

COMPARISON OF MEDITERRANEAN AND ATLANTIC FISHERY MANAGEMENT

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SUMMARY AND CONCLUSIONS

General

1. Atlantic and Mediterranean fisheries are unquestionably in many respects very different. However, the present research demonstrates that the differences do not necessarily imply different conclusions regarding the potential for an effective fisheries management policy.
2. In the Atlantic areas the management through TACs and quota has not produced the expected results. This may be attributed to still insufficient biological knowledge, problems with compliance and policy implementation. Many stocks are managed with precautionary TACs. Feasibility of effective fisheries management in the Atlantic through the current system of TACs still remains to be demonstrated beyond reasonable doubt. Management through TACs in the Mediterranean is considered unfeasible because of the multi-species character of the fisheries. It can be concluded for both areas that output regulations may not be as effective as desired.
3. Implementation of technical measures is difficult in both areas because of the variety of technologies applied and high cost of enforcement, if it is to be done by centralized institutions.
4. It may be expected for both areas that more intensive participation of user-groups in fisheries management would create conditions for greater effectiveness of policy. Creation and development of appropriate decentralised institutions together with necessary framework for dialogue should be supported.
5. Management of Atlantic fish stocks falls within the jurisdiction of the EC thanks to 200 mi EEZ. In the Mediterranean, national waters extend to 12 mi at most, so that most of the area falls under the International Law of the Sea. Still, the mostly rather narrow continental shelf puts a substantial share of the commercial fish stocks under the jurisdiction of the coastal states.
6. In the Atlantic area most fish stocks are exploited by international fleets so that arrangements at EU level are essential. In the Mediterranean the interaction of international fleets is limited to a number of specific fisheries or areas. The need for international arrangements is therefore particularly related to these fisheries.
7. Relative stability is not (yet) an issue in the Mediterranean, while it is a leading principle in the Atlantic CFP.

Stocks and biological knowledge

1. The fisheries of the (northern) Atlantic can be roughly characterized by: large stocks of single species, spread over wide areas, fished on a large scale by fleets from a multitude of countries with a small variety of gears and target fish dominating the catches. In contrast to this, Mediterranean fisheries typically are small scale operations by local fishermen, fishing with a multitude of gears on small, highly mixed local stocks, with no distinct target species.
2. The European Union manages over 100 stocks in Atlantic waters, representing about 70 percent of total catches. In spite of the highly developed biological research in the Atlantic area, analytical assessments are only available for some 35 of these stocks, the remainder is managed with precautionary TACs. In the Mediterranean the extent and size of most of the stocks are unknown and their level of exploitation can only be suspected.
3. The standard methods of (analytical) stock assessment, developed for Atlantic fisheries, require long time series of detailed and reliable data. Such data are generally not available in the Mediterranean. But the mixed character of the fisheries, makes the standard biological models hardly applicable.

4. Because of its legal status within the CFP, the management advice procedure for Atlantic fisheries is well developed. In the Mediterranean biological research is less well coordinated, but there is also less need for that, as fisheries and stocks are generally local, with little interaction.
5. In view of the local, small scale nature of most of its fisheries, subsidiarity should be the leading principle in setting up a CFP for the Mediterranean. The conservation part of the CFP should be primarily directed at shared or straddling stocks.
6. As a consequence of the general lack of adequate stock assessments, mainly due to the complexity and diversity of the fisheries, the main management instrument will have to be effort control.

Structure of the fleets

1. Contrary to the conservation policy, the EU structural policy applies in the same way to the Atlantic and to the Mediterranean countries.
2. The Mediterranean fleet consists of relatively small vessels. Some 90% of the vessels is under 10 m of length. As a whole, the Mediterranean fleet makes up for nearly one half of the number of vessels of the EU fleet, while it accounts for only a quarter of the total tonnage and for one third of total engine power. Various Atlantic countries also have substantial small scale fishing fleets.
3. The kW/GRT- ratio is higher for the Mediterranean fleet than for the Atlantic fleet as small vessels generally have a relatively high kW/GRT- ratio.
4. A further difference in fleet structure is the lower share of trawlers in the Mediterranean fleets as compared to the Atlantic fleets. Consequently, the MAGPs for Mediterranean fleets generally require lower reduction rates than those for the Atlantic fleets.
5. During the period '92-'95 the EU fleet has been reduced by about 5%, which is less than the 8% required by MAGPIII. Adherence to MAGPs differs widely among the Member States.
6. The priority of structural policy has shifted from investment support towards the reduction of fishing effort. The link between structural policy and conservation policy has become stronger. MAGP targets for fleets operating in Atlantic waters will have to be in balance with relative stability as expressed in the allocation of quota.
7. In Mediterranean waters, input restrictions imposed by structural policy are in a way more crucial than in Atlantic waters, because of the lack of a quota system in the Mediterranean. In other words, achievement of the fisheries management objectives depends on structural policy and technical measures. Mediterranean fisheries are dominated by small vessels fishing for local stocks. Conservation needs would require a further segmentation of fleet targets within the MAGPs, to bring structural policy in accordance with the locally different situations of fish stocks. Thus, both in Mediterranean and Atlantic waters, a consistency between structural policy and conservation policy is essential.

Technical measures

1. Most technical measures applied in the Atlantic areas to commercial fisheries are specified in the EC Reg. 3094/86. A new proposal has been put forward by the EC by mid-1996, which attempts to simplify the current regulations.
2. Technical measures in the Mediterranean are contained in the national and regional regulations as well as regulations introduced by local professional organisations. EC Reg. 1626/94 is a first step towards homogenization at EU level.
3. In both areas there is a trend towards an increasing level of detail regarding technical measures in terms of minimum sizes of fish, minimum mesh sizes, gear specifications, closed seasons and areas. In view of the differences between the two areas it does not seem relevant to attempt to develop a common scheme of technical measures which would be applicable in the Mediterranean as well as in the Atlantic.

User group participation

1. In the Atlantic area different degrees of influence of user-groups exist, depending on country, type of measure and/or fishery. Some level of consultation exists in nearly all countries. Centralized approach is common. No forms of self-governance have been found. In several North Sea countries (NL, DK, UK) certain forms of co-management, particularly in the area of quota management, are being implemented.
2. In the Mediterranean Member States there is a fairly consistent degree of participation in fisheries management by user organisations (Prud'homies in France, Cofradias in Spain, various groups in Italy). In Greece the participation is very limited
3. Fisheries management is embedded in national institutional structures. This explains the differences between countries. The variety in degrees of user-participation within one country is partly explained by the way rules are set and the 'stages of evolution' of the relation between fishermen and government.
4. The principle of co-management becomes increasingly relevant in all Member States. Implementation of CFP in the Atlantic fisheries of the Member States has not produced the desired results and there is regularly heavy resentment against it within the fisheries sector. The wide dispersion of the fishing activities in the Mediterranean makes intensive involvement of local organizations essential. While there is a common need in both areas for further development of co-management principles, the practical implementation must recognize the institutional, cultural and other differences between but equally also within these areas.

INTRODUCTION

Management of fisheries in the European Union is continuously being adapted to newly rising situations and problems. Level of stocks fluctuates depending on fishing intensity and biological and environmental phenomena. Economic performance of the fleets changes according to catches, prices and production costs. Trends in the consumer market are affected by supplies from EU waters, developments in aquaculture and imports from third non-EU countries. Institutional adjustments are based on inadequacies experienced in the past, which are not necessarily relevant to future requirements.

The Common Fisheries Policy applied to the EU Atlantic areas since 1983 is being adapted in pursuit of greater effectiveness. The biological advice has shifted from indicating precise TACs to offering a series of choices to the policy makers. The Multi-annual Guidance Programmes are becoming increasingly detailed in terms of fleet segments and fisheries. Furthermore the notion of 'activity' reduction has been introduced in complement of capacity. First steps towards effort based management have been made in some fisheries in the area west of Scotland. Regional economic restructuring of fisheries dependent areas has been explicitly introduced as a part of CFP, within the application of the Financial Instrument for Fisheries Guidance (FIFG). The entire set of technical measures is under review and by mid-1996 the European Commission has put forward proposals to streamline the multitude of these measures which has gradually developed since 1983. Finally, new components of possible future CFP are appearing in the discussion - institutional adjustment to allow for a greater participation of the professional organizations in fisheries management and the introduction of property rights (like ITQs), to mention just two examples. It may be expected that the CFP review in 2002 will institutionalize at least some of the changes currently under way.

The EU fisheries policy in the Mediterranean is becoming more specific. Measures taken within the structural policy are equally applicable to the Atlantic as well as Mediterranean areas. The structural policy has been extended to small scale fisheries, benefiting particularly the Mediterranean countries. First steps towards homogenization of the technical measures have been taken in 1994. There is a continuous discussion and evaluation of the possibilities of introducing a comprehensive fisheries management policy for the Mediterranean basin.

Major differences between the Atlantic and the Mediterranean areas have to be recognized from the outset. The legal and institutional situations are very different. Application of the 200mi EEZ is not practical in the Mediterranean. The national EEZs are limited to 6-12mi, and in some instances to only 3mi. At the same time the geomorphological conditions are characterized by mostly very narrow continental shelf, often not exceeding 30mi. Most fishing areas still fall under the jurisdiction of the coastal states. Low concentrations of the commercially important bottom species in the Mediterranean is paralleled by large dispersion of the fishing activities. Only very few larger fishing centres exist there.

The objectives of the present study are:

1. *to determine the relevant similarities and differences between the fisheries sectors in the Mediterranean and the Atlantic areas; and*
2. *to evaluate the applicability of the existing principles of the (Atlantic) Common Fisheries Policy to the Mediterranean situation in the light of the above comparison.*

This report discusses four major aspects of fisheries, three of which are also the basis for fisheries regulations. Each issue is briefly reviewed for the Atlantic and Mediterranean area, leading to a comparison between the two. First, fish stocks and biological knowledge are discussed. Second, the structure of the fleets in the two areas and its implications for the structural policy are presented. Third, the development in the area of technical measures is

outlined. Fourth and final section reviews the institutions and the fishermen's participation in fisheries management.

It is evident that the report deals with a very broad area in which a large multitude of varying situations and conditions occurs. The report does not attempt to present a detailed review, but much rather to provide an as clear as possible outline of the major issues at stake and at the same time sufficient references to relevant literature related to Atlantic and Mediterranean fisheries and their comparison.

1. STOCKS, BIOLOGICAL ADVICE, TACs AND QUOTAS

1.1 Atlantic fisheries

Species and stocks

Catches by EU Member States from the Northeast Atlantic are specified by FAO fishery statistics into about 170 single species or groups of species (FAO, 1993). Roughly there are 75 demersal fish species, 50 pelagic fish species, 20 crustacean species and 25 species of molluscs. Specifications vary widely from country to country, from Belgium and the Netherlands having only about 40 species, to France and Portugal specifying around 130.

The contributions of the main groups of species to the total catch of about 4.7 mln tonnes are given in figure 1.1. Only 19 species contribute by more than one percent to the total catch, making a combined contribution of nearly 85%. Ten demersal and six pelagic species make fairly equal contributions by group to a total of close to 75%. The balance is contributed by two species of molluscs (9%) and one crustacean species (figure 1.2).

A primary reason for managing fisheries is the fear for overfishing of the stocks, a fear best founded for economically attractive stocks. Another important reason for management within the CFP has been, and still is, preservation of the 'relative stability' between participating states in a fishery. The size of a fishery as such is not a ground for managing it.

Management of fish stocks under the CFP is primarily done by setting Total Allowable Catches and quotas. Presently (1996) TACs and quotas are set for twenty NE Atlantic species: eleven demersals, seven pelagics and two crustaceans (EC, 1995). Most of these species coincide with the species contributing over one percent to the total EU catch from the NE Atlantic. Mussels and oysters, generally cultured in coastal waters, are not managed under the CFP. Sandeels, the species with the highest volume, but only used for reduction to meal and oil, are apparently not (yet?) requiring management, and neither are pilchards. Five species are being managed, that contribute less than one percent to the total EU catch from the NE Atlantic: common sole, megrims, pollack, anchovy and Northern prawn.

Generally management of species is by unit stocks, defined by areas. A total of 106 unit stocks is managed, varying from 1 to 11 per species, with an average of 6 for the demersals and of 4.5 for the pelagics and crustaceans (appendix A1). Species are not always managed throughout the areas where they occur. E.g. Atlantic salmon are only managed in the Baltic, and megrims and pollack are not managed in the North Sea. The areas covered by unit stocks may differ very widely in size: from the very local Clyde herring to the Western mackerel ranging from the Norwegian Sea to the Bay of Biscay (ICES divisions IIa, Vb, VI, VII, VIIIabde, XII, XIV).

Most of the TACs are fished exclusively by Member States, but 26 of them are shared with non-members, particularly the Faeroes and Norway in the Faeroese waters, the Norwegian Sea, the North Sea and the Baltic areas. For these stocks the TACs cannot be decided upon by the EU alone, but have to be negotiated with the non-members concerned, together with the allocation of shares.

Within the EU the allocation key of shares is fixed, thus establishing 'relative stability'. The numbers of Member States having a share in TACs vary from one to seven, apart from the ten undivided TACs available to all except the new entrants (including Spain and Portugal in a number of cases). Six stocks have only one and 22 only two participants; here EU-management is clearly meant to protect the fishery from new entrants, as in these cases stock conservation as such could well be secured on a mono- or bi-lateral level. On average 4.6 countries share the EU parts of TACs.

Biological advice

In principle TACs are set on the basis of biological advice, comprising stock assessments and forecasts of the consequences of various levels of fishing. These assessments do not always cover the same unit stocks as defined in the quota regulations. In some cases biologically distinct stocks are managed in combination. In other cases biological unit stocks are split up into several management units.

'Stock assessment aims at understanding the dynamics of exploited resources and involves the estimation of a variety of population parameters, in particular mortality rates due to fishing and other causes, numbers at age (including recruitment) and spawning stock biomass. Stock assessments in which these parameters can be estimated are described as analytical assessments' (ACFM, 1991).

Stock assessments generally are made using mathematical procedures to describe the population dynamics of stocks, the main one being virtual population analysis (VPA). Until now, a single species approach is being used, as multi-species models are not (yet) considered sufficiently reliable. Apart from a thorough knowledge of the biology of the species, application of these mathematical procedures requires data from a variety of sources, generally over a longer period of time. Some of these data are: catches including discards, catch composition by size, growth by age, fishing effort and pattern, recruitment estimates, etc.

For an analytical assessment the input data have to meet high standards of reliability, which is not always possible. In a number of cases, catch statistics have to be adapted with personal information on actual landings, to correct for under- or misreporting. Catch composition data require market sampling programmes; growth by age relations have to be derived from market samples and should be checked regularly. Although EU-logbooks are a very welcome source of information on fishing effort, they do not offer a complete set of data on all fisheries. Recruitment estimates should preferably be cross-checked with data from at least two independent sources. The same goes more or less for the complete stock assessment: it is nice if the result from one method of assessment, e.g. VPA is corroborated by the result of another method, e.g. surveys by research vessels.

When biological knowledge and data are not up to standard for an analytical assessment, in most cases general statements about the state of exploitation of the stock can be made. This kind of advice results in precautionary TACs, just as for stocks where no biological information is available at all.

