

### 1.6.1.3 EU request on data needs for monitoring of recreational fisheries

#### Advice summary

ICES has identified that the main drivers for the collection of recreational fishery data are: providing advice on fishing opportunities, designing and evaluating management measures for recreational fisheries, developing fishery management plans and strategies, and supporting the development of marine spatial planning. The data needed to support the scientific advice, and how these data are or could be used, are discussed for each of these drivers. The data needed depends on the type of advice and the scientific methods used in developing the advice. ICES is therefore not able to develop a generic list of recreational fishery data that would meet all needs for data in support of scientific advice. The species covered, type of data to collect, frequency of data collection, spatio-temporal resolution and target precision of recreational fishery catch estimates should be established on a regional basis with expert advice. With regards to data collected under the EU Data Collection Framework (DCF) (EU, 2008), ICES supports the process for evaluating end-user needs for data suggested by STECF (STECF, 2013) to deliver a balanced and cost-effective programme of data collection across recreational and commercial fisheries in each region.

#### Request

*DG MARE kindly requests that ICES provides advice on how data needs for monitoring the recreational fisheries should best be defined to meet expected end-user needs. This advice should be delivered the latest by 21st August 2015 and address the following questions in detail:*

1. *What are the drivers for the collection of recreational fishing data?*
2. *What recreational fishery data (biological, economic & fisheries activity) are needed to support the scientific advice?*
3. *How will these data be used in stock assessment and fishery management advice?*
4. *What spatial and temporal resolution of data is needed to support fisheries management?*

#### Elaboration on the advice

ICES considers, in its response to this request, the need for recreational fishery data to support its advisory process. ICES is only one end-user of such data; the overall design and coverage of data collection may need to address a broader range of end-user needs.

##### 1. What are the drivers for the collection of recreational fishing data?

There are many potential drivers for the collection of recreational fishery data and a wide range of existing and potential end-users of the data. ICES has identified the following main drivers for collection of recreational data:

- i) **Advice on fishing opportunities.** The need to quantify the total removals from a stock in order to give accurate advice on the fishing opportunities currently drives most of the data collection of recreational fishery;
- ii) **Design and evaluation of management measures.** Where there is a need for specific management measures for recreational fisheries, the development and evaluation of the measures require information on the characteristics of the fisheries concerned;
- iii) **Development and evaluation of management plans/strategies involving recreational fisheries.** The development of fisheries management plans or strategies for a stock should include recreational catches where they are relevant for achieving management objectives including economic and social objectives, and environmental and ecosystem objectives, for example as included in the EU Marine Strategy Framework Directive (MSFD);
- iv) **Marine spatial planning.** There is a need for information to support marine spatial planning in areas where recreational fisheries compete for space with other users of the marine environment.

## 2. What recreational fishery data (biological, economic & fisheries activity) are needed to support the scientific advice?

The type of recreational fishery data needed to support scientific advice depends on the type of advice and the scientific methods used in developing the advice. ICES is therefore not able to develop a generic list of recreational data that would meet all needs for data in support of scientific advice. ICES considers it important that the data to be collected are defined on a case-by-case basis. The first step in defining needs for recreational fishery data should be to document what data are available, not just those required under existing regulations, so that the relative removals and existing data gaps are identified and feed into any decisions around data collection at a regional level. The species covered, type of data to collect, frequency of data collection, spatio-temporal resolution and target precision of recreational fishery catch estimates should be established on a regional basis with expert advice from ICES. With regards to data collected under the DCF, ICES supports the process for evaluating end-user needs for data suggested by STECF (STECF, 2013) to deliver a balanced and cost-effective programme of data collection across recreational and commercial fisheries.

- i) **Advice on fishing opportunities.** The core recreational fishery data needed assessing stock status to support advice on fishing opportunities are estimates of total removals (catches minus surviving released fish). If data are to be included in an analytical length- or age-based stock assessment, information on size or age compositions of catches is usually required. Recreational fishery survey data can also provide indices of relative abundance (as catch per unit of effort) for monitoring stock trends.

