

WORKING GROUP ON SOCIAL INDICATORS (WGSOCIAL; outputs from 2020 meeting)

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WORKING GROUP ON SOCIAL INDICATORS (WGSOCIAL)

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i Executive summary

The Working Group on Social Indicators (WGSOCIAL) seeks to improve the integration of social sciences in ICES Ecosystem Overviews (EOs) and Integrated Ecosystem Assessments (IEAs) through the development of culturally relevant social indicators. WGSOCIAL has identified five key issues regarding development of social indicators: 1. expand social science capacity within ICES through coordination; 2. identify and report on culturally relevant social indicators and data gaps; 3. explore approaches to trade-off analysis in EOs and IEAs; 4. assess and report on social and cultural significance of commercial fishing in ICES area; and 5. coordinate use of social indicators into a framework for Ecosystem-Based Management (EBM).

To address social science capacity, WGSOCIAL examined broadly the social dimension of fishing and identified potential interest within ICES. This led to coordination with other working groups (Working Group on Economics (WGECON) and Working Group on Ecosystem Assessment of Western European Shelf Seas (WGEAWESS)) and formal interactions to leverage interest in social dimensions to define relevant qualitative and quantitative approaches. WGSOCIAL made connections with a number of relevant entities outside ICES, including: Scientific, Technical and Economic Committee for Fisheries (STECF), The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), The North Pacific Marine Science Organization (PICES), Organisation for Economic Co-operation and Development (OECD), and The Centre for Maritime Research (MARE).

WGSOCIAL identified key social indicators and data gaps for selected ICES Member Countries with recommendations for approaches to close the gaps. WGSOCIAL and WGEAWESS worked collaboratively to develop a case study for the use of social fishing data in the Celtic Seas EO. WGSOCIAL has also introduced a framework for developing social indicators that can be applicable to future pandemics or disasters; this framework was presented during an ICES seminar on COVID-19 impacts. WGSOCIAL has begun working on the definition and context of trade-offs and trade-off analysis in the social context of fisheries.

To assess social and cultural significance of commercial fishing, WGSOCIAL is advancing five case studies in five ICES Member Countries: United States, Spain, Portugal, Netherlands, and Sweden. Each case study tackles a different approach with a different context. We identified place-based social indicators derived from census data and examine how they can be applied in three settings: large continental coastline, regional fisheries, and contiguous coastline. Two case studies focus on communities of practice and historical connection of societies to fishing.

To support integrated socio-ecological evaluations in EBM, WGSOCIAL has contributed to the development of a framework for collective reporting of social, economic and ecological data. This work will continue in collaboration with WGECON with whom several parallel Terms of Reference are shared.

ii Expert group information

Expert group name	Working Group on Social Indicators (WGSOCIAL)
Expert group cycle	Multiannual fixed term
Year cycle started	2018
Reporting year in cycle	3/3
Chair(s)	Lisa Colburn, US
	Amber Himes-Cornell, Italy
	Marloes Kraan, Netherlands
Meeting venue(s) and dates	25-29 June 2018, Copenhagen, Denmark (20 participants)
	11-15 March 2019, Rome, Italy (16 participants)
	15-19 June 2020, Online meeting (41 participants)

1 Summary of work plan

Table 1.1 Summary of work plan

Year	Summary of work plan
Year 1	<p>Start mapping the current work and identify future needs for social science and community impact assessment in ICES (ToR a) and identifying social data gaps (ToR b).</p> <p>Briefly brainstorm and discuss ideas on how to address and organize work under the remaining ToRs in year 2.</p> <p>Establish close connections with other relevant groups within and outside ICES (ToRs a and e).</p> <p>Produce Interim Report.</p>
Year 2	<p>Work towards completion of ToR a and ToR b. Start work on defining the information flow needed to provide trade-off analysis (ToR c) and assessing the social and cultural significance of commercial fishing (ToR d).</p> <p>Work with other relevant groups within and outside ICES (ToR e).</p> <p>Produce Interim Report.</p>
Year 3	<p>Finalize ToR c, d, and e, including the manuscript. Discuss and plan strategies and concrete steps for future work.</p> <p>Produce Final Report.</p> <p>Establish next set of 3-year ToRs.</p>

2 List of Outcomes and Achievements of the Working Group

- Established its identity as WGSOCIAL and recruited initial members;
- Mapped the current social science work in ICES and identified future needs for social science in ICES (in discussion with other ICES groups);
- Mapped best practices and current work with relevance for the scope of the WGSOCIAL. A preliminary assessment of peer-reviewed literature on social indicators was carried out;
- Gathered theoretical and empirical information on approaches and methods for integration of culturally important, economic and ecological dimensions in fisheries management;
- Conducted a preliminary review of the contributions of social sciences to fisheries management and ecosystem-based fisheries management;
- Determined social research and data needs to support the institutional objectives of ICES;
- Identified and mapped other networks/organizations dealing with marine social science working on integration of human dimensions in IEAs;
- Developed collaborative relationship with Working Group on Economics (WGECON; including a coordination of joint session for the 2019 ASC) with plans to reach out to other working groups;
- Developed a case study for use of social data on fishing communities in the Celtic Seas EO;
- Provided advice on the definition and inclusion of fishing port level data in the ICES EOs;
- Hosted COVID-19 listening session where WGSOCIAL members could share the social impacts of COVID-19 on fisheries in their countries and facilitated publication of a written summary in the ICES newsletter;
- Collected and shared information on the social impact of COVID-19 on fisheries in ICES Member Countries and developed a framework for developing social indicators that can be applicable to future pandemics or disasters. This framework was presented during an ICES seminar on COVID-19 impacts;
- Began working on the definition and context of trade-offs and trade-off analysis in the social context of fisheries;
- Assessed the available data and information regarding culturally relevant social indicators and community data for selected ICES Member Countries (UK, France, Italy, Spain);
- Initiated case studies in five ICES countries: United States, Spain, Portugal, Netherlands, Sweden.

3 Progress report on ToR and workplan

The 2018 meeting kicked off the first WGSOCIAL 3-year work cycle. Given that WGSOCIAL was formed in March 2018, this first meeting focused on developing its identity as an expert group and creating a work plan for the remainder of 2018 and into 2019. This work plan allowed significant progress to be made in years 2 and 3 on the majority of the ToRs.

3.1 ToR a: Identify current social science work and future needs while making connections to relevant international social science organizations

ToR a is ongoing, as the WG will continuously reflect on what social science work might be relevant in ICES context, as well as make and maintain contact with relevant international social science organizations.

WGSOCIAL is an interdisciplinary community of practice within ICES that works on both a general and a place/space-specific understanding of the social aspects, concerns and knowledge of marine resource use and governance. WGSOCIAL aims to help integrate social science knowledge into the current management and advice system by contributing to and improving the ongoing processes (understanding, approaches and methods) at ICES (e.g. the IEA's and fisheries overviews). WGSOCIAL shares knowledge, methods, indicators, and concepts, and provides support to and links with both other expert groups within ICES (see ToR e) and expert and other groups outside ICES. Contact with all these organizations is maintained primarily via WGSOCIAL members' connections to and/or participation in each organization.

3.1.1 Relevant connections

In Year 1, the group mapped best practices and current work including literature reviews, case studies, and projects of relevance. The literature on how social science research can contribute to fisheries management and governance led to WGSOCIAL developing a proposal for what social sciences research could contribute to ICES overall work and objectives.

Of relevance for the European countries in WGSOCIAL is the interest that DGMARE (EU commission) has in the development of social indicators. Raymond Maes (DGMARE) has been present as an observer to the WGSOCIAL meetings and has emphasized how important it is to liaise with the working groups of the Scientific, Technical and Economic Committee for Fisheries (STECF). The STECF was established by the European Parliament and Council to give advice to the EC with regard to implementation of the CFP. Two working groups have been held to develop social indicators and Raymond Maes emphasized the need to coordinate with the social indicators being developed by WGSOCIAL.

