

Guidelines on the principles of cooperation and best practices

Deliverable 2.3

Version 6

Work Package no.	WP2
Deliverable no.	2.3
Lead Beneficiary	LVVN
Topic	Best practice in fisheries stakeholder engagement on bycatch of ETP species
Grant Agreement No.	101114301 — LIFE22-NAT-NL-LIFE
Dissemination Level	Public
Date	17 July 2025

Please cite this work as: Guidelines on the principles of cooperation and best practices, Steven Mackinson & Marije L. Siemensma CIBBRiNA 2025

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Executive summary

This guidance document provides advice and recommendations from a series of interviews with different stakeholders involved in CIBBRiNA in the field of bycatch mitigation (Section 2), based on a compilation of short videos that give insights into real experiences. Section 3 offers core principles for effective collaboration among all stakeholders and a deeper-dive on best practices to achieve successful and effective collaboration with fishing industry stakeholders and impact with policy makers on work to reduce bycatch of ETP species. This is based on an expert review of both peer reviewed and grey literature (Section 3). Section 4 employs AI as a tool to summarize the essential lessons learned from this literature and compare it to the synthesis undertaken by experts from CIBBRiNA. It should be acknowledged that an extensive but not an exhaustive list of literature has been reviewed, although the literature list was chosen based on specific criteria.

Background to CIBBRiNA

The Coordinated Development and Implementation of Best Practice in Bycatch Reduction in the North Atlantic, Baltic and Mediterranean Regions (CIBBRiNA) project aims to minimise the bycatch of Endangered, Threatened and Protected (ETP) species in the North-East Atlantic, Baltic, and Mediterranean seas, working collaboratively as fishers, authorities, scientists, and other relevant stakeholders to achieve this. The species that we focus on include a variety of mammals, birds, turtles, and elasmobranchs (sharks, skates, and rays).

Through cross-border and cross-sectoral collaboration involving stakeholders from 13 European countries, CIBBRiNA is establishing mitigation, monitoring, and assessment programmes in a selection of fisheries with a higher risk of bycatch. Within a proactively fostered “Safe Working Environment” characterised by mutual trust, safety, and cooperation, we will build on a review of current approaches and learning from our Case Study fisheries to deliver an innovative toolbox designed to be integrated into policy and best practice in European fisheries management.

CIBBRiNA is funded by the EU’s LIFE programme and runs from 2023 to 2029.

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Purpose and intended use

The purpose of CIBBRiNA Deliverable 2.3 is to inspire and support partners in their engagement with the fishing industry and other stakeholders by providing guidance on the principles of cooperation and best practice experiences. Deliverable 2.3 will also be communicated more widely so that anyone beyond CIBBRiNA can benefit from the learnings produced.

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1. Introduction

1.1 Best practice in engaging fisheries stakeholders in CIBBRiNA

Different stakeholders have different needs, resources, capabilities, roles and responsibilities; each of which determines the approaches to engagement that will have the best chance of success.

Much guidance already exists on what constitutes good practice in stakeholder engagement in research actions across the world. The EU's policy on Responsible Research and Innovation (RRI) provides both a framework and guidance for what this means in practice. There are many examples across many research disciplines, which are not duplicated here; instead, the aim of this guidance is to provide information relevant to support the work of CIBBRiNA partners and the wider communities engaged in bycatch mitigation of Endangered, Threatened, and Protected (ETP) species. In this regard, CIBBRiNA puts engagement with fisheries stakeholders at the heart of developing practical solutions for monitoring and mitigating bycatch.

Bycatch is a sensitive issue, for fishers, the public, managers and policy makers alike. This also makes the 'conditions' or 'climate' for engagement sensitive, because those involved may face reputational fears and economic loss, and can be at risk of confrontation with opposing views, which may affect their personal wellbeing.

This guidance is for all stakeholders who aim to minimise bycatch of ETP species in effective ways. Whether they are researchers, environmental NGOs, policymakers, fishing industry stakeholders¹, or otherwise have an interest in the topic, this guidance aims to give both general and practical guidance to start exploring fruitful ways of collaboration based on expert advice and literature reviewed.

In the CIBBRiNA Stakeholder Engagement and Communication Strategy, CIBBRiNA's stakeholder groups have been identified and defined. A CIBBRiNA stakeholder is any person or organisation which affects or is affected by a decision, process, action, output and/or outcome of the CIBBRiNA project. The strategy provides definitions of the different stakeholder groups and provides guidance for CIBBRiNA engagement activities. The guidelines on principles and best practices in this document align with the CIBBRiNA strategy.

2. Approach and Methods

¹ Following the definition in CIBBRiNA's Stakeholder Engagement and Communications Strategy, "Fishing industry stakeholders" refers to: Individual skippers, fishers, and other crew members; Fisheries (catching) sector federations, organisations and associations; Fishing companies; and Fisheries schools and educational programmes.

The approach to D2.3 is to ensure that the guidelines are accessible and useful for CIBBRiNA partners as well as others involved in similar work worldwide. To that end, a two-stage approach has been adopted: the first stage uses videos and audio from those who have worked on reducing bycatch of ETP species, bringing to life what it takes in practice. These contributions have been developed by the CIBBRiNA partners.

The second stage is a synthesis of the essential principles and good practice ‘do’s and don’ts’ drawn from relevant literature covering experiences and perspectives from research and governance arenas around the world.

2.1 Visual and audio

A series of videos have been created by CIBBRiNA’s partners in close collaboration with different stakeholders involved with CIBBRiNA that has led to a “Stakeholder engagement and participation series” of 6 videos.

In this section a brief overview is given of all video contributions. 6 are available at the time of publishing D2.3 pending final editing and consent for public use and more are to come over the course of the project as learning continues. All videos will be published on the CIBBRiNA website's [Results page](#).

1. Interview with Anne-Marie Svoboda, coordinator CIBBRiNA from the Dutch Ministry of Agriculture, Fisheries, Food Security and Nature, Merel den Held, North Sea Foundation, Lotte Kindt-Larsen, DTU Aqua, Gijs Duijndam, skipper.
2. Interview with Alfredo López. Researcher from CEMMA, an NGO from Galicia, Spain, working with marine mammals.
3. Interview with José A. Fernández Bouzas. Director of the “Galician Atlantic Islands Marine-Terrestrial National Park” in Spain.
4. Interview Niels Frederiksen, gillnet fisher and Lotte Kindt-Larsen, Gildas Glemarec and Anne-Mette Kroner, DTU Aqua on Electronic monitoring.
5. Interview with bycatch observers in Ireland: lessons learned, coordinated by the Marine Institute.
6. Interview with members from the Dutch Pelagic Fisheries Association – The role of fishers in the pelagic case study.

2.2 Literature synthesis

The literature synthesis (Section 3) summarises what is necessary for effective cooperation between scientists, the fishing industry, NGOs and policy partners in CIBBRiNA. The review covers the general principles that apply to all these stakeholders and then specifies the operational best practices for engagement with the fishing industry and policy makers. The fishing industry is essential to focus on because their expert role in implementing practical solutions at sea is essential for success, while policy makers are essential in developing implementable policies based on the knowledge from research projects like CIBBRiNA.

The following criteria were used by CIBBRiNA partners involved in WP2 to guide their selection of relevant published and grey literature related to effective stakeholder engagement in fisheries research and management, with a focus on the topic of ETP species bycatch:

- Examples were prioritised if they involved ETP species that are listed in the CIBBRiNA project.
- The fishing industry is or was involved in the work, for example, in relation to aspects such as problem specification, design and implementation of monitoring, evaluation of results.
- Examples from countries with well-developed fisheries management systems were emphasised because of their utility in drawing lessons most applicable in the EU fisheries context.
- Information had to be accessible either in the public domain or from a referenceable source.
- Lessons learned from failures as much as successes were included.

Bearing in mind the two special dimensions related to bycatch mitigation of ETP species (see Section 1.1), the literature review covered the following aspects:

- 1 The 'arena' the stakeholder engagement experiences are related to (i.e. engagement in fishing industry, management, policy, conservation arena).
- 2 Where and when the example(s) or experience refer to.
- 3 How the work is relevant to CIBBRiNA activities for the case studies (i.e. species/fishery interactions, the monitoring and mitigation measures used, the regulatory/policy conditions, communications, other).
- 4 The engagement approaches that worked or did not work – including a short explanation of why and identification of any particular conditions or circumstances that were necessary for success.
- 5 Specific advice or guidance that could be helpful to enable CIBBRiNA partners to do their work effectively.

3. Essential aspects for effective engagement

3.1 Principles adopted by CIBBRiNA

One of the most widely established principles for successful engagement of stakeholders in research and innovation initiatives on any topic is **‘to have engagement from the start and maintain it throughout’**. This basic idea was a foundation for the development of the CIBBRiNA consortium and was subsequently cemented into its constitution under the [Code of Conduct](#) (CoC, Section 6) of the Consortium Agreement. The CoC is intended to promote a Safe Working Environment (SWE, Box 1), guided by a commitment to Key Values (Box 2) underpinning how partners should collaborate in their work.

The SWE (Box 1) and Key Values (Box 2) were agreed by all partners as representing the core operating philosophy for CIBBRiNA because they specifically address the two special dimensions of (i) putting engagement with fisheries stakeholder at the heart of the developing practical solutions, and (ii) adopting engagement approaches that fully recognise that bycatch is a sensitive issue, for fishers, the public, managers and policy makers alike. Thus, the SWE and Key Values are, *de facto*, the essential principles for effective stakeholder engagement in CIBBRiNA.

Box 1. Safe Working Environment (CIBBRiNA)

Achieving effective collaboration requires mutual trust, respect for, and understanding of different perspectives. The incidental bycatch of ETP species is an inherently sensitive subject and adverse publicity has a high potential to disrupt work aimed at finding solutions. Therefore, a “Safe Working Environment” (SWE) is created within which all Parties and their collaborators (including collaborators who are not Parties to the Consortium Agreement) can share information and develop applicable solutions. The elements of the SWE include respecting confidentiality in situations where that is required and/or agreed, supporting the work of the Project and Parties where possible and communicating in good faith on behalf of the Project and the common goal, and abiding by the Stakeholder Engagement and Communication Strategy that will be developed within the Project.

Specific elements of the Safe Working Environment are:

- Information generated by and/or belonging to Parties to this CIBBRiNA Consortium Agreement (including among others data, images, videos, notes) which refers to bycatch or results from specific trials from specific vessels or recognisable fleet segments shall not be shared outside the group of Parties, Affiliated Entities or sub-contractors that generated the information without prior consent of the relevant representatives of those Parties and Affiliated Entities.
- Any publication or dissemination of information that has been compiled as part of the Project, shall – before the material is published/disseminated - be announced to and shared with the Parties or Affiliated Entities who have been involved in the creation of the underlying information of the publication and also the Steering Committee, in accordance with article 12.
- All Parties or Affiliated Entities or third parties who have access to raw data from bycatch mitigation trials, shall sign a standardized CIBBRiNA Non-Disclosure Agreement with all Parties to this Consortium Agreement.
- All Parties, Affiliated Entities or third parties shall respect the General Data Protection Regulation or equivalent applicable legislation.
- Images and video material with bycatch, recognisable people or vessels on it generated by and/or belonging to Parties to this CIBBRiNA Consortium Agreement shall not be used, unless the people or owners of the vessels have agreed to feature in those materials.

Evidently, the existence of the Project, its aims and public deliverables are and/or will be a matter of public record. However clear boundaries as mentioned in the aforementioned bullets are established between what may and may not be disseminated beyond the Parties to this Consortium Agreement, as well as clear rules as to how information may be disseminated, as set out in this Consortium Agreement.

Affiliated Entities, sub-contractors and stakeholders which are not Parties to this Consortium Agreement shall be required to sign a separate Non-disclosure and Confidentiality Agreement with all Parties to this Consortium Agreement thereby accepting the Safe Working Environment Obligations laid down in this Consortium Agreement.

Box 2. Key values (CIBBRiNA)

1. To facilitate joint work between fishers, authorities, researchers, NGOs and other relevant stakeholders aiming to minimise - and, where possible, eliminate – incidental bycatch of priority Endangered, Threatened and Protected (ETP) marine species
2. To have open mind towards possible solutions
3. To work on solutions that are both effective and sustainable, suitable for use by fishers and, ideally applicable for multiple gear types, regions and species
4. To strive for cooperation and co-creation between the fishers, authorities, researchers, NGOs and other relevant stakeholders from early on (RRI principles¹). In doing this, mutual trust, respect and understanding of different perspectives are essential
5. To respect the perspectives of all Parties, recognising that these perspectives might be different and even contradictory
6. To build upon existing work to avoid repetition, while remaining sensitive to possible limitations of earlier approaches
7. To report on what works but also on what does not work and, in both cases to try to understand why
8. To generate a safe working environment for co-production of knowledge, data sharing, testing and assessing tools and measures
9. To ensure that reports and other communication materials are tailored for, and will reach, their intended audience
10. To communicate in good faith about the Project and Parties, translating to: o Act honestly, openly, and without hidden motives.
11. To familiarize yourself with other Parties' perspectives, raise potential issues in a fair and timely way and contact each other in advance on relevant issues affecting Parties.
12. To not engage in negative media campaigning against any Parties, on issues related to the Project and specific pilot project as stipulated in the Grant Agreement.
13. To abide by the overarching Stakeholder Engagement and Communication Strategy that will be developed within the Project.

