

Workshop on Small-Scale Fisheries

**Kavala, Greece
12th -16th September 2005**

Table of contents

Agenda	3
Background documents	5
List of participants	6
Introduction.....	7
Key note speaker.....	7
Terms of Reference.....	9
ToR 1:	9
Cyprus	9
Estonia.....	10
Finland	10
France.....	11
Germany.....	12
Greece	12
Ireland	13
Italy	13
Malta	14
Portugal.....	16
Sweden.....	16
ToR 2:	18
Definition of Small Scale Fisheries	18
Data Collection Strategy	18
ToR 3:	19
Estimation of effort of polyvalent vessels (per gear and per vessel)	19
ToR 4:	19
Note on Recreational Fisheries	20
ToR 5:	20
A\ Sampling approach.....	20
B\ Census approach.....	21
Annex 1.....	22

Agenda

Monday 12 September 2005

Monday morning: ONLY FOR MEDITERRANEAN COUNTRIES

9:00-11:00 Fleet based approach for the Mediterranean Small Scale Fisheries according to the conclusions of the last Mediterranean coordination meeting of Athens.

11:00-11:30 Coffee Break

11:30-13:30 Follow up

13:30-15:00 Lunch

15:00-16:30 Opening of the general meeting

1. Adoption of the agenda and arrangements of the session
2. Invited key speaker presentation

16:30-17:00 Coffee Break

17:00-18:30 **ToR 1.** Brief presentation of the inventory of small scale fisheries by country, with an explanation on the criteria used for establishing segments. Review of biological and economic data availability.

Tuesday 13 September 2005

9:00-11:00 **ToR 2.** Discuss standard criteria, at regional level, for aggregating segments into fisheries and fleets based on the recommendations from the Workshop on Fleet Segmentation (Nantes, May 2005). Propose regional adaptations for identified fleets, whenever needed. (could be done by regional subgroup if necessary).

11:00-11:30 Coffee Break

11:30-13:30 **ToR 2.** Follow up

13:30-15:00 Lunch

15:00-16:30 **ToR 3.** Discuss the aggregation of effort and catches data. Review reliability of current series on effort and catches data.

16:30-17:00 Coffee Break

17:00-18:00 **ToR 3** Follow up

18:00-18:30 Conclusions. Report on the issues discussed during the day

Wednesday 14 September 2005

2 Sub groups: A : ToR 4; B : ToR 5

ToR 4 : Review current sampling strategies/approaches for identified fleets. Collection of landings and effort data through random sampling approach via interview/questionnaire if exhaustive data do not exist - primary landings and effort information. Effort definitions for passive gears

ToR 5 : Define the appropriate standard methods to establish sampling protocols for all the fishery data requested by the DCR (e.i. landings, discards, the length/age composition, etc.) and propose the relevant raising procedures (which minimise the bias and maximise the precision of estimates).

9:00-11:00 Sub group A and sub group B meetings

11:00-11:30 Coffee Break

11:30-13:30 Follow up Sub group A and B meetings

13:30-15:00 Lunch

15:00-16:30 Follow up sub group A and B meetings

16:30-17:00 Coffee Break

17:00-18:00 General meeting

18:00-18:30 Conclusions. Report on the issues discussed during the day

Thursday 15 September 2005

9:00-11:00 Follow up Sub group A and sub group B meetings

11:00-11:30 Coffee Break

11:30-13:30 Follow up Sub group A and sub group B meetings

13:30-15:00 Lunch

15:00-16:30 Break to give time for reporters to prepare report on ToR 4 and ToR 5
Preparation of the 1st draft of the Workshop report

16:30-17:00 Coffee Break

17:00-18:30 Review of the 1st draft of the Workshop report

Friday 16 September 2005

10:00-11:00 Review of the 2nd draft of the Workshop report

11:00-11:30 Coffee Break

11:30-13:30 Follow up of the review

14:00 Adoption of the report, end of the meeting

NOTES:

- Monday morning the session will be dedicated to the issues related exclusively to the Mediterranean small scale fisheries according to the conclusions of the Mediterranean Coordination meeting held in Athens last June. The General meeting on Small Scale Fisheries will start at 15:00 after lunch.
- For further information please contact Ms Maria Tzotzou secretary of the fishery Research Institute.

Background documents

▶ Commission Staff Working Paper: Report of the Ad Hoc Meeting of independent experts on Fleet-Fishery based sampling. Nantes, France, 23-27 May 2005.

http://datacollection.jrc.it/documents/nantes/FLEETSEG05_final.pdf

▶ Scientific, Technical and Economic Committee for Fisheries, Subgroup on Economic data (SGECA), Brussels, Belgium, 4–8 October 2004.

<http://stecf.jrc.cec.eu.int/meetings/sgecaoctober2004/report.pdf>

▶ ICES Study Group on the Development of a Fisheries Forecast. Oostende, Belgium, 27-30 January 2004.

<http://www.ices.dk/reports/ACFM/2004/SGDFF/SGDFF04.pdf>

▶ Case study on the definition of operational units.

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Introduction

The workshop on Small-Scale Fisheries took place in Kavala, Greece, from the 12th until the 16th of September 2005. Representatives of 12 countries attended the meeting. Prior to the workshop a discussion was held on “Fleet based approach for the Mediterranean Small Scale Fisheries according to the conclusions of the last Mediterranean coordination meeting in Athens”.

The opening of the general meeting started with the election of Ms. Alicia Mosteiro Cabanelas as chairwoman and the adoption of the Agenda. The Terms of Reference were introduced and the key note speaker was invited to present his comments on the Small Scale Fisheries in Europe.

