

**GENERAL FISHERIES COMMISSION FOR THE MEDITERRANEAN
SCIENTIFIC ADVISORY COMMITTEE
SUB-COMMITTEE ON STATISTICS AND INFORMATION
WORKING GROUP ON OPERATIONAL UNITS**

Ancona (Italy) 18th-19th April 2001

Background to the meeting

A Working Group meeting of the Scientific Advisory Committee took place at the ICM in Barcelona, Spain between 25-27 January 2000, where the following definition of an Operational Unit was proposed:

“For the sake of managing fishing effort within a Management Unit, an Operational Unit is the group of fishing vessels practising the same type of fishing operation, targeting the same species or group of species and presenting a similar economic structure. The grouping of fishing vessels should not be understood as fixed over time but be function of the management objectives to be reached”

This definition was broadly discussed during the Sub-Committees’ meeting in Madrid in April 2000.

The report of the 25th GFCM Session (Sliema, Malta, 12-15 September 2000) stated in paragraph 52 that:

“1. After consideration of the recommendations made by SAC, the Commission adopted the following recommendations.

Statistics and Information

That a multidisciplinary Working Group, under the responsibility of SCSI should be brought together to design and compile an inventory of Operational Units as well as to define the data structure and fishing effort parameters. This working group would, in the first instance, meet under the framework of the ADRIAMED project and focus on the Adriatic region.”

The meeting

1. The meeting was held between 18-19 April 2001 in Ancona, Italy, hosted by IRPEM and co-organised by the ADRIAMED project. The meeting was attended by 25 participants which included delegates and experts from nine countries (Annex I). The Coordinator of the Sub-Committee on Statistics and Information (SCSI), Prof Dino Levi opened the meeting and invited the Director of IRPEM, Antonio Artegiani to deliver an introductory speech. Prof Levi was then unanimously elected as Chairman

of the meeting and Piero Mannini and Matthew Camilleri were nominated Rapporteurs.

2. The tentative Agenda proposed to the Working Group was adopted with no changes (Annex II).
3. The Chairman went on to set the scene for the meeting and pointed out that there are two position papers (Annex III and IV) on the subject in question:
 - Invitation and background information
 - Operational Units; a preliminary approach.
4. He explained that provisional geographical limits for Management Units in the Mediterranean were identified during a meeting in Alicante in January 2001, and that now this meeting would focus on the identification of Operational Units within these Management Units. He stated that the identification of Operational Units, which encompass the resources and the exploiters, is essential for the multidisciplinary management of fisheries. In this respect, the type and quality of data which should be collected must be discussed by the Working Group.
5. The Chairman invited the participants to avoid discussing the Operational Units definition as much as possible and to adhere to the definition previously proposed by the Scientific Advisory Committee (SAC) Sub-Committees. However, a few grammatical amendments were made to the definition and will now read as follows:

“For the sake of managing fishing effort within a Management Unit, an Operational Unit is the group of fishing vessels practising the same type of fishing operation, targeting the same species or group of species and having a similar economic structure. The grouping of fishing vessels may be subject to change over time and depends on the management objectives to be reached”

This definition is being proposed to the SAC for adoption.

6. The President of the SAC, Juan Antonio Caminas, then gave an overview of the proceedings of the meeting on Management Units. He explained that the map produced with the provisional limits of the Management Units was based on limits of national jurisdiction, continental shelf geography and scientific papers presented by a number of participants. He also explained that waters surrounding Islands were considered as independent Management Units and that provisional limits for Management Units, which pertained to countries which did not participate in the meeting, were also included. He pointed out that the proposed Management Units were given a reference number and a name. It was agreed that the provisional Management Units would be adopted by the Working Group during the meeting.
7. The Chairman later requested the participants' agreement on the following statement “The need to define Operational Units originates from the fact that stock assessment deals, by definition, with stocks, whose management in turn deals with fishing

(vessels and/or fishermen). In this respect, one should therefore focus on unifying the object to be analysed. Naturally, once “the object is unified”, scientists from different disciplines would be expected to view it from different angles and analyse it with different tools”.

8. The Chairman then invited Matthew Camilleri to present the paper on the preliminary study carried out on Operational Units which was financed by COPEMED and originally presented to the SAC in April 2000. It was made clear that this paper only attempted to compile useful data from various sources and present them in such a way as to be able to identify Operational Units. The paper also highlighted some aspects of the nature of Mediterranean fisheries and associated resources, by making reference to various regions, which may create problems when identifying Operational Units.
9. The importance of Operational Units for managing fishing effort was addressed and it was agreed that Operational Units would be subject to change over time. It was also highlighted that this inherent complexity needs to be simplified if Operational Units were to be used as a useful tool for fishery managers.
10. The ADRIAMED working paper entitled “A preliminary contribution to the Mediterranean Operational Units” (Annex V) was presented by Piero Mannini who informed the meeting that it was a contribution made possible through a joint exercise of information gathering carried out by the experts of the countries participating in this Regional Project. The paper provided an overview in the region concerned (Management Units 17 and 18) of some of the basic information available relevant to the identification and listing of Operational Units. Preliminary figures and composition of the Adriatic fishing fleet as a total and by country/gear/vessel size were given together with the base ports. The sardine fishery in the Northern and Central Adriatic (Management Unit 17) was used as an example of the application of Operational Units. Within this Management Unit the sardine stock is considered to be shared by the fishing fleets of the coastal states and it is believed to be a single stock. Therefore, the paper proposed to consider only one Operational Unit for this resource and some of its specific, or elementary, components such as base ports, fleet segments and fishing seasonality were worked out as an example of the complementary and desirable information.
11. Some participants suggested that initially the identification of Operational Units should be kept as simple as possible. For example in the case of small pelagics (sardines and anchovies) two Operational Units in the whole Mediterranean could be broadly identified – that of purse seiners and mid-water trawlers. This would be the case, provided that there is certainty on the unity of stocks (*i.e.* homogeneity of biological traits and of genetic stock structure).
12. It was also stressed that the Operational Units should serve as a tool for the SAC to advise the GFCM on the control of fishing effort. It was also noted that in the ADRIAMED paper an analogous approach had been applied, using some concepts developed in the work, financed by FIPP and COPEMED on behalf of the