In its first term, WGSOCIAL also made connections with a number of other relevant entities outside ICES, including:

- **The Centre for Maritime Research (MARE)** is an interdisciplinary social science organization interested in the use and management of marine resources. www.marecentre.nl
- **The Intergovernmental science-policy Platform on Biodiversity and Ecosystem Services (IPBES)** is an independent intergovernmental body which was established to provide policymakers with scientific information about the current state of global biodiversity, ecosystem services, and how they benefit people. <https://ipbes.net/>

- **The Society for Applied Anthropology (SfAA)** is a professional organization that promotes the integration of social and behavioral sciences for better understanding human behavior and current social issues. <https://www.appliedanthro.org/>
- **The North Pacific Marine Science Organization (PICES)** is an intergovernmental scientific organization that helps to promote and coordinate marine research in the northern North Pacific Ocean and adjacent maritime areas. <https://meetings.pices.int/about>
- **The Marine Social Sciences Network (#marsocsci)** is a social media outlet for those interested in marine social science to share information, stories and events with a broad community. It is an interdisciplinary and international network working to bring together a growing community and facilitate knowledge exchange between diverse stakeholders from across the marine and coastal sector. www.marsocsci.net
- **Scientific, Technical and Economic Committee for Fisheries (STECF)** was established by the European Parliament and Council to give advice to the EC with regards to implementation of the CFP. Two working groups have been held to develop social indicators. https://ec.europa.eu/fisheries/partners/stecf_en
- **The Organisation for Economic Co-operation and Development (OECD)** – Every two years the OECD publishes statistics related to economic and social indicators of the fishery sector across 37 member countries and other key partners. <https://www.oecd.org/>
- **Coast action:** The Action, Oceans Past Platform (OPP), aims to measure and understand the significance and value to European societies of living marine resource extraction and production to help shape the future of coasts and oceans. <https://www.tcd.ie/history/opp/>

3.1.2 COVID-19 outreach and data collection framework

WGSOCIAL facilitated three Webex meetings on the impacts of COVID-19 on fisheries internationally. A summary of the first meeting, a listening session that was attended by 25 social scientists from 12 countries in April 2020, can be found as an ICES News item: <http://ices.dk/news-and-events/news-archive/news/Pages/wgsocialCOVID.aspx>. Following this listening session, WGSOCIAL facilitated a series of follow-up meetings focused on international assessment approaches and protocols. Based on these meetings, it was decided that it would be useful to develop a framework that could be applicable in case of a future pandemic (such as COVID-19) or other disaster. A framework that could guide research, allowing for integrated approaches with different disciplines (economics, biology, ecology) to study impacts, was developed and presented during an ICES webinar on understanding the impacts of the COVID-19 pandemic on fisheries, markets, communities, and management that was held on September 16, 2020: http://ices.dk/events/webinars/Pages/webinar_2020.aspx. The framework highlights the different geographical scales (from the individual to the global level) that can be looked at to assess impacts, the different parts of the fisheries value chain (from production to consumption) that might be impacted, and research design (theoretical approach, research questions, the application, methods, types of data (gaps)). WGSOCIAL's aim is to use the case of COVID-19 as a way to highlight how the social indicators could be useful in all types of disaster assessments and to be able to advise EU and national governments on the current data gaps and a strategy to move forward.

3.1.3 MARE policy day

WGSOCIAL co-organized the MARE policy day (June 2019) together with Wageningen Marine Research with the theme 'the social-cultural importance of the North Sea fishery.' Policy-makers, scientists and fishers came together to discuss the societal importance of fisheries in the North

Sea and the avenues through which research can contribute to social fisheries policy making. The policy day had a series of presentations highlighting different perspectives and approaches (fleet, policy, science). On behalf of the fishery sector, Brita Trapman (Vissersbond) shared input that was gathered from the Dutch fishing sector prior to the policy day. Next, policy-makers Raymond Maes (DG-MARE) and Herman Snijders (Dutch Ministry of Agriculture, Nature and Food Quality) emphasized that policy makers wish to consider social aspects in the policy process. Maes explained that the European Union (EU) has requested countries to gather more social data, but he also emphasized the importance of stories and experience sharing. Anthropologist Rob van Ginkel underlined in his presentation that to understand a fishery you must also look at its cultural and social aspects. Presentations from WGSOCIAL members showed how social information is gathered in the US (Amber Himes-Cornell) and developed in ICES (Debbi Pedreschi) and can be used to inform decision- and policymakers.

3.2 ToR b: Identify culturally relevant social indicators, data gaps, data collection needs and research including institutional needs and training

3.2.1 Integrating social science into the ICES Ecosystem Overviews

A key element of ToR b is to identify culturally relevant social indicators for use in ICES Ecosystem Overviews (EOs), which provide a description of a defined ecosystem (e.g. the Celtic Seas Ecoregion), including its ecosystem components and relevant major ecological events, trends and pressures, with fishing identified as a pressure. As of yet, there has been no explicit inclusion of social science perspectives or data in the EOs. However, the EOs have been identified by the Strategic Initiative on the Human Dimension (SIHD) as one of the avenues through which social science information can be incorporated into the ICES advice process.

In Year 2, the ICES Workshop on the Design and Scope of the 3rd Generation of ICES Ecosystem Overviews (WKEO3) requested input from WGSOCIAL on what social indicators could be included in future EOs. WGSOCIAL proposed to move towards a social-ecological system framework. While many ICES documents already include such language, it is not yet reflected in the current EOs. New language could explain how human activity contributes to society as well as how human activity can be a pressure on the environment.

Work toward ToR b also included a first step in identifying and mapping the geospatial importance of fisheries to coastal communities and presenting them in the EOs. This provides baseline information, and a starting point for further indicator development and analysis. WGSOCIAL is collaborating with the Working Group on Ecosystem Assessment of Western European Shelf Seas (WGEAWESS) and WGECON to develop a proof of concept using the Celtic Seas EO as a pilot study. Because WGEAWESS is an IEA Working Group this process also links to improving IEAs. Thus, it helps progress development towards integrated socio-ecological assessments and improves ICES ability to provide integrated ecosystem-based advice, thereby leading to better informed trade-off analyses and decision-making in future.

Scope

The second figure in the majority of the current regional EOs presents the 'Catchment area for the specific ecoregion, showing major cities, ports, and ICES areas.' Figure 3.1a shows an example that was included in the most recent EO for the Celtic Seas Ecoregion. Ports are labelled as 'medium and large,' but it is not immediately clear what type of port is indicated, nor the criteria

for selection or categorization as ‘medium’ or ‘large.’ Ultimately, WGSOCIAL determined, based on data provided by ESRI on global shipping lanes and harbours, that the ports illustrated are shipping ports and not necessarily fishing ports. This is the data source for most EOs. WGSOCIAL felt that the maps were lacking indication of fishing ports and harbours, which can be distinctly different from shipping-dependent ports (Figure 3.1b). This is particularly relevant as ‘Fishing’ and ‘Selective Extraction of Species’ are the top sector and pressure listed in all of the current regional EOs, and as fishing activity is core to the work of ICES.