Key note speaker – Patrick Berthou

Some initial comments about Small-Scale Fisheries (SSF) in Europe

The first part of the document points out the context of the SSF in Europe. First of all, the different commitments at international or national levels which will be following by management measures (gear restrictions, temporal and spatial closures, effort reduction measures) affecting also the SSF. Moreover two elements can give advantage in the future to small-scale and static fishing equipment fisheries: the persistent rise in oil prices, affecting the costs of fishing and will likely modify the fishing strategies as well as the suppression of subsidies. This context supposes an improvement of the knowledge of this fishing sector and the marine resources called in parallel by the EU Data Collection Regulations.

Following some considerations about the difficulty to formulate a universally applicable definition for the small-scale fisheries, a presentation of the SSF at the level of EU 15 is proposed using the Fishing Fleet Register available of the DG Fish website. The basic indicators of the mean parameters of fishing vessel length (9.4 m) and nominal engine power (82.9 kW) point out the importance of the small-scale sector in the EU 15 fleet. With the exception of the Netherlands and Belgium, the mean vessel’s length is between 7 and 12 meters in all the MS. Even the South part of Europe concentrates the majority of EU15 fishing vessels, no tendency is observed in terms of average parameters or fleet structure. An implicit definition of the small-scale fisheries at the European level proceeds from the way the European Commission is collecting information on the vessel’s activity and catches; the under than 10 meters (74% of the EU15 fleet) fishing vessels shall be exempt from the logbook requirement. Furthermore, considering the inshore character of the fishing activity, and using the French Atlantic and Mediterranean fleets cases, it is possible to suggest more precise technical criterion of the inshore fleet at least 12 m (**81 %** of the EU 15 whole fleet) and even 15m (**87%**).

Some arguments commonly used in order to avoid the follow up of the coastal fleets are then discussed from the French case: degree of inactivity, employment, earnings. It clearly appears that it would be not reasonable at EU level to ignore at least the more than 7 meters sub-fleet.

After a description of the nature of the fishing activity of the small-scale vessels, mainly but not only involved in passive gears, a **common segmentation of the SSF** EU 15 fleet, by

Member State is proposed using the two gears described in the 2005 Community FFR by Member State, according with the recommendations of the STECF sub-group on fleet segmentation, Nantes, May 2005. With 59526 vessels, the “**passive fleets**” represent **89 %** of the total less than 12 m EU15 fleet; 63 % of these vessels are under than 7 meters long and 13 % between 9 and 12m. With only 7237 vessels, the “**active fleets**” represent **11%** of the total under 12 m EU15 fleet. They are comparatively more powerful than the “passive fleets” and therefore cannot be ignored: about 44% of these vessels are between 9 and 12 meters. Despite the rough quality of the gear data in the FFR, these segmentations give evidence of the usefulness of the gear data at European level for a first quite detailed and homogeneous description of the European small-scale fleet.

Available data at EU level allows only to have a rough idea of SSF in term of fleet structure but are clearly insufficient in order to manage this Sub fleet. Ifremer has developed a multidisciplinary and statistic approach in order to collect more precise data at individual level and national scale: fishing activities, effort and landings data, economic and biological data.

This methodology is described in the last section. The first stage is a follow up of the SSF based on a complete information about the whole fleet (FFR, EU and national licences and ownership) and on the elaboration of an annual fishing activity calendar for each FFR’s vessel (which can be obtained by census or by stratified sampling, using for example the above primary common typology). These information allows to built various typologies as a base for setting sampling plans (fleet and fishing activity based approaches). Others proposals are done concerning the implementation of a common fishing form for the upper than 7 meters long vessel, as well as the interest of improving fishermen volunteers approaches to obtain the pertinent data. The annual fishing activity calendar is a powerful and little costly mean in order to organise sampling plans and allows adequate extrapolations of the sampled data in the context of SSF.

Terms of Reference

TOR 1: Brief presentation of the inventory of small scale fisheries by country, with an explanation on the criteria used for establishing segments. Review of biological and economic data availability.

Cyprus

General Information

Small Scale Fishery in Cyprus is practiced with boats 6 to 12 m. long, operating in coastal waters with mixed passive gears. The main gears used are the bottom static nets (gillnets and trammel nets), but also bottom static longlines, traps, and handlines are used. The Inshore boats are by far the largest segment in the Cyprus fleet, comprising more than 90% of the licensed fishing vessels and about 92% of all vessels registered in the national FVR.

According to Cyprus Fisheries Law, a limited number of 500 licenses is given each year for the small scale fishery; applications for fishing licenses are made every year, accompanied with sales notes. Logbooks are obligatory for boats over than 10m., and production reports are provided to a 10% sample of boats $\leq 10m.$. Therefore, the DFMR collects the production from about a 20% of the inshore vessels.

Cyprus Small Scale Fishing Activities

Five fishing activities have been identified for the Cyprus Inshore Fleet, based on gear*target (group of) species*period of the year.

Based on the recommendations from the Workshop on Fleet-Fishery based sampling, modified for Cyprus, the suggested Gear- and Length- based Segmentations for the Cyprus Inshore Fleet are given in Tables 1 and 2 respectively:

Table 1. Gear- based segmentation of Cyprus Inshore Fleet and no. of vessels involved.

<i>Fleet</i>	<i>No. of vessels involved</i>
Exclusive bottom set long liners	~ 30
Vessels using exclusively traps	~15
Non-exclusive netters	~ 450
Inactive	322

Table 2. Length-based segmentation of Cyprus Inshore Fleet and no. of vessels involved.

<i>Fleet</i>	<i>No. of vessels involved</i>
< 10m.	~ 450 licensed
[10-12[m.	~ 50 licensed

Biological and Economic Data Availability

Biological and economic data of the Cyprus capture fisheries are being collected by the DFMR for years, either systematically or at irregular intervals. A number of practices are used for the collection of data: production reports, sales notes, biological sampling, the national FVR, applications for fishing licenses and interviews (on a sample basis, or by census).

