



2nd Meeting of the Joint Bycatch Working Group
Online, 5-6 February 2025



ACCOBAMS-ASCOBANS/JBWG2/Inf.6.1
Dist. 31 January 2025

ICES ROADMAP FOR MARINE RECREATIONAL FISHERIES (MRF)

(Prepared by ICES)

This paper was originally published on the [ICES website](#) (December 2024).

ICES Roadmap for Marine Recreational Fisheries (MRF)



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Recommended format for purpose of citation:

ICES. 2024. Roadmap for Marine Recreational Fisheries (MRF). 17 pp. <https://doi.org/10.17895/ices.pub.27930003>

This document has been produced under the auspices of the International Council for the Exploration of the Sea.

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Cover image: Deutscher Angelfischerverband, Johannes Arlt



Purpose of the roadmap

The overarching goal of this roadmap is to guide the development of robust marine recreational fisheries (MRF) assessments through data and methodological improvements, in line with current and future management needs. To address the requirements of the policy and legislative instruments in relation to MRF and to plan future steps in ICES, there is need to further improve and operationalize the required MRF dataflows and assessment procedures. Better integration of MRF into advice is in line with ICES vision and mission alongside its advisory framework and principles. This will assist not only managers but also the angling community, fishing industry, and environmental NGOs in implementation of the relevant legislative instruments.



Image: Deutscher Angelfischerverband, Johannes Artl

Background

Marine recreational fishing is an important activity that generates significant economic and social benefits, but it can also impact on fish stocks. In 2003, a global meta-analysis found that there were 58 million marine recreational fishers, generating \$39.7 billion in expenditures, and supporting 954 000 jobs (Cisneros-Montemayor and Sumaila, 2010). In Europe, there are 8.8 million people engaged in MRF that fish for 78 million days (Hyder *et al.*, 2018), generating a total of 10.5 billion € which supports 100 000 jobs (Hyder *et al.*, 2017). In US in 2022, MRF generated \$138 billion in sales that supported 692 000 jobs (National Marine Fisheries Service, 2024) and were fished for 200 million days catching 1 billion fish (National Marine Fisheries Service, 2022). MRF generates important health and wellbeing benefits for participants (Griffiths *et al.*, 2017) and creates economic benefits in coastal communities (Strehlow *et al.*, 2023). However, MRF catches can impact on fish stocks (Radford *et al.*, 2018) and the environment (Lewin *et al.*, 2019).

Despite these benefits and impacts, governance is generally lacking (Potts *et al.*, 2020), meaning that MRF catches are often excluded from stock assessments, which may impact on the ability to manage stocks to within sustainable limits (Hyder *et al.*, 2014). This is the case in Europe, where few stock assessments and advice include MRF catches. There is, however, a growing recognition of the need to embed MRF in fisheries management and advice (Hyder *et al.*, 2018). ICES is uniquely positioned to do this: for example, the EU's Directorate-General for Maritime Affairs and Fisheries (DG MARE) has included the provision advice on MRF in its grant agreement with ICES (EU and ICES, 2024), and other ICES Member Countries have requested advice. This document provides a roadmap for embedding MRF within the ICES assessment and advisory processes.

Governance background

Effective MRF governance requires a clear legal definition, policy, co-management, monitoring, and cost recovery, and it must be adaptive (Potts *et al.*, 2020). Governance is challenging and varies greatly between countries. Australia and America are considered to have the most advanced MRF governance systems, whereas often governance is lacking in Europe (Potts *et al.*, 2020). Effective governance of MRF is needed in Europe to maximize the societal benefits of its fisheries (Grati *et al.*, in press). The regulatory framework governing MRF also varies greatly across ICES Member Countries and regions. Examples of approaches used in the European Union, Norway, UK, US, Australia, and New Zealand are provided in Annex 1.