In the Interim Report of this study a comprehensive survey was made on the state of biological knowledge on stocks of important Atlantic species: four pelagics (herring, mackerel, horse mackerel and sardine), five demersals (cod, haddock, plaice, sole and anglerfish) and Norway lobsters. It appeared that even in case of well researched and monitored species like herring, cod and plaice, only of a limited number of stocks the level of biological knowledge and the reliability of data was adequate for making analytical assessments. The results of this survey are summarized in table 1.1.

Out of the 106 TACs for 1996, 68 are explicitly mentioned to be precautionary, meaning that for two thirds of the stocks under management insufficient biological knowledge and data are available to make analytical assessments of the state of the stocks concerned.

Even when analytical assessments can be made, they still leave a rather wide margin of uncertainty about the actual state of the stock. Fisheries biologists admit these uncertainties can be up to 20% one sided. Mis- and underreporting of catches, notably brought about by fishery restrictions, have affected the accuracy of stock assessments negatively during the last decade. In some cases (plaice, herring) substantial revisions of earlier assessments have been necessary when new or additional data became available. Such situations neither contribute to the mutual trust between biologists and fishermen, nor to the confidence of the fishing industry in the management system.

Table 1.1 Numbers of unit stocks of major NE-Atlantic species where analytical assessments, inadequate assessments, or no assessment at all could be made in 1992/93

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Species	Unit stocks	Analytical assessments	Inadequate assessments	No assessments
Herring	10	4	5	1
Mackerel	3	1	1	1
Horse mackerel	3	1	2	-
Sardine *)	1	1	-	-
Cod	8	5	3	-
Haddock	4	2	1	1
Plaice	11	4	2	5
Sole	11	7	1	3
Anglerfish	4	1	3	-
Norway lobster	12	2	10	.
Total of 10 species	67	28	28	11

*) Not managed by EU

Advice procedure

Biological fisheries research in the Northeast Atlantic, including the North Sea and the Baltic is generally done under coordination of the International Council for the Exploration of the Sea (ICES). All countries bordering and fishing the seas in this area are members of this body. The Council has its headquarters in Copenhagen. ICES provides management advice for practically all European Atlantic fisheries, with the exception of tuna.

The advice is prepared by working groups, consisting of biologists from the member countries with an interest in the species concerned. The working groups have annual meetings, where the results of contributions to routine research programmes - surveys, sampling programmes, etc. - are brought together and evaluated, as well as those of ad hoc research into specific problems.

The Advisory Committee for Fisheries Management (ACFM) controls the quality of the working group reports and bases the final biological advice on them. In total, ACFM provides advice on 68 stocks of 19 different species in the Common Fishing Zone.

ACFM reports its advice to the North-East Atlantic Fisheries Commission, the executive body of the North-East Atlantic Fisheries Convention. Originally all nations participating in the NE Atlantic fisheries were separate members of NEAFC, but effectively since the inception of the CFP the EC represents the Member States. Although NEAFC appears to be the right forum for negotiating TACs shared with Norway, but Norway prefers to do this bilaterally. The EC is the main user of the scientific results produced by ACFM.

Rather excessively the EC asks its own advisory body, the Scientific, Technical and Economic Committee on Fisheries (STECF), to review and comment upon the ACFM advice. As most STECF biologists are also concerned with the formulation of the ACFM advice, only where this is considered relevant comments are made. Generally STECF effort is mainly directed at ad hoc questions of the Commission.

In 1991 ACFM has changed its approach to formulating the advice. Whereas formerly recommendations on catch and effort levels were made according to self chosen management objectives, now the responsibility for choosing the objectives is left to the managing bodies. For itself ACFM has set the objective: 'To provide the advice necessary to maintain viable fisheries within sustainable ecosystems'. In its advice ACFM presents options as to how management objectives can be reached, as well as the implications and consequences of these options and their associated risks. Only where stocks are, or tend to be exploited outside safe biological limits, recommendations are made on measures to rectify this situation (Serchuk & Grainger, 1992).

The structure of the working groups has been changed as well. From species based groups they have been reorganized into area based groups. This should enable the biolo-

gists to take into account interactions between stocks and fisheries. Only a few species based working groups were maintained, e.g. for herring.

For the Baltic Sea fisheries for cod, salmon, herring and sprat, the EU takes into account the recommendations of the International Baltic Sea Fisheries Commission (IBSFC), a similar body as NEAFC, on TACs and shares of contracting parties (EC, 1995).

Every fall the European Commission makes a proposal on TACs and quotas for the coming year, based on the available advice and recommendations. The final decision is made by the Council of Fisheries Ministers, generally in the December meeting. The Council usually adopts most of the Commission proposals unchanged, but particularly when drastic reductions of TACs are proposed, the Council tends to try and alleviate the cutback. On the other hand, any room for an increase of TACs tends to be eagerly seized. Such political pressure, generally in line with pressure from the industry, has an intensifying effect on the overfishing tendency that the management policy is meant to counteract.

The management of Atlantic tuna fisheries is done by the International Commission for the Conservation of Atlantic Tunas (ICCAT). The ICCAT secretariat is established in Madrid.

Fisheries for Atlantic tuna are not managed by TAC at the level of the European Union. The Member States France, Portugal and Spain, having considerable interests in those fisheries, are contracting parties to the ICCAT on an individual basis. Union waters are only an insignificant part of the area covered by ICCAT, and for the EU-members concerned, most of their tuna fisheries lie outside the Common Fishery Zone. Besides, tuna are highly migratory and species visiting the CFZ do so only for limited seasons.

A good view of the way of working of ICCAT and of the state of biological knowledge of Atlantic tuna species is given in (ICCAT, 1993).

1.2 Mediterranean fisheries

Species and stocks

The number of species caught in the Mediterranean by the four EU Member States as specified by FAO is about 115; roughly 55 demersals, 25 pelagics, 15 crustaceans and 20 molluscs (FAO, 1993). Specifications vary from 40 species in Spain to 70 in France. In quite a few instances species are entered in some countries under their particular name and in others under a collective name (with the appendage *nei*). Sometimes entries are there under the particular as well as the collective name. This indicates varying levels of accuracy in the collection of data, probably also connected with the importance attached to the species in the region concerned.

The contributions of the main groups of species to the total catch of 0.8 mln tonnes are shown in figure 1.3. A significant contribution is made by the item '*marine fishes nei*', meaning that for seven percent of the total catches no further specification was known than that these were marine fishes. Molluscs contribute over one third to the total catches, mainly by Italy, which takes care of nearly three quarters of the EU Mediterranean mollusc production. The main species is the *Mediterranean mussel*, contributing more than half to the total mollusc production.

Mussels are also the most important species by volume produced in the Mediterranean, as is shown in figure 1.4 11). Of the 22 species contributing over one percent to the Mediterranean catch by EU Members (apart from the *natantian decapods nei*), seven are demersals, eight pelagics and again seven molluscs. In total the 23 species of figure 1.4 contribute close to 80% to the total catches. The figure does not only display the most important species by volume, but also most of the economically important species fished in the Mediterranean.

A striking number of the 23 most important (groups of) species is fished exclusively or almost exclusively by one country. Apart from the mussels (only not produced by Spain), this goes for all shellfish species: *striped venus* and *carpet shells nei* are practically exclusively fished by Italy, as are the *marine molluscs nei*, and *Portuguese cupped oyster* is produced exclusively in France. *Chub mackerel* and *Mediterranean horse mackerel* are fished exclusively by Greece and *picarels* almost. *Natantian decapods nei*, a collective name for shrimps, are almost exclusively reported by Italy.

Hake is the most important demersal fish species, particularly for Italy, where more than two thirds of the catches are made. *Bogue* is important in Greece, where nearly two thirds of the catches are landed; most of the balance is caught by Italy. Catches of *red mullets* appear to be of minor importance in France, but are quite significant in the other Member States. Aquaculture production of *seabass* and *gilthead seabream* (dorade), in Greece mainly, is included in FAO statistics. Catches by fishing of these species are relatively modest.

There are hardly any directed fisheries, where particular gears catch particular species, in the Mediterranean. In fact, in most bottom fisheries target species can hardly be distinguished from bycatches. The only partially directed fisheries are (STCF, 1992, p. 14):

- deep water prawn trawl;
- surface long-lines for albacore and swordfish;
- dredge for clam.

The fisheries for the small pelagics *sardine* and *anchovy* are traditionally important for the purse seining/ring netting/lampara sections of the fleets of all Member States, particularly in Spain. Anchovy is a high priced species and is therefore economically attractive. Sardines are generally low priced and fishermen occasionally even try to avoid catching them. *Atlantic mackerels* are caught throughout the Mediterranean, partly as one of the products of mixed local fisheries. The same goes for *jack and horse mackerels nei*, which are however not reported by Greece (perhaps because these are considered important enough to report them by their specific names, like chub mackerel and Mediterranean horse mackerel).

The large pelagics *bluefin tuna* and *swordfish* are amongst the economically most important species of the Mediterranean. Greece has virtually no bluefin tuna fishery, but the species is particularly important for France. On the other hand, France has no fishery for swordfish and it is of minor importance in Spain. But the swordfish is of major importance in Italy, and although the fishery has developed only rather recently, it is of growing importance in Greece (GFCM, 1992).

Octopuses are a valuable and important species in all Member States, but especially so in Spain and Italy. Over three quarters of *common cuttlefish* catches are made by Italy and nearly all of the balance by Greece.

Most of the demersal species are caught in diverse, multi-species and multi-gear fisheries, with a local character. Only in a few areas fleets of various countries are interacting: the Gulf of Lions (France and Spain), the Adriatic (Italy and non-Members) and the Ionian (Italy and Greece). In the Gulf of Lions this concerns primarily the fisheries for hake and anglerfish; in the other areas all kinds of demersals. The limited extent of interaction of fleets is reflected by the sedentary nature of most of the stocks with little exchange with stocks farther afield. The statistical areas defined by the General Fisheries Council for the Mediterranean (GFCM) in quite a few instances cover several unit stocks of a species. Hake

1) The unspecified *marine fishes nei* are not included in this figure.

is one of the few important demersal species where the stocks may cover wide areas (STCF, 1991).

The fisheries for small pelagics generally have a more directed character, using encircling nets or pair trawls, but they are largely restricted to local coastal zones as well. Most of these fisheries are seasonal, due to migrations of the fish. Related to their greater mobility, the small pelagic stocks cover wider areas than demersals, with more sharing of stocks between various fishing areas. Interaction of fleets from various countries occur in the same areas as with the demersal fisheries, with addition of the Aegean.

The fisheries for the highly migratory large pelagics are the only truly international ones in the Mediterranean. Also countries from outside the Mediterranean, like Japan, are participating in it, and even vessels under flags of convenience ¹²⁾ have been observed. Some of the more traditional fisheries, using passive gears like gill nets and long lines, have a rather local character, but the more modern vessels follow the seasonal migration of the fish over extended ranges. Each species is considered as one unit stock in the Mediterranean, the swordfish being independent, the others being part of Atlantic stocks (Miyake, 1993). Local components of swordfish stocks are suspected to exist in Greek waters (GFCM, 1992).

Analyses of the level of exploitation of demersal stocks indicate, with a few exceptions, that they are fully or over exploited. Generally higher levels of exploitation are found with long living species. In most cases a reduction of size of the fish and of CPUE is observed, and mortality rates are generally highest for the juvenile fish. The pelagic resources, on the other hand, do not appear to be fully exploited everywhere (Ancona, 1992).

State of biological knowledge

The marine fauna of the Mediterranean has been and is the subject of extensive biological research. Most of this research used to have a rather academic character, looking into all kinds of aspects of the life and behaviour of fish, crustaceans, molluscs or other species of marine life. Therefore the vast body of biological knowledge is mostly fragmentary and limited to local phenomena, albeit frequently quite profound. According to Farrugio (1992) basic biological parameters like growth, fecundity and sexual cycles, are sufficiently well known in most cases. But other important parameters for the description of the complex Mediterranean multi-species ecosystems, like rates of mortality, recruitment mechanisms, migration patterns and interspecific relations are generally missing. In fact, for the majority of species the geographical and biological delimitation of single (unit) stocks is unknown.

Fishery relevant aspects like resource assessment and exploitation level started to be researched only since the sixties. Now, in the nineties, the first attempts at making analytical stock assessments have been made. This kind of research requires the availability of vast amounts of high quality data. A problem is, that for large parts of the Mediterranean there is a lack of detailed fishery related data, e.g. on fishing effort, landings by size, etc., in sufficiently long time series and of adequate quality. In its summary stock review STCF (1991) found the quality of data 'doubtful' for most species in the areas reviewed and few to be 'good' (except the overall good quality in the Sea of Alboran, South of Spain). Similar conclusions can be drawn from the reviews of the most important species in the Interim Report (see appendices A2 and A3).

Due to the small scale and widely scattered nature of most fisheries, where considerable amounts of the fish landed are sold directly to traders or even final users, even the basic collection of landings data poses its problems, as became apparent above and is corroborated in the Mediterranean Observatory (1994). In spite of the huge efforts in this field over the last ten years, that certainly have had a very significant effect, data collection still is a recurrent top item of GFCM recommendations (GFCM, 1995).

2) Here particularly not being Contracting Parties to ICCAT (apart from offering the usual legal and fiscal benefits).

In its FAR and FAIR programmes and its special Mediterranean research programme, the EC has supported and is supporting a considerable number of projects to assess and increase the level of fisheries biological knowledge. On one hand this concerns comprehensive collections and compilations of available or new fisheries biological data. Some examples are: Farrugio et al., (1991), Campillo (1992), the Mediterranean Observatory (1994) and COFREPECHE (1995). These studies are not just useful on their own, but data and knowledge on certain species in certain areas, laid down in these studies, could well be used as a first approach for stocks of the same species in other, not (yet) researched areas. On the other hand a wide variety of new biological research, ranging from Bottom Trawl Surveys in each Member State to very comprehensive and detailed descriptions of local, small scale fisheries (like Petrakis et al., 1993) have been and are supported.

For most Mediterranean demersal fisheries, by their nature the methods for monitoring and stock assessment developed for and used in the management of most major Atlantic fisheries can not be easily applied. Different approaches have to be developed, like direct monitoring of the stocks through time series of surveys of stock and pre-recruits. Management advice could be based on the interpretation of the stock indices derived from that (STCF, 1991). Another disturbing factor in making 'classic' stock assessments, are the cyclical fluctuations in abundance of certain species that have been observed in the Western Mediterranean (Farrugio, 1992).

Mediterranean fisheries biologists are astonished by the phenomenon that fisheries based on massive catches of juveniles of certain species can be sustained throughout the years. Apparently very small stocks of adults are able to produce sufficient recruitment, and can continue to do so, as they live outside the traditional fishing areas. Both Farrugio (1992) and Caddy (1991) have warned that this phenomenon requires careful study before measures (like mesh size increases) are introduced that could change the fishing pattern and endanger such adult stocks.

There is general agreement between fisheries biologists, that environmental changes in the Mediterranean (pollution, eutrophication) have (had) significant effects on fisheries. These changes are generally observed with concern (GFCM, 1995), although in certain areas increases in production have been ascribed to fertilisation of the sea by effluents of human origin. But such increases could as well be partly the result of statistical improvements (Caddy and Griffiths, 1990).

Role and activities of GFCM 13)

The General Fisheries Council for the Mediterranean was established in 1949 on the initiative of the UN Food and Agriculture Organization FAO. The working area of GFCM also includes the Black Sea and connecting waters. Although legally a separate international body, in fact it is strongly connected to FAO, having to report bi-annually to the Director General of FAO. FAO provides most of the funding, FAO officers are closely involved in GFCM work and the GFCM Secretariat keeps close contact with the FAO Fisheries Department.