Since the Data Collection Regulation is being applied by Cyprus for the first time in 2005, not all required data concerning the DCR are available. Regarding the biological data required by the DCR, the collection of *Landings* and *Biological parameters* (age, length, weight and maturity data) for five demersal species is in progress. As regards the economic data required by the DCR, data on *Fleet technical characteristics* and *Employment* are available, while data on *Effort*, *Fuel consumption* and *Prices* of species landed are being collected. Further required economic data are to be collected with a questionnaire method, prepared by the DFMR in cooperation with the Statistical Service of Cyprus.

Estonia

885 of 1044 vessels registered in Estonian Fishing Fleet Register are shorter than 12 m (2005), being in numbers the largest segment of Estonian fisheries. Therefore small-scale fisheries are very important part in socio-economic terms, even though the share of landings is limited: 12.5 % of total landings (10 455 metric tons according to the official catch statistics; total value of the catch 2.04 mil. Euro) in 2004. The segment is very heterogeneous, catching various species, the most important being herring, perch, pikeperch, flounder, eel, sea trout, roach, ide, garfish and salmon, Baltic herring being the most important species by total value of landings. Gears used in Estonian small-scale fisheries are trapnets (incl. fyke nets and pound nets), gillnets, longlines and seines. There were 1641 coastal commercial fishermen registered in 2004. Most of the coastal fishermen are part-timers, receiving only minor part of their income from fishery. Fishermen are obliged to keep logbooks, where the data about the number of gears, number of fishing days with a particular type of gear per fishing area and quantity of catches per species are provided. Data about landings and first buyer prices are collected from sales notes. Information about the vessels is based on National Fishing Fleet Register. For economic data collection the data from statistical office and questionnaires are used. Biological data are obtained by sampling and also by fisheries independent surveys.

Finland

In Finland the small scale fisheries are considered as commercial fishing of vessels under 12 meter. The fishery of that segment is typically conducted with passive gears, such as gillnets and trap nets. Most of the fishermen of that segment are part time or occasional professionals. The catch of the segment consists often of freshwater species that have a relatively value. The share of the catch of that segment is about 10 % of the total catch volume in Finland.

The number of vessels <12 m is 3000, i.e. about 90 % of the total number of registered vessels in Finland. However, most of the vessels of <12 m are inactive, and typically, one fisherman has several small registered fishing boats.

The catch, effort and landings data of vessels <10 m are collected with coastal fishery reports on a monthly basis. The coastal fishery reports basically create a census data. The economic data of vessels <12m (the same applies to other segments too) are compiled by merging catch-landings-vessels data with financial statements collected by Statistics Finland. The target population of economic data collection consists of operational fishing units. They are defined as units with annual turnover/catch value of at least € 9 134.

France

Based on the 2004 official fleet register, there are 4062 vessels less than 12 meters in the French fleet out of a total of 5415 vessels. The so called “small scale” vessels represent then 75% of the total fleet and their contribution to the national fishing fleet is high whatever the region concerned. 87% of the French Mediterranean fleet is composed with vessels less than 12 meters, but also to 70% of the French North Sea – Atlantic fleet. Since the beginning of the 90’s, the number of less than 12 meters vessels in the French fleet have decreased by 40%, through the decommissioning plans.

The contribution of small scale vessels to the total earnings generated by the fishing fleet has been assessed for the Atlantic coast and amounts 35% in the recent period. Most of the vessels practice passive gears: this activity concerns a large majority of vessels in the Mediterranean coast and around 50% of the small scale vessels for the Atlantic coast with a large proportion of netters. The segmentation of the fleet is based on the combination of métiers practiced by a vessel during a given year.

Source of data for the knowledge of this fleet in France are diverse:

- Administrative and official data, particularly the National official fleet register, allows identifying the vessels which belong to the category of small scale fleets and their characteristics (geographical distribution, technical features). Some official fishing forms exist to collect information on their catches and fishing effort but this information is unfortunately non exhaustive.
- Ifremer Observatory system for fisheries
 - Activity data: since 2000, Ifremer has implemented an annual census in the fishing sector to collect the activity calendar of each vessel belonging to the National official fleet register. This activity calendar is a registration of all the métiers (combination of gear, target species and fishing areas) practiced by a vessel during a month and for each month of a given year.
 - Economic data: the small scale vessels are a significant part of the Ifremer sample for the collection of economic data by questionnaires (75% of the total sample which is in line with the average contribution of small scale fleet to the French fleet).

Germany

Based on the data for 2004 (31 Dec 2004) there are 1659 vessels less or equal 10m in length out of a total of 2163 vessels in the German fishing fleet, which accounts for 77 %. The majority of these vessels (94 %) operate locally in the Baltic, the remaining in the North Sea. This Small Scale Coastal fleet contributes for 2.7 % (7,000 t) of the total German catches and 3.4 % (6 Mio. €) of the earnings resulting in an average per vessel of about 4 t or 3600 € per year (ranging from 0 to 100,000 €, 1450 vessels with less than 10,000 €). About 95 % of the Baltic \leq 10 m vessel segment uses mainly gillnets. Depending on season and location only some apply traps, longlines and towed gears in addition.

Focused on the Baltic, the main target species are herring and cod (63 and 15 %, respectively, in terms of catch, and 28 % and 24 %, respectively, in terms of earnings), followed by flatfish species, eel and several non quoted brackish water adapted whitefish species. This Baltic fleet segment has a share of 20 % on the herring and 15 % on the cod Baltic landings. The German Baltic quotas for this species are still not fully used, less than 85 % for cod and 90 % for herring.

Source of data is the European Fleet Register where all netters, including part-time and recreational fishery, have to be registered. All registered vessels are obliged to report items such as landings by volume and value per area and species. High selectivity in size of passive gears results in a low share of discards ($<$ 5 %). Seasonal and regional concentration of fish stocks targeted and closed areas and seasons reduce the by-catch. Additionally, in the case of herring pure and homogenous herring catches in terms of fish size are premium paid by the local fish processors.

