.11 A preliminary draft will be provided with the minutes of the 3rd intermediate meeting at M18.

## II.2. Methods of study

### *Task 2.1: Supporting the quantification of the effects of programs of measures*

The pilot areas will be selected regarding a selection of PoMs implemented by the Member States. We will consider various factors emerging from INDICIT outputs, such as 1) the feasibility of acquiring samples (collaborations already existing or possibility to extend the networking locally), 2) gradients of pollution and impacts (e.g., occurrence and quantity of ingested litter in sea turtles), 3) the feasibility to evaluate the PoM thanks to the parameter collected (e.g., Following the banning of plastic bags, the attention will target especially the category (USE she)).

Each partner will be in charge to take note of national PoM (<https://rod.eionet.europa.eu/obligations/%20612/deliveries>) and make proposal of both PoM and pilot areas to the consortium. The consortium will propose a list of PoM and pilot areas to the EAB for validation.

The standard data collected throughout the project will be analysed to assess the efficiency of PoMs by testing the spatial differences in occurrence and quantity of ingested litter per litter category (e.g., USE SHE to evaluate plastic ban local effects). Our results will consider a regular update of the literature on litter ingestion in sea turtles as well as the main results, encouraged by Activity 5, obtained by Members states and other programs regarding the other D10 Criteria (e.g. relative to beach litter, floating litter...).

### *Task 2.2: Strengthening the implementation of the indicator*

Stakeholders, both from Mediterranean and from Atlantic area, will be continuously trained for using standardized methodologies. To foster a sustained collaboration, the INDICIT-II consortium should involve them as much as possible through the training courses and data sharing. For this purpose, we will encourage the use of the protocol for the collection of data on ingestion (and entanglement, see Activity 3) in the loggerhead turtle, developed during INDICIT project. Other species will also be considered such as the leatherback turtle *Dermochelys coriacea* (previous data collected during INDICIT), and if possible, the green turtle *Chelonia mydas*.

As far as possible, and supported by EAB and Activity 5, the Mediterranean Network will be enlarged, through the involvement of more stakeholders from North Africa countries, as well as the Adriatic and Aegian Seas.

The protocol will be possibly improved according to stakeholders' feedback and Task 2.1 outputs. Training sessions and dissemination of the protocol will ensure that all collaborators will follow the standardized methodology, from the recovery of the turtle to the collection of the samples and their analysis in laboratory.

### *Task 2.3: Updating indicator's GES, units and constraints at the RSCs scale*

To update the GES scenarios, all data will be filled in the database, so those about abundance and weight of litter categories. For example, in order to better evaluate the scenario proposed by INDICIT consortium, which considers the number of individuals having more litter than food

remains (category FOO), we will encourage reporting the weight of FOO, which was regularly missing before and that must be reported now. In addition, biometric measures will be standardized (such as body length) and other parameters previously considered as “optional”, especially those describing the individuals’ health status will be standardized and encouraged to be measured, on both live and dead individuals. These data are crucial to better assess the relationship between health and litter ingestion, and better understand if litter ingestion decreases the health status or inversely, if a bad health condition increases the risk of litter ingestion. Indeed, Travaglini et al. (2013, in Dell’Amico & Gambaiani, 2013) found more debris items in individuals in bad health condition. However, it was not possible in literature, to have information on the individual’s health condition before the ingestion of litter, to assess how the individual’s condition or its feeding behaviour would change after having ingested debris. Raw data shall be analysed to compare the body condition (CCL, mass, Body Condition Indices, etc.) between the individuals having ingested debris and those who did not.

The data related to individuals’ health and toxicological contamination will be analysed to further assess the impact of ingested litter and upgrade the GES scenario if needed, in adequacy with the definition proposed in the New Decision Commission. Some budget will be dedicated to sub-contract analysis in ecotoxicology to consider the individuals’ level of contamination in regards to the litter ingested. Several European team are currently working on these issues (mostly with marine mammals). We will discuss with them on which analysis (e.g. presence of plastic derived pollutants such as phthalates) would be used to connect health status and litter ingestion. The Task will benefit from collaborations in Activity 5.

### III. Participants and tasks sharing, expected time table

All partners are expected to participate in Activity 2.