Sub-Committee on Economics and Social Sciences, dealing with socio-economic indicators for Mediterranean fisheries by Franquesa *et al.* (2000). This indicates that aspects such as fleet segmentation could be applied in a biological and economic sense.

13. A proposal to switch from a descriptive approach into a database management approach was presented by Rino Coppola (FAO). The system, which is under development, would aggregate the data according to the disciplines of the users. The data entered into the system will be organised into basic parameters, combinable parameters and sector parameters. There are two major outputs from the system: (1) output models by discipline, (2) list of operational units. The structure of the databank is split into 7 databanks: (a) elementary, (b) sector, (c) bibliography, (d) referral (backbone), (e) spatial, (f) links and connections to external access databank. The system has three functions: data entry and data management, data manipulating and modelling, data retrieval and presentation.
14. A table listing the required basic parameters for identifying Operational Units was distributed, including Libyan data as an example. As a first step, participants were encouraged to provide the data associated with these parameters.
15. It was stressed that in order to have a comprehensive set of data enabling sound management, all countries should adhere to this initiative and submit the data in due course.
16. The Chairman suggested that the concept of Operational Units could be tackled on the basis of indicators as used in other fisheries management studies and reviews. He also stated that a management system could only be effective if relevant data are continually updated and readily available to the decision-makers. In this respect, he highlighted the fact that the management of the data collected is important.
17. It was agreed that the data for the basic parameters (Annex VI) to identify Operational Units should be compiled by each country before the Sub-Committee meeting next month. It was pointed out that basic parameters included in other existing forms such as those for the European Commission could also be adopted.
18. It was also agreed that it was vital that the meeting would produce a preliminary document on the identification of Operational Units using the readily available data of identified basic parameters from each country. Furthermore, it was suggested that COPEMED and ADRIAMED would assist in the form compilation in connection with their respective participating countries. The collection of data from other countries outside these projects would be coordinated by the SCSI Coordinator in close collaboration with the SAC President and national delegates.
19. The Chairman later invited the participants to discuss the meaning of the basic parameters which should be collected. Following the discussion and agreement on the definitions of these parameters, the data sheet (Annex VI) was amended accordingly,

making it more user-friendly in the process. With respect to the parameter related to “economic structure”, it was agreed that the necessary basic information has yet to be indicated by the appropriate economic experts who were not present at the meeting, therefore this economic data would not be submitted for the time being. However, the minimum required economic parameters were broadly identified as being GRT, HP, employment, salary share, landings value, vessel value, running costs and fixed costs. It was agreed that countries should focus in particular on the GFCM selected species as listed in paragraph 55 of the Report of the 25th Session of the GFCM. A summary table (Annex VII) essentially gathering the general information on Operational Units was also prepared. This summary table would be filled in by the GFCM technical secretariat from the data available at FAO and/or provided by the countries at the next SCSI meeting. Examples of this summary form filled up with some data from Spain and Morocco are given in Annex VIII and Annex IX.

20. It was agreed that the SAC President would bring the request for information on the basic parameters to the attention of national delegates of every member country who would in turn be responsible for the compilation of the form (Annex VI). They would later be expected to submit the collected data to the SCSI during its next meeting taking place at FAO headquarters (Rome) between 15-18 May 2001.
21. This report was adopted on 19th April 2001.

ANNEX I

Working Group Meeting on Operational Units Ancona, Italy 18th – 19th April 2001

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ANNEX II

GENERAL FISHERIES COMMISSION FOR THE MEDITERRANEAN SCIENTIFIC ADVISORY COMMITTEE SUB COMMITTEE ON STATISTICS AND INFORMATION

WORKING GROUP ON OPERATIONAL UNITS

Ancona (Italy), 18-20 April 2001.

Tentative Agenda

1. Opening of the Meeting and election of the Chair
2. Background and Objectives of the meeting
3. Outcome of the meeting on Management Units
4. Preliminary study of Operational Units (paper presented by Camilleri)
5. Other contributions on Operational Units
6. List and review available information on (including source of data):
Management Units; target species; fleet/gear base port; catch;
characteristics of fisheries (spatial/temporal/dynamic/period/area);
bordering Management Units, etc...).
7. Synthesis of data available per country/Management Unit
8. Tentative identification of Operational Units
9. Discussion
10. Any other matters

ANNEX III

GENERAL FISHERIES COMMISSION FOR THE MEDITERRANEAN SCIENTIFIC ADVISORY COMMITTEE

WORKING GROUP ON OPERATIONAL UNITS

Ancona (Italy), 18-20 April 2001.