Image: David Mandos Roca

ICES expert groups involved

Within ICES, efforts on MRF are led by the Working Group on Recreational Fisheries Surveys (WGRFS). The role of WGRFS is to compile and validate data from European countries' recreational fisheries and contribute to the ICES advisory process regarding MRF issues. The group engages in various aspects of MRF including consolidating and evaluating national survey programmes; validating new survey methodologies; offering guidance on data availability, quality, and usage; facilitating regional data gathering and storage; and exploring human dimensions. The group also covers issues related to governance, catch and release and animal welfare, stock assessment and reconstruction, human dimensions, and communication and engagement because of the importance of MRF for communities and ecosystems.

The WGRFS members interact widely across ICES and with decision-makers at national, European, and international scales. The end users for outputs are ICES assessment and other expert groups, Regional Coordination Groups, European Commission, other international MRF networks, and the angling community. The group's members also interact regularly with ICES assessment working groups, contribute to benchmarking processes, and collaborate with other ICES expert groups. There is a close collaboration with Regional Coordination Groups, the General Fisheries Commission for the Mediterranean (GFCM), and representatives from the Directorate-General for Maritime Affairs and Fisheries (DG MARE), and the angling community are members of WGRFS. Finally, there is regular interaction with other networks of recreational fisheries scientists alongside leading sessions at international conferences. An illustration of how WGRFS interacts with these other groups and bodies and the flow of MRF data into ICES advice can be seen in Figure 1.