All recreational fishery data used in the advisory process should be collected using statistically sound survey designs with full documentation of data collection methods, evaluation of potential for bias, and estimates of precision, so that estimates from different surveys can be reliably combined to deliver stock-wide estimates with associated measures of precision and indicators of bias. Furthermore, to achieve this, data collection needs to be coordinated on a regional level.

Throughout Europe, recreational fisheries may be significantly impacting a much larger number of species, particularly in inshore waters, than are included in current data collection requirements. Some of these species may be at relatively low abundance, but are particularly vulnerable to recreational fishing, and may even be designated as protected, endangered, or threatened. To design regional surveys covering all stocks where the recreational catch data are needed for assessing stock status and providing advice on fishing opportunities, an initial study is needed to collate and evaluate available catch estimates by stock from existing surveys, scientific literature, and reports. The quality of these estimates must be clearly documented. Collation of available estimates for a much wider range of species is a large exercise that is likely to require separate studies.

A large proportion of many recreational catches is released alive, including target species as well as bycatch, so it may also be important to quantify mortality of released catches caused by the capture process. If the mortality of released catches is not accounted for, the total mortality associated with recreational fishing may be underestimated, impacting the ability to achieve goals for sustainable fishing of stocks with significant recreational catches.

- ii) **Design and evaluation of management measures.** Recreational fisheries are typically managed using size limits (e.g. minimum conservation reference size), bag and/or gear limits. If an end-user needs data to help establish and evaluate the outcome of such measures, recreational fishery surveys would need to be designed to provide the necessary information on the characteristics of the different types of recreational fisheries in a region, the size compositions for retained and released fish, and the numbers of fish retained and released per individual fishing trip. These data are also needed to allow the effects of changes in control measures to be represented where necessary in scientific advice on fishing opportunities.
- iii) **Development and evaluation of management plans/strategies involving recreational fisheries.** The recreational fishery data needed for developing fisheries management plans/strategies, including those addressing environmental and ecosystem objectives (as specified for example in the MSFD), will primarily include the catch

estimates needed for advice on fishing opportunities, and the data needed for developing and evaluating management measures. Where management plans or strategies require knowledge of the social and economic benefits of recreational fishing to communities, alongside the benefits from inshore commercial fisheries exploiting the same stocks, a common methodology is needed for all the fisheries, which will in turn define the types of data that must be collected.

- iv) **Marine spatial planning.** Detailed information on spatial activities of all forms of fishing activities is required to evaluate candidate marine protected areas (MPAs) or any other form of spatial management. The spatio-temporal resolution and types of information required may exceed the possibilities of recreational fishery surveys designed to support advice on fishing opportunities for stocks, if these cover a much larger area than the proposed MPAs. Additional, dedicated smaller-scale surveys at higher resolution and intensity would be required depending on the precision of estimates needed.