INVITATION AND BACKGROUND INFORMATION

During the last SAC and Sub Committees sessions we have been discussing on the appropriate Management Units and on the Operational Units within each Management Units for the Mediterranean fisheries evaluation and management.

A working group meeting of the SAC at the ICM (Barcelona, Spain. January 2000, 25-27) suggested the next definition:

“For the sake of managing fishing effort within a Management Unit, an operational unit is the group of fishing vessels practising the same type of fishing operation, targeting the same species or group of species and presenting similar economic structure. The grouping of fishing vessels should not be understand as fixed over time but be function of the management objectives to be reached”

This definition was broadly discussed during the 2000 Sub Committees meeting in Madrid (Spain) and adopted by the SAC.

The 25th GFCM Session Report (Sliema, Malta, 12-15 September 2000) stated in the paragraph 52 the following:

“1. After consideration of the recommendations made by SAC, the Commission adopted the following recommendations.

Statistics and Information

- That a multidisciplinary Working Group, under the responsibility of SCSI, should be brought together to design and compile an inventory of Operational Units as well as to define the data structure and fishing effort parameters. This Working Group would, in the first instance, meet under the framework of the ADRIAMED project and focus on the Adriatic region”.

This Working Group in Ancona, co-ordinated by ADRIAMED Project will try to advance in the practical definition of Operational Units within the defined Management Units (see the Alicante Working Group report for provisional Management Units limits). In order to be more effective in our task and try to advance in all Mediterranean areas co-ordinated, we shall like to have a Mediterranean meeting and not only an Adriatic Sea one. Please try to understand the importance of this meeting to advance in the SAC mission.

A tentative Agenda is attached also.

Concerning participation, first of all it is important that the SAC delegates will be present and to have a wide participation, representative of SAC countries. However it is also very important that the other people invited come with prepared contributions concerning point 1 of the Agenda.

For the organization of participation in the meeting, ADRIAMED will guarantee that from the participating Adriatic countries, COPEMED will do the same for its areas of competence.

This letter is to invite to you as SAC Delegate or Sub Committee Coordinator to participate at the meeting. I would like to generate with your participation, an profitable document containing as much as possible information on the existing operational units by Management Units and country. To do that it should be practice if you can participate at the meeting and of course other experts from your country, carrying on as much information as possible on the operational units existing in your country.

Please contact Dr. Fabio Massa, ADRIAMED Director (fabio.massa@fao.org) for further details concerning travel and accommodations.

Thank you very much for your co-operation with the SAC activities. I hope see you in Ancona.

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ANNEX IV

Informal Meeting on SAC and Sub-Committee Agendas and Operational Units Definition

Barcelona, 25-27th January 2000

Introduction

The SAC President to called this meeting to:

- Review the agendas for the forthcoming meetings of the Scientific Advisory Committee and its Sub-Committees and Working Groups, as well as
- Discuss the concept of “Operational Units” within the Management Units as GFCM has defined.

The latter subject follows on from previous informal meetings, which were held in Barcelona and Mazara (September 1999) and at FAO headquarters in Rome (December 1999). It is also closely linked to the work being carried out by three experts working for the Sub-Committees whose work is being supported by COPEMED. The GFCM Secretariat acknowledged this meeting.

General considerations

The President brought to the attention of the Sub-Committee Coordinators, the necessity for the revision and the preparation of annotated Agendas in order to facilitate the compilation of documents in various countries and the discussions during the forthcoming meetings.

In this respect, it was deemed important that annotations would be made in such a way as to indicate which of the items on the agenda would require the input of national documentation.

Experts/delegates of the different Sub-Committees and Working Groups are invited to send documents. A summary of which should be sent to the Co-ordinators who will link them accordingly to the Agenda items. The authors should provide 30 copies of each document in order to be distributed during the meetings of the Working Groups and Sub-Committees.

The annotated agendas should be sent to the SAC President as soon as possible so as to be distributed amongst the country delegates through the official channel.

Due to the lack of some nationally recognised experts in the various Sub-Committee lists, it was agreed that the Chairman of the SAC would send another letter of invitation, through the GFCM President to those country delegates who are not currently represented in the SAC and its Sub-Committees.

It was also highlighted that the Sub-Committee Co-ordinators should be granted the power to execute all matters pertaining to their own Sub-Committee and that the members of a particular Sub-Committee should feel free to contribute to the different Sub-Committees.

Sub-Committee on Statistics and Information

The provisional annotated agenda was reviewed and the role of this Sub-Committee and the others was discussed. It was suggested that it should receive information from the other Sub-Committees in order to deliver reliable outputs related to their requirements.

The need for the collation of scientific statistics and official statistics was addressed. It was agreed that management strategies could only be formulated on predefined required information, which should be collected in “grid format”. In this way, scattered data from various marine science disciplines could be aggregated in a structured manner for the use of the GFCM.

It was noted that a number of fisheries statistics collection systems have recently been developed in a few Mediterranean countries with the support of COPEMED and that the European Union has also recently defined regulations to improve its scientific data collection. Whilst it is perfectly reasonable to have different systems which are suited to the needs of different countries, it was stressed that they should be compatible and hence deliver common outputs useful for the GFCM. In this respect, it was suggested that financial support should be found by GFCM in order to promote compatible systems in all Mediterranean countries. Finally, it was agreed that a number of presentations on fisheries statistics systems would be delivered at the next Sub-Committee meeting at the request of the Co-ordinator.

