



**IMAGINE THE
(UN)IMAGINABLE**

REVITALIZING SMALL-SCALE FISHERIES IN EUROPE

THE SMALL-SCALE FISHERIES EUROPEAN CONGRESS
MALTA | SEPTEMBER 12-14, 2022

 **GOVERNMENT OF MALTA**
MINISTRY FOR AGRICULTURE, FISHERIES,
FOOD AND ANIMAL RIGHTS

 **TBTI
GLOBAL**
Small-Scale Fisheries are Too Big To Ignore

 **INTERNATIONAL YEAR OF
ARTISANAL FISHERIES
AND AQUACULTURE
2022**

WSFC 

4TH WORLD SMALL-SCALE FISHERIES CONGRESS SERIES
ASIA-PACIFIC | NORTH AMERICA | EUROPE | LATIN AMERICA & THE CARIBBEAN | AFRICA
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4th World Small-Scale Fisheries Congress

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CONGRESS PROGRAM

MONDAY, SEPTEMBER 12th – DAY 1

OPENING REMARKS

Monday, September 12th, 9:00 – 9:40

Opening and welcome remarks

PLENARY SESSION #1 – Imagine Blue Justice

Monday, September 12th, 10:00 AM – 12:00

Location: Student House Hall

Organizers:

- Milena Arias Schreiber, Universidad Santiago de Compostela, Spain
- Katia Frangoudes, University of Bretagne Occidentale, France

The concept of Blue Economy has its roots in the UN Rio + 20 Conference and is intended to provide a framework for achieving a sustainable ocean economy. For this, Blue Economy should contribute to eradicate poverty as well as sustain economic growth, enhance social inclusion, improve human welfare and create opportunities for employment with decent work, while maintaining the healthy functioning of the Earth’s marine and coastal ecosystems. Under the Blue Economy framework, the EU Blue Growth Strategy promotes aquaculture, energy generation, marine transport, tourism, seabed mining and bioprospecting as economic sectors with significant sustainable growth potential. Fisheries in the EU, especially small-scale fisheries, are perceived as a sector with limited growth potential and minimal contribution to a sustainable ocean economy. Given that the Blue Growth implementation leans toward supporting large-scale, profit-driven, corporatized industries, it is difficult to gauge whether there would be space for small-scale fisheries. “Blue Justice” is therefore of real concern for small-scale fisheries whose rights and access to fisheries resources and ocean space may be affected by the new visions for ocean growth and development. For Blue Growth Strategy to work, one needs to, first and foremost, imagine small-scale fisheries as key actors in the process, and incorporate principles that matter for small-scale fisheries, including social justice and tenure rights, when planning for the ocean’s future.

- Svein Jentoft, UiT The Arctic University of Norway
- Brian O'Riordan, LIFE, Belgium
- Brice Trouillet, University of Nantes, France
- Arne Kinds, University of Santiago de Compostela, Spain

LUNCH (12:00-13:00)

PLENARY SESSION #2 – Imagine Gender Equality

Monday, September 12th, 13:00 – 15:00

Location: Student House Hall

Organizers:

- Katia Frangoudes, University of Bretagne Occidentale, France
- Milena Arias Schreiber, Universidad Santiago de Compostela, Spain

This plenary explores what it means to be 'small' in coastal and marine systems, and how we can better understand and support connections to understand diverse interactions in coastal social-ecological systems. Making connections is at the heart of making sense of small-scale fisheries, including their relationships with other aspects of coastal and marine sustainability. The 3rd World Small-Scale Fisheries Congress enriched many discussions about the meaning of 'small', drawing attention to relationships among coastal and marine aspects often thought of as too 'small' to require broad attention, including rural families, dependent communities, local markets, and local governance. Now, during the 4th World Small-Scale Fisheries Regional Congress, we have an opportunity to exchange knowledge and reflections, and to ask new questions about the meaning of 'small' in North American contexts, where small-scale fisheries and these coastal connections are under-recognized. To take advantage of this opportunity, this plenary seeks to foster and enable connections among ideas to enrich and broaden discussion about how to Get Small Right in complex coastal and marine systems. As such, the plenary builds on previous plenaries and sessions, and feeds into discussions about the future. The plenary will feature three presentations from researchers and practitioners, followed by an opportunity to ask questions. Then, guided by key questions, attendees will discuss what they see as key connections for small-scale fisheries in coastal and marine systems.

- Sandra Amezaga, Mulleres Salgadas, Spain
- Kristina Svets, Network Seven Sisters in Arctic Blue, Finland
- Constance Verlhac, GFCM, France
- Siri Gerrard, UiT The Arctic University of Norway

Short talks by fisherwomen:

- Maria Isabel Cera Chillida, Spain
- Sandrine Thomas, France
- Raquel Llopis Morell, Spain

BREAK (15:00 – 15:30)

PARALLEL SESSION #1

| Time | Session title |
|---------------|---|
| 03:30 – 18:00 | Parallel Session #1 |
| | <ul style="list-style-type: none"> • 1.1: Imagine Rising TIDES – Transformative Initiatives Driving Equity in our Seas • 1.2: Imagine Low Impact & Safe Fishing - Contributed Papers (1) • 1.3: The Regional Plan of Action for Small-Scale Fisheries in the Mediterranean and the Black Sea (RPOA-SSF) at the time of the IYAFA 2022 (PART 1) • 1.4: Imagine Just & Equitable Space for SSF - Contributed papers |

Parallel session #1.1: Imagine Rising TIDES – Transformative Initiatives Driving Equity in our Seas

Organizers:

- Katina Roumbedakis, Universidad Santiago de Compostela, Spain
- Ignacio Gianelli, Universidad Santiago de Compostela, Spain
- Sebastian Villasante, Universidad Santiago de Compostela, Spain

Synopsis:

Our oceans provide food security and livelihoods for millions of people worldwide and shape cultures and people's identities. Human activities and climate change threatens the health of oceans and the people depending on them. This is especially true for small-scale fisheries. These pressures are exacerbated by different forms of inequality. To overcome these challenges and achieve sustainable and resilient futures for our oceans, we need to deeply transform the current system. One possible way to foster transformative changes to desirable futures of our oceans are networking platforms of initiatives, something we call TIDES – Transformative Initiatives Driving Equity in our Seas. TIDES are initiatives that are created by, and further motivated, individuals, communities, or societies to take collective action in favour of the oceans and marine resources, while ensuring better livelihoods. TIDES can be projects, associations, networks, or any other type of initiative, promoted by the public or private sectors. This session aims to promote the dialogue on how TIDES can strengthen partnership, co-create knowledge and engagement in coastal communities now and in the future. We look for an exchange of experiences via a roundtable discussion of a variety of initiatives, especially those which drive equity – in its various spheres – for example, by empowering small-scale fishers and their communities, catalyzing collaboration across multiple stakeholders, promoting equal access to resources and opportunities, enhancing women's participation in decision-making processes. We will identify positive examples and lessons learned from these initiatives, types of impacts, innovations, and the potential for reproducibility of successful cases.

Speakers:

- Cristina Pita, University of Aveiro, Portugal
- Raul Garcia Rodriguez, WWF Spain
- Miguel Gomez, WWF, Spain
- Milena Arias Schreiber, Universidad Santiago de Compostela, Spain
[presented by Maris Gillette]

Parallel session #1.2: Imagine Low Impact & Safe Fishing - Contributed Papers (1)

Contributions from individual papers.

Chair: Milena Arias Schreiber, Universidad Santiago de Compostela, Spain

| Speakers | Title |
|--------------------------|---|
| Wendell MEDEIROS-LEAL | Estimating the biomass of priority exploited fishery stocks in the Azores |
| Viktor VESTERBERG | Dead in the water? Sustainability and direct seafood sales in Sweden |
| Anna MUJAL-COLILLES | Coupling small scale fisheries geo-positional data with meteoceanographic variables |
| Matteo SCARPONI | Stress Tests on Wolfson Stability Method for Small Fishing Vessels |
| Raquel DE LA CRUZ MODINO | Crisis and opportunities in oceanic archipelagos. Coastal fishing communities facing uncertainties in El Hierro (Canary Islands) and Santa Cruz (Galápagos) |

Parallel session #1.3: The Regional Plan of Action for Small-Scale Fisheries in the Mediterranean and the Black Sea (RPOA-SSF) at the time of the International Year of Artisanal Fisheries (IYFA 2022): achievements and challenges ahead

PART 1

Organizers:

- Friends of SSF: <https://www.fao.org/gfcm/activities/fisheries/small-scale-fisheries/friends-of-ssf/en/>

Speakers:

- Marta Cavallé, Low Impact Fishers of Europe
- Constance Verlhac, GFCM
- Lena Westlund, FAO Fisheries and Aquaculture Division
- Marco Costantini, WWF Mediterranean Marine Initiative
- Sophia Kopela, WWF Greece
- Reda Neveu, MedPAN
- Giampaolo Buonfiglio, MEDAC
- Maria Isabel Cera Chillida, AKTEA network

- Raquel Llopis Morell, AKTEA network
- Simone Niedermuller, WWF Austria
- Stefano Carbonara, CIHEAM Bari

The Regional Plan of Action for Small-Scale Fisheries in the Mediterranean and the Black Sea (RPOA-SSF; <https://www.fao.org/gfcm/activities/fisheries/small-scale-fisheries/rpoa-ssf>) is a historic political commitment setting out a ten-year roadmap towards the long-term environmental, economic and social sustainability of the sector. It builds on the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (SSF Guidelines; <https://www.fao.org/voluntary-guidelines-small-scale-fisheries/en/>), and sets out the specific principles, objectives and – importantly – concrete actions over nine key thematic areas: scientific research, data, management measures, value chains, participation in decision-making processes, capacity building, decent work, role of women, and climate and environment.

The implementation of the RPOA-SSF is supported by the Friends of Small-Scale Fisheries (Friends of SSF), a regional network of actors sharing common interests and objectives for the subsector. The network aims to promote transnational cooperation and building synergies among ongoing work in the region and plays an integral role in the implementation of the Regional Plan of Action for Small-Scale Fisheries in the Mediterranean and the Black Sea (RPOA-SSF).

Within the context of the United Nations International Year of Artisanal Fisheries and Aquaculture (IYAFA 2022), this two-hour session will explore the importance of the RPOA-SSF for small-scale fisheries in the Mediterranean and the Black Sea while showcasing initiatives and first-hand experiences of the Friends of SSF's members. The session will take a deep dive into some of topics of the RPOA-SSF and address, for example, participation of small-scale fisheries actors in decision-making processes and capacity building, including the current European stakeholder involvement's status in the Mediterranean, as well as the role of women in fisheries and actions needed for achieving gender equality.

Parallel session #1.4: Imagine Just & Equitable Space for SSF - Contributed papers

Contributions from individual papers.

