Coordinated Cetacean Assessment, Monitoring and Management Strategy in the Bay of Biscay and Iberian Coast sub-region:

Progress update 13-07-22

Graham Pierce, Julio Valeiras, Ana Marçalo, Jorge Gonçalves, Joana Otero, Matias, Vera Lopes, Rafael Pacheco, António Teixeira, Ana Mafalda Tomas Correia, Francisco Javier Martinez Bedia, Teresa Moura, Amaia Astarloa Diaz, Camilo Saavedra, Nair Vilas Arrondo, Paula Gutierrez, Diego Fernandez Fernandez, Matthieu Authier, Helene Peltier, Estanis Mugerza, Nolwenn Cozannet, Victor Gutierrez, Monica Timon Arroyo, Rebeca Rodriguez.... and colleagues

ABIOMMED
Meeting 13-07-22

CETAM BICION

March 2021- February 2023, DG ENV/MSFD 2020 call, GA 110661/2020/839610/SUB/ENV.C2

Implementation period

2021

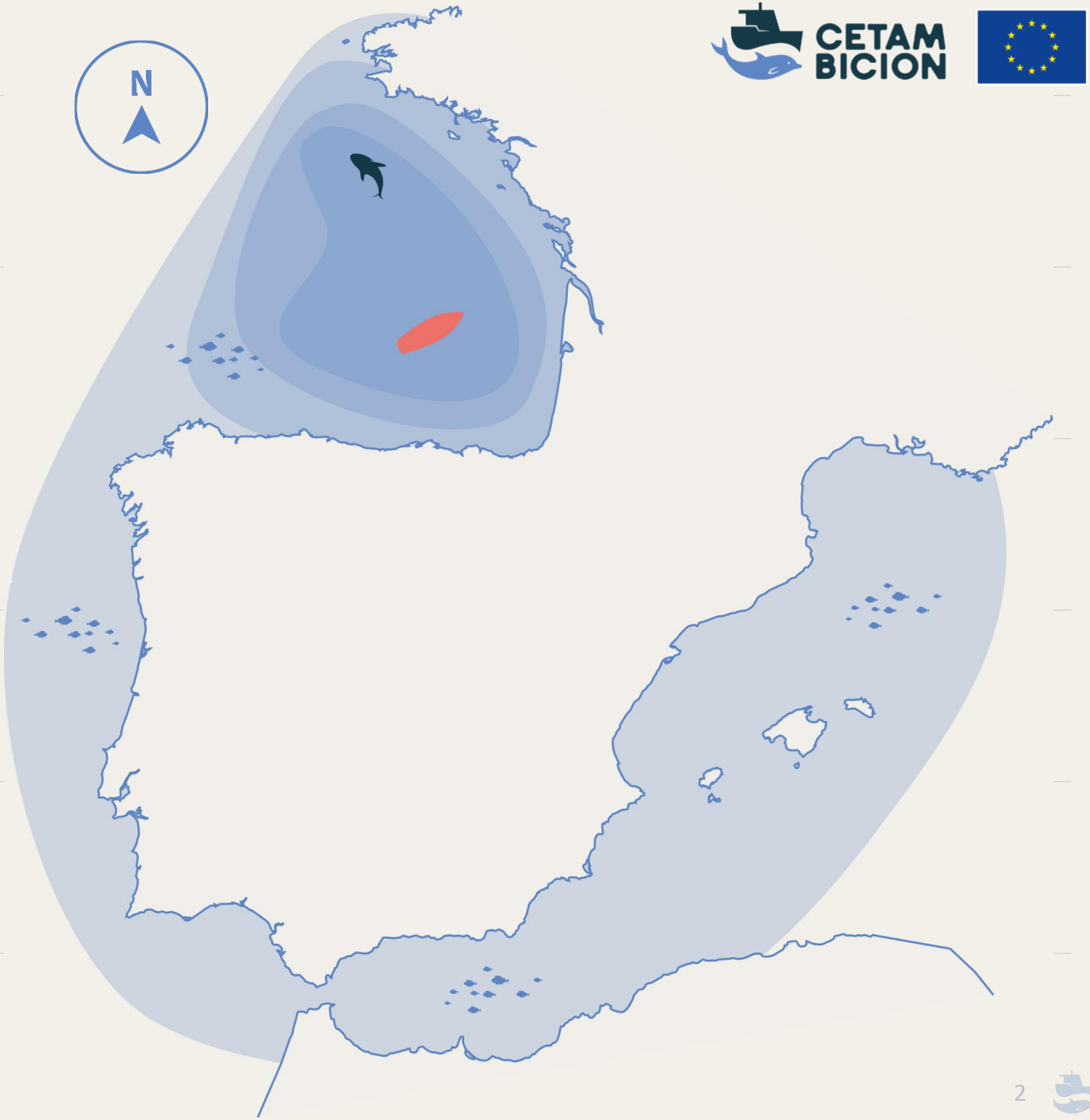
2022

2023

Area of action

Coordination between France, Portugal and Spain is one of the core values of the project.

(but the focus is very much in the Atlantic)



Project objectives

(improve MSFD implementation, reduce cetacean bycatch mortality)

- Set up a **cooperative working structure** bringing together the MSFD-competent authorities of Spain, France and Portugal and scientific expertise, in consultation with stakeholders, relevant international bodies and DG ENV;
- **Streamline MSFD implementation** (improved data availability and comparability, better regional coordination, alignment of concepts and approaches);
- Support the **coordinated (sub)regional monitoring and assessment** of the extent to which Good Environmental Status (GES) has been achieved;
- Support the establishment of new and effective **(sub)regionally-coordinated measures** that target at least the most important pressures (e.g. bycatch);
- Support the **coordinated implementation** of these measures.