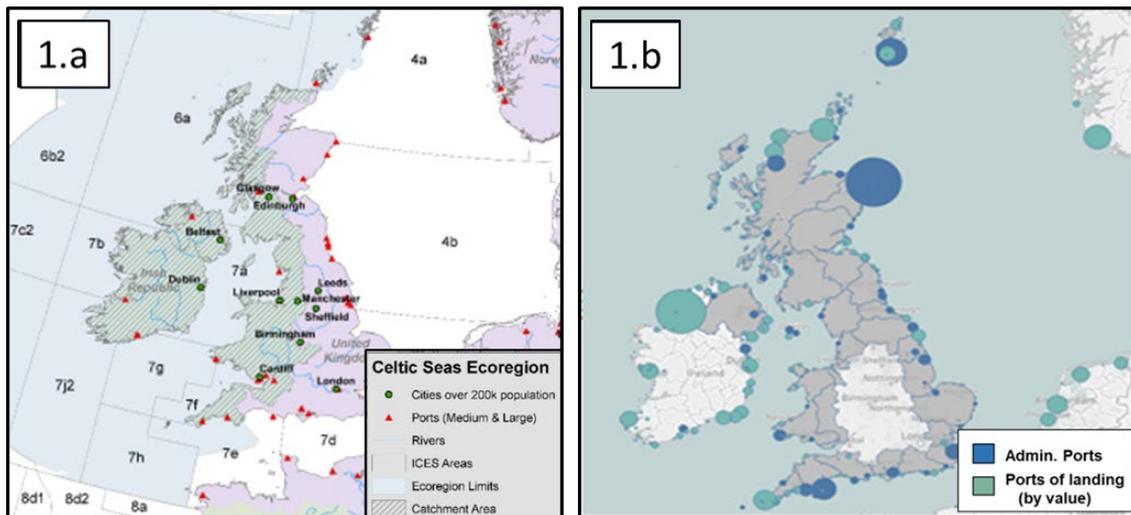


Figure 3.1a) [the current 'Figure 2' of the Celtic Seas Ecoregion-Ecosystem Overview](#); b) Ports of administration and ports of landings by value landed (indicated by point size) in Ireland and UK, 2018.

As such, WGSOCIAL is in the process of developing place-based indicators of fishing activity at the port level as a first step towards putting fishing communities on the EO maps. This serves multiple purposes:

1. The link with society gets a clear face and place: fishing ports;
2. The EO maps are improved with a common approach and useful content (fishing being a top sector and pressure) and can link with the relevant ICES Fisheries Overviews;
3. Defining fishing ports can serve as a first step towards defining fishing communities on EO maps;
4. Defining fishing ports throughout the EOs is a good exercise to understand the challenges of arriving at a common definition and methodology EU wide, whilst taking local context into account;
5. Fishing ports as geographical locations can then also serve as anchor points for other social and economic data (e.g. employment, landings values, economic dependence and profitability).

Approach

WGSOCIAL members reviewed a number of potential data sources for improving the EO maps, including the ‘Coastal Community’ maps published by the Joint Research Council (JRC) of the EU Fisheries and Aquaculture Socio-Economics group, and data collected under the EU Data Collection Framework (DCF) legislation. No suitable, reliable and accurate data source was found. For example, for numerous countries the JRC data underestimated or overestimated the number of ports known/reported nationally. Landings and effort data published and requested by STECF under the DCF data calls does not report the data by port, but is aggregated by species, FAO Area level 3-4 and DCF Fleet segments.

For these reasons, WGSOCIAL believes the best way forward is via a data call via the Regional DataBase (RDB) FishFrame. Through conversations with the ICES Data Centre and Secretariat, and reviewing RDB documents, the RDB includes the information required to associate geographical land-based ports to marine-based fishing activity and landings location, and to further provide understanding and insight into the cross-ecoregional dependence of fishing. WGSOCIAL proposes that the following data be requested from the RDB for each ICES country:

- Landings (tonnes and value);
- Landing country;
- Harbour;
- Vessel flag country;
- Year;
- Species;
- Vessel length category;
- Area;
- Statistical rectangle (where no confidentiality issues exist).

This approach would use port of landing to disaggregate economic activities to countries and regions (as currently done by some countries¹). The landing port could then potentially be used as a proxy to attach economic and social indicators collected by EU DCF to terrestrial regions (aggregating up as required). WGSOCIAL and WGECON propose to use landings value to assign main port of landings to each vessel and disaggregate economic indicators to specific regions in the future. Despite some difficulties (e.g. diversification of operations and landings in multiple ports by some vessels, market gravitation, vessel level estimation needs, and restrictions in sample size), this approach seems to be the most pragmatic and opens wider possibilities to analyse fishing communities at the regional level by incorporating a wider range of economic and social indicators. Aggregation issues have been considered and as annual values are requested, data protection issues are expected to be minimal. This type of analysis could be further developed in the future and complement landings-by-port analyses proposed as a starting point by WGSOCIAL and WGECON. Furthermore, working with the ICES Secretariat and Data Centre will enable us to embed the approach in a sustainable, transparent framework that can be rolled out across the EOs as a key advice product.

Initial goal

WGSOCIAL's initial goal is to put fishing ports onto maps in the EOs with some indication as to the importance/dependence of communities on fisheries. This will be achieved with the addition of ports of landings by value as shown in Figure 1b in addition to the map currently found in most EOs (Figure 1a).

Future goals

With these data, WGSOCIAL and WGECON will continue to work to develop more informative analyses, such as a fleet query tool for stakeholders and policy decision-makers. Further, this work is a foundational step in linking social well-being indicators to fishing communities.

¹ See example of ports level analysis in UK Fleet Enquiry Tool published by Seafish: <https://public.tableau.com/profile/seafish#!/vizhome/FleetEnquiryTool/1Overview>

3.3 ToR c: Information needed for trade-off analysis of fishing impacts on communities and stakeholders

Work on ToR c did not begin until Year 3 because the WGSOCIAL membership in Years 1 and 2 did not have the expertise to address it. In particular, WGSOCIAL focused on clarifying and defining the concept of trade-off analysis in the context of providing fisheries management advice. WGSOCIAL questioned whether this TOR should assess trade-offs under different management approaches of different fishing intensities/impact between *communities and stakeholders*. WGSOCIAL also considered whether the focus should be on trade-offs between these two groups or if the focus should be on fishing impacts or the trade-off between *fishing and other marine activities and uses*.

WGSOCIAL considers a trade-off² as a balancing of objectives or targets that are not all fully attainable at the same time; otherwise thought of as a “compromise.” Trade-offs emerge when an action, for example a management decision, improves one aspect to the detriment of another, or improves both but unequally (Galafassi *et al.*, 2017). A different action may involve a different balance, and the question is which choice is preferable.

WGSOCIAL notes that there is a difference between a trade-off analysis (i.e. understanding trade-offs; for example, “When I produce more oysters, the quality will be reduced.”) and a trade-off decision (e.g. “I will accept lower quality for more oysters”). Trade-off analysis consists of understanding the trade-offs occurring in a social-ecological system; and helps to provide relevant information for decisions. Trade-off analysis does not require the monetizing of benefits; it only requires analysing the relation between units. Therefore, it is possible to perform trade-off analysis between quantitative and qualitative indicators (and between ecological, economic and social dimensions).

WGSOCIAL considers it important to differentiate between two main classes of trade-offs: 1) trade-offs among/between objectives (for example, what are the consequences of a decision in a fishery with respect to economic objectives of efficiency vs. social objectives related to distribution of benefits?); and 2) trade-offs among/between activities (for example, the consequences of devoting a certain area to wind farms or marine protected areas vs. maintaining the area’s yield in fisheries). Furthermore, trade-offs can take other forms, such as trade-offs over a time-scale, along a spatial scale, between risk and performance, in terms of reversibility, or between governance types.

Two key considerations illustrate the importance of incorporating social factors into trade-off analysis in fisheries and marine systems (as elsewhere): 1) the ‘values’ (what people care about) of stakeholder groups, decision-makers and others and 2) the distribution of benefits and costs in a system. Many conventional trade-off analyses look only at aggregate measures, but in reality, each choice that must be made implies certain ‘winners’ and certain ‘losers’.