Sub-Committee on Economics and Social Sciences

Following the review of the agenda for this Sub-Committee the discussion mainly focused on the development of a network of socio-economic fisheries experts. To facilitate the network was agreed that the use of the database developed under the framework of COPEMED is a starting point that can be completed with additional information from the Sub-Committee participants. The group suggested that new information on experts and publications be compiled in the same format that the previously mentioned COPEMED database.

Sub-Committee on Stock Assessment

The agenda for this Sub-Committee and its two Working Group were annotated further.

Sub-Committee on the Environment

In the absence of the Sub-Committee Co-ordinator, the SAC President reviewed the Agenda. The participants present at this meeting formulated some suggestions:

- The importance in informing the CIESM on the contents of the Sub-Committee meeting and Agenda.
- Considering the EU as a GFCM contracting party, the convenience in that experts from DG11 and DG 12 could participate in this Sub-Committee.

The group participants formulated also some annotations to the Sub Committee Agenda:

- To include the subject of MAP data and results, and the GEF Black Sea Programme, within item 5 (“status of the existing information”). Such data and information are considered to be very useful for the Sub-Committee .
- To include some comments for discussion during the Sub-Committee meeting on statistics and information related to water quality indicators and environmental data directly connected to fisheries resources.

The Scientific Advisory Committee (SAC) Agenda

The group decided to include a new item on national scientific reports in the SAC agenda. According to paragraph 42, (Report of the SAC second session (FAO Fisheries Report N.º 602), “reports of national scientific activities of each country should be presented to SAC”.

The SAC President indicated that the GFCM Secretary proposed inclusion of the “Red Coral” issue as an item for discussion at the next SAC meeting and commented on the necessity to have more information before including this new subject in the Agenda.

Definition on the Operational Units concept

The discussion on the operational units was opened by means of the presentation of three works in progress prepared by experts working for the Stock Assessment, Statistics and Information and Economic and Social Sciences Sub-Committees, whose work is being supported by the COPEMED Project. Two other documents were prepared by an expert group in FAO and by the SAC President.

A very intense and constructive discussion developed. Following this, a draft document was prepared and reviewed by the group. The final agreed definition is annexed to the meeting report.

The President proposed that the Co-ordinators would inform to the Sub-Committees members of such a document. The SAC President will send the definition document to the SAC Members before the next SAC meeting for further improvement.

Operational Units; a preliminary approach

Introduction

During the first session of the Scientific Advisory Committee (SAC), 27 provisional management units for small pelagic and shelf demersal species were broadly defined. Whilst making every effort in keeping the existing GFCM statistical divisions, the creation of the proposed management units was based on a number of criteria including, *inter alia*, continental shelf geography, species distribution patterns and oceanographic features. National management units for coastal resources established within limits of national jurisdiction were not considered and it was suggested that islands would constitute distinct management units.

It was envisaged that this arbitrary partitioning would be revised following further in-depth studies which needed to be carried out by the different Sub-Committees of the SAC in the future. In this respect, at the 24th session, the GFCM agreed that a working group would be set up to review the geographic coordinates of the proposed management units.

Under the general guidance of the President of the SAC an informal group participated by the two SAC vice Presidents, three of the Sub Committee Coordinators, the Chairman of the demersal species working group, the three FAO experts backstopping the SAC, the COPEMED Director who supported the participation of three experts working on the preparation of documents for the Sub Committees was held in Barcelona (ICM-CSIC) to formulate a definition for an Operational Unit.

The definition for an “Operational Unit”

During a preliminary meeting held at FAO headquarters a number of possible definitions for an “Operational Unit” were discussed. The members at this meeting eventually agreed upon a definition, which seemed to be compatible with all disciplines concerned with fisheries management. It was reviewed at a follow-up meeting held in Barcelona (January 2000, 25-27) and it was suggested the next definition:

“For the sake of managing fishing effort within a Management Unit, an operational unit is the group of fishing vessels practising the same type of fishing operation, targeting the same species or group of species and presenting similar economic structure. The grouping of fishing vessels should not be understood as fixed over time but be function of the management objectives to be reached”.

ANNEX V

A preliminary contribution to the Mediterranean Operational Units FAO-Adriamed Project

This paper should be cited as follows: Adriamed. (2001) A preliminary contribution to the Mediterranean Operational Units. Paper presented at the GFCM-SAC Working Group on Operational Units (Ancona, 18th-19th March 2001). FAO-MiPAF Scientific Cooperation to Support Responsible Fisheries in the Adriatic Sea. GCP/RER/010/ITA/OP-04: 9 pp. Available from the World Wide Web at <http://www.faoadriamed.org/pdf/ancona.pdf>

Abstract

The paper provided an overview of some of the basic information available relevant to the identification and listing of Operational Units in the Adriatic Sea (Geographical Management Units 17 and 18). Preliminary figures and composition of the Adriatic fishing fleet as a total and by country, fishing gear and vessel size were given together with the base ports. The sardine fishery in the Northern and Central Adriatic was used as an example of the application of Operational Units. Within this Management Unit (17) the sardine stock is considered to be shared by the fishing fleets of the coastal states and it is believed to be a single stock. Therefore, the paper proposed to consider only one Operational Unit for this resource and some of its specific, or elementary, components such as base ports, fleet segments and fishing seasonality were indicated as an example of the complementary and desirable information.