Table 2.3. Proposed time table for Activity 3

Tasks/Months	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
2.1																								
2.2																								
2.3																								

### IV. Limitations and mitigation measures

The good evaluation of GES scenarios depends on data available and spatial extent and the possibility to sort the data per litter category and relative to health. An important task is the establishment and signature of sharing agreements with involved stakeholders. This will be realized in inter-relation among all INDICIT-II Activities. In parallel, INDICIT-II will highlight the litter categories ingested by sea turtles to better describe and standardize the parameters relative to health.

**Activity 3**  
**A. Liria-Loza (ULPGC, Spain)**  
**O. Chaieb (INSTM, Tunisia)**

**Implementation of the indicator “Entanglement in floating debris by sea turtles, birds and cetaceans” at the OSPAR and Barcelona RSCs and MSFD areas**



## **I. Introduction**

The main objective of this Activity is constituting the networks from stakeholders identified in the INDICIT feasibility study report, defining standard procedures and collecting standard data in order to provide a first assessment of GES and indicator's characteristics.

The work will concern specifically the entanglement of sea turtles, birds and cetaceans in floating debris. This Activity will benefit to the data and expert knowledge collected within Activity 5 and also provide expertise and data to programs on Descriptor 10 and others, specifically Descriptors 1 and 4.

The activity is divided in 4 tasks:

### *3.1. Networking and standardization of monitoring*

This task aims at establishing the networks notably identified and contacted during INDICIT, and train stakeholders to the collect of standard data.

### *3.2. Collection of standard data*

This task aims at constituting standard database and the platform to gather standard data.

### *3.3. Evaluation of GES and indicator's characteristics at the RSC scale*

This task aims at analysing statistically the data from Task 3.2. in order to propose a first assessment of GES (baseline / threshold, scenarios) and evaluate the indicator's characteristics: species, biological constraints and units.

### *3.4. Evaluation of the indicator in pilot areas*

This task aims at collecting specific data in the pilot areas selected in Task 2.1 in order to provide a first assessment of the capacity of the "Entanglement in floating debris by sea turtles, birds and cetaceans" indicator to quantify the effect of PoMs.

## **II. Methodology**

### **II.1. Working plan and deliverables**

The target is to fill the gaps of knowledge necessary to a first assessment of GES and the determination of the methodological standards for the use of the indicator for monitoring debris impacts related to Entanglement at the RSCs scale with inter-calibration at the MSFD scale. The interaction with experts involved in Activity 5 will be crucial for allowing the implementation of a standard monitoring and the evaluation of the indicators' characteristics and units.

The working plan is described in Table 3.1 and the expected deliverables are listed in Table 3.2.

The deliverable (D3.13, Report from assessment in pilot areas) is important and planned to be delivered at M24. The work will start in month M18, during the 3rd intermediate meeting (M18). A preliminary draft will be provided with the minutes of the meeting.

Table 3.1: working plan for Activity 3 (new table that replaces the table in Annex A)

	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24
Inception report		D3.1																						
Progress report						D3.2						D3.3						D3.4						D3.5
Training sessions												D3.6												
List of stakeholders + map												D3.7												D3.8
Standard procedures (protocols)												D3.9												D3.10
Final database																								D3.11
Baseline / target species																								D3.12
Assessment in pilot areas																								D3.13

*Table 3.2: deliverables for Activity 3 (new table that replaces the table in Annex A)*

Number	Deliverable name	Coordinator	Month	Deadline
<b>D3.1</b>	Inception report	ULPGC/INSTM	M2	31/03/2019
<b>D3.2</b>	Progress report RP1	ULPGC/INSTM	M6	15/08/2019
<b>D3.3</b>	Progress report RP2	ULPGC/INSTM	M12	15/02/2020
<b>D3.4</b>	Progress report RP3	ULPGC/INSTM	M18	15/08/2020
<b>D3.5</b>	Progress report RP4	ULPGC/INSTM	M24	15/02/2021
<b>D3.6</b>	Training session (workshop with stakeholders involved in implementation)	ULPGC/INSTM	M12	15/02/2020
<b>D3.7</b>	List of stakeholders + Google map	ULPGC/INSTM	M12	15/02/2020
<b>D3.8</b>	Final list of stakeholders + google map	ULPGC/INSTM	M24	15/02/2021
<b>D3.9</b>	Standard procedures (protocol entanglement)	ULPGC/INSTM	M12	15/02/2020
<b>D3.10</b>	Final standard procedures (protocol)	ULPGC/INSTM	M24	15/02/2021
<b>D3.11</b>	Final common standard database	ULPGC/INSTM	M24	15/02/2021
<b>D3.12</b>	Report on baselines and target species/taxa	ULPGC/INSTM	M24	15/02/2021
<b>D3.13</b>	Report on conclusions from assessment in pilot areas	ULPGC/INSTM	M24	15/02/2021