Trade-offs are fundamental in fisheries (e.g. in setting total allowable catch (TACs)), and across human uses of marine systems - e.g. in the governance of fisheries and of biodiversity conservation. There is a need for a systematic approach to trade-off analysis that covers the dimensions of sustainable development, includes the full values of ecological, economic, social/cultural and institutional aspects, and that recognizes that different participants have different values. There is a particular need for a framework that links social and economic objectives and approaches, and can be used to articulate and evaluate social and economic trade-offs. How, then, can socio-

² In economics, the term trade-off is often expressed as an opportunity cost, i.e. the cost of one action is the lost opportunity that would have been obtained following the best alternative action.

economic trade-off analysis contribute to ICES? WGSOCIAL ultimately needs to consider how to engage the right expertise to provide advice on how to consider trade-offs in decisions and advice. However, there remains the issue of current WGSOCIAL member capacity in the economic, social and institutional/governance areas. During the next term of WGSOCIAL, we will delve into these issues further to provide advice on how trade-off analysis in a social context can contribute to ICES advice to its member countries.

3.4 ToR d: Social and cultural significance of commercial fishing for select regions

In many ways ToR d is related to ToR b as the group's understanding of socially and culturally relevant social indicators (ToR b) has evolved due to the ongoing exploration of data availability (quantitative and qualitative) for ICES Member Countries. In Year 1, WGSOCIAL began identifying key social research questions and defining the meaning of fishing community as precursors to beginning the work of assessing the social and cultural significance of commercial fishing for selected coastal regions in the ICES area. WGSOCIAL then identified five case studies for the purpose of understanding regional variation in fishing dependence and social and cultural characteristics.

WGSOCIAL explored the concept of fishing community right from the start. Fishing communities, in a place-based perspective, are the places which connect the activities of people at sea (fishing) with society on land (trading, consuming). They also serve as important units of analysis where the socio-economic impacts of fishing (including its contribution to wellbeing, identity, values, knowledge) can be studied. These communities serve as a link between the natural part of the ecosystem (where fishing takes place) and the social part, and as such are crucial to get a better understanding of the human dimension. One of the first questions to be asked then is: where are the fishing communities located? Although the question is simple, creating a methodology to answer the question in a wide range of contexts is not so simple. Because when does a community define as a fishing community? Does it need to be dependent on fishing? Does it refer to where fishers live, or where they depart from with their vessels? Which indicators can be used to define a community as such? In the Celtic Seas case study WGSOCIAL works with mapping fishing ports as a first step towards defining fishing communities in ecoregions. A fishing port, a port where fish is landed, can be seen as an indicator of a fishing community. Yet, in order to define a place as a fishing community, more elements play a role. In the Wadden Sea case study, a suite of indicators is used to map fishing communities, of which some of them have a fishing port.

Next to the place-based perspective on fishing communities there is also the perspective of communities of practice. This relates to a group of people with shared cultural, social and/or economic interests. Fishing communities refer to both the place and the people that occupy that place whether it be on land or at sea. The relationship between the importance of fishing to a physical place vs. a group of people with shared interests is complex and multifaceted. In many cases, a sea basin is important for the fishing communities (place-based) on the shore adjacent to the sea basin, but also to different communities of fishers (e.g. certain gear groups) from places further away.

This can be seen in WGSOCIAL's chosen case studies. For instance, the Celtic Seas are important for some Belgian fishers (Celtic Sea case study), while mussel fishers from Zeeland fish a lot in the Wadden Sea (Wadden Sea case study). Thus, mapping fishing communities requires making use of both definitions in order to include all physical places. However, it also shows how at sea, land-based fixed geographies have a different meaning; fishers from different regions or countries might share a lot technological and experiential knowledge of certain fishing places. The

third perspective on fishing community is historical. The significance of fishing to a place may persist due to its historical and cultural importance even if the activity is no longer a central economic feature (Swedish case study). These three different perspectives on fishing community, inspired by the work of Clay and Olsen (2008), guide the work of WGSOCIAL (see Figure 3.1 for conceptual model). In the case studies these perspectives and above mentioned questions are used to develop methodologies that can help advance a common approach for defining fishing communities in the ICES regions.

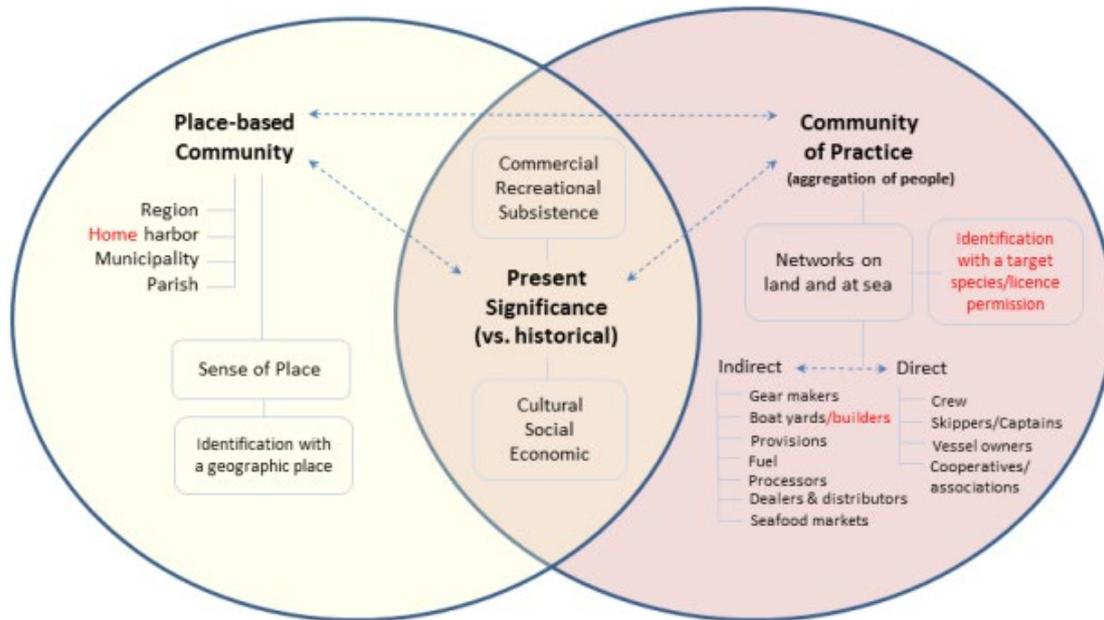


Figure 3.1 Conceptual model of the social landscape of fishing communities.

The evolving case studies enhance understanding of how to create social indicators that are contextually relevant across many countries. The end goal is to develop a standard set of indicators for inclusion in ICES EOs. Each of the following case studies illustrates different, but related, approaches to recognizing the social and cultural importance of fishing to a social dimension, such as community, national or regional heritage.

3.4.1 United States

In the US, place-based fishing communities have been the focus of indicator development. Fisheries are managed regionally, with only a few examples of shared stocks with other countries and a large recreational fishing component. As a result, fishing networks have been regionally organized and may compete with other regions' networks for quotas and resources. Fishing in the US has a rich cultural and historical foundation with substantial differences between regions as well as engagement with indigenous peoples.