3.2 Principles for effective engagement in fisheries research and management applicable to all stakeholders

12 principles were extracted from the synthesis of the literature review (see Appendix 6.1 for detail)

1. Engagement should be an **inclusive process** to support the development of strong, constructive, and responsive relationships that: encourage positive outcomes for both stakeholders and conservation; and help to identify and manage risks.
2. Creating spaces that enable **genuine dialogue**. Creating a safe space to foster open dialogue is important to developing a respectful working culture (see 5). A safe space does not have to be a neutral space, but it is where individuals feel comfortable and confident to speak their mind freely, be listened to and respected, and know that their knowledge and views are valued.
3. Give **equal credence** to the diversity of knowledge 'types' and perspectives.
4. Begin the **co-design** of bycatch solutions **as early as possible**, and maintain cooperative working throughout, with a long-term vision that fosters a joint sense of ownership of the outcomes.
5. Build **trust, respect, shared understanding** and a personal sense of value. Avoid accusations because it leads to defensive responses.
6. Prioritize face-to-face and personal modes of communication. Engagement is about making relationships among individuals. **Be reliable, open and honest.**
7. **Target** well-identified **needs**, while being aware of policies and regulations that could change the needs, motivations and trust among participants.
8. Being inclusive does not mean 'everyone' should be involved. The balance of who to include and how they are included (**roles and responsibilities**) should reflect the needs of the issue to be addressed, be sensitive to different expectations and cultures of stakeholders, and be non-discriminatory.
9. **Be transparent.** Where possible and without risk of discrimination, information and documentation relevant to the issue should be shared freely and engagement activities should be documented. Feedback should be encouraged and responded to.
10. Identify, evaluate and communicate the **socio-economic and cultural impacts** of bycatch solutions on affected people and local organizations which represent them.
11. **Be flexible.** Assess the effectiveness of engagement efforts and adjust strategies as needed according to changes in needs and circumstance.
12. For projects that may affect the rights, interests, lands, resources, and territories of Indigenous Peoples, **ensure any prior consent processes are followed.**

3.3 Best practices for engaging fishing industry stakeholders

Beyond the core principles for effective engagement that apply to all stakeholders, every practical case requires tailoring to the issues that need to be addressed, the people involved, and their institutional and personal relationships that affect how they work with one another. Drawing on experiences from relevant literature listed in Appendix 6.1, best practices have been synthesised for the elements that should be considered when engaging fishing industry stakeholders. Full details and source references are available in Appendix 6.1 and a [spreadsheet inventory](#) is accessible on the CIBBRiNA project Teams site that is accessible for all the CIBBRiNA Partners.

1. Work with positive people/ organisations that thrive on collaborative working

Positive people dynamics are a key ingredient for effective collaboration. The people and personalities involved in a project can make all the difference. Typical personal characteristics include committed can-do leaders, respected ambassadors, excellent organisers, natural collaborators, negotiators, and strong personalities (Mackinson and Middleton 2018, Hetherington and Bendall 2020, Holm et al. 2020). Fishery organizations can play a key role in organizing data collection and representing fishers in policy discussions, so their involvement can be pivotal to making measures effective and broadly accepted (Steins et al. 2023).

2. Unite around shared problems and goals that empower participants

A strong common purpose is important because it leads to clearly defined actions to achieve success. However, a common purpose might not eliminate conflicts and disagreements that can be necessary for identifying trade-offs and mitigating negative outcomes. Processes should enable opportunities for innovation by fishing industry stakeholders and for initiatives that empower them, value their experiential knowledge and foster responsibility and buy in (Cambell and Cornwell 2008, Peckham and Diaz 2012, Mackinson et al. 2017, Mackinson and Middleton 2018, Steins et al. 2022, Prado et al. 2024).

3. Know each other's motivations and reinforce them

Understanding each other's motivations for engagement and working in ways that positively reinforce them is powerful in helping to sustain engagement without need for external incentives such as paying fishers to work with scientists. Specifically, the need to understand how fishers might value ETP species is important because this affects their motivation to find solutions, and which approaches could be productive (Campbell and Cornwell 2008, ICES 2019). To help understand other motivations and perspectives, one needs to 'walk in each other's shoes' and consider how different factors may support or undermine these (Suuronen 2022, see Table 3.1). This is easier said than done, but an insight to this can be gained from thinking about the '*Similarities and differences for scientists and fishermen in collaborative research*' (Mackinson et al. 2017, Annex 2). Participation is meaningful when people feel valued and heard (FitF 2024). In some cases, incentives like financial support for bycatch-reducing technologies may also enhance positive engagement and mitigate industry pushback (ICES 2024).

“In a project where fishers were at first hesitant and reluctant to participate on a voluntary basis in a Remote Electronic Monitoring (REM) project, this changed when the Ministry offered compensation for additional installation costs of the REM system and when they were invited to apply for a science TAC. At the early phase of the project, fishers felt their concern about the use of Remote Electronic Monitoring in regard to their privacy was neglected and their contribution despite the effort was not valued. When the Ministry agreed to compensate for the additional – unforeseen - costs for the installation of the REM systems on board and the fishers were invited to apply for science TAC there was a change in the attitude of the fishers. The acknowledgment for the fishers' effort from the Ministry made fishers participate.”

Marije Siemensma, coordinator project “Onbedoelde bijvangst in Beeld”

4. Clearly define roles, responsibilities and ground rules / do's & don'ts that create a respectful working culture

Clearly define the roles and responsibility of each of the actors involved in collaborative research projects to increase transparency and understanding of each other's positions (MPI 2007, Steins et al. 2022) and to help mitigate against power asymmetries (Prado et al. 2024). Establish ground rules based on understanding of each other's 'do's and don'ts', and consideration of confidentiality issues (Table 3.2). Don't be afraid to talk openly about do's and don'ts because everyone will benefit from being on the same page about what's expected and what's possible from one another. (ICES 2007, Mackinson et al. 2015, Suuronen 2022, Hetherington and Bendall 2022, Morf et al. 2023, Prado et al. 2024).

5. Enlisting neutral facilitators can help develop constructive pathways

Neutral facilitators, as knowledge-brokers, can ease tensions and create a sense of equality during interactions. They can be essential in enabling effective engagement by helping overcome seemingly insurmountable barriers that may exist with working with the fishing industry on bycatch of ETP species, such as strong prejudices or a lack of openness amongst participants (Mackinson et al 2015, Suuronen 2022, Prado et al. 2024, FitF 2024).

6. Plan engagement actions in tandem with research actions

When the research actions are twinned with associated engagement actions over a long time, inclusiveness, involvement and personal value becomes routine (Johnson and van Densen 2007, Mackinson et al. 2017, (Figure 3.1), Morf et al. 2023). It is strongly advised that plans for trialling at sea gear modifications and innovations should only take place after consulting relevant fishing industry members because their knowledge will be critical to successful implementation at sea (Cronin et al. 2022).

7. Use established pathways and standards for best impact

International/regional organizations like ICES and OSPAR play an essential role in bridging alternative perspectives and providing methodological frameworks to generate applied, relevant knowledge and solutions in fisheries research and management. So, to have the best chance of impact of work on reducing ETP bycatch, where possible, organise data

collection actions with fishing industry stakeholders such that it aligns with established institutional pathways. Where needed, engage in supporting adaptation and evolution of the organisational process to help ensure they are fit-for-purpose (ICES 2007, 2019, 2021, 2023a,b, Komoroske & Lewison 2015, Hawkins 2019, Cvitanovic et al. 2024)

8. Believe and be mindful of the intangible outcomes

‘Believe in’ and adopt a spirit of collaboration. Forging industry-science research initiatives requires dedicated time to fully engage and maintain engagement with the fishing industry to collect policy-relevant data, while pursuing and further developing open collaborative partnerships. Quite often the development of industry-science research leads to ‘intangible outcomes’ that are difficult to measure, but whose future impact can be important. For example, such as how people behave differently or make future choices based on their experiences in the past (Morf et al. 2023, Hetherington and Bendall 2020). Recognising these outcomes provides positive reinforcement for collaborative work.

9. Create meaningful feedback systems

Feedback systems that elevate participants’ knowledge require that scientific data and knowledge are shared with fishing industry stakeholders in transparent and compelling ways, which often increases willingness to share knowledge. (Mackinson et al. 2017, Hetherington and Bendall 2020, Caze et al. 2022, FitF 2024).

10. Learn by doing, customize to needs

Approaches for engaging fishing industry stakeholders need to be customized to different fisheries and regulatory conditions. There is no one size fits all solution. Smaller fisheries may need more direct incentives or simplified processes to participate. e.g. loaning gear for fishers to test the effectiveness themselves can help encourage investment in adopting new practices. Whereas larger fisheries might need another approach. (Cox et al. 2007, Peckham and Diaz 2012, Kirby and Ward 2013, Komoroske & Lewison 2015, Squires et al. 2021, ICES 2024).

“Almost all skippers we work with like technology and gadgets such as underwater cameras. Equipping them with these allows them to learn about fishing gear behaviour and helps in gathering the scientific information we need to develop new net designs to prevent bycatch”

Niels Hintzen, Pelagic Freezer Trawler Association

11. Make knowledge count, share the kudos, build capacity and evolve

Jointly creating knowledge with fishing industry stakeholders and other stakeholders is essential for developing effective solutions tailored to local specificities (Steins et al. 2023). Capacity building and training on finding bycatch solutions are examples of positive engagement. Building a positive narrative of the fishing industry’s role in sustainability encourages pride and cooperation (Mackinson et al. 2017, ICES 2024, FitF 2024).

12. Success breeds success

Peer-to-peer exchange among the fishing industry on solutions to mitigate bycatch provides powerful arenas for creation and adoption of such solutions because fishers share a common language and understanding of what it takes to work in practice.

“Maintaining the dialogue with skippers and repeating what we try to achieve has been my key lesson learned for the past year and a half. We have had seven dialogue sessions with a large group of skippers and we see more ideas and experiments being developed over the course of this period”

Niels Hintzen, Pelagic Freezer Trawler Association.

Table 3.1. Example of considering stakeholder incentives in bycatch mitigation work. [reproduced from Suuronen 2022]

Measure/factor	Potential effect	Challenges and potential development actions
Economic incentive	<ul style="list-style-type: none"> • Uptake is encouraged by economic benefit (e.g. higher catch rate, improved price, better market access, preferential access to a fishing ground) • Market-based mechanisms establish a situation in which fishers consider it is in their economic interest to reduce bycatch 	<ul style="list-style-type: none"> • Benefits often inadequate to inspire a change in behaviour • May not affect the intrinsic motivation that is the key in achieving a permanent change in behaviour • Attention may not focus to the desired output
Social incentive	<ul style="list-style-type: none"> • Encourages individuals to behave in a socially valued and approved manner • Helps to gain a positive social reputation • Builds confidence in mutually agreed objectives and foster acceptance • Critically important where top-down regulation is not feasible and economic incentives are absent 	<ul style="list-style-type: none"> • Role of social incentives is under-appreciated, poorly understood and often ignored • Social incentives can have a significant effect in reinforcing non-compliance or strengthening the compliance • Social and cultural meanings that fishers attach on their fishing practices should be considered carefully in bycatch management.
Participation	<ul style="list-style-type: none"> • Potential to enhance the quality of decisions by more comprehensive information inputs • Potential to facilitate the incorporation of local knowledge • Potential to build ownership and reduce suspicions and scepticism 	<ul style="list-style-type: none"> • Little evidence that ensures adoption • Fishers often not sufficiently motivated to engage • Participation structure can easily erode • Fishers not willing to give their detailed knowledge because it may compromise their business • Needs a highly skilled facilitator
Legal framework	<ul style="list-style-type: none"> • Command and control approach which has a penalty for violation • When successful may lead to compliance • Potential to create a level playing field that benefits responsible fishers • Legitimacy of rules may act as an incentive for compliance 	<ul style="list-style-type: none"> • Does not affect internal motivation and may not inspire—does not build a cultural change • Efficacy highly dependent on enforcement capacity of regulatory agency • May result to micromanagement and cause unnecessary cost • May result in inappropriate manipulation of gear • May deny fishers the flexibility required to innovate and adopt new technologies • May freeze the technological development
Trust building	<ul style="list-style-type: none"> • Enables constructive dialogue among scientists, fishers, and managers • Reduces the impact of incorrect information • Reduces misunderstandings and helps fishers to accept the goals and solutions • Reduces unnecessary tension 	<ul style="list-style-type: none"> • Building trust is time-consuming and requires good understanding of fishers' attitudes, hopes and hidden emotions • Trust is complex by nature and is lost easily • Facilitation requires special skills-setting and education

	1. INITIATION BY CO-CREATION	2. PLANNING BY CO-DESIGN	3. SURVEY AND ANALYSIS	4. APPLYING THE KNOWLEDGE	5. EVALUATION
	What do we want to achieve?	The evidence we need and how to get it	Gathering evidence and making the most of it.	How do we make the knowledge count?	Did it achieve what was expected?
SCIENCE questions to consider	<ul style="list-style-type: none"> - What is the problem and why does it need to be solved? - Who wants to solve it and what outcomes do they expect? - What are the aims for the project? - Who are the gatekeepers that will influence how the evidence will be applied? - What is the scope, scale and timing of the project? - Are the outcomes achievable? 	<ul style="list-style-type: none"> - What objectives are needed? - What information is needed for it to be fit for purpose? - Critical needs and constraints to address? - What is needed to make the data robust scientifically? - What skills and training are required? - What are the resource implications? - Who owns the data and what access will they require? 	<ul style="list-style-type: none"> - What on-board procedures are needed to make the data collection work? - How will the work be managed to ensure quality control? - How will the team and others be kept up to date with progress? - How will data be analysed and interpreted? 	<ul style="list-style-type: none"> - What routes lead scientific data to being used as evidence and how takes it? - What format does the data need to be in for a quality review? - What's required to justify any proposal based on the findings? 	<ul style="list-style-type: none"> - Has the aim been achieved? - Do the benefits outweigh the costs? - What worked well and what can be improved? - What strategic actions need to occur for this to continue?
COLLABORATION questions to consider	<ul style="list-style-type: none"> - Who are the end-users and knowledge providers who need to be involved? - What understanding and expectations do people have? - Is the aim agreed and understood? - What core values are needed to make the collaboration work? - Who needs to be on the project team? 	<ul style="list-style-type: none"> - How to motivate industry's participation? - Who needs to be involved and how? - What feedback mechanisms are needed? - What working practices can meet the needs of the science? - What research tools might help co-delivery? - What communications will strengthen collaboration? 	<ul style="list-style-type: none"> - How can we build shared knowledge and skills? - Why is it a good idea for scientists to be on board fishing vessels whenever possible? - How do we keep a focus on getting the job done to the required standard? 	<ul style="list-style-type: none"> - How do we gain the support of relevant managers and other stakeholders? - What needs to be communicated about the process and outcomes? - Why is it important to give visibility to fishermen's contributions and how they have been used? 	<ul style="list-style-type: none"> - How did the collaboration process go? - What was the value and benefit of co-construction? - Why should we give credit where it is due? - What should the group do next?