All states surrounding the Mediterranean now are Members of GFCM, except some of the former Yugoslavian states. Monaco is the only country that is not also a FAO Member. The financial contribution is considered to be made through FAO. Lack of funding, however, has chronically impaired the level of activities of the Council. It has become customary for countries hosting sessions of GFCM or subsidiary bodies to take account of their costs. The EC has also on a number of occasions financially assisted in the organization of meetings. In its latest session the Council suggested the establishment of a fund for voluntary contributions by Members, in order to finance strengthening of GFCM.

The functions and activities of GFCM are very broad, covering the biological, scientific, economic and technical aspects of problems of management and development of living marine resources. More specifically GFCM is responsible for:

3) This paragraph is largely derived from Tsimenidis and GFCM, 1995.

- keeping under review the state of these resources and for recommending measures for their conservation and rational management;
- keeping under review the economic and social aspects of the fishing industry and recommending measures for its development;
- encouraging, recommending, coordinating and, as appropriate, undertaking research and development, and training and extension activities in the field of fisheries and the protection of living marine resources;
- disseminating information on exploitable marine resources and associated fisheries.

For the execution of these tasks, GFCM has set up a number of subsidiary bodies, who by their work also provide the basis for the bi-annual sessions of the Council. The Executive Committee conducts the current business between Council sessions. The Committee on Fisheries Management studies possible management measures and their effects and makes recommendations on their implementation and on methods of control at a national level. The Working Party on Fisheries Economics and Statistics on one hand has to determine the most relevant data on fisheries for bio-economic research, to review the quality of data being collected, and to recommend cost-effective methods for collection. On the other hand it has to promote bio-economic and socio-economic research on fisheries, to study the (socio-) economic effects of management measures and to develop analytical tools to facilitate fishery economic research. In its 1995 meeting the Council decided to establish a Committee on Aquaculture.

In addition Technical Consultations have been and are held on a more or less regular basis on stock assessment in various sub-regions of the Mediterranean: the Western, the Central and the Eastern Mediterranean, the Gulf of Lions and Balearics, the Adriatic, and finally, but outside the scope of this study, the Black Sea. Reports of the Technical Consultations are usually submitted to the Committee on Fisheries Management. Also there are Ad hoc Working Groups on specific resources, e.g. the Joint GFCM/ICCAT Working Group on Large Pelagics, and Ad hoc Meetings of Experts on specific fishery management subjects.

The First Joint GFCM/ICCAT Expert Consultation in Bari, 1990, marked the start of a cooperation between the two bodies on the management of the large pelagic fisheries in the Mediterranean. Basically both organizations are to a certain extent responsible for this field of fishery management: the fisheries take place in the GFCM working area, and it concerns stocks, or at least species managed by ICCAT in the Atlantic. After a couple of these Joint Expert Consultations and the establishment of the Ad hoc Joint Working Group on (the assessment of) Large Pelagics, the organizations strive to formalize their cooperation '.. also at the management level, by involving (them) in the decision-making process as regards the management of large pelagics in the Mediterranean' (GFCM, 1995, p.17).

The signatory states have ceded specified powers to the Council as a fishery management body, that have largely remained latent to date. The Resolutions of the Council generally have an advisory character: Members are in fact free to include them in their rules and regulations or not. Of course this reduces the urgency of decision making and as a consequence, in combination with the bi-annual meeting schedule, the mills of GFCM grind rather slowly. However, recent Council Meeting Reports are showing an increasing sense of urgency. On one hand this is probably connected with the poor state of many demersal stocks. On the other hand the Council possibly is feeling the hot breath of the EU, preparing a Common Fisheries Policy for the Mediterranean, in its neck. Anyway this has resulted in a call for strengthening of GFCM, by strengthening the Secretariat, regular intersessional meetings of all advisory bodies and an expansion of the Executive Committee. The availability of funds is the restrictive factor in the realization of the desired strengthening.

1.3 Comparison of Mediterranean and Atlantic situation

Stocks

Mediterranean fisheries are commonly characterized as being extremely diverse. However, when comparing the FAO catches and landings statistics of the European Mediterranean and Atlantic fisheries, there is no direct evidence of a greater diversity of the former. As Farrugio (1992) is speaking of 150 species caught in the Mediterranean, and FAO statistics only show little more than 100, apparently difficulties in statistical data collection trouble the picture. Still it may not be totally wrong, as the comparison that generally is made, most likely concerns the more northern EU countries and fisheries. Here the typical large single stocks, spread over wide areas and fished with a small variety of gears by a number of different nations and fleets can be found. But the more southerly, the more the fisheries look like the typical small scale, mainly local, highly diverse multi-species, multi-gear fisheries of the Mediterranean. This already begins with the, as such not really small scale or local, French artisanal fisheries of the Celtic Sea (Salz, 1996), showing a great diversity of species and gears. In fact diversity is a characteristic of most small scale inshore fisheries, also in more northern waters, only there the large scale fisheries are dominating. By lack of extensive fishing grounds and large single stocks, a similar dominance of large scale operations is not to be expected in the Mediterranean.

The composition of species groups differs widely between the two areas. In the Atlantic fishes dominate, with a contribution to total catches of 85%, equally divided over demersals and pelagics (figure 1.1). In the Mediterranean fishes contribute just over 60% to the total production, with not specified species accounting for a substantial 7%; molluscs make the greatest contribution, closely followed by pelagic species; the contribution of specified demersals is about half of that in the Atlantic (figure 1.3).

A remarkable difference appearing from the FAO Statistics is the concentration of many of the major fisheries (by volume) in the Mediterranean in one or two countries. In the Atlantic this is only seen with the industrial species sandeels and Norway pout (almost exclusively exploited by Denmark), and the Pacific cupped oyster (farmed in France). The commercially interesting species are mostly caught by a variety of countries.

Biological knowledge

Mediterranean fisheries biologists tend to idealize the situation in the Atlantic, where it seems that standard methodologies for stock assessment can be applied widely and high quality data are generally available. On closer look, however, it appears that only one third of Atlantic TACs is based on analytical assessments. In quite a few instances, stocks are managed by the EC, on which no biological advice can be given at all (table 1.1). But certainly it is true that biologists have a pretty good idea of the extent, biology, interactions and state of the stocks they are monitoring in the Atlantic. In the Mediterranean, in spite of a vast body of basic biological knowledge, the size and extent of most stocks is unknown. In the Atlantic biologists can prove that certain stocks are more or less heavily overfished; in the Mediterranean this can only be suspected.

On the other hand the Mediterranean biologists are well aware that the Atlantic standard methods are not generally applicable in Mediterranean fisheries. The high quality and availability of data that are required is one problem. Another one is the mixed character of the fisheries, making it virtually impossible to allocate catches by species to effort by method in a useful way. In quite a few cases the collection of simple data on effort, CPUE and average fish sizes can suffice to adequately monitor the state of stocks. Another way to provide the necessary information on the state and development of stocks, avoiding excessive cost of data collection, can be direct monitoring by surveys. Also new approaches are developing to cope with the complexities of Mediterranean fisheries in providing management advice, e.g. multi-species bio-economic modelling (IREPA, 1995b).

Advisory bodies, procedures, measures

The Atlantic fisheries have a relatively long tradition with international management, starting shortly after WWII with the 'Overfishing Convention'. Initially purely technical measures, like minimum mesh and fish sizes, closed seasons or areas, were taken. Although the measures agreed upon had an advisory character, they were generally adopted and enforced by the members. The introduction of TACs and quotas in the mid-seventies by NEAFC marked a significant break, but also these measures were still in effect advisory. Only when agreement was reached on the conservation part of CFP in 1983, the measures became obligatory, having power of law, for the Member States.

ICES, as a body for the coordination of international fisheries biological research, has an even much longer history. Consequently the Atlantic biologists have had ample time to put their act as fishery management advisors together. And at that, supply and demand of advice have been mutually stimulating. That does not mean that all (commercially important) species, fisheries and areas are covered with the same intensity. Research is still primarily focused on the large fisheries of the northern waters, and apart from possible technical problems, budgetary restrictions prevent expansion to and intensification of research on less well known fisheries and species.

Although GFCM was also established not long after WWII, the position of fishery management in the Mediterranean is still more or less comparable to that in the early stages of NEAFC. The measures agreed upon are mainly technical and they have the character of recommendations. The history of NEAFC shows that, as long as management measures do not have power of law, such measures may be ignored if they are not considered 'opportune'. This lack of power, connected with the continuous scarcity of funds, looks like a vicious circle. It is doubtful that this will be changed by the establishment of a CFP for the Mediterranean.

The lack of power of GFCM has not been stimulating the biologists to put their advisory act together in a similar way they were able to do in ICES. They consider it a problem that there is no forum for intercountry scientific discussions and for the coordination of scientific programmes like ICES in the Mediterranean (STCF, 1992).

1.4 Implications for a Mediterranean CFP

- In view of the local, small scale nature of most of the Mediterranean fisheries, having little or no interaction with fisheries from other countries or even regions, subsidiarity should be the leading principle in setting up a CFP for the Mediterranean. The EC should create a forum for coordination of management, particularly where fisheries and fleets from different regions or countries interact, leaving the management of local fisheries to local authorities. The conservation part of the CFP should be primarily directed at shared or straddling stocks.
- This entails in the first place, that regulation should concentrate on the fisheries for stocks extending into the waters of several Member States (e.g. hake and small pelagics), or where the fleets of several Member States interact (e.g. in the Gulf of Lions, Thyrreanean and Ionian). In such regulations, relative stability between fisheries and between countries probably will have to play an important role.
- Secondly appropriate and adequate third country agreements have to be made. Such agreements and following amendments could be discussed and prepared within the framework of GFCM, but will eventually have to have a bilateral character.
- As a consequence of the general lack of adequate stock assessments, mainly due to the complexity and diversity of the fisheries, the main management instrument will have to be effort control. This fact has been long recognized by STCF (1991 and 1992). Also GFCM is working on it (1995), primarily in connection with the UN Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas (the latter covering most of the Mediterranean).
- With respect to the management of the important highly migratory large pelagics, ICCAT can play a more pronounced role, on its own, but preferably in cooperation with GFCM.

2. STRUCTURAL POLICY

In this chapter the implementation of structural policies in EU Member States will be highlighted. After a brief discussion of the objectives of structural policy in section 2.1, the implementation of MAGPs in some Member States is presented in section 2.2, starting out with the Mediterranean countries Italy and Greece in sub-section 2.2.1. In sub-section 2.2.2 the policies in France and Spain, which have fleets operating in both Atlantic and Mediterranean waters, will be described. Sub-section 2.2.3 continues with the presentation of structural policy in two Atlantic Member States, Denmark and the United Kingdom. Finally, in section 2.3 the comparison of Atlantic and Mediterranean policies and the implications for future structural policy will be discussed.

2.1 Objectives and instruments of structural policy

The original objectives of the Common Structural policy, as described in Regulation No. 101/76, were

'...to promote harmonious and balanced development of the industry within the general economy and to encourage rational use of the biological resources of the sea and of inland waters'.

Priority was given to grants for modernisation and construction of vessels to eliminate the deficit in supplies of most species of fish in the EC. In the mid-eighties, as awareness of the biological constraints grew, the emphasis shifted to reducing fishing capacity of the fleets. Multi-annual guidance programmes (MAGPs) became the major instruments for coordination of structural policies. Their objective is defined in Regulation No. 2908/83 as achieving

' a satisfactory balance between the fishing capacity to be deployed by the production facilities covered by the programmes and the stocks which are expected to be available during the period of validity of the programme'.

In MAGPs, targets are set for reduction of fishing capacity of the Member States' fleets in terms of GRTs and kW. These programmes are legally binding to the Member States and it is their responsibility to develop policies to meet their targets. The only way that the Commission can enforce the MAGPs is by not approving applications for new grants for modernisation and construction by those Member States which have not met their targets (Holden, 1994). Adjustment of fishing capacity has become the number one priority of structural policy. This means that there is a strong link between structural policy, conservation policy and the maintenance of profitability of the fleets.

In 1993, structural policy with respect to the fisheries sector was fully integrated into the Structural Funds mechanism. All of the structural measures were brought together within a single regulatory mechanism (Council Regulation (EC) No. 3699/93) and the financial instruments for structural policy were grouped together within a single Financial Instrument for Fisheries Guidance (FIFG) (Council Regulation 2080/93), designed to contribute to Objective 5a (adaptation of agricultural and fisheries structures). Furthermore, most areas dependent on fisheries are part of Objective 1, 2 or 5b regions, which means that they are also eligible for assistance from the European Social Fund or the European Regional Development Fund (European Commission, 1995).

At the same time as the FIGG was set up, the PESCA Community Initiative was developed. PESCA is specially devoted to socio-economic measures in support of areas dependent on fishing. The PESCA Community Initiative makes it possible to get assistance from several Structural Funds simultaneously.

2.2 Multi-annual guidance programmes

The first generation of Multi-annual Guidance Programmes (MAGP I, 1983-1986) imposed the maintenance of the capacity of each country's fleet at the 1983 level. This goal was not achieved by most of the Member States. In MAGP II (1987-1991) a capacity reduction of 2% in kW and 3% in GRTs compared to MAGP I objectives was required. For those countries that had not met their MAGP I targets, the actual required reduction was of course larger. Again, these targets were not met by a majority of the Member States (Holden, 1994).

In MAGP III (1993-1996), (1992 was a transitory year, during which the negotiations for MAGP III took place) different objectives were set for different fleet segments. These sectoral targets are a 20% reduction in fishing effort for those fleets using bottom trawls to fish for demersal species, a 15% reduction for those using bottom trawls and dredges to fish for benthic stocks. Again, for those countries that did not meet their MAGP II objectives, the resulting lag was carried over to the objectives for MAGP III. Contrary to the former MAGPs, in MAGP III Member States were given the opportunity to realise the required reduction of fishing effort partly (up to a maximum of 45%) through a reduction in fleet activity (defined as the number of days spent at sea¹). However, most of the Member States have planned to achieve the targets purely through capacity reductions. Only the Netherlands and Italy plan to reduce fishing effort through cuts in activity. In table 2.1 the MAGP targets and actual situations of some Member States' fleets are summarized. Further information about fleet structure and MAGP targets can be found in appendix B.

Table 2.1 Objectives of MAGPs and actual situation of the fleets of some Member States

Member State	Unit	Objective 31 Dec 91 (a)	Situation 31 Dec 91 (a)	Objective 31 Dec 96 (a)	Situation June 95 (b)
Denmark	GRT	119 188	114 621	111 639	98 772
	kW	514 716	472 146	471 762	412 723
France (excl. over-seas departments)	GRT	201 604	198 803	180 557	181 760
	kW	1 055 050	1 088 949	948 591	997 548
Greece	GRT	126 528	130 373	117 056	120 325
	kW	688 203	664 193	657 547	662 768
Italy	GRT	268 198	267 471	249 182	259 981
	kW	1 541 664	1 536 518	1 464 680	1 513 871
Spain	GRT	673 303	645 103	618 174	613 521
	kW	1 955 372	1 917 442	1 803 927	1 849 993
UK	GRT	193 027	214 733	176 981	239 783
	kW	1 095 206	1 228 922	1 015 214	1 104 406

Source: (a): OJ No L166/1-45 Commission Decisions 95/238-248/EC; (b): European Commission, DG XIV (1995).