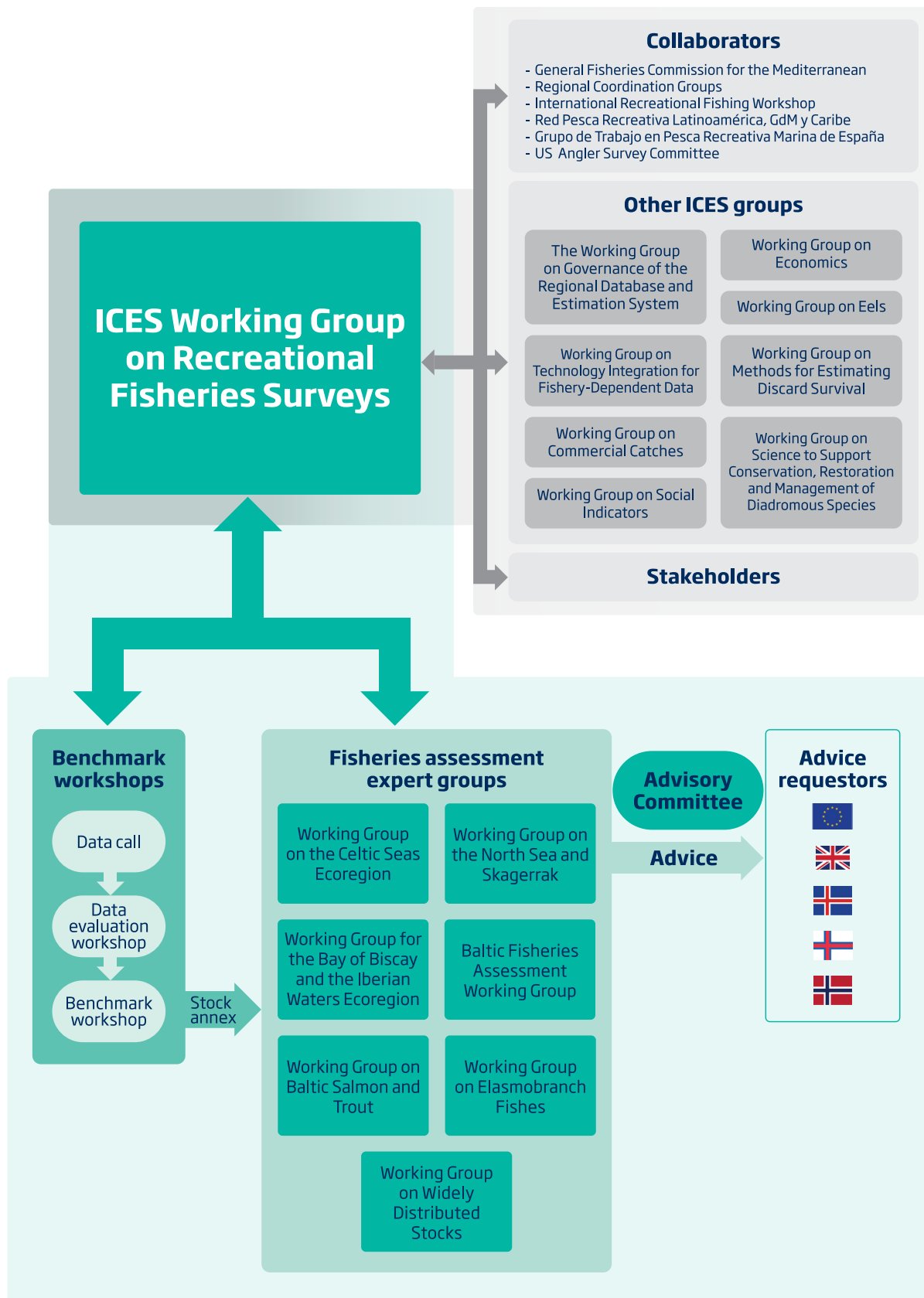


Figure 1 How interactions between WGRFS and other ICES expert groups feed into ICES advice via the benchmark process.

Challenges

The Workshop on Recreational Fisheries in Stock Assessments (WKRFSAs) aimed to establish a process for integrating MRF data into stock assessments and advice (ICES, 2024). The group identified key challenges for MRF inclusion, categorized into data, communication, and resourcing. Needs for improved quality, quantity, and consistency of MRF data and better communication about MRF data availability were highlighted, while resourcing challenges included knowledge gaps within ICES stock assessment community, communication of MRF-specific advice, and capacity for improved methods. To overcome the challenges, several requirements were identified, including better communication around MRF data use and availability; better data quality and transparency; more co-design of data-collection between stakeholders, scientists, organizations, and regional/international jurisdictions; appropriate processes for allocation of total allowable catch (TAC); and funding to develop the methods for inclusion of MRF data and allocation of resources. Presentation of the advice was outside of the scope of WKRFSAs, so guidance from ICES Advisory Committee (ACOM) is required to outline how MRF should appear in advisory outputs and to consider how social and economic information should be included.