1. Introduction

This paper was made possible through the collaboration of experts from the countries participating in the FAO-Adriamed Project, it represents part of the output of the Joint Meeting of the Adriamed Working Groups on Shared Demersal and Small Pelagic Fishery Resources of the Adriatic Sea (Bari, 13-15 February 2001) and the follow up to an "*ad hoc*" meeting of the Adriamed National Focal Points (Fano, 20 March 2001). The information, which has as far as possible been standardized, was gathered in each country and the paper was prepared by Piero Mannini and Fabio Massa with the assistance of the Project staff.

The national experts who participated in the data collection exercise were: E. Kapedani and K. Osmani from the Fisheries Research Institute of Dürres (Albania); S. Jukić and G. Sinovčić from the Institute of Fisheries and Oceanography of Split and A. Misura of the Ministry of Agriculture and Forestry, Zagreb (Croatia); N. Cingolani from IRPEM-CNR of Ancona, C. Piccinetti from the Laboratory of Marine Biology and Fisheries of Fano and N. Ungaro from the Laboratory of Marine Biology of Bari (Italy); B. Marčeta of National Institute of Biology of Ljubljana and T. Karis of Delamaris d.d, Izola (Slovenia).

2. The Operational Unit concept

The GFCM Executive Committee requested that the SAC define the Management Units in the Mediterranean and thereafter to define and list the Operational Units within the Management Units.

The current definition was drawn up by the SAC-WG (Barcelona, 2000) and used in a study undertaken by Camilleri *et al.* (2000). A major step towards defining the Operational Units was taken although the agreed definition did not give a clear indication on how to systematically list and analytically process them. This first approach to OU definition and identification within the Management Units was carried out on the basis of the information available for different areas of the Mediterranean on related resources, fishing fleet/gear and fishing grounds.

The OU concept was also applied in a study on the identification and application of socio-economic indicators to Mediterranean Fisheries (Franquesa *et al.* 2000) “Feasibility assessment study on the setting-up of a socio-economic indicator database for Mediterranean fisheries”.

3. The OU in the Adriatic context

The Adriatic can be considered as a semi-enclosed sea within the Mediterranean Sea, which itself constitutes a larger semi-enclosed sea. Six countries, whose coastline development differs greatly, border the Adriatic. In the Mediterranean coastal nations living marine resources have been intensively exploited for a long time and the majority of stocks are considered to be at least fully exploited (Caddy and Oliver, 1996; Grainger and Garcia, 1996).

A series of activities and meetings were held within the framework of the Adriamed Project in order to strengthen scientific cooperation between the countries participating in the Project as support for responsible fisheries. To improve the basic understanding of Adriatic fisheries, all available information from each country is being collected, compiled and assessed. In this context, regional experts identified and listed the main commercial species whose stocks are shared by national fishing fleets, research programmes on some of these species have been formulated and are under implementation (Adriamed, 2000; Adriamed, 2001_a; Mannini *et al.*, in press).

Recently, the limits of the two Geographical Management Units (MUs) into which the Adriatic Sea is divided, have been jointly defined by the participating countries on the basis of recent geo-political changes, national statistical division, geomorphologic characteristics, fishery exploitation strategies and policy (Adriamed, 2001_b; see also the Report of the GFCM-SAC Working Group on Management Units, Alicante, Spain, 23-25 January 2001). The Northern and Central Adriatic is included in MU 37.2.1a (currently proposed by the *ad hoc* SAC-WG as MU 17), this area is characterised by relatively shallow bottoms over the much-extended continental shelf. Coastline and territorial

waters of Croatia, Bosnia-Herzegovina, Italy, and Slovenia fall within this MU. The Pomo/Jabuka Pit is the deepest area of the MU and serves as an important nursery area for high value species such as the hake. Management Unit 37.2.2b (now proposed as MU 18 by the SAC-WG) encompasses the Southern Adriatic (Albania, Italy and Montenegro-Federal Republic of Yugoslavia) and, unlike MU 37.2.1a, is characterised by a relatively narrow continental shelf and by a marked, steep continental slope (Figure 1). In this paper the revised boundaries have been applied.

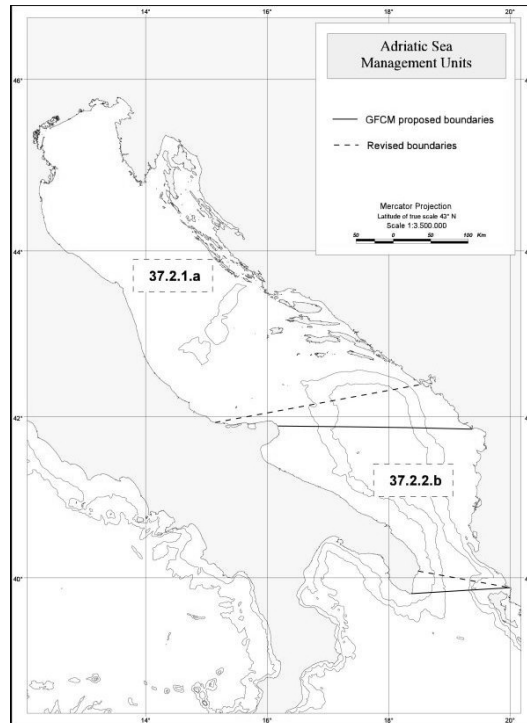


Figure 1. Map showing the boundaries of the Adriatic Sea Management Units 37.2.1.a and 37.2.2.b as originally indicated by the GFCM (solid line) and with the currently proposed revision (dotted line) defined as MU 17 and 18 respectively.