4) In MAGP III fishing effort is defined as the product of capacity and fishing activity.

2.2.1 National policies for implementation of MAGPs in Mediterranean countries

Italy

The Italian fishing fleet consists of around 16,000 vessels with a total of 260,000 GRT and 1,5 mln kW. Apart from the category of multi-purpose vessels which is very heterogeneous, trawlers targeting demersal species make up the most important component (1700 vessels, 95000 GRT). Other important components are the purse seiners fishing for anchovy and sardine, long liners, netters and drifters targeting tuna and swordfish and the hydraulic dredgers fishing for clams (Lassen, 1996).

According to MAGP II (1987-1991), the Italian fishing fleet was required to reduce its GRT by 2% through the introduction of measures dealing with effort adjustment and fleet renewal. In order to achieve the MAGP targets, the following subsidies were applied along the lines of Regulation No. 4028/86:

- subsidies for decommissioning old vessels;
- subsidies for temporary withdrawal of trawlers and pair trawlers;
- subsidies for temporary and permanent joint ventures when exploiting external resources (third countries);
- subsidies for vessel construction, provided that an equal or larger amount of power and tonnage was withdrawn; in case of trawlers fishing in overexploited areas, withdrawal of a larger amount of tonnage was required to qualify for subsidies (IREPA, 1995).

As a result of these measures the targets set in MAGP II were achieved. In 1992 the fleet, measured in GRTs, was even smaller than required. Some progress has also been made with the renewal of the fleet. In the period 1987-1992 over 390 modernization projects (6% of the national tonnage) have been implemented and about 120 new boats were financed, while an equal number of old vessels was scrapped.

The principal objectives of MAGP III (1993-1996) are a further modernization of the fleet and a reduction of fishing intensity. As required by MAGP III, the reduction of fishing capacity has been concentrated on trawlers. The reduction of the trawler fleet contributes to the establishment of an economic and biological equilibrium because of the low efficiency of the trawler fleet in combination with its excessive capacity in relation with fish stocks. Therefore MAGP III is being used to reallocate vessels towards more efficient fleet segments which have more acceptable economic yields. A further reduction of fishing effort is planned between now and 1999 through permanent withdrawal (33,600 GRT) and through the creation of joint ventures.

The policy heavily relies on the licensing system which was introduced in 1982. The issue of new licences for trawlers has been forbidden and priority for building new vessels is assigned to cases in which a licence for trawling is transferred to a different segment. Furthermore, priority for decommissioning and withdrawal is given to those vessels using trawls and fishing in areas where stocks are more depleted.

The Italian licence system is based on the operational characteristics of the vessels. In the licence the fishing zone in which the vessel is allowed to fish is specified. Professional fishing without a licence is not allowed. Four types of licences are distinguished corresponding to four components of the fleet:

- Local fisheries ('pesca locale'), allowed to operate within 6 miles from the coastline. This component comprises 85% of the total number of Italian vessels;
- Coastal fisheries ('pesca ravvicinata') for vessels allowed to operate within 20 miles from the coastline;
- Mediterranean fisheries ('pesca mediterranea') for vessels allowed to operate in the Mediterranean Sea;
- Oceanic fisheries ('pesca Oceanica') for vessels allowed to operate outside the Mediterranean Sea.

In the Italian system, the fishing licence is an administrative document issued by the Ministry. The licence system is used as a tool to redistribute fishing effort among different

fishing areas and different fishing gears in order to achieve biological equilibrium and economic efficiency.

The main characteristics of the licence system are:

- Licences are divisible in the sense that they may be aggregated in order to build a larger vessel. However, from a larger vessel it is not allowed to build more than one smaller vessel.
- Licences are transferable, except in the case of clam fishery. A market has developed only for trawler and dredges licences. Licences for using other gears have no value because of the low demand for such licences and because new licences for these gears are still issued in exceptional cases.
- Licences are valid for a period of four years. Renewal is secured on demand of the licence holder. A licence loses its validity in case of:
 - * bankruptcy or dissolution of the company;
 - * no request for renewal at the end of the four year period of validity;
 - * ending the fishing activities on a voluntary basis;
 - * transfer of the vessel to another owner or to another administrative district without notifying the Ministry within a 60 days term.
- Licences are registered in the National Archive of Fishing Licences (ALP) and every change in ownership and structure of the vessel is monitored. The licence system is strongly centralized to avoid abuse.

Fishing effort is restricted by a set of measures concerning the time spent at sea:

- Weekend bans. Fishing is not allowed during weekends and national days (JDM, 5.7.94).
- Temporary withdrawal. Fishing activity by trawlers and dredges is closed for 30 or 45 days a year, depending on the available budget for compensation. The period of temporary closure varies from year to year, according to the spawning season in different fishing areas. The ban is compulsory for the eastern fishing grounds, while it is facultative for all other Italian fishing grounds. This facultative closure is respected by virtually all fishermen. During the closed season fishermen obtain a premium per vessel per day which is the same as the one set in the EC rule. For clam fisheries a second month closure is established each year, but no financial compensation is given in this case.
- Days-at-sea. For dredges, fishing time is restricted to eight hours per day and to four days a week. For a two month period after the temporal withdrawal, fishing with dredges is limited to three days a week. For all other gears there are no restrictions on days-at-sea.

The EU structural policy has played an important role in the restructuring and modernisation of the Italian fleet. As a result of the decommissioning subsidies, MAGP targets have been fully achieved. However, the effects of structural policy on fish stocks are not clear. It is believed that national measures taken by the Italian administration had a larger impact on resources (IREPA, 1995).

Greece

According to the targets set in MAGP III, Greece will have to reduce the capacity of the fleet before the end of 1996 by about 5,000 kW and 3,000 GRT as compared to the situation of 1991. The bottom trawler fleet operating in coastal and Mediterranean waters is to be reduced by 20%, while the capacity of the trawler fleet operating in third countries and international waters must be decreased by 15%. The actual situation of the Greek fleet is roughly in line with the MAGP objectives.

The Greek fleet consists of 20,300 mainly old vessels (1995), but in the last fifteen years the fleet has been modernised and improved dramatically. This modernisation was carried out with financial aid from national and Community funds and with loans granted by the Agricultural Bank of Greece.

The Greek fisheries are divided in a coastal, a medium and an overseas component, which are administrated distinctly through the gear licence system. The coastal fisheries are the fisheries operating in the coastal zone with vessels employing mainly set gear (gill and

trammel nets, surrounding nets, hook lines, longlines, traps, etc.) and certain types of towed gear (dredges and beach seines). The coastal fleet represents about 95% of the number of vessels, but it accounts for only 51% of total production.

The medium fisheries include trawlers targeting different demersal species like hake, picarel, mullet and sea-breams and purse seiners fishing for sardine, anchovy, bogue, mackerels and tunas. This fleet segment lands 40% of total production while it represents only 4% of the total number of vessels.

The last segment are trawlers fishing outside the Mediterranean Sea, mainly in the Atlantic Ocean. The Atlantic fleet represents 9% of production (mainly shrimps and finfish species) and 0.4% of the number of vessels (European Commission, DG XIV, 1995 and Lassen, 1996).

There is no quota system in Greece, which means that fisheries are regulated through effort restrictions and technical measures. For this reason conservation of stocks relies heavily on structural policy.

Effort is being restricted by means of conditions layed down in the fishing licences:

- Trawlers are not allowed to fish from May to September.
- The closed season for purse seiners lasts from December till March.
- The coastal fishing vessels may operate throughout the year.
- The duration of fishing trips is restricted in all cases to only a few days:
trawlers 2-5 days, purse seiners 1-2 days, coastal vessels 1/2-2 or 3 days.

The main objective for structural policy between now and 1999 is a further modernisation of the fleet, the processing industry and the infrastructure. At the same time aquaculture is to be further developed and the capacity of the trawler fleet will be further reduced, by means of permanent and temporary withdrawals and the establishment of joint ventures.

2.2.2 Implementation of MAGPs in France and Spain

France

Although MAGP I was not very demanding, France had some difficulties in maintaining the overall fleet power at the 1983 level. As a result of this, the EC interrupted its aid package for construction and modernisation and all measures encouraging the increase of fleet power had to be suspended (Kalaydjian, 1996).

MAGP II required a 2.4% decrease in the fleet's total power. In 1988 a new system of capacity licences (Permis de Mise en Exploitation) was introduced to accomplish this objective. The system of PMEs, designed to limit entry, became the main national policy tool for implementation of MAGPs. The PME is not required for vessels in operation, but it is necessary in case of new construction, modernisation or other adjustments. After the introduction of this system in 1988 a market for PMEs came into being. However, new adjustments introduced in 1991 made possession of free kW's useless, as all investments had to be approved by the authorities. In case of approval, the investor is given the necessary PME. Construction of new vessels was limited by the obligation to withdraw from the fleet an equivalent amount of power. For vessels of less than 25 m, additional kW's are allocated by the Ministry to each region, taking account of the situation of regional fleets and the expected number of vessels to be decommissioned. Each Regional Commission for the Modernisation of the Fleet (COREMODE) allocates these regional kW quota to applicants on the basis of the quality of application files. For vessels over 25 m, the Ministry itself determines the amount of kW's to be allocated to applicants. Through this PME system, entry and withdrawal were balanced but this was not enough to meet the MAGP II objectives.

In March 1991, a decommissioning scheme called the 'Mellick plan' was introduced. The objective was to reduce total fleet power by 10% (100,000 kW). Under this system, vessel owners could be awarded a decommissioning premium for vessels over ten years of age. The qualifying vessels, 90% of which were under 12 m, were scrapped. By the end of 1991 the objective was met and France was roughly in line with its MAGP II targets (table 2.1). 973 Vessels were scrapped at the cost of 188 mln FF in subsidies. The EC funded 70%

of total costs. Some 1,400 jobs were lost, although a significant number of the fishermen involved, was able to embark on another vessel.

In MAGP III, objectives are formulated for seven segments of the French fleet (table 2.2). The demersal trawler fleet is to be reduced by 20% and polyvalent static gears in Atlantic waters by 15%. For the total French fleet, excluding the overseas segments, this implies a reduction of about 19,000 GRT and 141,000 kW (table 2.2). The Atlantic part of the fleet has to account for a reduction of 18,000 GRT and 128,000 kW while the Mediterranean fleet must be reduced by 1,000 GRT and 13,000 kW. The targets for the tropical tuna freezers are set equal to the actual situation in 1992 while the capacity of the overseas segments of the fleet is allowed to increase slightly.

In the course of 1993 a new 20,000 kW decommissioning scheme was introduced to meet the MAGP III targets. It remains to be seen if this second decommissioning scheme will be sufficient. Some observers think that, in addition to the official figures of 1995 (table 2.1), there is a trawling capacity surplus of 40,000 kW (Kalaydjian, 1996).

Table 2.2 MAGP III targets and actual situation of the French fleet (excl. overseas segments)

Fleet segment	Engine power (kW) (* 1000)		Gross tonnage (GRT) (* 1000)	
	Situation 1.1.1992	Objective 31.12.1996	Situation 1.1.1992	Objective 31.12.1996
Coastal, EU waters and third countries	825	697	147	129
Mediterranean	177	164	18	17
Tuna freezers	87	87	34	34
Total Mainland	1,089	948	199	180

Derived from: OJ No L166/1-45 Commission Decisions 95/238-248/EC.

Other tools for French structural policy are:

- Subsidies for modernisation and construction may be obtained up to a maximum of 20% of total costs.
- Interest discounts. Beneficial loans with low interest are granted to fishermen with financial problems. In the region Provence Alpes Côte d'Azur a regional development plan was set up in collaboration with the financial organisation 'SOFARIS' in order to facilitate fishermen's access to financial resources.
- Subsidies within the framework of the 'PIMs' (Programmes Méditerranéens Intégrées).

On the basis of EC regulations no. 355-77 and 4042-89, four regional programmes were created in France, three of them concerning Mediterranean France. The programmes include support and subsidies for infrastructural development, commercialisation and promotion of quality of products (CEP, 1995).

Mediterranean France

In 1975 a licence system was set up for trawling in French Mediterranean waters. These licences were required for trawlers with a length of 18 m or more. The aim is to limit the number of these vessels as well as their engine power. In these licences, the fishing zone where the vessel is allowed to operate is specified. The licences are transferable and renewable each year.

A more general system of licences for all kinds of professional fisheries in Mediterranean waters was created by the ministerial regulation of 14 May 1993. Each year the exact number of licences for each type of gear is specified in a ministerial regulation. Each fisherman can hold several types of licences with a maximum of three.

Fishing effort in the Mediterranean is further restricted by time limitations on fishing activities. Trawlers are not allowed to fish in weekends and on holidays. In addition there are strict hours concerning fishing activities of trawlers as a result of autoregulation by the sector. There are no time restrictions for the 'petits métiers' and the tuna-vessels.

Atlantic France

Due to the difference in fleet structures, the MAGP III targets imply different rates of reduction for the Atlantic and the Mediterranean fleet. Polyvalent static gears in Atlantic waters have to be reduced by 15% and the trawler fleet which is to be reduced by 20% is largely concentrated in the Atlantic fleet segment. As a result of this, the Atlantic fleet has to account for the major part of the reduction in capacity (15% in kW) while the Mediterranean fleet is to be reduced by 5% in terms of engine power.

Spain

The Spanish fleet may be divided in (Lassen, 1996):

- the fleet fishing in European Atlantic waters, consisting of long liners, purse seiners, trawlers and a large number of artisanal vessels.
- the Mediterranean fleet, consisting of trawlers, purse seiners and many different small scale gears. For Mediterranean trawlers the main target species are hake, red mullets, blue whiting, anglerfish, squid and red shrimp. However, in the Mediterranean it is not easy to separate target species from bycatch species and target species in many cases account for less than 20% of total landings. Sardine and anchovy are the main target species for the Mediterranean purse seiners with bycatches of mainly mackerels and horse mackerel;
- the tuna fleets fishing in North and South Atlantic waters, around the Canary Islands, in Western African waters and in the Indian Ocean;
- the fleets fishing in African Atlantic waters under several agreements between the European Union and African countries, particularly Morocco, Mauritania and Senegal;
- the long distance fleet operating in international waters (NAFO).

The Spanish fleet has a very high presence in international waters. More than one half of Spanish catches is made in international and third countries waters. The Spanish fleet is therefore to a large extent dependent on fishing agreements between the EU and third countries. In recent years, gaining access to third countries waters has become more and more difficult. This has necessitated a substantial reduction of fleet activity and capacity.

Spain entered the EC in 1986. The first targets for Spanish structural policy were set in MAGP II (1987-1991). By the end of 1991 these targets were fully achieved, both with respect to tonnage and engine power. However, it is not possible to evaluate them separately for the Mediterranean and Atlantic regions, because they were formulated for Spain as a whole.

In MAGP III targets were set per fleet segment. The demersal trawler fleet is to be reduced by 20% and polyvalent static gear in Atlantic waters by 15%. These objectives, set for the end of 1996, had already been achieved in June 1995.

Structural policy in Spain is implemented by means of subsidies, licences and effort restrictions. Subsidies, financed partly by the EC and partly by the Spanish Government, are available for construction, modernisation, temporary and permanent withdrawal of vessels. Effort restrictions play a major role in the management of biological resources. Effort is regulated by means of licences, time limitations and technical measures. For the professional fleet a fishing licence (autorización de pesca) is required. The licence specifies the type of gear and the home port of the vessel. These licences are not transferable to another vessel.