Project structure

Review of MSFD second cycle reports and state-of the-art for cetaceans

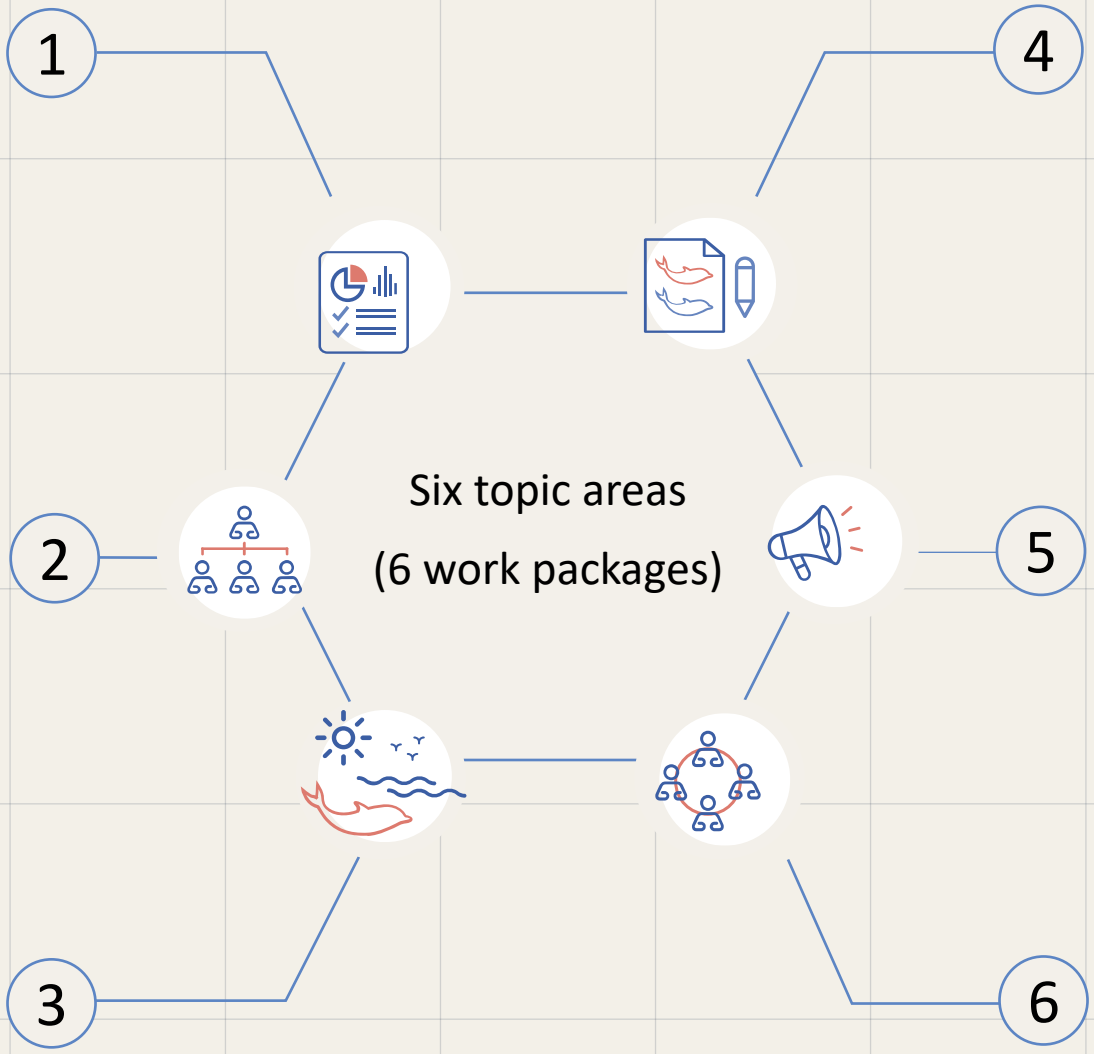
Support the establishment of new coordinated measures considering the main threats affecting the good environmental status of marine mammals in the sub-region.

Proposal of coordinated sub-regional assessment, GES determination and monitoring strategy for cetaceans

Develop the necessary techniques for the regional assessment of cetacean species and their populations.

Proposal of coordinated sub-regional assessment, GES determination and monitoring strategy for cetacean bycatch

Analyse the bycatch sampling schemes currently implemented in this sub-region and propose a common coordinated strategy and protocol for Bay of Biscay and Iberian Coast.



(14 partners, three countries: France, Spain, Portugal))

Effectiveness assessment of cetacean bycatch reduction strategies and fishing technical measures proposal

Perform a series of pilot studies onboard commercial fishing vessels and to assess the potential fisheries technical measures to the fisheries management.

Dissemination of results, sectoral participation, and capacity building strategy

Ensure the legacy of the project and its dissemination, transferring the results and deliverables to key end-users and promoting their implementation.

Coordination among all the partners

Assure smooth running and effective management of the project by way of the establishment of clear guidelines and procedures for internal decision-making and communication.

Project timetable

Year	2021						2022												2023					
Semester	1						2						3						4					
Month	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
WP1																								
Task 1.1						D1.1																		
WP2																								
Task 2.1						D2.1												D2.2						
Task 2.2									WK2.1			D2.2												
Task 2.3																								D2.3
Task 2.4																								D2.4
WP3																								
Task 3.1												D3.1												
Task 3.2																		D3.2						
Task 3.3																		D3.3						
Task 3.4																				WK 3.1				D3.4
WP4																								
Task 4.1								D4.1																
Task 4.2																		D4.2						
Task 4.3																		D4.3						
Task 4.4																		D4.4						
Task 4.5																						D4.5		
Task 4.6																					WK 4.1			D4.6
WP5																								
All tasks				D5.1	D5.4	D5.10						D5.9, D5.13												Other WP5 Deliv.
WP6																								
Task 6.1		D6.1	D6.2																					
Task 6.2		D6.3a				D6.3b						D6.3c						D6.3d						D6.3e
Task 6.3																								D6.4
Task 6.4												D6.5												D6.6
Task 6.5																								D6.7, D6.8, D6.9

WP1 - Review of MSFD second cycle reports and state-of the-art for cetaceans

Table: Criteria and assessments reported, by Member State and species, in Bay of Biscay and Iberian Coast.

Species Group	Species/Management units	Member State			
		Portugal	Spain		France
			Northern waters	Southern waters	
Small toothed cetaceans	Common dolphin	**D1C1; D1C2; D1C4; D1C5**	**D1C1; D1C2**; *D1C3*; **D1C4;** *D1C5*	*D1C1; D1C2; D1C3; D1C4; D1C5*	**D1C1; D1C2; D1C3; D1C4;** ~~D1C5~~
	Harbour porpoise	**D1C1; D1C2; D1C4; D1C5**	**D1C1**; *D1C2*; **D1C3**; *D1C4*; **D1C5**	n.a.	**D1C1**; ~~D1C2~~; ~~D1C3~~; ~~D1C4~~; ~~D1C5~~
	Striped dolphin	**D1C1; D1C2; D1C4**; ~~D1C5~~	n.a.	n.a.	~~D1C1~~; **D1C2**; ~~D1C3~~; **D1C4**; ~~D1C5~~
	Bottlenose dolphin Atlantic management unit	**D1C1; D1C2; D1C4; D1C5**	n.a.	n.a.	~~D1C1~~; **D1C2**; ~~D1C3~~; **D1C4**; ~~D1C5~~
	Bottlenose dolphin (coastal management unit UG2-TT)	n.a.	*D1C1; D1C2; D1C3*; **D1C4;** *D1C5*	n.a.	n.a.
	Bottlenose dolphin (coastal management unit UG3-TT)	n.a.	*D1C1; D1C2; D1C3*; **D1C4;** *D1C5*	n.a.	n.a.
	Bottlenose dolphin (coastal management unit UG4-TT)	n.a.	n.a.	*D1C1; D1C2; D1C3; D1C4*; **D1C5**	n.a.
Deep-diving toothed cetaceans	Long-finned pilot whale	**D1C1**; ~~D1C2~~; ~~D1C4~~; ~~D1C5~~	**D1C1;** *D1C2; D1C3*; **D1C4;** *D1C5*	n.a.	~~D1C1~~; **D1C2**; ~~D1C3~~; **D1C4**; ~~D1C5~~
	Risso's dolphin	~~D1C1~~; ~~D1C2~~; **D1C4**; D1C5	n.a.	n.a.	~~D1C1~~; **D1C2**; ~~D1C3~~; **D1C4**; ~~D1C5~~
	Pygmy sperm whale	**D1C1**; ~~D1C2~~; ~~D1C4~~; ~~D1C5~~	n.a.	n.a.	n.a.
	Killer whale	-	n.a.	**D1C1; D1C2; D1C3;** *D1C4*; **D1C5**	n.a.
	Cuvier's beaked whale	**D1C1**; ~~D1C2~~; ~~D1C4~~; ~~D1C5~~	*D1C1; D1C2; D1C3*; **D1C4;** *D1C5*	n.a.	n.a.
Baleen Whales	Minke whale	**D1C1; D1C2; D1C4; D1C5**	n.a.	n.a.	~~D1C1~~; **D1C2**; ~~D1C3~~; **D1C4**; ~~D1C5~~
	Common whale	**D1C1; D1C2; D1C4; D1C5**	*D1C1; D1C2; D1C3*; **D1C4;** *D1C5*	*D1C1; D1C2; D1C3; D1C4*; **D1C5**	~~D1C1~~; ~~D1C2~~; ~~D1C3~~; **D1C4**; ~~D1C5~~

Bold: criteria assessed, status good or not good;

Italic: assessed, status unknown;

~~Strikethrough~~: status not assessed;

n.a. : not applicable;

[UG2: resident MU in coastal waters, S Galicia; UG3: coastal MU in N + NW platform waters; UG4: coastal MU in platform waters, Gulf of Cádiz].

