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Workshops with the Fishing Sector in Portugal

CetAMBICion

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

Workshops with the Fishing Sector in Portugal

Drafted by:



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Coordinated Cetacean Assessment, Monitoring and Management Strategy in the Bay of Biscay and Iberian Coast sub-region (CetAMBICion).

The CetAMBICion project, coordinated by the Spanish National Research Council (CSIC) and which includes 15 partners from Spain, France and Portugal, aims to strengthen collaboration and scientific work between the three countries to estimate and reduce cetacean bycatch in the Bay of Biscay and Iberian Coast sub-region, in close collaboration with the fishing sector. Until 2023, the project will work to improve scientific knowledge on population abundance, incidental bycatch and its mitigation measures.

The project is part of the European Commission's DG ENV/MSFD 2020 (Marine Strategy Framework Directive) call, and the objectives are aligned with the Habitats Directive and the Common Fisheries Policy.



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Figure 7. Results of the evaluation forms regarding the organisation and logistics of the CetAMBICion workshop with the fishing sector in Portugal – Western Coast (WK3). Each pie chart shows the distribution of the scored given to the questions: a) “Do you think the location was appropriate?”. Number of answers analysed: 15; b) “Do you think the catering service was appropriate?”. Number of answers analysed: 14; and c) “Do you think the duration of the workshop was appropriate?”. Number of answers analysed: 15. Rating ranges between 1 (not at all) to 5 (a lot).

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Acronyms

AAPSACV: Associação de Armadores de Pesca Artesanal e do Cerco do Sudoeste Alentejano e Costa Vicentina

ABI: Bay of Biscay and the Iberian coast sub-region

AMN: Autoridade Marítima Nacional

ANOPCERCO: Associação Nacional das Organizações de Produtores da Pesca do Cerco

APX: Associação Portuguesa da Arte Xávega

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

CIIMAR: Interdisciplinary Centre for Marine and Environmental Research

DDD: *Dolphin Deterrent Device*

DiD: *Dolphin interactive Deterrent*

DGRM: Directorate General of Natural Resources, Safety and Maritime Services

ESTM: School of Tourism and Maritime Technology

ICNF: Institute for Nature Conservation and Forests

IPMA: Portuguese Institute for Sea and Atmosphere

MARE-UE: Marine and Environmental Sciences Center of the University of Évora

NGO: Non-Governmental Organisation

PONG-Pesca: Plataforma de Organizações Não Governamentais Portuguesas sobre a Pesca

QUARPESCA: Associação dos Armadores Pescadores de Quarteira

UAlg: University of Algarve

UMinho: University of Minho

1. Introduction

The CetAMBICion Project (Coordinated Cetacean Assessment, Monitoring and Management Strategy in the Bay of Biscay and Iberian Coast sub-region) has as its main goal to contribute to reducing cetacean bycatch in the Bay of Biscay and the Iberian coast sub-region (ABI), in close collaboration with the fishing sector. In this context, one of the actions of the project was the development and implementation of a capacity-building plan, aimed at the sector, which included the organization of national workshops in each of the partner countries (France, Portugal and Spain), in order to inform the fishing sector about the implementation, objectives and results of the project, also encouraging the participation of the sector in the proposal of mitigation measures for incidental captures.

In Portugal, the first online workshop was held on April 24, 2021. This event included representatives of fishing associations and the Portuguese partners of the project: the Interdisciplinary Centre for Marine and Environmental Research (CIIMAR), the Directorate General of Natural Resources, Safety and Maritime Services (DGRM), the Portuguese Institute of Sea and Atmosphere (IPMA) and the University of Algarve (UAlg). This workshop aimed to present the project and analyse the status of fishery-cetacean interactions along the Portuguese coast.

Subsequently, three face-to-face workshops were held called "Fisheries and Cetaceans: an inclusive conversation on good practices and solutions for the sector", where the existing problems resulting from the interactions between fishing activities and cetaceans in Portuguese waters were addressed, as well as possible solutions to mitigate bycatch were discussed. The three events worked as an open space for the different stakeholders to share experiences and knowledge, and also to discuss possible mechanisms and solutions adaptable to the reality of national fisheries. The target audience of these workshops was the fishing sector, however, in addition to fishing associations, representatives from academic and research institutions, non-governmental organizations (NGOs) and competent authorities, as well as all the Portuguese partners of the project (i.e., all those mentioned above and the Institute for Nature Conservation and Forests – ICNF) were also invited to these workshops.

The first face-to-face workshop took place on April 1, 2022, at UAlg, Faro, Portugal, and targeted fishing associations of the southern coast of Portugal. Most of the fishers present were already aware of the project and the problematic, due to their participation in the mitigation trials (conducted under Task 4.3 of the project and previous projects). The second face-to-face workshop was held on June 1, 2022, at CIIMAR, Matosinhos, Portugal, and addressed fishing associations from the western coast of the country. Although the two workshops shared the same general objectives, the approaches adopted were different, as the fishing associations from the west and south coasts had different levels of knowledge regarding the project and the problems addressed. Furthermore, the fisheries that take place in each region have different characteristics and a different level of interaction with cetaceans, even for similar types of fishing gear. Finally, the third and last face-to-face workshop took place on March 17, 2023, at the School of Tourism and Maritime Technology (ESTM) of the Polytechnic Institute of Leiria, Peniche, Portugal, and brought together fishing associations from the west and south coasts of mainland

Portugal, with the main goal of consolidating and finishing the work developed in the previous workshops.

The present report includes information on the main logistical, technical and scientific results of the workshops held, to summarise the main conclusions of this multisectoral work and support the organisation of similar events in the future.

2. Workshops Logistics

Given that the first workshop was online, the next sections of this chapter refer only to the workshops that took place in face-to-face format.

Invitations

In order to get as many entities as possible represented, “Save the Date” invitations were officially sent to the general e-mails of the organisations/associations 30 days before each workshop. In addition, one week before each workshop, reminders were sent out with the programme. Whenever possible and necessary, direct informal contacts were made with the invited entities, via telephone and/or in person, reinforcing the importance of participating in the workshops.

Due to space and organisational issues, participation was limited to three representatives per invited entity.

Agendas

The agenda of the southern coast workshop is presented in Figure 1. The workshop began with a brief introduction to cetaceans, the problem of incidental captures and the status of mitigation trials conducted with commercial fishing vessels on the south coast of the country. After this presentation, fishers shared their experiences of collaboration with the CetAMBICion project, particularly on mitigation trials of cetacean bycatch. In addition, during the coffee break, fishers shared their personal experiences, in a guided way, through the recording of a video.

WORKSHOP “PESCA E CETÁCEOS: CONVERSA INCLUSIVA SOBRE BOAS PRÁTICAS E SOLUÇÕES PARA O SETOR”	
1 DE ABRIL 2022 14:00 UNIVERSIDADE DO ALGARVE	
14h00-14h30	REGISTO E ENTRADA
14h30-16h00	ABERTURA Centro Interdisciplinar de Investigação Marinha e Ambiental. 5min PROBLEMÁTICA & PROJETO Direção-Geral de Recursos Naturais, Segurança e Serviços Marítimos. 15min PROJETO PILOTO Universidade do Algarve. 10min PARTILHA DE EXPERIÊNCIAS DO SETOR DA PESCA NO CETAMBICION Moderação: Centro Interdisciplinar de Investigação Marinha e Ambiental + Universidade do Algarve. 60min
16h00-16h45	COFFEE BREAK
16h45-18h00	MESAS DE TRABALHO: Principais conflitos artes de pesca – cetáceos. Medidas práticas e comportamentais Moderação: Centro Interdisciplinar de Investigação Marinha e Ambiental + Universidade do Algarve. 50min APRESENTAÇÃO DOS RESULTADOS DAS MESAS DE TRABALHO Moderação: Centro Interdisciplinar de Investigação Marinha e Ambiental + Universidade do Algarve. 20min ENCERRAMENTO Centro Interdisciplinar de Investigação Marinha e Ambiental. 5min

Figure 1. Agenda of the CetAMBICion workshop with the fishing sector in Portugal – Southern Coast (WK2).

The workshop agenda for the western coast included a more detailed introduction, the inclusion of a video with some images and video testimonials from fishers captured during the southern coast workshop (available [here](#)) and two talks given by two different fishing associations (Figure 2).

O vídeo preparado consiste num resumo do trabalho desenvolvido no workshop da costa sul, e inclui os testemunhos individuais de cinco pescadores que colaboraram nos ensaios de mitigação das capturas acidentais de cetáceos do projeto-piloto CetAMBICion. O vídeo foi uma das metodologias encontradas para transmitir os resultados do projeto-piloto aos participantes do workshop da costa ocidental. Além disso, constitui também um importante resultado visual do plano setorial do projeto.

The video prepared consisted of a summary of the work developed at the southern workshop and included the individual testimonies of five fishers who collaborated in the mitigation trials of the CetAMBICion pilot project aiming to reduce cetacean bycatch. The video was one of the methodologies found to transmit the results of the pilot project to the participants of the western coast workshop. It also constitutes an important visual outcome of the project's sectorial plan.



WORKSHOP "PESCA E CETÁCEOS: CONVERSA INCLUSIVA SOBRE BOAS PRÁTICAS E SOLUÇÕES PARA O SETOR"	
1 DE JUNHO 2022 14:00 TERMINAL DE CRUZEIROS DO PORTO DE LEIXÕES  	
14h00-14h30	REGISTO E ENTRADA
14h30-16h00	ABERTURA Centro Interdisciplinar de Investigação Marinha e Ambiental. 5min PROBLEMÁTICA & PROJETO Direção-Geral de Recursos Naturais, Segurança e Serviços Marítimos. 15min INTERAÇÕES PESCA – CETÁCEOS EM PORTUGAL Universidade do Algarve. 15min PERSPETIVA DA PESCA POR ARTE DO CERCO Associação Nacional das Organizações de Produtores da Pesca do Cerco. 15min PERSPETIVA DA PESCA COM ARTE-XÁVEGA Associação Portuguesa de Xávega. 15min
16h00-16h45	<i>COFFEE BREAK</i>
16h45-18h00	MESAS DE TRABALHO: Principais conflitos arte de pesca – cetáceos. Medidas práticas e comportamentais Moderação: Centro Interdisciplinar de Investigação Marinha e Ambiental + Universidade do Algarve. 50min APRESENTAÇÃO DOS RESULTADOS DAS MESAS DE TRABALHO Moderação: Centro Interdisciplinar de Investigação Marinha e Ambiental + Universidade do Algarve. 20min ENCERRAMENTO Centro Interdisciplinar de Investigação Marinha e Ambiental. 5min

Figure 2. Agenda of the CetAMBICion workshop with the fishing sector in Portugal – Western Coast (WK3).

In both workshops, roundtable discussions were organised with the task of compiling the participants' perspectives on technical and behavioural measures, which could be applied in their fishing activities, that could decrease cetacean bycatch and, simultaneously, minimise their economic losses. This activity was guided through worksheets, prepared for three fishing gears operating in Portugal and targeted by the project, since they are significantly associated with incidental catches of cetaceans: fixed-nets (gillnets and trammel nets), purse seine and beach seine (Appendices 1, 2 and 3). The latter was only discussed in the western coast workshop as this fishing gear is mainly operated in this region. Each roundtable was dedicated to one of the

fishing gears and participants were divided among tables, ensuring the presence of at least one representative from the fishing association operating the gear selected for that roundtable, competent authorities, academic and research institutions, and NGOs.

The agenda of the last face-to-face workshop with the fishing sector in Portugal is presented in Figure 3. As in the previous workshops, it included a brief introduction to the project and the issue of cetacean bycatch in Portugal, with two interventions from the fishing sector that set the tone for a large room conversation focused on the perspective of the sector. There were also presented the main results of the project, including the main developments in the monitoring of incidental captures and mitigation trials underway in the Algarve. In the afternoon, and to finish, the main results and conclusions of the previous workshops were presented and discussed, once again with a very active discussion between the entities present.