*The deliverables D3.7, D3.8 and D3.10 will be produce in collaboration with the Task 1.3 Communication.*

*D3.13 Report from assessment in pilot areas: A preliminary draft will be provided with the minutes of the 3rd intermediate meeting (M18).*

## **II.2 Methods of Data Collection and Data Analysis:**

### *3.1. Networking and standardization of monitoring*

This task will benefit from the capitalization of INDICIT results. The availability of data and the possible networks to engage in the monitoring of entanglement have been assessed thanks to the feasibility study performed during INDICIT project (INDICIT Deliverable 2.5). This feasibility study and the optional data related to entanglement also reveals some caveats such as the typology of fishing gears and other litters involved in entanglement, and discrimination between active and passive entanglement. The protocol will be consolidated thanks to new data collection and new stakeholders involved (especially in the new taxa surveyed).

Several identified stakeholders having already collected data, or who could possibly be engaged for the monitoring of entanglement on one or several taxa among sea turtles, birds or cetaceans, will be networked. Data collected on entanglement on sea turtles with INDICIT protocols and/or ancient data not yet standardized, will participate in a better understanding of litter causing entanglement (such as the typology of entangling litter), while differentiating marine litter causing entanglement from litter originating from active fishing is fundamental to develop the Standard Protocols.

Workshops will be organized among partners and including the stakeholders in order to update the standardized protocol elaborated in INDICIT, considering the relevance and refinement of the proposed parameters according to the feasibility in the field and in order to achieve the MSFD objectives. The standardisation of the monitoring will also be done thanks to the knowledge of external expertise from other programs related to Marine Litter (abundance, distribution, type of debris, etc.), as well as experts on specific issues (such as fishermen), which will be contacted and consulted (Activity 5) to better understand and update an adequate and more useful classification of the litter that could impact the animals by entanglement.

The standardisation of the monitoring will be updated thanks to the data collected in the framework of Task 3.2 and their statistical analyses relative to Task 3.3, until the end of the project.

### *3.2. Collection of standard data*

Once the first draft of the standard protocol will be established, training sessions will be proposed to stakeholders to strengthen and homogenize the network's technical abilities.

For sea turtles, the optional collection of standardized data relative to entanglement, including parameters relative to the origin and type of litter and the consequences on the individual health, initiated in the INDICIT framework, will be included in the database.

In addition, the measure of several parameters on the individuals (e.g., carapace lengths, description of body condition, evaluation of health status), will allow to evaluate the (individual and environmental) risk factors exposing individuals to entanglement. The individual characteristics (e.g., size, feeding behaviour) are possible biological constraints, which should be considered for the development of the indicator. These parameters will be particularly discussed during the training sessions to ensure the harmonization of data collection by the whole network.

For birds and cetaceans, existing data have been identified in the INDICIT feasibility studies and will be completed and updated in this Task 3.2. The gathering of data will be supported by subcontractors (NGOs, Rescue centres, stranding networks) in order to standardize the data already acquired or to provide new standardized data.



A standardized Database will be developed and shared with stakeholders to gather standard data collected by stakeholders. As it has been done in INDICIT, mandatory and optional parameters will be included, taking into account the great differences (technical, logistic and capabilities) between the working groups (stakeholders).

In relation to Activity 1 and Activity 5, different workshops will be organized with stakeholders in order to agree on the conditions for data sharing to the INDICIT-II consortium and with other programs. The data collected within this Activity will be proposed to other programs related to Descriptor 10 or Descriptors 1 and 4. Data sharing agreements will be developed and proposed to all the stakeholders.

### *3.3. Evaluation of GES and indicator's characteristics at the RSC scale*

The statistical analyses of the standardized data collected in the previous task will allow proposing a first assessment of GES at the RSC/MSFD level and of the indicator's biological constraints (more relevant species, biological constraints, units). The GES scenario(s) will be analysed and discussed with external experts and other programs during common workshops organized within Activity 5.