Landing declarations have neither an entry for effort figures nor an entry for the gear used. Information on these parameters are subject of a pilot study, based on a questionnaire, on the economics of the small vessel fleet. Unfortunately, the return rate was less than 20 %. Hence, legislation is under way to get exhaustive access to all data requested in the regulation.

Greece

The small scale fishery in Greece is operated by vessels $<$ 12 m using passive gears (nets, hooks, pots & traps) as well as by polyvalent vessels that use passive and active gears (i.e. beach seines). However, there is a number of boats using passive gears that belongs in to the 12-24 m fleet segment but they follow the same fishing practices as the small vessels.

Over than 16000 boats of small scale fishery (passive gears, beach seiners $<$ 12 m and 12-24 m) are spread all over the extended Greek coasts and the islands. These vessels target a mixed group of 95 species and they have more than one fishing license (more than 2 gears per vessel). The use of 2 or more fishing gears during the same fishing trip is also very common practice for these vessels.

The vessels of small scale fishery are about 84% of the total Greek fishing fleet. The most of these vessels are not monitored even by the Statistical Service The Production of these vessels is about 50% of the total Greek landings

Fleet segmentation by gear type and vessel size of the Greek fleet (2004) _

		Length category			Total
		<12 m	12-24 m	24-40 m	
Mobile gears	Trawlers	1	88	131	220
	Purse Seine	7	294	21	322
	Polyvalent		76	47	123
Passive gears	Hooks		70		17657
	Static Nets	17230	357		
	Traps				
Polyvalent gears	Beach Seine	353	53		406
Total		17591	938	199	18728

Ireland

The Irish fleet register currently contains 1,510 vessels under 12 m in length; these are divided between boats which have a polyvalent licence (797, 47%) and those which have a potting only entitlement (797, 53%). Polyvalent vessels also operate pots and traps but a minority use trawls (for whitefish and *Nephrops*), dredges [specialist (for scallop), box (for clams), suction (for cockles) and hydraulic (for clams)] in addition to nets (bottom set gill net, tangle net for flat fish and crawfish). There is some, but very little, long lining or commercial trolling and jigging. The pots and traps which the majority of vessels in both categories employ are for shrimp, whelk (*Buccinum undatum*) and large crustaceans. Soft eye pots bring ashore the heaviest landings of brown crab (*Cancer pagurus*), lobster (*Homarus gammarus*) and velvet crab (*Necora puber*); spider crab (*Maja brachydactyla*) is also vulnerable to soft eye pots although, where targeted, they are fished with inkwell traps. The simultaneous use of several types of pots is not uncommon; otherwise the use on the same day of two or more of the gear types listed is an unusual occurrence.

Italy

The small-scale segment includes vessels using passive gears, mainly fixed nets, and are less than 12 metres in length. In terms of capacity the small-scale segment makes up only 8% of the national GT, but covers 60% of fishing boats in number and 61% of the total days at sea. The average size of these vessels is 1.7 GT and 25 kW, while the average size of national fleet is 14 GT and 81 kW. Small scale vessels are older than other segments of the fleet, 29 years on average.

The small-scale fisheries segment accounts for about 17% of the national catch and for 25% of national value of landings. The difference between the above two figures depends on the target of small-scale gear which is mostly high value species.

The vessel owner usually undertakes fishing with an additional person. The number of fishermen in 2004 was 15.258, which is the highest level employment by fleet segments.

The small scale fishery shows low capital intensity and it is highly affected by climate conditions, market fluctuations by the interaction with trawlers fishing the same species, often in the same grounds, which substantially reduce the availability of fish.

The small scale segment is mainly composed by “multi-purpose” vessels (seasonally varying target species, fishing practices, etc.). The number of fishing activities (gear*fishing area*species) employed by these vessels by area and by season is relatively high (more than 350).

Data collection (landings and effort) and estimates of economic parameters concerning the Italian small scale fishery is produced through a National Observatory. The survey is based on a unique panel. Around 400 vessels of the small scale segment are monitored each week and elementary data are later expanded to the universe (the whole Italian fleet) using statistical sampling procedures.

Malta

Maltese fisheries are of a typically Mediterranean artisanal type which are not species selective and are frequently described as multi-species and multi-gear fisheries, with fishermen switching from one gear to another several times throughout the year.

Fleet:

In Malta, vessels under 10m in length are considered as small-scale vessels and account for 92% of the total fishing fleet (2252 in total). The majority of the small-scale fleet are of two traditional types of vessel: the *Luzzu* and the *Kajjik* (1192 units) being the average boat of 5.7 m LOA, 1.7 GT and 51.3 kW.

Gears:

Out of the registered 2,074 small-scale fishing vessels, more than 60% either use trammel nets or bottom-set longlines as their main fishing gear. Almost 15% use hand trolling lines and more than 8% use traps. The actual number of operational vessels each month was about 1,119 or 54%. The number of vessels that go out fishing every day was much less and during the 9 months sampling period, only about 18% of the activity for each given day was observed. Trammel nets, longlines, traps and trolling lines are the main gears in terms of estimated annual landings, being the two first the ones with a highest variety of species caught. Trammel nets and other artisanal demersal gears account for about 3 percent of the annual landings whilst minor pelagic gears account for over 4 percent of the annual landings.

Landings:

Total annual landings (all fleet) recorded at the central fish market are normally in the region of 1,000 tones. About 65% of this weight is made up of large pelagic species caught by larger vessels. Landings by the small-scale fleet only amount to a third of total landings. However,

the variety and quality of valuable species landed by this category makes a significant contribution to the Maltese fishing industry.

Effort:

The effort is calculated using the number of hours spent fishing (or in the water). The trammel nets and longlines have the highest effort (and catches) but the traps and trolling lines show a higher efficiency (catches/effort). The spatial distribution of fishing effort of the small scale fishing fleet was highly concentrated within the area of the main ports and in waters less than 200m deep, (i.e. on the shelf), and in coastal areas up to 12 nautical miles (territorial waters).