WORKSHOP "PESCA E CETÁCEOS: CONVERSA INCLUSIVA SOBRE BOAS PRÁTICAS E SOLUÇÕES PARA O SETOR" 17 DE MARÇO 2023 10:00 ESCOLA SUPERIOR DE TURISMO E TECNOLOGIA DO MAR DO INSTITUTO POLITÉCNICO DE LEIRIA	
10h00-10h15	REGISTO E ENTRADA
10h15-12h30	ABERTURA Escola Superior de Turismo e Tecnologia do Mar do Instituto Politécnico de Leiria. 5min INTRODUÇÃO AO PROJETO CETAMBICION Direção-Geral de Recursos Naturais, Segurança e Serviços Marítimos. 15min PROBLEMÁTICA DA CAPTURA ACIDENTAL EM PORTUGAL Direção-Geral de Recursos Naturais, Segurança e Serviços Marítimos + Instituto da Conservação da Natureza e das Florestas. 15min PERSPETIVA DO SETOR DA PESCA Associações de Pesca. 30min MONITORIZAÇÃO DE CAPTURAS ACIDENTAIS E ENSAIOS DE MITIGAÇÃO Instituto Português do Mar e da Atmosfera + Universidade do Algarve. 30min DISCUSSÃO ABERTA Moderação: Centro Interdisciplinar de Investigação Marinha e Ambiental + Universidade do Algarve. 30min
12h30-14h00	ALMOÇO
14h00-15h45	RESULTADOS WORKSHOPS ANTERIORES + VÍDEO DE TESTEMUNHOS DO SETOR DA PESCA Centro Interdisciplinar de Investigação Marinha e Ambiental. 15min DISCUSSÃO ABERTA Moderação: Centro Interdisciplinar de Investigação Marinha e Ambiental + Universidade do Algarve. 80min
15h45-16h15	COFFEE-BREAK
16h15-17h00	REMATE FINAL: BALANÇO DO WORKSHOP Centro Interdisciplinar de Investigação Marinha e Ambiental + Universidade do Algarve. 30min ENCERRAMENTO Escola Superior de Turismo e Tecnologia do Mar do Instituto Politécnico de Leiria. 5min

Figure 3. Agenda of the CetAMBICion workshop with the fishing sector in Portugal – Portuguese Coast (WK4).

Evaluation forms

To evaluate the success and impact of the workshops, evaluation forms were prepared and delivered to all participants at the end of all face-to-face events. These forms were divided into three groups of questions: i) workshop content, ii) workshop organisation and logistics, and iii) general considerations about the workshop (Appendix 4). Questions included in groups i) and ii) were closed-ended questions for rating attribution, ranging from 1 (not at all) to 5 (very much), while in group iii) questions were open-ended.

3. CetAMBICion Workshop with the Fishing Sector in Portugal – Online

Participants

In total, this first workshop was attended by the project partners and fishing associations, adding up to 17 participants (11 of which were Portuguese CetAMBICion partners; Table 1).

Table 1. List of the participants who attended the CetAMBICion workshop with the fishing sector in Portugal – Online (WK1). Lines in blue indicate the participants who represented fishing associations. Asterisks indicate the CetAMBICion Portuguese partners.

Entities	Number of Participants
APX	1
AAPABMG	1
CIIMAR	2*
DGRM	7*
IPMA	2*

Entities	Number of Participants
Olhãopesca	1
QUARPESCA	1
UAlg	1*
Vianapesca	1

Talks

In this first workshop, DGRM made a brief presentation about the project which was in its initial phase, with reinforcement on the objectives and importance of the active participation of the fishing sector. This presentation focused on the three main phases of the project: pilot project in Portugal conducted under Task 4.3 of the project; sectorial plan - workshops focused on the fishing sector to discuss and exchange ideas; and the proposal of common measures. In this presentation, UAlg also intervened to develop the problematic of fishery-cetacean interactions and present the mitigation trials on the south coast of the country planned under the CetAMBICion project, as well as previous projects (e.g., iNOVPESCA).

4. CetAMBICion Workshop with the Fishing Sector in Portugal – Southern Coast

Participants

In total, 18 entities were invited to the southern coast workshop (Table A1 in Appendix 5). Of these, 12 were present (67%), adding up to 34 participants (12 of which were Portuguese CetAMBICion partners; Table 2).

Table 2. List of the participants who attended the CetAMBICion workshop with the fishing sector in Portugal – Southern Coast (WK2). Lines in blue indicate the participants who represent fishing associations. Within brackets and/or marked with asterisks indicate the CetAMBICion Portuguese partners. All acronyms are listed in Table A1 in Appendix 5.

Entities	Number of Participants	Entities	Number of Participants
AAPSACV	2	IPMA	4*
AMN	1	MARE-UE	3
Barlapescas	2	Olhãopesca	3
CIIMAR	2*	PONG-Pesca	2
DGRM	3*	QUARPESCA	5
ICNF	3 (1*)	UAlg	4(2*)

Academic and research institutions had a higher representation at the workshop (38% of the participants) and were represented by CIIMAR, IPMA, Marine and Environmental Sciences Center of the University of Évora (MARE-UE) and UAlg. Several fishing associations were also represented (35% of the participants). The competent authorities were represented by Autoridade Marítima Nacional (AMN, “Portuguese Maritime Police”), DGRM, and ICNF (21% of the participants). The Plataforma de Organizações Não Governamentais Portuguesas sobre a Pesca (PONG-Pesca, “Portuguese Platform of Non-Governmental Fisheries Organizations”) was also present (6% of participants).

Except for the Associação de Armadores de Pesca Artesanal e do Cerco do Sudoeste Alentejano e Costa Vicentina (AAPSACV, “Association of Artisanal and Purse Seine Fisheries of the Southwest Alentejo and Costa Vicentina”), all participating fishing associations collaborate with the CetAMBICion pilot project, related to bycatch mitigation trials in Algarve, Portugal (conducted under Task 4.3 of the project). Despite several contacts made, many the invited entities were not represented (six in total). Of these, five were from the fishing sector (Table A1 in Appendix 5).

Talks

After welcoming the participants, the DGRM started the workshop with a presentation on cetaceans (focusing on their biology and particularities that make them susceptible to anthropogenic threats), the genesis and objectives of the CetAMBICion project, and the problem of cetacean bycatch by fisheries. UAlg then presented the preliminary results of mitigation trials underway on the south coast. Besides being of interest to those present, since most of them

participate in this pilot project, this last presentation encouraged, afterwards, the sharing of experiences (Figure 1).

Roundtable results

The southern coast workshop held four roundtables: three on fixed-nets (gillnets and trammel nets) and one on the purse seine fishing gear.

Overall, all participants were cooperative, actively participating in the discussion of the problem and possible solutions to reduce cetacean bycatch, with the workshop being extended for about an extra hour.

Fisheries operating with fixed-nets (gillnets and trammel nets)

Regarding bottom-set fixed-nets, the most evident problem is the incidental capture of several species of small cetaceans, mainly the common dolphin (*Delphinus delphis*), the striped dolphin (*Stenella coeruleoalba*), or even the harbour porpoise (*Phocoena phocoena*; much less abundant in the south of the country). On the other hand, particularly in the south, another relevant interaction is the depredation by bottlenose dolphins (*Tursiops truncatus*), which causes considerable economic impacts by creating damage to both fish and gear. One of the exercises challenged the tables to discuss the option of including gaps between net panels. The fishers were receptive to the idea and willing to test it, mentioning that this method would allow them to cover a larger fishing area. Some fishers who participated in the workshop reported that when two nets spaced about 500 m apart were used, the bottlenose dolphins ended up depleting only the fish in the first net, leaving the second net intact. This suggests that the effectiveness of the measure may depend on the distance used between nets - this hypothesis should be explored in the future. However, some disadvantages were also noted: the nets may become heavier; take up more space on the boats; take longer to set; and the fishing operation may have higher associated costs (e.g., fuel). Furthermore, in the case of fisheries using nets targeting red mullet, where there is often depredation of fish by bottlenose dolphins, fishers were reluctant to test it, even considering it unnecessary, as these animals can depredate fish without being caught. In the case of gillnets targeting hake, the fishermen stated that these gaps between nets already exist (about one palm apart) and argued that an escape window is of no benefit, not agreeing with the study presented.

Regarding the use of acoustic deterrent devices, some fishers argued that initially this method keeps the cetaceans away but as time goes by the animals get used to it and the devices can start working as a lure. It was also mentioned that the greater the depth at which they are placed, the more effective the devices are. Another disadvantage pointed out was the cost of the device and initial investment, since in the fixed-nets fisheries it is necessary to use several devices (depending on the size of the net). Although there are no funding mechanisms to support fishermen in this matter, in general they recognise that the acquisition of acoustic deterrent devices is a good investment and that it is worth testing and implementing their use. Specifically for nets targeting monkfish, it was mentioned that the development of acoustic deterrent devices with longer battery life would be useful as these nets remain underwater for longer periods.

When asked about the areas they consider having a greater risk of conflict, fishers identified the area between Quarteira and Portimão, the tuna fishing trap areas operating in the Algarve (owned by Tunipex and Atunara) and the areas closest to the coast. In general, bottlenose dolphins seem to be the species that causes more damage to fishing nets and is more associated with depredation. Some fishers mentioned that these animals seem to memorise the boats (e.g., through engine noise). Common dolphins and harbour porpoises can also cause some damage to nets, but being less robust they are more associated with bycatch. The lack of fish to feed the dolphins' populations was one of the causes given for this conflict.

To avoid bycatch, some fishers use fewer buoys, which means that the net does not remain fully upright (allowing some space for the dolphins to escape). Some fishers also tried to use different coloured nets to make them more visible and avoidable, but this strategy was not successful. It was mentioned that cetaceans could indeed see the nets, but prey (e.g., cuttlefish, hake, mackerel), due to their brightness, attract more of their attention and they still come to depredate. Furthermore, these animals navigate by echolocation, so the visibility of the nets may not have much effect. It was also suggested to mark cetaceans and give fishers access to their location in real time, allowing them to avoid interaction, which from a scientific, logistical and monetary perspective is not feasible.

Purse seine fisheries

In the purse seine fisheries, the major conflict between fishing operations and the cetaceans is due to a strong association between these fisheries and the common dolphin, since these dolphins' main prey are some of the target species of this fishing gear, in particular sardine and mackerel. Therefore, there is a higher risk of incidental capture when these fisheries target these species. In general, the fishers involved in the trials were satisfied with the use of acoustic deterrent devices in this fishing gear, considering their low cost, as only one device is required for each seine net. Furthermore, they have a simple method of use and a long battery life. No disadvantages were noted.

Regarding the measures to be adopted on board when cetaceans are accidentally captured, the use of stretchers was considered beneficial, avoiding injuries and allowing the release of animals in better physical conditions. However, it was recognised that, in practice, the implementation of this measure is very challenging, due to the size and behaviour of cetaceans within the purse seine and the lack of manpower. Considering these difficulties, a different type of stretcher was suggested.

Regarding the proposal to lower the cork rope (or head rope) to create an escape window, the fishers were very reluctant to implement this measure as they believe it would lead to a significant loss of fish caught. However, they stated that they would be willing to test it. This measure has not been tested in previous projects from the CetAMBICion partners. Another suggestion mentioned was to drop the purse seine at a slower rate, giving the animals more time to escape. The possibility of turning off the sonar, to minimise the stress caused to the captured cetaceans, was seen as something feasible, with no drawbacks pointed out.

Regarding the possibility of not setting up the purse seine net when a group of cetaceans feeding is detected (which usually signals the presence of fish), the fishers assured that this is already a common practice. They also mentioned that it is common for one of the crew members to look for cetaceans: they assured that since the fishers must watch out for fishing buoys and other possible obstacles, they are also already vigilant for the presence of cetaceans.