### *3.4. Evaluation of the indicator in pilot areas*

The efforts for the collection of data relative to Entanglement will especially target the pilot areas selected in the framework of Activity 2 (Task 2.1), or other specific areas proposed by the Activity 3 partners (more adequate for entanglement). These specific areas will be defined thanks to partners and collaborators' expertise and a first appraisal of the data collected and/or available during the first year of the program (M12).

Data on marine litter abundance, types and origin will be collected thanks to the involvement of specialists who will be involved (e.g., related to fisheries and NGOs) and gathered from other international programs thanks to synergies realized in Activity 5. Ideally, to the extent of available data, the data on occurrence, prevalence and typology of litter causing entanglement in sea turtles, birds and cetaceans should be confronted to the classification of marine litter found in the environment in order to specify the possible sources of litter and quantify the effects of targeted PoMs, related e.g. to clean-ups activities conducted by different institutions, authorities, researchers and citizen collaborative programs.

## **III. Participants and tasks sharing, expected time table**

EPHE, UVEG, PAU-DEKAMER, HCMR, UNEXE, FRCT, CNR are expected to participate in Activity 3.

### *3.1. Networking and standardization of monitoring*

- i. A Stakeholder's Table will be developed by Activity 3' Leaders (based on Stakeholder's Table developed during INDICIT) and distributed among Partners to be filled with the potential groups that could be involved in data collection or knowledge expertise on entanglement in each region. The specific taxa (sea turtles, seabirds and cetaceans; one or several) will be included in the Table.  
(M2 to M6) - Partners involved in Activity 3 will participate.

- ii. Potential stakeholders will be contacted by Activity 3 Leaders and Partners in order to be involved on the entanglement monitoring.  
 (M2-M6) – Stakeholders will be contacted to share knowledge, ancient data on entanglement, or specific experiences (for example, specific litter typologies)  
 (M7-M12) – Stakeholders will be contacted to take advice on the draft of Standard Protocols for entanglement and co-built the standard Database.
- iii. Draft of Standardized Protocol, coordinated by Activity 3 Leaders taking into account knowledge and expertise of stakeholders (including professional fishermen) and other experts, will be shared with all partners to receive comments and suggestions (workshops).  
 (M7-M12) – All Partners involved in Activity 3 will be involved.

### 3.2. Collection of standard data

(M2 – M23) - All partners involved in Activity 3 will collect data from the regional stakeholders.

### 3.3. Evaluation of GES and indicator's characteristics at the RSC scale

(M13-M24) - Results from the statistical analysis will be shared and discussed together among Partners involved in Activity 3.

### 3.4. Evaluation of the indicator in pilot areas

(M4-M6) - Proposal of Pilot areas will be consulted to Partners involved in Activity 3, in relation with Activity 2 (D.2.7 in M9).

(M18-M24) - Results from the statistical analysis and main conclusions on Pilot areas will be shared and discussed together between Partners involved in Activity 3.

Tasks/Months	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
3.1																								
3.2																								
3.3																								
3.4									*															

\* Proposal of pilot areas and/or specific areas for entanglement indicator

## IV. Limitations and mitigation measures

- ❖ The ambition of this Activity is to collect data at the scale of the MSFD area including new networks working on birds and cetaceans. This was achieved for Sea turtles in INDICIT in 2 years because most of the partners were involved in sea turtle research or conservation. For INDICIT-II, the main risk is to be unable to rapidly collect enough (available) data for e.g. GES evaluation. The experience of INDICIT will benefit to this task by considering stakeholders' possible conditions to be involved.
- ❖ Great differences between working groups and/or potential stakeholders (NGOs, stranding networks, recovery centres, etc.) exist, mainly on logistic, technical or personal capabilities. For this reason, the Standard Protocol to monitor entanglement needs to be very simple, but effective. Images collection and storage is proposed as an important tool for this indicator.