Figure 3.1. Framework for the Guidelines for Industry-Science Data Collection, Mackinson et al., 2017 (reproduced with permission)

Table 3.2. The Hot List: Do's and Don'ts for collaborative research (adapted with additions to Mackinson et al. 2015, reproduced with permission)

<i>Behaviours</i>	
DO	DON'T
Listen with an open mind	Assert prior feelings or knowledge
Be honest	Make false promises
Respect others knowledge and views	Assume you know more or are 'better'
Be modest and sensitive to others	Be arrogant
Give before you expect to receive	Take knowledge and data and use it to others disadvantage
Explain clearly and give feedback using a language that everyone understands	Assume everyone understands
Ask questions and challenge views	Be afraid to ask questions
Respect the research process and results	Undermine the process and results if it does not match expectations/ desires
Respect and understand that fishers primary motivation is to make a living	Undermine the motivation of fishers by questioning their need to make a living
Try to meet face-to-face	Remain closeted in 'ivory tower'
Be human too!	Make appearance or behave in ways that make you 'unapproachable'
<i>Actions</i>	
DO	DON'T
Get to know one another	Avoid or be worried about getting to know someone new
Include others whose knowledge and views are relevant to the problem	Exclude others who might challenge your views
Be aware of motivations, expectations and agenda	Let motivations and political agenda de-rail good research
Be aware of source and quality of knowledge, but treat it fairly	Apply different principles when scrutinizing different knowledge
Question knowledge for the purpose of gaining a better understanding	Undermine credibility
Address problems and issues of common interest	Bias research toward the interests of a particular group
Be clear on the use of research	Hide intentions of research
Be sensitive to and consider outcomes and impacts broadly	Point the blame
Agree about data ownership. Be open when possible but respect confidentiality	Unnecessarily protect and limit access to data
Expect criticism of findings	Hide weakness of research
Be sensitive to operational constraints	Believe it will run like clock-work
When on board help out – researchers help fishers & fishers help researchers. Having a practical job makes people feel valued	Isolate yourself by not contributing to the team working on vessels
Welcome fishermen to science events and welcome scientists on board fishing vessels	Make it difficult or intimidating when in the company of others
Be consistent with the people involved	Keep changing the people because it sends a silent message that the work is not important

3.4 Best practices for engaging policy makers from NGO's and from policy makers

For these guidelines, the World Wide Fund for Nature (WWF) and Seas at Risk (SAR) have been invited to give their experience and best practices from *their* perspective as an environmental NGO for engaging policy makers. WWF and SAR are both partners within CIBBRiNA.

Simultaneously policy officers from CIBBRiNA's beneficiaries, associated partners, and the Stakeholder Advisory Board have been invited to participate in a survey. The aim of this survey was to understand their perspective on best practices related to addressing bycatch of ETP species based on experience and expertise.

3.4.1 Best practice from the perspective of WWF and SAR

As much as it is essential to foster a good collaboration between researchers and fishers, it is important to realise that policy makers are essential in developing implementable policies based on knowledge from research projects like CIBBRiNA. Engaging policy makers can make a difference.

Experience from WWF and SAR points to several best practices to effectively engage policy makers on bycatch issues (as well as developing sustainable fisheries management policies).

Presentation of evidence

Presentation of comprehensive, clear, and actionable information on bycatch issues, impacts, and potential solutions which is supported with scientific evidence.

Policy makers are busy and bombarded with information from various sources. Presenting information in the right format increases the chances of capturing their attention and consideration. It is important to simplify complex information. Using a storytelling type of narrative using specific case examples can be helpful compared to dense data-heavy reports, because narratives are more likely to resonate with decision-makers and leave a lasting impression (see example: [Stories | WWF](#))

The format WWF and SAR usually use for policymakers is a policy brief, short report, and/or factsheet:

- Example of a **policy brief** related with Sharks used in the IOTC (Indian Ocean Tuna Commission) meetings: [Policy Brief](#)
- Example of a **short report** summarizing the main issues regarding Sharks & Rays in Portugal: [Sharks and rays guardians of the ocean in crisis](#)
- Example of a **factsheet** using evidence-based advocacy: [Bycatch | Panda.org](#) and an example of a factsheet using infographics to explain how a solution can work: [Dolphin bycatch and REM | SAR](#)
 - Another example of a factsheet regarding the mako shark that was used as an advocacy tool for Portuguese authorities to gain support of a fishing ban and improvement of management measures in ICCAT (International Commission for the Conservation of Atlantic Tunas) 2021 annual meeting: [Saving mako sharks: how to help the fastest sharks escape extinction](#)

Highlighting nature positive, economic and social implications of bycatch, including potential benefits of reduction strategies and market incentives and emphasizing how the research can support policymakers' priorities and agendas. This could be done using successful case studies, showcasing examples of effective bycatch reduction programs from various jurisdictions to illustrate potential positive outcomes:

- What is Bycatch? Understanding and Preventing Fishing Bycatch
- WWF recommends the use of turtle excluder devices (TEDs) in shrimp trawlers, which allow marine turtles to safely escape from the nets. In Mozambique, WWF helped create a new law that makes TEDs mandatory in the country's shrimp trawl fleet. Once implemented, Turtle Excluder Devices (TEDs) have the potential to reduce sea turtle bycatch. In Mozambique, results indicate that this will save the lives of up to 5,000 marine turtles per year and allow Mozambican fishers to sell their shrimp to the U.S. market. In the Gulf of Mexico, the reduction of bycatch turtles was up to 97% using TEDs. Circle hooks in longline fisheries also have potential and can decrease turtle bycatch by up to 90% while maintaining or increasing fish catches. Protecting Turtles from the Threat of Bycatch | Initiatives | WWF
- In the Baltic Sea, the population of harbour porpoises is critically in danger of extinction due to various reasons, including the use of trawl nets and gillnets. SAR partnered with member organisations and other NGOs in the region to assess different bycatch mitigation solutions based on science and empirical research. These findings were detailed in a report for a wider public and decision-makers. In a spirit of collaboration, the European Commission asked for advice to ICES and these findings delivered a technical report.

Strategic approach

WWF's and SAR's approach in involving policymakers considers **different levels of action: international, regional and national policy levels, targeting specific groups of policymakers** with a structured approach that includes problem identification, goal setting, and evaluation of mitigation measures. This is important because different recommended actions need to be implemented at different levels (local, national, and European administrators).

- Example: Policy recommendations – Minouw Project.
 - Another example by SAR of a series of existing practices of fishing opportunities allocation that can be used and scaled up as incentives to, among other priorities, mitigate bycatch: EU CFP Article 17 good practices.
- Example of the MEDASSET project in the Mediterranean: Policy - MEDASSET

WWF and SAR conduct **campaigns and media outreach** and in some cases **partner with other organizations** locally and/or from around the world to **create social constructs that highlight the need for reform, increase public awareness and put environmental issues on the political agenda**.

- For example, partnering with the Convention for Migratory Species (CMS) and the International Whaling Commission (IWC) to develop guidelines for safe handling and release of bycaught species or with seafood companies to find solutions to fisheries bycatch. How WWF can help you address fisheries bycatch.
- SAR has several member organisations across Europe which are working at local level with citizens and various stakeholders, from politicians to civil servants, to fishers. In order to raise awareness in a positive way that avoids conflicts and search for collective solution

design, SAR has for instance partnered with its French member organisation to set up a [photo and sculpture exhibition](#) in places that speak both to coastal communities and fishers.

- Actions to encourage decision-makers to address an issue and play their role of bringing together all involved parties and finding appropriate solutions, can take the form of [petitions](#). Petitions and other citizen mobilisations show to the fishing communities and decision-makers that others are concerned and eager that a solution is found. This incentivizes stakeholders to engage in addressing a problem.

Timing and relationship building

The **timing and framing to present results to policymakers** is equally important. Policy makers often have a small window of opportunity to use evidence and influence policy, hence the importance of developing strategic lobbying and being proactive in building and maintaining contacts with policymakers. Through dedicated teams, WWF and SAR develop relationships with key decision-makers, sharing research, case studies, and policy positions at events, working groups, and meetings.

- Example of participation in the Indian Ocean Tuna Commission meeting and advocacy for increased funding and support for bycatch reduction research, including the development of new technologies and fishing gear modifications: [Mitigating bycatch: Policy innovation to fight growing fisheries bycatch in the Indian Ocean — WWF Protecting Whales & Dolphins Initiative](#).
- Another example is of engagement with newly elected Members of the European Parliament who struggle at the beginning of their mandate with an overwhelming amount of information. SAR helped them this year with a dedicated fisheries leaflet summarising key issues, including bycatch in the EU, and by providing them with a [leaflet including relevant resources and materials](#).

In addition to meetings, materials and constructive dialogue, it is usually helpful to organise encounters between decision-makers and affected parties for them to have a chance to fully understand the realities of each other and discuss pragmatic solutions. Hence NGOs help to **encourage cooperation between government agencies**, to gain different perspectives from other stakeholders and users (e.g. fisheries management organizations, academia), facilitate data sharing on bycatch, and promote policy alignment in different jurisdictions. These stakeholders' engagement moments also encourage policymakers to **consider holistic strategies that address multiple species and avoid unintended consequences of single-species management**. Example of a [fisheries event in front of the European Parliament](#) with fishers, environmentalists and MEPs.

On capacity building, WWF offers training and resources to enhance policymakers' understanding of bycatch issues and potential solutions. These solutions already acknowledge and address the fears and doubts of fishers and other stakeholders and ensure that they are practical and meaningful. Capacity building in this form can be a tool to improve effective stakeholder engagement. Example of a workshop with stakeholders to create a bycatch manual: [Maritime academy launches bycatch manual | WWF](#)

NGOs can act as conveners, bringing together diverse stakeholders like fishers, government agencies, scientists, and other interest groups. They can facilitate constructive dialogue and help to build trust between different parties. WWF and SAR with its member organisations play an important role in bringing people together by creating opportunities for stakeholders to work together on developing solutions, such as through working groups, advisory panels, and capacity

building, that encourage sharing of local knowledge and expertise and where different stakeholders are invited to participate. It is important to develop targeted messaging and engagement strategies for different stakeholder groups and use appropriate channels to reach each group effectively.

3.4.2 Best practice from the perspective of policy makers within CIBBRiNA

Policy officers from CIBBRiNA's beneficiaries, associated partners, and the Stakeholder Advisory Board have been invited to participate in a survey. The aim of this survey was to understand their perspective on best practices related to addressing bycatch of ETP species based on experience and expertise.

Find the survey questions in appendix 6.3.

All seven respondents have experience in collaboration with fishers, some more than others, and work in a ministry or directorate linked to fisheries, with one exception of a respondent that works in a ministry not directly connected to fisheries.

Their role within CIBBRiNA is defined as to implement – guided by legal requirements - CIBBRiNA's results. To achieve this, facilitating discussion and collaboration with fishers and other stakeholders to discuss bycatch mitigation and what is needed and what can be achieved are mentioned.

Based on the input from the respondents we extracted some **recommendations** and **advice** which is given from the perspective of policy makers:

- Look at interests more than only positions and see things from the others' perspective adds in collaboration. This helps to identify what are problems for fishers, potentially hampering finding solutions.
- Join a fishing trip. Join fishers at sea to get a better understanding where fishers are coming from and what life at sea is like. Fieldwork adds to developing a well-balanced set of measures.
- Implement the core values of the Mutual Gains Approach: work on a joint knowledge base, determine a set of common rules, look at interests more than only positions, and see things from the others' perspective.
- Work on a joint knowledge base and determine a set of common rules.
- Organise joint meetings with multiple stakeholders to share information on different (international) projects and discuss options for mitigation including alternative gears.
- Keep an open mind. While you may have great ideas to reduce bycatch, remember that solutions need to be both practical for the industry and enforceable by fisheries management. Balancing these aspects is key in the long-term.
- Invite fishers or their representatives to meetings on other relevant topics such as the MSFD.
- Collaborate with fishers for a more informed sustainability assessment by getting data on catch composition, bycatch and ETP bycatch.
- Collaboration with fishers and stakeholders early in the process is essential in developing effective policies that are realistic. It can also increase compliance. Different stakeholders might have different priorities which can affect decision-making / the policy process. If collaboration begins too late in the process, stakeholders may feel they are landed with policies rather than co-creating something attainable. This may lead to non-compliance.
- Fishers are the eyes at sea, they have a wealth of knowledge, which is vital when looking for solutions for bycatch.
- Realise it is impossible to control 100% what fishers are doing, so if a solution is not practical or it will cost them a lot of money, they will not implement it.
- Discuss how to compensate measures that will affect the way how fishermen carry out their fishing operations such as investigate providing money from the European Maritime Fisheries and Aquaculture Fund (EMFAF).

- Be persistent and bring positive energy when talking with fishers. Treat them as equals and never underestimate their knowledge - they understand their challenges better than policy people do.
- Invest in making relevant contacts nationally, not only with policy makers, but especially with fisheries organisations, NGOs. It is important to recognise these that are ready to cooperate.
- Trust is fundamental to achieve common goals.

When asking for **drawbacks** it has been mentioned that it occurs that fishers fear repercussions so much, that they don't share any information about for instance which areas are most important or how much bycatch there really is, leading to a potential situation where much larger areas are closed than needed.

It also happens that despite a collaborative process, meetings turn out not to lead to solutions. However, the perception and understanding between policy makers and fishermen usually improve. These processes where fishers are consulted and can express their views are vital to help fishermen understand the idea that, the more collaboration there is from the fishing sector, the more feasible it will be to design solutions and to develop effective measures affecting the only the necessary part of the fleet.

As a **challenge** one of the respondents mentions the fact that not always the fishers with the largest risk of bycatch are attending meetings as this is perceived as a threat, while fishers using lower-risk fishing gears are sometimes more open to collaborate.

How can policy measures help to achieve collaboration to address local and regional scale issues of ETP bycatch?

When asking how policy measures can help to achieve collaboration among stakeholders to address local and regional scale issues of ETP bycatch in general it is believed to help although collaboration is also considered key to implement policy measures.

- Policy measures can help to create a level playing field, which is considered necessary in a field which is quite competitive. Not only among fishers from one country, but also among countries.
- Change usually starts with ambassadors, and they are needed to demonstrate the changes are not too difficult or costly, to bring more fishers over the line, but further take-up can be helped if policy measures are put in place for all.
- By providing clear guidelines, incentives, and support for joint actions, policies help build trust and shared responsibility to effectively reduce ETP bycatch at both local and regional levels.
- Policy measures help foster collaboration by involving stakeholders early in the process. Early and open conversations build trust and lead to more effective, achievable and realistic approaches. Including fishers and others from the start ensures key questions—like “What counts as bycatch?” and “How much is too much?”—are addressed together.
- Policy measures should encourage cooperation through mechanisms how European Maritime Fisheries and Aquaculture Fund (EMFAF) money can be distributed and under what conditions.
- Other options include organisation of different meetings, conferences, invitation of different guests to inform about new solutions.