Workshop evaluation results

In total, 27 evaluation forms were collected (79% of the total number of participants, including the Portuguese CetAMBICion partners). However, the number of responses analysed ranged from 20 to 25, as some answers are not eligible (e.g., "yes" or "no" answers to questions prepared for response in a rating format).

Workshop content

Regarding the questions about the content of the workshop, the results were generally quite positive. The question with the highest proportion of answers with a score of 5 (87% participants "totally agree") was about the suitability of the speakers (Figure 4a). In fact, the main speakers already have experience in capacity building activities with the fishing sector, namely with some of the fishing associations present at the event. However, this question also had the highest proportion of responses with a rating of 3 (9%) (Figure 4a). The question with the second highest proportion of responses with a score of 5 (83%) was about the appropriateness of the approaches applied to present the topics, with only 4% responding with a 3 (Figure 4b).

The third question with the proportion of responses with the highest score was about whether participants felt their opinions were heard, with 80% responding with a 5 (Figure 4c). However, this question also had the lowest score, with one participant responding with a score of 2.5. In the future, it is suggested to extend the moments of interaction so that participants have more time for sharing opinions and concerns. In fact, it was generally agreed that there was an imbalance between exposure time and interaction time, as the question about this issue had the lowest percentage of participants responding with 5 (61%) (Figure 4d).

Regarding the suitability of the lectures for the event, 65% of participants responded with a 5 rating, and this question had one of the highest proportions of low ratings, with 9% of questions rated 3 of (Figure 4e). Finally, on the question of the usefulness of the workshop, 78% responded with a 5, and only 4% with a 3 (Figure 4f).

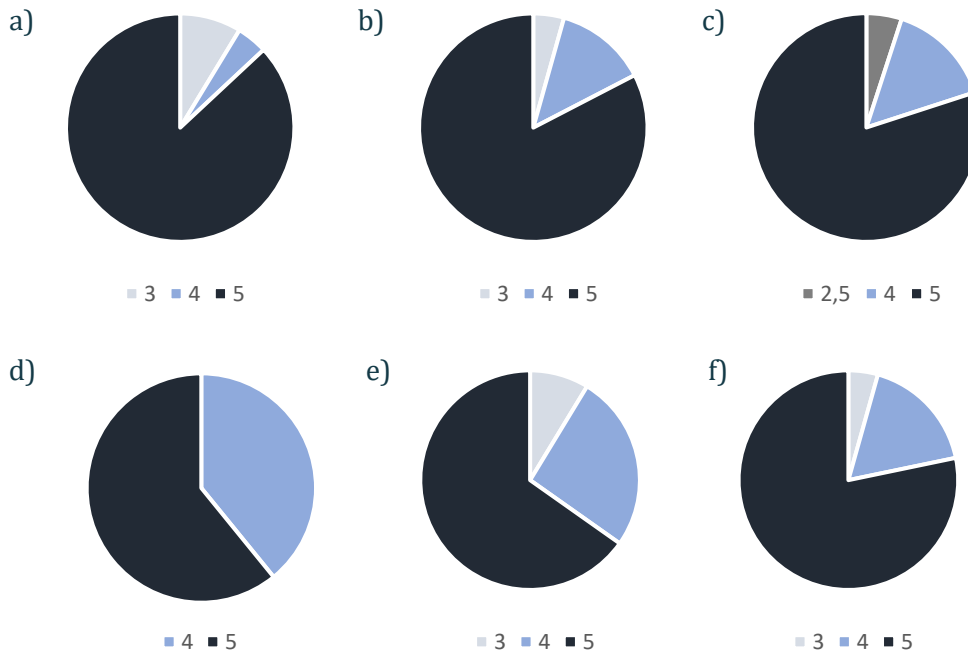


Figure 4. Results of the evaluation forms regarding the content of the CetAMBICion workshop with the fishing sector in Portugal – Southern Coast (WK2). Each pie chart shows the distribution of the scored given to the questions: a) “Do you think the speakers were the most suitable?”. Number of answers analysed: 23; b) “Do you think the topics were correctly covered?”. Number of answers analysed: 23; c) “Do you think that your opinion was heard and considered?”. Number of answers analysed: 23; d) “Do you considered the times of interaction and exposure moments to be balanced?”. Number of answers analysed: 23; e) “Do you think the lectures were the most suitable?”. Number of answers analysed: 23; and f) “Do you think the workshop was useful?”. Number of answers analysed: 20. Rating ranges between 1 (not at all) to 5 (a lot).

In the future, to improve these ratings, it will be important to shorten lecture times, allocating more time for participants to share their experiences and doubts, and possibly address other topics of interest. It would also be useful to consult stakeholders/guests (fishing sector, competent authorities, academic and research institutions, and NGOs) in advance on topics they would like to see covered.

Workshop organisation and logistics

Regarding the organisation and logistics of the workshop, the question with the highest proportion of answers with the highest score was about the choice of venue, with 88% of the participants answering with a 5 (Figure 5a). UAlg has easy access, having previously been the venue for other workshops with the fishing sector. The question about the catering service also had positive results, with 84% (Figure 5b) of participants answering with a 5. On the other hand, the duration of the workshop had only 68% of the answers with a rating of 5 (Figure 5c).

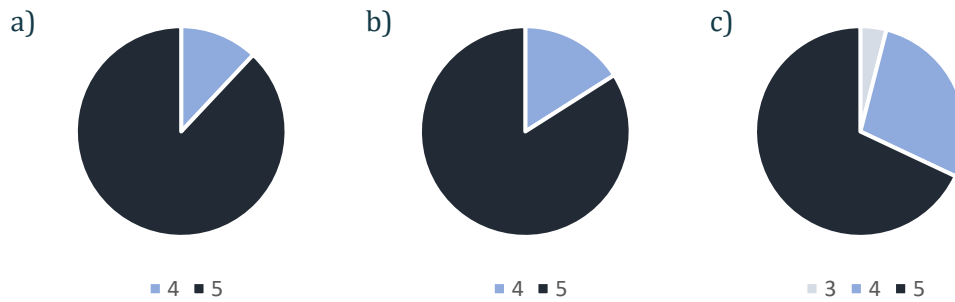


Figure 5. Results of the evaluation forms regarding the organisation and logistics of the CetAMBICion workshop with the fishing sector in Portugal – Southern Coast (WK2). Each pie chart shows the distribution of the scored given to the questions: a) “Do you think the location was appropriate?”. Number of answers analysed: 25; b) “Do you think the catering service was appropriate?”. Number of answers analysed: 25; and c) “Do you think the duration of the workshop was appropriate?”. Number of answers analysed: 25. Rating ranges between 1 (not at all) to 5 (a lot).

General Considerations about the workshop

When asked if they consider/intend to participate in similar workshops on this topic in the future, all participants said yes. As for the most appropriate time/day of the week for this type of event, Fridays at noon was considered the most convenient day/time by the fishing sector. In the future, it would be important to take this into account to increase the number of participants representing fishing associations.

Several participants suggested that interaction moments, such as roundtables, should last longer. Therefore, as already mentioned, it is important to shorten the lectures and increase the time dedicated to moments of interaction. Another suggestion was to shorten the coffee break and/or increase the total duration of the event, which may allow a longer interaction time, without substantially decreasing the time dedicated to lectures, also of relevant character to inform about the problematic and the project.

5. CetAMBICion Workshop with the Fishing Sector in Portugal – Western Coast

Participants

In total, 46 entities were invited to the western coast workshop (Table A2 in Appendix 5). Of these, 11 were represented (24%), adding a total of 22 participants (11 of which were Portuguese CetAMBICion partners; Table 3).

Table 3. List of the participants who attended the CetAMBICion workshop with the fishing sector in Portugal – Western Coast (WK3). Lines in blue indicate the participants who represent fishing associations. Within brackets and/or marked with asterisks indicate the CetAMBICion Portuguese partners. All acronyms are listed in Table A2 in Appendix 5.

Entities	Number of Participants	Entities	Number of Participants
AAPN + Vianapesca	1	DGRM	3*
Apropesca	1	ICNF	5(1*)
APX	1	IPMA	4*
AMN	2	UAlg	1*
CIIMAR	2*	UMinho	2

Most participants in this workshop came representing competent authorities (45% of the participants), namely AMN, DGRM and ICNF. Academic and research institutions (41% of the participants) were represented by CIIMAR, IPMA, UAlg and the University of Minho (UMinho). The fishing associations were represented by four associations (14% of the participants). No NGO was present.

Most of the invited associations/institutions that were not represented (80% of the invited entities) were part of the fishing sector (Table A2 in Appendix 5). This may relate to the fact that west coast fishers were not sufficiently informed or familiar with the CetAMBICion project, willing to travel long distances (plus associated costs), or reluctant to address the problem of incidental catches. In the long term, it is crucial to continue efforts to involve and reach out to all stakeholders, especially the fishing sector.

Talks

Similarly to the southern coast workshop, the event started with a reception to the participants followed by a presentation of the DGRM about cetaceans (focusing on their biology and particularities that make them susceptible to anthropogenic threats), the genesis and objectives of the CetAMBICion project and the problem of cetaceans bycatch by fisheries. Afterwards, UAlg made a more informative presentation about the interaction between fisheries and cetaceans in Portugal (Figure 2). As mentioned before, a video prepared with images captured in the southern coast workshop was shown.

In addition, two lectures led by two fishing associations were also included in the programme: the Associação Nacional das Organizações de Produtores da Pesca do Cerco (ANOPCERCO, “National Association of Producers’ Organisations of Purse Seine Fisheries”) and the Associação

Portuguesa da Arte Xávega (APX, “Portuguese Beach Seine Association”). Due to an unforeseen event, ANOPCERCO was not able to participate and therefore their lecture was replaced by a lecture conducted by Apropesca - Organisation of Artisanal Fishery Producers. Each lecture had a duration of about 15 minutes (Figure 2). During the associations' lectures there was space for discussion, which allowed the fishers to share their perspectives on the topic as well as trigger ideas for the roundtable exercise that followed the coffee break.

Roundtable results

The western coast workshop held three roundtables, one for each fishing gear: fixed-nets (gillnets and trammel nets), purse seine and beach seine.

Overall, all participants showed willingness to collaborate, although the fishers present were a little reluctant to acknowledge the problem of cetacean bycatch in the region. Once again, due to the very active participation of all involved, the workshop exceeded the scheduled time by about one hour.

Fisheries operating with fixed-nets (gillnets and trammel nets)

Similarly to the south coast workshop, when asked about the inclusion of gaps between net panels, and according to one of the participants, these already exist (spaced about 1 m apart), and do not work. The dolphins seem to go through the nets until they find an escape at the end of the net. Although it would be possible to increase these ranges by at least 2 m in the gillnets, the fisher present was not optimistic about their success. However, the fisher present was willing to carry out the experiment. Furthermore, the same fisher claimed that fishing-cetacean interactions are minimal, as well as the damage the animals cause to the nets.

As reported by the fisher, incidental catches of cetaceans occur more in trammel nets, and with common dolphins and harbour porpoises, apparently, mostly when pulling the nets. Yet, he considers that these interactions are so rare that it is more profitable not to change anything, and consequently have few fatalities every year (death of one or two animals), than to try to find other solutions that may negatively affect the fishing activity. However, although he does not see the need for it, they have offered to test acoustic deterrent devices if funding is available.

Another suggestion was to make the nets more visible and reflective by using paint. However, this measure has already been tested under the LIFE+ MarPro project and failed due to the resulting rigidity of the nets. One way to try to avoid this consequence would be to paint only the upper part of the net panels. Again, the fisher has offered to test the measure, but only if there are no associated costs on their part.

On the issue of behavioural measures, once again, the fisher considered that existing interactions are minimal and for this reason he does not see the need for a change in behaviour during fishing activities.