- ❖ Marine litter classification is crucial to understand the specific impacts causing entanglement. Different projects and groups are actually working on different levels (floating debris, waste treatment of fisheries gears, beach clean-ups, etc.), and a homogeneous classification is required to identify the sources and develop adequate Programs of Measures. Experts and participants on different programs and projects will be involved in the regional workshops conducted by INDICIT-II to achieve a useful indicator on entanglement.
- ❖ Different taxa are involved in the Indicator 2 – “*Entanglement*”. Therefore, biological constraints for each taxa need to be taken into account, because differences on entanglement could be caused by specific biological characteristics of each taxa (distribution, habitat use, feeding behaviour, swimming behaviour, etc.) and not only by differences in marine litter presence or abundance on each region. The knowledge of experts from each taxon is required for the analysis of the data collected and the development of the indicator. The synergies elaborated with other experts and programs within Activity 5, will benefit to this task.

## **Activity 4**

**M. Matiddi and C. Silvestri (ISPRA, Italy)**  
**M.L. Paramio Martin and M.L. Adrião Do Vale (FRCT, Portugal)**

**Implementation of the indicator “Micro-litter ingested by fish and sea turtles” at the OSPAR and Barcelona RSCs and MSFD areas**



**ISPRA**

Istituto Superiore per la Protezione  
e la Ricerca Ambientale



**FRCT**

FUNDO REGIONAL PARA A CIÊNCIA E TECNOLOGIA

## **I. Introduction**

The Activity - Implementation of the Indicator "Micro-litter ingested by fish", will benefit from the INDICIT feasibility study on this topic (INDICIT Deliverable 2.5), which highlighted the strong potential of this Indicator for D10C3 and allowed to identify the appropriate tools to monitor micro-litter ingestion in fish. An international training course, organized among partners and stakeholders, will allow for the elaboration and dissemination of a rigorous standardized monitoring protocol, as required by OSPAR, HELCOM, and Barcelona Conventions, in which the use of fish as an Indicator for this scope is under evaluation. The collection of new data using this harmonized protocol will reduce the gaps of knowledge and help understanding operational mistakes. The overarching objective of this Task will be to propose a program to monitor micro-litter ingested by fish following a multi-criteria approach for the choice of target species. Lack of previous data on this topic will not allow elaborating e.g. Threshold value, but rather scenarios for setting baselines.

Data on ingestion of micro-litter in sea turtles will be collected and analyzed within Activity 2. This will consist in differentiating ingested litter from 1 to 5 mm specifically, size below 1 mm being to realistic from the material means already in place. The results will be included in a report specific for evaluating the indicator for sea turtles, at the end of the project.

The Tasks proposed below differs from Annex A proposal, considering the INDICIT outputs acquired after the submission.

## **II. Methodology**

### **II.1. Working plan and deliverables**

#### *Task 4.1 Networking and standardization of monitoring for fish*

This task will aim at proposing and disseminating standardized protocols and a harmonization of methods used both in the field and in the laboratory, by confronting the expertise in isolating and categorizing micro-litter among partners, stakeholders and external experts.

The objective is the identification, contact and networking of the stakeholders who will be in charge of the sampling and laboratory analyses to collect the data on micro-litter ingested by fish. The established network can be a useful tool for those countries looking for National experts in the monitoring programs.

A specific questionnaire will be disseminated among INDICIT-II partners and EU project Leaders (Medsealitter, Baseman, Plastic Buster, Ephemare, etc.), but also to technical groups of the RSCs and other stakeholders, with the aim to elaborate a practical, widely applicable and harmonized protocol for micro-litter ingestion by fish.

This task will also allow defining the lower size limit of micro-items detectable in fish for monitoring purposes, differentiating the activity from fundamental research. An international training session, with the aim to disseminate the standardized protocol, will be organized among partners inviting also the stakeholders, and UNEP/MAP, OSPAR and HELCOM delegates.

#### *Task 4.2 Collection of standard data for fish*

Once the protocol is defined and ready, the data will be collected in different pilot areas of some partners' countries. A database will be built for archiving the data with a restricted access. The collection of these data will be used to test the harmonized protocol verifying its applicability within a monitoring program.

#### *Task 4.3 Report on GES and indicator's characteristics at the RSC scale for fish*

Considering the lack of previous standardized data on this topic, it will not be possible to define a Threshold value but the data analysis will provide insights on the most suitable species and the relevant biological constraints for a definition of GES. The identification of common species, or groups of species, across European waters, will allow large-scale comparisons of micro-litter ingestion by fish throughout MSFD areas. Our results will allow MSFD and RSCs States to plan monitoring activities with the long-term aim of defining their own baselines and targets.