How can policy makers help to ensure that policies can be applied in practical settings by the fishing industry?

From the perspective of the respondents to the question how policy makers can help to ensure that policies designed at a regional level can be applied local in practical settings by the fishing industry **collaboration** and **good communication** and **awareness** stood out.

- Good communication: explain why it is needed, either collecting data or taking certain measures. Motivate fishers by explaining what's in it for them. And sometimes it can also help to provide monetary incentives.
- By ensuring good communication and collaboration among all stakeholders, and by raising awareness within the fishing sector, policy makers can help make regional policies more practical and effective at the local level.
- Policies only work when these are attainable for the industry. Collaboration and information from the industry is crucial to come to achievable and realistic measures and policy.
- Working in close collaboration with fishing sector and make sure this is based on a **robust scientific basis**, avoiding general measures, not adjusted to the reality of the fleets and their potential risk of bycatch.
- Make sure there is awareness of the fishing sector of measures that will be implemented (what, when, where).

4. AI based insight on principles and best practices

There's a lot of literature on the principles and practices of engaging fisheries stakeholders in research and management of marine resources. In Section 3, CIBBRiNA experts selected 31 key resources on stakeholder engagement deemed to be most relevant to the CIBBRiNA project, based on the priorities listed in Section 2, then reviewed and synthesized them into the take-home messages of Section 3.

The volume and complexity of the 31 key resources is considerable, so it is possible that some valuable learning may have been left uncovered by the expert reviewers, or that personal beliefs and experiences may have caused some bias in the analysis. We asked the AI program NotebookLM to dig into the 31 resources (+4 more²) and reveal its take on principles for engaging all stakeholders and best practices for engaging with the fishing industry and policy stakeholders.

The results are given as supplementary material (Appendix 6.2) because they are very similar to the expert review (albeit less concise and nuanced) – providing confidence that the experts captured the salient points of learning.

² **Note:** The +4 additional resources include the GAP1 Code of Conduct and Hot List of do's and don'ts, a research paper collection of 17 articles on 'Co-creating knowledge with fishers: Challenges and lessons for integrating fishers' knowledge contributions into marine science in well-developed scientific advisory systems', and the book 'Collaborative Research in fisheries: Co-creating knowledge for fisheries governance in Europe'

5. Conclusion

The key take home message from all three sections is that effective collaboration benefits implementing a set of core principles for any collaboration one aims for among all stakeholders. Key actions extracted from the interviews, expert literature review, perspective from NGOs and policy makes and AI extract are:

- Invest in the other perspective,
- Developing an inclusive process,
- Creating a safe space,
- Giving equal credence,
- Co-designing as early as possible,
- Building trust, respect and shared understanding,
- Being reliable, open and honest,
- Targeting needs,
- Specifying roles and responsibilities,
- Being transparent
- Communicating socio-economic and cultural impacts,
- Being flexible,
- Ensuring any prior consent processes are followed.
- Motivate and explain policy choices and consider incentives for collaboration

When it comes to the best practices to engage with fishing industry stakeholders on work to reduce bycatch of ETP species, it is essential to engage with them early and continuously in the process by focusing on building trust and respecting others' viewpoints and being transparent and genuine. The literature review has also led to a valuable compilation of do's and don'ts (such as Table 3.2) based on a variety of experience and field work trials from a wide range of fisheries – small and large scale – in different countries with different legal and/or management systems.

Apart from best practices to engage with fishing industry stakeholders, engagement with policy makers also with the aim to reduce bycatch of ETP species can benefit from – apart from the core principles that apply to all stakeholders – strategic approaching and respecting timing and framing to present results to policy makers. Present comprehensive, clear, and actionable information on bycatch issues, impacts, and potential solutions that are supported with scientific evidence.

From policy makers perspective recommendations don't divert from the already stated. These emphasize engagement from early on, good communication and explanation,

investing in the other perspective and supporting exchange of information and potential solutions.

Finally, the advice from the expert analysis in Section 3 and AI-based analysis in Section 4, Appendix 6.2, are considered complementary, with Section 3 providing concise summarisation and direct references to the reviewed literature, whereas Section 4, Appendix 6.2, gives a neat and thorough (if repetitive) overview, providing confidence that the experts captured the salient points of learning.

6. Appendices

6.1 Literature inventory

Highlights of a review by experts of selected published and grey literature related to the effective stakeholder in to fisheries research and management, with a specific attention the topic of bycatch of ETP species. The full detailed [spreadsheet inventory](#) used to create this summary is accessible on the CIBBRiNA project Teams site for all the CIBBRiNA Partners.

ID#	Reference	Relevance to CIBRRINA activities – either the case studies (i.e. species/fishery interactions, the monitoring and mitigation measures used, the regulatory/policy conditions, communications, other)	List the engagement approaches that worked / or did not and include a short explanation of why. Think carefully about any particular conditions/ circumstances that were necessary for success and be sure to identify them.	From these experiences, what specific advice/ guidance could be helpful to enable CIBRRINA partners to do their work effectively?
1	ICES. 2007. Report of the Workshop on Using Fishers to Sample Catches (WKUFS), 5–6 June 2007, Bergen, Norway. ICES CM 2007/ACFM:24. 45 pp.	Relevance to any CIBRRINA case study activities aiming to establish bycatch monitoring schemes where industry take responsibility for self-monitoring and data recording.	<p>Defining methods and quality standards for data collection</p> <p>Incentives and practical aspects of industry-led sampling</p>	<p>(ICES 2007)</p> <p>Fishers are an important source of information on how sampling programmes can be made effective more closely reflect the reality in the sea.</p> <p>Data collection programmes using agreed methods and standards provide consistency across sampling initiatives and the best chance of the data being useable and useful for advice</p> <p>Create incentives for fishermen, communicate, understand and put in measures to respect confidentiality, consider financing need, undertake training, and agree appropriate survey design</p>
2	ICES. 2019. Workshop on Science with Industry Initiatives (WKSCINDI). ICES Scientific Reports. 1:68. 67 pp. http://doi.org/10.17895/ices.pub.5610	<p>Useful where intention is to develop data and evidence that may be used ICES</p> <p>Industry initiatives for data collection create opportunities for ICES to new sources of information on the marine environment that would not otherwise be possible</p>	see specific bycatch-related examples in the report, the most relevant to CIBRRINA being Hetherington and Bendall (2020) detailed separately below.	<p>(ICES 2019)</p> <p>If data and knowledge products from science-industry research collaboration are intended for use in ICES, there is a 'roadmap' for this process that can be helpful, along with further information on data standards (see ICES</p>

		<p>The report provides many recent examples of data collection initiatives with and by industry, motivated by different reasons, including: to provide information for fisheries management, to use as business intelligence data and, to demonstrate to markets industry's responsibility and sustainability credentials.</p>		<p>WKDSG) and approaches to incorporating data and other structured information from industry (see ICES WKAFPA).</p> <p>Demonstration of the industry's sustainability credentials can be an important reason to engage in industry-science activities.</p>
3	Ministry for Primary Industries, Research Science and Information Standard for New Zealand Fisheries, 2011.	<p>Shows that standards for science can be applied to any data-provider, whether they be government science institutions, consultancies or stakeholders.</p>	<p>The standards document provides a formal structure for the standards and process for delivery and use of scientific information, which can be used to help design the process, and role and responsibilities in cooperative research.</p>	<p>(MPI 2007)</p> <p>Important to clearly define the roles and responsibility of each of the actors involved in co-operative research projects so that it is transparent and understood.</p>
4	Mackinson, S., Mangi S., Hetherington, S., Catchpole, T., Masters, J. 2017. Guidelines for Industry-Science Data Collection: Step-by-step guidance to gathering useful and useable scientific information. Fishing into the Future report to Seafish. 65p. June 2017.	<p>Guidance on how to plan and deliver effective engagement in participatory research projects. (see separate TAB with overview diagram)</p>	<p>see guidance for detail.</p> <p>Stages in the process, based on Mackinson et al., 2017:</p> <ol style="list-style-type: none"> 1. What do we want to achieve The aim or goal of the collaboration must be clearly defined, understood and agreed to by all parties. 2. How do we make the knowledge count There must be someone who wants the data, somewhere for it to go, to make a difference. This somewhere or someone must be identified from the outset, to have them involved from the beginning to achieve their buy-in and create ownership 3. What evidence is needed & how do we get it How and when the goal is to be achieved, must be laid out. All partners must have the same goal or outcome, but the drivers of different partners or parties are likely to be different. For the industry to get or collect the data, an incentive is often required. 	<p>(Mackinson et al. 2017)</p> <p>Attention and effort invested into planning effective engagement and feedback actions must go hand in hand with planning scientific data collection actions</p> <p>It can be important to understand the different perspectives that fishermen and scientist view participatory research because this strongly affects their motivation and 'investment'. See the table A2 'Similarities and differences for scientists and fishermen in collaborative research'</p>

			<p>4. Gathering the evidence & making sense of it</p> <p>The (scientific) question(s) to be answered must be agreed from the outset, designing and agreeing the data collection programme to address the question(s). The feasibility for the industry to collect the required data is identified at the beginning, rather than just collect some data because you can.</p> <p>5. Applying it (How do we make the knowledge count)</p> <p>Links back to (2).</p> <p>6. Evaluation – Did we achieve what we expected?</p> <p>Determine if the goal was met, project uptake and impact, with any lessons learnt applied to forward planning with continuous learning.</p>	
5	Mackinson, S., Raicevich, S., Kraan, M., Magudia, R., Borrow, K. (eds) 2015, Good Practice Guide: Participatory Research in Fisheries Science.	<p>A shorthand first introduction for those starting out on collaborative research projects. Says what participatory research is, why it is important and how to go about doing it. Applicable to any project where the fishing industry (in particular) and other stakeholders will participate in the research activity at any stage of planning or implementation.</p>	<p>The details in the Good Practice Guide are applicable to any research projects where the fishing industry or other stakeholders will participate in the scientific work. The guide provides some support to help design processes and be sensitive to the personal and practical considerations, as well as a toolbox of methods that may be useful to support engagement processes. This guide is a complementary with the 'Guidelines for Industry-Science Data Collection: step-by-step guidance' listed here too. Both are useful 'How to' resources</p>	<p>(Mackinson et al. 2015)</p> <p>Before you start, review the HOT LIST of Do's and Don'ts behaviours and actions (given on the GAP Good Practice guide tab in this workbook)</p>
6	ICES. 2023b. Workshop on accounting for fishers and other stakeholders' perceptions of the dynamics of fish stocks in ICES advice (WKAFPA). ICES Scientific Reports.	<p>Where information is intended to support ICES advice on ETP species bycatch, the processes for preparing and delivering that information need to be established with ICES because there are well defined existing processes that should be worked with to make the processes efficient and evolve to be</p>	<p>It was recommended to include in the ICES process the organisation of pre-benchmark/roadmap workshops where science and data needs can be identified, followed by making arrangements how scientists and stakeholders can collaborate to access, prepare for use (where relevant)</p>	<p>(ICES 2023)</p> <p>To facilitate the best chance of new data sources being available and useable by ICES, stakeholders need to be engaged early through a structured process intended to deliver the evidence base in a way that can work with existing established processes.</p>

	<p>5:104. 28 pp. https://doi.org/10.17895/ices.pub.24866088</p>	<p>fit-for-purpose.</p> <p>The workshop defined the different roles of stakeholder within ICES and why greater and more diverse modes engagement was relevant now and in future. It describes previous work leading to the workshop, which is important to understand how and why these ambitions have developed.</p> <p>The report is aimed at practical implementation required to operationalise the application of alternative knowledge in ICES assessment and advice process. Therefore, it covers:</p> <ul style="list-style-type: none"> - Criteria to facilitate inclusion of stakeholder perceptions - Process for identifying and assessing potential utility of alternative information contributions - Where in the ICES process - Evaluate, reason, respond <p>Finally, methods / mechanism to systematically monitor and collate information are covered, building on work of WKDSG and other guidelines</p>	<p>and document the structured and unstructured information well ahead of the benchmark meetings.</p> <p>It was also recommended to organise ‘sense-checking’ sessions with stakeholders when preliminary assessments are available but not yet used as the basis for advisory production. This would allow stakeholders and assessment scientists to verify available knowledge and data against stock perceptions and provide additional considerations relevant for the production of TAC advice. Next to these two additional activities, it is recommended that communication on differences in stakeholder perception or data derived perceptions are communicated within the ICES assessment reports as well as in the ICES advice in a transparent manner. Essential in this entire process is making sure the same language is spoken between scientists and stakeholders, that there are clear and transparent processes in place on how to deal with stakeholder information and communicate clearly how this information is used in the preparation of ICES advice.</p>	
7	<p>Johnson, T. R. and W. L. T. van Densen, 2007. Benefits and organization of cooperative research for fisheries management. ICES Journal of Marine Science 64 (4): 834–840.</p>	<p>A description of how to organise cooperative research processes, intended to help others in their work. Practical guidance.</p>	<p>See TAB with Table of Criteria for cooperative research</p>	<p>(Johnson & van Densen 2007) Collaborative research should follow an organised process, which could be planned with the participants. Direct benefits are having an impact on the shared problem/ issue. Indirect benefits are trust, improved relationships and capacity building - which are best achieved when the conditions for transparency and good communication are enabled.</p>