D1C1 (bycatch mortality), D1C2 (abundance), D1C3 (demographic parameters), D1C4 (distribution), D1C5 (habitat)

Table: Parameters and assessment methodology (including thresholds values applied) considered, by Member State [in bold: parameters included in the e-reports] (Part of the table. D1C5 is not shown)

Criteria	Portugal		Spain		France	
	Parameters	**Assessment Methodology**	**Parameters**	**Assessment Methodology**	**Parameters**	**Assessment Methodology**
D1C1	**Mortality rate (including from fishing - F)**	Anthropogenic removal rate < 1.7%; and expert judgment based on stranding data	**Mortality rate (including from fishing - F)**	Anthropogenic removal rate: • < 0.7% (Dd) • < 1.4% (Tt) • < 1.7%	**Mortality rate (including from fishing - F)**	Accidental capture mortality rate is < 1.7% of the abundance with a probability > 80% **and** the CI at 80% of the average mortality rate by capture is < 1.7%
			Percentage of animals stranded with signals compatible with bycatch		Accidental catches of Harbour porpoises obtained by on-board observers (M6_OSPAR)*	*No assessment*
D1C2	**Abundance (number of individuals)**	Trend in relation to HD 2013 report	**Abundance (number of individuals)**	No significant decrease	**Relative abundance within community (short term)**	Percentage of the mean annual difference in the relative abundance of a species **does not decline** by more than 0.5% per year, is **centered** at 0, **for** CI at 80%, including 0%
					Distribution and abundance of cetaceans (M4b_OSPAR)*	*No assessment*
D1C3	-	-	1) Age distribution; 2) Fecundity rate; 3) Sex ratio; 4) Survival rate; 5) Growth rate<, 6) Breeding interval 7) Size (length); 8) Natural mortality rate; 9) Annual gestation rate; 10) Life expectancy; 11) Temporal emigration probability (TEP)	*No assessment*	**Maximum number of strandings**	Number of strandings observed over 3 days **does not exceed** (over more than one month for two years of the current cycle) the upper limit of the CI at 95% of the monthly threshold (predicted from the previous cycle)
D1C4	**Distribution (spatial)**	Trend in relation to HD 2013 report	**Distribution (spatial)**	Positive or maintained trend in relation to 1st cycle assessment	**Distribution (spatial)**	The **upper limit** for the CI at 80% of the average annual percentage difference in the PAO over the assessment cycle **must be** > 0%
			Distribution (range)			

WP2 - Proposal of coordinated subregional assessment, GES determination and monitoring strategy for cetaceans. Task 2.1 Data gathering, joint analysis and identification of data gaps

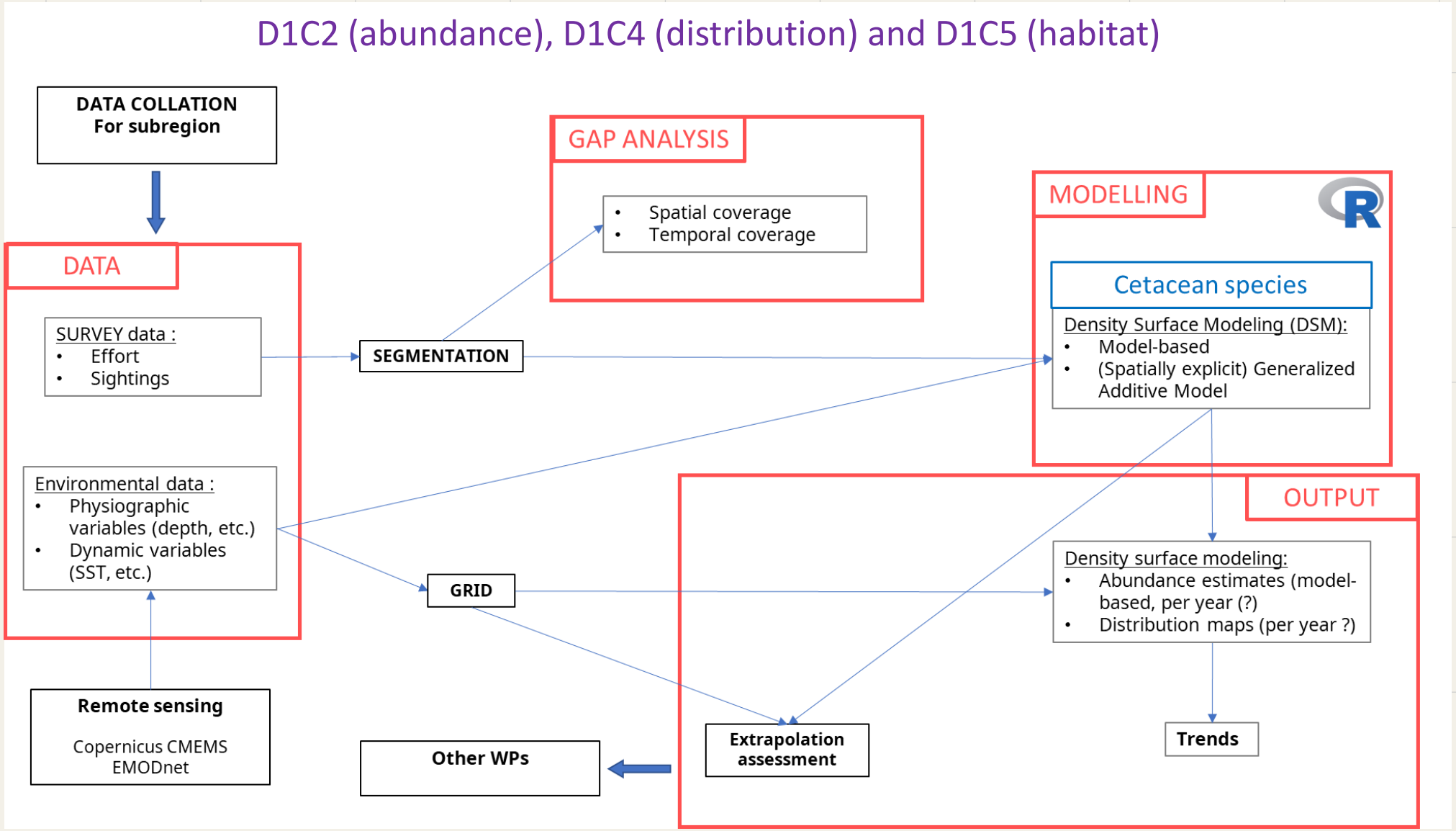


Figure:

Flowchart of Task 2.1 within WP2.