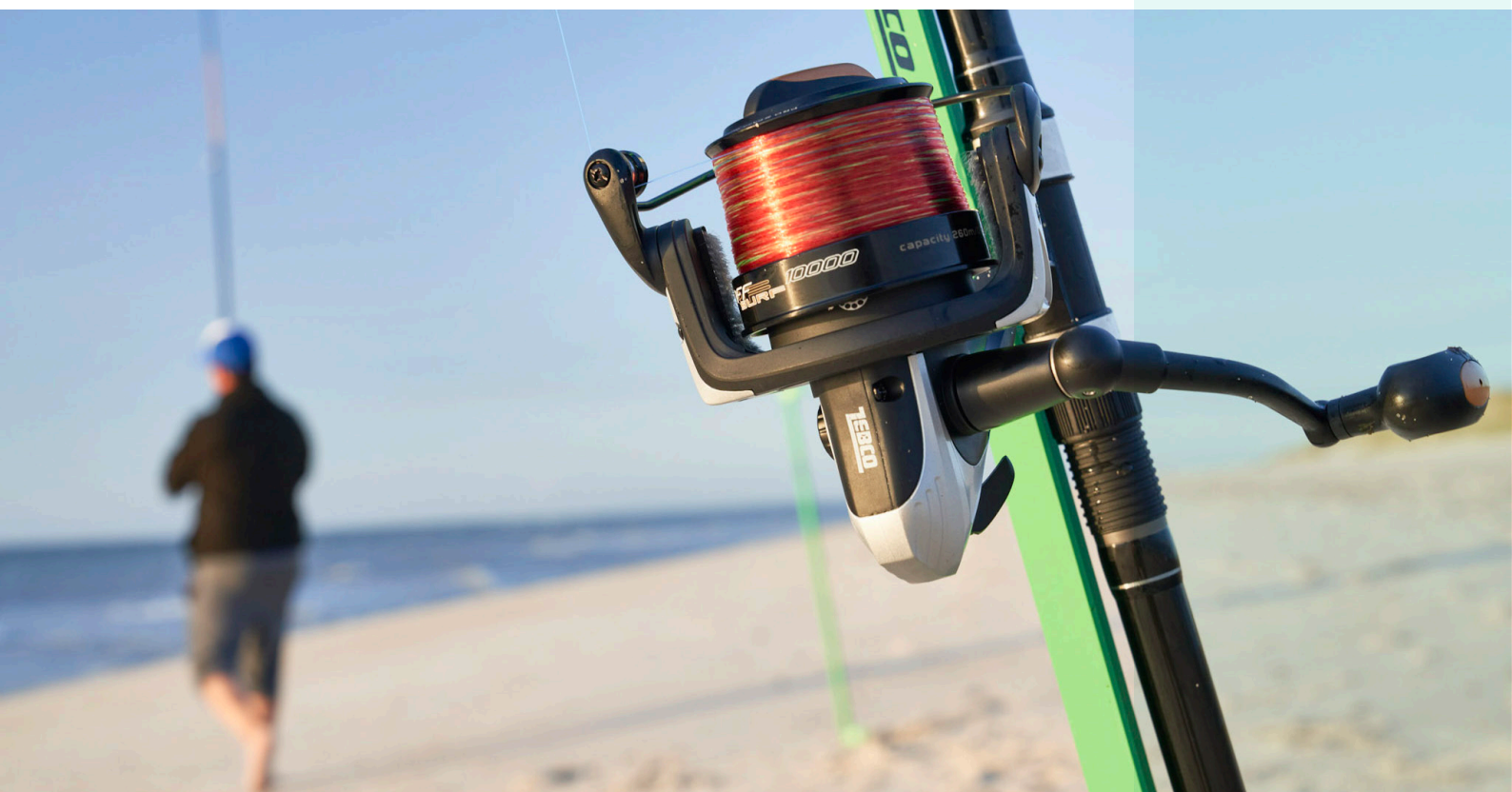


Image: Deutscher Angelfischerverband, Johannes Artt

Embedding MRF in ICES advice

To embed MRF in ICES advice, a step change in approach is needed. WGRFS has identified a way forward using the **DAISY** model: **D**ata must be robust and accessible; an agreed and consistent approach should be used for MRF **A**dvice; **I**ntegration of MRF into assessment is needed; **S**cience is required to meet future needs; and these steps must be implemented **Y**early within the annual advice cycle (Figure 2). Twelve recommendations associated with the DAISY model that provide a roadmap for provision of MRF advice by ICES are described in the "Data", "Advice", "Integration", "Science", and "Yearly" subsections.