Development of the NOAA Fisheries' [Social Indicators for Fishing Communities](#) has been an iterative process since 2010. The initial step was to create 13 statistically robust indicators of fishing community vulnerability and resilience for nearly 2,900 communities in coastal counties from 19 states in the Eastern US (Jepson and Colburn, 2013; Colburn and Jepson, 2012). This was followed by a rigorous ground-truthing of the external validity of the indicators (Pollnac *et al.*, 2015). This process was repeated with the addition of coastal communities from the West Coast, Alaska and Hawaii, increasing the number of communities to nearly 4,600 (Himes-Cornell and Kasperski, 2016; Kleiber *et al.*, 2018). Updated annually, the indicators are primarily developed

with NOAA Fisheries landings and data from the US Census Bureau's American Community Survey. There are currently 14 indices representing different facets of social and ecological well-being including social vulnerability, gentrification pressure vulnerability, environmental vulnerability and commercial and recreational fishing dependence. They are used as a suite of indicators or individually in fisheries social impact assessments to identify places which may experience adverse effects from proposed regulatory changes and in integrated ecosystem assessments to understand the relationship between the social conditions in fishing dependent communities and environmental change. The US indicator approach can support development of indicators outside the US and is being modified by WGSOCIAL members for use in some ICES member areas.

3.4.2 Spain (Galicia)

WGSOCIAL is building off of the US social indicators example for the Galicia case study to better understand fishing dependence and social well-being in the European context. While a goal of WGSOCIAL is to develop a standard set of indicators for all ICES member areas, the Galicia case study explores the use of regional fisheries and census data for that purpose.

Galicia is the main fishing region in Spain, and one of the most fishing dependent areas in the EU (Villasante *et al.*, 2016). Fishing is a major contributor to gross domestic product (GDP) in Galicia and is a key fishing sector within the EU. Galicia accounts for around 40% of Spain's fleet, around 60% of total Spanish employment in fishery-related sectors and 50% of catches reported by Spanish vessels fishing in EU waters (STECF, 2020; www.pescadegalicia.com).

In Galicia, the definition of small-scale fisheries is those vessels less than 12 m which do not use trawler nets. The small-scale fishing sector involves almost 13,000 fishers directly (5,000 are women) and more than 35,000 indirect employees. The small-scale fishing fleet operates from more than 80 towns and villages, with over 60% of the total population employed in the fisheries sector. According to the official census updated in 2020, there were over 3,853 small fishing vessels operating in coastal embayments and shallow oceanic waters (Xunta de Galicia, 2020). The small-scale fishing fleet fish with a great variety of passive gears, the so-called "artes menores" (traps for octopus or crabs, hooks and lines, and nets such as gillnets and small seines), exploiting a diverse range of species, most of which are subject to TACs (Villasante *et al.*, 2016).

There is also a traditional and innovative fishing fleet harvesting highly valued species for seafood consumers that operates in European Union waters (hake, horse mackerel, mackerel, megrim), in Africa (hake) and South America (hake, cephalopods, etc.). Vessels that operate in EU waters have historically been based in the ports of A Coruña, Burela, Celeiro, and Vigo; while the fleet that operates in Africa and South America is based in Marin, Ribeira and Vigo.

Fisheries data were gathered from the official platform (www.pescadegalicia.gal) of the Galician Government for 1997-2019. Data included reported landings (volume, value and average prices) by auction markets ("Lonjas") for approximately 255 commercial species (fish, crustaceans, molluscs), and the number of fishing vessels (length, tonnage and fishing power) by port. A Fishing Engagement Index was calculated to demonstrate the importance of fishing activities to a given community relative to other coastal communities in a region (Colburn *et al.*, 2017). This index was estimated based on the differences between small scale and large scale fishing vessels operating from Galician ports.

WGSOCIAL's members also collected 123 social variables from the official platform (www.ige.eu) of the Galician Government at the municipality level for the 1995-2018. These variables were screened and a subset were selected for the development of indices of the social vulnerability of Galician coastal communities. Population migration patterns were also evaluated for Galician coastal communities. The in- and outmigration patterns in fishing communities

illustrate the dynamic of demographic changes over time, and are calculated as follows: Net population growth (births – deaths) plus in-migration minus outmigration. Including the community migration patterns in the analysis is particularly relevant in Galicia, an Autonomous Community historically characterized by an intense process of emigration in the 20th Century due to the lack of labour opportunities during World War I and II and afterward.

Finally, the migration patterns also influence the capacity of the communities to deal with social-ecological changes such as climate change or economic crisis. The results thus far indicate that, in general, the population in fishing communities is decreasing, in part because there is an increasing trend in more deaths than births. Both types of communities (those engaging small-scale and non-Galician waters) seem to be experiencing this common pattern over time. There is also a clear relationship between communities with a high fishing engagement index score and communities with positive population changes. Indeed, the communities with an increasing negative growth over time usually present lower Fishing Engagement Scores.

3.4.3 Portugal

A second key case study for WGSOCIAL is the tradition of fishing and current importance of fishing to livelihoods and well-being in Portugal. Fishing is an integral part of Portuguese culture and society and has long been an economically important activity for many coastal communities (Pita *et al.*, 2015, Pita and Gaspar, 2020). The Portuguese fishing sector accounts for 10% of the EU fleet in number and 12% in employment. The fishing sector contributes directly and indirectly to employment and income for many rural coastal communities where there are restricted employment opportunities (Pita *et al.* 2010).

The small-scale sector is a major component of Portuguese fisheries, due to its extensive national coverage, diversity of gears used and species captured, large number of fishers and other people indirectly involved in the sector, as well as its high social and cultural importance at local, regional and national levels (Gaspar *et al.*, 2014, Pita *et al.*, 2015, Pita and Gaspar, 2020). Portuguese fisheries (on the mainland and in the Azores and Madeira archipelagos) have traditionally been characterized as being artisanal, small-scale, labor intensive, multi-gear and multispecies fisheries. They tend to catch species with a high commercial value and supply fresh fish to the local and national markets (Pita and Gaspar, 2020).

Fish is an important component of the traditional diet. Despite the Portuguese fishing sector landing a small proportion of the of the total EU-28 landings (4% in quantity), the Portuguese are the biggest consumers per capita of fishery products in the EU (56.8 kg/head/year); they consume more than double the EU average consumption per capita (24.9 kg/head/year) and the country spends almost six times the value of fish landings importing fish food products (fish, crustaceans and molluscs) (European Commission , n.d.; INE, 2020).

WGSOCIAL's intent is to create community-level indices of fishing participation in Portugal, following the work done in the US and Galicia. As a first step, WGSOCIAL members gathered a time-series of fisheries data (1993-2018) for 46 fishing ports, including:

- landings data (volume, value and average prices) by fishing port for all the species (fish, crustaceans, molluscs),
- number of fishing vessels (length, tonnage, fishing power, age of vessel, etc.) by fishing port and by segment of the fleet,
- number of fishers

The next step will be to collect a time-series of official social data from 51 municipalities along the Portuguese coast (depending on available resources). Based on the differences between the different segments of the fleet (local and coastal multi-gear, local and coastal purse-seiners, and

coastal trawlers) operating from Portuguese ports, WGSOCIAL aims to estimate the Fishing Engagement Index which demonstrates the importance of fishing activities to a given community relative to other coastal communities in a region (Colburn et al., 2017).

3.4.4 The Netherlands (Wadden Sea)

Fisheries do not only have an economic value, but also a socio-cultural value. In the Netherlands for instance there is a strong awareness of the historical value of fishing to which the many fishing and maritime museums in the Netherlands testify. Herring is a national symbol and it is generally known that the herring fishery played a crucial role as the backbone of the Dutch economy during the Dutch 'Golden Age'. However, the value of fisheries is not only historical. Fishing currently contributes to global food security (90% of Dutch pelagic catches are traded to Africa and Asia) and has a traditional place in coastal towns where it keeps (fishing) cultural heritage alive. It provides employment, which can be important in more remote regions (Zeeland, Groningen, Noord Holland, Friesland) where other job opportunities are scarce. And, as many fishing businesses are family-owned, the industry contributes to social cohesion in fishing communities. The fact that businesses are family owned with many family members working in the business also contributes to the resilience of the sector. This more contemporary recognition of the socio-cultural significance of fisheries is, however, not completely accepted in this region.