Chair: Brice Trouillet, University on Nantes, France

| Speakers | Title |
|------------------------------|--|
| Maria BATTAGLIA | Cooperation and collective action in Mediterranean small-scale fisheries: lessons from the Asinara Marine Protected Area, Sardinia, Italy |
| João Nuno MONTEIRO | Characterization of the European green crab fisheries in the Portuguese coast: An important small-scale socioeconomic fishery |
| Pablo MARTIN-SOSA | Fishery essentiality: Imagining viable and sustainable small-scale fisheries in Europe |
| Siegling WALLNER-HAHN | Blue-green transformations of small-scale fisheries - Fishers' perspectives |
| María del Mar Cerbán Jiménez | The economic effect of the individual transferable quota system (ITQ) on the catch of Atlantic bluefin tuna in the strait of Gibraltar |
| Laura GARCIA de la FUENTE | Co-production of ecosystem services provided by Small-Scale Fisheries in the Atlantic Area. A fuzzy approach towards an Ecosystem Based Management |

BREAK (17:00 – 17:15)

PARALLEL SESSION #2

| Time | Session title |
|---------------|--|
| 17:15 – 18:45 | Parallel Session #2 |
| | <ul style="list-style-type: none"> • 2.1: Imagining together fair transitions to good futures of artisanal fisheries and fishers in Europe • 2.2: Recruitment of small-scale fishers in Europe: what can we learn from science and experience? |

| | |
|--|--|
| | <ul style="list-style-type: none"> • 2.3: The Regional Plan of Action for Small-Scale Fisheries in the Mediterranean and the Black Sea (RPOA-SSF) at the time of the IYAFA 2022 (PART 2) • 2.4: Imagine Low Impact & Safe Fishing - Contributed Papers (2) |
|--|--|

Parallel session #2.1: Imagining together fair transitions to good futures of artisanal fisheries and fishers in Europe

Organizers & Speakers:

- Tobias Troll, Seas At Risk, Belgium
- Cornelia E Nauen, Mundus maris asbl, Belgium

Short impulse talks:

- Cornelia E Nauen, Mundus maris asbl, Belgium
- Brian O'Riordan, LIFE, Belgium

Synopsis:

In the International Year of Artisanal Fisheries and Aquaculture (IYAFA2022), we invite participants of all backgrounds to this moderated workshop session to explore how we can together imagine futures of European artisanal fisheries in the context of rebuilding the ecosystems for and with coastal fishers to make a good living and at least partially replace unsustainable industrial operations based on fossil fuels and subsidies by low impact artisanal fishing. Following on from a short introduction with an example that combines marine protection through an underwater museum to prevent destructive bottom trawling with low impact fishing and ecotourism, we invite participants to share their positive experiences and examples in small discussion groups to enable probing conversations that can provide pointers for future developments. We will collect participants' examples and propose to take the conversation further in session 4.3 the following day (How to build just futures on existing experiences with artisanal fisheries in Europe).

Parallel session #2.2: Recruitment of small-scale fishers in Europe: what can we learn from science and experience?

Organizers:

- Sophia Kochalski, University of Santiago de Compostela, Spain
- Milena Arias Schreiber, University of Santiago de Compostela, Spain
- Arne Kinds, University of Santiago de Compostela, Spain

- Sebastian Villasante, University of Santiago de Compostela, Spain

Speakers:

- Pekka Salmi, Natural Resources Institute Finland, Finland
- Arne Kinds, University of Santiago de Compostela, Spain
- Miren Garmendia, OPEGUI, Spain
- Markku Ahonen, Fisheries Local Action Group Lapland, Finland
- Alexander Ford, FAMANET, Belgium

Synopsis:

Small-scale fisheries across Europe are notoriously under pressure due to increased competition (for space, resources and markets) with industrial fisheries as well as other maritime sectors. The failure to attract new generations of fishers to the sector is one of the key threats to their continued existence. This session aims at collecting experiences from different parts of Europe, and synthesizing knowledge about recruitment within fisheries. We combine academic and non-academic perspectives to understand (perceived) drivers and strategies that countries, regions or local actors are taking (or not) to tackle this recruitment crisis. In the first part of the session, short contributions from fisheries organizations, fishers and researchers will be presented. Based on this input, presenters and session participants will discuss in the second part of the session three guiding questions regarding recruitment. The discussion will take place in small groups at the conference and online (hybrid World Café Format). This session is the first regional attempt to draw a collective image of the European fisheries recruitment crisis. By improving our understanding of why the recruitment of fishers is declining and what has been suggested or attempted to reverse this trend across a range of contexts, the session aims to develop tangible suggestions on what could be done to improve the resilience and social sustainability of small-scale fisheries in Europe.

Parallel session #2.3: The Regional Plan of Action for Small-Scale Fisheries in the Mediterranean and the Black Sea (RPOA-SSF) at the time of the International Year of Artisanal Fisheries (IYAFA 2022): achievements and challenges ahead

PART 2

Organizers:

- Friends of SSF:
<https://www.fao.org/gfcm/activities/fisheries/small-scale-fisheries/friends-of-ssf/en/>

Speakers:

- Marta Cavallé, Low Impact Fishers of Europe
- Constance Verlhac, GFCM
- Lena Westlund, FAO Fisheries and Aquaculture Division
- Marco Costantini, WWF Mediterranean Marine Initiative
- Sophia Kopela, WWF Greece
- Reda Neveu, MedPAN
- Giampaolo Buonfiglio, MEDAC
- Maria Isabel Cera Chillida, AKTEA network
- Raquel Llopis Morell, AKTEA network
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the current European stakeholder involvement's status in the Mediterranean, as well as the role of women in fisheries and actions needed for achieving gender equality.

Parallel session #2.4: Imagine Low Impact & Safe Fishing - Contributed Papers (2)

Contributions from individual papers.

Chair: José J. Pascual-Fernández, Universidad de La Laguna, Spain

| Speaker | Title |
|------------------------|--|
| André CARVALHO | Small-scale fisheries impacts in the Atlantic Area: stakeholder perception based on a multi-criteria evaluation matrix |
| Amelia CLARKE | Exploring UK and Ireland fishers' perceptions of marine environmental issues and their use of sustainable fishing methods |
| Maria GARAGOUNI | Gear damage profile caused by bottlenose dolphin depredation of bottom-set gillnets in the Northern Aegean Sea |
| Rebecca HUBBARD | How the EU fishing fleet can become low environmental impact, low carbon and socially just |
| Fabienne DAURES | How viable are the new marketing channels promoting sustainable, fresh and ethical small-scale fishing recently developed in France? |
| Claudia HURTADO-PAMPIN | Sea turtle stranding records and fishing interactions on an oceanic Atlantic Island (Tenerife, Canary Islands) [SPEED] |

CONGRESS RECEPTION (19:00 – 21:00)

TUESDAY September 13th – Day 2

DAY 1 Summary

08:30 – 09:00

PLENARY SESSION #3 – Imagine Good Subsidies

Tuesday, September 13th, 09:00 – 11:00

Location: Student House Hall

Organizers:

- José J. Pascual-Fernández, Universidad de La Laguna, Spain
- Brian O’Riordan, LIFE, Belgium
- Salmi Pekka, Natural Resources Institute Finland

For decades, capacity-enhancing subsidies have fuelled the development of large-scale fisheries. Indeed, they have received billions of dollars of financial support for fuel, new infrastructure, business development, and marketing. The knock-on effect has been to make small-scale fleets less competitive, as their share of subsidies is often limited or even negligible. Therefore, alternative subsidy models are needed to enhance low-impact fishing and resource sustainability. Funds need to be directed towards scientific advice and impact evaluations of alternative fishing strategies. Furthermore, resources should be aimed at improving collective actions for small-scale fisheries as well as actions at community levels. Too frequently, only large-scale fisheries can afford premium technical staff to participate in key decision-making forums. Consequently, subsidies should be assigned to promoting local marketing of sustainable seafood catches to strengthen food security. Moreover, the carbon footprints of our food supply are enormous. Consequently, we envisage having good subsidies that would help reduce these footprints, make better use of local resources, lower fishing fleets’ carbon footprints, and improve fishers’ lives in communities so that they can collectively tackle impending challenges.

Speakers:

- Eoin Mac Aoidh, DG MARE, Belgium
- Miguel Ortega, Fundación ENT, Spain
- Sebastián Villasante, Universidad Santiago de Compostela, Spain

BREAK (11:00 – 11:30)

PARALLEL SESSION #3

| Time | Session title |
|---------------|---------------------|
| 11:30 – 13:00 | Parallel Session #3 |

| | |
|--|---|
| | <ul style="list-style-type: none"> • 3.1: On the road to co-management, from concept to reality: the experiences of implementing co-management of a Co-management Focus Group convened by LIFE and its partners • 3.2: "Better than the Status Quo? The Journey towards sustainable fisheries in Wales" • 3.3: Imagine Inclusive & Holistic Governance - Contributed Papers • 3.4: Imagine sustainable SSF in Portugal - Contributed Papers |
|--|---|

Parallel session #3.1: On the road to co-management, from concept to reality: the experiences of implementing co-management of a Co-management Focus Group convened by LIFE and its partners

Organizer:

- Brian O’Riordan, LIFE, Belgium

Synopsis:

Defined as “as a partnership arrangement between government and the local community of resource users, sometimes also connected with agents such as NGOs and research institutions, and other resource stakeholders, to share the responsibility and authority for management of a resource or an area”, co-management can contribute to restoring the health of European seas through improved governance by taking into account different local and regional realities and building on the experience and skills of people who directly depend on the fishery. Co-management is particularly useful for small scale fisheries as it provides the basis for more localized management and strengthens the 3 pillars of fisheries sustainability. LIFE, together with other organizations and institutions with practical experience on co-management (including the Government of Catalunya, WWF, MEDPAN, AGIR, SPA/RAC, Fundación Lonxanet), has compiled a list of sites within the Mediterranean Basin and throughout Europe where co-management schemes have been established or are in process of being established in order to provide a bank of experiences and relevant case studies. Together they constitute a Focus Group of stakeholders practically working on the subject. After interviewing many of those case study sites, relevant lessons learned, key principles, attributes for successful co-management as well as key challenges have emerged. The session will enable the results of our ongoing work to be shared and will provide a platform to share and discuss the collective and local know-how on co-management of the Focus Group, facilitating replication and cooperation among them and more widely.

Speakers:

- Marta Cavallé
- Benoit Guerin
- Antonis Petrou
- Noora Huusari
- Karoliina Lehtimäki
- Macarena Molina
- Federico Gelmi
- Bengt Larsson
- Ebrucan Kalecik
- Andrea Zanella
- Vahdet Unal

Parallel session #3.2: "Better than the Status Quo? The Journey towards sustainable fisheries in Wales"

Organizer: Natalie Hold, Bangor University, UK

Synopsis:

Over 90% of the fishing fleet in Wales uses boats under 10m in length, operating from small coastal towns and villages, often from tidally restricted beach launches. These small-scale inshore fisheries are primarily reliant on the data poor fisheries of whelk, crab, lobster and bass. Managing data rich fisheries at maximum sustainable yield is an end-goal of scientists, fisheries managers and fishers, and is written into national legislation. However, moving from data poor, with only limited, incomplete landings data, to being able to estimate fishing mortality at MSY is a monumental leap that would take many years of data collection and remains a long-term aim. In the meantime fishers and the wider community are demanding improved management of the resources they rely on for their livelihood with anxiety about stock abundances, catch rates, changing weather patterns and changing markets. This project has aimed to take steps towards providing a strong evidence base for managing fisheries sustainably in Wales, through research that has fisher engagement and participation at its heart and translating this evidence to provide short- and medium-term management options for these fisheries. We will present several case studies from recent research and management changes in Wales and ask the questions; are these small steps towards sustainability better than doing nothing and what benefits does fisher participation in research bring?

Speakers:

- Natalie Hold, Bangor University, UK
- Charlotte Colvin, Bangor University, UK
- Charlotte Heney, Bangor University, UK
- Welsh Government

Parallel session #3.3: Imagine Inclusive & Holistic Governance - Contributed Papers

Contributions from individual papers.

Chair: Evan Andrews, Memorial University, Canada

| Speaker | Title |
|------------------------|---|
| Prateep KUMAR NAYAK | Imagining the vulnerability to viability transitions in small-scale fisheries: Europe and the global context |
| Julia NAKAMURA | The Fundamental Rights of Small-Scale Fishers and Their Communities in the International Law Jurisprudence |
| Katia FRANGOUEDES | Can French liners in the English Channel remain exclusive liners? |
| Eneko BACHILLER | Optimization of small-scale fishery in the eastern Cantabrian coast |
| Evan ANDREWS | Imagine Transformation in Anticipatory Governance for Small-Scale Fisheries |
| Eider GRANER | Social Network Analysis (SNA): a graphic representation of fisheries management and marine conservation in the English Channel (France) |

Parallel session #3.4: Imagine sustainable SSF in Portugal - Contributed Papers

Contributions from individual papers.