It is important to mention that the claims regarding the low number of interactions between dolphins and fisheries were made by one fisher who operates a large vessel, and sets his nets at great distances from shore, which may be the reason why interactions are minimal.

Purse seine fisheries

The use of acoustic deterrent devices was considered a beneficial approach to be applied along the west coast. Furthermore, the fisher present found it very practical, and the annual cost of around 300 euros was also considered reasonable/acceptable. The cons pointed out during the roundtable were the possible need to replace equipment and the lack of funding available to support fishers.

The use of stretchers was considered beneficial to avoid injuries that could arise during the release process. Furthermore, it was also mentioned that its use would avoid having to retrieve the purse seine with the weight of the cetaceans along with the fish. As well as alleviating the weight, this method could prevent the caught fish from being crushed. The disadvantages mentioned were the time taken for the rescue operation, the lack of space to keep stretchers on board and the need to have crew members trained in handling the equipment and animals.

It was mentioned by the fisher that, unlike the reality on the southern coast, lowering the cork rope to create an escape window is something already practiced on some vessels operating in northern Portugal. Due to the low sardine quota, a larger daily quantity is caught, and for this reason, the number of fish that manage to escape does not seem to affect fishing activity. Thus, fishers consider this measure quite effective to help cetaceans escape. On the other hand, and contrary to what happened in the previous workshop, turning off the sonar did not seem to be a viable option, as the fisher stated that the collection of the nets is controlled by sonar and could lead to difficulties in collecting them at the ideal time, and eventually negatively affect the fishing activity. For this reason, the fisher is very reluctant to test this measure.

When asked about postponing the release of the net when a cetacean feeding frenzy is sighted, the fisher was receptive, but only in cases of large groups of dolphins. In these situations, the fisher believes that the consequent process of trying to rescue many bycaught dolphins does not make the fishing activity profitable. In cases where the group of dolphins is small, the fisher believes that the animals have a good chance of escaping, or being rescued later, by lowering the cork rope. Having a fisher in charge of spotting cetaceans also seemed to be an acceptable option. It was, however, pointed out that this measure can only be put in place during the day (with visibility conditions), and many fishing activities take place at night. Moreover, in vessels with small crews, it may be difficult to have someone available for the detection of animals.

Beach seine fisheries

Although, according to Portuguese law, the use of acoustic deterrent devices is mandatory in the beach seine gear, the participating fisher considers the devices useless, stating that, in his opinion, habituation of the animals occurs, which eventually leads to the devices working as a lure. When asked about how often they use the devices, the fisher reported using them on every fishing trip, although they only worked successfully the first time.

The use of stretchers on the beach when cetaceans are accidentally caught was also discussed and no obstacles were raised except the lack of funding to support fishers in this matter. It was questioned if there would be a possibility to rescue the animals at sea, without taking them to

the beach, and it was argued that rescue is easier on land. Another suggestion was to use DDDs (Dolphin Deterrent Devices) or DiDs (Dolphin interactive Deterrents) instead of pingers (currently compulsory for this fishing gear), but only when dropping the net and removing them immediately afterwards. The use of DDDs in this fishing gear is not currently allowed due to their high frequencies, which can be harmful to small cetaceans such as the harbour porpoise, a species considered critically endangered in the country.

When discussing possible behavioural changes in fishing activities, the fisher argued that waiting for animals to come out before dropping the net is already a measure put in place. Finally, having someone in charge of detecting animals was a well-accepted possibility.

Workshop evaluation results

In total, 18 evaluation forms were collected (82% of the total number of participants, including the Portuguese CetAMBICion partners). However, the number of responses analysed varied between 11 and 15, as some responses are not eligible.

Workshop content

In 85% of the answers, the rating regarding the suitability of the speakers was 5 points (Figure 6a), as well as for the rating given to the type of approach to the workshop topics (Figure 6b). Regarding the question about the suitability of the lectures, a better rating was given compared to that obtained in the southern coast workshop, with 77% of the answers scoring 5 points (Figure 6c). Since the biggest difference between the two agendas was the inclusion of the two fishers' talks at the western coast workshop (Figures 1 and 2), this approach may have had a positive impact on the audience. This allowed the fishers to share their perspectives, which was a key element in the discussion that followed.

The question with the lowest percentage of top-rated answers (38%) was the balance between interaction times and exhibition moments (Figure 6d). Such an evaluation corroborates the need to shorten the time of the lectures, and/or extend the duration of the workshops in the future, including more interactive time (clearly, highly valued by the participants).

The question about the usefulness of the workshop also had a lower rating compared to the south coast workshop, with 62% of participants rating it 5 (Figure 6e). Since the problem is difficult to solve and to agree between the different sectors on the necessary measures, some participants may feel that these types of workshops are of little use. However, it remains the opinion of the majority that finding solutions for mitigating incidental catches in national fisheries involves regularly organising similar events that bring together fishers, competent authorities, and academic and research institutions.

Finally, 73% of participants responded with the maximum score to the question on whether they felt their opinions were heard (Figure 6f).

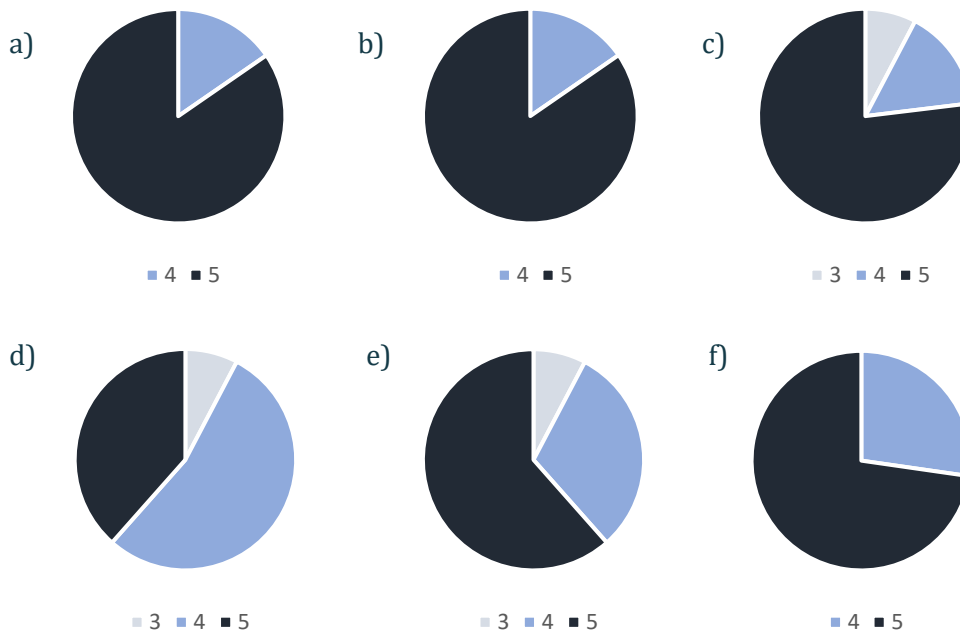


Figure 6. Results of the evaluation forms regarding the content of the CetAMBICion workshop with the fishing sector in Portugal – Western Coast (WK3). Each pie chart shows the distribution of the scored given to the questions: a) “Do you think the speakers were the most suitable?”. Number of answers analysed: 13; b) “Do you think the topics were correctly covered?”. Number of answers analysed: 13; c) “Do you think the lectures were the most suitable?”. Number of answers analysed: 13; d) “Did you consider the times of interaction and exposure moments to be balanced?”. Number of answers analysed: 13; e) “Do you think the workshop was useful?”. Number of answers analysed: 13; and f) “Do you think that your opinion was heard and considered?”. Number of answers analysed: 11. Rating ranges between 1 (not at all) to 5 (a lot).

Workshop organisation and logistics

As with the evaluation of the southern coast workshop, the highest proportion of top scoring responses was on the choice of venue (87%) (Figure 7a). The duration of the workshop was considered appropriate for most participants, although only 60% responded with a 5 (Figure 7c).

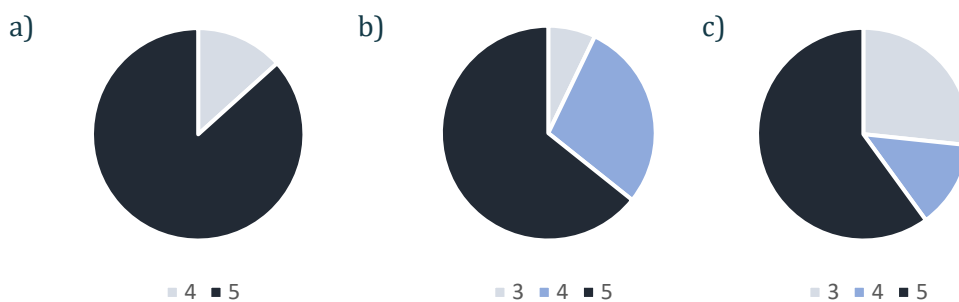


Figure 7. Results of the evaluation forms regarding the organisation and logistics of the CetAMBICion workshop with the fishing sector in Portugal – Western Coast (WK3). Each pie chart shows the distribution of the scored given to the questions: a) “Do you think the location was appropriate?”. Number of answers analysed: 15; b) “Do you think the duration was appropriate?”. Number of answers analysed: 13; and c) “Do you think the duration was appropriate?”. Number of answers analysed: 13.

catering service was appropriate?”. Number of answers analysed: 14; and c) “Do you think the duration of the workshop was appropriate?”. Number of answers analysed: 15. Rating ranges between 1 (not at all) to 5 (a lot).

General Considerations about the workshop

When asked if they would consider attending other similar workshops focused on this topic, all participants gave a positive response. Regarding the most appropriate time/day of the week for the fisheries sector, participants suggested that future meetings should be held at noon, during weekends, and in winter. Most participants suggested increasing the time allocated to roundtables, or even the overall duration of the workshop. One participant suggested a minimum of five hours duration in future events - which would allow more time for interaction. The low participation of the fishing sector was highlighted. A suggestion given by one of the participants was to consider holding future meetings at fisher's operational sites.

6. CetAMBICion Workshop with the Fishing Sector in Portugal – Portuguese Coast

Participants

In total, 56 entities were invited to the Portuguese coast workshop (Table A3 in Appendix 5). Of these, 13 were represented (23%), adding a total of 31 participants (13 of which were Portuguese partners of CetAMBICion; Table 4).

Table 4. List of the participants who attended the CetAMBICion workshop with the fishing sector in Portugal – Portuguese Coast (WK4). Lines in blue indicate the participants who represent fishing associations. Within brackets and/or marked with asterisks indicate the CetAMBICion Portuguese partners. All acronyms are listed in Table A3 in Appendix 5.

Entities	Number of Participants	Entities	Number of Participants
AAPACSACV	2	IPMA	5*
ANOPCERCO	1	MARE-UE	2
AMN	2	PONG-Pesca	1
CIIMAR	3(2*)	QUARPESCA	5
DGRM	3*	SCIAENA	1
ESTM	1	UAlg	2*
ICNF	3(1*)		

Academic and research institutions had a higher representation in the workshop (42% of the participants) and were represented by CIIMAR, ESTM, IPMA, MARE-UE and UAlg. Fishing associations were represented by three associations (26% of the participants). Representatives of competent authorities were also present (26% of the participants), namely AMN, DGRM and ICNF. Regarding NGOs, the workshop was attended by PONG-Pesca and SCIAENA (6% of the participants).

Most of the invited associations/institutions that were not represented (61% of the invited entities) were part of the fishing sector (Table A3 in Appendix 5), which may be related, again, to the fact that fishers were not informed/familiar with the project, willing to travel, or reluctant to address the problem of bycatch.

Talks

As in the previous workshops, the event began with a reception to the participants, followed by a presentation of the DGRM about cetaceans (focusing on their biology and particularities that make them susceptible to anthropogenic threats), the genesis and objectives of the CetAMBICion project, and the problem of cetacean bycatch. Still on the issue of bycatch, ICNF presented the information collected by the North Regional Strandings Network – North – on the strandings along the northern part of the Portuguese coast (Caminha to Peniche).