Question marks in the Output box flag are to be discussed among partners, etc.

Cetacean survey effort in space and time

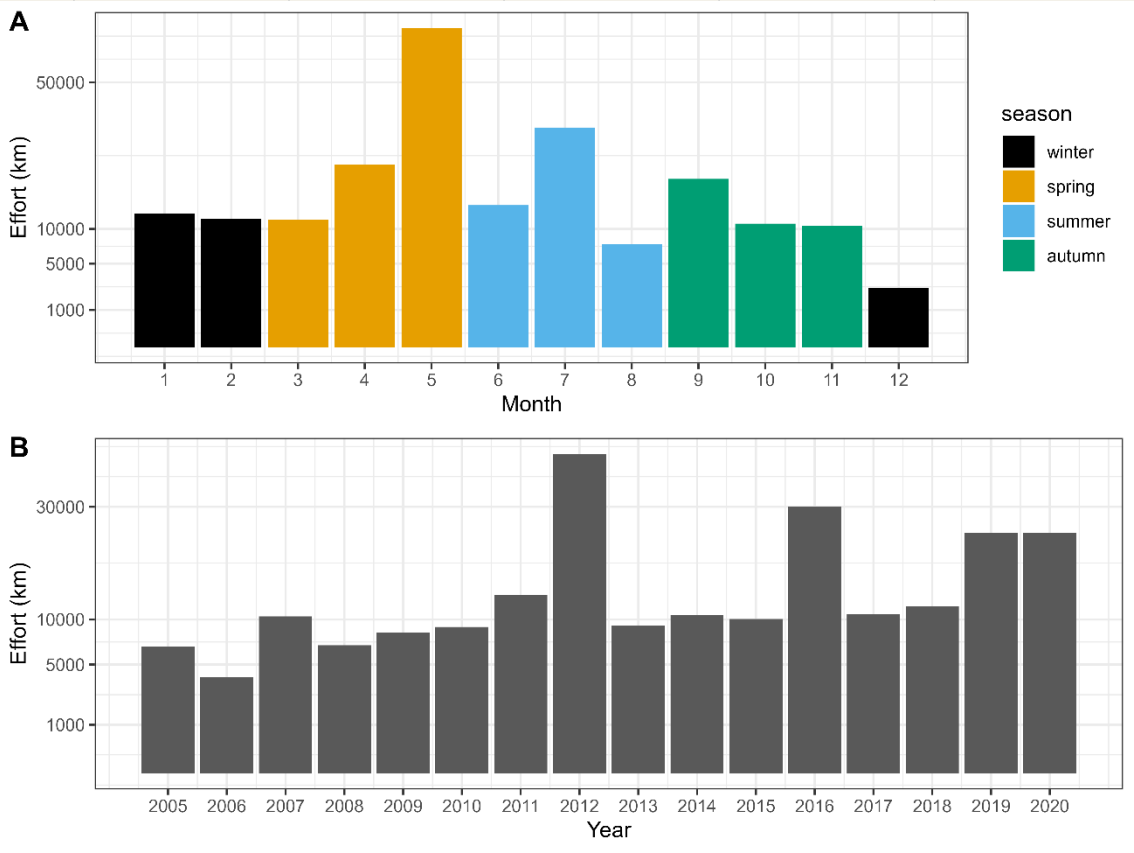


Figure:: Temporal pattern in survey effort for each season (A) and each year (B) between 2005 and 2020

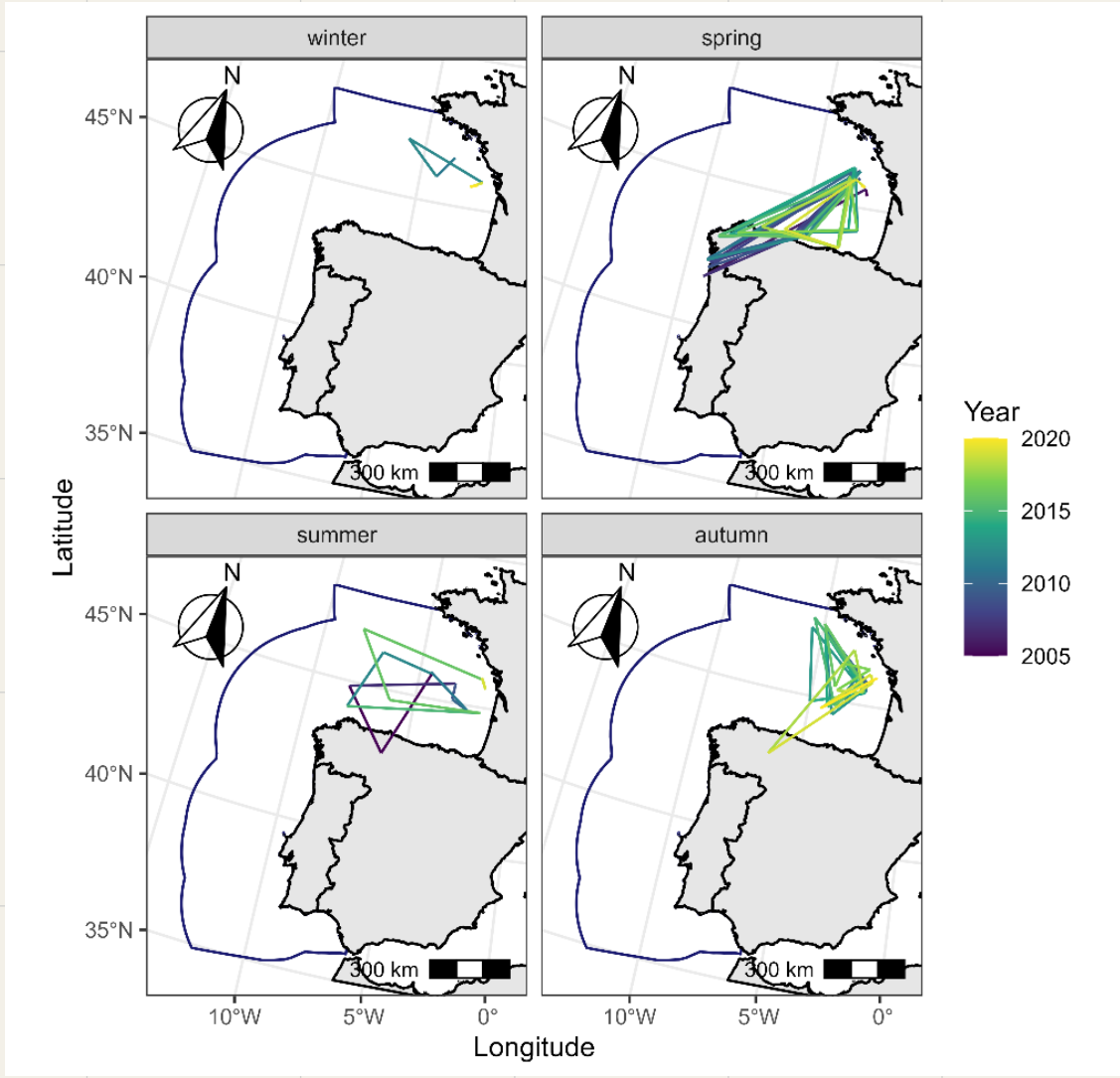
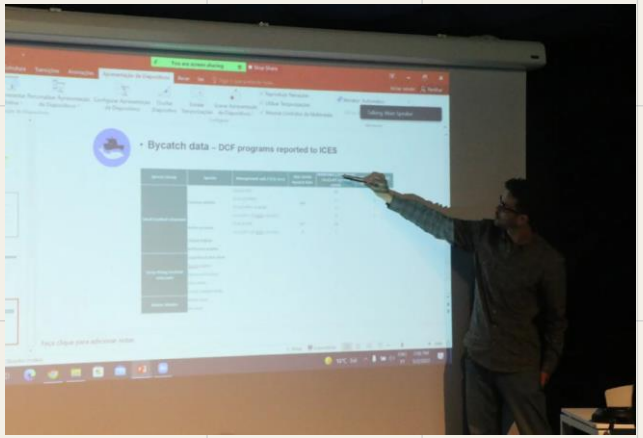