Fisheries research focuses on understanding the impact of fishing on the ecosystem and the understanding of the impact of fishing on society is largely directed to economics. As social and cultural aspects of social science do not play a large part in applied marine science in the Netherlands and as social objectives in the CFP are rarely operationalized, social science information apart from economics is not explicitly considered. While there is a general understanding that fisheries contribute to society and that socio-cultural aspects are a bedrock of the fishery, there is no standardized research into this domain. Therefore, it is important to unlock this information, by making use of concepts that can help explain the socio-cultural value of fishing, such as, cultural heritage, social wellbeing, social cohesion, identity, fisheries dependence, and socio-cultural capital. Case studies can advance this understanding through a variety of methods (e.g. mapping, quantification and portrayals). In the Wadden Sea case study, WGSOCIAL is building on the work done in the EU funded research and innovation project *Pericles*.

The *Pericles* project promotes sustainable, participatory governance of cultural heritage in European coastal and maritime regions. This is done in different case-regions throughout Europe, with the methods tailored to the location. By bringing coastal and maritime cultural heritage and the stories surrounding them to the forefront, the project aims, together with local inhabitants, to contribute to keeping the heritage alive. One of the focal topics used in this project, 'traditional fishing practices', is particularly relevant for WGSOCIAL. This focal topic uses a two-tiered approach. First, the fishing communities in the area are mapped, then the communities of fishing practice. Once they are mapped, with the use of a suite of indicators and data sources, these communities become units of analysis to which other sources of social data can be connected. Through the *Pericles* project, multiple research methodologies will be used to identify fisher cultural heritage and discuss its value for the communities with community members: what is the heritage, what is it about, is it at risk, what do they want to do with it? One of the possibilities is to map it, for instance, via the *Pericles* portal. Cultural heritage is both material as well as immaterial. By also looking at the communities of practice, it becomes clear that not all fishers active in the Wadden Sea region come from the region; some may come from fishing communities located elsewhere (i.e. Zeeland and Urk). This case study contributes to WGSOCIAL's aim to put fishing communities in the forefront and to identify and describe the socio-cultural value of fishing in different ICES regions and identify relevant indicators (in this case – in the Netherlands) to describe that.

3.4.5 Sweden

Sweden today does not currently fall into the category of a “fishing country,” as do other Nordic countries such as Iceland and Norway. Yet in the past, fishing was a major economic activity. On the west coast, in the area known as Bohuslän, a herring fishery of unprecedented size in European history developed during the latter half of the 18th century (Poulsen *et al.*, 2007). On the east coast (Baltic Sea and the Sound), fishing sustained many communities and was for centuries part of the way of life and a distinctive place identity for inhabitants (Delaney, 2007; Arias-Schreiber *et al.*, 2017).

A reduced number of coastal fishers in Sweden has affected the socio-cultural contribution of this fishery sector to Swedish society. This contribution – as opposed to landings and employment which can be measured when placed into markets – would, in economic terms, be described as non-market values of fisheries, among which are (adapted from Waldo and Lovén, 2019):

- Coastal fisheries connect people to their traditional culture and allow people to express their links to their past through cultural heritage;
- Coastal fisheries enhance tourism and recreation;
- Coastal fisheries offer place identity, social trust and order, ways of life, wellbeing for vulnerable social groups (what is known as coastal fisheries providing the “glue” for coastal communities);
- Coastal fisheries have the potential to attract people to live and work in rural areas;
- Coastal fisheries deliver a certain security through a sense that local food will be available in case of food shortages or crises; and
- Coastal fisheries are a repository of unique local knowledge that enables a regular and systematic observation and monitoring of the marine environment.

This socio-cultural significance and its sustainability are not easily assessed or re-ported quantitatively, which does not mean that it is irrelevant or secondary in relation to ecological and economic objectives of fisheries management. On the contrary, overlooking coastal cultural heritage can result in a deterioration of cultural identity connected with certain marine habitats, loss of educational and recreational opportunities, decline in traditional local knowledge and social capital, and also loss of opportunities for alternative economic activities like tourism (Khakzad *et al.*, 2015).

Swedish (and EU) fisheries management will need to integrate both quantitative and qualitative data on socio-cultural contributions of fisheries in order to achieve sustainable ecosystem-based management. Fishers in Sweden are aware of their socio-cultural contribution and are dissatisfied with the current fisheries management that do not value it and does not react against the disappearance of the coastal fishery sector. This situation has negative impacts on the job satisfaction and well-being of coastal fishers, who in their majority are considering quitting the fishing profession in a near future (Arias Schreiber and Gillette, under review). Levels of job satisfaction among fishers can be used as an indirect measure of well-being, which in the case of coastal fishers in Sweden is directly related to respect towards their socio-cultural contribution to society.

3.5 ToR e: Integrate culturally relevant social indicators and analysis with economic and ecological information

In order to make sure that the work of WGSOCIAL, as for example described above, is taken up within the wider ICES community, it is important to collaborate with other WGs (e.g. WGECON)

and to participate in interdisciplinary meetings (e.g. WGCONSERVE). WGSOCIAL also has a relationship with other ICES WGs via its members (see Table 3 below) and other WGs can and do request support from WGSOCIAL.

Table 3.1 ICES Working Groups and initiatives that include WGSOCIAL members.

ICES WG / Strategic Initiative	WGSOCIAL member, also part of this group	Useful thematic / methodological linkage
SIHD: Strategic Initiative on the Human Dimension	Marloes Kraan, Lisa Colburn, Amber Himes Cornell, David Goldsborough, Fanny Barz, Sebastian Linke, Ana Rita Fraga, Arina Motova, Cristina Pita, Gesche Krause, Mimi Elizabeth Lam, Paulina Ramirez-Monsalve, Sebastian Villasante, Tony Charles	WGSOCIAL was formed as part of the SIHD. WGSOCIAL ToR A is a direct link to why this is important.
WGECON: Working Group on Economics	Arina Motova, Sophie Gourguet, Claire Delpuech, Leyre Goti, David Goldsborough, Sebastian Villasante	<i>See below section 3.5.1 Linking up with other working groups</i>
WGBESEO: Working Group on Balancing Economic, Social and Ecological Objectives	David Goldsborough, Paulina, Leyre Goti, Ana Rita Fraga, Claire Delpuech, Debbi Pedreschi, Mimi Elizabeth Lam, Robert L. Stephenson	<i>See below section 3.5.1 Linking up with other working groups</i>
WGEAWESS: Working Group on Ecosystem Assessment of Western European Shelf Seas	Debbi Pedreschi, Arina Motova, David Goldsborough, Marloes Kraan, Paulina Ramirez-Monsalve	In the Celtic Seas case study close collaboration is set up with WGEAWESS. WGEAWESS has a key responsibility in reviewing and updating ICES Ecosystem Overviews for the Bay of Biscay and Iberian Coast, and the Celtic Seas ecoregions. Connecting with this group will help to identify needs of the groups, and routes to include social science and indicators into the Ecosystem Overviews, key to this ToR (A).
WGMARS: Working Group on Maritime Systems	Marloes Kraan, Debbi Pedreschi, Leyre Gohti, Sebastian Linke, Ana Rita Fraga, Jessica Fuller, Marc Larose, Mimi Elizabeth Lam, Tony Charles, David Goldsborough, Robert L. Stephenson	The WGMARS 2020-2022 ToRs focus on several key areas of interest to WGSOCIAL, including Integrated Ecosystem Assessments (IEA), social network analysis (SNA), and behavioural economics (BE), as well having as a focus on interacting with variety of types of stakeholders.
WGCOMEDA: Working Group on Comparative Ecosystem-based Analyses of Atlantic and Mediterranean marine systems	M. Cristina Mangano	WGCOMEDA aims to investigate and improve the Ecosystem-based Approaches to Fisheries (EAF) across European Seas. ToR d explores socio-ecological systems to support integrated fisheries advice and marine management.
WGRMES: Working Group on Resilience and Marine Ecosystem Services	Sebastián Villasante, Pablo Pita, Amber Himes-Cornell, Milena Arias Schreiber, Cristina Pita, Elene Ojea	WGRMES explores a variety of aspects of human-environment interactions, including monetary and non-monetary assessment of marine ecosystem services.