8	<p><u>Hetherington, S.J., Bendall, V.A. (2020). People, Sharks and Science. In: Holm, P., Hadjimichael, M., Linke, S., Mackinson, S. (eds) Collaborative Research in Fisheries. MARE Publication Series, vol 22. Springer, Cham. https://doi.org/10.1007/978-3-030-26784-1_16</u></p>	<p>Example related to data limited and ETP species - spurdog and skates and rays</p>	<p>Participatory research approaches were adopted whereby fishers were trained to undertake the sampling themselves. Scientists and fishermen worked closely together throughout, co-designing and co-developing the work. Policy were also closely involved because of the explicit link to management measures.</p>	<p>(Hetherington and Bendall 2020)</p> <p>The key ingredients for successfully engaging with the fishing industry and for fishery-dependent data to feed into effective management can sometimes be difficult to discern. However, through our experience, five key ingredients were evident:</p> <ol style="list-style-type: none"> 1. A passionate and driven fishing industry representative (in this case, the Chief Executive of the CFPO), well respected by fishermen, able to distil emotive and complex positioning of fishermen into specific and realistic objectives. 2. A proactive, reasoned, centre-ground eNGO (in this case, the Shark Trust), willing to constructively engage and support fishery-dependent data collection to increase the evidence base to support sustainable management. 3. A dynamic Government (Defra) policy advisor, genuinely engaged with and valuing the worth of fishermen's involvement in data collection, able to effectively communicate with the fishing industry, and respected by fishermen. 4. Participatory research scientists at Cefas, building trust and professional relationships with fishermen at sea, understanding the worth and utility of fishermen providing information on their fisheries, to complement traditional fisheries science approaches. 5. The fifth magic ingredient, without which all else fails – 'belief'. Forging out an industry-led research pathway requires dedicated time to fully engage and maintain engagement with the fishing industry to collect policy-relevant data, while pursuing and further developing open collaborative partnerships. This path is not easy
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				and should never be taken lightly: Failure to succeed is all too easy and can take a lifetime to undo, with a detrimental impact to reputation and future collaborations. (ICES 2021)
9	ICES. 2021. ICES Workshop on Standards and Guidelines for fisheries dependent data (WKDSG; Outputs from 2020 meeting). ICES Scientific Reports. 3:38. 90 pp. https://doi.org/10.17895/ices.pub.8038	Data collection quality, standards and guidance on quality improvement.	Overview of the principles and processes for quality control and assurance of data intended for use in ICES advice and collected by industry (Annex 6)	Guidelines for industry data collection with questionnaires, standardized bycatch reporting methodology and quality assurance strategies (standards + guidelines + tools) from scientific institutions that can be applied to industry-led initiatives.
10	ICES. 2023a. Workshop on developing guidance for ensuring the integrity of scientific information submitted to ICES by data providers (WKEnsure). ICES Scientific Reports. 5:44. 40 pp. https://doi.org/10.17895/ices.pub.5796935	Manage and avoid conflicts of interests (Col) in data collection and processing.	Key findings and recommendations include: Growing Col Risks: The integration of new data streams from diverse providers raises the likelihood of Col, necessitating proactive measures. Enhanced Col Evaluation: ICES should extend Col declarations to include data provision, applying a standardized template for assessing the impact and likelihood of Col. Improved Tools: The existing Data Profiling Tool should be updated to flag potential Col and applied across all data flows, starting with benchmarks. Tracking and Transparency: A system for documenting how Col is identified, evaluated, and managed is essential for maintaining transparency and addressing stakeholder concerns. Perceived Col Challenges: Perceived Col, even if unfounded, can significantly damage credibility. A case study from New Zealand highlighted the difficulty of managing public perceptions once Col accusations emerge.	(ICES 2023a) All the recommendations listed in reference to ICES 2021, but with specific addition about processes for handling Conflicts of Interest in data.

			<p>Communication Strategy: To mitigate the impact of perceived Col, a robust communication plan should be developed to engage stakeholders and maintain public trust.</p>	
11	<p>ICES (2023c). Workshop on Implementation of Stakeholder Engagement Strategy (WKSTIMP). ICES Scientific Reports. Report. https://doi.org/10.17895/ices.pub.23507958.v1</p>	<p>Engagers training (Action 33) and the Stakeholder Engagement Toolbox/Manual (WKSHOES, 2021=), to assist the engagers in all steps of the way from identifying relevant stakeholders and contacting them to planning the engagement process, finding suitable methods for workshops and analysis, and for integrating of different kinds of knowledge (scientific/experiential).</p>	<p>A combination of tools and approaches creates a robust and inclusive engagement process, including:</p> <ul style="list-style-type: none"> • Online collaboration platforms to facilitate communication and collaboration. • Surveys & questionnaires to gather feedback and insights from stakeholders. • Social media and online communities to foster dialogue and reach a wider audience. • Webinars and virtual events to facilitate direct engagement with stakeholders. • Dedicated stakeholder engagement software to manage and analyze stakeholder engagement activities in a centralized manner. 	<p>(ICES 2023c)</p> <p>Two major risks to the integrity of ICES advice are: "creative and created blindness" and "advice shopping."</p> <p>Creative and Created Blindness occurs when data are deliberately withheld, unsampled, or manipulated to prevent unwanted advice. It can distort ICES advice, making researchers "blind" to specific issues, undermining data-based science. Experts are reminded to account for the possibility of missing data and avoid assuming "absence of evidence" means "evidence of absence."</p> <p>Advice Shopping occurs when multiple parties seek advice on the same issue from different sources to use selectively in policy negotiations.</p> <p>To mitigate these risks, ICES must enhance transparency, use the best available data, establish clear protocols for data use, carefully define boundaries in collaborative research to uphold the integrity of its advice, and adhere to an ecosystem approach, even if the resulting advice is unwelcome.</p>
12	<p>ICES Roadmap for Bycatch of Endangered, Threatened, and Protected (ETP) Species. 2024 https://doi.org/10.17895/ices.pub.26003467</p>	<p>Case studies are very relevant.</p>	<p>1. Collaboration with International and Regional Organizations</p> <p>Success: ICES established cooperation with organizations like ACCOBAMS, ASCOBANS, HELCOM, OSPAR, NEAFC, and others. These partnerships have facilitated data sharing, risk evaluations, and the development of</p>	<p>(ICES 2024)</p> <p>1. Collaborative platforms are essential</p> <p>Engagement efforts that include multiple stakeholders (industry, conservation groups, and policymakers) in data collection, methodology development, and mitigation strategies tend to succeed more.</p>

joint methodologies, effectively addressing regional and conservation priorities.

Challenges: Differences in priorities and objectives among organizations can delay unified action.

2. Advisory Contributions and Data Sharing

Success: ICES expert groups collaborated with fisheries management organizations and environmental stakeholders, ensuring data from multiple sources (e.g., strandings, monitoring, and interviews) is synthesized into actionable advice.

Challenges: Data gaps and inconsistencies, especially for smaller vessels and data-deficient regions, hinder the effectiveness of these collaborations.

3. Involvement of National and Regional Managers

Success: National engagement through EU Member States' coordination (via Regional Coordination Groups - RCGs) has improved regional data collection and fisheries management plans under the EU Marine Strategy Framework Directive and other policies.

Challenges: Variability in commitment and resource allocation by individual nations affects consistency and comprehensive data submission.

4. Engagement with Industry Stakeholders

Success: Efforts to involve the fishing sector in bycatch reporting and mitigation strategies have been beneficial in raising awareness and improving compliance with regulations like acoustic deterrents.

2. Customized approaches are needed

Different fisheries, regions, and stakeholders require tailored engagement strategies. Smaller fisheries may need more direct incentives or simplified processes to participate.

3. Capacity building and incentives improve engagement

Providing resources and training for stakeholders (e.g., small-scale fishers) improves compliance. Incentives like subsidies for bycatch-reducing technologies could help mitigate industry pushback.

Challenges: Resistance from industry stakeholders due to perceived economic impacts or lack of incentives for bycatch mitigation measures.

5. Inclusion of Environmental NGOs

Success: Collaboration with NGOs has contributed to raising public awareness and advocacy for stricter bycatch mitigation measures.

Challenges: Conflicts between conservation goals and fishing industry objectives may hinder constructive dialogue.

13 [Caze' C, Re' veillas J, Danto A and Maze' C \(2022\) Integrating fishers' knowledge contributions in Marine Science to tackle bycatch in the Bay of Biscay. Front. Mar. Sci. 9:1071163. doi: 10.3389/fmars.2022.1071163](#)

Integration of fishers (with its Local Ecological Knowledge-LEK) recommended not only in knowledge production (co-creation) but also in the design and decision-making processes on bycatch reduction (potential measures/policies) to keep the industry involved, trust and keen to improve.

Use of LEK to determine which areas are to be managed, and when, to develop dynamic adaptive ecosystem management.

Look conflict and collaboration as driving forces to improve understanding of the complex system dynamics at play and to develop regulations adapted to local specificities, towards an adaptive socio-ecosystem based management of the issue.

Building mutual trust is indispensable to keeping fishers' interests to participate. Researchers and fishers are in a mutual defensive position, when sharing doubts about each other's intentions

>Approaches that worked:

-Relationship built on trust is needed, old or new.

-Political and scientific approaches of integrating fishers in knowledge production and in decision-making processes on bycatch reduction.

-Adhoc/Specific approach to be carried out in subgroups discussing specific dimensions of bycatch and/or by metier, avoiding generalizations that may not affect a gear while has impact on others.

-Promoting the integration of fishers' feedback, of their expertise and knowledge of the marine ecosystems, in order to create more specified regulations, rather than applying regulations to all gears and fishing practices.

-Participating in research projects on bycatch giving them the opportunity to refute/discuss the data with which they do not relate.

(Caze et al. 2022)

Main advice:

-Communicating and collaborating with fishers require logistics and reliable channels of communication (professional representative bodies support is essential).

-Deploying a network of "sentinel fishers" by metier and area, using app. to report on bycatch, helps monitoring and initiating a reflection on the evolution of fishing strategies

-Promoting the integration of fishers' feedback, of their expertise and knowledge of the marine ecosystems, in order to create more specific regulations, rather than applying regulations to all gears and fishing practices.

-Regulations already in force add legitimacy to scientists' approach.

-Explain the impact of fishing on cetacean and seabird populations as a whole/global problem involving the whole fleet, not only their single vessel, to avoid frictions in the cocreation process.

-Perform approaches that avoid defensive position and doubts about each other's intentions. Avoid accusations because it leads

	<p>Frequent divergence of fishers and researchers regarding the perceived importance of the issue. Fishers perceiving that generate data on the issue may endorse an additional constraint on their activities.</p> <p>Iconic species. For fishers, cetaceans and seabirds arouse respect and consideration; while bycatch induces significant costs related to the degradation of fishing gears.</p> <p>Analyzing the points of friction and identifying power asymmetries and institutional failures, can help understanding the transformations necessary to take into account the social and environmental issues in the decisionmaking process regarding the management of a marine socioecosystem faced with anthropogenic pressures.</p> <p>Relevance for CS7. Interactions with Pelagic trawl with common dolphin (<i>Delphinus delphis</i>). Pingers.</p> <p>Relevance for CS1,2, 3. Interactions gillnets with common dolphin (<i>Delphinus delphis</i>) and harbour porpoise (<i>Phocoena phocoena</i>); to a minor extent, seabird species.</p>	<p>Approaches did not work:</p> <ul style="list-style-type: none">-Global approach to a complex issue that varies dep on each fishery.-Point the fishery as the problem in stead of looking for collaboration in producing the best possible solutions.-Make fishers perceiving their role only as "data suppliers" and dismiss their potential as co-creator of solutions to reduce bycatch.	<p>to defensive responses.</p> <ul style="list-style-type: none">-Scientists highlight the need to adopt a long term vision in today' policies, to avoid danger and reluctant.-Avoid the perception of dichotomy between academia and fisheries to reduce disagreements.-Co-creation of knowledge requires building trust between the different parties.-Avoid generating lack of trust led (for different reasons) that would alter stakeholder relationships/interactions.-Pay attention to unexpected regulations that could erode trust very quickly.-Socio-ecological conflicts tend to be seen as negative phenomena to be avoided and "resolved" as quickly as possible by finding win-win solutions, through cooperation, negotiation and consensus seeking.-knowledge co-creation including fishers info-view-data is a way for fishers to seen themselves reflected in the decision-making/measures design.-To "test" integrating fishers' representatives at the step of interpretation of the projects' results to inform policy making and develop bycatch mitigation tools such as thresholds.	
14	<p>Steins, N et al. 2022. A will-o'-the wisp? On the utility of voluntary contributions of data and knowledge from the</p>	<p>Relevant for CIBBRiNA component that focusses on data collection of bycatch and the case studies in which the collaboration with the industry takes place. It involves all stakeholders within CIBBRiNA and this paper</p>	<p>5 key elements associated with resistance to the use of voluntary knowledge contributions in scientific evidence to support management are identified: 1) threats to quality; 2) lack of reliability; 3)</p>	<p>(Steins et al. 2022)</p> <p>SIRC is context-dependent and it depends on the case. Achieving SIRC will involve adaptations to current fisheries governance frameworks towards new cultures of</p>