Chair: Cristina Pita, International Institute for Environment and Development, UK / Universidade de Aveiro, Portugal

| Speaker | Title |
|-------------------------|---|
| Paula QUINTEIRO | Environmental assessment of sardine fishery in Portugal |
| Mafalda RANGEL | ParticiPESCA: co-management of the Algarve trap and pot octopus' fishery |
| Luis BENTES | Understanding the spatial dynamics of the Small-Scale Algarve trap and pot octopus' fishery |
| David PILO | Do you imagine an octopus trap fishery only catching octopus? |
| Marta RUFINO | Are they fishing or not? Effect of time interval and method on estimated fishing effort in a bivalve dredge and octopus traps small scale fisheries in Portugal |
| Ualerson Iran PEIXOTO | The triple bottom line to assess the performance of demersal small-scale fishery in the Azores [SPEED] |
| Javier SEIJO VILLAMIZAR | Sustainable sea”: a project to integrate local ecological and scientific knowledge in the management of the octopus fishery (<i>Octopus vulgaris</i>) in the province of Pontevedra (GALICIA, NW Spain) [SPEED] |

LUNCH (13:00 – 14:00)

PLENARY SESSION #4 – Imagining Low Impact Fishing

Tuesday, September 13th, 14:00 – 16:00

Location: Student House Hall

Organizers:

- Brian O’Riordan, LIFE, Belgium
- José J. Pascual-Fernández, Universidad de La Laguna, Spain

A prerequisite to low-impact fishing is using the right gear, in the right place at the right time. Low-impact fishing also requires effective governance structures and systems to ensure that fishing is carried out within the bounds of resource sustainability. Besides that, fair access to coastal spaces and fishing grounds needs to be secured for all fleet segments. Furthermore, fair trading arrangements, marketing structures and value chains need to be in place to a).- assure fishers a fair return on their labour

and investments, b).- provide consumers with good quality and nutritious products at a fair price; c).- ensure an equitable distribution of benefits (economic, nutritional, social, cultural, etc.), and, d).- facilitate a food system that delivers the product to the consumer in a way that causes the least waste, uses the least energy (transport, storage, etc.) and meets the nutritional, socio-economic and cultural requirements of consumers.

Speaker:

- Jeremy Percy, LIFE

Panellists:

- Seamus Bonner, IIMRO, Ireland
- Gwen Pennarun, Pointe de Bretagne Handliners Association, France
- Katarzyna Stepanowska, Darłowska Fish Producer Organisation, Poland
- Antonis Petrou, AP Marine/ Pancyriot Fishers Association, Cyprus
- Federico Gelmi, Associazione Pescatori di Pantelleria, Italy
- Jesmark Sciculuna, Maltese Fisherman

BREAK (16:00 – 16:30)

PARALLEL SESSION #4

| Time | Session title |
|---------------|---|
| 16:30 – 18:00 | Parallel Session #4 |
| | <ul style="list-style-type: none"> ● 4.1: Fisheries Co-Management in MPAs ● 4.2: Are market-based approaches relevant to small scale fisheries? ● 4.3: How to build just futures on existing experiences with artisanal fisheries in Europe ● 4.4: Adjusting the Research Lens – Contributed papers |

Parallel session #4.1: Fisheries Co-Management in MPAs

Organizers:

- Matthew Laspina, Department of Fisheries, Malta

- Martese Degabriele, Department of Fisheries, Malta

Synopsis:

The Department of Fisheries and Aquaculture in Malta are partnered with LIFE (Low Impact Fishers of Europe) in a project towards establishing and implementing co-management plans with small-scale low impact fishers in a designated Marine Protected Area (MPA) in the NE of Malta. The main objective is to improve its governance and create a formal space for local fishers to co-manage their fisheries within the MPA, together with the administrative parties. The project forms part of a larger Mediterranean wide multi-partner project supported by the MAVA Foundation to boost resilience in the Mediterranean Sea through scaling up co-managed and financially sustainable MPAs and No-Take Zones (NTZs). During the capacity building stages of this project, the researchers have conducted a series of semi-structured interviews in ports to investigate the interaction of fishers within the chosen MPA and to inform them about their role in the implementation of co-management plans in MPAs. In parallel to these visits, DFA has collected GPRS data to determine the main users of the area and to estimate the fishing effort present in the chosen MPA. DFA is currently performing phase 2 of this project which involves: the collection of small-scale fishers proposed measures through a series of workshops and the establishment of a co-management committee. Following the formation of the co-management committee, which will be composed of members from DFA, ERA (Environment and Resources Authority) and small-scale fishers' representatives, a co-management plan is presented.

Speakers:

- Matthew Laspina, Department of Fisheries, Malta
- Jesmark Scicluna, Malta
- George Albert Abela, Malta

Parallel session #4.2: Are market-based approaches relevant to small-scale fisheries?

Organizers:

- Andrew Hough, Community Catch, UK

Synopsis:

Does a gap exist with regards to market-based approaches and their accessibility to SSF? Can market based approaches be specifically built and tailored to the unique and complex situation of SSF, giving this sector a more direct opportunity to engage in markets- global, regional and domestic? Are there optimum ways of incorporating human rights, social aspects and an

environmental focus which would fill a gap identified in the market for certified and verified products originating from ‘improving’ small scale fisheries? This panel will discuss the opportunities which exist in the current landscape and identify how to fully engage and adequately service the small-scale sector globally with regards to market-based approaches.

Speakers:

- Urs Baumgartner, Independent, Switzerland/Spain
- Annika Mackenson, Global Sustainable Seafood Initiative, Germany
- Enrique Alonso, SFP, Spain
- Linda Wood, Marks & Spencers, UK
- Fiona MacInnes, Orkney Fishermen's Society, Scotland

Parallel session #4.3: How to build just futures on existing experiences with artisanal fisheries in Europe

Organizers:

- Tobias Troll, Seas At Risk, Belgium
- Cornelia E Nauen, Mundus maris asbl, Belgium

Introduction - summary of results of good examples identified in Session 2.1:

- Tobias Troll/Cornelia E Nauen, Seas At Risk, Belgium/Mundus maris asbl, Belgium

Synopsis:

Marine industrial capture fisheries have produced peak fish in Europe already in the 70ies, and globally in the mid-90ies. Since then, actual wild catches in European waters have been declining. The industrial fisheries were able to provoke the decline of resources and their ecosystems largely by relying on fossil energies and public subsidies. Without such subsidies a large part of this part of the industry would be economically unviable. Low impact, artisanal fisheries would be able to replace the industrial production at lower CO2 output, higher employment, excellent quality of fish particularly for regional markets and diversify coastal economies, including those relying excessively on mass tourism. Building on the results of Session 2.1 and the good examples identified, this moderated workshop session invites participants to carry out a SWOT analysis of the good examples. The conversations in small groups and in the plenary should help identify avenues to extend the good practices elsewhere in locally adapted ways and enhance their visibility.

DAY 2 SUMMARY

08:30 – 09:00

PLENARY SESSION #5 – Imagine SSF-centric Governance

Wednesday, September 14th, 09:00-11:00

Location: Student House Hall

Organizers:

- Cristina Pita, University of Aveiro, Portugal
- Jerneja Penca, Euro-Mediterranean University, Slovenia

Ocean governance stands high on the political and public policy agendas of European states. Yet, ocean governance is a complex process and faces many challenges within and beyond states, reflecting the multi-dimensional and interconnected role the ocean plays in environmental sustainability, economic prosperity and human well-being. Ocean governance requires the effective and inclusive participation of multiple stakeholders within and across sectors and scales. It requires governance arrangements, which address inequalities, secure the rights of local coastal communities, providing fair equitable access to coastal space, fishing grounds, aquatic resources and seafood markets, while respecting the traditional livelihoods of people that have depended on coastal areas for centuries. Imagine a European ocean governance system with small-scale fisheries at center stage, with structures, institutions and processes improving collaborative, inclusive, equitable and fair governance at local, national and European scales. How can the inclusion of small-scale fishers and fish workers be facilitated within fisheries sector governance structures? How can the positive opportunities available through scientific findings, sustainable trade and policy documents be better leveraged to advance the participation of small-scale fisheries in ocean governance? How would centering on small-scale fisheries affect sustainability of ocean governance?

Speakers:

- Marta Cavalle, LIFE, Belgium
- Lena Westland, FAO, Sweden
- Sebastian Linke, University of Gothenburg, Sweden

BREAK (11:00 – 11:30)

PARALLEL SESSION #5

| Time | Session title |
|---------------|--|
| 11:30 – 13:00 | Parallel Session #5 |
| | <ul style="list-style-type: none">• 5.1: Markets and Value Chains in Small-Scale Fisheries: Strengthening Communities and Collective Action• 5.2: Inspiring the Sustainable Development Goals with Small-Scale Fisheries clues: stakeholders voices• 5.3: Small scale fisheries centric data collection and stock status assessment in the digital age |

Parallel session #5.1: Markets and Value Chains in Small-Scale Fisheries: Strengthening Communities and Collective Action

Organizers:

- Jose J. Pascual-Fernández, Unversidad de La Laguna, Spain
- Cristina Pita, International Institute for Environment and Development, UK / Universidade de Aveiro, Portugal

Synopsis:

For small-scale fishers (SSF), securing good marketing of their catches is a crucial element for their success. In general, catches from small-scale fisheries have superior quality and freshness, but this does not always lead to better prices or higher demand. A critical factor in this scenario is the transformation of consumer habits, a process in which industrial fleets and freezing have decisively collaborated. Large-scale fishing companies have increasingly integrated value chain elements to offer a processed product in various formats adapted to different markets, focusing on a few species that concentrate most of the demand. This session focuses on strategies adopted by small-scale fishers to overcome these transformations and improve the market penetration of their catches. Implementing these strategies is not easy for small-scale fishers due to the increase in complexity and requirements of seafood marketing, including sustainability, labour and taxes regulations and, above all, sanitary conditions that are intrinsic to the new ways of product circulation. Collective action is increasingly needed for the success of these innovative strategies in coping with the new requisites and challenges posed by regulation and markets. In this context, further effort needs to be developed to better understand, document, support, and catalyse existing and new initiatives in this field for SSF, and identify drivers and barriers to sustainable, responsible seafood consumption. In this context, a special

consideration needs to be placed on the role of state and public administrations in shaping these markets. Perhaps, too frequently against small-scale fisheries.

Speakers:

- Jose J. Pascual-Fernández, Universidad de La Laguna, Spain
- Cristina Pita, University of Aveiro, Portugal
- David Florido del Corral, Universidad de La Laguna, Spain
- Raquel de la Cruz Modino, Universidad de La Laguna, Spain
- Jaime Ramón-Bruquetas, Universidad de La Laguna, Spain
- Hazel Farrugia, Ministry for Agriculture, Fisheries and Animal Rights, Malta

Parallel session #5.2: Inspiring the Sustainable Development Goals with Small-Scale Fisheries clues: stakeholders voices

Session hosted by CABFishMAN project

1. Introduction

- Arantza Murillas, CABFishMAN Project leader (EU project), and AZTI amurillas@azti.es, Spain

2. Fishing sector.

Moderator:

- Estanis Mugerza, AZTI emugerza@azti.es. CABFishMAN WP leader and Malta session moderator, Spain

Speakers:

- Manuela Leal, OPP72 presidentaopp72@gmail.com (fishing sector producer organization, PO), Patrona Mayor de la Cofradía de Pescadores de Conil and OPP72 president, Spain
- Inmaculada Leal

Online: Question to participants through Mural/Slido whiteboard: Are you aware of any initiatives developed by fishers that could be included under this topic?