Effort is further restricted by the following time limitations:

- purse seine fishing is only allowed during five days a week, excluding (part of) the weekend, and additional closed periods may be established;

- drifting longline fishing is not allowed to be practised more than 20 days on average per month;
- coastal trawling may only be performed five days a week, with a maximum of 16 hours a day.

Fishing effort in domestic waters is regulated in more detail by the Autonomous Communities. Fishing effort in Community waters is regulated by means of 'censos', 'listas', licences and fishing plans. All vessels with access to specific fisheries or using certain gear have to be registered on the particular 'censo'. Depending on the state of the stock a number of lists of vessels is prepared for distinguished periods of the year, e.g. six 2-months lists. For each period a number of licences is issued. This number is usually smaller than the number of vessels on the list. Subsequently, the involved fleet has to work out a fishing plan indicating which vessels are going to fish and when. The number of licences is the maximum number of vessels allowed to fish simultaneously in each period. Some vessels which are active in seasonal fisheries may be included in various lists.

For fisheries outside Spanish jurisdiction a temporary fisheries permit is required. These temporary permits are issued by the General Directorate responsible. A temporary fisheries permit is required for fishing in the waters of third countries as well as in international waters. The permit specifies the fishing zones, the periods and the type of fisheries.

Mediterranean Spain

The Mediterranean fleet represents about one quarter of the Spanish fleet. The trawler segment, which has to be reduced by 20% represents about two thirds of the Mediterranean fleet (Lassen, 1996). Between 1986 and 1994 a major reduction of the size of the Spanish Mediterranean fleet has occurred (table 2.4).

Table 2.4 Size of the Spanish Mediterranean fleet in 1986 and 1994

Unit	1986	1994
Number of Vessels	5861	5057
GRT	100 351	89 809
kW	456 570	348 408

Source: GEM (1995).

At the same time Spain had access to a substantial amount of EC subsidies for modernisation and construction of vessels. In 1994, 111 construction projects were carried out in the Mediterranean at total costs of 13.6 mECU, which is 55% of total expenditures for construction of new vessels in Spain. In the same year 291.5 mECU was spent on modernisation projects (42% of total modernisation outlays in Spain). Therefore it may be expected that the productivity per kW and per GRT has increased. For this reason the reduction of the size of the fleet may not be associated with a proportional reduction of catching capacity.

Atlantic Spain

A large part of Spanish fisheries is concentrated in Galicia, where the fisheries sector represents about 25% of total employment. According to the MAGP '93- '96, the fleet of trawlers and polyvalent vessels operating in the coastal and EC waters has to be reduced by about 13,000 GRT and 57,000 kW (20%). Temporary and definitive withdrawals are promoted. On the other hand subsidies are available for construction and modernisation, although a relatively large part of these funds is granted to the Mediterranean regions.

2.2.3 National policies for implementation of MAGPs in Atlantic countries

Denmark

The Danish fleet consists of about 5000 vessels (1995), two thirds of which are under 10 m. The fleet can be divided in six segments according to the kind of gear (Lassen, 1996):

- Trawlers including side, stern and pelagic trawlers, fishing for Nephrops, cod and pelagic species. Trawlers are also involved in industrial fisheries in the North Sea.
- Gill netters, mainly targeting cod although very flexible with respect to target species.
- Danish seiners, involved in plaice and cod fisheries.
- Purse seiners targeting pelagic species like mackerel and herring.
- Beam trawlers specialising in flatfish.
- Mussel dredgers targeting blue mussels.

The Danish structural policy has concentrated on a rigorous reduction of the size of the fleet. As a result of this, Denmark managed to meet all of its MAGP targets. The capacity diminished from about 137,000 GRT in 1987 to 99,000 GRT in 1995 while the MAGP III final objective is 112,000 GRT.

This was accomplished through a decommissioning scheme for permanent withdrawal, which consisted of Community aid (up to 70%) and national subsidies of 120 mECU in the period 1987-1993. During this period, a total of 815 vessels, representing 40,000 GRT, has been decommissioned (European Commission, DG XIV, 1995). Priority was given to vessels that were targeting quota-species.

At the same time very few new vessels have entered the fishing fleet, due to a restrictive policy of the Danish authorities. In case of construction of a new vessel, the investor must withdraw 100-130% of the constructed GRT from the fleet, depending on whether the financing is from a private bank or from the state Fiskeribank. As a result of this, the Danish fleet is now relatively old.

Only limited funds have been available for modernisation of vessels. These funds have been concentrated on modernisation projects involving improvement of working conditions and the quality of fish (Europêche, 1995).

Future structural policy will be aimed at a further reduction of capacity combined with modernisation of the fleet to preserve its economic viability. The capacity reduction plan focuses on two main goals:

- reasonable incomes for fishermen; and
- exploitation of available resources.

To accomplish these objectives, a monitoring system for earnings is set up and support is redirected into experimental fisheries and experiments with new management schemes (Concerted Action, 1995a).

United Kingdom

The UK fleet comprises about 10,000 vessels, 70% of which measure less than 10 m. The under 10 m segment mainly consists of multi-purpose vessels targeting different species and using a variety of gears on a seasonal basis. Other important fleet segments are the demersal trawlers, purse seiners and beam trawlers (about 180 units). (Lassen, 1996).

The UK did not meet the targets set in MAGP II. Contrary to the MAGP objectives, the size of the UK fleet has increased in the early nineties both in terms of GRTs and kW. This is why MAGP III requires a substantial reduction of the fleet of almost 20% compared to the situation of 1992. The British authorities have taken a series of restrictive measures to keep fishing capacity under control but still the UK is behind schedule in achieving the 1996 objectives of its MAGP.

In 1993 the British Government introduced a package of measures designed to achieve the MAGP III objectives. These included a decommissioning scheme, modifications in the licence system and more liberal rules on quota trading and self-funded decommissioning by POs.

All vessels, including those under 10 m, are required to possess a capacity licence. There are seven categories of licences depending on the characteristics of the vessel, the

target species and the fishing zones. Capacity is measured in Vessel Capacity Units (VCUs) which are determined with a formula based on engine power and the size of a vessel ¹⁾. All licences are transferable between vessels and between owners, but only licences of the same kind can be combined in a single larger or more powerful vessel. Aggregation of two licences is permitted under the condition that capacity is reduced by 20% in terms of VCUs. The 'capacity penalty' for aggregation of three licences is 30%. North Sea beamer licences can be aggregated provided that the resulting engine power does not exceed 1500 kW.

The decommissioning scheme started out with a budget of 25 mGBP for the period 1993-1996. In 1995 the scheme was extended to 1998 and the budget was increased to 53 mGBP which will be matched by a similar amount from the EC Structural Funds (FIG) (Concerted Action, 1995b). Owners of vessels were requested to submit tenders for compensation and the authorities select those vessels with the lowest price/capacity ratio until the budget is exhausted. Vessels had to be over 10 m and hold a valid fishing licence. In 1995 the scheme was limited to vessels over 10 years old with a full pressure stock licence (licences for those quota stocks considered under greatest pressure). Decommissioned vessels are scrapped after deregistration and the applicants have to surrender their licence entitlement. Between 1993 and 1995 a total of 461 vessels, representing about 15,000 GRT, was decommissioned at total costs of 28.5 mGBP.

Since 1994 POs are able to purchase track records attached to licences of vessels seeking exit from the fleet. This prevents the PO from eroding as vessels leave the PO. In effect this arrangement functions as an industry-funded decommissioning scheme, because the owner is compensated by the PO for permanent withdrawal of his vessel (Concerted Action, 1995b).

The new Sea (Conservation) Fish Act enables to attach days-at-sea-restrictions to fishing licences, but strong protests from the fishing industry prevented the implementation of such measures. A legal challenge by the NFFO resulted in referral to the European Court of Justice, which in October 1995 decided in favour of the Government. However, the Government did not try to reintroduce the scheme.

5) $VCU=(Loa*B)+(0.45*kW)$, Loa=Length overall, B=maximum width.

2.3 Comparison of Mediterranean and Atlantic structural policies

Contrary to the conservation policy, the EU structural policy applies in the same way to the Atlantic countries and to the Mediterranean countries. The main difference relevant to structural policy between the two groups of countries is the difference in fleet structures. The Mediterranean fleet consists of relatively small vessels. For instance, in Greece some 90% of the vessels is under 10 m of length. As a whole, the Mediterranean fleet makes up for nearly one half of the number of vessels of the EU fleet, while it accounts for only a quarter of the total tonnage and for one third of total engine power. On average, a Mediterranean vessel has a capacity of 11 GRT and 62 kW. For the Atlantic fleet these figures are respectively 30 GRT and 105 kW (table 2.5). At the same time there appear to be considerable differences within both areas.

Table 2.5 Characteristics of the Atlantic and Mediterranean fleets (1991)

	Number of vessels	GRT (*1000)	kW (*1000)	GRT per vessel	kW per vessel	kW/GRT
France (Med.)*	2,263	18	177	8.0	78.2	9.8
Greece	21,796	130	664	6.0	30.5	5.1
Italy	16,670	267	1,537	16.0	92.2	5.8
Spain (Med.)	4,975	87	432	17.5	86.8	5.0
Total Mediterranean	45,704	502	2,810	11.0	61.5	5.6
Belgium	218	28	81	128.4	371.6	2.9
Denmark	2,766	115	472	41.6	170.6	4.1
France (Atl.)*	5,405	147	825	27.2	152.6	5.6
Germany	2,689	79	190	29.4	70.7	2.4
Ireland**	1,421	51	176	35.9	123.9	3.5
Netherlands	540	143	447	264.8	827.8	3.1
Portugal	12,516	165	456	13.2	36.4	2.8
Spain (Atl.)	14,793	584	1,547	39.5	104.6	2.6
UK	11,411	215	1,229	18.8	107.7	5.7
Total Atlantic	51,759	1,527	5,423	29.5	104.8	3.6
Total EU	97,463	2,029	8,233	20.8	84.5	4.1

*) French fleet excl. tropical tuna fleet and overseas departments; **) Ireland number of vessels: 1995.

Source: OJ No L166/1-45 Commission Decisions 95/238-248/EC; Ireland, number of vessels: European Commission, DGXIV 1995; Spain (Atl. and Med.) : European Commission, DG XIV 1992.

Nearly 90% of the Portuguese vessels is under 10 m and about 70% of the Danish and British vessels belong to the under 10 m group. Conversely, the average number of GRTs per vessel for the Spanish Mediterranean fleet is 17.5, which is well above the average for the total Mediterranean fleet and comparable to the corresponding figure for the UK fleet.

The kW/GRT- ratio is higher for the Mediterranean fleet than for the Atlantic fleet as small vessels generally have a relatively high kW/GRT- ratio. Important exceptions to this rule are Portugal and Germany with a relative high percentage of small vessels (respectively 87% and 77%) and a low kW/GRT-ratio (respectively 2.8 and 2.4). The UK fleet has the highest kW/GRT ratio (5.7) of the Atlantic countries, which is even higher than the Mediterranean average.

A further difference in fleet structure is the lower share of trawlers in the Mediterranean fleets as compared to the Atlantic fleets. As a consequence of this, the MAGPs for Mediterranean fleets generally require lower reduction rates than those for the Atlantic fleets. This does not mean that stocks in the Mediterranean are less depleted, but the MAGPs are simply not meant to manage static gears. There is no obvious relation between fishing effort

as defined within structural policy and the efficiency of static fishing gears. The management of static gears is therefore accomplished through technical measures 1) regarding mesh size, surface area of gears and closed seasons (European Commission DG XIV, 1995).

In the early eighties, the Mediterranean countries, Italy and Greece, felt that they were discriminated against as regards the Community subsidies for construction and modernisation of vessels. At that time these subsidies were limited to vessels with a length between 9 and 33 m¹⁾, which excluded much of their fleets. As a result of their protests, the lower limit was reduced to 5 m by a modification of Regulation No. 4028/86 which was adopted in 1990 (Regulation No. 3944/90). In the same Regulation, the lower limit for vessels to be eligible for permanent or temporary withdrawal was reduced from 18 m to 12 m.

Table 2.6 displays the required and realised reduction rates for the Member States' fleets within the framework of MAGP III. The overall required reduction rate for the EU fleet amounts to about 8% compared to the objective of MAGP II. Those countries that did not meet their MAGP II targets (especially the UK, the Netherlands and Belgium) face higher required reduction rates in relation to their fleet size in 1991 for MAGP III. However, it should be noted that the Netherlands has chosen for the option of adjusting fishing effort partly through a reduction of fleet activity (days-at-sea).

Table 2.6 Required and realised reduction rates of fleet capacity

	Req. % reduction objective '91-obj.'96		Req. % reduction situation '91-objective '96		Realised % reduction '91-'95	
	GRTs	kWs	GRTs	kWs	GRTs	kWs
Belgium	3	3	2	17	17	19
Denmark	6	8	3	0	14	13
France	10	0	9	13	9	8
Germany	12	10	6	2	3	12
Greece	7	4	10	1	8	0
Ireland	-5	9	-1	-2	-9	-8
Italy	7	5	7	5	3	1
Netherlands	5	9	36	16	-7	2
Portugal	10	7	4	-0	18	5
Spain	8	8	4	6	5	4
UK	8	7	18	17	-12	10
Total	8	7	9	8	4	5

Derived from: tables B5 and B6.

During the period 92-95 the EU fleet has been reduced by about 5%, which is slightly behind schedule. However, from table 2.6 it is clear that the results of structural policy differ widely among the Member States.

6) See also chapter 3.

7) For trawlers the lower limit was set at 12 m.

As the priority of structural policy has shifted more towards the reduction of fishing effort, the link between structural policy and conservation policy has become stronger. From a biological point of view, MAGP targets for reduction of fishing effort should be based on the situation of the target stocks of the fleet concerned. Problems may then arise in three cases (see also Lassen, (1996), p. 7).

- A fleet may be operating in several areas. If the objective is to protect one of those areas, the imposed effort reduction could be absorbed by other areas without having the desired effect on the area concerned.
- A fleet may consist of several sub-fleets targeting different species, only some of which are critical. In this case a reduction of capacity imposed on the fleet as a whole may be absorbed by fleet segments targeting other species.
- A fleet may consist of multi-purpose vessels, each of them targeting different species at different times. If one of the stocks is at a critical level, an effort reduction imposed on such a fleet will not be able to make sure that the critical stock is protected and may have undesired consequences for the fisheries on stocks which are not critical.

Fishing effort in such cases will be reallocated in the direction of the most profitable fisheries, which are not always the fisheries targeting the least critical stocks. This means that in these cases fleet targets should be set for fleets on a less aggregated level or that structural measures should be accompanied by technical and conservation measures, making sure that critical stocks are protected and that the fisheries on other stocks is not unnecessarily harmed.

The strong link between structural and conservation policy has consequences for the Atlantic areas as well as for the Mediterranean areas. MAGP targets for fleets operating in Atlantic waters will have to be in balance with relative stability as expressed in the allocation of quota. In Mediterranean waters, input restrictions imposed by structural policy are in a way more crucial than in Atlantic waters, because of the lack of output management in the Mediterranean. In other words, achievement of the objectives of conservational policy in the Mediterranean depends largely on structural policy and technical measures. As Mediterranean fisheries are dominated by small vessels fishing for local stocks, conservation objectives seem to require a further segmentation of fleet targets within the framework of MAGPs, to bring structural policy in accordance with the locally different situations of fish stocks.