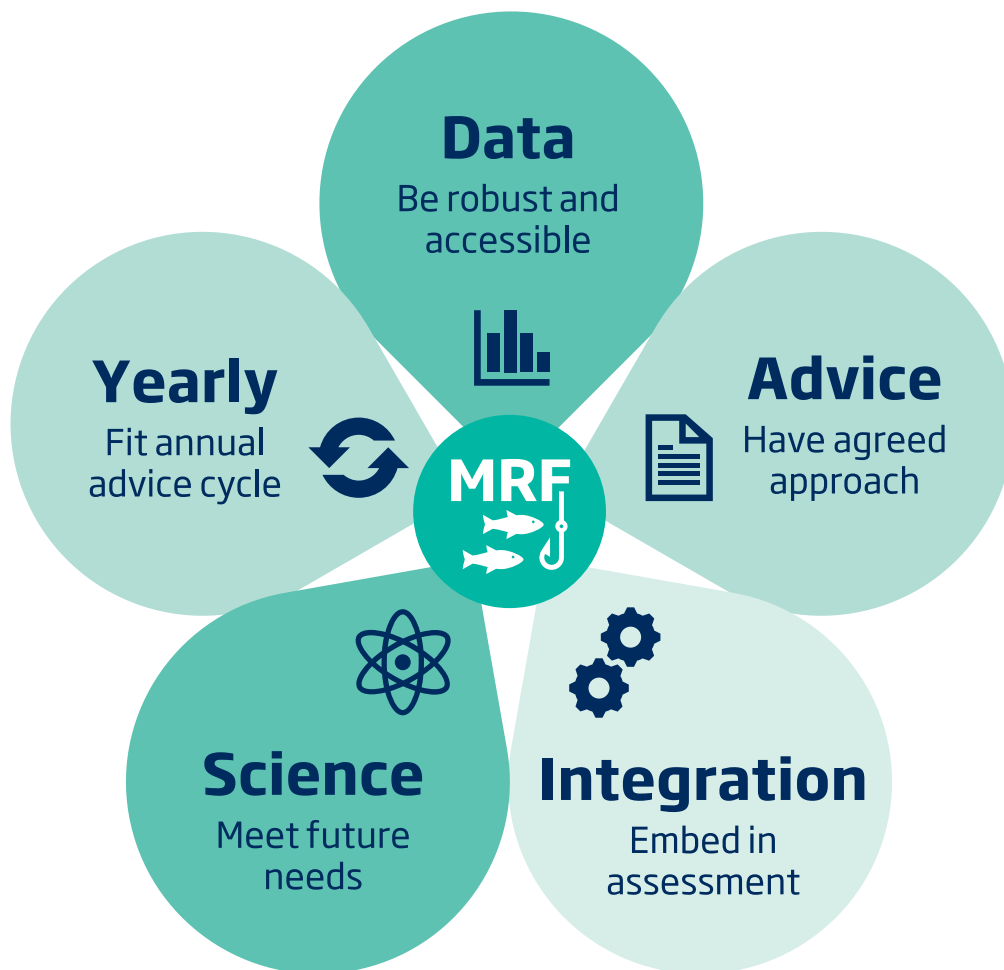


Figure 2 DAISY model for inclusion of marine recreational fisheries (MRF) in ICES advice

Data

Robust monitoring programmes are essential to collect the data needed to underpin ICES assessments and advice. Few MRF time-series exist and are of inconsistent coverage, extent, and quality across countries, making inclusion of MRF in stock assessment and advice challenging. ICES should highlight current issues and future needs to ensure that advice is based on a robust evidence base. To achieve this, the following actions should be taken:

- 1. Current status and future needs.** All existing MRF data should be compiled, and a stock take of extent, coverage, and quality should be done. A report highlighting the issues with existing data, potential for inclusion in advice, and future data needs should be produced.
- 2. Storage and access.** The Regional DataBase and Estimation System (RDBES) should become the single source of MRF data for stock assessment and advice. This requires prioritizing and funding the inclusion of MRF data in RDBES and annual MRF data calls from ICES to all countries to submit MRF data.

Advice

Advice on MRF from ICES is now required by DG MARE and other ICES Member Countries in which recreational fisheries take a significant part of catches. This advice is based around catch scenarios, gears responsible, inclusion of MRF in stock assessments, management measures, and contribution to reaching maximum sustainable yield (MSY) objectives. Catches from MRF are likely to become an increasingly important part of fishing mortality as commercial catches decline and a broader range of stocks are assessed (e.g. non-quota). However, no agreed approach or process exists for provision of MRF advice by ICES, so the following tasks are needed:

- 3. Catch advice.** An agreed process, approach, and format for catch advice that includes MRF should be generated. This should be led by ACOM with support from WGRFS and should include a workflow for advice generation, proposed approaches to address key issues such as allocation to sectors, and an agreed format for advice outputs.
- 4. Special requests.** Requests from the EC, ICES Member Countries, and other advice requesters are possible for MRF. These requests should be reviewed by WGRFS to assess both feasibility and resource requirements as part of a response. If accepted, delivery should be led by ICES Secretariat with support from WGRFS, only taking place if the advice is deemed robust by WGRFS.