3. Advisory Councils

Moderator:

- Marina Santurtun, AZTI, Sustainable Fisheries and Oceans Market Manager

Speakers:

- Miren Garmendia, South Westerns Waters Advisory Council (SWWAC), EU
- Marzia Piron, Executive assistant of Mediterranean Advisory Council - MEDAC. Remote participation, EU

Online: Question to participants through Mural/Slido whiteboard: how are the forthcoming legislative changes going to affect the ACs? What is the capacity to translate these into the sector?

4. Non-Governmental Organizations, NGOs.

Moderator:

- Mark James, maj8@st-andrews.ac.uk, University of St. Andrews. MASTS Operations Director. CABFishMAN project moderator, UK

Speakers:

- Rita Sá, rsa@natureza-portugal.org, Oceans and Fisheries, ANP (Associação Natureza Portugal) in association with WWF. Portugal, PT
- Morven Robertson, morven@bluemarinefoundation.com, Blue Marine Foundation. Head of projects in UK.

Online: Mentimeter to vote risks

5. European Commission (DG MARE).

Moderator:

- Mariola Norte (remote), and Marta Ballesteros, mnorte@cetmar.es, mballesteros@cetmar.es, CETMAR, CABFishMAN Project moderator, Spain
- David Castilla (david.castilla@dehie.uhu.es), CABFishMAN Project moderator, Spain

Speaker:

- Hidde Politeik, Economic Unit working with small scale fisheries lead by Angel Calvo Santos, Angel-Andres.CALVO-SANTOS@ec.europa.eu, Brussels, UE

6. Conclusions/end of the session

- Arantza Murillas, CABFishMAN Project leader (EU project), and AZTI amurillas@azti.es, Spain

Synopsis:

Under the theme of the congress “Imagine the (Un)Imaginable”, this session will provide a forum which will enable stakeholders to share and explore capacities and solutions that increase the resilience of the Small-Scale

Fisheries (SSF) to potential future outcomes ([un]-imaginable). The session is designed as a structured dialogue among SSF fishers, the Advisory Councils (ACs); the Non-Government Organizations (NGOs) and the European Commission (EC), and will be facilitated by the European research project CABFishMAN (<https://www.cabfishman.net/>).

The session has a hybrid format (physical-online) and uses a before-during-after approach. Before, working groups will be organized to frame and focus the debate. In addition, stakeholders' voices will be multiplied through short videos collected under the action "Influencers of the Sea". In Malta, short presentations and round tables will be combined with online insights, voting and ranking from physical and remote participants ensuring effective interaction and dialogue. After the session, the output will be embedded in the capitalization actions of the Cabfishman project, including policy recommendations.

This action will provide an exceptional opportunity to gather knowledge from EU fishers about their capacity and their necessities for a socio-economically viable SSF. To support this session, EU fishers will first provide a presentation on initiatives they have developed and address their capacity to adapt. Secondly, round table discussions with the ACs will aim to identify how the forthcoming and expected legislative changes will affect the ACs. This round table will also discuss other impacts, such as climate change and governance issues, and address what capacity there is for these impacts in the fishing sector. Thirdly, the NGOs will propose how they can reinforce the capacity of the SSF and share practical examples. Finally, the session will engage with the EC in order to provide feedback for the discussions had on actual capacity of SSF and the support received from ACs and NGOs.

Parallel session #5.3: Small scale fisheries centric data collection and stock status assessment in the digital age

Organizers:

- Asta Audzijonyte, Nature Research Centre & University of Tasmania, Australia
- Catarina Silva, Nature Research Centre, Australia
- Nils Krueck, University of Tasmania, Australia

Synopsis:

Recent technological developments and increase in accessibility and popularity of smart digital devices is generating big amounts of data. For small scale fisheries, typically considered data-poor, this provides an important

opportunity to develop technologies that will engage society in data collection and enable active contribution and participation in local fisheries management. The key missing technological gap is the availability of efficient user-friendly and open-source tools for handling and analysing datasets (mostly photos of fish catches) that can be collected by the small-scale fisheries community. This session invites contributions presenting digital methods and tools that can empower small scale fisheries communities to collect data and increase knowledge on the status of populations they are harvesting. This specifically includes talks on open-source user friendly machine learning tools for species and size determination, experiences with the applications in recreational fisheries and citizen science initiatives, and collaborative initiatives. It also invites contributions on user friendly, simple and transparent population status analyses, suitable for fish species and body size datasets that can be collected by the community.

Speakers

- Asta AUDZIJONTYE, Nature Research Centre & University of Tasmania, Australia: Introduction and welcome - digital data, citizen science and the new age of fisheries analyses
- Ahmad Catur WIDYATMOKO, University of Tasmania: Application of an Electronic Monitoring (EM) system and Artificial Intelligence (AI) data analysis in a small-scale tuna fishery
- Lorenzo LONGOBARDI, WorldFish: Near-real-time nutrition-sensitive fisheries management
- Catarina SILVA, Nature Research Centre, Australia: Predicting fish size classes with image classification models
- Joar NYKVIST, Fish Brain: Fish Species Identification using Deep Learning
- Marie NEAL, Bangor University: Catch Monitoring Camera: CatchCam - an onboard system for collecting and processing video of fishing activity and catch
- Andrew HALFORD, FAME, The Pacific Community: Development and integration of an e-data system for improving coastal fisheries management across the Pacific Islands
- Jeremy PRINCE - Biospherics: Spawning Potential Surveys: Informing and empowering community-based management with citizen science
- Nathaniel P HITT - US Geological Survey: AI for fish abundance estimation in streams
- Sean SIMMONS - Angler's Atlas: How the mobile app MyCatch can help small scale fisheries generate big results

- Christina Acevedo BRASWEL, Fishial.ai: Introduction to the Fishial.AI project & Platform

LUNCH (13:00 – 14:00)

PLENARY SESSION #6 – Imagine SSF in all SDGS

Wednesday, September 14th, 14:00 – 16:00

Location: Student House Hall

Organizers:

- Brice Trouillet, University of Nantes, France
- Matthew Laspina, Department of Fisheries, Malta

Small-scale fisheries are explicitly addressed in Sustainable Development Goal (SDG) Target 14.b. The sustainability of small-scale fisheries extends, however, well beyond SDG14, as it also relates to jobs in small communities (SDG1 and SDG8), food security (SDG2), women’s employment (SDG5), etc. While the SDGs are supposed to be about all countries, and if a worldwide and cross-cutting vision of small-scale fisheries relationships to SDGs is a necessity, the specific case of small-scale fisheries in developed countries remains a research blind spot. In contrast to most other parts of the world, small-scale fisheries in Europe have experienced a slow and gradual decline over the last 30 years, raising unique issues. Therefore, the counterpoint provided by the European case allows us to broaden and deepen reflections on the contributions of small-scale fisheries to the SDGs. Based on the diversity of contexts and situations in which small-scale fisheries find themselves, it is important to imagine the whole spectrum of possible contributions of small-scale fisheries to the SDGs. Bold proposals should be made and discussed, going beyond the quest to simply achieve the multiple targets (169) associated with the SDGs, to make explicit and address the structural causes and drivers of poverty, inequality, indecent work, irresponsible consumption patterns, cultural landscape, cultural identity, and community building.

Speakers:

- Alicia Bugeja Said, Ministry for Fisheries, Agriculture and Animal Rights, Malta
- Enrico Maria Andreini, FISHMEDNET
- Charaf M’Rabet, Institute: Association Tunisienne pour le Développement de la Pêche Artisanale – FISH MED NET, Tunisia
- Aisha Salem, Economic and Social Development Center of Palestine, Palestine

- Sylva Koteiche, Ministry of Agriculture, Lebanon
- Claudia Colabella, Halièus, Italy

BREAK (16:00 – 16:15)

FINAL SUMMARY AND CLOSING REMARKS

Individual abstracts

The economic effects of the Individual Transferable Quota system (ITQ) on the catch of Atlantic bluefin tuna in the strait of Gibraltar

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The Individual Transferable Quota (ITQ) is the management system used by the Common Fisheries Policy (CFP) to regulate fishing, maintain the economic level and favour the sustainability of resources. This policy has been developed in the Ports of the Strait of Gibraltar since 2008 for the bluefin tuna fishery, which has evolved from relatively low number of catches during the first years of application of the ITQ to become the only species caught nowadays in this area. The main objective of this paper is to evaluate the effects of the application of the ITQ in the ports of Tarifa and Algeciras. We address the following research questions: How was the ITQ established in the Ports of the Straits? How was the catch allocated to vessels? What economic and social effects has ITQ had on the fishing community? For the purpose of our research, we combine the Lorenz concentration curves and the Gini indices with the evolution of catches and income, which will allow us to compare the effects of the ITQ over time in different scenarios of bluefin tuna catches. Our results reveal that the application of the ITQ in the Ports of the Strait of Gibraltar has had a counterproductive effect on the economic performance of the fishermen. From our results we derive the need to design mechanisms that avoid the perverse effects of ITQ on the concentration of fishing in the Strait of Gibraltar.

Bio-economic indices to disentangling trade-offs of small-scale fisheries in central Mediterranean mixed fisheries

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Marine fisheries provide a huge variety of seafood products, as well as job and economic incomes for millions of people on global scale. However, human population growth expected over the next three decades and ongoing environmental changes require a wider understanding of fishing impacts on marine ecosystems to increase bio-economic efficiency of fisheries and maintain sustainable exploitation of resources. In the context of Mediterranean mixed fisheries, we have applied an ecosystem modelling approach to quantify the cumulative impacts contrasted with socio-economic aspects for disentangling trade-offs of fisheries. Validated food web models from Ionian areas (Central Mediterranean) were adopted to estimate the ecosystems functioning at the end of 2000s. Fisheries including those of small scale, were described by fleet segments resulting from a combination of fishing gears and vessel size. The Mixed Trophic Impact analysis related to economic indices such as profitability was used to quantify cumulative impact produced by each fleet on biological functional groups. Results showed complex interactions among ecosystem components mediated by the food web. Bottom trawlers had the highest profits but also the largest negative impact on the food web. The other fleet segments showed variable profits against impact suggesting that the shift towards small fisheries with lower physical impact on the sea floor, such as purse-seine and gillnet is a way for sustainability even considering the range of profits. The cumulative impact related to economic indices resulted a useful approach to quantify small scale fishery trade-offs and overall bio-economic efficiency of fisheries.

Optimization of small-scale fishery in the eastern Cantabrian coast

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The general picture of most harbours in the Basque region (eastern Cantabrian coast) has changed during the last decades, suggesting a decline in small-scale fisheries (SSF) activity which is carried out by vessels with LOA<15m.

However, little is known in detail about this change, i.e., the recent development of the different fleet segments, or temporal changes regarding landed species. The present study shows that during the last decade (2010 – 2020) trolling lines targeting albacore in summer and especially handlines fishery targeting mackerel in spring was the most important seasonal SSF in the region. Moreover, they intensified the fishing effort and showed the highest landings, especially for mackerel. In contrast, a decline in vessel number, fishing effort and therefore in landings was observed for netters i.e., gillnets and trammelnets. The use of longlines and pots did not show any time trend. Regarding targeted species, the mean fish length landed by both longliners and netters decreased with time, and so did their fish length-based niche breadth, indicating a lower length range in landed fish. In contrast, while fish diversity landed by handliners decreased probably due to the mackerel fishing intensification, netters targeted on a wider variety of small fish species. Technical optimization, probably related with specific market demands, suggests that Basque SSF fleet is shifting to specialized hookers, i.e., seasonal mackerel and albacore fishing, while netters, which are declining in number, are landing a wider range of target species. Understanding such developments might contribute towards future management plans on regional scale.