After this brief introduction, the fishing sector had the opportunity to share its perspective with all those present. Here, the Associação dos Armadores Pescadores de Quarteira (QUARPESCA, “Quarteira Fishing Association”) and ANOPCERCO made interventions as speakers. The focus of

these participations was largely on the fishers' willingness to collaborate with science in order to minimise fisheries – cetacean interactions. Subsequently, IPMA and UAlg gave a more informative presentation about bycatch monitoring and mitigation trials taking place in the Algarve, respectively (Figure 3). These lectures set the tone for the open discussion that took place afterwards.

After the lunch break, the main results of the previous face-to-face workshops were presented and the video prepared with images captured in the south coast workshop was shown again. After this brief presentation made by CIIMAR, there was again an open discussion. This focused on some of the issues that, in the previous workshops, generated more controversy, more difference between the southern and western coasts, or that revealed themselves in mitigation proposals with potential to be put into practice. To conclude, after the coffee-break, the results of the open discussion were presented.

Results of open discussion moments

Regarding the first moment of open discussion, still in the morning, several topics were discussed. Namely, the possibility of extending in the future the mitigation tests taking place in the Algarve to the western coast of Portugal. This would be crucial for the optimisation of the solutions, considering their adaptation to the different fishing realities and different fisheries in the national territory. Another recurrent topic was the lack of funding mechanisms to support fishers in the acquisition of acoustic deterrent devices. Finally, during this discussion it was also mentioned the urgent need to focus on the monitoring of fishing operations, a proposal supported by the AMN representatives at the workshop.

The second moment of open discussion was based on themes from the round tables held in the previous workshops, and two topics (most controversial, greatest potential, with most diverse opinions between southern and western coast workshops) were selected for each of the fishing gears:

- Fisheries operating with fixed-nets (gillnets and trammel nets): i) inclusion of gaps between net panels, and ii) use of acoustic deterrent devices - both measures aimed at avoiding the incidental capture of cetaceans.

- Purse seine fisheries: i) lower the cork rope, creating an escape window for the animals caught in the nets - avoid capture and ii) turning off the sonars after the purse-seine turn - minimise the stress caused to the cetaceans.

- Beach seine fisheries: i) use of acoustic deterrent devices - avoid capture and ii) release of bycaught cetaceans still at sea, not bringing them to shore for release - post-capture mitigation.

Regarding the inclusion of gaps between net panels in gillnet and trammel nets operations, again this seemed to be something practicable. Namely the idea of using two nets spaced about 500m apart, a proposal already put forward in the face-to-face workshop held on the southern coast. When asked again about using fewer buoys, to avoid the net remaining completely upright, the

fishers were quite reluctant. This is because they argue that dolphins still end up depleting the fish caught, thus not solving the problem. In general, for fishing with fixed-nets, it was concluded that it is necessary to focus on the regulation of concrete measures (e.g., monitoring of fishing operations, awareness-raising on the issue), specifically in fisheries and areas with more impact, as seems to be the case of trammel nets targeting monkfish on the southern coast.

Regarding the use of acoustic deterrent devices in gillnet and trammel nets operations, animal habituation remained the most discussed obstacle to the use of these devices. Furthermore, as already mentioned in the southern coast workshop, some fishers assured that animals seem to memorise the noise of specific vessels and are attracted by them. The type of boat (e.g., wood vs. fibre) also seems to be relevant, as well as the type of winch, although these hypotheses are of empirical origin and have not been scientifically proven. The solutions presented to deal with this problem include "deceiving" the animals, for example, by placing acoustic deterrent devices (for which habituation and possible attraction has already occurred) and/or recordings of the engines of the most affected boats in locations far from the position where the boats are operating. However, it is important to consider that the realities in the southern and western coasts are different in what concerns the interaction between cetaceans and fisheries, both due to the characteristics of the fisheries operating and the distribution of cetacean populations. It is thus important to test the use of acoustic deterrent devices also on the western coast. Here, the associated costs and the size of the fleet may be an obstacle. The possibility of adapting fisheries to this problem was also mentioned, specifically gillnet and trammel net fisheries: investing on traps (e.g., cages, creels) was one of the ideas proposed. However, these do not work for many target species and the large number of traps on the seabed already exceeds the limit allowed by law, so it would not be a viable option.

In the purse seine fishery, opinions differed according to the regions of the fisheries. While the creation of the escape window (lowering the cork rope) is already practiced on the western coast, largely due to the low sardine quota, as mentioned above; on the southern coast there is still a reluctance to apply this measure, due to potential fish losses. This is also related to the fact that in the north of Portugal there is a greater sharing of fish between vessels, thus compensating for possible losses. Opinions also diverged when the possibility of turning off the sonars after the turn of the purse seine was discussed: in this case, while this measure is already applied on the southern coast, there is reluctance to do so on the western coast. Once again, these results prove that the realities of the fisheries along the entire Portuguese coast differ profoundly, thus there is a need to apply specific measures for the different regions.

Finally, for issues related to the beach seine fishing gear, the use of DDDs or DiDs (instead of pingers, currently compulsory use in this gear) tested, and with very positive results, in the southern purse seine fishery was discussed once again. However, in this fishing gear, these devices are not currently allowed because they can be harmful to small cetaceans due to their high frequencies. Regarding the rescue at sea, of bycaught animals, this does not seem to be an option for fishers operating this gear, and there is the possibility of a large loss of fish. Furthermore, dropping one of the cables does not seem to be viable either, as the animals would most likely drown. Other solutions include stopping the hauling and cutting the net and fast opening systems.

Still on this topic, the viability of the use of stretchers in land was also discussed, and it was proposed that their use should be compulsory (e.g., two stretchers per tractor). However, for this measure to be included in the legislation covering fishing with beach seine gear and for the stretchers to be used correctly, it is necessary to invest in training and monitoring. It was also proposed to contact a rescue team that would carry out the rescue of these animals. However, this did not seem to be a viable option, considering that the response time of the rescue teams would possibly not be compatible with the urgency in returning the animals to the water. Again, it was stressed that for animals to be safely returned to the sea, fishers need to be trained to do so. This could be solved, for example, with training actions in the field, with the fishing associations. It was also mentioned that incidental capture in this fishing gear is quite low, partly because this gear operates mainly in the summer. However, sometimes, in a single throw several dozens of animals are captured. Thus, although these events are occasional, their impact is considered quite significant.

Workshop evaluation results

In total, 24 evaluation forms were collected (77% of the total number of participants, including the Portuguese CetAMBICion partners). However, the number of responses analysed varied between 21 and 23, as some responses were not eligible for analysis.

Workshop content

Regarding the questions about the content of the workshop, the results were again overall quite positive. In this last workshop there was a significant increase of answers with a score of 5 (91%) to the question related to the usefulness of the workshop (Figure 8a), in comparison with the previous workshops (78% on the southern coast and 62% on the western coast). This might be related not only to the further developing on the work started in the previous workshops, but also to preparing a workshop in line with the suggestions and opinions given by the participants in the previous events (e.g., having a longer workshop with more time for discussion). The question with the second highest proportion of responses with a score of 5 (86%) was about the appropriateness of the approaches applied to present the topics (Figure 8b). As for the question about the adequacy of the lectures, 82% of the responses scored 5 points (Figure 8c).

73% of participants responded with the maximum score to the question about whether they felt their opinions were heard (Figure 8d). This was the question with the lowest percentage of participants responding with the maximum score, with two participants still responding with a 3. Although this workshop had an overall better evaluation compared to previous workshops, this question still has a similar percentage between regions (80% on the southern coast and 73% on the western coast). Interaction and exposure times were considered as very adequate (score 5) by 77% of the participants (Figures 8e and 8f). This percentage was much higher than that obtained in the previous workshop, corroborating the importance of adapting the event considering the opinions and suggestions obtained (38% on the western coast). In 82% of the responses, the rating regarding the suitability of the speakers was 5 points (Figure 8g), a similar percentage to that obtained in the previous workshops (87% on the southern coast and 85% on the western coast).

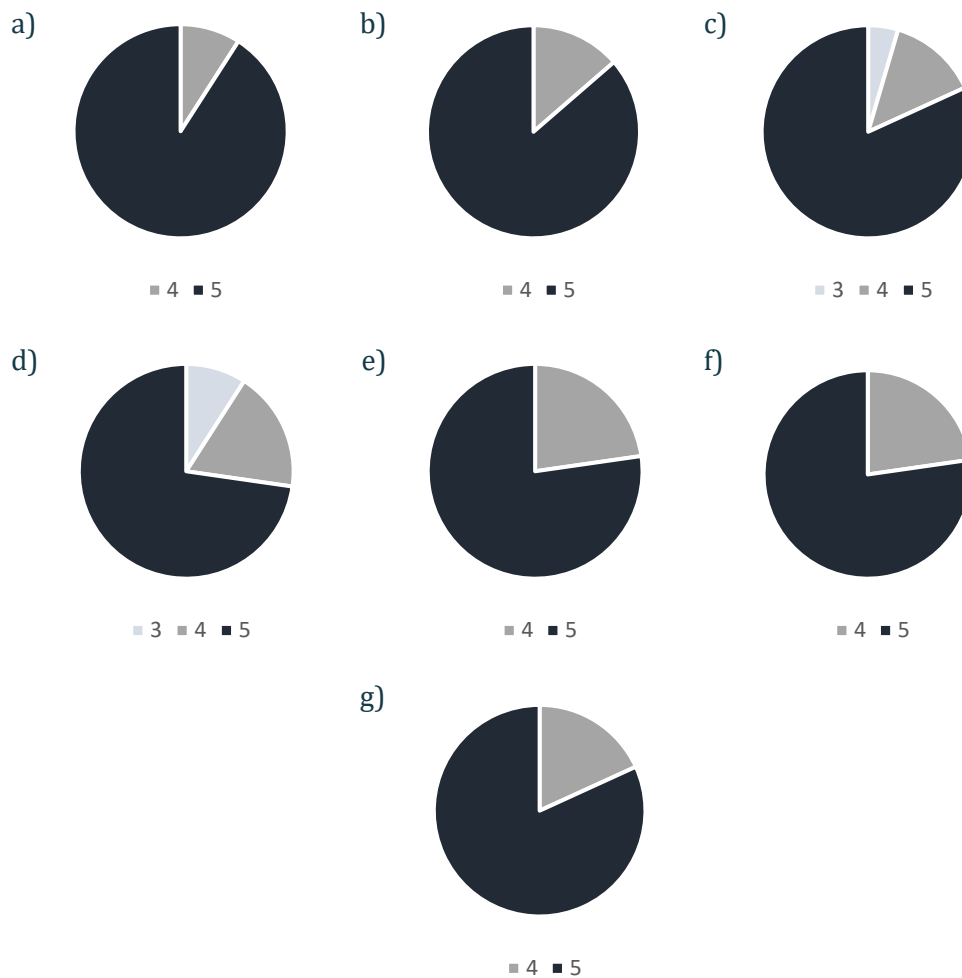


Figure 8. Results of the evaluation forms regarding the content of the CetAMBICion workshop with the fishing sector in Portugal – Portuguese Coast (WK4). Each pie chart shows the distribution of the scored given to the questions: a) “Do you think the workshop was useful?”. Number of answers analysed: 22; b) “Do you think the topics were correctly covered?”. Number of answers analysed: 22; c) “Do you think the lectures were the most suitable?”. Number of answers analysed: 22; d) “Do you think that your opinion was heard and considered?”. Number of answers analysed: 22; e) “Did you consider the times of exposure moments sufficient?”. Number of answers analysed: 21; f) “Did you consider the times of interactive moments sufficient?”. Number of answers analysed: 21; and g) “Do you think the speakers were the most suitable?”. Number of answers analysed: 22. Rating ranges between 1 (not at all) to 5 (a lot).