#### *Task 4.4 Evaluation of the indicator "micro-litter ingested by sea turtles" (coordination ULPCG/EPHE)*

This task will concern specifically the sea turtles. Networks of stakeholders involved in this task will be globally the same than those of Activity 2 (stranding networks and rescue centres). Laboratories able to record micro-litter have to be identified.

The INDICIT feasibility study will be capitalized to propose a standard methodology to the stakeholders for the extraction of litter items of size between 1 and 5 mm from the digestive content of dead individuals and the faeces of live individuals (e.g. use of 2 superimposed sieves). Preliminary standard data are available because the INDICIT standard protocol proposed the collection of optional parameters on micro-debris ingestion in sea turtles. This dataset, specific to the fraction 1-5 mm, will be verified before analysis, to ensure that a homogenized approach was used. Specific training sessions and supports in data collection will be proposed to collect new standard data.

The standardized protocol (collection of micro-litter and avoidance of field and laboratory contamination) will be optimized by comparing the methodologies employed on fish (Task 4.2). Following the same approach than for fish, these data will be analysed in order to propose accurate baselines at the RSC/MSFD level. Workshops with the external experts contacted within Activity 5 and gathering of expert knowledge and of data will also aim to identify if micro-litter could be indirectly ingested, either derived from a transfer into the food web (ingestion via preys) or from fragmentation of the macro-litter items inside the digestive track (use of FTIR techniques, analysis funded by each involved laboratories).

In addition, and in relation to Task 2.3, the impact of micro-litter ingestion on individual health (related to the transfer of pollutants adhered to the micro-debris ingested) will be tested thanks to toxicological analysis. The results will be confronted to the GES scenarios proposed from standard data. Sub-contractors will be engaged in order to collect data in particular in specific Pilot areas defined in Activity 2 (e.g. reinforce the sampling in the Gibraltar Strait).

## **II.1 Working plan and deliverables**

Table 4.1: working plan for Activity 4 (new table that replaces the table in Annex A)

	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24
Inception report		D4.1																						
Progress reports						D4.2 RP1						D4.3 RP2						D4.4 RP3						D4.5 RP4
Training session														D4.6 Training										
List of stakeholders+map												D4.7												D4.8
Standard procedures (protocols)												D4.9												D4.10
Final database																								D4.11
Report on Baseline / target species																								D4.12
Report on Indicator “Micro-sea turtles”																								D4.13

*Table 4.2: deliverables for Activity 4 (new table that replaces the table in Annex A)*

D4.1	Inception report	ISPRA/FRCT	M2	31/03/2019
D4.2	Progress report RP1	ISPRA/FRCT	M6	15/08/2019
D4.3	Progress report RP2	ISPRA/FRCT	M12	15/02/2020
D4.4	Progress report RP3	ISPRA/FRCT	M18	15/08/2020
D4.5	Progress report RP4	ISPRA/FRCT	M24	15/02/2021
D4.6	Training session (workshop with stakeholders involved in implementation)	ISPRA/FRCT	M14	15/04/2020
D4.7	List of stakeholders + Google map	ISPRA/FRCT	M12	15/02/2020
D4.8	Final list of stakeholders + google map	ISPRA/FRCT	M24	15/02/2021
D4.9	Standard procedures (protocol micro/fish)	ISPRA/FRCT	M12	15/02/2020
D4.10	Final standard procedures (protocol)	ISPRA/FRCT	M24	15/02/2021
D4.11	Final common standard database	ISPRA/FRCT	M24	15/02/2021
D4.12	Report on baselines and target fish species	ISPRA/FRCT	M24	15/02/2021
D4.13	Report on Indicator “Micro-debris ingested by sea turtles” (relevance, methodology, baselines (if relevant))	ULPGC/EPHE	M24	15/02/2021

*The deliverables D4.7, D4.8 and D4.10 will be produced in collaboration with the Task 1.3 Communication.*

*The deliverable D4.13 will be managed by ULPGC/EPHE.*



### III. Participants and tasks sharing, expected time table

EPHE, ULPGC, UVEG, PAU-DEKAMER, HCMR, UNEXE, CNR are expected to participate in Activity 4.