Cooperation and collective action in Mediterranean small-scale fisheries: lessons from the Asinara Marine Protected Area, Sardinia, Italy

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How can a better understanding of fisher behaviour support a shift from vulnerability to viability of Mediterranean small-scale fisheries (SSFs)? SSFs provide an important source of livelihood and cultural identity for many coastal communities across the Mediterranean. However, these systems are vulnerable to drivers of change, including climate change, fishing pressure and habitat loss. In this context, collective action and cooperation amongst fishers and other key stakeholders is a key requirement to move towards SSFs' viability and understanding behavioural drivers of cooperation is a crucial component of this transition. We draw on experiences with SSFs adjacent to the Asinara National Park and Marine Protected Area 'Isola dell'Asinara' in Sardinia, Italy, to show how cooperation is enhanced when social norms, such as norms of reciprocity, are present. Here, social norms serve as drivers of cooperation and, more generally, collective action. Findings from this research thus challenge theories of rational choice and self-interest that continue to dominate fisheries policies.

Understanding the spatial dynamics of the Small-Scale Algarve trap and pot octopus' fishery

Luís Bentes (1),
Mafalda Rangel (1),
David Piló (2,1),
Sofia Alexandre (1),
João Pontes (1),
Lidia Nicolau (2),
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(2) IPMA - Portuguese Institute for the Sea and Atmosphere, Av. 5 de Outubro, 8700-305, Olhão

The common octopus (*Octopus vulgaris*) trap and pot fishery of the Algarve (south Portugal) is the most important small-scale fishery in the region, occupying a significant operating area and having vital biological and socioeconomic implications. Nevertheless, little is known about this fishery spatial usage and dynamics. Spatial planning of coastal fishing activities is of utmost importance to allow for proper management, promoting compliance with regulations, and avoiding unnecessary conflicts between involved stakeholders. To fulfil this important lack of information, the ParticiPESCA project, aiming at developing a co-management system for the octopus' fishery at the Algarve, developed a monitoring one-year real-time tracker program equipping 60 volunteer vessels with GPS trackers and carrying on a simultaneous one-year onboard observer campaign to gather spatial fishing behaviour and catch data. Obtained data allowed mapping operating areas and identifying fishing hotspots, considering vessel sizes, depths of activity, catch composition and fishery yield, providing also a measure of the legal compliance of this fishery regarding number of pots and traps. Preliminary results provided valuable and innovative information regarding the spatial distribution of juveniles and adults, indicating previously unidentified hotspot areas, and allowing for a potentially significant improvement of this fishery yield and contributing to a better knowledge of essential habitats for this species. Understanding the spatial dynamic of this small-scale fishery provides essential information to address fracturing conflicts that need to be solved prior to the establishing of a co-management system, where cooperation between users is essential for ensuring compliance and cooperation.

A lot of species, but few really matter for small-scale fisheries: evidence from a multi-area study in the Mediterranean Sea

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Achieving sound management of small-scale fisheries (SSFs) is globally recognized as a key priority for sustaining livelihoods, local economies, social wealth and cultural heritage in coastal areas. The design of appropriate management strategies for SSFs and the adoption of effective policies to foster SSFs sustainability hinge on extensive and reliable knowledge of their socio-ecological dimensions, which is currently scant. Here, we carried out a multi-disciplinary and data-rich assessment of SSF at 11 areas in 6 Mediterranean EU countries over a 17-months period, combining the analysis of 1,292 SSF fishing operations and 149 semi-structured surveys of fishers. Specifically, we aimed at assessing landed species contribution to SSF catches and revenues. Results highlighted that, in spite of a high species diversity (ranging among areas between 40 and 85 species), Mediterranean SSFs actually rely economically upon a very limited number of species, with both CPUEs and, especially, RPUEs mostly determined in each area by less than 5 species, that can guarantee high and stable catches and revenues over time. Also, some fishing communities were found to rely on a restricted number of gears, suggesting some SSFs' properties often assumed, but never broadly verified, should be carefully reconsidered, especially when viewed from a broader socio-ecological perspective, as in the case of the diversified portfolio or of the polyvalence of fishing gears. Taking the local scale into proper account is likely to reduce the risk of implementing management strategies potentially generating socio-ecological inequalities.

Small-scale fisheries impacts in the Atlantic Area: stakeholder perception based on a multi-criteria evaluation matrix

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The Common Fisheries Policy, Marine Strategy Framework Directive and Marine Spatial Planning Directive share the common goal of moving towards more sustainable and ecosystem-based management of the seas. To achieve this, it is crucial to identify and better understand the conflicts of use for space and resources and the impacts on marine biodiversity. Within this context, small-scale fisheries (SSF) in the Atlantic Area require special attention, considering the inherent challenges faced in data collection compared to other fishing fleet segments. In this study, an innovative and multidisciplinary approach was adopted for stakeholders to score and rank a range of potential impacts induced by SSF gears based on a multi-criteria evaluation matrix. It comprises physical-chemical, biological-ecological and fishery components and considers diverse impacts and interactions (e.g., habitat damage and degradation, threatened or protected habitats and species, bycatch, discards and

ghost fishing), scored as a function of their frequency, severity (or proportion) and duration. Covering more than 10 different types of fishing gears across the Atlantic Area (Portugal, Spain and United Kingdom), more than 200 matrices were filled in until now by about 100 different stakeholders (researchers, managers, NGOs and fishermen) based on their perception, expert knowledge and/or professional experience, through a common and standardised approach by face-to-face interviews or email enquiries. Ultimately, besides identifying the potential impacts and assessing the main species/habitats impacted by SSF gears in the Atlantic Area, potential mitigation measures might be proposed to minimize SSF impacts in the marine environment.

Exploring UK and Ireland fishers' perceptions of marine environmental issues and their use of sustainable fishing methods

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Conserving ocean resources is imperative for assuring global food security. Small-scale fisheries are estimated to contribute half of global seafood catch and play a crucial role in upholding millions of livelihoods around the world. Understanding how fishers perceive fishery-related environmental issues and the factors influencing their choice of fishing methods will be pivotal in the development of improved fishery management plans. Adopting a mixed-methods approach, UK and Ireland small-scale fishers' methods and their perceptions of two key marine environmental issues were explored. Fishers typically showed greater concern over abandoned, lost and discarded fishing gear (ALDFG) than bycatch. Personal experiences with environmental degradation and an individual's sense of community within their fishery were identified as strong predictors of awareness and risk perceptions of marine environmental issues. Significant positive correlations were identified between awareness and risk perceptions and risk perceptions and sustainable fishing methods (SFM). Financial barriers, lack of awareness and government legislation were identified as key barriers to SFMs. Conversely, financial drivers and feelings of personal responsibility were identified as key drivers of SFMs. The results suggest that strengthening community bonds and developing targeted awareness outreach campaigns could encourage improved resource management and help secure a more sustainable future for small-scale fisheries.

Management of artisanal fishing within a marine national park on the island of El Hierro

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El Hierro is recognized for its initiatives which emphasize the sustainability and conservation of marine resources. Currently, there is a proposal to create the first fully marine park in Spanish territory, in order to guarantee the preservation of existing marine biodiversity and stimulate the economic development of the island. Based on an ecosystem model, different management strategies are simulated in the area proposed as a national park, to evaluate their possible medium-term effect on artisanal fishing activity and target species, considering as a reference the year 2050. To do this, very restrictive scenarios are proposed, where fishing activity is completely prohibited, along with others that include different zonings, including integral areas, restricted uses of certain traditional fishing systems, moderate uses, or special use areas. These scenarios will be complemented by forcing functions related to the possible effects of climate change on marine biodiversity. The results of each scenario allow to evaluate management strategies that reconcile the conservation of species and ecosystems with traditional artisanal fishing on the island.

How viable are the new marketing channels promoting sustainable, fresh and ethical small-scale fishing recently developed in France?

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In mainland France, small-scale fishing vessels using passive gear represent 75% of vessels for around 15% of the landings in value. Landings are generally marketed by direct sale to local coastal consumers or fishmonger, in fish auction halls where the products are "drowned" in the rest of the production without necessarily being well differentiated. In recent years, new private intermediaries using web technologies for the selling of fishery products have emerged and are growing rapidly. Their objective is to develop short supply chains allowing the delivery of fresh products from small producers using selective passive gears and having limited impact on ecosystems to non-coastal consumers throughout the national territory. Annual contracts are offered to producers with prices fixed for the year. Undervalued "ugly" species are also proposed to consumers complementary to high valued species. The communication proposes to analyse: i) the economic and organizational model of these intermediaries supposed to offer win-win solutions for both producers

and consumers compared to the current fish sales model in course in France, ii) the structure of the supply and its evolution over the recent years as well as iii) the structure of the demand (type, frequency, regularity). Given that this new organization could contribute to achieve simultaneously several SDGs (in particular SDGs 12, 13 and 14), we propose an analysis of the prospects for extending these marketing methods and the constraints posed by these models to the small fishers.

Crisis and opportunities in oceanic archipelagos. Coastal fishing communities facing uncertainties in El Hierro (Canary Islands) and Santa Cruz (Galápagos)

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Crisis caused by natural disasters, pandemics, other environmental shocks, and social unrest have had important negative effects on food access and affordability and on livelihoods of coastal human communities, globally. These effects are salient in islands, where their natural isolation is enhanced by intended and unintended responses to crises. Oceanic islands, such as the Canary Islands (Spain) and Galapagos Islands (Ecuador), have limited infrastructure, financial and natural resources, including land and drinking water. Furthermore, these archipelagos' economies depend upon tourism and service activities, highly reliant on international markets and vulnerable to a diversity of hazards, as the COVID-19 pandemic has demonstrated. This comparative study illustrates how, the small-scale fisheries sector developed and fostered strategies and opportunities during different lockdown periods, resulted from shocking hazardous events, in El Hierro (Canary Islands) and Santa Cruz (Galapagos). It also explores what role institutions play, within the socio-ecological systems in front of uncertainty. Data was gathered through different methods such as: participatory observation, interviews, and content

analysis of relevant social media channels. Preliminary results show that small-scale fisheries sector is a fundamental pillar in both islands' society and food security, irrespective of a crisis situation or not. Food supply and food access to the local population, specifically fish-as-food, was critical as a source of quality protein for the human communities. The ecological adaptiveness of their social practices, including professional (i.e., commercial small-scale fisheries) and non-professional ones (food production) were also important. This study demonstrates that resilience encourages further collective action, robust governance systems, as well as diversity of livelihood choices. Collective action was also essential to protect the local market and fish trade during hazardous periods, in both study cases.

BLUEfasma: Fostering a Blue Circular Economy in the Fisheries Sector

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The Interreg MED BLUEfasma is a territorial cooperation project belonging to the Blue Growth Community co-financed by the ERDF. It aims to trigger change in the fisheries and aquaculture sector in Mediterranean insular and coastal areas, reinforcing the adaptation of Circular Economy (CE) practices. CE prevents depletion of resources by closing energy and materials loops, leading to smart and sustainable growth as a key Mediterranean joint asset. BLUEfasma brought together key stakeholders from nine countries, sharing challenges and co-creating opportunities, developed tools to support the CE transition and strived for a more circular economy in fisheries and aquaculture by drafting proposals to foster circular practices. Twelve Policy Recommendations were identified and documented in order to help shift policy towards CE, whilst the White Paper identified existing barriers to the development of a CE in fisheries and aquaculture in the Mediterranean area and proposed solutions to overcome them. The White Paper explores the relationship between the principles of CE, Blue Economy and Sustainable fisheries and aquaculture, through the analysis of relevant sources and dialogue between several players. The main focus by the Department of Fisheries and Aquaculture, as one of the project partners, is to ensure that CE principles are instilled in the Maltese fisheries sector.

Can French liners in the English Channel remain exclusive liners?