Figure: Centroids of effort survey for each season and each year between 2005 and 2020.

https://www.cetambicion-project.eu/technical-workshop-held-establish-cetacean-species-indicators/



"In the framework of the European project "Coordinated Strategy for the Assessment, Monitoring and Management of Cetaceans in the Bay of Biscay and Iberian Coast sub-region" (CetAMBICion), a technical workshop has been held in Porto (Portugal), aiming at establishing a list of species, indicators, and scales of assessment to propose a coordinated assessment of cetaceans..."

WP3: Proposal of coordinated subregional assessment, GES determination and monitoring strategy for cetacean bycatch: *D3.1 Inventory of existing bycatch monitoring programmes*

ICES Division	Metier level 3	Year	Fishing days	Total Observed Effort (DaS)	Monitoring coverage %	Species	Events	Specimens (N)
27.8.a	Nets	2019	220741.60	164.83	0.07	*Delphinus delphis*	4	4
						Phocoena phocoena	1	1
		2020	206685.81	228.98	0.11	*Delphinus delphis*	3	3
	Pelagic trawls	2019	22886.82	167.75	0.73	*Delphinus delphis*	8	13
		2020	20388.26	32.04	0.16	*Delphinus delphis*	2	4
	Bottom trawls	2020	51267.85	72.96	0.01	*Delphinus delphis*	4	21
27.8.b	Pelagic trawls	2019	8573.72	50.95	0.59	*Delphinus delphis*	4	16
	Bottom trawls	2019	123485.13	164.07	0.13	*Delphinus delphis*	4	8
	Longlines	2020	20958.44	5.13	0.02	*Delphinus delphis*	1	1
	Nets	2020	124019.86	81.85	0.07	*Delphinus delphis*	1	2
27.8.c	Bottom trawls	2020	14730.24	62.00	0.42	*Delphinus delphis*	1	1
	Nets	2020	27969.71	49.00	0.18	*Delphinus delphis*	1	1
27.8.d.2	Bottom trawls	2020	5295.43	9.00	0.17	*Delphinus delphis*	1	4
27.9.a	Nets	2019	167598.46	302.00	0.18	*Tursiops truncatus*	1	1
		2020	170840.28	434.00	0.25	*Delphinus delphis*	4	6
	Surrounding nets	2019	157150.00	45.00	0.29	*Delphinus delphis*	1	2
		2020	25571.00	194.00	0.76	*Delphinus delphis*	4	4

Reported fishing days and **onboard monitoring** days, with the number of bycatch events and specimens in 2019 and 2020, for the project area and species, for all metiers with recorded bycatch of marine mammals).

Recommended sampling level is 5-10 % of the total annual fleet effort... Actual levels = 0.01% to 0.76%

Species	Country	Year	Strandings	Examinations	Bycatch evidence/examinations (%)
Phocoena phocoena	France (Atl)	2019	276	134	34/134 (26%)
		2020	215	96	27/96 (28%)
	Portugal	2019	45	25	12/25 (50%)
		2020	40	20	10/20 (50%)
	Spain (Galicia)	2019	12	5	3/5 (60%)
		2020	23	7	4/7 (57%)
Delphinus delphis	France (Atl)	2019	1142	574	368/574 (64%)
		2020	1289	704	504/705 (72%)
	Portugal	2019	279	110	72/110 (65%)
	Portugal – W	2020	311	132	115/132 (72%)
	Portugal – S	2020	23	6	3/6 (50%)
	Spain (Galicia)	2019	261	53	30/53 (57%)
		2020	184	48	32/48 (67%)
Tursiops truncatus	France (Atl)	2019	41	16	3/16 (19%)
		2020	50	14	8/14 (57%)
	Spain (Galicia)	2019	31	10	3/10 (30%)
		2020	24	6	3/6 (50%)
	Portugal – W	2020	8	2	½ (50%)
	Portugal – S	2020	4	1	1/1 (100%)
Stenella coeruleoalba	France (Atl)	2019	36	19	2/19 (10%)

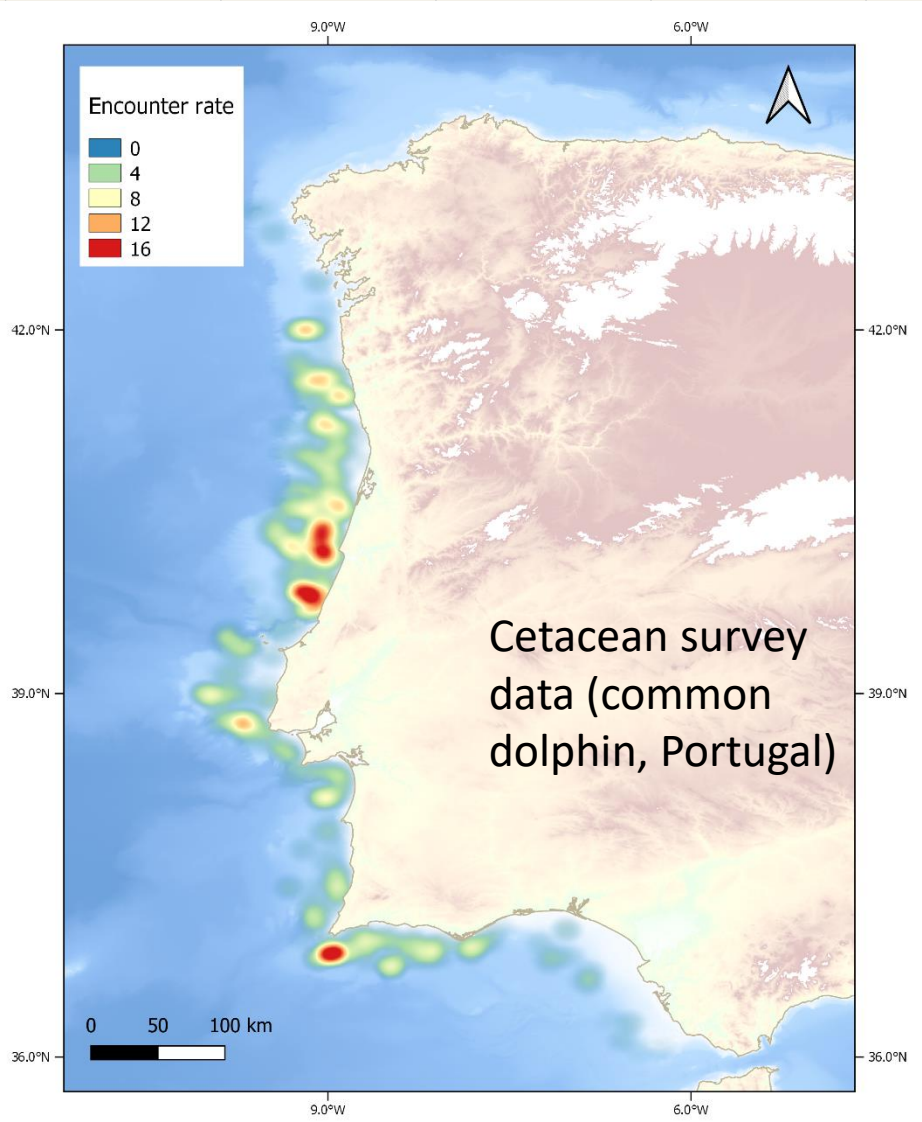
Proportion of the **stranded cetaceans** that presented evidence of fisheries interaction, for the project area.