Integration

MRF catches are currently included in ICES stock assessments and advice for very few stocks. This is due to a combination of reasons including lack of data, lack of recognition of the importance of MRF for the stock, minimal catches, incompatible methods, and resource limitations. As a result, integration of MRF into assessment requires the following approaches:

- 5. Prioritization of species.** Given the large number of potential species for inclusion, it will not be possible to include MRF data for all stocks. A productivity susceptibility analysis (Phillips *et al.*, 2015) will be done to identify species where MRF catches could be important to prioritize both in terms of inclusion in assessment and data collection needs. When a risk is identified and there is an assessment, MRF should be added to the issue list and included in the data call process for consideration at the next benchmark. Where there is no assessment, an approach should be agreed within ICES on a case-by-case basis. In addition, high risk stocks should be shared with the RCGs for inclusion in future monitoring requirements.

- 6. Data provision.** For recreational removals to be incorporated into ICES assessments, the path for data to enter this system needs to be considered and agreed upon. It would be appropriate to do so through the ICES data call process, with suitable data processing and quality checks in place at the country or jurisdiction level. An MRF coordinator should be appointed for each priority stock within both the assessment working groups and benchmark workshops to ensure that this can be done.
- 7. Inclusion in assessment.** Existing assessment methods are often not compatible with the MRF data available, so a variety of approaches are needed to facilitate inclusion in the broader assessment and advisory processes. Stock assessment scientists need to work with WGRFS to develop processes for inclusion.

Science

MRF is a rapidly changing field with new studies and approaches emerging regularly. It is important both to ensure that the latest science is used to support ICES advice and to develop new approaches within WGRFS that can be used in the future. Experts already use the latest developments in their field, but there is a need for practical solutions that ICES is in a unique position to offer. These should focus on the following:

- 8. Data generation.** The advent of non-probability survey approaches, new technologies such as apps and web scraping, and mandatory reporting means that information can come from a multitude of sources. In addition, countries collect information in different ways that need to be combined for assessment and advice. WGRFS should develop approaches to integrate data from different sources alongside estimation of the uncertainty.
- 9. Impact on fish stocks.** Two areas of research are needed to support the impact on fish stocks. Firstly, release rates are high, but post-release mortality studies are lacking, so there is need for a global review to develop default estimates. In addition, methods for stock assessment that include MRF are needed, so WGRFS should work with assessment working groups to develop new approaches, particularly for data-limited stocks.
- 10. Catch allocation.** DG MARE and ICES Member Countries require advice on the impact of management, which results in de facto catch allocation between sectors. Methods are needed for allocation of catches between sectors that account for social and economic benefits alongside biological sustainability to maximize the benefit to society from fish stocks. Transdisciplinary approaches are needed that build on knowledge gained by WGRFS members from other projects alongside approaches for valuing social and economic benefits that result in regular data collection.
- 11. Human dimensions.** Participation in MRF is very diverse with different motivations which, alongside lack of enforcement, makes the outcomes of management difficult to predict. WGRFS is in a unique position to assess the link between motivation and catch rates that could be used to better understand or predict responses to management measures and understand baseline levels of and ways to engender compliance with limited enforcement.

Yearly

The inclusion of MRF in the routine catch advice requires data to be available by the end of March each year to be used by the assessment working groups in that April or May. This is a challenge for MRF surveys, as there is a delay in obtaining data, and analyses are usually complex. Hence, it may be the case that the MRF catches may not be available for inclusion until the subsequent assessment. In addition, the organizations responsible for MRF data collection are often different to commercial fisheries, so either do not receive the data calls or do not understand the requirements. As a result, the following task is needed:

- 12. Roles.** It is important that everyone understands their annual role and responsibilities. Firstly, ICES needs to ensure that the data calls go to the national MRF expert and that national correspondents know who that is. Secondly, national MRF experts need training in responding to data calls.