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	<p>fishing industry to marine science. Front. Mar. Sci., 19 December 2022 Sec. Marine Fisheries, Aquaculture and Living Resources. Volume 9 - 2022 https://doi.org/10.3389/fmars.2022.954959</p>	<p>can contribute to advise on how to address these issues that inhibit integration of voluntary industry contribution to science.</p>	<p>threats to the integrity of science; (4) concerns about the uniqueness or lack of added-value in Science Industry Research Collaboration (SIRC) and 5) inconsistent availability. The issue of perceptions about the impact of industry contributions on the integrity of science is most difficult to tackle as it entails perceptions from a variety of stakeholders with different belief systems.</p>	<p>cooperation including a better definition of industry's role in contributing to science that will improve credibility and legitimacy of the scientific process. Within CIBBRiNA defining the role of industry contributing to science in the different case studies could help to start a dialogue about SIRC.</p>
15	<p>Tubbs S and Berggren P (2024). Questionnaire surveys to investigate marine mammal fisheries bycatch: systematic review and best practice. Front. Mar. Sci. 11:1481840. doi: 10.3389/fmars.2024.1481840</p>	<p>relevance for those dealing with bycatch assessment and monitoring in CIBBRiNA. That includes the case studies.</p>	<p>The article has reviewed past studies using questionnaires and provides recommendations to aid the development and design of future studies using the methodology. It also gives recommendations for the interviewer of questionnaires, providing pros and cons for different options. A table is provided as supplementary material with recommendations for best practice focusing on different method elements (sampling, questionnaire instrument, questionnaire implementation procedure, data analysis); the way questions are worded and structured can also influence the answers; For example the way questions are styled can affect reporting (closed multiple choice questions yielded higher responses than open questions); Recommendations also include to carefully design the order of your questions; Questions on bycatch where always either towards the end or in the centre of the questionnaire and starting with easier questions and leading onto more difficult questions can reduce response fatigue and honesty in answers. Authors provide a questionnaire design flow diagram (figure 2 - see separate sheet in this</p>	<p>(Tubbs & Berggren 2024) If you are going to develop questionnaires regarding bycatch with fishers the recommendations provided in this paper are worth to consider and easy to implement in your design.</p>

			workbook) including recommendations for pre-testing your questionnaires.	
16	Squires D, Balance LT, Dagorn L, Dutton PH and Lent R (2021). Mitigating Bycatch: Novel Insights to Multidisciplinary Approaches. Front. Mar. Sci. 8:613285. doi: 10.3389/fmars.2021.613285	A multidisciplinary approach conducted in collaboration with the fishing community can provide the widest array of options for mitigating bycatch whilst maintaining a viable fishery. It is of relevance for the case studies which differ from each other (gear type, bycatch species, small- and large scale) that there is no single best approach as the 'best approach' almost invariably differs by a range of factors that influence what approach might be the best.	The regulatory approach to bycatch mitigation policies can be placed in 4 categories: 1) Private solutions; 2) Direct regulation; 3) Incentive based measures; 4) Hybrid solutions. All approaches are explored in the paper. Combining approaches that are complementary can lead to a better overall outcome than use of a single approach in isolation, but it can also work counterproductive. Designing and implementing workable solutions to bycatch presents a challenge for fishery managers and stakeholders.	(Squires et al. 2021) A multidisciplinary approach conducted in collaboration with the fishing community can provide the widest possible array of options for mitigation bycatch whilst maintaining a viable fishery. However, when combining instruments it should be considered whether this is complementary, as combining instruments also can be counterproductive
17	Petri Suuronen, Understanding perspectives and barriers that affect fishers' responses to bycatch reduction technologies, ICES Journal of Marine Science, Volume 79, Issue 4, May 2022, Pages 1015–1023, https://doi.org/10.1093/icesjms/fsac045	Fishers need a clear vision of what the suggested technologies means for their livelihood and evidence that these technologies perform sufficiently well in various conditions. The essential element for a change is a fishers' motivation and readiness. While research can tell which measures can lead to a particular outcome, fishers' attitudes determine what the final outcome is. Adoption of measures requires willingness and readiness of fishers to accept a change; Fishers should not be alienated nor underestimated	see table 1 of Suuronen 2022 providing a summary of effects, challenges and potential development actions of various measures and approaches in building a bycatch mitigation program that uses technological solutions;	(Suuronen 2022) Do include fishers from early on and put yourself in the shoes of the fisher when participation is needed; constructive dialogue is a tool to build trust and readiness to change; focus on perceptions of others, rather than assuming they are similar to yours; Respect for the views of others is needed to build trust and move a debate forward constructively; take into account that there are multiple ways to incentivize for participation; several factors may influence motivation (market pressure, status of fisheries resources, and feeling of fairness); be open what works but also show what does not; step by step approach may work better than a massive leap; if influential fishers adopt a solution often more will follow; language is an important element in any dialogue; social media can be used in a way to issue joint statements, make basic rules what to do and not do on social media regarding a project/collaboration

18	<p>Steins NA, Baker MR, Brooks K, Mackinson S and Stephenson RL (2023). Editorial: Co-creating knowledge with fishers: challenges and lessons for integrating fishers' knowledge contributions into marine science in well-developed scientific advisory systems. Front. Mar. Sci. 10:1338271. doi: 10.3389/fmars.2023.1338271</p>	<p>CIBBRiNA is already working with many of the lessons of this study: Fostering trust, integrating diverse knowledge, ensuring inclusive participation, and maintaining a long-term adaptive approach.</p>	<p>(Steins et al. 2023)</p> <p>Jointly creating knowledge, involving fishers, scientists, and policymakers, is essential for developing effective solutions tailored to local specificities.</p> <p>Conflicts should not be avoided but seen as opportunities for collective learning and the development of inclusive and adaptive solutions.</p> <p>Fishers possess valuable knowledge through their daily interactions with ecosystems. This knowledge can be utilized to better align measures, such as spatial-temporal closures, with specific circumstances.</p> <p>A climate of mistrust among stakeholders, caused by differences in interests and perceptions, can hinder collaboration. Open communication and mutual understanding are crucial.</p> <p>Fishery organizations play a key role in organizing data collection and representing fishers in policy discussions. Their involvement is essential to make measures effective and broadly accepted.</p> <p>Technical measures, such as the use of deterrent devices (pingers), have shown mixed success. Their effectiveness varies depending on the context, underscoring the importance of locally tailored solutions.</p> <p>Spatial-temporal closures are often seen as effective by scientists but may face resistance from fishers due to economic impacts. This calls for carefully negotiated solutions that balance ecological and social interests.</p> <p>Waiting until a species is endangered reduces the chances of successful protection. There is a</p>
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need for long-term policies that are anticipatory and proactive.

- 19 C. Cvitanovic, R.J. Shellock, D.B. Karcher, P. Tuohy, M. Mackay, E.I. van Putten, Marta Ballesteros, M. Dickey-Collas. 2024. Navigating the stormy seas of building 'trust' as a boundary organisation connecting marine science with policy and management. Ocean & Coastal Management. Volume 248, 2024, 106952. ISSN 0964-5691, <https://doi.org/10.1016/j.ocecoaman.2023.106952>.
- integrating fishers' knowledge contributions into marine science in

(Cvitanovic et al. 2024)
Trust is a critical component for successful collaboration between scientific, policy, and stakeholder communities. Transparency, mutual respect, and open communication strengthen trust among participants. Boundary organizations like ICES (International Council for the Exploration of the Sea) play an essential role in bridging science, policy, and stakeholder perspectives. They provide independent scientific advice and ensure equal accountability to all parties involved, maintaining the credibility and relevance of their contributions. The integration of scientific, experiential, and cultural knowledge is crucial. This includes leveraging the observational expertise of fishers alongside formal scientific methods to create more comprehensive and contextually relevant solutions. Transparent methodologies, including clearly defined roles, responsibilities, and quality assurance protocols, are vital for building confidence in the advice provided and ensuring that all stakeholders understand and trust the process. Successful collaboration requires creating opportunities for active participation by all stakeholders in the development of advice, knowledge-sharing, and decision-making processes. This participatory approach ensures that the resulting recommendations are robust, widely supported, and practically applicable. Conflicts and tensions are inevitable in collaborative settings. These should be seen as

			<p>opportunities for learning and adaptation rather than obstacles. Establishing processes for constructive dialogue and conflict resolution is key to sustaining partnerships. Ensuring that advice remains grounded in rigorous science while being practically applicable to policy is a delicate balance. This requires clearly communicating the limitations and uncertainties of scientific findings while working closely with policymakers to tailor advice to decision-making needs. Flexibility and responsiveness to evolving ecological, social, and policy contexts are necessary for maintaining the relevance and effectiveness of initiatives aimed at reducing bycatch.</p>
20	<p>Fishing into the Future. 2024. Core values for working together effectively. 16p. https://www.fishingporthole.co.uk/core-values/</p>	well-developed scientific advisory systems	<p>(FitF 2024)</p> <p>Create platforms for meaningful participation, ensuring all stakeholders, especially fishers, feel valued and heard.</p> <p>Use clear, jargon-free language and provide multiple channels for feedback and information-sharing.</p> <p>Conduct regular, face-to-face interactions to develop trust and deepen relationships between stakeholders.</p> <p>Ground bycatch mitigation measures in robust scientific data, complemented by experiential knowledge from fishers.</p> <p>Develop straightforward frameworks for participation and feedback, making it easier for stakeholders to engage effectively.</p> <p>Recognize the economic and personal investment of fishers by compensating their involvement in policy discussions.</p> <p>Shift the narrative around the fishing industry to highlight its role in sustainability and</p>

				stewardship, encouraging pride and cooperation.
21	Anthony D. Hawkins, The Importance of Involving Stakeholders and Scientists in the Management, Journal of Fisheries Science, Volume 01, Issue 01, March 2019	(no specific case studies)		<p>(Hawkins 2019)</p> <p>Ensure decision-making processes are transparent, and all stakeholders have access to relevant data and a clear understanding of policies.</p> <p>Expand the role of stakeholders in advisory bodies, giving them a more active role in decision-making processes.</p> <p>Fishers' experiential knowledge is invaluable for understanding bycatch hotspots and developing practical mitigation measures.</p> <p>Establish formal partnerships similar to the North Sea Fisheries Partnership to facilitate dialogue between fishers, scientists, NGOs, and policymakers.</p> <p>Address the broader ecological impacts of bycatch, including predator-prey relationships and habitat protection.</p> <p>Use modern technologies (e.g., electronic monitoring, data systems) to improve bycatch monitoring and provide real-time insights to stakeholders.</p> <p>Align short-term measures with long-term sustainability objectives, emphasizing adaptability to environmental changes.</p>
22	Cronin, M.R., Croll, D.A., Hall, M.A., Lezama-Ochoa, N., Lopez, J., Murua, H., Murua, J., Restrepo, V., Rojas-Perea, S., Stewart, J.D., Waldo, J.L., Moreno, G. 2022. Harnessing stakeholder knowledge for the collaborative development of Mobulid	case study (purse seine targeting tropical tunas in Eastern Pacific) can provide insights on elasmobranchs bycatch avoidance in other sea basins.	used a mixed approach: surveys and focus groups. difficulties in having respondents for the surveys and organizing focus groups as the fishers are on the sea for prolonged times --> focus on defence periods (e.g.). importance of having different types of respondents/focus groups (masters/captains, operators and observers) , despite the masters are the ones who decide whether to put out the net in certain	<p>(Cronin et al. 2022)</p> <p>Trials at sea/innovations of gear modifications/best practices safe handling and release should be done only after stakeholder consultations. snowball method to identify knowledgeable stakeholders is important</p>

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	bycatch mitigation strategies in tuna fisheries, ICES Journal of Marine Science, Volume 80, Issue 3, April 2023, Pages 620–634, https://doi.org/10.1093/icesjms/fsac093		times and locations, but for handling and releasing the operators have more knowledge on whether best practices could work. recommendations include: Conduct smaller, longer focus groups for in-depth discussions; Target highly knowledgeable participants, including recently retired fishers	
23	Morf, A., Bly Joyce, K., Matthiesen, H., Elin Cedergren, E., Cuadrado, A., Andringa, J., Oelen, J.P., Gee, K., Varjopuro, R., Annica Brink, A., Matczak, M., Zaucha, J. (2023). Policy Brief Communities of Practice in marine spatial planning across sea basins - making it work. Policy brief of the eMSP NSBR project, download from https://www.emspproject.eu/results/	The Community of Practice approach and key questions to establish a CoP: In what context is the CoP embedded? How is the CoP supported?; Who participates and how? How do we facilitate interaction and contribution? What do we need to learn? What do we want to achieve?	CoPs are even more dependent on personal commitment and voluntary contributions as there are no contracts or formal assignments. If the aim is to initiate a new CoP within a project, it can be difficult to secure ongoing commitment as this is a different mode of working compared to working towards a pre-defined goal. This particularly applies in the initial explorative phase of a CoP. Combining online and in-person work requires good planning and skilled facilitation. Too strong a focus on deliverables can restrict a CoP's openness and limit the group's ability to listen to various perspectives: Working as a CoP requires faith in the approach - which comes with experience;	(Morf et al. 2023) Consider that intangible outcomes and concrete outputs are equally important; Structures and deadlines can be helpful to progress towards final products important to both participants and end users. discussion and solution seeking should take place in a non-hierarchical manner; establish the ground rules before hand
24	Kirby, D.S. and Ward, P. 2014. Standards for the effective management of fisheries bycatch. Marine Policy, Volume 44, 2014, Pages 419-426, ISSN 0308-597X, https://doi.org/10.1016/j.marpol.2013.10.008.	Application of the proposed standards to the prohibition of wire traces/leaders in the Eastern Tuna and Billfish Fishery with bycatch of sharks illustrates that monitoring and evaluation of performance can be neglected. Evaluation of the costs and benefits of bycatch management is particularly important. standards, with accompanying guidelines, are desirable for managing fisheries bycatch	5 technical workshops held with different objectives, one was specific for stakeholder involvement. Mixed approach of having more focused technical workshops with experts in certain fields and a more broader workshop regarding a more diverse range of stakeholders could be interesting for CIBBRiNA and more cost-effective.	(Kirby and Ward 2014) Importance of combining literature review, policies (national and international) and experts and stakeholders input for a given solution to minimise bycatch can enhance its effectiveness, implementation and applicability.
25	Prado, D.S, Martins, I.M., Christofoletti, R.A. 2024. Participatory scenario	It describes a case study around the implementation of a regulation to reduce the bycatch of some megafauna taxa in Brazil	The method logical approach gives primordial importance to the context analysis (background history including ethics,	(Prado et al. 2024) Positive outcomes that eliminate conflicts for everyone might not always be possible, but

	<p>planning as a useful method for transforming ocean conflicts: Insights from a small-scale fishing conflict in São Paulo coast, Brazil. Marine Policy, Volume 160, 2024, 105922, ISSN 0308-597X, https://doi.org/10.1016/j.marpol.2023.105922.</p>	<p>(cetaceans and chelonians). It gives valuable hints (and insight from the directly involved participants) on the implementation of the methodology that can be applicable (could feed valuable internal discussions) in the context of Cibbrina.</p>	<p>also including good and bad experiences) and to the careful preparation of the interactions (through interviews and the PSP workshop itself) addressing the role of each party in each of the scenarios considered and investing time in building legitimacy; the approach suggests valuing conflict transformation more than conflict resolution, so we could say it is trade-offs oriented and it points at the process rather than at the final result. In this respect, this work suggests that focusing only on desirable scenarios can have a negative effect on engagement if actors cannot envisage feasible achievements. Viability needs to be considered.</p> <p>The study highlights professional and "neutral" (not directly/previously involved) facilitation as a key enabler.</p> <p>Engagement of relevant and "powerful" parties, with decision capacity, but also not strongly confronted has also been recommended. It is remarked the importance of avoiding or minimizing power asymmetries "making room for divergences to emerge and be hosted".</p> <p>An important highlight of the final conclusion "To foster conflict transformation into more equitable scenarios the method should not be applied in a technocratic way, apolitical, looking for fake consensus, but rather to provide a space that highlights commonalities, foster dialogue and allow differences to emerge and be valued."</p>	<p>nevertheless, participatory processes can be useful in identifying trade-offs and mitigating the worst outcomes.</p> <p>Participatory planning work should carefully address the roles of each party, avoid power asymmetries and provide a space enabling genuine dialogue to emerge, rather than as a technocratic process.</p>
26	<p>Crowder, L.B. & Murawski, S.A. 1998. Fisheries Bycatch: Implications for</p>	<p>divergence regarding the perceived importance of the issue. Bycatch is conceived in a broad sense, from non-target species to sensitive/protected species. Paper is not</p>		<p>(Crowder & Murawski 1998)</p> <p>No specific relevant advice</p>