Strandings reveal very high levels of bycatch mortality: in three-quarters of the examples, over 50% of deaths are due to fishery bycatch

WP3: Proposal of coordinated subregional assessment, GES determination and monitoring strategy for cetacean bycatch: *Task 3.2 Common approach to Bycatch Risk Assessment*

Table: Risk assessment methodologies

Publications	Input data	Output
Currey et al., 2012 Breen et al., 2017 Pennino et al., 2017 Verutes et al., 2020 Evans et al., 2021	• Fishing effort data (by metier, quarter, year) (e.g. AIS, MMSI, gear / vessel characteristics). • Cetacean survey data • Environmental data (e.g. sea temperature ºC, seabed depth m).	• Maps of fishing pressure • Maps of cetacean distribution • Risk maps (observed and modelled spatio-temporal overlap of cetaceans and fisheries) • Mortality estimates
Brown et al., 2015 Temple et al., 2021	• Biological data on species susceptibility (e.g. age at sexual maturity, calf survival, inter-calving interval) • Estimates of fishing pressure (by country)	• Risk Assessment based on Productivity Susceptibility Analysis (PSA). • Risk assessment maps (large-scale)



Delphinus delphis (2005 - 2020)

WP 4 – Effectiveness assessment of cetacean bycatch reduction strategies and fishing technical measures proposal: D4.1. Compilation of the available information on cetacean bycatch reduction devices or measures:

Format

Technical description of each bycatch reduction measure / device for marine mammals

1. General presentation of the measure / device
2. Pilot projects + current knowledge
3. Current regulations around the world
4. Analysis (effectiveness, pros and cons, feasibility)

Main categories of bycatch reduction measures / devices

Improve the fishing gear visibility	Fishing gear modification	Fishing practices modification	Fisheries management	Regulation and economic incentives
Acoustic Deterrent Device (passive or active)	Net modification	Alternatives fishing gear	Spatio-temporal closures	Regulation
Reflectors	Cetacean Excluder Device	Soak time	Triggered closures	Monitoring and reporting
Alert signal	« Smart » fishing gear	Fishing gear depth	« Move-on rule »	Economic leverage
Colour net change		Good practices	Forecasting closures	
Net illumination				

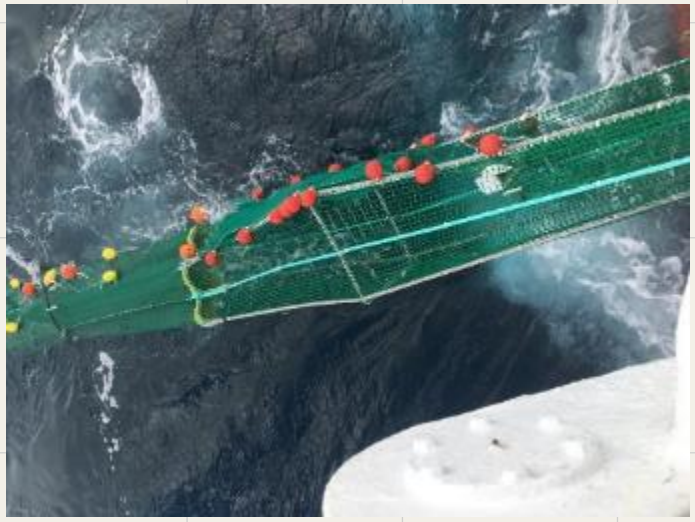
There are SEVERAL solutions available which, especially if applied simultaneously, could significantly reduce marine mammal bycatch

Task 4.2. Pilot project: Trawling (CEDs and pingers)

Objectives

Test of **Cetacean Excluder Devices** (CED) and pingers in trawling fisheries

Reduce common dolphin bycatch

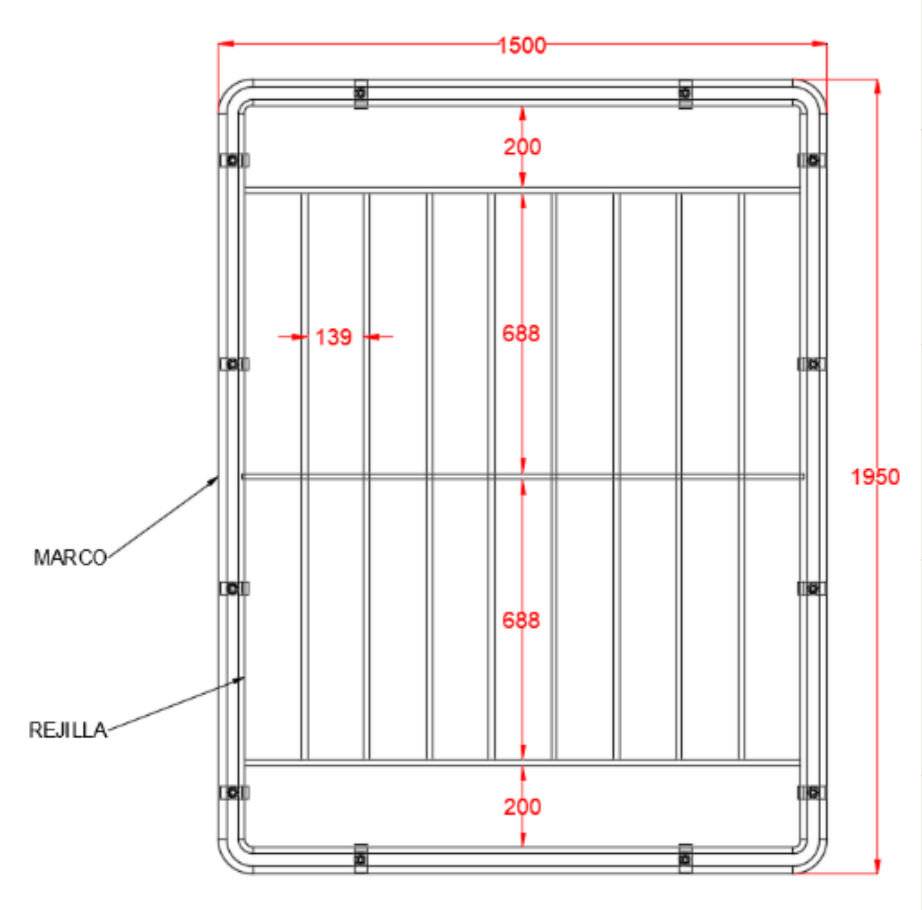


Field work in progress

- ✓ Two bottom pair trawlers in NW Spanish waters
- ✓ Trials with a Cetacean Excluder Device CED (one month in winter, one month in summer)
- ✓ Pingers used in alternate hauls (Spanish regulation requires 2-3 pingers mounted always on the headline)
- ✓ Trial data are reported by onboard observers
- ✓ Design of logbooks for self-reporting by fishers
- ✓ Field work at sea began in February 2022
- ✓ Changes in CED in March. New onboard trials in March-April