Workshop organisation and logistics

Regarding the organisation and logistics of the workshop, the question with the highest proportion of answers with the highest score was about the catering service, with 96% of participants answering with a 5 (Figure 9a). This percentage improved significantly compared to the previous workshops (84% on the southern coast and 64% on the western coast), which may be related to the choice of catering service. In fact, the service contracted differed from previous ones in that its menus favoured products with species from our coast, in particular mackerel and horse mackerel, mostly caught by the purse seine fishing gear.

As in the previous workshops, the choice of location was also one of the questions with a higher proportion of top-scoring responses, with 91% of participants answering with a 5 (Figure 9b).

On the other hand, the duration of the workshop had a much higher percentage of responses with a rating of 5 compared to the previous workshops (68% on the southern coast and 60% on the western coast), with 87% responding with a 5 (Figure 9c). This is likely related to the increased duration of the workshop (from half day to full day), as suggested by.

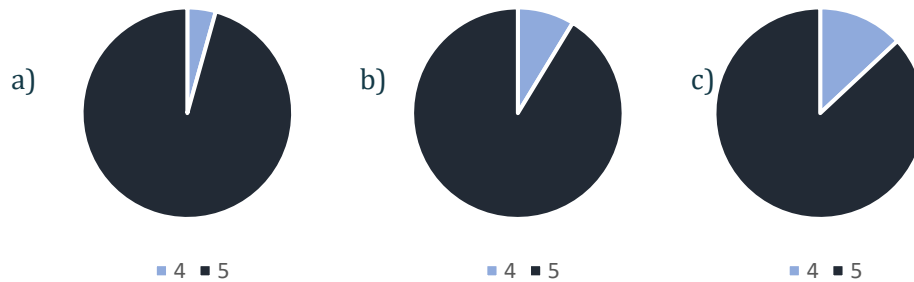


Figure 9. Results of the evaluation forms regarding the organisation and logistics of the CetAMBICion workshop with the fishing sector in Portugal – Portuguese Coast (WK4). Each pie chart shows the distribution of the scored given to the questions: a) “Do you think the catering service was appropriate?”. Number of answers analysed: 23; b) “Do you think the location was appropriate?”. Number of answers analysed: 23; and c) “Do you think the duration of the workshop was appropriate?”. Number of answers analysed: 23. Rating ranges between 1 (not at all) to 5 (a lot).

General Considerations about the workshop

Again, when asked if they would consider attending other similar workshops, all participants gave a positive response. Regarding the most suitable time/day of the week for the fishing sector, participants in general again suggested that future events should take place on Fridays or during weekends. The low participation of the fishing sector was also highlighted at this workshop, along with the low representation of the different fishing gears.

It was also suggested the possibility of participating in future events by videoconference. This was already discussed among the project partners, however, being the main objective of these events the discussion among all participants, it was generally agreed that it is important to continue to opt for the face-to-face format. Furthermore, it is also important to mention that a large part of the participants was willing to travel long distances to attend the last workshop in Peniche, including fishers from the southern coast of Portugal. Finally, one of the participants also suggested that more mitigation trials should be implemented in other parts of the country.

7. Main Conclusions

Mitigation of cetacean bycatch in ABI is a problem that requires strong collaboration among all stakeholders. Meetings between the fishing sector, competent authorities, academic and research institutions, and NGOs, such as the workshops promoted under CetAMBICion, can lead to consensual practical solutions and should be more frequent. However, for a positive outcome, there must be willingness and interest from all parties.

In general, according to the feedback from all the workshops, cetacean bycatch was considered a problem both for the conservation of this group of animals (when mortality of the animals occurs) and for the fishers who suffer not only monetary but also emotional and physical harm. Fishers have shown willingness and readiness to test new methods, participate in the development of new solutions, propose ideas and engage with science to address and mitigate the problem. The importance of engaging and collaborating with fishers is obvious, and with the fishing sector being the most important piece of the puzzle, their motivation should be harnessed by science and administration and policy makers to mitigate the impact of fishing on cetaceans.

A recurrent issue that seems to be relevant in the motivation for mitigation of bycatch, and which deserves to be discussed, is the issue of financial support. There should be a greater concern to support fishers in obtaining funding to adopt the necessary measures to mitigate cetacean bycatch.

To improve the effectiveness of this type of initiative, it is important to consider all suggestions, namely: keep introductory talks short, include fishers' talks, have longer interactive moments where all participants are heard (their opinions, suggestions, questions, concerns), schedule events on Friday afternoons, weekends, preferably during winter (i.e., occasions when fishing activities have less effort), and ideally in locations close to relevant fishing ports. In fact, by considering the results of the first two face-to-face workshops in the organisation of the Portuguese coast workshop, we contributed significantly to its greater success. We also suggest the practice of consulting previously with the guests about the topics they would like to see addressed.

Appendix 1

EXERCÍCIO PRÁTICO – MESAS DE TRABALHO

O problema das interações entre golfinhos e pescarias é um problema mundial que tem vindo a agravar-se nas últimas décadas.

A atividade piscatória tem como alvo algumas das espécies que são o alimento preferido dos golfinhos. À medida que os recursos disponíveis têm vindo a diminuir, os golfinhos, como predadores marinhos inteligentes, procuram ser o mais eficientes possível na procura de alimento, reduzindo os custos de tempo, energia e distância até ao local onde este se encontra. Por este motivo, seguem, muitas vezes, as embarcações de pesca. Assim, a interação entre artes de pesca e estes mamíferos torna-se inevitável, podendo ocorrer depredação do pescado e/ou destruição de redes com perda económica para o pescador e levando muitas vezes à morte acidental de golfinhos por emaranhamento ou ingestão de redes.

O Projeto CetAMBICion não trabalha para mudar legislações ou estatutos de proteção/conservação, mas sim para otimizar mecanismos práticos que tornem as pescarias portuguesas mais sustentáveis, minimizando o seu impacto em espécies não-alvo, como um passo vital para a conservação da biodiversidade marinha, como nos é exigido por legislações da Comunidade Europeia. Existem dois objetivos específicos neste trabalho: 1) diminuir as perdas económicas dos pescadores e 2) diminuir a morte destes animais capturados acidentalmente nas artes de pesca. **Tal trabalho só pode ser feito com a troca de conhecimento entre pescadores e cientistas.**

Assim, no âmbito deste Workshop, propomos a divisão dos participantes em mesas de trabalho para realizarem um exercício de compilação das suas perspetivas em relação a possíveis medidas técnicas e comportamentais no sector de pesca que podem minimizar o problema acima descrito. No final deste exercício de 60 minutos, **um representante de cada mesa** ficará encarregue de apresentar à restante sala um resumo das conclusões obtidas.

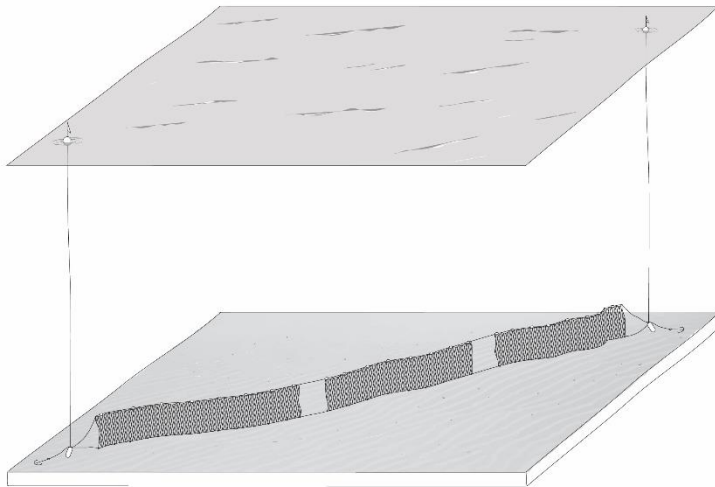


Este projeto enquadra-se no programa DG ENV/DQEM 2020 (Diretiva-Quadro de Estratégia Marinha) da Comissão Europeia, e os objetivos estão alinhados com a Diretiva Habitats e a Política Comum das Pescas.

REDES FIXAS – MEDIDAS TÉCNICAS

PROBLEMA: As redes são barreiras com centenas de metros ou alguns quilômetros de comprimento que podem não ser detetadas pelo “biosonar” dos cetáceos (forma que utilizam para comunicar, alimentar ou movimentar-se debaixo de água). Isto pode dever-se a vários fatores, como por exemplo o tipo de material com que as redes são feitas, ou porque a sua operacionalidade e tamanho coloca os cetáceos que se aproximam em risco, causando muitas vezes a sua captura acidental e morte.

1. Seguem-se algumas medidas técnicas que podem minimizar os problemas da interação pescas-cetáceos nesta arte. Façam uma reflexão sobre estas possibilidades, referindo: prós e contras para o sector pesqueiro, opinião sobre a aplicação destas medidas, possíveis adaptações à realidade do sector, se já são medidas praticadas e com que frequência.



1.1. Alteração das redes.

Exemplo: Criar um espaço entre os panos de rede.

Estudos nos EUA têm revelado que as capturas acidentais de golfinhos em redes ocorrem muitas vezes nas extremidades das redes, o que leva a supor que os animais tentam procurar janelas de escape (ver figura ao lado). É possível fazer esta alteração e testá-la numa experiência no futuro?

A considerar nesta experiência:

- 1. Avaliar o nível de interações com golfinhos, de capturas de peixe e fazer o balanço económico (a possível diminuição de interações com golfinhos pode trazer benefícios económicos devido a haver menos danos nas redes e menor quantidade de pescado rejeitado, danificado pelos golfinhos).*
- 2. Considerar esta solução para as diferentes espécies de golfinhos (ex.: golfinho-comum e roaz).*

REDES FIXAS – MEDIDAS TÉCNICAS

Prós

Contras

1.2. Utilização de alarmes acústicos.

Ter em conta os resultados que foram apresentados e que o preço da utilização de alarmes por embarcação varia entre os 600 a 900 euros por Km de rede.

Prós

Contras

REDES FIXAS – MEDIDAS TÉCNICAS

2. Qual a opinião geral sobre estas medidas? Será que há outras alterações técnicas que podem ser feitas para impedir a captura acidental de golfinhos em redes? Se sim, quais?

REDES FIXAS – MEDIDAS COMPORTAMENTAIS

Façam uma reflexão sobre as seguintes questões:

1. Em que áreas ou pesqueiros notam que existe maior risco de conflito com golfinhos?
2. Que golfinhos estão mais associadas a este conflito? Indiquem as espécies que mais ficam presas e/ou que causam danos nas artes.
3. Indiquem as possíveis razões para este conflito.
4. Será que existe alguma alteração na rotina da pesca (ex.: tempos de calagem) ou na arte (ex.: o seu tamanho) que possa ser feita para evitar ou diminuir estas interações? Perspetivem a médio-longo prazo.
Exemplo: Em algumas zonas do Algarve, é na rede utilizada para o tamboril que se observam mais capturas acidentais de golfinhos e de outras espécies protegidas (aves marinhas e tartarugas marinhas). O tamboril não é o alimento favorito dos golfinhos mais capturados (golfinho-comum, roaz, boto e golfinho-riscado). O que poderá estar a acontecer? Mudariam alguma forma de praticar esta arte?

REDES FIXAS – CONSIDERAÇÃO GERAL

Como perspetivam a adoção de medidas técnicas e/ou comportamentais para dar resposta a este problema? Consideram ser uma questão a resolver apenas pelo setor pesqueiro? Consideram necessária/importante a colaboração/cooperação com entidades científicas/governamentais/autoridades competentes? De que forma deve ser realizada essa colaboração/cooperação?

Appendix 2

EXERCÍCIO PRÁTICO – MESAS DE TRABALHO

O problema das interações entre golfinhos e pescarias é um problema mundial que tem vindo a agravar-se nas últimas décadas.