WGRFS: Working Group on Recreational Fisheries Surveys	Pablo Pita	WGRFS deals with recreational fishing surveys, including socio-economic data, fishers' profiles, communication gaps, etc.
WGSEDA: Working Group on Social and Economic Dimensions of Aquaculture	Gesche Krause, Sebastián Vilasante	WGSEDA develops and tests methods on how to capture social/socio-economic indicators that can be used to capture aquaculture production effects in an operational manner.

3.5.1 Linking up with other working groups

WGECON

The ToRs of WGECON and WGSOCIAL share many similarities. WGECON and WGSOCIAL were both created in 2018 to support socio-economic data input and understanding for a more transdisciplinary approach in ICES. There has been a fluid exchange of information between the two WGs since their inception. The WGSOCIAL 2020 virtual annual meeting was run collaboratively with WGECON and the two groups agreed to continue collaborating. It was decided to keep the ToRs aligned and broad enough to continue the work set out in the first three years. There was agreement that it is important for each WG to be disciplinary and have strictly social or economic work, but also cooperative work between the groups. Therefore, the two groups intend to work collaboratively on three case studies: the Celtic Seas Ecoregion; ToR c on trade-off analysis; and on rights-based fisheries management in the US. The first two case studies have been addressed elsewhere in this report. The third case study intends to review right-based fisheries in general, and to assess how different types of programs (e.g. market-based systems, territorial quotas) affect social and economic aspects of fisheries and fishing communities. Several issues guided the discussion, such as: what are the lessons learned – what is necessary to make catch shares successful? What are the design principles that are robust? How might objectives evolve over time and the effect of programs often being structured as an answer to something we do not like (e.g. overfishing).

WGBESEO

The Working Group on Balancing Economic, Social and Ecological Objectives (WGBESEO)'s goal is to develop a generic methodology for identifying, characterizing, and classifying social, economic, and ecological objectives – and enabling the awareness of such objectives in ICES advisory process. Synergies between WGBESEO and WGSOCIAL are in relation to three points:

- *Social indicators*

WGSOCIAL's ToR b aims to report on culturally relevant social indicators. WGBESEO's ToR d aims to define a methodology that will allow social, as well as ecological and economic objectives (and indicators where applicable), to be extracted from policy documents. The information is intended to be of use for Integrated Ecosystem Assessment groups.

- *Trade-off analysis*

WGSOCIAL's ToR c aims to collect information that can help to do trade-off analysis specifically related to impacts on fishing-dependent/coastal communities. WGBESEO's ToR b aims to identify the most common discussions on trade-offs that tend to occur between ecological, social, and economic objectives, and provide an indication of the type of indicators that could be used for

understanding the potential implications. The information is intended to support potential future advice requests.

- Contribute to the development of a framework for collective reporting of social, economic and ecological data

WGSOCIAL's ToR e aims to coordinate provision of social indicators with economic and ecological information. WGBESEO's ToR d aims to define a methodology that will allow social, as well as ecological and economic objectives (and indicators where applicable) to be extracted from policy documents.

These synergies are on the basis upon which WGSOCIAL aims to concentrate on culturally relevant social indicators and trade-offs for fishing-dependent coastal communities. WGBESEO's methodology is for identification of a broader set of all social (economic and ecological) objectives, required for trade-off discussions between these objectives for ecosystem-based management.

3.5.2 Interdisciplinary ICES meetings

WKCONSERVE

The Workshop on Challenges, Opportunities, Needs and Successes for including human dimensions in IEAs (WKCONSERVE) was convened in 2019 to examine the current status of social science across ICES IEA groups, assess needs and opportunities for greater integration, and develop practical steps to do this across the ICES area. It was decided that it is key, in order to progress in this regard, that all IEA groups have social scientists. Challenges are funding and identifying the appropriate experts. WGSOCIAL can help the IEA groups to find social scientists in their regions. Not only can social scientists in IEA groups help with including assessment of the social system in ecosystems but also with scoping and stakeholder consultation on the natural side of the ecosystem. WKCONSERVE was found to be helpful in enabling working together across ICES WGs.

ICES workshop on 3rd Generation Ecosystem Overviews (WKEO3)

In Year 2, the ICES Workshop on the Design and Scope of the 3rd Generation of ICES Ecosystem Overviews (WKEO3) requested input from WGSOCIAL on what social indicators could be included in future EOs. EOs currently reference purely ecological systems. WGSOCIAL proposed to move toward a social-ecological system framework. Many ICES documents already include such language, but it is not yet reflected in the current Ecosystem Overviews. New language should explain how human activity contributes to society as well as how human activity can be a pressure on the environment. In addition, WGSOCIAL works on making use of fishing ports in the maps of EOs standard and to have a similar approach of defining them across the different seas (see Celtic Sea case study).

3.5.3 Training courses on social science methods

Maiken Bjorkan and Marloes Kraan developed the ICES training course 'Social science methods for natural scientists' in 2016. The course has a "learning by doing" set up. The facilitators provide guidance on the basics of the methods (e.g. interviewing) while participants develop their confidence in using them. Background information (such as the epistemology and ontology of the social sciences). The underpinning social science theory will also be discussed to provide a more in-depth understanding of the methods. Through gaining new skills, participants will be able to work more effectively with stakeholders in (cooperative) research projects, as well as

having a better appreciation of the strengths of social sciences in fisheries research. The course was planned to rerun in 2020, but due to COVID-19 it was postponed.

4 Proposal for Terms of Reference for a new term

ToR	Description	Background	SCIENCE PLAN CODES	Duration	Expected Deliverables
a	To continue building capacity for social science in ICES, giving consideration to research and institutional needs in all ICES Member Countries, as well as useful connections to international marine/ fisheries social science organizations, such as the Society for Applied Anthropology and the Centre for Maritime Research (MARE).	This builds on the initial scoping exercise within ICES to expand social science capacity building efforts, but also ensures coordination of activities with other international bodies and links to the wider scoping work in the Strategic Initiative for the Human Dimension (SIHD).	5.4, 6.6	Years 1 –3	Annual reporting
b	To identify and report on culturally relevant social indicators and community data gaps that point to priorities for data collection, research, institutional needs, and training in all ICES Member Countries; and where possible propose systems to collect missing data.	To aid prioritization of data collection, management and analysis to enable qualitative and quantitative analyses of social issues for Ecosystem Overviews, Integrated Ecosystem Assessments and future advice requests. The ToR also links to ICES Data Centre.	4.2, 5.4, 6.6, 7.1, 7.2, 7.7	Years 1 –3	Annual reporting, potentially also scientific manuscript
c	To investigate the approaches, methods, tools and information flow needed to provide trade-off analysis of the impacts of alternative management measures on communities and stakeholder groups	To develop a system to support potential future advice requests and development of Ecosystem Overviews and Integrated Ecosystem Assessments.	5.4, 5.8, 6.5, 7.3, 7.5, 7.6	Years 1 –3	Annual reporting
d	To assess and report on the social and cultural	To support future potential advice requests and	2.7, 5.8, 6.6, 7.1, 7.2, 7.7	Years 1 –3	Annual reporting, potentially also

	significance of commercial fishing and its management for selected coastal regions in the ICES area	development of Ecosystem Overviews and Integrated Ecosystem Assessments.			scientific manuscript(s)
e	To coordinate the provision of culturally relevant social indicators and analysis as part of integrated socio-ecological evaluations in support of Ecosystem-Based Management.	To contribute to the development of a framework for integrated assessment of alternative scenarios for marine fisheries, as part of broader Ecosystem-Based Management approaches.	2.7, 4.3, 6.5, 6.6,, 7.1, 7.2, 7.7	Years 1 –3	Annual reporting

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Annex 2: Resolution

WGSOCIAL - Working Group on SOCIAL indicators

2017/MA2/IEASG04

A Working Group on SOCIAL indicators (WGSOCIAL), chaired by Lisa L. Colburn, United States, Amber Himes-Cornell, FAO, and Marloes Kraan, Netherlands, will be established and will work on ToRs and generate deliverables as listed in the Table below.