Thus, both in Mediterranean and Atlantic waters, consistency between structural policy and conservation policy is essential.

3. TECHNICAL MEASURES

The primary objective of technical measures is to protect juvenile fish in order to assure sufficient recruitment into the spawning stock. These measures may be specified in terms of:

- minimum allowed landing sizes for specified species;
- minimum mesh size;
- closed seasons;
- closed areas.

The measures are often specified as a combination of the above elements. Further technical measures are aimed at limitation of the overall fishing effort or prevention of undesired bycatch (marine mammals) and reduction of discards. These measures may be restrictions on technical characteristics of vessels (engine power, gross tonnage) or gear (length of drift nets, width of beam trawl, excluder devices). General protection of coastal nursery areas may be pursued by applying a maximum size of vessels (221 kW in the North Sea) or prohibiting certain gears (trawling within 3mi/50m in the Mediterranean).

It may be expected that technical measures will be also necessary for environmental reasons, particularly in relation to the effects on the food-chain. Trawling (particularly beam trawling) may cause deterioration of seabed quality. Protection of feeding grounds of birds or other animals may be required in some areas. Loss of gear (particularly static gears) has to be prevented as 'ghost nets' continue fishing and have negative effects on the stocks.

3.1 Atlantic areas

The basis for implementation of technical measures in Atlantic areas is set in the EC Council Regulation 3094/86 of October 7, 1986. Since then eighteen modifications have been introduced. Consequently technical regulations in the EU Atlantic areas have become increasingly complex and difficult to monitor and enforce.

The effectiveness of the technical measures in the Atlantic areas has been evaluated by the European Commission at the end of 1995 (EC, 1995). The conclusion drawn in this assessment is quite clear (p. 15):

'The introduction of technical measures did not have the hoped-for effects in protecting juveniles and the species affected by by-catches. By-catches and discards continue to raise considerable problems'.

The problems with the various types of measures could be characterized as follows:

- Minimum mesh sizes are difficult to enforce as long as the 'one net rule' 1) is not accepted. Furthermore, there does not yet exist one unified and objective method to measure the mesh size. Various Member States apply their own system.
- Minimum landings sizes do not necessarily lead to selective fishing, but rather may cause higher discards of small specimen. A complete ban on discarding, along the Norwegian example, could curb this practice, but effective implementation would require appropriate monitoring.
- Closed areas, as protection of nursery grounds, are not always easy to determine because some species spawn in low densities over a large area.

8) Only webbing of one mesh size is allowed on board.

- Gear selectivity, through mesh size or other arrangements, can be well attuned to one species only. However, most fisheries have significant bycatch of species of various sizes. A well suited average mesh size does not exist.
- Arrangements regarding allowed catch composition on board oblige either discarding or illegal landings.

In general the complexity of the marine environment is reflected in the operation of the fishing vessels. In practice it proves difficult if not impossible to specify technical measures which would take this complexity realistically into account and which would remain at the same time simple to understand and feasible to implement.

In June 1996 the Commission has produced a proposal for a new regulation which should entirely replace the Council reg. No. 3094/86. The new proposal is a substantial improvement because it is clearly structured. The Commission has attempted to keep the derogations to a minimum and to use the clearest possible language. In respect to the derogations, it remains at this stage (mid 1996) to be seen whether the Council will be willing to accept the regulation as it is proposed or whether pressure from specific interest groups will call for adjustments, which will require new derogations. First reactions from the industry are not uncritical.

Table 3.1 Review of the proposal on technical measures in the Atlantic areas

Title	Contents
I. Definitions	Maritime waters, Marine organisms, Minimum mesh size; Square mesh size; Gill nets, Trammel nets.
II. Nets and conditions for their use	Towed nets; Fixed gear; General provisions on nets and conditions of their use.
III. Minimum size of marine organisms	Var. species.
IV. Special provisions relating to fishing of certain marine organisms	Herring; Sprat to protect herring; Mackerel; Anchovy; Tuna; Shrimp to protect flatfish; Salmon&sea trout; Norway pout to protect other roundish; Hake; Plaice; Sole and plaice; Demersal fish.
V. Restrictions on certain amounts of fishing and associated activities	Beam trawls; Unconventional fishing methods; Automatic sorting equipment; Purse seines; 12mi limit United Kingdom and Ireland.
VI. Special provisions for Skagerrak and Kattegat	Max 10% undersized; Salmon and sea trout; Mesh size / season /target; Weekend pelagic ban; No beam trawling in Kattegat; Electricity for basking shark.
VII. Technical provisions	Processing; Research; Artificial restocking.
Appendices: 1. Checklist of marine organisms 2. Minimum sizes and target species in regions 1-4 3. Minimum sizes and target species in Kattegat and Skagerrak 4. Minimum sizes and target species in regions 5+6 5. Fixed gears, regions 1+2 6. Fixed gears, region 3 7. Minimum landing sizes 8. Measurement of the size of marine organisms	

Despite the attempts to simplify, special provisions are formulated for twelve species. In case of herring or hake, more than 10 situations are identified when fishing is prohibited in certain regions or during defined seasons. Special provisions are necessary for Skagerrak and Kattegat. Appendices specify minimum landing sizes for 27 species of fish, crustacea and bivalves in the Atlantic regions (1-5) and for 13 species in Skagerrak and Kattegat. Detailed tables elaborate minimum percentages of target species which should

be on board, depending on the utilized mesh size: seven mesh size ranges and about 35 species are dealt with in this manner. Also in this case Skagerrak and Kattegat are treated separately.

Acceptance of the new regulation, independently of the final formulation, will have at least one major advantage. Because of the many amendments of the Reg. 3094/86, no consolidated version has been published since its introduction. At the same time evidently the need for a new and comprehensive text has grown.

12-mile limit

Article 6 of the basic regulation (3760/92) specifies that national jurisdiction extends to the 12 nautical miles coastal waters. This implies that the individual Member States are in the position to carry out fisheries management in this area as long as two conditions are met: 1. National measures may not jeopardize measures taken within CFP; and 2. Appropriate arrangements must be made with the neighbouring states.

In some cases EU legislation provides for certain aspects of the fisheries management in the coastal zone, e.g. the 221 kW limit for vessel allowed to fish within 12 mi or specification of boxes in which international fisheries take place (Plaice box, Irish box, etc.).

In general national legislation of fisheries in the 12 mi coastal areas regards the small scale fishing: boats up to 9-12 m, passive gears (allowed length of gill nets) and management of local sedentary stocks (shrimp, bivalves).

3.2 Mediterranean

A study executed in 1991 (Levieil, 1991) reviewed technical measures which were imposed by public authorities in the four Mediterranean EU Member States. A total of 185 regulations were identified. A summary is presented in table 3.2.

It is self-evident that the qualitative contents of these measures vary widely. Some measures indicate precisely what is and what is not allowed, while other measures only offer the juridical basis to introduce specific legislation if necessary. Furthermore, these regulations cover only those technical measures imposed by national or regional public institutions. Many other measures have been implemented by professional organizations, but these are not included in the overview.

Minimum landing sizes are regulated for a total of 95 species, of which 13 species of crustaceans, 27 species of molluscs and 55 species of fish. In some cases, various minimum sizes apply to one species, depending on specific conditions, e.g. fishing gear, but also the way of measurement.

A first step towards coordination of technical measures among the Mediterranean EU Member States was taken by the introduction of the EU Regulation No. 1626/94 (EC, 1994). This regulation sets minimum mesh size for towed nets at 40 mm and of encircling nets on 14 mm. It specifies minimum requirements for six types of gear: pelagic and demersal trawls, dredges, encircling nets, bottom-set nets, trammel nets, bottom and surface-set longline. Finally, it specifies minimum landing sizes for 17 species of fish, three species of crustaceans and three species of molluscs.

Table 3.2 Summary of technical measures in France (F), Greece (G), Italy (I) and Spain (S)

Measures referring to	Trawling				Dredging				Lamparo				Beach seine				Seine (night)				Seine (small pelagics)				Seine (tuna/sparids)				Encircling trammel net			
	F	G	I	S	F	G	I	S	F	G	I	S	F	G	I	S	F	G	I	S	F	G	I	S	F	G	I	S	F	G	I	S
Gear			x	x	x	x			x					x				x			x	x		x				x		x		
Vessel characteristics	x			x			x													x				x								
Control of fleet	x	x	x	x		x	x		x					x				x			x	x	x	x	x			x				
Fishing seasons/time	x	x	x	x	x	x	x		x					x				x			x	x		x				x				
Mesh size	x	x	x	x	x		x		x					x				x			x	x	x	x	x			x		x		
Individual quota				x			x																									
Fishing zones	x	x	x	x					x		x			x				x			x	x	x	x				x		x		
	Entangling nets				Drift nets				Bottom long line				Drifting long line				Small scale gears				Red coral				All fisheries				Recreational fisheries			
	F	G	I	S	F	G	I	S	F	G	I	S	F	G	I	S	F	G	I	S	F	G	I	S	F	G	I	S	F	G	I	S
Gear	x	x	x	x				x				x				x						x	x	x	x	x	x	x	x	x	x	x
Vessel characteristics				x				x				x								x				x	x		x			x		
Control of fleet		x		x			x	x				x				x	x				x	x		x	x	x	x	x		x	x	x
Fishing seasons/time		x		x								x				x	x			x		x		x	x	x	x	x	x	x		
Mesh size	x	x	x	x			x	x									x			x					x							
Individual quota																									x				x	x	x	x
Fishing zones		x	x	x			x	x				x					x			x		x	x	x	x	x	x	x	x	x		

Table 3.3 Review of the EC Regulation 1626/94

Content of article	
1. Scope for legislation	6. Minimum mesh size
2. Prohibition of certain fishing techniques	7. Landings only in designated places
3. Prohibition of specific gear in certain areas	8. Minimum landing size
4. Protected zones*	9. Exclusion of scientific research fishing
5. Technical characteristics of main types of gear*	10. Consultation between EC and professional organizations
Annex 1. Fragile or endangered species or environments. Annex 2. Minimum requirements relating to the characteristics of the main types of fishing gear. Annex 3. Minimum mesh sizes. Annex 4. Minimum sizes (of fish, crustaceans and molluscs).	

*) To be elaborated by Member States.

When assessing the feasibility and relevance of unified technical measures in the Mediterranean, it is essential to stress several major characteristics of this area. Effective implementation of any measure will be only possible if these characteristics are fully taken into account:

- Continental shelf mostly does not exceed 25-30 mi. Major exceptions are in the Adriatic Sea, Sicilian and Malta Channel and the shelf east of Tunisia. The 30 m depth remains almost everywhere well within the limits of the national jurisdiction.
- Some 90% of all fishing vessels are small coastal craft, with a limited action radius.
- Economically important species are demersals, with limited migration patterns.
- Low densities of fish are closely related to high dispersion of the fishing activities along the coast.
- Most Mediterranean countries are not EU Members.

These characteristics justify to question seriously the rationality of an overall fisheries management in the Mediterranean in general and implementation of specific technical measures in particular:

- Only few well defined stocks are exploited by international fleets (sardine and anchovy in Gulf of Lions, tuna).
- There is only a limited interaction of fleets under various flags.
- Specification of acceptable technical measures is difficult because of varying geomorphological and other conditions, which will call for a large number of derogations. This is already the case with the current Reg. 1626/94.
- Effective implementation of any measures for which there is not sufficient support among the fishermen will be difficult and rather costly because of the high dispersion of the fishing activities.

Harmonization of technical measures will not, in its own right, contribute to an improved management of the Mediterranean fisheries. Effective implementation of non-harmonized but well accepted and supported existing national or regional measures may be more productive in this respect. Non-compliance with harmonized, but ill-accepted or even unworkable measures leads to a situation where there are in practice no measures at all! Harmonization of technical measures therefore should be attempted only in situations where it is really necessary, e.g. shared or straddling stocks.

Furthermore, technical measures form a part of a comprehensive fisheries management policy and should be viewed as such. It is not self evident that harmonization of technical measures without considering the totality of management requirements will produce the desired results.

Despite of all the apparent complexity, the Mediterranean fisheries may be characterized technically as follows. About 90% of all fishing craft are small coastal vessels using very varied passive fishing gear. According to area definition 40-70% of the volume of catch is realized by the fleet of seiners targeting small pelagics (sardine and anchovy). A major part (70-80%) of the value and volume is constituted by 8-10 species (STECF, 1995). A very substantial share of this production has to be attributed to the small scale coastal fleet. The production of trawlers is restricted by the zonal division. Trawling is not permitted within 50m depth and/or 3 mi. High seas fishing on tuna and swordfish is a seasonal activity carried out by fleets from various Mediterranean coastal states but also by other vessels, particularly Japanese and Korean.

3.3 Comparison

A comparison of the technical measures in the Atlantic and Mediterranean EU fisheries has to recognize a major difference in the scope of relevance of these measures from the 'bird's eye view of the Union'. In the Atlantic areas, most fish resources are exploited within the 200 mi EEZ of the Union, while only a small part of the production originates from the 12 mi zones which fall under the national jurisdiction. In the Mediterranean on the other hand, most marine production originates from the narrow continental shelf, major part of which falls within the national jurisdiction (12 mi). A 200 mi EEZ does not exist and even if it would, it would be of little relevance for fisheries purposes, because it would mainly relate to large pelagics (tuna, swordfish).

The following comparison takes place along the aspects which are specified in the regulations (mesh size, gear, species, zones and seasons).

Minimum mesh size

In the Atlantic areas a minimum percentage of target species is specified according to minimum mesh size applied. Distinction is made between towed and fixed gear and between various regions ¹⁾. As for the Mediterranean one minimum mesh size for towed nets (40 mm) and for fixed gear (14 mm) are set. For some types of gear maximum sizes are specified, e.g. length and drop of gill nets.

The difference in the level of detail of the European legislation for the two areas is just the reverse of the perceived technological characteristics of the fisheries in the two regions. The Mediterranean fisheries are in general considered more diverse and complex than those in the Atlantic. The EU legislation is relatively simple for the Mediterranean, while it is rather 'complex' for the Atlantic areas. It may be questioned whether the details of the national legislations of the four Mediterranean Member States should be reflected in the future EU legislation.

Type of gear

For Atlantic areas special provisions are made for beam trawling and purse seining. In the Mediterranean use of trawls and encircling nets is prohibited within a certain distance from the coast.

A common paragraph for both areas regards the prohibition of explosives, fishing with electricity or with poison.

Fishing gear is always developed and adapted to the biological and geomorphological conditions of the area in which it is used. Therefore attempts to develop a common basis for the regulations which would apply to the Atlantic as well as to the Mediterranean areas may not contribute significantly to an efficient management of the stocks.

9) Annexes II to VI of the new proposition.

Fish species

For the Atlantic areas special provisions for exploitation of species and groups of species are specified as well as minimum landing sizes. For the Mediterranean minimum sizes for certain species are set.

Currently the regulations on fish species have little in common. Only six finfish species can be found on both lists. Major Atlantic roundfish species do not occur in the Mediterranean. Various species of sea bream and sea bass which are of commercial importance in the Mediterranean play only a marginal role in the Atlantic. Different minimum sizes have to be applied to the species which are common for both areas (e.g. hake, anchovy or horse mackerel) because of the differences in biological characteristics (e.g. growth rate, spawning size/age, size at maturity, etc.).