A atividade piscatória tem como alvo algumas das espécies que são o alimento preferido dos golfinhos. À medida que os recursos disponíveis têm vindo a diminuir, os golfinhos, como predadores marinhos inteligentes, procuram ser o mais eficientes possível na procura de alimento, reduzindo os custos de tempo, energia e distância até ao local onde este se encontra. Por este motivo, seguem, muitas vezes, as embarcações de pesca. Assim, a interação entre artes de pesca e estes mamíferos torna-se inevitável, podendo ocorrer depredação do pescado e/ou destruição de redes com perda económica para o pescador e levando muitas vezes à morte acidental de golfinhos por emaranhamento ou ingestão de redes.

O Projeto CetAMBICion não trabalha para mudar legislações ou estatutos de proteção/conservação, mas sim para otimizar mecanismos práticos que tornem as pescarias portuguesas mais sustentáveis, minimizando o seu impacto em espécies não-alvo, como um passo vital para a conservação da biodiversidade marinha, como nos é exigido por legislações da Comunidade Europeia. Existem dois objetivos específicos neste trabalho: 1) diminuir as perdas económicas dos pescadores e 2) diminuir a morte destes animais capturados acidentalmente nas artes de pesca. **Tal trabalho só pode ser feito com a troca de conhecimento entre pescadores e cientistas.**

Assim, no âmbito deste Workshop, propomos a divisão dos participantes em mesas de trabalho para realizarem um exercício de compilação das suas perspetivas em relação a possíveis medidas técnicas e comportamentais no sector de pesca que podem minimizar o problema acima descrito. No final deste exercício de 60 minutos, **um representante de cada mesa** ficará encarregue de apresentar à restante sala um resumo das conclusões obtidas.



Este projeto enquadra-se no programa DG ENV/DQEM 2020 (Diretiva-Quadro de Estratégia Marinha) da Comissão Europeia, e os objetivos estão alinhados com a Diretiva Habitats e a Política Comum das Pescas.

CERCO – MEDIDAS TÉCNICAS

PROBLEMA: No momento da largada, os animais não são muitas vezes detetados, acabando por ficar dentro da rede, sendo só libertados no final das operações. Além disso, quando libertados vivos, o método para os libertar é muitas vezes fisicamente traumático para os animais (ex.: laçar os golfinhos pela cauda e içá-lo com a grua ou pau de carga para fora da rede), causando frequentemente posterior arrojamento/morte do animal.

1. Seguem-se algumas medidas técnicas que podem minimizar os problemas da interação pescas-cetáceos nesta arte. Façam uma reflexão sobre estas possibilidades, referindo: prós e contras para o sector pesqueiro, opinião sobre a aplicação destas medidas, possíveis adaptações à realidade do sector, se já são medidas praticadas e com que frequência.

EVITAR CAPTURA

1.1 Utilização de alarmes acústicos.

Ter em conta os resultados que foram apresentados e que o preço da utilização de alarmes por embarcação de cerco ronda os 300 euros (apenas é necessário 1 alarme - DDD).

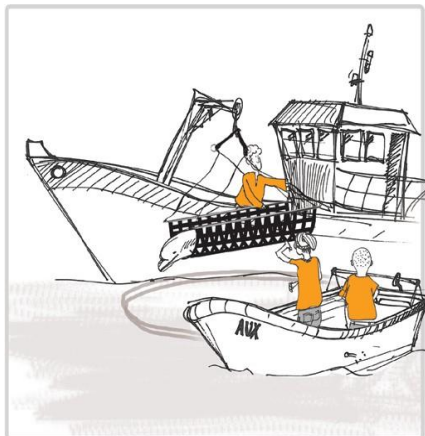
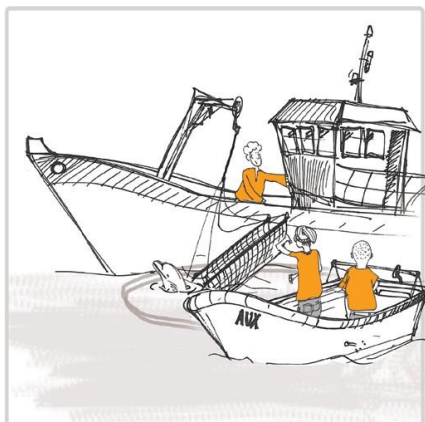
Prós

Contras

CERCO – MEDIDAS TÉCNICAS

APÓS CAPTURA

1.2 Utilização de uma maca ou cinta para deslizar o animal pelo abdómen (ver figuras abaixo), para o deslocar até à cortiça e libertá-lo em segurança.



Prós

Contras

CERCO – MEDIDAS TÉCNICAS

1.3 Baixar a cortiça criando uma janela de escape.

Prós	Contras

1.4 Desligar as sondas após a viragem da retenida para minimizar o stress dos golfinhos.

Prós	Contras

CERCO – MEDIDAS TÉCNICAS

**2. Qual a opinião geral sobre estas medidas? Será que há outras alterações técnicas que podem ser feitas para impedir a captura acidental de golfinhos na arte do cerco?
Se sim, quais?**

CERCO – MEDIDAS COMPORTAMENTAIS

Façam uma reflexão sobre as seguintes questões:

1. Que comportamentos podem ser praticados a bordo para evitar a captura de golfinhos?

2. Seguem-se algumas medidas comportamentais que podem minimizar os problemas da interação pescas-cetáceos nesta arte. Façam uma reflexão sobre estas possibilidades, referindo: prós e contras para o sector pesqueiro, opinião sobre a aplicação destas medidas, possíveis adaptações à realidade do sector, se já são medidas praticadas e com que frequência.

2.1 Na sua pescaria, pontualmente e durante o dia, a observação de aves marinhas e golfinhos na proximidade das embarcações serve como indicador da presença de peixe. No entanto, largadas muito próximo destes animais podem levar a capturas acidentais. Reflita sobre a possibilidade de não largar quando são detetados golfinhos na proximidade da embarcação a uma distância que pode levar a uma captura acidental indesejada.

Prós	Contras

CERCO – MEDIDAS COMPORTAMENTAIS

2.2 Ter um observador/camarada pescador dedicado a comunicar a presença de animais ao mestre, o qual poderá informar outras embarcações nas proximidades.

Prós

Contras

CERCO – CONSIDERAÇÃO GERAL

Como perspetivam a adoção de medidas técnicas e/ou comportamentais para dar resposta a este problema? Consideram uma questão a resolver apenas pelo setor pesqueiro? Consideram necessária/importante a colaboração/cooperação com entidades científicas/governamentais/autoridades competentes? De que forma deve ser realizada essa colaboração/cooperação?

Appendix 3

EXERCÍCIO PRÁTICO – MESAS DE TRABALHO

O problema das interações entre golfinhos e pescarias é um problema mundial que tem vindo a agravar-se nas últimas décadas.

A atividade piscatória tem como alvo algumas das espécies que são o alimento preferido dos golfinhos. À medida que os recursos disponíveis têm vindo a diminuir, os golfinhos, como predadores marinhos inteligentes, procuram ser o mais eficientes possível na procura de alimento, reduzindo os custos de tempo, energia e distância até ao local onde este se encontra. Por este motivo, seguem, muitas vezes, as embarcações de pesca. Assim, a interação entre artes de pesca e estes mamíferos torna-se inevitável, podendo ocorrer depredação do pescado e/ou destruição de redes com perda económica para o pescador e levando muitas vezes à morte acidental de golfinhos por emaranhamento ou ingestão de redes.

O Projeto CetAMBICion não trabalha para mudar legislações ou estatutos de proteção/conservação, mas sim para otimizar mecanismos práticos que tornem as pescarias portuguesas mais sustentáveis, minimizando o seu impacto em espécies não-alvo, como um passo vital para a conservação da biodiversidade marinha, como nos é exigido por legislações da Comunidade Europeia. Existem dois objetivos específicos neste trabalho: 1) diminuir as perdas económicas dos pescadores e 2) diminuir a morte destes animais capturados acidentalmente nas artes de pesca. **Tal trabalho só pode ser feito com a troca de conhecimento entre pescadores e cientistas.**

Assim, no âmbito deste Workshop, propomos a divisão dos participantes em mesas de trabalho para realizarem um exercício de compilação das suas perspetivas em relação a possíveis medidas técnicas e comportamentais no sector de pesca que podem minimizar o problema acima descrito. No final deste exercício de 60 minutos, **um representante de cada mesa** ficará encarregue de apresentar à restante sala um resumo das conclusões obtidas.



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XÁVEGA – MEDIDAS TÉCNICAS

PROBLEMA: Os animais ficam muitas vezes dentro da rede, sendo apenas possível libertar os golfinhos quando o saco chega à praia, causando-lhes muito stress e alguns casos de mortalidade. Já na praia, o método para os libertar e a forma de os devolver à água com vida é, muitas vezes, fisicamente traumático levando frequentemente a posterior arrojamento/morte do animal.

1. Seguem-se algumas medidas técnicas que podem minimizar os problemas da interação pescas-cetáceos nesta arte. Façam uma reflexão sobre estas possibilidades, referindo: prós e contras para o sector pesqueiro, opinião sobre a aplicação destas medidas, possíveis adaptações à realidade do sector, se já são medidas praticadas e com que frequência.

EVITAR CAPTURA

1.1 Utilização de alarmes acústicos.

Está satisfeito com as características técnicas dos dispositivos acústicos para dissuadir golfinhos previstos no nº 1 do artigo 5º da Portaria nº 172/2017 de 25 de maio e descritos no Despacho Nº 19/DG/2020? Comente também sobre a sua eficácia para eliminar capturas acidentais indesejadas de golfinhos ou botos.

Prós	Contras

XÁVEGA – MEDIDAS TÉCNICAS

1.1.1. Com que frequência utiliza alarmes acústicos na sua área de operação?

APÓS CAPTURA

1.2 Quando na praia, utilização de uma maca de lona (ver figura abaixo) para libertarem os animais em segurança em alternativa ao arrastamento dos golfinhos de volta para o mar.



Prós

Contras

XÁVEGA – MEDIDAS TÉCNICAS

2. Na impossibilidade de abortar o lance depois de confirmada a presença de golfinhos no interior da rede, qual a melhor maneira de libertar os golfinhos quando se dá a alagem? Só na praia? Sim ou não? Porquê?

3. Qual a opinião geral sobre estas medidas? Será que há outras alterações técnicas que podem ser feitas para impedir a captura acidental de cetáceos na arte da xávega? Se sim, quais?

XÁVEGA – MEDIDAS COMPORTAMENTAIS

Façam uma reflexão sobre as seguintes questões:

1. Que comportamentos podem ser praticados para evitar a captura de golfinhos durante a largada / alagem da xávega?

2. Seguem-se algumas medidas comportamentais que podem minimizar os problemas da interação pescas-cetáceos nesta arte. Façam uma reflexão sobre estas possibilidades, referindo: prós e contras para o sector pesqueiro, opinião sobre a aplicação destas medidas, possíveis adaptações à realidade do sector, se já são medidas praticadas e com que frequência.

2.1 Na sua pescaria, a observação de aves marinhas e golfinhos na proximidade das embarcações serve como indicador da presença de peixe. No entanto, largadas muito próximo destes animais podem levar a capturas acidentais que depois se refletem em situações muito indesejadas quando o saco da rede chega à praia. Reflita sobre a possibilidade de não largar quando são detetados golfinhos na proximidade da rede, a uma distância que pode levar a uma captura acidental indesejada.

Prós	Contras

XÁVEGA – MEDIDAS COMPORTAMENTAIS

2.2 Ter um observador/camarada pescador dedicado a comunicar a presença de animais ao mestre.

Prós

Contras

XÁVEGA – CONSIDERAÇÃO GERAL

Como perspetivam a adoção de medidas técnicas e/ou comportamentais para dar resposta a este problema? Consideram uma questão a resolver apenas pelo setor pesqueiro? Consideram necessária/importante a colaboração/cooperação com entidades científicas/governamentais/autoridades competentes? De que forma deve ser realizada essa colaboração/cooperação?