Monitoring system:

The fleet is divided into two segments: vessels over 10 m and less than 10m. A sampling approach is used in the first segment (segmented by gear) and the Logbook approach in the second (segmented by species). The Maltese fishing fleet register is divided into 3 categories: MFA (full time), MFB (part time) and MFC (recreational). The majority (46%) of the small-scale fishing units fall under the part-time category.

Malta monitors the activity of the small-scale fishing fleet through the Catch Assessment Survey, which includes a database and processing system in which the segmentation is determined by size of fishing vessel (<10m) and by the type of gear used. A number of ports are sampled every month through a well established sampling frame and the time and area raising factors are calculated using the daily catch per boat, the total catch in the port per day and month and, the number of registered active vessels. The system produces statistical reports on monthly landings and effort estimates by stratum (island) and gear class used.

The economic situation:

A clear picture of the economic situation of the fisheries sector in Malta has not yet been obtained. Its importance to the economy is often underestimated. The social and cultural importance of the Maltese fishing industry far outweighs its negligible economic contribution which is equivalent to about 0.16 percent of the national Gross Domestic Product. The livelihood of most of the local fishermen depends on the sale of highly prized species which are available to the consumer as fresh fish of highest quality caught by traditional artisanal methods during very short fishing trips. The proportion of the working population depending, to varying extents, on this industry for its livelihood, is around 1.3 percent.

A pilot survey for the economic situation of the sector is to be carried out in accordance with the minimum programme requirements. The task is to develop a sampling plan in order to achieve the possibility to estimate population requested parameters. The sampling frame can be based on the vessel register recorded in MALTASTAT and on logbooks' information from catch and landings evaluation.

The recreational fishing fleet:

The recreational fishing sector in Malta could be divided into two classes. The major one comprises vessels (total 826 vessels) which are registered in the national fishing fleet register and are classified as non-commercial "Category C" vessels. According to national legislation this category cannot practice any professional type of fishing operation and can only use only minor fishing gear listed in the fishing gear regulations. A fishing licence is issued to each vessel in "Category C" as in the case of professional vessels. The second class of vessels engaged in recreational fishing are only registered in the National Maritime Register and owners can only use sport fishing gear for which licenses are not required.

The fisheries sector is assessed in terms of its overall economic, social and ecological performance.

Portugal

The Portuguese Fleet was compound at 31 December 2004 by 10.089 vessels. From these, 9.180 are vessels with an overall length (LOA) less than 12 m, which are Portugal's universe of Small Scale Fisheries.

A typical vessel from this segment has about 6 m LOA, 18 kW engine power, a gross tonnage of 1,2 GT, a hull type of wood, an outboard engine and a crew of two fishermen.

The fishing licenses must be annually renovated. The number of gears per vessel is unlimited but the majority has about 3 or 4 gears. Thus the fleet is mostly a multi-gear fleet with a fishing activity that can combine passive and mobile gears. Nevertheless 84% of the vessels belong to the polyvalent passive gears segment.

In order to obtain the DCR parameters Portugal developed a stratified random sample survey. Geographical and fishing techniques strata are considered and data is collected by an interview made every fortnight. For each fortnight sample 150 vessels are randomly selected from the licensed universe.

Two years of experience have confirmed the complexity of this activity and the high variability of the population. This causes lack of accuracy in the first estimates. However the gain of knowledge is considerable and it is essential for the development of the future work

Sweden

Swedish coastal fishery with small vessels in the Baltic Sea is a mixed fishery on a variety of both marine and freshwater species. Target species varies depending on time of year and coastal areas. Catches along the Swedish west coast (Kattegat and Skagerrak) are exclusively marine species while the catches along the Swedish east coast in the brackish Baltic Sea include several freshwater species. Main species are cod, herring, turbot, flounder, salmon and eel. Important freshwater/brackish species are whitefish, vendace, zander, perch and pike. Several of these species appear in local, genetically differentiated, stocks, which have to be managed stock-specific. The fishery is mostly conducted with passive gears (gillnets, fyke nets, pound nets, and trap nets), but small-scale trawl fisheries are also conducted.

Biological and economic data on the Swedish small-scale fisheries are available from both official documentation, scientific sampling programs and from inquires to the public or individual fishermen. The data sources include:

1. Vessel register for licensed and part-time fishermen
2. Daily logbooks on catches and effort, provided by licensed fishermen.
2. Monthly coastal journals on catches and effort, provided by fishermen using fishing vessels that are between 5 to 10 m long.
3. Sales notes which specify quantities and prices of sold fish. All sales above 10 kg are registered.
4. Biological and discard sampling by fishery scientist
5. Data register and sampling by voluntary logbooks from representative fisheries.
6. Inquires to the public on non-commercial fisheries (recreational, household)

In addition to these data sources, fishery independent surveys are conducted annually along the Swedish coast. These data sources are compiled and crosschecked by the Swedish Board of Fisheries.

The Swedish small-scale fishery has until recently not been classified by vessels size and gear type alone, but rather by type of fishing activity. Fishing trips up to 24 h is considered to be performed by local (i.e. small-scale) fisheries. These local fisheries are characterized by the use of diverse fishing gears and to catch several different species. Target species varies due to local and regional variation as well as to season. Small-scale fisheries, according to this definition, landed around 5% of the total landed quantity in Sweden in 2000. The landings represented 21% of the total economic value of the Swedish fishery. .

Six fisheries/metiers are defined along the coast of the Baltic, and six fisheries/metiers are defined along the Swedish west coast (Kattegat and Skagerrak).