Table 4.3. Proposed time table for Activity 5

Tasks/Months	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
4.1																								
4.2																								
4.3																								
4.4																								

### IV. Limitations and mitigation measures

Ingested micro-plastic detection and analysis are still at a level considered of fundamental research, with new discoveries almost every day. Difficulties to adapt research activities to the monitoring purpose will be overcome thanks to the experience of the partners involved, and other project results.

The high cost of collection and analysis of fish, including equipment, could reduce the number of partners and stakeholder involved. Data will be gathered at least by ISPRA and FRCT in a pilot area in Italy and Portugal.

## **Activity 5**

### **Synergies with other (inter)national programs**

**H. Kaberi (HCMR, Greece)**  
**C. Miaud, G. Darmon (EPHE, France)**



**École Pratique  
des Hautes Études**

## **I. Introduction**

The main objective of this activity is to foster the synergy with other projects and better interact with authorities and expert groups aiming at exchanging data and expertise in order to provide more accurate assessments of the indicators in line with the European Commission and the RSCs. Activity 5 also aims to facilitate the flow of the gained expertise (networks, knowledge, data, tools) within INDICIT and pursued in INDICIT-II, to other projects, which may need information on marine fauna's behaviour, spatial distribution and exposure to anthropogenic debris. In this way, synergy with other projects can enable the development of integrated tools and the spatial quantification of anthropogenic risks to marine fauna and the calculation of distance from GES.

## **II. Methodology**

### **II.1. Working plan and deliverables**

The activity is divided into three tasks:

#### *Task 5.1 Identification of international projects*

This task aims at listing the finished and ongoing international or EU projects related to the studied taxa, marine litter, anthropogenic risks and the elaboration of automatized tools. The aim is also to list the approaches, data and means of these projects in order to evaluate the potential mutualisation of efforts and means.

#### *Task 5.2 Data sharing with international programs*

This task aims at sharing data, approaches and knowledge with experts of other projects. This Task will be concomitant to Task 5.1.

#### *Task 5.3 Tools for automatic calculation of the distance from GES*

This task aims at supporting the development of GIS tool to support the implementation of the D10C3 and D10C4 criteria and to automatically calculate the distance from GES and spatially assess the anthropogenic risks.

Table 5.1: Working plan for Activity 5 (new table that replaces the table in Annex A)

	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24
Inception report		D5.1																						
Progress reports						D5.2						D5.3						D5.4						D5.5
List of identified projects and meetings						D5.6																		
Report on interactions with other programs																								D5.7
Report on methodology GIS tools																								D5.8

Table 5.2: Deliverables for Activity 5 (new table that replaces the table in Annex A)

D5.1	Inception report	HCMR/EPHE	M2	31/03/2019	15/02/2019
D5.2	Progress report RP1	HCMR/EPHE	M6	15/08/2019	31/07/2019
D5.3	Progress report RP2	HCMR/EPHE	M12	15/02/2020	31/01/2020
D5.4	Progress report RP3	HCMR/EPHE	M18	15/08/2020	31/07/2020
D5.5	Progress report RP4	HCMR/EPHE	M24	15/02/2021	31/01/2021
D5.6	List of identified projects for collaboration, meetings, type of data and available means	HCMR/EPHE	M13	15/08/2019	31/07/2019
D5.7	Report on interactions with identified projects, experts and representatives	HCMR/EPHE	M24	15/02/2021	31/01/2021
D5.8	Report on methodology for integrative tools	HCMR/EPHE	M24	15/02/2021	31/01/2021

D5.8 will be achieved thanks to a close collaboration with the project QUIETMED 2.

## II.2 Methods

### *Task 5.1. Identification of international programs*

The methodology will consist in listing the (EU) projects related either to Marine litter (list initiated in INDICIT) or to biodiversity and other anthropogenic pressures. The projects will be listed based on their geographical scope, the approaches, the data collected, the taxa and habitats sampled, the available methodological and material means. This will be done by the partners who are involved in complete and/or ongoing programs (e.g., MEDSEALITTER (MED-INTERREG), MEDCIS (DG ENV), DeFishGear (IPA ADRIATIC), MISTIC SEAS II (DG ENV), Plastic Busters MPAs (MED-INTERREG), Microplastic in the Baltic Sea (FANPLESSTIC-SEA)) or in projects funded under this call (e.g. MEDREGION, QUIETMED), as well as thanks to the support of EAB. Furthermore, INDICIT II will interact with the Marine Turtle working group within the MedPAN network, which brings together MPA managers, NGOs and researchers working on marine turtles' conservation from 10 Mediterranean countries.