Adriatic capture fisheries are based on the exploitation of demersal and pelagic species whose stocks, in most cases, are considered as shared by the fishing fleets of coastal states. In this respect “shared fisheries” are a major feature of the Adriatic Sea.

The definition of an Operational Unit, as endorsed by the GFCM, encompasses four key-components: fishing effort; (group of) fishing vessels operating a given category of fishing gear (practising the same type of fishing operation); target resources (either made up of one species or group of species); and (similar) economic structure.

Therefore an Operational Unit could be considered as characterised and constituted by identified fishing vessel categories which target resources consisting of one or, more probably, of a species assemblage. This could be seen as species (or group of species)-related fishery, meaning, for example the bottom trawl fishery targeting on hake and co-occurring species.

Given this, the identification of Operational Units involves the prior identification of key-fisheries which at the initial disaggregated level may be seen as locally structured according to the resource, the local fishing grounds and related ports where the fishing vessels operate from and where the economics of production originate (*e.g.* access to local/regional markets, trading, processing, vessel-related activities and costs, etc.). These basic aggregations might be considered as elementary or sub-Operational Unit constituents.

An initial step is to assess the type, quality and quantity of information available, as this may be different from one area to another. This is particularly important when dealing with fishery resources exploited by more than one country, as it is the case for the Adriatic.

4. Preliminary global picture of the Adriatic Sea fishing fleet

Most of the Adriatic Sea fishing fleet is based in 109 fishing ports of which 94 are located within the Northern and Central Adriatic MU and the remaining 15 are in the MU of the Southern Adriatic (Figure 2). Some of the minor associated ports, mostly bases for small artisanal fishing boats, are probably not accounted for.

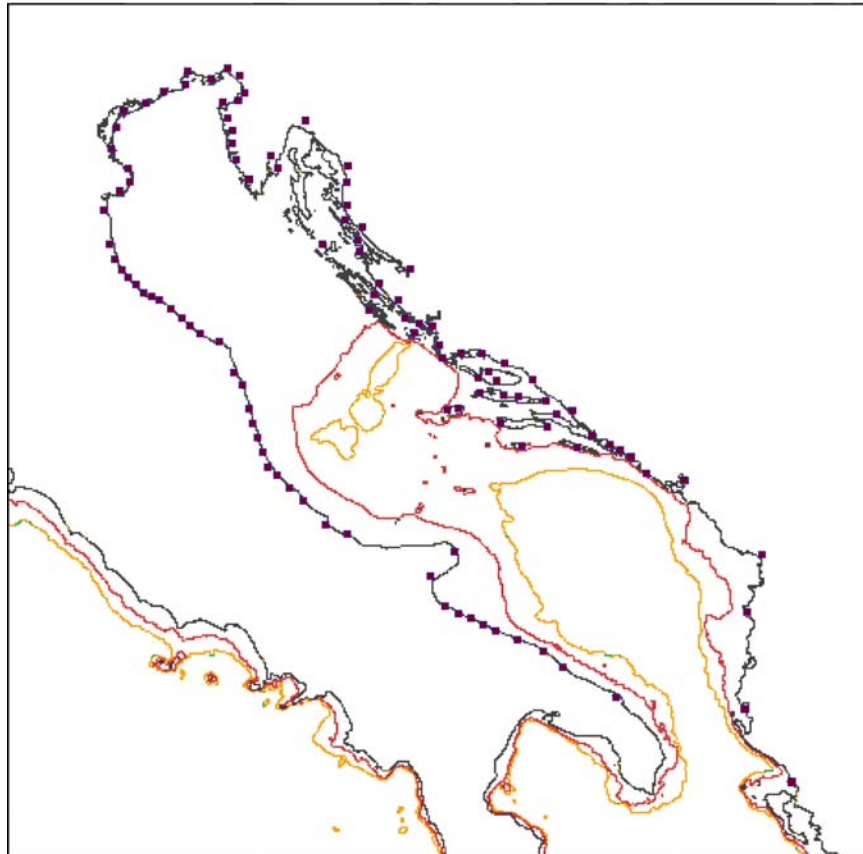


Figure 2. Distribution of fishing ports along the coast of the Adriatic Sea.

The preliminary compilation of the information from official and semi-official sources (*i.e.* from relevant national authorities and from fishery research institutes) on the Adriatic Sea nominal fishing fleet would lead to the following picture.

The total number of vessels of all sizes authorised to carry out professional fishing, both small-scale artisanal and industrial or semi-industrial, amounts to about 12800 units. A tentative breakdown by fishery (bottom, pelagic and artisanal-coastal fishery) and by target resources (demersal, pelagic and coastal resources) typology indicates that about 9500 fishing units of small size (*i.e.* less than 12 m LOA) operate small-scale artisanal fishing in coastal waters. To this figure 609 small to medium size vessels must be added which are equipped with hydraulic dredges and exploit bivalve molluscs along the Italian coast (this kind of information is not available for the other coastal nations).

Demersal trawl fishery is carried out by about 1600 trawlers mostly of small-medium size (*i.e.* up to 24 m LOA). The number of fishing vessel targeting pelagic (mostly small pelagic) stocks is about 500 units with the largest percentage (40%) made up of medium size (12-24 m LOA) vessels.