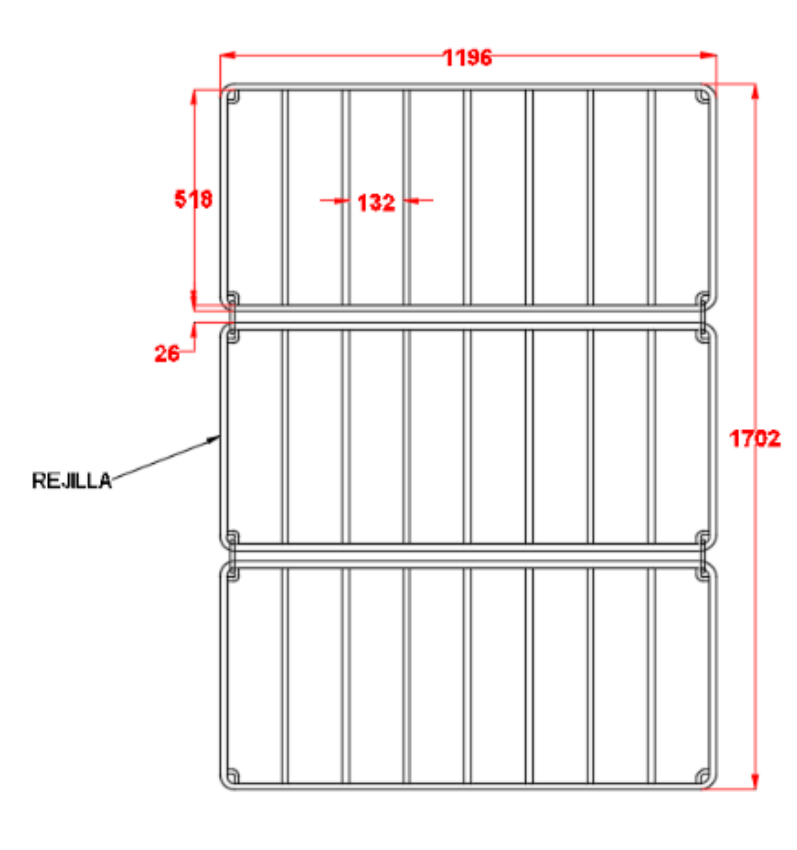
Task 4.2. Pilot project: Trawling (CEDs and pingers)

Rigid device to exclude cetaceans: design with one metal panel



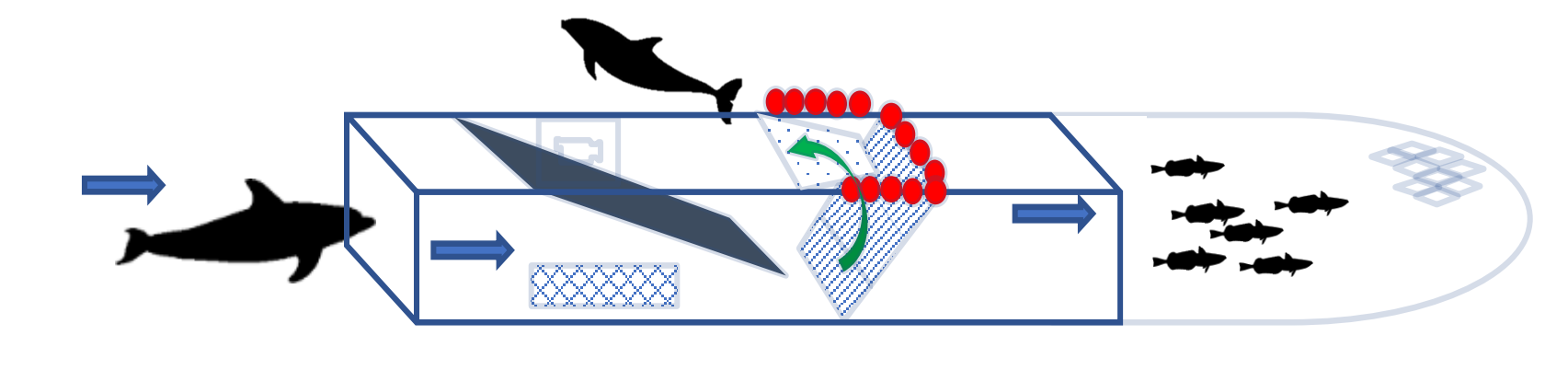
Task 4.2. Pilot project: Trawling (CEDs and pingers)

Semi-rigid device to exclude dolphins: design with 3 articulated metal panels



Task 4.2. Pilot project: Trawling (CEDs and pingers)

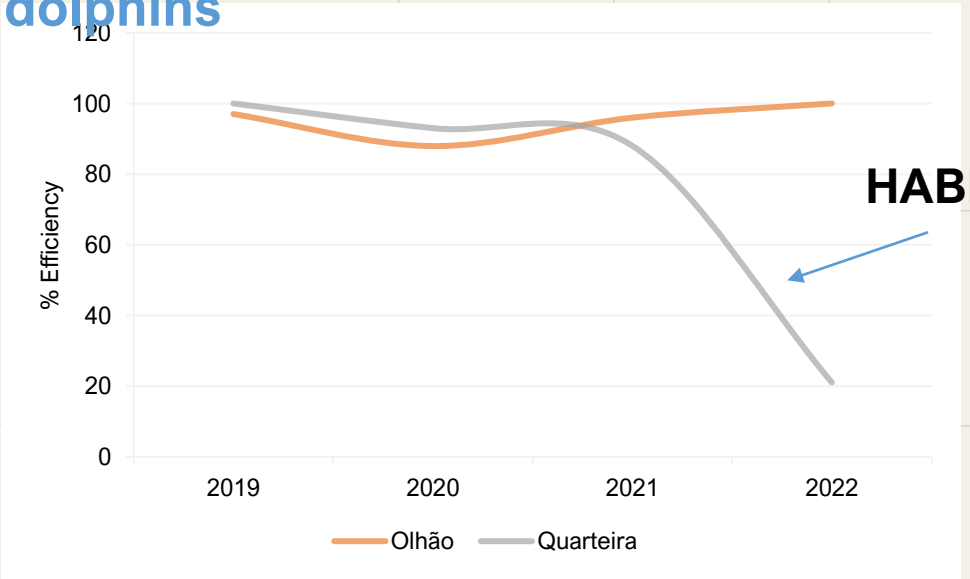
- No differences in target fish catch between gear with CED and normal gear.
- Further testing is needed to determine loss of fish catch passing into the cod-end.
- The rigid CED makes it difficult to handle the net on deck (a potential safety risk).
- The semi-flexible CED is more suitable for handling onboard
- The CED apparently prevented accidental captures of elasmobranchs (only 1 skate and 1 Porbeagle shark passed into the codend).
- Four species of cetaceans observed in the fishing area; **no accidental catches of cetaceans**
- More tests are needed to obtain more robust results in relation to cetacean bycatch.