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FISH INTEL project (Interreg Channel-Manche) uses acoustic devices to study the movements and behaviour of four commercial species (seabass, pollack, crawfish and bluefin tuna) and their related habitats in pilot sites in the English Channel (3 in French waters). The results will be used to suggest Ecosystem Based Fisheries Management measures for the four species to national and regional managers. Fisher's ecological knowledge on species behaviour, habitats or seasonality and factors affecting fisher's strategies for the different species are important information to develop such plans. Interviews and focus groups meeting were organised with small scale fishers, and more particularly liners, to identify the areas to deploy the acoustic devices and to understand the current situation of French fishers and fish stocks in the English Channel. This presentation will develop the main elements coming out from interviews regarding the species of interest for the liners (seabass, pollack and bluefin tuna) and their strategies to adapt into the changes of fish behaviour and abundance, as well as in regulation. Strict regulation for seabass implemented since 2012, evidence of pollack overexploitation, lack of quota for the raising stock of bluefin tuna raises the question of the need for liners to shift to a multi-gear operation and to modify the way their organisation operates.

Status and way forward for sustainable small-scale fisheries in Mediterranean MPAs

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Since 2010 and every four years, MedPAN (the Network of Mediterranean MPAs) and the UNEP Barcelona Convention's Regional Activity Center for Specially Protected Areas (SPA/ RAC) support Mediterranean countries, NGOs, MPA management bodies and other regional organizations to take stock of progress toward Mediterranean marine protected area (MPA) goals in international and regional commitments. In 2020, 8.33 % of the Mediterranean Sea is under protection status (MPAs). However, 97.33 % of the total Mediterranean surface under protection status is located in EU member countries water and the cumulative surface of no-go, no-take or no fishing area represents only 0.04 % of the Mediterranean. Managers from 152 nationally designated Mediterranean MPAs shared their experience via an online survey in 2019. Data about various aspects of their management were collected to assess if conditions are favorable for MPAs to ensure an effective management. Those data show that currently only 0.71% of the Mediterranean is covered by MPAs with a fishery management plan (14.2% of nationally designated Mediterranean MPAs) whilst this is a key target of the Regional Plan of Action for Small Scale Fisheries in the Mediterranean and the Black Sea (RPOA-SSF). Moreover, one of the key recommendations of the Post-2020 Mediterranean

MPA Roadmap is to support participatory processes and co-management approaches. MedPAN, a member of Friends of SSF platform, is developing and supporting activities (small projects et pilot activities), bringing together MPA managers and involving NGOs, actors and researchers working towards supporting sustainable SSF in the Mediterranean. In particular, a recurrent training programme on sustainable SSF has been developed for MPA managers and fishers.

Gear damage profile caused by bottlenose dolphin depredation of bottom-set gillnets in the Northern Aegean Sea

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Bottlenose dolphins (*Tursiops truncatus*) are known to depredate static fishing gear throughout the Mediterranean, resulting in both catch loss and gear damage. We quantified the latter during systematic gillnet fishing trials in the Thermaikos Gulf, Northern Aegean, Greece. Specifically, after each haul we counted the holes torn in the gear, grouped by vertical position (Lower, Middle, Upper) on the net, and by size class (Tiny, Small, Medium, Large). We modelled the number of holes against the occurrence or not of dolphin depredation, vertical position, and size class (GLM, Poisson distribution). Over 44 hauls, we found that dolphins created nearly 20 times more holes than non-dolphin predators. Moreover, the vertical damage profile differed between dolphin and non-dolphin depredation events, in that dolphins consistently created most holes in the lower third of the net and fewest in the upper third, for every size class. Conversely, when dolphins were not the cause of damage, most holes were observed in the upper third of the net. This difference could be attributable to dolphins targeting more benthic species, e.g. *Mullus* spp., which are generally caught in the lower part of the net, while other predators such as seabirds may either be less selective or restricted to shallower foraging depths. Our findings can help inform gear manufacturers as to which parts of the nets suffer the most damage and should be reinforced. As a result, gillnets will be damaged—and thus discarded—less frequently, leading to more financially and environmentally sustainable fishing practices.

Co-production of ecosystem services provided by Small-Scale Fisheries in the Atlantic Area. A fuzzy approach towards an Ecosystem Based Management

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Identifying the provision of ecosystem services (ES), provisioning, regulating and cultural ES, linked to Small-Scale Fisheries (SSF) and integrating their economic assessment into an Ecosystem Based Management Approach is a challenging task. A deeper knowledge about the drivers of change affecting ES supply needs to depict the structure and flows governing the relationships between social, economic, environmental and institutional variables in this SSF social-ecological system. On the one hand, the co-production of ES concept (natural and non-natural capital for production) represents an operational way of doing such integration, although it requires to catch fuzzy interactions between multiple interconnected variables. On the other hand, Fuzzy Cognitive Mapping (FCM) may help stakeholders and experts to identify the relationships between those variables through a participatory process. This work addresses the co-production of ES provided by vessels under 18 metres of total length in the European Atlantic Area (countries SP, FR, PT, IR and UK). First, the research developed a set of indicators of the different forms of capital involved when co-producing cultural and fish provisioning ES by SSF, as well as potential trade-offs on regulating ES. The database is based on both EU standardised data and local/regional information. Secondly, FCM were built to describe connections and quantify levels of co-production under different scenarios opened to stakeholders' perception. Policy options simulations arise as one of the most promising results for policy makers and small-scale fishing managers to know in which way ES supply will be altered under different measures if compared to a steady state.

Social Network Analysis (SNA): a graphic representation of fisheries management and marine conservation in the English Channel (France)

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With the support of the results of acoustic telemetry device, the FISH INTEL project (EU Interreg Channel-Manche) will suggest Ecosystem-Based Fisheries Management (EBFM) plans for four species (Seabass, Pollack, Crawfish, Bluefin tuna). The shift from mono species management to EBFM will allow taking into account the whole ecosystem and the interactions between different species, aspects facilitated thanks to the use of acoustic telemetry tools. In order to do produce such plans, an identification of the main stakeholders involved in the current management of fisheries and marine conservation of the English Channel (French side) has been realized. Using a social network analysis (SNA) software (Gephi 2.0), we identified first the main stakeholders and then the different types of links existing between them, their diversity and their importance. SNA, often applied to study social interactions, allowed us to determine who is what, as well as the level of power (regarding the number of relationships) they have within the governance system, and what each of the stakeholders can bring to the preparation of the four EBFM plans. The presentation will focus on the methodology we used to produce the English Channel (France side) stakeholder's network graph and on how this tool can help support the implementation of EBFM in a maritime sector.

How the EU fishing fleet can become low environmental impact, low carbon and socially just

Our Fish and Low Impact Fishers of Europe
Authors: Rebecca Hubbard, Fintan Kelly, Brian O'Riordan

In principle, the allocation of fishing opportunities, e.g. quotas has the potential to ensure environmentally sustainable and socially just fisheries. The EU already has legislation in place for this purpose, but lacks both the political will and a clear mechanism for implementation, and as a result, has so far failed to realise the potential environmental and social benefits. // There is a solution: activating Article 17 of the Common Fisheries Policy to reallocate fishing quotas to the “forgotten” small-scale low-impact fleet, which for historic reasons has had restricted access to quota species. In the context of the climate and biodiversity crises, a just transition to a low-carbon, low-impact EU fishing fleet is critical. This paper proposes criteria and processes which the European Commission and EU member states could harness in order to enable a transition to a more ecologically, socially and economically sustainable fishing industry.

Sea turtle stranding records and fishing interactions on an oceanic Atlantic Island (Tenerife, Canary Islands)

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The commercial fishing fleet in Tenerife may be characterized by its small-scale and it employs hand-based gear, traps, and small gillnets. However, other fleets coming from the other Mediterranean Sea and from other Atlantic ports temporarily fish around the Canarian waters; these fleets use surface longlines more intensively. This surface longlines catch a certain amount of unwanted marine species, for example sea turtles. This study explores the main causes of sea turtle strandings in a collaborative way, working with small-scale fishers and conservationists. Small-scale fishers' gave us complimentary information for our analysis as well as a lot of information about the current situation of the sea turtle populations. We have also observed a lack of knowledge about how to act when they find a sea turtle stranding. These results reflect the importance of incorporating the local knowledge possessed by the main users of the sea, such as fishermen, given their constant contact with the sea and the marine resources. Finally, from this study the need has arisen to create a simple protocol to provide fishermen with a simple way of knowing how to act once they come across a stranded turtle and the implementation of informative campaigns are carried out on the correct handling of an encounter with one of these animals.

Reclaiming blue space: can producer cooperatives and innovative financing schemes transform artisanal fisheries? Perspectives from France

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The French quota management system has been shown to discriminate against small-scale and artisanal fishers, especially young skippers without family ties

in the sector. Despite de jure non-transferability, fishing opportunities attached to the vessel can be obtained de facto through the acquisition of fishing vessels. This mechanism favors established multi-vessel companies in their quest for more, while marginalizing artisanal fishers lacking the financial capacity to invest altogether. In interviews conducted in 2019, fishers furthermore denounced the loss of fishing capital and employment from their ports following acquisitions by industrial companies located elsewhere in the country. Policies directed at bringing more justice in the system have not been implemented, and it remains unclear to date how France's Blue Growth strategy will include artisanal fisheries. It is in this context that artisanal fishers and their representatives are devising new modes of firm governance and vessel financing. Notable examples include joint ventures between artisanal fishers and large-scale fishing companies, and 'new' cooperative forms of governance. We focus on these cooperative structures, whose model is based on progressive shared ownership with skippers in a financial structure involving local value chain actors, banks and Producer Organizations (POs). The PO directors expressed their ambition to (i) bring back vessels and employment to the port, (ii) revitalize the local economy across the value chain, and (iii) provide stable opportunities for young skippers. In this study, we compare and discuss these new forms of governance and their potential for transforming marginalized fishing communities across France and Europe.

Imagining the Future of the EU's Sustainable Fisheries Partnership Agreements from a Leverage Point Perspective

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As part of the Common Fisheries Policy, the European Union (EU) maintains Sustainable Fisheries Partnership Agreements (SFPAs) with third countries. Protocols for nine tuna and four mixed agreements are currently in force, with an annual contribution of €180 million paid by the EU and shipowners for access rights and sectoral support in partner countries. Whether the payments for SFPAs can be considered "good subsidies" depends on their ecological, economic and social effects, including their interactions with local small-scale fisheries. Various stakeholder groups have submitted proposals for increasing the sustainability, efficiency or equity of SFPAs. This study aims to explore the transformative potential of these proposals. Based on a review of documents from the policy, non-governmental, and academic literature, 127 possible actions to improve SFPAs from recent years were identified and mapped using the leverage point perspective developed by Donella Meadows. Leverage

points are places in a system where relatively minor interventions can lead to relatively major changes in specific outcomes. They can be classified in a hierarchy with increasing systemic depth at which a system can be intervened: from “deep” leverage points, with greater potential to bring about transformative change but are difficult to tackle, to “shallow” leverage points, having limited potential for transformation. The distribution of proposals along this hierarchy and complementary expert interviews yielded insights into the focus and gaps in the discussion around SFPAs and revealed differences and similarities between stakeholder groups. We discuss the proposed interventions in terms of their transformative potential to achieve “good subsidies”.