1. Fishing with salmon and whitefish traps in the Bay of Bothnia.
2. Gillnet fishery for herring and whitefish in the Gulf of Bothnia
3. Trawl fishery for vendace in the Bay of Bothnia
4. Gillnet fishery for cod and turbot in the Baltic Proper
5. Eel fishery in the Baltic Proper
6. Mixed fishery with gillnet and fyke nets in the Gulf of Bothnia and Baltic Proper
7. Yellow eel fishery in the Kattegat and Skagerrak
8. *Nephrops* fishery with cages.
9. Lobster and crab fishery with cages.
10. Small-scale trawl fishery in the Kattegat and Skagerrak
11. Mixed fishery in the Kattegat and Skagerrak
12. Purse seine fishery with light in the Kattegat and Skagerrak

Besides the above 12 different types of fisheries/métiers there are also a small scale trawl fishery for mainly herring and sprat in the Baltic Sea. Due to the size of the vessels, this fishery may be judged as “small-scale” according to the 24 hour rule.

Although the fishing trip approach is convenient to generalize the major fisheries into a biological framework, there is also a demand to harmonize all fishing activities in order to include economic analyses. Therefore, in an *ad hoc* effort all Swedish fisheries have been divided into six separate segments characterized by vessel size and gear type.

1. This segment contains fishing vessels less than 12 m in length, which fish with passive gears (gillnets, fykenets, traps, etc).
2. This segment consists of all shrimp (*Pandalus*) trawlers irrespectively of vessel size.
3. This segment consists of pelagic trawlers operating in both the Baltic and along the Swedish west coast. Major target species are herring and sprat.
4. This segment consists of demersal trawlers. The major target species is cod in the Baltic and *Nephrops* on the west coast.
5. This segment includes fishing vessels above 12 m in length, which fish with passive gears. Major target species is codDCR.
6. This segment includes fishing vessels above 12 m in length, which fish salmon with passive gears.

In 2003 the segments 1 and 5, which comprise fisheries with passive gears, included 935 vessels less than 12m and 40 vessels larger than 12 m in length. These figures represent almost 60% by numbers of the total Swedish fleet. Around 80% of the vessels in segments 1 and 5 fished in the Baltic. Landings of these segments in 2003 have been estimated to 11 kton representing a value of more than 17 million Euro. These sums correspond roughly to 20% the total value and 4% of the total landings in Sweden during 2003. It should be noted that the non-

commercial (recreational and household) landings and value are not included in these estimates. Public inquiries indicate that non-commercial fisheries are significant.

The small-scale fisheries in Sweden are monitored and managed nationally and by international cooperation. Data for these purposes are partly collected within the National Programme for Collection of Fisheries Data (DCR) Table 1 shows an overview of the species that are currently included in the Swedish DCR programme.

Table 1. Sampling of species in Swedish landings by programme and area in 2005.

Minimum Programme		Extended Programme	
Baltic Sea	Skagerrak/Kattegatt	Baltic Sea	Skagerrak/Kattegatt
Cod	Cod	European whitefish	Norway lobster
Flounder	Herring	Perch	
Herring	Norway Lobster	Pike	
Salmon	Pandalid shrimps	Zander	
Sprat	Plaice	Turbot	
Eel	Sprat		
	Eel		

TO R 2: Discussion of standard criteria for aggregating segments into fleets based on the recommendation from the workshop on fleet segmentation (Nantes, May 2005) . Propose regional adaptations for identified fleets, whenever needed.

Definition of Small Scale Fisheries

The group discussed the definition of **small scale fisheries** and concluded that the term should no longer be used in the context of the data collection regulation (DCR) to avoid confusion with the different definitions. Instead the term **fleet segment of vessels <12 m in length** all gears included (active and passive) must be adopted in order to be consistent with previous regulations. The fleet segmentation will be based on the Nantes workshop and can be adapted by each regional group.

Data Collection Strategy

The group identified various obstacles to the collection of data for the fleet segment of vessels less than 12 m and identified the need for specific sampling strategies due to the complexity of the segment. It was concluded that the fleet based approach should be used as far as possible.

With regards to regional adaptations for the identification of fleets, a final matrix was defined for the Mediterranean area but not for the rest of the regions because of lack of regional experts. This will be dealt with in future regional coordination meetings.

ToR 3: Aggregation of effort and catches data. Review of reliability of current series on catch and effort data.

Various problems were identified regarding the reliability of both biological and economic data. The group considered the definition of effort units in the context of EU regulation 1639/2001.

It was agreed that the unit requirements for passive gears appearing in Appendix IX (extended programme) should be upgraded to the minimum mandatory programme. Moreover, the term “time at sea”, referring to passive gears, needs to be changed to “soak time at sea”.

The data contributed (number of hooks, traps, nets, length of net and soaking time) should be forwarded separately, not multiplied as stated in the regulation.

For each parameter it should be stated whether the data has been estimated or observed.

The group considered specific fishing effort by small vessels on endangered species for which Council recovery plans have been put in place. It was concluded that the specific effort data should then be collected.

Estimation of effort of polyvalent vessels (per gear and per vessel)

The group discussed how effort by polyvalent activities should be estimated. It was concluded that for a vessel using several gears on the same day each gear would be assigned one effort day. However one effort day will be attributed to the vessel.

Pilot surveys must be carried out to establish a level of precision in the estimation of effort for both active and passive gears.

ToR 4: Review current sampling strategies for identified fleets. Collection of landings and effort data through random sampling approach via interview/questionnaire if exhaustive data do not exist- primary landings and effort information. Effort for passive gears.

The level of reliability of currently reported landings by member states was discussed. The main problems identified were on one hand, the estimation of unreported and misreported landings, discards for commercial fisheries and on the other hand, catches by recreational fisheries. Concerning unreported / misreported landings the following suggestions were made:

- Pilot studies to estimate their amount (unsigned questionnaires etc.)
- Sample the active vessels and extrapolate to the whole fleet (Over or under estimations due to extrapolation)
- Collection of data *in situ*

- Fisheries independent surveys
- The use of correction factors

Concerning discards the following suggestions were made:

- Give priority firstly to mobile gears and secondly to passive nets
- Seek volunteer fishermen to take measurements (needs to be validated)
- Discard bags
- Give incentive (buy the discards)

Note on Recreational Fisheries

The question of recreational fisheries was further discussed. Where they make up a significant proportion of national landings there was an opinion that such landings should be monitored. Their inclusion within the less than 12 m segment was discussed. This topic will have to be further analyzed addressing the whole fleet.