Image: David Mandos Roca

Conclusions

Although MRF are important economically, socially, and biologically, they are often excluded from fisheries assessments and management, which may impact the ability to meet conservation, management, and sustainability goals. In Europe, governance varies, with MRF management being a national competence and the EU only able to impose MRF measures to rebuild stocks. There is a growing recognition of the importance of MRF within Europe, evidenced by DG MARE and ICES Member Countries requesting that MRF catches are accounted for in recurrent advice and by special request related to MRF. As a result, ICES needs to develop robust processes to deliver advice on MRF. This roadmap provides an approach to embed MRF within ICES assessment and advisory processes. To achieve this, WGRFS have proposed the DAISY model presented in Figure 2. Twelve recommendations associated with the DAISY model are described and provide a roadmap for provision of MRF advice by ICES.



Image: Angling Trust

Annex 1

National and regional legislation

European Union

In Europe, fisheries are governed through the Common Fisheries Policy (CFP), which sets the systems for monitoring, assessment, control and enforcement alongside funds for the development of fisheries. It aims to maximize the societal benefits generated from fisheries within sustainable exploitation limits (defined as maximum sustainable yield [MSY]). However, this is limited to the single statement in the CFP: “Recreational fisheries can have a significant impact on fish resources and Member States (MSs) should, therefore, ensure that they are conducted in a manner that is compatible with the objectives of the CFP.”

The EU Control Regulation prohibits the sale of MRF catches in Europe, mandates monitoring of stocks subject to recovery plans by recreational fisheries, and allows for the implementation of specific management measures where MRF significantly impacts stocks. Coastal MSs shall ensure that recreational fishers are registered and that they establish an electronic system for the recording and reporting of MRF catches of species under Union-set fishing opportunities, multiannual plans, or the landing obligation. Finally, the EU Data Collection Framework specifies that MSs should have regular multispecies surveys of MRF catches and generate biological data where MRF affects stock development. Managing MRF in accordance with the CFP is a national competency, with the EU only legally able to issue management measures for MRF where rebuilding measures are imposed for a stock in poor biological condition. MRF governance is complex, primarily taking place at national level apart from where EU legislation prevails (e.g. rebuilding stocks), while monitoring and control is regulated at EU level.

Norway

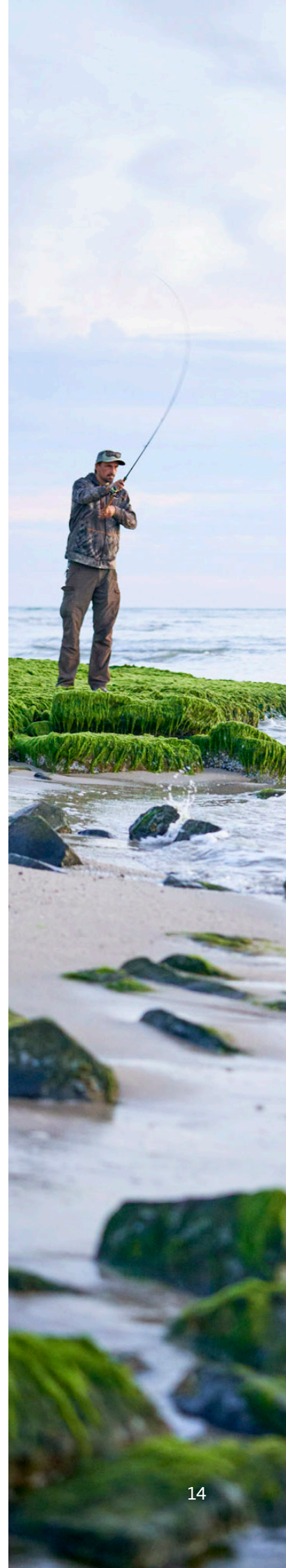
Norway has the largest participation rate of recreational fishers in Europe (Hyder *et al.*, 2018), and the tourist fishing industry that provides accommodation and rental boats to tourist fishers has become an important source of employment and income in rural areas along the coast. The Marine Resources Act, which entered into force in 2009, is a central law in Norwegian fisheries management that regulates the extraction of marine resources in Norway. The Act forms a far-reaching legal basis for the ministry to regulate the extraction of marine resources through national quotas, group quotas, district quotas, and vessel quotas. Amendments to the Act enacted fees (Fisheries Research Fees) for the commercial fishing fleet that supports fisheries research and monitoring. In Norway, the Institute of Marine Research (IMR) and the Directorate of Fisheries are instructed by the Ministry of Commerce and Fisheries to increase knowledge of catches in the tourist and recreational fishery. IMR conducts statistically robust multispecies surveys of tourist and recreational fishing in selected regions annually, and the Directorate of Fisheries is implementing national mandatory reporting in the tourist fishery, funded by Fisheries Research Fees. Increased knowledge on the catches of coastal cod taken by tourist and recreational fishers is prioritized.