### 3. How will these data be used in stock assessment and fishery management advice?

- i) **Advice on fishing opportunities:** Recreational fishery data can be used in different ways in stock assessment and in advice on fisheries management. Catch options for recreational fisheries can be computed if a recreational dataserie is included in an assessment together with series of commercial data. If such a dataserie is not included in the assessment model, recent ratios of recreational to commercial catches may be used as a top-up on the forecasted commercial catch to estimate the total catch, as is done presently with discards in several stocks, both with and without analytical assessment. Currently, data on recreational fishery catches for a longer time period have only been included in ICES stock assessments of salmon and eel. ICES has also included recreational catch estimates from recent surveys of western Baltic cod and of sea bass in the North Sea, Channel, Celtic, and Irish Seas, in analytical assessments (ICES, 2015a, 2015b).
- ii) **Design and evaluation of management measures:** To evaluate the impact of changes in size limits for recreational fisheries, it is necessary to estimate how the fishing mortality-at-age (selection pattern) will be altered, and evaluate the impact of this on forecasts or on long-term yield and stock size. This requires information on the size composition of recreational fishery catches and the proportion released at length, and a means of converting from selection-at-length to selection-at-age. The potential effects of bag limits can be evaluated from existing recreational survey data only if numbers of fish by species retained per fisher trip are recorded for each fisher, taking into account any changes in size limits or fish abundance that affect the numbers that could be retained on each day. These approaches were used recently to develop technical measures for sea bass in ICES Subareas IV and VII.
- iii) **Development and evaluation of management plans/strategies involving recreational fisheries:** The approaches for providing advice on fishing opportunities and designing management measures will be a core part of developing long-term management plans or strategies. An evaluation of the social and economic impacts of the measures and regulations contained within a proposed plan will require comparable data and methods of analysis for commercial and recreational fisheries.
- iv) **Marine spatial planning:** The use of the data will depend on the intended purpose of spatial management measures and will vary on a case-by-case basis. Comprehensive data will be needed that represent the spatial patterns of recreational fishery activities and their impacts.

### 4. What spatial and temporal resolution of data is needed to support fisheries management?

The appropriate spatial and temporal resolution of recreational fishery data collection depends on the intended use of the data. The spatial and temporal resolution of recreational fishery surveys should therefore be agreed on a case-by-case basis. For inclusion in stock assessment, annual estimates of recreational catches are preferable unless they are so small that imputations for missing survey years have only a small effect on the quality of assessment results and advice. In terms

of spatial coverage, all recreational fisheries (e.g. rod-and-line, handlines, gillnets, pots, spearfishing, hand-picking by scuba divers) of importance for quantifying total recreational removals of the stocks concerned should be included.

### Additional information

ICES notes that recreational fisheries could be considered as a component of small-scale inshore fisheries which involve large numbers of commercial fishing vessels under 10 m fishing full time or part time. In many areas such as the Mediterranean these commercial vessels are diffusely distributed and poorly monitored. In addition, an extensive recreational shore-fishing activity takes place in many areas as well. Recreational boat fisheries may operate in similar ways to small-scale commercial fisheries, fishing in similar areas and targeting similar species assemblages, often using similar fishing methods such as rod-and-line, handlines, longlines, nets, pots, spearfishing, and hand-picking by scuba divers. In some areas, recreational fishery catches of charter and private boats may be comparable to those of small-scale commercial fishing vessels for many inshore species, and the same data collection methods may apply to commercial vessels and angling charter boats where complete or almost complete lists of vessels are available and can be used for selecting vessels to sample. ICES advice for regions with large inshore recreational and commercial small-scale fisheries could be improved, where appropriate, through a coherent, regionally coordinated approach to data collection from inshore fisheries as a whole, covering commercial and recreational fisheries.

National recreational fishery surveys, and similar types of surveys needed for some small-scale inshore commercial fisheries, can be of comparable cost to other forms of fishery data collection such as research vessel surveys, port sampling, and at-sea estimation of discards and catch composition. There is a need for analytical methods to evaluate the relationships between the cost of data collection, the precision of estimates, and the contribution of each dataset to the precision of assessments and advice, allowing funds to be allocated to data collection schemes in the most cost-effective way.

Regional cooperation on recreational surveys between nations is needed as any estimates need to be comparable and of appropriate quality. This could also lead to improvements in cost-effectiveness.

Robust methods are needed for including recreational fishery catch estimates in analytical or non-analytical assessments and associated advice when there are relatively few years with estimates, and/or where the estimates are only available at intervals of two or more years. These methods should be developed by an appropriate scientific working group or through a commissioned project.

Release rates can be high in European marine recreational fisheries, and there is a need for studies on post-release mortality to allow estimation of total removals (Ferter *et al.*, 2013).

### Sources and references

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