Malta's Efforts in Ensuring Low Impact Fishing Practices: An Overview

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The CFP has attempted to pave the way to ensure that the European fishing sectors have a low environmental impact, however to still provide fishers with the economic yield they require. After Malta’s EU accession in 2004, the Department of Fisheries and Aquaculture (DFA) had to undergo several changes to conform with EU legislations and policies. Malta’s DFA’s goal is to ensure that fish species populations are harvested in a sustainable manner, in accordance to EU legislation. It is a fact that approximately 90% of Mediterranean fish stocks are overfished and riddled with several scientific recommendations. However, scientific recommendations must be acted upon and not just recommended. The DFA has implemented schemes, such as the Swordfish Cessation Scheme, the Lost Gear Response Unit and the Sustainable Fishing Incentive Scheme, to name a few. Projects aimed to improve the sustainability of fisheries include, the implementation of acoustic deterrent devices to ward off cetaceans from entangling in fishing gear and projects that fall under the Data Collection Multi-Annual Programme. Other projects and schemes are being planned for the years to come, to ensure that low impact fishing is practiced. The aim of this paper is to outline what Malta has done on to implement sustainable measures, what lessons have been learnt, so as to improve these schemes and to plan new ones for the future generations. This paper would aim to further knowledge on low impact fishing in Malta, providing further education on how such a sector should be managed sustainably.

Institutionalizing Injustice? Aligning Governance Orders in Swedish Small-Scale Fisheries

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Our study investigates how small-scale fisheries' interests are represented in Swedish fisheries governance from a social justice perspective, linking these findings to the transnational case of the Baltic Sea Advisory Council, which connects Swedish and EU fisheries governance. In neither the Swedish national system nor the Baltic Sea Advisory Council are small-scale fisheries justly represented; rather, the small-scale sector is persistently marginalized and disempowered. The importance of small-scale fisheries for society is highly accentuated on the meta-level of governance, namely in principles and policy documents, while existing institutions, as shown through results from a national survey, are inappropriately designed and malfunctioning for small-scale fisheries' interests and participation. Furthermore, our results show that fishers have negative views and experiences about existing governance institutions and processes. We conclude that innovations are needed to improve social justice for small-scale fisheries in Sweden and the EU. If small-scale fishers are to contribute towards shaping their own futures, they must be able to influence decision-making and policies that affect their daily lives.

Fishery essentiality: Imagining viable and sustainable small-scale fisheries in Europe

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The EC performs analytical work on the different European fisheries, including indicators' estimation, both ecological, fishery and socio-economic. EC uses fishing indicators based on traditional fishing profitability concepts to assess the balance between fishing capacity and fishing opportunities. As an example, the Vessel Utilization Rate only takes into account the number of fishing days as a measure of effort. The Canary Islands fishing capacity is absolutely underestimated by EC due to four reasons: 1) The landings economic value is lower than it should as a consequence of market uncertainties. 2) The fishing ground occupation officially considered by EC for fleets lacking VMS is one mile from the coast, which is a great underestimation of the real degree of geographical dispersion. 3) Several vessels associate in a single fishing unit regularly, so measuring capacity by vessel also brings about underestimation. 4) The main degree of capacity underestimation occurs with fishing days, officially considered as landing days, when it is very frequent not to land every fishing day. Relating fishing effort to the target species and their essentiality would better reflect the behaviour of the small-scale fishers in search of

economic viability. The time dedicated to the capture of a species, the number of units that fish it, and the economic yield obtained from the sale of the catch: Frequency, Fleet Recruiting and Income, define essentiality. The essentiality of a fishery is a plausible alternative method of assessment and management of a fishery to the traditional evaluation methods used for industrial fisheries.

Estimating the biomass of priority exploited fishery stocks in the Azores

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Small-scale fisheries play a critical role in food security and contribute to nearly half of reported global fish catches. Despite their importance, the status of most small-scale fisheries stocks is still poorly known due to the scarcity of available data to apply traditional assessment methods. This study applied three different catch-based assessment method (Catch Maximum Sustainable Yield - CMSY, Bayesian Schaefer Model – BSM, and the Stochastic Surplus Production Model in Continuous Time – SPiCT) to estimate the biomass of priority fishery stocks (Thornback ray *Raja clavata*, Blackspot seabream *Pagellus bogaraveo*, Blackbelly rosefish *Helicolenus dactylopterus* and Common mora *Mora moro*) exploited by small-scale fisheries in the Azores. The results show that among the four stocks in question, three (Thornback ray, Blackspot seabream and Blackbelly rosefish) were slightly overfished and Common mora healthy. Also, we compared results of the CMSY, BSM and SPiCT methods, and it shows, that, while the CPUE or LPUE data for use with the BSM method lead to narrower confidence intervals and many modify the shape of the biomass trajectory, they do not lead to over or underestimates of terminal B/BMSY values. Based on our results, a consistent signal is obtained, thus suggesting that a reduction in fishing pressure would be necessary to restore the abundance status of these four stocks and this framework should be applied to the other priority stocks in the Azores.

Progress, challenges, and data gaps: towards standardisation of electronic reporting in small-scale fisheries in Europe

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Over the last two decades, data from electronic reporting systems (ERS) has revolutionised our understanding of fishing activities and its associated impacts (e.g. by increasing spatial resolution of fishing grounds, and direct transmission of catch, bycatch and effort data to fisheries managers). Most systems have been implemented in large-scale industrial fisheries, however 80% of the fishing fleet in the European Union (EU) operate at much smaller spatial scales. Until recently, most Small-Scale Fisheries (SSF) have been exempt from reporting requirements using these technologies due to the great number of vessels and the mismatch between the associated costs of such reporting and SSF profits. Increased recognition of the benefits of electronic reporting, and the recent availability of low-cost systems, opens the possibility to explore their applicability to SSF. Several pilot trials have been conducted in Europe, however, most have not been published in either peer-reviewed or grey literature. A comprehensive review of ERS in the North Sea and North Atlantic was therefore conducted with researchers from 12 institutions to assess the strengths, weaknesses, opportunities and threats associated with the use of ERS and develop recommendations for future data collection protocols for SSF. This review shows that ERS offer a more robust and cost-effective approach than other methods to collecting data on effort and catches required by EU states, informing stock assessments and marine spatial planning. ERS have also facilitated more spatially resolved fisheries management, and data-sharing with relevant stakeholders. Integration into statutory databases is lacking, and clear guidance on the requirements and technical specifications for ERS is needed.

Characterization of the European green crab fisheries in the Portuguese coast: An important small-scale socioeconomic fishery

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Small-scale fisheries exhibit great variation between geographic areas, not only due to different biological and environmental conditions, but also a variation on the socio-economic contexts. Information on harvesting and fishery of small crabs, caught along Portuguese coast by local communities, and their dependence on this fishery is scarce, so an integrated study was implemented to characterize this fishery through the Portuguese coast. For this purpose, logbooks were given to fishermen allowing them to record fishing areas, fishing yields and catch effort. Furthermore, information about fishing activity, types of gear, effort and catches, were studied along regions of Portugal. Unexpectedly, results showed that the artisanal fishery for small crabs in the Portuguese coast is a locally important fishing activity assuming increasing importance to the industry and as bait for other fishing activities. A large number of families are involved in crab fisheries and this activity is the main source of subsistence from many fishermen, being mostly of the catch sold to the octopus's fishery for bait. The various gear types used to catch crabs were described and fishing yields per region were estimated. Different gear uses were observed along the Portuguese coast, box traps are used in the southern and central regions and drop nets are used in the northern regions. Furthermore, the selectivity parameters and species selectivity of both gears were studied in order to minimize juveniles catch and evaluate the by-catch. There is a need to define regulation roles namely mesh sizes, but bycatch is minimum being discarded immediately on board, so mortality is negligible. Considering the overall information gathered on this fishing activity, some management measures are proposed for this artisanal fishery, which might ultimately contribute to the long-term sustainable exploitation of the fishing resource in the Portuguese coast.

Keywords: *Carcinus maenas*, Artisanal fishery, fishing gear, catches, by-catch, management measures.

Coupling small scale fisheries geo-positional data with meteoceanographic variables

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Environmental variables, among other socio-cultural and economic variables, have always been key to small scale fishing skippers decision to go fishing. Their experiential knowledge of meteoceanographic conditions can now be quantified using the recent expansion of tracking systems within small scale fisheries. We have developed a methodology to couple wind, waves and superficial currents with tracking data of around ~40 small scale fishing vessels. The tracking system is based on low-cost devices originally designed for the road transport sector using GNSS and GSM antennas together with an integrated accelerometer and on-board memory. This system has been satisfactorily recording data for the last 14 months with a frequency acquisition of 30 seconds. Geo-positional data is coupled with local wind data obtained from ERA5-ECMWF and significant wave height, wave direction and superficial current -including tides- obtained from Copernicus Marine (CMEMS). Both products provide an hourly temporal resolution whereas the spatial resolution differs among them: 25*25 km² for wind data and 1.4*3 km² for waves and currents. The coupling methodology is based on spatial and temporal interpolation: data is spatially interpolated using bilinear interpolation. This is also needed in a pre-process step to complete missing data points caused by a lack of GNSS signal in some locations. Temporal interpolation is linear. The final result is then used to set the probability of fishing activity in different meteoceanographic conditions.

Artisanal fishers as guardians of the coastal environment

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The policy preference for industrial types of fishing and aquaculture at European level contrasts with the cultural values of artisanal activities, often high value of landings, and potential role in recovering resources from long-term industrial overfishing. Here we report about a decade-long struggle off the Maremma terrestrial protected area in Tuscany, Italy, to help enforce the prohibition of destructive bottom trawling in the three-mile coastal strip reserved for artisanal fishing with static gear. The originality of the approach adopted by local fishers and their supporters consists in sinking marble sculptures created by renowned artists to complement concrete bollards lined up along the coast to prevent illegal bottom trawling. Data will be presented about the effectiveness of the measures. An indirect indication of some effects is the return of turtles and dolphins. These measures are complemented by a diversification of income streams to reduce the dependency on extraction

particularly during recovery. Coastal fishers are allowed to take tourists on board and thus have similar rights as agro-tourism companies. The fees paid by tourists contribute to income. Their exposure to the work of coastal fishers and on-site explanations about marine ecosystem protection complementary to terrestrial parks is often an eye-opening experience for urbanised people. In addition, tasting freshly caught fish has potential to recreate demand for local quality products. We hypothesize that the future of artisanal fisheries needs rethinking its different functions so as to renew maritime cultures into a cultural, ecological and socio-economic revival of coastal zones.

The triple bottom line to assess the performance of demersal small-scale fishery in the Azores

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Small-scale fisheries (SSF) play an important role around the world; it is responsible for food security, livelihoods, poverty reduction, contributing to employment and income. Most efforts on sustainability of fisheries are made by assessing ecological indicators, performing traditional single-species assessment, which is not the most suitable for multispecies and multigear SSF. The fisheries are a complex system so a holistic assessment, considering the social and economic indicators, is important for a comprehensive assessment of the sustainability of fishing sector. This study uses the triple bottom line of Fisheries Performance Indicator tools to make a preliminary assessment of the sustainability performance of the demersal fishery in the Azores archipelago, assessing ecological, economic and community indicators of the fishery. The

results show that the ecological indicators are in good condition, mostly due to stocks are healthy, in stable condition/recovering being exploited below the msy and low bycatch catches. The community indicator shows an intermediate condition, in this fishery, the fishermen are not salaried workers, they do not receive labour rights, such as vacations, leaves and insurance, they have access to many government benefits, and the good condition of this indicator may reflect the fishery's socioeconomic and cultural relevance, even when it operates on a small scale. The economic indicators show intermediate conditions, probably due to the landing volatility, current total revenues compared to historical revenues and source of capital can make fishing less competitive economically. Our preliminary results indicate that fishing is ecologically healthy but needs improvements in economic and community indicators.

Do you imagine an octopus trap fishery only catching octopus?