United Kingdom

UK is an independent coastal state with control over its territorial waters. MRF are embedded in UK fisheries management through the Fisheries Act of 2020, alongside the provision for funding for recreational and commercial fishing development. This means that to meet the objectives of the Fisheries Act, it is important to have biological, social, and economic data on recreational fisheries to inform Fisheries Management Plans and sector development. No licence is required to fish in the sea, so no list of participants exists. Annual monitoring of MRF participation, catches, and economic impact is done using offsite diaries (Hyder *et al.*, 2024), with onsite surveys underway. Data have been used to inform fisheries management plans, and approaches for management have been co-designed with the angling community for species such as sea bass (Department for Environment Food, and Rural Affairs [Defra] and the Welsh Government, 2023).

United States

The MRF legislative framework in US is governed by a combination of federal and state laws aimed at conservation, management, and the sustainable use of marine resources. At the federal level, the Magnuson–Stevens Fishery Conservation and Management Act serves as the primary legislation guiding MRF management. In 2018, the Act was amended by the Modernizing Recreational Fisheries Management Act. This supported improvements to recreational fishing data and management of mixed-use fisheries, including requirements for new reports, studies, and guidance. The Magnusen–Stevens Act establishes regional fishery management councils that are responsible for developing fishery management plans tailored to the specific needs of each region. Additionally, the National Marine Fisheries Service (NMFS) implements the plans, oversees the enforcement of regulations and the collection of data through programmes such as the Marine Recreational Information Program (MRIP), which provides crucial statistics on recreational fishing activity. States also play a significant role in regulating recreational fishing within their waters, often implementing additional measures to address local concerns and species management. Collaborative efforts between federal and state agencies, as well as engagement with stakeholders, are crucial for ensuring the sustainability and enjoyment of marine recreational fishing across the country.





Australia

Fisheries policies have been adopted across all Australian jurisdictions to maintain or improve sustainability, with fish stocks assessed biennially. Management approaches for MRF vary across jurisdictions and typically include size, bag, boat and possession limits, gear restrictions, and temporal and spatial closures. While MRF have been historically viewed as having minimal impact on fisheries, there have been sustainability concerns because of the impacts of MRF on some high-value stocks. In many jurisdictions, understanding of MRF has improved with regular monitoring, including state-wide surveys conducted every two to five years. In some states, these surveys use recreational fishing licensing systems, but these systems are not consistent across jurisdictions. MRF licences are not required in the Northern Territory or Queensland and for impoundments only in South Australia, while general licences are required in New South Wales and Victoria with some exemption categories, and gear- and species-specific licences are required in Tasmania and Western Australia. Where licensing systems and monitoring occur, these provide information for statutory reporting and stock assessments, and evidence for fisheries policy, including resource allocation and access for recreational fishers. Some jurisdictions are reviewing policy settings to maximize the value of fisheries to the community, such as including social and economic objectives in harvest strategies.

New Zealand

Recreational fisheries management in New Zealand is not managed by a quota, such as that used to manage the commercial landings that account for approximately 98% of the annual landed catch. Instead, the Minister of Fisheries shall allow for customary (Māori) and recreational interests when the total allowable commercial catch is set or adjusted for a given fish stock. The setting of annual recreational catch allowances by the Minister is informed by recreational estimates provided by five yearly National Panel surveys, stock assessments and other sources of information, including input by Māori and consultations with stakeholders. The primary management measures used to constrain recreational harvests to around their annual catch allowances are daily bag limits and minimum legal-size limits.

Image:
Deutscher Angelfischerverband,
Johannes Artl

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