The specific way of interacting with the ongoing projects will be discussed during co-organized workshops and during intermediate meetings in which external experts and project coordinators will be invited. A few number of projects will be selected for favouring close collaborations.

During the whole duration of the project, INDICIT II will be in close collaboration with expert groups like the MSFD TG ML, in order to refine the products of the project for the concrete implementation of the second cycle of the MSFD.

### *Task 5.2. Data sharing with international projects*

INDICIT-II can benefit from ongoing projects regarding the exchange of data and expertise. Besides data on the impact of litter on marine fauna, more information will be produced that could be integrated in projects working on biodiversity and food webs, e.g. marine wildlife distribution, population structure, individual characteristics and health status of the species. Common workshops will be organized to define the best (common) pilot areas. The standardised data collected within INDICIT II will be shared in order to support the projects in charge of data banking and establishing integration rules.

The approach will start first by preparing for the exchange of agreements on the collection of data and its availability in other programs. This aspect will be discussed at the beginning of the Activity during workshops (or teleconferences) to which stakeholders involved in data collection (Activities 2, 3 and 4) will be invited. Decisions will be made on whether to propose an access to external experts or to establish a platform for sharing of specific data.

For example, experts from the Plastic Busters MPAs project will be involved in INDICIT II in order to define common pilot areas, target the hypotheses to be tested with regards to specific PoMs for the assessment of the implementation of the Indicators (especially the Indicator “Litter ingested by sea turtles”) as well as for elaborating a common approach to evaluate impact of litter ingestion on health. The overall objective of Plastic Busters MPAs project is to contribute to the maintenance of the biodiversity and the preservation of natural ecosystems in pelagic and coastal Marine Protected Areas by defining and implementing a harmonized approach against marine litter. Plastic Busters MPAs entails actions that address the whole management cycle of marine litter, from monitoring to prevention and mitigation, as well as actions for strengthening the networks between and among pelagic and coastal Mediterranean MPAs. The data concerning both marine wildlife and marine litter impacts on marine species (including new bio-indicator species) will be shared and merged between the two projects in order to provide adequate tools for tackling the marine litter pressure.

An analogous approach will be followed with other relevant programs.

### *Task 5.3. Tools for automatic calculation of distances from GES*

Standardized tools will be built thanks to the involvement of external experts from other international programs for the elaboration of layers on the different taxa (species abundance and distribution) and on the impacts caused by marine litter (prevalence of ingestion and entanglement, abundance and distribution of marine litter). INDICIT-II will collaborate with experts from other projects which have already initiated the development of such tools (e.g. QuietMED 2). The properties of a new layer for litter impacts will be defined in order to be added to existing tools. This task will be done in collaboration with the experts of these projects.

## **III. Participants and tasks sharing, expected time table**

All INDICIT-II partners participate in Activity 5.

*Table 5.3. Proposed time table for Activity 5*

<b>Tasks/Months</b>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
5.1																								
5.2																								
5.3																								

Task 5.1 (identification of projects with which an interaction will be established) will produce Deliverable 5.1 on M6 but will continuously identify new projects to be contacted. Task 5.2 will start at M5 after the planning of data and expertise exchange with the identified projects within Task 5.1 and will continue until the end of the project. Finally, Task 5.3 will start at M6 after identifying and contacting the relevant project(s) and will continue until the end of the project as new data will be produced by the partners.

## **IV. Limitations and mitigation measures**

There are many UE program involved in the MSFD implementation support and the INDICIT project is short in time (2 years). The selection of relevant projects which will allow concrete collaboration with the INDICIT program has to be quick and efficient. Similarly, the participation to important meeting (UE Working groups, RCS meetings, etc.) will be defined precisely. The help of the EAB will be asked for this task.

Another important topic will be the elaboration of sharing agreement and protected database to share data among stakeholders within INDICIT-II and with other programs. This crucial task will be performed in interaction with the other Activities, considering other program's experience.