Appendix 4

Evaluation Form

“Fisheries and Cetaceans: an inclusive conversation on good practices and solutions for the sector”

Workshop Content

Rate from 1 (not at all) to 5 (a lot).

1. Do you think the workshop was useful?
2. Do you think the topics were correctly covered?
3. Do you think that your opinion was heard and considered?
4. Do you think the speakers were the most suitable?
5. Do you think the lectures were the most suitable?
6. Do you considered the times of interaction and exposure moments to be balanced?

Workshop Organization and Logistics

Rate from 1 (not at all) to 5 (a lot).

1. Do you think the duration of the workshop was appropriate?
2. Do you think the location was appropriate?
3. Do you think the catering service was appropriate?

General Workshop Considerations

1. Do you plan to attend future workshops on this topic?
2. What time/day of the week do you consider most convenient for the fishing sector to attend future workshops?
3. What suggestions for improvement would you give us?

Appendix 5

Table A1. List of the participants invited to the CetAMBICion workshop for the fishing sector in Portugal – Southern Coast (WK2). Lines in green indicate the entities who attended the workshop.

Acronyms	Entities	Sector
AAPABMG	Associação dos Armadores de Pesca Artesanal da Baía de Monte Gordo	Fisheries
AAPSACV	Associação de Armadores de Pesca Artesanal e do Cerco do Sudoeste Alentejano e Costa Vicentina	Fisheries
AMIC	Associação dos Moradores da Ilha da Culatra	Fisheries
AMN	Autoridade Marítima Nacional	Competent Authorities
ANOPCERCO	Associação Nacional das Organizações de Produtores da Pesca do Cerco	Fisheries
APPACV	Associação dos Pescadores do Portinho da Arrifana e Costa Vicentina	Fisheries
Barlapescas	Cooperativa dos Armadores de Pesca do Barlavento	Fisheries
CIIMAR	Interdisciplinary Centre of Marine and Environmental Research	Academic and Research Institutions
Docapesca	Docapesca – Portos e Lotas	Fisheries
DGRM	Directorate General of Natural Resources, Safety and Maritime Services	Competent Authorities
ICNF	Institute for Nature Conservation and Forests	Competent Authorities
IPMA	Portuguese Institute for Sea and Atmosphere	Academic and Research Institutions
MARE-UE	Marine and Environmental Sciences Center of the University of Évora	Academic and Research Institutions
OLHÃOPESCA	Organização de Produtores de Pesca do Algarve, CRL	Fisheries
PONG-Pesca	Plataforma de ONG Portuguesas sobre a Pesca	NGO
QUARPESCA	Associação dos Armadores de Pesca de Quarteira	Fisheries
SCIAENA	SCIAENA	NGO
UALg	University of Algarve	Academic and Research Institutions

Table A2. List of the participants invited to the CetAMBICion workshop for the fishing sector in Portugal – Western Coast (WK3). Lines in green indicate the entities who attended the workshop.

Acronyms	Entities	Sector
-	Associação de Pescadores Profissionais e Desportivos de Vila Praia de Âncora	Fisheries
-	Cooperativa de Produtores de Peixe do Centro Litoral	Fisheries
AAPCN	Associação dos Armadores de Pesca de Castelo de Neiva	Fisheries
AAPCS	Associação dos Armadores da Pesca do Centro e Sul	Fisheries
AAPLCLZO	Associação dos Armadores da Pesca Local, Costeira e Largo da Zona Oeste	Fisheries
AAPN	Associação de Armadores de Pesca do Norte	Fisheries
AAPP	Associação de Apoio aos Profissionais de Pesca	Fisheries
AAPSACV	Associação de Armadores da Pesca Artesanal e do Cerco do Sudoeste Alentejano e da Costa Vicentina	Fisheries
ADAP	Associação de Desenvolvimento e Apoio às Pescas em Porto Dinheiro	Fisheries
ADAPI	Associação dos Armadores das Pescas Industriais	Fisheries
ADAPLA	Associação dos Armadores da Pesca Longínqua	Fisheries
ALA	Associação de Pesca Artesanal, Local e Costeira e de Apoio Social aos Pescadores	Fisheries
AMAPA	Associação Mútua dos Armadores de Pesca de Angeiras	Fisheries
AMAR SÃO PEDRO	Associação Mar e Rio de São Pedro	Fisheries
AMN	Autoridade Marítima Nacional	Competent Authorities
ANOPCERCO	Associação Nacional das Organizações de Produtores da Pesca do Cerco	Fisheries
APA	Agência Portuguesa do Ambiente	Competent Authorities
APA	Administração do Porto de Aveiro	Competent Authorities
APAASMP	Associação de Pesca e Apanha de Algas de São Martinho do Porto	Fisheries
APAC	Associação de Pesca do Arrasto Costeiro	Fisheries
APARA	Associação de Pesca Artesanal da Região de Aveiro	Fisheries
APDL	Administração dos Portos do Douro, Leixões e Viana do Castelo, SA	Competent Authorities
APFF	Administração do Porto da Figueira da Foz	Competent Authorities
APPACV	Associação dos Pescadores do Portinho da Arrifana e Costa Vicentina	Fisheries
APPC	Associação de Profissionais da Pesca de Cascais	Fisheries
APPCE	Associação dos Pescadores Profissionais do Concelho de Esposende	Fisheries
APPPA	Associação dos Pescadores da Pesca Profissional da Afurada	Fisheries
APPRMM	Associação de Profissionais de Pesca do Rio Minho e Mar	Fisheries

Apropesca	Organização de Produtores de Pesca Artesanal	Fisheries
APX	Associação Portuguesa da Arte Xávega	Fisheries
AVCP	Associação Vila Chã Pesca	Fisheries
CESAM	Centre for Environmental and Marine Studies	Academic and Research Institutions
CIIMAR	Interdisciplinary Centre for Marine and Environmental Research	Academic and Research Institutions
DGRM	Directorate General of Natural Resources, Safety and Maritime Services	Competent Authorities
Docapesca	Docapesca	Fisheries
ICNF	Institute for Nature Conservation and Forests	Competent Authorities
IPMA	Portuguese Institute for Sea and Atmosphere	Academic and Research Institutions
PESQUISUCESO	Associação de Pescadores Pesquisucesso	Fisheries
PONG-Pesca	Plataforma de ONG Portuguesas sobre a Pesca	NGO
PROPEIXE	Cooperativa de Produção de Peixe do Norte	Fisheries
SCIAENA	SCIAENA	NGO
Sesibal	Cooperativa de Pesca de Setúbal, Sesimbra e Sines, CRL	Fisheries
SETUBALPESCA	Associação Pesca Artesanal	Fisheries
UAlg	University of Algarve	Academic and Research Institutions
UMinho	University of Minho	Academic and Research Institutions
Vianapesca	Cooperativa de Produtores de Peixe de Viana do Castelo	Fisheries

Table A3. List of the participants invited to the CetAMBICion workshop for the fishing sector in Portugal – Portuguese Coast (WK4). Lines in green indicate the entities who attended the workshop.

Acronyms	Entities	Sector
-	Associação de Pescadores Profissionais e Desportivos de Vila Praia de Âncora	Fisheries
-	Cooperativa de Produtores de Peixe do Centro Litoral	Fisheries
AAPABMG	Associação dos Armadores de Pesca Artesanal da Baía de Monte Gordo	Fisheries
AAPCN	Associação dos Armadores de Pesca de Castelo de Neiva	Fisheries
AAPCS	Associação dos Armadores da Pesca do Centro e Sul	Fisheries
AAPLCLZO	Associação dos Armadores da Pesca Local, Costeira e Largo da Zona Oeste	Fisheries
AAPN	Associação de Armadores de Pesca do Norte	Fisheries
AAPP	Associação de Apoio aos Profissionais de Pesca	Fisheries
AAPSACV	Associação de Armadores da Pesca Artesanal e do Cerco do Sudoeste Alentejano e da Costa Vicentina	Fisheries
ADAP	Associação de Desenvolvimento e Apoio às Pescas em Porto Dinheiro	Fisheries
ADAPI	Associação dos Armadores das Pescas Industriais	Fisheries
ADAPLA	Associação dos Armadores da Pesca Longínqua	Fisheries
ALA	Associação de Pesca Artesanal, Local e Costeira e de Apoio Social aos Pescadores	Fisheries
AMAPA	Associação Mútua dos Armadores de Pesca de Angeiras	Fisheries
AMAR SÃO PEDRO	Associação Mar e Rio de São Pedro	Fisheries
AMIC	Associação dos Moradores da Ilha da Culatra	Fisheries
AMN	Autoridade Marítima Nacional	Competent Authorities
ANOPCERCO	Associação Nacional das Organizações de Produtores da Pesca do Cerco	Fisheries
APA	Agência Portuguesa do Ambiente	Competent Authorities
APA	Administração do Porto de Aveiro	Competent Authorities
APAASMP	Associação de Pesca e Apanha de Algas de São Martinho do Porto	Fisheries
APAC	Associação de Pesca do Arrasto Costeiro	Fisheries
APARA	Associação de Pesca Artesanal da Região de Aveiro	Fisheries
APDL	Administração dos Portos do Douro, Leixões e Viana do Castelo, SA	Competent Authorities
APFF	Administração do Porto da Figueira da Foz	Competent Authorities
APL	Administração do Porto de Lisboa	Competent Authorities
APPACV	Associação dos Pescadores do Portinho da Arrifana e Costa Vicentina	Fisheries
APPC	Associação de Profissionais da Pesca de Cascais	Fisheries

APPCE	Associação dos Pescadores Profissionais do Concelho de Esposende	Fisheries
APPPA	Associação dos Pescadores da Pesca Profissional da Afurada	Fisheries
APPRMM	Associação de Profissionais de Pesca do Rio Minho e Mar	Fisheries
Apropesca	Organização de Produtores de Pesca Artesanal	Fisheries
APSA	Administração dos Portos de Sines e do Algarve	Competent Authorities
APSS	Administração dos Portos de Setúbal e Sesimbra	Competent Authorities
APX	Associação Portuguesa da Arte Xávega	Fisheries
AVCP	Associação Vila Chã Pesca	Fisheries
Barlapescas	Cooperativa dos Armadores de Pesca do Barlavento	Fisheries
CESAM	Centre for Environmental and Marine Studies	Academic and Research Institutions
CIIMAR	Interdisciplinary Centre for Marine and Environmental Research	Academic and Research Institutions
DGRM	Directorate General of Natural Resources, Safety and Maritime Services	Competent Authorities
Docapesca	Docapesca	Fisheries
ESTM	School of Tourism and Maritime Technology	Academic and Research Institutions
ICNF	Institute for Nature Conservation and Forests	Competent Authorities
IPMA	Portuguese Institute for Sea and Atmosphere	Academic and Research Institutions
MARE-UE	Marine and Environmental Sciences Center of the University of Évora	Academic and Research Institutions
OLHÃOPESCA	Organização de Produtores de Pesca do Algarve, CRL	Fisheries
PESQUISUCESO	Associação de Pescadores Pesquisucesso	Fisheries
PONG-Pesca	Plataforma de ONG Portuguesas sobre a Pesca	NGO
PROPEIXE	Cooperativa de Produção de Peixe do Norte	Fisheries
QUARPESCA	Associação dos Armadores de Pesca de Quarteira	Fisheries
SCIAENA	SCIAENA	NGO
Sesibal	Cooperativa de Pesca de Setúbal, Sesimbra e Sines, CRL	Fisheries
SETUBALPESCA	Associação Pesca Artesanal	Fisheries
UAlg	University of Algarve	Academic and Research Institutions
UMinho	University of Minho	Academic and Research Institutions
Vianapesca	Cooperativa de Produtores de Peixe de Viana do Castelo	Fisheries