TOR 5: Definition of a standard method to establish sampling protocols for the data requested by the DCR and propose the relevant raising procedures.

Statistical procedure:

The universe is defined as the European Fishing Fleet register with technical characteristics and geographical area. Additional data should be available: Ownership and all the licenses per vessels or owners.

Sample unit: Vessel

Two approaches can be considered for the collection of data:

Sampling Approach

Census Approach

Sampling approach is the most suitable for the collection of economic and biological data.

A\ Sampling approach

1 - Stratification of the universe through variables known for all the population according to the fleet based approach (Nantes workshop). To better stratify this universe, it is important to have more information for all vessels (gears, métiers, information about activity, fishing area ...) than that available in the fleet register for all vessels.

2 – Define the precision to be achieved (minimum of the EU reg. demanded in the future implementation regulation)

3 - Define sample size based on the precision and the estimated variance of the population

- 4 – Allocate sample to stratum (Neyman Allocation, Bethel Allocation ...).
- 5 – Randomly carry out sampling (Equal probability, Unequal probability ...).
- 6 – Validate the data statistically including the representative character of the sample
- 7 – Post stratify, when necessary
- 8 – Estimate the variables and precision level through analytical or bootstrap methodology.

The general procedure is the same regardless of the variable to be estimated (e.g. Landings and effort data per fleet segment / fishing activity and per stock / species, economic data per fleet). However, initial statistical parameters (CV, estimated variance, etc.) must be defined depending on the variable to be estimated.

The estimates must be cross validated through other data available (sales note, fishing forms, fishing calendar ...) as far as possible, including modeling procedures.

Suggestions

The sample used to obtain biological data can be a sub sample of the sample used to obtain economic data.

In the special case of having a panel it is desirable to rotate the sampled units annually.

The non response must be pursued. The sample unit can be re interviewed or substituted.

B\ Census approach

1 – This approach is used when the whole fleet can be observed. A full description in terms of catches and effort for the whole fleet has to be obtained.

2 – Collection of the data is done through fishing forms.

3 - The collected information has to be validated through cross checking with other data available (sales note, fishing activity calendar, fisheries independent surveys ...) or collate procedures.

Missing values need to be pursued. A suggestion could be to apply the average calculated value on a strata basis. The stratification is based on variables available from the whole fleet (size class, geographical information, income information, gears, métiers, fishing area ...)

In this case, bootstrap methodology and analytical methods can then be used to calculate estimates and precision level.

When missing values are significant, bootstrap methodology is preferable to calculate estimates and precision level (re-evaluation of the data).

Annex 1. Contribution to the terms of reference of the Workshop on Small Scale Fisheries.

A working proposal for the economic and biological data collection of the small scale fisheries

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DRAFT for the workshop on Small Scale Fishery; Kavala, September 12-16th 2005

Introduction

There is general recognition amongst scientists and managers that fisheries management should move from a stock-based to a fishery-based approach, taking into account the technical interactions between fisheries and the linkage between species that are concurrently being exploited by the same fishery(ies).

In order to facilitate the provision of advice on an area and fishery basis, a Workshop was established, under the auspices of the European Commission, for the definition of a fleet and fishery segmentation to be used for the future sampling design of bio-economic data (Nantes May 2005).

The workshop recognised that the provision of advice in a fisheries context rather than on an individual stock basis and the collection of catch data disaggregated by fisheries, by area and age group, is a complex task in the case of small scale vessels.

The complexity of the small scale fisheries, in terms of species and diversity of fishing techniques and practices, together with its economic structure, requires fishermen to be flexible and to adapt quickly to external factors, including management measures.

From a data collection point of view, one crucial point is that the small scale segment is mainly composed by “multi-purpose” vessels (seasonally varying target species, fishing practices, etc.). Therefore, the first step in adopting a fishery-based approach, should be to identify the fishing activities employed by these vessels by area and by season. Obviously, for data collection purpose, the number of fishing activities to consider should be a compromise between precision and cost, which implies that fishing operations may have to be grouped into a limited number of fishing activities.

In order to identify fishing activities, two approaches prevail in the literature and in the experience available in the fisheries institutes. The first one is a quantitative analysis of official and census data, mainly on the composition of catches and/or landings, with the inclusion of information on gear, season and area. Obviously this approach cannot be applied in the case of the small scale segment as census and exhaustive data are not available. The other approach is more *ad hoc*, and is based on qualitative *a priori* knowledge of the fisheries.

The second step is the estimation of effort and production at the level of fishing activities. This picture will allow the definition of the sample design for biological sampling of landings and for discard evaluation.

Two approaches could be suggested to collect basic biological information:

- an activity census of the small scale fleet. This solution seems to be too ambitious and not practicable to apply considering the high number of vessels belonging to the small scale segment and their geographical dispersion
- a sample approach. Starting from a representative sample of the segment, it will be possible to raise age-structured landings sampled by fishing activity to the total landings.

The present note briefly explains the sample approach as it has been applied in Italy so far.

Biological requirements for fishery-based management advice

The input data required by a fishery-based approach, besides the assessment and management parameters from the single-stock assessment, is the catch-at-age by fishing activity¹ and species.