	Management, Fisheries, 23:6, 8-17.	really focused on the role of fishers in implementing solutions to mitigate bycatch. Overall not too relevant for CIBBRiNA.		
27	Komoroske, L.M and Lewison, R.L. 2015. Addressing fisheries bycatch in a changing world. Front. Mar.Sci.2:83. doi: 10.3389/fmars.2015.00083	The review contains several references to the integration of socio ecological approaches and the engagement of stakeholders alongside the desing and implementation of solutions.	<p>-One overarching conclusion of the review is that multidisciplinary technical approaches combined with strong investment in science communication and social networking between science, managers and fishers has shown a great potential to find feasible solutions (meaning technically, socially and economically). Collaboration has led to real conditions testing of several technologies with a relative success rate. Communities operate to discuss, co-develop and test the measures and techniques to be used, and then participate in the decisions and implementation of mitigation strategies. Increased communication, knowledge transfer and enhanced understanding of the rational underlying fishery regulations is reported "crucial for compliance".</p> <p>-Standardised systematic interviews and surveys are highlighted as a recommended approach to address data gaps and data sharing (enabling comparison at global level).</p> <p>-Emerging trends around understanding dynamics of ecologic and social systems it is highlighted the different paces at which change occurs. Adaptation to shifts in fisheries distribution and abundance are not always followed at the same pace by fishers and managers strategies. Constraints to social adaptations may also contribute to novel fishery-bycatch interaction and/or dynamics. Advances are made in incorporating climate forecasts, impacts and social adaptations into ecosystem-based fisheries management, but not yet</p>	<p>(Komoroske and Lewison 2015)</p> <p>Most of the emerging approaches and recommendations related with socio-ecological systems and ALL SHs engagement alongside the solutions design, development, testing and implementation are very relevant to all Cibbrina WPs. Some of the suggestions about the use of standardised frameworks for data gathering, interviewing and surveying are worth considering for Cibbrina CSs. Dynamics and local specificities are also very important highlights to Cibbrina. Bycatch mitigation solutions are highly context-dependent, varying across fisheries and regions due to political, cultural, and economic factors.</p>

specifically into megafauna bycatch assessments and mitigation measures. Dynamic Ocean Management practices is gaining traction worldwide. Again, increasing knowledge on science and technology with the stakeholders onboard can make a difference in the efficacy of DOM for bycatch reduction. But this depends much on the availability of robust data, continuous data collection continues being critical for success. Outdated or poor quality data may not only lead to inaccurate predictions but also may seriously hinder the trust based relationship needed between scientists, fishers and regulators.

The text on understanding Social-Ecological-System linkages is very relevant to Cibraña Bycatch mitigation solutions are highly context-dependent, varying across fisheries and regions due to political, cultural, and economic factors. Effective measures in one area may fail elsewhere due to differences in regulatory frameworks, infrastructure, or local fishing practices. For example, solutions that work for large-scale, regulated fisheries may not apply to small-scale, artisanal fisheries with limited enforcement.

Socio-cultural barriers, such as traditional values and community dynamics, can impede the adoption of bycatch mitigation strategies, especially in regions where fishers value independence and resist regulation. Similarly, socio-economic challenges, such as poverty and lack of resources, can hinder fishers' ability and willingness to alter fishing methods. Compliance is particularly difficult when mitigation measures involve perceived economic costs, such as reduced target catch

or increased operational costs.

Integrated frameworks have been developed to identify socio-cultural and economic factors affecting bycatch and ecosystem management. These frameworks emphasize the importance of local-scale factors, like social capital and community participation, in small-scale fisheries. For effective mitigation, strategies must integrate local livelihoods, consider market forces, and support continuous dialogue with stakeholders. Additionally, bycatch-driven closures or shifts in fishing practices can have unintended consequences, such as creating new bycatch problems or undermining sustainability.

In an increasingly globalized market, bycatch reduction measures can lead to market transfer effects, where restrictions in one region shift fishing pressures to less regulated international waters. This underscores the need for global coordination and context-sensitive solutions that consider local socio-economic and cultural conditions.

-The sixth topic around emerging approaches is about stakeholder engagement and evaluation. Engagement of the stakeholders is recommended at all levels, fisheries and regions. Their involvement is not only key for regulation compliance but for designing, building and implementing the actual solutions, which are operable under real conditions. Co-management and cooperative communities have proved instrumental for the successful implementation of sustainable fishing policies.

Such approaches facilitate continued dialogue among scientists, fishers, and

			managers to assess and adapt mitigation strategies to adjust to real vs. ideal implementation scenarios. Utilizing a framework of standards to perform systematic, robust assessment of mitigation technologies and practices, facilitate feedback, and drive adaptation has also been effective in fisheries with greater infrastructure capacity. Also media strategies more focused on reaching out to influence consumer decisions have also had some efficacy. Also media strategies more focused on reaching out to influence consumer decisions have also had some efficacy.	
28	Mackinson, Steven & Middleton, David. (2018). <u>Evolving the ecosystem approach in European fisheries: Transferable lessons from New Zealand's experience in strengthening stakeholder involvement.</u> Marine Policy. 90. 194-202. 10.1016/j.marpol.2017.12.001.	Experiences in inclusivity of stakeholder in research and management arenas	Experience from NZ with efforts to strengthen inclusive governance display several hallmarks which provide clues to their success and are widely applicable to any endeavour seeking engagement with fisheries stakeholders: they are open and transparent; they provide conditions for industry innovation and initiative; they create/promote participation in ways that empower stakeholders, foster responsibility and buy in.	(Mackinson and Middleton 2018) Endeavour to be open and transparent, provide conditions for industry innovation and initiative, they create/promote participation in ways that empower stakeholders, foster responsibility and buy in.
29	Campbell, L., and Cornwell, M.(2008).Human dimensions of by catch reduction technology: current assumptions and directions for future research. Endanger SpeciesRes. 5,325–334.doi:10.3354/esr00172	Frequently mentions fisher participation as a key factor in bycatch mitigation success. Participation is often equated with education, assuming that increasing fishers' understanding of the bycatch problem and the benefits of reducing bycatch will lead to greater acceptance. However, this approach overlooks the complexity of fisher perspectives and the importance of acknowledging their knowledge and concerns. At a fundamental level, fishers may not value charismatic animals in the same way that the	Engagement approaches emphasizing collaboration, trust-building, and fisher empowerment are more likely to succeed in fostering bycatch reduction technology uptake than top-down, enforcement-centric methods or superficial educational campaigns.	(Campbell and Cornwell 2008) Empowering fishermen to be part of the team solving the issues is key to success. Need to understand how fishermen might value ETP species and their concerns because this affects their incentive to find solutions and which approaches to take.

		public, environmental groups, and some resource management agencies (and/or their mandates) do, and fishers may resent the time and energy spent on their management. Advocates for more meaningful participation that involves fishers in the design and development of solutions, fostering trust between stakeholders, and empowering fishers to contribute to solutions. Treating participation merely as a means to ensure compliance is insufficient.		
30	Cox,T.M., Lewison,R.L., Zydelis,R., Crowder,L.B., Safina,C.,and Read,A.J. (2007). Comparing effectiveness of experimental and implemented bycatch reduction measures: the ideal and the real. Conserv.Biol. 21,1155–1164.doi: 10.1111/j.1523-1739.2007.00772.x	Emphasizes that collaboration among stakeholders, including fishers, resource managers, and scientists, is crucial for developing and implementing effective bycatch reduction strategies. Collaboration should extend beyond the initial development phase and continue through the implementation stages, involving ongoing communication, education, and outreach. Provides examples of California pingers, Alaska demersal longline and Queensland prawn fisheries.	Researcher-industry partnerships and regulatory flexibility: The success of TED implementation in Australia's northern prawn fishery was attributed to a close partnership between researchers and fishers. Researchers loaned TEDs to fishers, allowing them to experience the benefits firsthand before investing in them. They also demonstrated flexibility by modifying TED designs to suit individual fishers' needs, addressing concerns about jellyfish bycatch and ensuring that using TEDs wouldn't negatively impact prawn catches. This collaborative and adaptive approach fostered trust and encouraged widespread adoption of TEDs. In California, a collaborative workshop identified regulatory changes that were implement to ease deployment of pingers. Unsuccessful approaches include top-down regulation without adequate enforcement or incentives, such as implementation of TEDs in the U.S. Gulf of Mexico shrimp, where too easy to bypass and went unnoticed.	(Cox et al.2007) Demonstrations of effective gear and loaning gear for fishermen to test the effectiveness themselves can help encourage investment in adopting new practices. Some regulations might be a barrier to solutions, so need to be re-considered to ensure they are fit-for-purpose. Fishers participation in developing solutions is key.
31	Peckham,S.,and Maldonado-Diaz,D.(2012).“Empoweri	Example of engaging fisheries in bycatch reduction and conservation of turtles. Concluded that engaging with fishermen on a	What worked: Building relationships with fishers over time, sharing scientific data in a clear and compelling way, empowering	(Peckham and Diaz 2012) Empowerment of fisheries stakeholders essential to get the conservation benefits of

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[ng small scale fishermen to be conservation heroes: a trinational fishermen's exchange to protect loggerhead turtles," in Sea Turtles of the Eastern Pacific Ocean: Natural History, Conservation Challenges and Signs of Success, eds\]. Seminoff and B.Wallace \(Tuscon,AZ: University of Arizona Press\),279–301.](#)

personal level, building trust and relationships, and empowering them to find their own solutions were essential for achieving bycatch reduction. Emphasized the importance of providing fishermen with clear and compelling scientific data to demonstrate the impact of their fishing practices. By combining these approaches, the researchers were able to achieve significant reductions in loggerhead turtle bycatch in the small-scale fisheries of Baja California Sur.

fishers to find their own solutions, highlighting the trans-Pacific migrations of loggerheads and their consequential vulnerability, recognizing and celebrating the conservation successes of the fishermen. What did not work: Appealing to the fishermen's sense of conservation without providing them with scientific data to support the claims, attempting to buy out the fishermen's gear, expecting fishermen to change their behaviour without addressing the social and economic factors that drive their fishing practices

bycatch reduction, as is scientist sharing scientific data in a clear and compelling way.

6.2 AI Queries

Principles

Query: “List the principles necessary to ensure effective and collaborative working with stakeholders on bycatch of endangered, threatened and protected species”.

To ensure effective and collaborative working with stakeholders on bycatch of endangered, threatened, and protected (ETP) species, several key principles should be considered. These principles can be applied to both the design and implementation of research and management processes.

Inclusivity and Opportunity:

- **Stakeholder engagement should be inclusive, proportional to the issue, and begin as early as possible.** It is important to extend invitations to a wide range of stakeholders, especially those who may have differing or opposing views.
- Identify organizations that can provide technical and evidence-based input. This can be done through open calls and by refining existing databases.
- Ensure inclusivity to identify relevant contributors and avoid leaving anyone behind.

Transparency and Defined Roles:

- **The roles, responsibilities, and expectations of all participants should be transparent.** All participants need to understand and respect their roles and the roles of others.
- **Clearly define the roles of each stakeholder involved.** This helps to manage expectations.
- Ensure that there is a clear process for reviewing and auditing plans.

Open Communication and Trust:

- **Be open and honest, and address any potential conflicts or equity issues directly.**
- **Foster a culture of collaboration, mutual trust, and respect.** Actively involve stakeholders in the development and sense-checking of advice.

- Establish communication platforms for setting objectives, management clauses, and evaluation criteria. Ensure that information is regularly communicated through appropriate media.
- **Maintain consistent communication to strengthen collaboration.** Provide feedback on how the consultation has been integrated.

Shared Goals and Ownership:

- **Set clear, specific, and realistic goals that are shared by all stakeholders.**
- Ensure that all parties feel a sense of ownership of the end results.
- **Engage stakeholders on scientific issues that are relevant to them and incorporate their concerns.**

Knowledge Co-creation and Use of Best Available Information:

- **Recognize stakeholders as key data, information, and knowledge providers.** Use their knowledge to help identify research questions and hypotheses.
- Ensure that the best available scientific information is used for assessment and decision-making. This includes environmental, biological, technical, economic, and social data.
- **Integrate interdisciplinary and transdisciplinary approaches that include socio-economic information and experiential knowledge into qualitative frameworks and models.**
- Acknowledge that fishers' participation is linked to their sense of ownership.

Adaptive and Systematic Approach:

- Develop a framework for measuring performance and a checklist of actions for bycatch management.
- Ensure that management actions are prioritized, achievable, appropriately resourced, measurable, and accountable.
- Use a systematic approach to manage bycatch, with defined goals, monitoring systems, and adaptive decision-making.
- Establish processes for identifying and mitigating conflicts of interest.

Addressing Challenges:

- Be mindful of "stakeholder fatigue" and limit the number of requests for participation in meetings.
- Recognize and address the potential for power imbalances.
- Work to overcome limitations to collaboration, using robust, relevant, cost-effective, and timely initiatives.

Specific Actions:

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- Develop guidelines for groups to ensure equity and balance in power relations.
- Update existing guidelines on conflict of interest, explicitly addressing those associated with each role.
- **Engage with fishers, involving all relevant stakeholders and communicating with the wider fishing industry.**
- **Design studies to accommodate skippers, crew, vessel, gear type, and normal fish handling practices.**
- Be prepared to adapt mitigation strategies to adjust to real-world scenarios.
- **Consider how to motivate people's participation by identifying the drivers and incentives.**
- **Ensure that there are feedback mechanisms in place to ensure quality participation.**
- **Focus on collaborative development, recognizing that scientific research in wide ranging fishing grounds is expensive.**

By adhering to these principles, stakeholders, scientists, and managers can work together more effectively to mitigate the bycatch of ETP species, promoting both conservation and sustainable fisheries.