It has to be noted that to the bottom trawl and pelagic fleet composition previously given, a fleet of 528 Italian vessels must be added which are above 12 m length and licensed for the use of several fishing gears (*e.g.* bottom trawl, mid-water trawl, purse seine for small pelagic and tunas) and which cannot therefore be assigned to a single fishing category. This, still approximate, outlook of the Adriatic Sea fishing fleet is summarised in the following Tables 1 and 2.

Table 1. Percentage national and total fleet composition by main fishery category.

Country	Demersal	Small Pelagic	Coastal/Artisanal	Other/Unidentified
Albania	79	8	13	
Croatia	10	4	85	
Italy	13	4	60	22
Montenegro	15	7	78	
Slovenia	22	12	55	11
Whole Adriatic	13	4	74	9

Table 2. Percentage national and total demersal small pelagics fishing fleet composition by vessel size (LOA).

	Demersal			Small pelagic		
	Small	Medium	Large	Small	Medium	Large
Albania	Not yet available			Not yet available		
Croatia	62	33	5	53	37	9
Italy	Not yet available			4	45	51
Montenegro	45	55		100		
Slovenia	59	35	6		78	22
Whole Adriatic				33	40	27

5. The example of sardine fishery in the North and Central Adriatic

A simple attempt to define the sardine (*Sardina pilchardus*) fishery Operational Unit of the Northern and Central Adriatic (MU 17) was carried out using the basic information currently available. For the sake of clarity and to use standard terminology as far as possible, the terms employed by Franquesa *et al.* (2000) were tentatively adopted. Therefore, an Operating Unit is intended to mean a given fishing fleet segment operating within the MU concerned, and Local Operating Unit is the basic, or elementary, constituent of the Operational Unit and specifically refers to the fishing fleet based at each port exploiting the resource/s (*i.e.* the sardine stock) in a certain fishing ground.

At this stage, possible differences such as those in fishing effort allocation and fishing power of the small pelagic fishing fleets in the MU were not considered. Also, it was assumed that the sardine stock is not divided into sub-stocks, and that biological traits and genetic stock structure are homogeneous in the area.

The distribution of the ports where the Adriatic fishing fleet targeting on small pelagics is based is shown in Figure 3. In this MU the pelagic fishing fleet operates from 22 main base ports: 8 in Croatia, 12 in Italy and 2 in Slovenia.

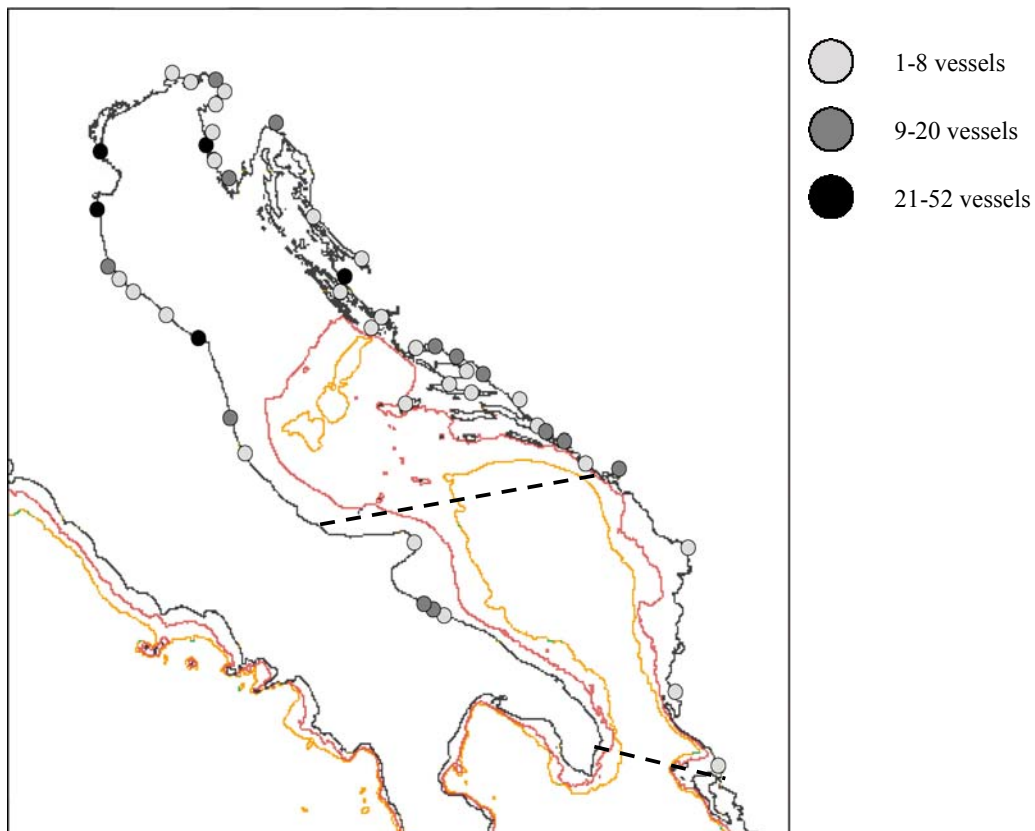


Figure 3. Distribution of base ports of the fishing fleet targeting on small pelagics in the Adriatic Sea, dotted lines indicates the boundaries of geographical management units.

These 22 base ports and the small pelagic fleet, divided into several segments by fishing gear and vessel size (LOA), stationed at each of them can be considered as the Local Operating Units. Fleet composition by base ports, fishing gear and vessel size with indication of the fishing season, are given in Table 3.