The complete set of biological information should include the following variables:

- Target species by fishery (single species or assemblage of species)
- Catch composition by gear
- Size and age classes affected by a specific fishery
- Seasonality of fishing activities on the resources
- Fishing areas for each fishery
- Catches and effort for each fishery
- Socio – economic information

In the case of the Mediterranean small scale segment all the previous information have been difficult to collect in the for several reasons, in particular:

- “multi-purpose” vessels (with seasonally varying target species, fishing practices, etc.).
- low concentration of landing sites
- commercial behaviour (landings of mixed species, direct selling to restaurants etc, ..)
- difficulties to go on board to collect data
- lack of data sources (e.g. log-books) documenting comprehensively total landings at the scale of the fishing operation
- very high number of vessels (around 10 thousand in Italy)

Economic requirements for fishery-based management advice

From an economic point of view the small scale segment is composed by homogenous vessels. Operative costs and employment structure are marginally effected by the gears effectively used - if we exclude the gear costs (purchase and maintenance).

The economic performance can be assessed for the whole segment and the variability is especially linked to the geographical areas.

The linkage between biological and economic data could be obtained trough a matrix approach², that consists in the splitting of data collected within the cells of the fleet/fishing

¹ Definition of fishing activity: a group of fishing trips targeting the same species, using similar gear, during the same period of the year and/or within the same area (Report of the Ad Hoc Meeting of independent experts on Fleet-Fishery based sampling, Nantes, May 2005).

activity matrix. In the case of the small scale, the “matrix” can work, but effort and production data per fishing activity are estimated through a sampling procedure, as census data are not available.

The BIRDMOD project

In Italy there are currently a number of projects/initiatives with a similar focus on data requirements and mixed fisheries models. In particular, the BIRDOMD project³ is aimed at developing a bio-economic model for the management of demersal species. Although the specific core of this project differs from the general context of data collection, the methodology used in the project can give valuable suggestions for the estimation of parameters of the small scale segment requested by the DCR.

BIRDMOD is a standard bio-economic model which considers several direct and data sources. The economic data are referred to fleet segments as available from the Irepa Observatory, while biological input data are derived from direct surveys and biological sampling of landings from SIBM (Società Italiana di Biologia Marina). In particular, selectivity parameters, which represent one of the main input of the biological part of the model, are referred to the fishing gears.

When considering the small scale fisheries, the lack of information per fishing activity was solved using the sample data derived from the Irepa Observatory, as explained in the following paragraph.

Methodology for the collection of data at the level of fishing activities performed by small vessels

A sampling approach for the collection of data for small scale vessels has been implemented in Italy by the IREPA monitoring system for economic data on the Italian fishery sector. This system is based on three main modules: on fishing effort and activities, on landings and prices by species and on economic data.

The definition⁴ of small scale adopted by the Italian Observatory is as follows: “the small-scale fleet segment is composed of vessels with total length (LOA) of less than 12 m. They are allowed to use only passive gears excluding towed gears of whatever type”.

Monthly catch and effort estimates for the small scale fleet are obtained from data collected from 455 representative vessels which together accommodate 4.4 percent of the national small scale fleet⁵. Surveys take place every week on a continuous basis. Data on catches, fishing effort, vessel activity and fishing area are recorded by gear and species using purposely formulated questionnaires. Results for each area and the entire country, by month, species and gear are obtained by applying raising factors to the sampled data.

In order to apply this methodology a strong hypothesis is required: all small vessels can use whatever fixed gear they prefer, there is no limitation on the licence scheme. This hypothesis is necessary because one sample random of vessels is extracted from the small scale segment

² See Report of the Ad Hoc Meeting of independent experts on Fleet-Fishery based sampling, Nantes, May 2005

³ BIRDMOD, “Supporto metodologico per un modello bio-economico di analisi della popolazione delle risorse demersali” - BIRD MOD”, UO 2, n° 6-A-31. 6th Triennial Plan, MiPAF – Starting date 05/05/2003, Closure date 04/11/2005

⁴ The definition adopted coincides with that provided for in Commission Regulation (EC) No 2091/1998 of 30 September 1998 concerning the segmentation of the Community fishing fleet and fishing effort in relation to the multiannual guidance programmes. This definition is also in line with the provisions of the Commission Regulation (EC) No 1639/2001 of 25 July 2001

⁵ Irepa sample survey for 2004

without any further technical stratification. A stratification per fishing gear is not possible as the universe in terms of actually performed fishery is unknown. In the Italian case, this hypothesis is reasonable and it is made weaker by the geographical stratification into homogenous fishing areas.

Moreover, the inventory of fishing activities by areas is very useful in order to verify if the random sample can be considered as representative of the whole small scale segment.

To summarise, a step by step process is suggested for the collection of bio-economic data for the small scale fishery:

- identification of the small scale fleet segment from the vessel register
- inventory of the fishing activities performed by the segment, for each season and for each area (in the Italian case, GFCM Geographical Sub Areas are considered)
- extraction of a random sample from the segment
- analysis of the representativeness of the sample compared to the whole segment (CV analysis, t-test to verify whether the mean of the sample is the same as the population mean, comparison with the inventory of the fishing activities,...)
- collection of elementary data on sample vessels through a questionnaire
- application of raising factors to obtain final estimates (catch and effort data per fishing activity and area)

Conclusions

The proposed methodology is based on the experience gained from a specific research project and it has been considered suitable to accommodate the Italian structure of the small scale fishery.

Of course, it has several limitations and it is based on some hypothesis of that oversimplifies the reality. Anyhow the sample procedure seems to be preferable to some kind of census approaches because of the cost-effectiveness relationship.⁶

Moreover, the proposed method allows to calculate the reliability of the estimates through analytical models.

Small scale fisheries cover a wide range of fishing operations which sometimes are restricted to small areas or small periods (for instance some special fisheries subject to specific management derogation). A sample approach could not be able to represent all these specific cases, but, whenever necessary, some analytical studies could be carried out.

References

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⁶ In Italy, small scale vessels represent $\frac{3}{4}$ of the total fleet in terms of number of vessels, but only $\frac{1}{4}$ of the production