Fishing vessels

Regulations regarding fishing vessels are not included in the EU legislation on technical measures, with the exception of the 221 kW limit in the 12 mi coastal zone. National regulations are often more specific regarding restrictions on fishing vessels, e.g. 2000 HP limit on beam trawlers in the Netherlands, 500 HP limit on trawling in the Gulf of Lions, etc.

Management of fleet by type and size falls in the domain of structural policy.

Fishing zones

Many technical measures in the Atlantic have a specified spatial component. Exploitation of many species is linked to zones where these species may be caught, including evidently the TAC and quota conservation policy. Eight regions, plus Kattegat and Skagerrak, are distinguished for the broad purposes of the technical regulations. Many more regions, and their combinations are specified in the TAC and quota policy. Particularly detailed spatial provisions are formulated for herring and hake. Furthermore, there is the definition of various boxes (Plaice, Irish, Shetland and Pout) and the application of the 12 mi coastal zone. In the Mediterranean zonation is elaborated in the national regulations. The EC reg. 1626/94 calls upon the Mediterranean Member States to '...fix the list of fishing gear which may be used in protected areas..' (art. 4, par. 2).

In this respect there is a significant difference between the situations in the two areas. In the Atlantic areas regulations regarding fishing zones must be drawn at EU level because these zones fall outside the jurisdiction of the individual Member States. In the Mediterranean, most zones will fall within the national jurisdiction because of narrow continental shelf where most commercial stocks can be found.

Seasons

As to the seasons, a similar argument is valid as that regarding the fishing zones. In view of the climatic and marine differences in the Mediterranean, many species have different seasonal patterns of reproduction. Common seasons in Atlantic and Mediterranean will be exceptional.

3.4 Implications

Technical measures are in the end combinations of the above mentioned aspects: vessels, gear, species, zone, season. While the principle of technical measures is evidently identical for the Mediterranean and the Atlantic, the necessary content (technical specifications) is very different. Also the consequences for implementation and control may not be quite the same.

In view of the level of detail of European legislation on technical measures for the Atlantic waters, a similar level of detail for the Mediterranean areas can be expected to become rather voluminous and will probably only repeat what is specified in the current national legislations. The additional value of such new EU legislation is unclear because it will have often little bearing on other areas than those already covered by the national legislation.

Exploitation of shared stocks and interaction of fleets from various (EU Member) States is much more limited in the Mediterranean than in the Atlantic. Therefore, in the EU regulation on technical measures in the Mediterranean there is need for a 'framework for coordination', within which responsible management of internationally exploited stocks could be arranged, rather than precise specification of measures which should be applied in the Mediterranean area.

4. USER PARTICIPATION IN FISHERIES MANAGEMENT

4.1 Introduction

In this chapter a review of user-group participation in institutionalised fisheries management in the EU Member States is presented. Objectives are a comparison of the relevant similarities and differences between the degree in user participation in fisheries management in the EU Atlantic area and the Mediterranean and to assess implications for implementation of Atlantic management systems to Mediterranean management systems.

In this part of the study the problem is approached from an institutional angle. Various institutions and organisations 1) concerned with fisheries management in the Mediterranean and Atlantic countries of the European Union are classified and compared. To this end, the criteria summed up in the next section are used. Both Atlantic and Mediterranean fisheries are related to European Union institutions. This supra governmental level is described in section 4.1.2. The outline of the remainder of this chapter is as follows. In section 4.2 North Atlantic Fisheries Management institutions and the influence of user-groups on fisheries management are described. For the Mediterranean these aspects are described in section 4.3. Finally a comparison is presented and implications for implementation of Atlantic management systems to Mediterranean management systems are assessed in section 4.4.

4.1.1 Criteria for comparison

Distinction between institutions

Organisations and institutions outside the immediate user-group (external institutions, like Government) are distinguished from organisations and institutions with a direct participation of fishermen also referred to as user-groups, and from those with a mixture of fishermen (or representatives) and other authorities, so called in-between institutions.

Scale of influence

The interaction between Government and industry/user-groups is measured along a scale ranging from Government power to fishermen power (Jentoft and McCay, 1995). Institutions of government-industry cooperation are commonplace within fisheries nations of the Western hemisphere and user participation is an integral part of a country's fisheries management regime (ibid: 233). However, how these institutions work is dependent on their design as well as on how they are implemented in their context. Basically, there are three alternatives available for institutional design that to a varying degree allow user-groups to be involved:

1. Government may restrict its role to informing user-groups of decisions it is ready to make.
2. Government may prefer to consult with user-groups (for instance by setting up advisory boards), but may later choose whether to follow or not the recommendations of user-groups.
3. Government and user-groups may co-manage the resource (ibid: 229). The degree of influence in fisheries management will be classified within the three mentioned categories. In order to be comprehensive the fourth category 'user-group self-governance' is added.

10) In literature different definitions of the concept 'institution' are in use. In this chapter the words institution and organisation will be used as synonyms, and refer to (semi-) public as well as (semi-) private bodies with a long or a short history or with an ad hoc nature.

Management categories

Fisheries management is characterized in three categories: output measures, structural measures and technical measures. Output measures consists of quota or other catch limits. Structural measures regard regulations of fleet size (capacity and activity limitations: licensing and days-at-sea). Technical measures are gear regulations on mesh size, minimum fish size, closed seasons and areas, etc.

Management tasks

Tasks of institutions and organisations can roughly be divided in 1) to regulate (establish norms); 2) to implement; and 3) to enforce. Here especially the first task is considered.

A comparison will be made between the Atlantic and Mediterranean by their 'score' within the matrix which has been developed from the management categories and influence scale (see table 4.1). It is aspired to include eleven EU Member States in this chapter: Belgium, Denmark, France, Germany, Greece, Ireland, Italy, the Netherlands, Portugal, Spain, and the United Kingdom. Spain and France are divided into Atlantic and Mediterranean parts. However, in some occasions influence degrees on management measures in some Member States did not become clear from the consulted sources.

4.1.2 The European level and the Common Fisheries Policy

Common Fisheries Policy

Fisheries management systems of these eleven countries work within the context of the Common Fisheries Policy, although this policy differs for the Mediterranean fishery. Common market policy and structural policy apply to all Member States. Conservation policy (TACs and quota) does not apply to the Mediterranean area. This is also the case regarding the technical measures, although a first step towards homogenization in the Mediterranean has been taken in the EC Reg. 1626/94.

The European Union

The European Union is the supra governmental level. The Union consists of four institutions: The Council, the Commission, the European Parliament and the Court of Justice 1). The Council has the power to adopt legislation, and can delegate this power to the Commission. The Member States' Ministers (for fisheries topics, Ministers with fisheries in portfolio) are representatives in the Council. The commissioners of the European Commission (EC) are appointed by the Member States for four years. The Common Fisheries Policy (CFP) is defined for 20 years, till 2002. The CFP consists of policies for Structures, Markets, External relations, Conservation and technical measures. Each year the European Commission determines Total Allowable Catches (TACs) per species and area in the European Atlantic and North Sea, on the basis of biological advice of the International Council of the Exploration of the Sea (ICES) and political negotiations. The EC allocates national quota for different species to the Member States (not to the Mediterranean countries) according to shares fixed in 1983 (relative stability). CFP also establishes maximum fleet capacities within Member States through Multi-annual Guidance Programmes (MAGP) and sets marketing standards, a minimum price for selected species and a common trade regime with non-EU countries.

Role of science

11) Here only the Council and Commission are considered.

Scientific advice to the Council is given by the Advisory Committee on Fisheries Management (ACFM) of ICES and by the Scientific, Technical and Economic Committee for Fisheries (STECF). Outside the EU the International Council for the Conservation of Atlantic Tuna (ICCAT) and the General Council Fisheries for the Mediterranean (GCFM) of FAO are important institutes (see Chapter 1 for more details).

In-between organisations

The EC consults the Advisory Committee on Fisheries which consists of representatives from all sectors of the fishing industry plus consumers. The European Association of Fish Producers' Organisations and *Europêche*, which represents fishing fleet owners, have also representatives in the Advisory Committee. The Committee consists of three sub-committees, dealing with resources, markets, and structures. Relations between EC and the sub-committee on resources are strained because the sub-committee is frequently not consulted on proposals (concerning TACs) until after they have been adopted by the Commission. This is partly due to lack of time (Holden, 1994).

Provisionally established within the Advisory Committee is a 'Mediterranean Ad Hoc Group' in 1992 (Galle, 1993). This Group meets at least every two months, and consists of fishermen/vessel owners, representatives from cooperatives, one scientist and one regional administrator, from Mediterranean Member States. Its aim is to define in what manner the industry may participate in a future Mediterranean fishing policy and to make joint propositions.

4.2 Atlantic institutions

The paragraph reviews Atlantic/North Sea fisheries management institutions in Belgium, Denmark, Atlantic France, Germany, Ireland, the Netherlands, Portugal, Atlantic Spain and the United Kingdom.

4.2.1 Organisations

Governmental institutions

The central governmental institution dealing with fisheries management is in most countries a Directorate or Service within a Ministry concerned with Fisheries. These Directorates are responsible for the establishment of fisheries management schemes within the context of the CFP and national policy. The Ministers have to discuss and give account on fishery matters in Parliament and have a seat in the EU Council. Furthermore, within or on behalf of the Member States' Ministry, monitoring of fisheries regulations is undertaken by Inspection Services. Some examples: the Netherlands has the General Inspection Service which is monitoring fishing activities and has legal powers to lead violators to court. In the UK enforcement is undertaken by the Royal Navy and by the Scottish Fisheries Protection Agency. In Denmark these tasks are performed by Danish Fisheries Control, a separate body dependent on the Ministry's Fisheries Directorate.

In-between institutions

In many Atlantic countries an organisational layer between Government and industry has been created for consultation. For the Dutch fishing industry this institution is the Fish Commodity Board (FCB). For the Fisheries Directorate this FCB is the partner in discussions of proposed management schemes. The Danish law on fisheries management specifies that the Ministry must hold an Advisory Committee on management, in which the industry is strongly represented. In France the National Maritime Fish and Aquaculture Committee fulfils the role of a consultative body. The ministry needs to consult this organisation which is composed of representatives of fishermen's organisations and local and regional committees (Galle, 1993). The Portuguese department for fisheries has an Advisory Committee made up of the professional organisations representatives (POs, associations and unions) in which

members are invited to give their opinion. In the United Kingdom exist Management Committees on national and Fisheries Department level, including industry representation. In Galician Spain there is a formal consultative body, the Consejo Gallego de Pesca, in which the FOs and regional administration are jointly involved. Informal consultations take place between central Government and the national committees of the industry's representative organisations (CEMARE/Univ. of Hull, 1996).

No 'in-between' organisation could be identified in Belgium, Germany and Ireland.

User group organisations

The fishing industry itself created a variety of organisations and associations on local, regional, national and (sub)sectoral basis. In some cases the origins of these organisations go far back in history. Relatively new are Producer Organisations (POs) which were set up according to EC rules. POs originally mainly played a role in the implementation of the common organisation of the market for fishery products¹⁾. As mentioned earlier these POs are also represented at the EU level.

4.2.2 Influence of user-groups

In this section influence of user-groups on output, structural and technical regulations is assessed.

Influence of user-groups on quota management

12) CFP Marketing Regulation Articles 5-8.

Output measures under consideration are TACs, quota and other catch limits. User-groups are not influential in the establishment of the yearly TAC levels for the European Union as a whole. TACs are divided in national quota. The degree in influence of user-groups on the management of national quota varies, although influence possibilities have been harmonized recently. The Marketing Regulation of the CFP has been expanded by allowing POs to manage quota on behalf of their members and, at the discretion of Member States, the national quota 1). 'This extension of power placed POs firmly to the fore in EU fisheries resource management decision-making. (Young, 1996). In the case of *the UK* quota-management responsibilities had earlier been entrusted to POs. But their degree of active involvement varies. Non PO-members are subject to the government's own management arrangements as administered by management committees including industry (Europêche, 1995). In the case of *the Netherlands* quota management has been entrusted to 'Groups' of fishermen within POs. While fishermen exploit their ITQ, the Group Management Board is responsible for up-take of the pooled quota. Almost all vessels participate in the management groups (Hoefnagel and Smit, 1995). In *France* an attempt in 1990 to introduce a system of quota-allocations to POs was abandoned after three years, largely because of disagreement over the basis for allocation. Furthermore POs were unable to implement catch restrictions for quota management purposes. Now Government allocates quota to the coastal regions, where they are subdivided by 'competent administrative authorities'. The roles of POs remain centered on the management of the market and their membership is primarily determined with reference to marketing requirements (CEMARE, 1996). However, marketing rules of French POs may sometimes work as output restrictions, e.g. limits on landed tonnage. In *Belgium*, the PO 'Redercentrale' is responsible for the administration and organisation of meetings between Government and Quota Commission. The Quota Commission, established in 1994, consists of representatives from the different Belgian fleet segments. The meetings discuss all of the quota regulations for the next three months (Europêche, 1995). In *Denmark* an Advisory Committee meets every month and advises the Ministry on the allocation of quota at national level. This Committee is made up of representatives from the Fishermen's Association, POs, fish processing industry and trade, the fish oil and fish meal industry, the fish canning industry, and the Workers' Union (Europêche, 1995). In *Germany*: 'Governmental regulations stipulate quota allocation per fishing zone, per vessel type and per species. Eligible fishermen must be member of the Deutsche Fischerei Verband. Certain quota are available to anyone entitled to fish on a 'first come, first serve' basis. (...) Other quota, cod for instance, are distributed to POs which allocate them to their members. For saithe in the North Sea, quota are distributed to the individual cutter fishing companies' (Europêche, 1995). In *Ireland* quota management is entirely the responsibility of the Ministry of Fisheries. In Ireland there is an ad hoc Industry Committee which has no legal standing, but gives advice on some aspects of quota-management. In *Portugal* the Department of Fisheries of the Ministry for Agriculture is responsible for distributing quota and maximum catches. The Department has an Advisory Committee consisting of representatives of professional organisations (POs, associations and unions), (Europêche, 1995). In Atlantic *Spain* Cofradías, have quota-management functions through the design of fishing plans. These fishing plans need to be approved by the appropriate authorities. 'The regional Government sees potential in the Cofradias for improving management, and is working for them to be formally recognized as producers organisations (...)', (Jentoft and McCay, 1995).

Degree of influence on structural measures

Structural measures under consideration are capacity and activity limitations (licensing respectively days-at-sea). All Member States are subject to MAGP (see chapter 2). Influence of professional organizations on structural measures is on the whole quite limited. It is exerted mostly through in-between institutions. The limits given, user-groups sometimes try to establish collective rules in order to, for instance, restrict fishing time and spread catches over the season/year.

13) Council Regulation 3759/92, as amended by Council Regulations 697/93 and 1891/93.

There is no indication that *Belgian* fishermen's organisations had influence on the prevailing maximum HP and GT regulations, on the licensing scheme, on the decommissioning measures or in the past on the abandoned restrictions on days-at-sea (Europêche, OECD 1995).

The *UK* fishing fleet is subject to a licensing scheme in which Government consulted the industry. POs may purchase licences held by members, in order to hold them separately from individual vessel catch records. A Government proposal to introduce a system of individual days-at-sea allocations has been successfully challenged by FOs and POs.