Table 3. Adriatic small pelagic fishing fleet composition by base port, fishing gear and vessel size with indication of fishing season.

Geographical Management Unit 37.2.1.a										
Local Operating Unit	Operating Unit (fleet segment)									
	Purse seiner			Mid-water trawler			Both gears			Fishing season
Croatia	1*	2	3	1	2	3	1	2	3	
Pula	46	4			17	3		6		Jan-Dec
Rijeka	11	14			2	2				Jan-Dec
Senj	2									Jan-Dec
Zadar	4	20	5		4			8	5	Jan-Dec
Šibenik	5				3		1			Jan-Dec
Split	47	15	7		6	1		1		Jan-Dec
Dubrovnik	34	6	1			2		1		Jan-Dec
Ploče	5					1				Jan-Dec
Total	154	59	13	0	32	9	1	16	5	
Grand Total		289								
Italy	1	2	3	1	2	3	1	2	3	
Trieste	9	4								Mar-Dec
Grado					6					Jan-Dec
Marano Lag.					4					Jan-Dec
Chioggia					28	2				Jan-Dec
Porto Garibaldi					27	17				Jan-Dec
Cesenatico					9	1				Jan-Dec
Rimini					4	4				Jan-Dec
Cattolica					2	2				Jan-Dec
Fano						6				Jan-Dec
Ancona						28				Jan-Dec
S.Benedetto T.			11			6				Apr-Dec; Jan-Mar
Giulianova			5			3				Apr-Dec; Jan-Mar
Total	9	4	16	0	80	69				
Grand Total		178								
Slovenia	1	2	3	1	2	3	1	2	3	
Izola	2				2	2				Apr-Nov; Jan-Dec
Koper	3									Apr-Nov
Total	5	0	0	0	2	2				
Grand Total		9								

* Vessel size category = 1:<12m LOA; 2: 12-24m; 3>24m

Therefore, providing that the unit stock assumption is met and not accounting for differences in economic structure, actual fishing power and effort, it resulted that the Operational Unit for the sardine fishery in MU 17 of the Mediterranean Sea is composed of 22 Local Operating Units hosting a total of 476 fishing vessels (260 purse seine, 194 mid-water trawl units and 22 vessels operating both gear). In reality, this also applies to the important anchovy (*Engraulis encrasicolus*) fishery as the same fishing fleet exploits the anchovy in this area. The importance as target species of sardine or anchovy depends on resource availability and national market demand. Further, an important aspect which should be assessed is whether this Operational Unit extends to include the adjacent MU 18.

6. The data model

The database "OP2001.test" is being developed by FAO as an example to demonstrate how the Operational Unit issue could be handled in the Mediterranean Region, satisfying, through a data management model the various users. This database has been designed mainly to respond to the SAC/GFCM request to list and report the Operational Units in the GFCM area by geographical management units.

7. Some concluding comments

A tentative global picture of the Adriatic fishing fleet is available and constitutes part of the necessary baseline knowledge to address the issue of Operational Unit identification and listing. Several components of the Operational Unit concept still require further information (*e.g.* socio-economic structure of national small pelagic fisheries, fishing ground mapping and related spatio-temporal effort allocation, etc.). Also, bio-economic criteria useful to limit the Operational Units (how extensive can an Operational Unit be?) would need to be taken into account. It might be worth considering the convenience of selecting target resource categories which, although characterised by one or few species, together with the assemblage of associated species, are the most representative of Mediterranean fisheries.

The sardine fishery example utilised in this paper is from a relatively simple situation where the resource is associated with only a few other species and the fishery is performed by mainly two kinds of fishing gear. It may be expected that the identification of Operational Units for demersal resources and relative fishery will be more complex due to the higher number of species and variety of fishing gear employed.

8. References

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ANNEX VIII

Operational Units Working Group. GFCM-SAC (Ancona, April 2001)		General information concerning Operational Units						
Country/ies :Spain								
Gear (1)	Resource (2)	1	2	3	4	5	6	7
Trawl	Octopus/Sparids	76						
Trawl	Hake/white prawn	46						
Trawl (#)	Red shrimp	30(*)	30(*)					
Trawl	Norway lobster	8						
Purse seiners	Anchovy/sardine	136						
Artisanal (excluding dredges) (j)	Sparids/mulletts/cep halopods	873						
Dredges	Bivalves	181						

In all the cases, except those with (#), the fishing trips are daily.

(*) This number corresponds to the same vessels which can fish in both Management Units (1 &2).

(#) If the vessel fish in the MU 1 the fishing trip is 1 day. When fish in the MU 2 the fishing trip is 5 days.

(j) Artisanal fisheries considered are mainly fixed gears (gillnets and entangling nets and small long lines) and other mobile gears using hooks or nets.

Provisional data from Spanish operational units in MUs 1 and 2.

ANNEX IX

**Operational Units Working Group.
GFCM-SAC (Ancona, April 2001)**

Country/ies :Morocco		General information concerning Operational Units						
Gear (1)	Resource (2)	MU						
		3						
Trawl	Sparids/white shrimp	118						
Trawl	Mullets	97						
Trawl	Hake	95						
Purse seine	Sardine/anchovy	141						
Artisanal	Sparids	2500						
Artisanal	Bivalves	90						
Longlines	Small tuna fish (bullet tuna, little tunny, atlantic bonito)	357						