	MEETING DATES	VENUE	REPORTING DETAILS	COMMENTS (CHANGE IN CHAIR, ETC.)
Year 2018	25-29 June	ICES HQ, Copenhagen, Denmark	Interim report by 15 August to IEASG	Incoming chair, Marloes Kraan, the Netherlands,
Year 2019	11-15 March	FAO, Rome, Italy	No reporting in 2019	
Year 2020	1 April 15-19 June	by correspondence	Final report by 31 July 2020 to IEASG	

ToR descriptors

ToR	DESCRIPTION	BACKGROUND	SCIENCE PLAN CODES	DURATION	EXPECTED DELIVERABLES
a	To map the current work and identify future needs for social science in ICES, giving consideration to useful connections to international marine/ fisheries social science organizations such as the Society for Applied Anthropology.	This is primarily a scoping exercise within ICES, but also ensures coordination of activities with other international bodies and links to the wider scoping work in the Strategic Initiative for the Human Dimension (SIHD).	5.4, 6.6	Years 1, 2	Annual reporting
b	To identify and report on culturally relevant social indicators and community data gaps that point to priorities for data collection, research, institutional needs, and training in all ICES Member Countries; and where possible propose systems to collect missing data.	To aid prioritization of data collection to enable qualitative and quantitative analyses of social issues for ecosystem overviews and integrated ecosystem assessments and future advice requests. The ToR also links to ICES Data Centre.	4.2, 5.4, 6.6, 7.1, 7.2, 7.7	Years 1, 2	Annual reporting
c	To define and report on the information flow needed to provide trade-off analysis of fishing impacts on communities and stakeholder groups.	To develop a system to support potential future advice requests and development of ecosystem overviews and integrated ecosystem assessments.	5.4, 5.8, 6.5, 7.3, 7.5, 7.6	Years 2, 3	Annual reporting

d	To assess and report on the social and cultural significance of commercial fishing for selected coastal regions in the ICES area	To support future potential advice requests and development of ecosystem overviews and integrated ecosystem assessments.	2.7, 5.8, 6.6, 7.1, 7.2, 7.7	Years 2, 3	Annual reporting, potentially also scientific manuscript
e	To coordinate the provision of culturally relevant social indicators, and analysis with economic and ecological information.	Contribution to the development of a framework for collective reporting of social, economic and ecological data and information.	2.7, 4.3, 6.5, 6.6,, 7.1, 7.2, 7.7	Years 1-3	Annual reporting

Summary of the Work Plan

Year 1	Start mapping the current work and identify future needs for social science and community impact assessment in ICES (ToR a) and identifying social data gaps (ToR b). Briefly brainstorm and discuss ideas on how to address and organize work under the remaining ToRs in year 2. Establish close connections with other relevant groups within and outside ICES (ToRs a and e). Produce Interim Report.
Year 2	Work towards completion of ToR a and ToR b. Start work on defining the information flow needed to provide trade-off analysis (ToR c) and assessing the social and cultural significance of commercial fishing (ToR d). Work with other relevant groups within and outside ICES (To e). Produce Interim Report.
Year 3	Finalize ToR c, d, and e, including the manuscript. Discuss and plan strategies and concrete steps for future work. Produce Final Report.

Supporting information

Priority	<p>Nations are concerned about fish stocks and marine ecosystems, not least because they can contribute to human wellbeing; therefore, these natural resources have a societal value. The social dimension is increasingly an integral part of marine science and scientific advice regarding the use and conservation of marine resources.</p> <p>Demand for science and advice to address social and societal considerations is increasing, but ICES does not engage many social scientists in its existing work. The Strategic Initiative on the Human Dimension (SIHD) has served to raise the profile of social science in ICES in the last few years, but, with a few exceptions, SIHD efforts are not comprehensively supported and informed by the work of ICES EG. Further, none of the existing EG that address social issues are focusing primarily on the development of social metrics and core social analyses that are demanded in parts of the ICES network (e.g. further development of ecosystem overviews).</p> <p>The benefits of expanding the engagement of ICES in social science were highlighted in the outcomes of recent meetings, especially the “Understanding marine socio-ecological systems” (MSEAS) Conference which ICES co-sponsored in Brest, France, in 2016. Other drivers include high level aspirations for Blue Growth in European countries and globally, and a desire to understand social consequences of human-induced changes in the sea (WGHIST). Although there is no official request of social indicators, there is a recognition in ICES that it would be desirable to add social metrics to ICES ecosystem overviews and thus to recognize people and their livelihoods as part of the ecosystem. Further, in the longer term, ICES growing engagement in aquaculture science will likely lead to overviews of aquaculture activity that will also require social inputs.</p>
Resource requirements	The group will rely on ongoing international and national research projects to support involvement of WGSOCIAL members.
Participants	This is a new Group, expected to be attended by some 15–20 participants.
Secretariat facilities	None.
Financial	No financial implications.

Linkages to ACOM and group under ACOM	In the longer term the EG will be ready to support ACOM in addressing advisor requests from ICES clients if these are forthcoming.
Linkages to other committees or groups	<p>The subject area of this EG has close linkage with the following ICES groups: WGSEDA, WGECON, WGIMM, WGRMES, WGNARS, WGHIST and the Strategic Initiative SIHD.</p> <p>Frequent interaction with WGECON and SIHD will be especially important to ensure the smooth and efficient introduction of further social and economic science into the ICES network</p>
Linkages to other organizations	Society of Applied Anthropologists, NOAA Fisheries Human Dimensions and IE Program, PICES, IMBER Human Dimension group, Future Coasts

Annex 3: Acronyms

Acronym	Full name
ACOM	ICES Advisory Committee
ASC	Annual Science Conference
CFP	Common Fisheries Policy
DCF	Data Collection Framework
DGMARE	Directorate-General for Maritime Affairs and Fisheries
EC	European Commission
EO	Ecosystem overviews
EU	European Union
EUMAP	EU Accession Monitoring Program
FAO	Food and Agriculture Organization of the United Nations
ICES	International Council for the Exploration of the Sea
IEA	Integrated ecosystem assessment
IPBES	Intergovernmental science-policy Platform on Biodiversity and Ecosystem Services
JRC	Joint Research Centre
MARE	Centre for Maritime Research
OECD	Organisation for Economic Co-operation and Development
OPP	Oceans Past Platform
PICES	North Pacific Marine Science Organization
RDB	Regional DataBase
SfAA	Society for Applied Anthropology
SIHD	Strategic Initiative for the Human Dimension
STECF	Scientific, Technical and Economic Committee for Fisheries
TAC	Total allowable catch
ToR	Term of reference

WG	Working group
WGBESEO	Working Group on Balancing Economic, Social and Ecological Objectives
WGECON	Working Group on Economics
WGSOCIAL	Working Group on Social Indicators
WGEAWESS	Working Group on Ecosystem Assessment of Western European Shelf Seas
WKCONSERVE	Workshop on Challenges, Opportunities, Needs and Successes for including human dimensions in IEAs