Best practice in fishing industry stakeholder engagement

Query: “What are the top 12 essential pieces of advice for making engagement with **fishing industry stakeholders** effective in finding solutions to reducing bycatch of endangered, threatened and protected species?”

Drawing on the sources, here are 12 essential pieces of advice for effectively engaging with fishing industry stakeholders to find solutions for reducing bycatch of endangered, threatened, and protected (ETP) species:

1. **Engage early and continuously with all stakeholders** involved in bycatch management. Early engagement with stakeholders is incredibly important.
2. **Ensure transparent communication** to address information deficits between different stakeholders and to help ensure fair science and advice processes.
3. **Use inclusive and understandable language** to avoid creating communication barriers. Exclusive and selective scientific language can be a communication barrier, so training ICES Chairs who are natural scientists to convey scientific arguments in an understandable manner to fishers or stakeholder representatives can be helpful.
4. **Acknowledge different stakeholder roles and share responsibility** for issues and how to solve them. The fishing industry needs opportunities facilitated by science and management to understand and build capacity to be involved in their work, and vice versa. Science and management need to invest time in understanding the industry and building skills to communicate and engage with industry effectively and understand the nature of fishing.
5. **Be mindful of stakeholders' fatigue** and consider limiting requests for participation in meetings where necessary.
6. **Understand fishers' perspectives and motivations.** A lack of consideration of fishers' needs and voice can undermine support and produce opposition, potentially undermining the long-term success of sustainability initiatives. Restoring a climate of trust requires understanding the needs, concerns, and motivations of the groups of fishers.
7. **Recognize the value of fishers' knowledge.** Experience-based knowledge comes from diverse sources, and the scientific process must recognize stakeholders' capability and availability.
8. **Use collaborative approaches to develop mitigation technologies.** Collaborative development is especially valuable, as scientific research in wide ranging fishing grounds is expensive due to the need to hire research vessels and the time needed for scientists to be at sea.
9. **Provide regular training and education** to address informational gaps and incentivize bycatch mitigation.
10. **Establish transparent frameworks** for how management measures are constituted.

11. **Build mutual trust** through face-to-face communication and long-term relationships.
12. **Carefully design studies to accommodate the skipper, crew, vessel, gear type, and normal fish handling practices** to mitigate potential pitfalls in fishery-dependent data.

Query: “What engagement approaches with fishing industry worked or did not work and why?”

Several sources in this collection discuss engagement approaches with the fishing industry, highlighting what has worked, what hasn't, and the reasons behind the outcomes.

Successful Engagement Approaches:

- **Collaborative research and co-management:** A collaborative approach that involves fishermen from the beginning builds trust and participation. Fishermen taking scientists to sea facilitates face-to-face interactions, developing trust and mutual understanding. Involving industry in the design of data collection programs increases the likelihood of success.
- **Addressing industry concerns:** Engaging fishers in experiments addressing their concerns can increase the relevance and credibility of results. Addressing issues important to fishermen can motivate their participation and allows them to shape the research topic.
- **Transparent communication and feedback:** Regular communication with stakeholders and transparency throughout projects are key to success and building positive relationships. Providing feedback to fishermen, allowing them to review preliminary results, is also beneficial.
- **Recognizing and utilizing fishers' knowledge (FEK):** Valuing and integrating FEK in research and management can lead to better outcomes. Combining FEK with scientific knowledge can create a more comprehensive understanding.
- **Building relationships and trust:** Long-term relationships and face-to-face contact build trust between fishers and researchers. Good working relationships are established when scientists and fishers spend time working together.
- **Industry-led initiatives:** Supporting industry-led initiatives can contribute to knowledge on stocks and fisheries. A passionate and driven fishing industry representative can effectively engage fishermen.
- **Adaptive and flexible approaches:** Recognizing the dynamic nature of fisheries and adapting management strategies accordingly is important. A flexible and adaptive approach is required when dealing with the complex nature of integrated ecosystem assessments.

- **Economic and social incentives:** Economic incentives, such as increased fishing efficiency or reduced sorting work, can encourage fishers to adopt bycatch reduction technologies.
- **Phased implementation:** Phasing in new regulations, like the landing obligation, and discussing the reasoning behind them can increase fishers' buy-in.

Less Successful Engagement Approaches:

- **Top-down or command-and-control management:** Management done in a top-down manner, with limited stakeholder engagement, can restrict fishermen's participation and access to the knowledge base.
- **Lack of industry involvement in design:** Programs designed without industry involvement are less likely to succeed.
- **Ignoring industry concerns:** Failing to address the concerns and motivations of fishers can undermine support for sustainability initiatives.
- **One-off engagement:** Engagement that is limited to the beginning of a process, rather than regular involvement, may not be as effective.
- **Short-term funding:** Short-term funding can compromise the continuity of industry data collection.
- **Lack of trust:** Mutual suspicion and legitimacy problems can hinder collaborative work, requiring substantial investment in trust-building activities.
- **Fatigue:** Stakeholder fatigue can occur if there is little output or return for the effort and contribution given by fishermen.
- **Data collection without a clear purpose:** Collecting data simply because it is possible, without a clear question or goal, may not be effective.

Several factors can influence the success of engagement approaches. Trust and communication are recurring themes. Building trust requires face-to-face interactions, long-term relationships, and transparent communication. Understanding fishers' perspectives, motivations, and knowledge is also critical. Furthermore, providing incentives, addressing concerns, and involving industry in the design and implementation of research and management initiatives increases the likelihood of successful engagement.

Query: “What advice can be summarized on the do’s and don’ts of collaborative working with fishing industry?”

Based on the sources, here is a summary of the "do's and don'ts" for collaborative work with the fishing industry, incorporating our conversation history:

Do's:

- **Involve Fishers Early and Often:** Engage fishers from the outset in all stages of the research process, starting with problem identification. Early engagement with stakeholders is incredibly important [your prior response].
- **Build Trust and Relationships:** Prioritize building mutual trust through face-to-face communication and long-term relationships [your prior response]. Good working relationships are established when scientists and fishers spend time working together [your prior response].
- **Communicate Transparently:** Ensure transparent communication to address information deficits between different stakeholders and to help ensure fair science and advice processes [your prior response]. Messages should be clearly communicated to stakeholders and the wider community, in a way that avoids 'jargon'.
- **Recognize and Value Fishers' Knowledge (FEK):** Value and integrate FEK in research and management to achieve better outcomes [your prior response]. Accept new forms of knowledge, including Experience Based Knowledge, to complement scientific information.
- **Share Responsibility and Acknowledge Different Roles:** Acknowledge different stakeholder roles and share responsibility for issues and how to solve them [your prior response].
- **Align Initiatives with Industry Needs:** Align initiatives with actual needs and evidence gaps so that they are fit-for-purpose. Engage fishers in experiments addressing their concerns to increase the relevance and credibility of results [your prior response].
- **Provide Feedback and Show Impact:** Provide feedback to fishermen, allowing them to review preliminary results [your prior response]. Make positive news of the industry's role in the work and the collaborative process itself.
- **Offer Incentives:** Provide remuneration to fishers where possible and appropriate. Economic incentives, such as increased fishing efficiency or reduced sorting work, can encourage fishers to adopt bycatch reduction technologies [your prior response].
- **Co-design Research Programs:** Co-construct projects and have strong feedback channels. Studies should be carefully designed to accommodate the skipper, crew, vessel, gear type, and normal fish handling practices [your prior response].
- **Promote a Culture of Cooperation:** Promote a scientific ethic based on respectful and bidirectional collaboration.

Don'ts:

- **Impose Top-Down Management:** Avoid management done in a top-down manner, with limited stakeholder engagement, as it can restrict fishermen's participation and access to the knowledge base [your prior response].

- **Ignore Industry Concerns:** Failing to address the concerns and motivations of fishers can undermine support for sustainability initiatives [your prior response]. Overcoming such issues requires that the concerns, motives, and expectations of fishers and scientists can be discussed openly during collaboration.
- **Conduct One-Off Engagements:** Avoid engagement that is limited to the beginning of a process, but rather ensure regular involvement [your prior response].
- **Allow Short-Term Funding to Disrupt Continuity:** Recognize that short-term funding can compromise the continuity of industry data collection [your prior response].
- **Create Data Silos:** Don't collect data simply because it is possible, without a clear question or goal [your prior response]. Sustained collaboration needs to address the place of industry information/data/knowledge in the management discourse, as well as in the science-advisory-policy system.
- **Disregard History:** "Don't forget that history is important". There is frustration with failed collaboration and instances where input was not implemented or incorporated into management perspectives.
- **Overwhelm Stakeholders:** Be mindful of stakeholders' fatigue and consider limiting requests for participation in meetings where necessary [your prior response, 34].
- **Use Exclusive Language:** Exclusive and selective scientific language can be a communication barrier [your prior response].

By following these "do's and don'ts," collaborative working relationships with the fishing industry can be strengthened, leading to more effective and sustainable fisheries management outcomes.

Query: “What are the best practices for engaging policy makers in finding solutions to reducing bycatch of endangered, threatened and protected species?”

Engaging policy makers in finding solutions to reduce bycatch of endangered, threatened, and protected (ETP) species involves several key strategies, including standardizing data collection, incorporating stakeholder input, and using collaborative approaches.

Key Strategies and Approaches:

- **Data and Knowledge Consolidation:** Policy and legislative instruments require efficient consolidation of data and knowledge to improve data flows and assessment procedures. This includes developing scientific sampling designs, monitoring programs, and bycatch estimation procedures.

- **Co-creation of Knowledge:** Involving fishers, scientists, and other stakeholders in the co-creation of knowledge is crucial for developing effective and locally adapted regulations. This process should acknowledge potential conflicts and promote transparency in the exchange between researchers and fishers.
- **Multidisciplinary Collaboration:** A multidisciplinary approach, integrating technical, biological, and human dimensions, can provide a wider array of options for mitigating bycatch while maintaining a viable fishery.
- **Incentive-Based Measures:** Utilizing incentive-based policies and instruments can create economic incentives for producers and consumers to change their behavior and decision-making, reducing bycatch.
- **Adaptive Management:** Bycatch management should be adaptive, with defined goals, monitoring systems, and decision-making processes. This includes regularly updating national strategies with concrete actions and supporting the experimentation of alternative practices.
- **Stakeholder Engagement:** Engaging stakeholders through participation in management committees, working groups, and direct communications is essential. Stakeholder involvement can define successful approaches, prevent wasting research resources, and increase buy-in and potential implementation by fishers.
- **Communities of Practice (CoP):** Using a CoP-based approach is helpful when dealing with urgent and complex issues that require multiple bodies of knowledge and stakeholders to come together.
- **Communication and Transparency:** Regularly communicating information on bycatch management through appropriate media and ensuring bycatch management actions are clearly and consistently communicated across different government agencies is crucial.
- **Addressing Socio-Cultural Factors:** Recognizing and addressing the socio-cultural factors that may override ecological concerns is important, particularly in developing nations.
- **Learning from Conflicts:** Acknowledging conflicts between stakeholders and understanding their roots can help identify factors hindering the adaptive capacity of institutions.
- **Participatory Research:** Employing participatory research methods like surveys, workshops, and focus groups can help gather and share information between fishers and scientists, leading to successful developments in mitigation technologies.
- **Economic and Social Incentives:** Providing economic incentives, such as increased fishing efficiency or cleaner catches, can encourage fishers to adopt bycatch reduction technologies.
- **Building Trust:** Efforts should be made to build and manage trust between scientists, policymakers, and stakeholders to enable knowledge exchange.

- **Systematic Assessment:** Utilizing a framework of standards to perform systematic assessments of mitigation technologies and practices, facilitate feedback, and drive adaptation can be effective.
- **Integrating Fishers' Knowledge:** Fishers' empirical knowledge can inform science and policymaking to create applicable mitigation measures adapted to local specificities.
- **Clear Objectives:** Specifying clear operational objectives for bycatch management is essential. Stakeholders need to be informed and engaged in developing these objectives.

By implementing these practices, policy makers can more effectively engage with relevant parties to create and implement successful strategies for reducing bycatch of ETP species.

6.3 Survey questions best practice from the perspective of policy makers within CIBBRiNA

Survey Guidelines on the principles of cooperation and best practices based on your experience related to resolve bycatch

- What is your name?
- What organisation/ministry do you work?
- What is your position?
- When did you became policymaker and/or started working on CIBBRiNA?
- What role do you see for yourself/your organisation within CIBBRiNA?
- Do you have experience in collaboration with fishers? If so, can you give some examples of your experience?
- As someone involved in the development of policy on bycatch of sensitive species...
- What is your view (and experience) in relation to the benefits and drawbacks of collaboration with the fishers and stakeholders on trying to resolve bycatch problems? (please use examples if you feel that is appropriate)
- How can, or do, policy measures help achieve the type of collaboration among stakeholders that are needed to address local and regional scale issues of ETP bycatch?
- How can policy makers help to ensure that policies designed at a regional level can be applied local in practical settings by the fishing industry?
- What would your advice be about to a new colleague that would start in CIBBRiNA or a similar project.

Document information

EU project reference	LIFE22-NAT-NL-LIFE-CIBBRiNA/101114301
Project name	Coordinated Development and Implementation of Best Practice in Bycatch Reduction in the North Atlantic, Baltic and Mediterranean Regions
Project acronym	CIBBRiNA
Project website	https://cibbrina.eu/

Deliverable	No.	2.3	Title	Guidelines on the principles of cooperation and best practices
Work Package	No.	2	Title	Stakeholder perspectives: participation and engagement towards bycatch mitigation solutions
Work Package Leader	Marije Siemensma, Steven Mackinson			
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Due Date	31 st July 2025			
Submission Date	30 July 2025			
Dissemination Level	Public			

Version Log			
Issue Date	Version	Author	Change
22.01.25	1	Steven Mackinson	First draft version
05.02.25	2	Editing Marije Siemensma, Steven Mackinson	Draft for review
28.02.25	3	Marije Siemensma, Steven Mackinson	Implementing review from reviewers
06.03.25	4	Steven Mackinson, Marije Siemensma	Draft for review for CIBBRiNA Steering Committee
26.03.25	5	Steven Mackinson, Marije Siemensma	Final edits in response to Steering Committee review
17.07.25	6	Marije Siemensma, Steve Mackinson	Adding results policy maker survey and processing final edits in response to review of CIBBRiNA programme manager