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The octopus trap and pot fishery is the Portuguese most important small-scale fishery, being particularly relevant in the Algarve (south Portugal) where octopus is the most important landed species, both in terms of quantity and

value. However, this is still a data-limited fishery, with important information gaps, such as an effective characterization of the bycatch and discards, as well as the assessment of biological and ecological implications of the losses of these non-target species. Indeed, despite octopus traps being among the most selective fishing gears, incidental catches normally occur. As in other gears, bycatch and discard rates are highly variable depending on different factors such as target species, gear characteristics, geographical location, season, habitat or depth. Within the current ParticiPESCA project, aiming at developing a co-management system for this fishery in the Algarve, an intensive sampling program was carried out onboard octopus trap fleet, to collect information on the species composition, biomass and catchability of the associated bycatch/discard species. First surveys revealed an important list of commercial and non-commercial bycatch species, including endangered species, such as sea horses, captured during fishing operations. Target species below minimum conservation reference size/weight were also an important fraction of the total catch. These results indicate the need for adopting urgent mitigation strategies to avoid unwanted mortality of non-commercial octopus and of protected species, based on the implementation of onboard best practices and on the gear redefinition to increase its selectivity.

Environmental assessment of sardine fishery in Portugal

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Sardine (*Sardina Pilchardus*) is one of the most captured species by purse seiners in the Portuguese coastal waters, detaining a significative relevance in the Portuguese fishery context. Given the relevance of sardine in Portugal, it is important to quantify its environmental impacts from a life cycle perspective using Life Cycle Assessment (LCA). Therefore, the goal of this study is to apply LCA to evaluate the environmental impacts associated with the sardine fishery. The functional unit is 1 kg of 1 kg of landed fresh sardine. System boundaries include the fishing and landing stage. The inventory data were retrieved from the most important cluster of purse seining vessels in northern Portugal, which represents approximately 35% of Portuguese landings. The characterisation factors used in this study are those suggested for conducting a Product Environmental Footprint (PEF). The results show that the main environmental burdens of the fishing and landing stages are mainly associated with diesel production and combustion. Therefore, LCA showed its potential to provide supporting information for defining strategies for improving the environmental performance of sardine fishery, since it identifies possible

measures to decrease the environmental impacts, such as increase of the energy efficiency of the purse seiner fleet and/or use of alternative fuels in the vessels. Acknowledgement This work was supported by the EAPA_576/2018NEPTUNUS project, supported by the Interreg Atlantic Area. Ana Cláudia Dias and Paula Quinteiro acknowledge FCT/MCTES for the financial support to CESAM (UIDB/50017/2020 + UIDP/50017/2020+LA/P/0094/2020), through national funds, and to the research contracts CEECIND/02174/2017 and CEECIND/00143/2017, respectively.

ParticiPESCA: co-management of the Algarve trap and pot octopus' fishery

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The common octopus (*Octopus vulgaris*) trap and pot fishery of the Algarve (south Portugal) is the most important small-scale fishery of Portugal, with important biological and socioeconomic implications. Octopus fisheries are not managed under the Common Fisheries Policy (CFP) quota regulations, and in Portugal this fishery is managed using a top-down approach, leading to low satisfaction and lack of compliance with regulations. The ParticiPESCA project aims at developing a co-management strategy for this fishery using a participatory approach involving different stakeholders in several complementary actions: implementation and management of a co-management committee; resource and fishery monitoring; fishers' empowerment; resource valuing; surveillance; fishing innovation; and communication. Identification and engagement of stakeholders (fishing associations, authorities, research institutions, NGOs, etc) was the first step to form a working group to develop this proposal. An international Science Advisory Group (SAG) with experts from different fields of research was created to advise on fishery management. Relevant information on resource and fleet activity was collected using onboard sampling and monitoring campaigns, and real-time tracking information obtained from a group of 60 volunteer vessels. The FISHE (Framework for Integrated Stock and Habitat Evaluation) tool is being used by the working group to guide the process of developing a proposed management plan. The final goal of the ParticiPESCA project is to deliver a formal co-management proposal for this fishery to the authorities by the end of 2022, contributing to the sustainability of the octopus' fishery in the Algarve, and promoting a paradigm shift in Portuguese fisheries management schemes.

Are they fishing or not? Effect of time interval and method on estimated fishing effort in a bivalve dredge and octopus traps small scale fisheries in Portugal

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Small scale fisheries (SSF, boats < 12 m) represent 90% of worldwide fisheries and 84% of the EU fleet, providing direct employment for ≈100,000 people in

the EU. These are a fundamental support for coastal communities, providing nutritional support, jobs and livelihoods, having also an important cultural heritage. The identification of the areas where the fishing operations are occurring and its intensity, is therefore, crucial for marine biodiversity conservation, maritime spatial planning and fisheries management. This information are thus fundamental to preserve and defend these important fisheries in the future, which are currently declining. Recent EU legislation will oblige SSF boats to be tracked, but unlike in most large-scale fisheries (LSF) where VMS data has been considered to be sufficient to determine fishing effort, the SSF fisheries require very high spatio-temporal resolution of the location data (i.e. secs-mins). In the current work we use an expert validated data set sampled from four SSF fisheries in Portugal (three areas of a bivalve dredge fleet and one octopus fishery using traps) that were equipped with GPS sensors to record the spatio-temporal position every 30 secs. Using these boat tracks, different statistical approaches can then be applied to discriminate between fishing from traveling periods (or others). Fishing periods are used to produce gridded surfaces of spatio-temporal estimates of fishing effort (fishing intensity) and the respective indicators. In the current work the tracking data was used to test and validate the effect of 1) data pre-processing; 2) statistical methods used to estimate ‘fishing events’ (i.e. Gaussian Mixture models); 3) temporal resolution (do we require regular 30 secs time intervals, or 5 min would be ok?) on 1) fishing effort indicators and 2) gridded fishing effort maps. Further, a new simple statistical approach was developed specifically for this data set and compared with other methods. The results of this work will be used to implement a system to monitor the Portuguese SSF in Portugal, whose country has the largest marine area in the EU.

Stress Tests on Wolfson Stability Method for Small Fishing Vessels

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In September 2021 the new UK Code of Practice (CoP) for the Safety of Small Fishing Vessels came into force. The CoP regulates new and existing fishing vessels under 15m length overall and is intended to reduce the high rate of fatalities in the fishing industry, approximately 100 times higher than that of the UK general workforce. The CoP states that ‘vessels not required to hold a Stability Information Book must have a Wolfson Stability Notice posted on board the vessel, which gives information on the loading of the vessel and its effect on stability’. The Wolfson Stability Method enables small scale fishermen to assess the limits for operating their own boats safely in relation to the prevailing seastate. The only information required are the vessel’s length and beam. The Method, consisting in a Stability Notice and a Freeboard Guidance Mark, was formulated in 2004-06. Whilst the Method stems from

model capsizes tests on high speed craft hullforms, the extent of the predicted area of safe operation was obtained from fishing vessel casualty statistics up to 2006. This paper describes how the Wolfson Method is being stress tested by adding further UK and international casualty data, to confirm or adjust the extent of the predicted safe zone of operation. Should a significant number of new capsizes occur within the safe zone, an alternative formulation of the Wolfson Method will be recommended, thus re-shaping future legislation. This work is being funded by the Lloyd's Register Foundation, whose support is gratefully acknowledged.

“Sustainable sea”: a project to integrate local ecological and scientific knowledge in the management of the octopus fishery (*Octopus vulgaris*) in the province of Pontevedra (GALICIA, NW Spain)

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This paper presents part of the results obtained through the socio-ecological study that was part of the Sustainable Sea Project, designed by Fundación Lonxanet (FPLS) and promoted by the Provincial Federation of Confrarías de Pontevedra, for an improvement in the management and exploitation of common octopus (*Octopus vulgaris*) in the Rías Baixas of Galicia (NW Spain). "Sustainable exploitation plan for the octopus (*Octopus vulgaris*) fishery 2010-2011". This primary sector of small-scale fishing represents one of the most important productive activities in the Autonomous Region of Galicia, as it is the driving force behind many complementary economic and social activities, as well as providing direct and indirect employment. The data we will present describe a fishery with an uncertain future in the coming years. The demand of octopus exceeds local production. On the other hand, the statistical data on octopus production do not reflect the real landings. The information was collected through interviews at the usual workplaces of the fishermen/boat owners. This information was deposited in the FLPS archive and processed statistically with contingency tables. According to experts and professionals, this activity is currently going through a period of crisis, mainly due to: a) the lack of effective productive studies to evaluate its stocks, b) the uncertainty of fishing production linked to the oscillation of prices at first sale, c) the biological behavior of the resource together with the climatological variability of the fishery, and d) the conditions and regulatory adaptations. Acknowledgements: Fundación Lonxanet para la Pesca Sostenible, Federación Provincial de Confrarías de Pescadores de Pontevedra, EqualseaLab.

Dead in the water? Sustainability and direct seafood sales in Sweden

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SDG 14.b aims to support small-scale fisheries by promoting their access to marine resources and markets. Swedish and EU authorities, scholars, and activists have articulated sustainability visions and goals related to direct sales of fish and seafood, small-scale fisheries, and coastal communities. Research that investigates whether and how direct seafood sales by European or Swedish coastal fishers achieve such sustainable futures is however only beginning to emerge. In this study we use the theoretical framework of sustainable materialism to analyse qualitative data from eight Swedish operations that market fish and seafood directly to consumers. Our findings reveal that fishers who sell directly confront social and economic challenges and operate at a small scale, which calls into question claims made in policy documents, reports, and the media about the relationship between direct sales and sustainable development. At the same time, the operations realise sustainability visions promoted by the global alternative food movement: they strengthen non-fishers' support for small-scale producers, transmit knowledge and concern about fish and marine environments, and facilitate some consumption outside the corporate-industrial food system. For the practice to contribute meaningfully to supporting small-scale fisheries, coastal communities and sustainable consumption, we argue, direct seafood sales must be repositioned in thicker social and institutional arrangements that can spread laterally and be networked.

Blue-green transformations of small-scale fisheries - Fishers' perspectives

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SSF in the Global North have, traditionally, been an important sector in terms of their socio-economic value. However, SSF are declining and their future looks bleak in many countries. Here we present a recently funded research project on blue-green transformations of SSF in the Global North. The overall aim of the project is to investigate if SSF can transform, and by doing so fulfill their potential to contribute to a larger transition towards social-ecological as well as economic sustainability. Working interdisciplinary, we will empirically assess current and potential future transitions in the case of Swedish SSF, focusing on fishers' perspectives. The project puts forward three research questions: (i) What are the opportunities for transitions of SSF in the Global

North? (i) When and how do fishers realize these opportunities? And (iii) What are the social, ecological and economic implications of SSF transitions in the Global North? The results of research will generate a deeper understanding of transitions which are already taking place, as well as knowledge that could contribute to and prepare for future transitions of SSF in the Global North. As such, we hope this research will build a crucial knowledge-base for facilitating future fishers' green-blue transitions towards increased sustainability.

Challenges for small-scale fishers marketing: how to overcome the inertias

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Small-scale fisheries (SSF) marketing strategies have been shaped by traditional models, mainly focused on the individual or familiar selling of the catches or depending on a diversity of intermediaries. These strategies usually do not fit very well with the demands of the consumers of the XXI century in most developed countries. These consumers may demand high-quality local seafood, but they need them arranged in the formats they like and offered through appropriate channels. That capacity for seafood transformation under increasing sanitary requirements usually escapes from the possibilities of the household, demanding expensive premises, collective action and new marketing strategies. Not coping with this challenge may drive the local seafood to increasingly reduced market niches or to dependency on processors. This presentation synthesises the experience developed in the Canary Islands (Spain) framed in the Macarofood and FoodE projects, which strives to close the gap between local SSF producers and the market. With intense basic research about local value chains since 2014, it has been aimed to facilitate the entry of local SSF seafood into new consumer niches, with a particular focus on collective consumers like schools. For that purpose, much work has been done with fisher organisations and not less with these collective consumers. Since 2018 this experience has been running with a dozen schools (more than 2000 pupils) in Tenerife (Canary Islands) and two fisher organisations; current perspectives of success may drive an expansion in the coming months.