Projecto Mar2020 – iNOVPESCA (2017-2021)
Projeto CetAMBICion (2021-2023)

Results: Mitigation in bottom set-nets: alarm efficiency (Marçalo et al. (in prep.)

Effect on depredation by bottlenose dolphins



HABITUATION?

(No) effect on target species catch rate

Port	Treatment	CPUE (Ave)	CPUE (Std)	Effect of alarm
Olhão	Control	8.6	6.5	Mann-Whitney U Test NS $p > 0.05$
	Alarm	9.0	6.9	
Quarteira	Control	12.3	8.1	Mann-Whitney U Test NS $p > 0.05$
	Alarm	12.2	7.7	

$$\text{Efficiency} = \frac{\text{Number of hauls with alarms with no attacks}}{\text{Total number of hauls with alarms}} = 85.4\% \pm 26.4\%$$

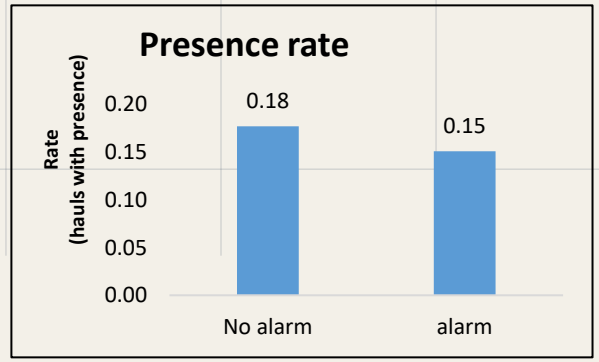
Task 4.3. Pilot project: Fixed and seine nets ("pingers"; Portugal)

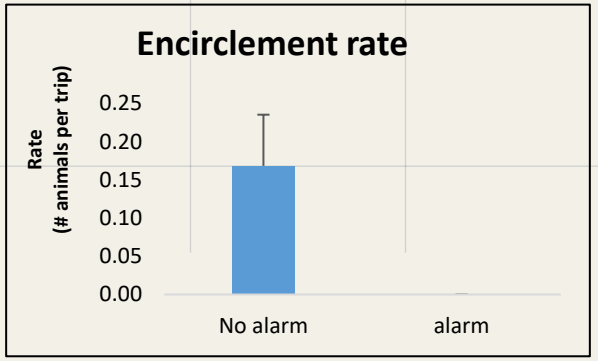
Projecto Mar2020 – iNOVPESCA (2017-2021)
Projeto CetAMBICion (2021-2023)

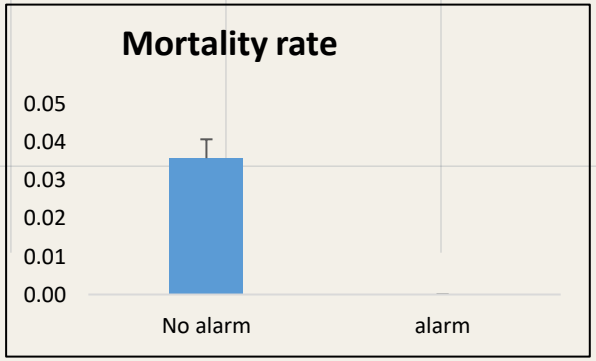
Results: Mitigation Purse Seine (2020-2021) Marçalo et al. (in prep.)

Category	Monitoring scheme	N Hauls	N hauls w capture	N animals captured	N animals dead	% Survival	Cetacean species
Control	Observer + Logbook	271	17	37	8	78	*Delphinus delphis*
Alarm		238	0	0	-	-	

- **Incidental captures observed only in control (not during use of alarms)**
- **100% common dolphin *Delphinus delphis***
- **Many captured animals are successfully released**







Take home message about mitigation in Southern PT fisheries

FIXED NETS

- **Economical and technological challenge for the PT net fisheries scenario; Habituation is a side effect to be monitored; Fishers still happy, but need financial support.**

- **Good practices are the best option** (follow soaking times, gear length, avoid areas of high bottlenose densities, use alarms at a seasonal basis in métiers with depredation)

PURSE SEINE

- **Mitigating** common dolphin **bycatch** with DDDs seems **promising & economically viable**

Integrated knowledge between **fishers** and **scientists** + other stakeholders paves the way to **sustainability**

Task 4.4. Feasibility study of using ‘move-on’ rules to mitigate cetaceans bycatch

Workshop

Objectives

- Study feasibility of management by "move-on rules" to reduce incidental catches of common dolphin in Bay of Biscay
- Joint reflection on SWOT analysis of this approach (Strengths, Weaknesses, Opportunities, Threats)

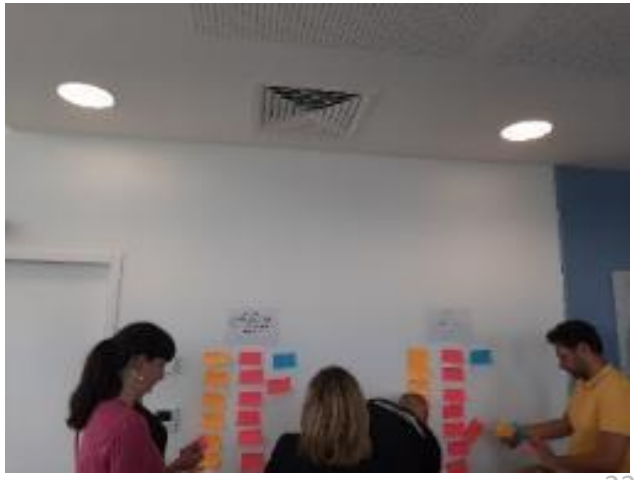
Questions :

✓ Identify requirements to implement a voluntary move-on rule in Biscay

- ✓What rules? (decision support, move-on during observation or capture, ...)
- ✓Which gear would be affected?
- ✓Could the Obsenpêche tool be adapted for this type of measurement?

✓ SWOT analysis to be completed

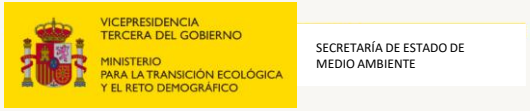
- ✓« Name one advantage/opportunity and one disadvantage/threat »



Summary

- WP1: there are considerable differences between the three countries in how cetaceans have been assessed under the MSFD, in part due to differences in monitoring. Even where the species and the criteria are the same, the assessment methodology often differs.
- WP2: Proposals are under development to harmonize monitoring and assessment for cetaceans.
- WP3: Existing bycatch monitoring (which is inadequate) and methods for risk assessment have been reviewed. Risk mapping is in progress
- WP4: Existing bycatch reduction measures have been reviewed. New trials are underway: the utility of Cetacean Excluder Devices in trawls is still unclear; promising results have been obtained for “pingers” on purse seines. “Move-on” procedures are being explored.
- (WP5: Communication, website, stakeholder engagement, etc.)
- (WP6: Coordination via Steering Committee and Advisory Group, Reporting to DGENV, liaison with other projects and international organisations (e.g. ICES, ASCOBANS, OSPAR, IWC))

Acknowledgements



- DGENV,
- Partner teams and administrative support,
- Advisory Board members,
- Industry collaborators