In *Denmark* a subcommittee of the above mentioned Advisory Committee on fisheries management advises the Ministry representatives on the national structural policy. Structural measures include decommissioning schemes and modernisation of the fleet (Europêche, 1995). Following working group meetings between the fishermen's association, scientists and the Ministry, days-at-sea restrictions were adopted on an experimental basis in the Kattegat. This effort regulation is considered to be co-management (Nielsen and Vedsmand, 1995). In *the Netherlands* the industry is consulted by the Ministry through the Fish Commodity Board. The FCB discusses and tries to influence proposed structural management schemes measures as decommissioning, days-at-sea regulation and licensing. The newly formed Groups manage fishing effort in relation to ITQs by approving fishing plans per vessel and the possible allocation of extra days-at-sea during the year.

In *France*, POs may take management measures for their members such as fishing plans aimed at regulating fishing effort on certain sub-quota depending on prevailing market conditions or given their up-take. Fishing effort is regulated through limits on the number of days per fishing trips and restrictions on unloaded tonnage (Europêche, 1995). French fleet capacity is regulated through the *Permis de Mise en Exploitation (PME)* (CEMARE). This is administered by the national management committee.

In *Germany* there is no days-at-sea regulation. Since 1 February 1995 fishing is only allowed with a valid licence on board (EC Regulation No. 3690/93). Licences are issued by the Federal Office (Europêche, 1995).

The *Irish* Ministry of Fisheries (Department of Marine) is entirely responsible for the management of the fishing effort. Some fisheries are licensed by the State. Regional Fisheries Boards determine the maximum number of licences for wild salmon fished at sea.

All *Portuguese* fishing vessels require a fishing licence that authorizes the type of fisheries and fishing area. These licences are issued by the Ministry for Agriculture, Fisheries and Food (Europêche, 1995).

Responsibilities for the managing of fishing effort in *Spain* are divided over the Ministry, the Autonomous Communities and professional associations. Vessels operating in Union waters are governed by a fishing plan that is drawn up by fleet associations and approved by the authorities concerned. Apart from quota, these plans specify the period in which fishing will take place, the vessels concerned, the species targeted, the fishing gear used. The General Secretariat for maritime fisheries consults the sector (coastal or ocean fisheries) to try to find the best possible compromise between fishermen's demands and the actual circumstances, also on structural measures like temporary limits and closed seasons.

Degree of influence on technical measures

As with structural measures, influence of user-groups on technical measures is limited in the CFP framework.

Minimum sizes and temporary closure of the sole fisheries in January 1995 have been stipulated by *Belgian* government, in correspondence with CFP (Europêche, 1995; OECD, 1995). In the *UK* different national technical measures are applied, like gear regulations, minimum landing sizes of specified species and the closure of certain areas to specified types of fishing for specified periods. Influence of user-groups could not be identified. In the Baltic sea, *Danish* fishermen have to stop (by mandate) fishing during the period June, July and August, they receive a tying-up compensation (Europêche, 1995). The *Dutch* Fisheries Directorate consults the FCB in proposed management schemes like technical measures as gear restrictions. However, many measures have been designed by EU regulation. Current

French technical measures have been established by EU regulation (Europêche, 1995). In *Germany* there are no closed fishing periods. (Other technical measures follow probably CFP rules.) In *Ireland* the State regulates the prohibition of certain methods of fishing and minimum fish-sizes (Europêche, 1995). The *Portuguese* Ministry issues gear permits and regulates gear restrictions like mesh sizes, and minimum fish sizes. Sometimes zones are closed periodically by decree for biological reasons. In *Spain*, Government consults the sector in technical matters, like minimum fish sizes.

4.2.3 Summary

In the Atlantic/North Sea EU countries different degrees of influence of user-groups exist, depending on type of measure and/or fishery. In *Germany*, for instance, there is at the same time a high degree of user-group participation (PO) in cod-quota management, while other quota are allocated by the state. Conversely, in *Spain*, there appears to be a consistent degree of participation through Cofradias. The highest degree of user-group participation can be found in quota-management, but Atlantic France and Ireland form an exception. There seems to be a tendency for consultation in most countries. The Netherlands, Denmark and the United Kingdom even tend to experiment with forms of co-management when it concerns output and some structural topics. No forms of self-governance have been found.

4.3 Mediterranean institutions

In the same way as for the Atlantic, influence degrees of user-groups on Mediterranean fisheries management will be assessed.

4.3.1 Organisations

Governmental organisations

In *Spain* the national fisheries management is determined by the General Maritime Fish Board within the Ministry of Agriculture, Fish and Food. In *Italy* fisheries management is the task of the Seafish Board within the Ministry of Merchant Marine. Fisheries management is planned through a Triennial Plan. In *France* the Directorate of Fisheries within the Ministry of Agriculture, Fisheries and Food deals with fisheries management on the national level. In six French districts 'Min. des Affaires Maritimes' is responsible for policy implementation. In *Greece* the governmental responsibility for fisheries management is for the Ministry of Agriculture and Ministry of Merchant Marine.

In-between organisations

In *Italy* the minister consults the Central Management Committee, in which all fishermen associations are represented as well as representatives from fisheries science, processing industry and regional administrations. The Committee is chaired by the Minister or the General Director for Fisheries, and is in fact a part of the Ministry. In *France* the National Maritime Fish and Aquaculture Committee fulfils the role of a consultative body. The ministry is required to consult this organisation which is composed of representatives of fishermen's organisations and committees (M. Galle, 1993). In *Spain* Fishermen's Cofradias or the (National) Federation of Fishermen's Cofradias consult directly with the Administration on local, regional or national level. There is a so-called Standing Committee on Mediterranean Fisheries for the Spanish coastline, which makes proposal for output, technical and structural measures. No specific consultative bodies have been found in *Greece*.

User-group organisations

In Mediterranean *Spain* the (87) Cofradias play a keyrole in fisheries management. Cofradias are involved in all decision-making processes at all levels, through local Cofradias, (regional) federations of Cofradias and the National Federation of Cofradias. Apart from

Cofradias, other user-groups organisations exist, like POs, Cooperatives and associations. Cooperatives and POs are often within a Cofradia (Franquesa, 1992). In Mediterranean *France* responsibilities have been divided, since 1992, between Prud'homies, which are a French type of Cofradias, and 'Organisation Professionnelle des Pêches'. There is one regional and nine local committees. Apart from producers, committees consist of processors and traders. Prud'homies perform community related tasks, which may work out as resource management. The Prud'homies, the committees, and also syndicates (e.g. in Corsica) exert some influence on fisheries regulation in the region. Communication with governmental and supra governmental institutions takes place via the Committees and comes together in the already mentioned National Maritime Fish and Aquaculture Committee. In Italy, the industry is organised in syndicates, cooperatives and associations which are linked to a national federation of one of the (main) political parties. Officially, decisions are made by the minister or, in autonomous regions, by regional commissions. Fishermen's organisations do contribute to local fisheries management issues. In *Greece* there are only few fishermen's organisations. Those organisations are nested in national cooperative organisations and agricultural professional associations, which are not very influential (Weber, 1993).

POs are not very well established in the Mediterranean, due to fragmentation and already existing institutions like Cofradias and Prud'homies. There are a few POs, mostly designed for migratory fish like anchovy, sardine and tuna. In Italy, for example, sardine cooperatives function in a PO structure because of price regulations.

4.3.2 Influence of user-groups

Output regulations

In *Italy* there is, apart from the clam fishery, no experience with output regulations. The Italian administration tried to manage clam resources by input and output regulations. Unfortunately they were unsuccessful. Since resources were decreasing, clam producers themselves introduced limits. This form of self-governance was made feasible through the introduction of Fishing Districts where fishermen themselves are responsible for the resource (IREPA, 1995). In *Spain* Cofradias may set limits on fish output per vessel (Country Report, Spain).

There is no indication in literature for output regulations in Mediterranean France and in Greece.

Structural measures

In *Italy* effort reduction seems to be stipulated by government, through the Central Committee and within the MAGP framework. The main tool for effort reduction is a licensing scheme. Licences are also used as a tool to redistribute fishing effort in relation to fishing grounds. Restrictions on the days-at-sea apply for dredges.

In *Spain* Cofradias regulate time limitations like hours and/or days spent at sea. Prud'homies and *French* local committees exert influence on effort regulations and access rules in their region. French fleet capacity is regulated through the Permis the Mise en Exploitation (PME) (CEMARE). This is administered by the national management committee. In Corsica, however, a regional licensing system has been adopted and accepted. To receive a licence one has to be a member of a Prud'homie. In *Greece* licensing and other structural measures are stipulated by the ministry following the directions of the common structural policy and specific regional or local circumstances.

Technical measures

In *Spain* Cofradias regulate gear limitations, minimum landing sizes and minimum mesh sizes. In *Italy* different technical measures are set by law and also foreseen in the Triennial Plan. There are limits on mesh size, on length of driftnets, on engine power and vessel length. Furthermore, there are restrictions on time spent at sea, like week-end bans and the temporary closure of certain fishing grounds in relation to the spawning season. In *France* in some occasions Prud'homies regulate gear use during specific periods in order to solve (international) conflicts between fishermen. Prud'homies and local committees exert influence on mesh size regulations as well as on closed seasons for specific species and closed territories (e.g. in Corsica). Technical measures are regulated on the governmental level in *Greece*.

4.3.3 Summary

It can be concluded that there is no user-group participation in fisheries management in Greece. In Mediterranean France, Prud'homies are consulted; however, local or regional committees seem to have more influence in fisheries management. In Corsica fishermen organisations like Prud'homies and local committees are more influential than in other French parts. In *Italy* user-groups are consulted in resource management, in the clam fisheries exists a form of self-regulation. Spanish fishermen are through Cofradias influential at all decision-making levels.

4.4 Comparison and implications

4.4.1 Comparison

A comparison of the degree in influence of Government and user-groups on (parts of) fisheries regulations and measures in Atlantic/North Sea Member States with the Mediterranean situation is presented in table 4.1.

Apart from Greece, Ireland, and to a lesser degree Portugal, there is a consultative approach in fisheries management in the EU. There are some experiments in co-management going on in the Atlantic Member States. In Mediterranean Spain co-management is a tradition. For many measures a centralized approach is common in the Atlantic.

In general in the Atlantic Member States different degrees of user participation can be found in one country, depending on the measure or fishery concerned. The Mediterranean Member States show a far more consistent approach in user participation. In the sense that one specific level of participation is applied in most types of policy. Although this level is different between the four countries.

Table 4.1 Role of Government and user-groups by type of regulation

		OUTPUT REGULATIONS		STRUCTURAL MEASURES		TECHNICAL MEASURES	
<i>Influence degree *)</i>		ATLANT	MEDITER	ATLANT	MEDITER	ATLANT	MEDITER
Government	Instructs and/or informs	FR; GER; IRL; P		B; IRL; P; GER; FR	GR	B; DK; IRL; P; FR	GR
	Consults	UK; DK; B; P; SP		DK; NL; UK; SP	IT; F	NL; SP; UK	IT; F
	Co-manages with usergroup	NL; UK; SP; GER(<i>cod</i>)	SP	DK (<i>days-at-sea, Kattegat</i>); FR (<i>POs/ days-at-sea</i>); NL (<i>fishing plans</i>); SP (<i>fishing plans</i>)	F <i>Corsica</i> ; SP		F <i>Corsica</i> ; SP
User-group self-governance			IT (<i>clams</i>)				

*) In this matrix some measures per country are in italic and put in brackets, this indicates a minor measure or an interesting exception of the rule.

According to Jentoft and McCay (1995) this varying degree of user participation within one country can partly be explained by the fact that fisheries management systems seldom result from a grand design. Their structures have evolved gradually, through a process of 'muddling through' and often as an urgent response to crisis in a specific fishery. However, in the Atlantic EU a 'grand design for fisheries management', in a way, does exist: the Common Fishery Policy. CFP co-exists with a variety of degrees of user-participation. Implementation of the EU-rules is a responsibility of Member States. Fisheries management is embedded in national institutional structures, which explains the differences between countries. Many measures under consideration like TACs and quota, effort reduction and gear limitations originate from CFP. Partly due to 'stock crisis' in the North Sea and Atlantic and partly for distributive reasons, CFP became increasingly restrictive. Many of the CFP rules are, according to user-groups, suddenly implemented and without or with little user-group influence. It can take a long time for a rule to be accepted. Fishermen have shown considerable creativity to circumvent the rules. Sometimes an authoritarian approach from Government to

fishermen's reactions is appropriate, while at other moments consultation would be desirable. In short, the variety in degrees of user-participation also depends on the way rules are set and the 'stage of evolution' of the relation between Government and the fishermen. A positive example forms quota-management in the Netherlands, which gradually evolved from the rejection through reluctant acceptance of quota by fishermen and finally to co-management of ITQs. In the EU Atlantic Member States a variety of stages of acceptance and shaping of EU rules can be found, which also explains the degree of user-participation.

The more consistent approach in Spanish user-participation in fisheries management, can probably be explained by the fact that their fisheries are traditionally managed on a local/regional level. Ancient user-groups institutes like Cofradias (and Prud'homies before World War II) function well in local or regional and mainly coastal fisheries management. Cofradias are co-operative organisations recognised by law (Alegret, 1996), this is the reason why they are well established at all decision-making levels. The from Spain differing, but rather consistent management styles in France (with Corsica as an exception) and Italy can be traced down in their broader institutional and, for Italy, political structures after World War II. In Greece the organisation of the fishery industry does not appear to be very strong. Decisions are made on the central level, while fishermen live and work on the edges of the State (Frangoudis, 1993 and Weber, 1993).

4.4.2 Implications

In the Mediterranean fisheries, the influence of the supra-governmental EU level is of a recent date and it plays a much less pronounced role than in the Atlantic. The question is whether Atlantic Common Fisheries Policy can form a model for a future Mediterranean Common Fishery Policy. The problem is approached from an institutional angle. POs in Spain are used as a case, because some literature 1) is available on the subject. A key EU institution is the Producers Organisation (PO). POs originally mainly played a role in the implementation of the common organisation of the market for fishery products 1), this function was revived in the Spanish case due to its accession. '...A campaign was carried out within part of the Spanish fishing sector with the objective of making the Cofradias disappear or at least, of transforming them into POs' (Alegret, 1996). 'In the North-West Mediterranean, POs have been created in the bosom of the Cofradias. (...) They have administrative powers but are controlled by the Cofradias. In reality POs are a mere facade...' (Franquesa and Lostado, 1994). They continue by stating that this fictitious institutions are until moment of writing done no harm, they might in the future disrupt the well functioning control and management system of the Cofradias. This is so because of the differences between Cofradias and POs. Role and tasks of Cofradias are broader than that of the commercial tasks of POs. Alegret comes to the same conclusion and states '.....no attempt to restructure aspects of the current organisational system of the fishing sector in the Catalan (north-west) region of the Mediterranean can be undertaken without affecting the system as a whole. This may even lead to the total destructuring of the sector and the surfacing of a range of conflicts which at present are contained and controlled within the existing organisations'. He continues: '..should a process of transforming the Cofradias into POs occur, it seems logical to conclude that the social and political roles of the former could not be undertaken by the latter; and this would force the State to intervene directly in the regulation of all those aspects which the 'laws of the market' do not cover. If this situation were to occur, it is obvious that the ensuing social, political and ecological costs would be astronomical in comparison to the problems which the process was intended to solve'. Alegret expects, for this reason, the Cofradias to remain in existence, 'despite the compulsory nature of the European 'logic'..'

14) See Alegret, 1996, and R. Franquesa and R. Lostado, 1992.

15) The Marketing Regulation of the CFP has been recently expanded by allowing POs to manage quota on behalf of their members and, at the discretion of Member States, the national quota. In Mediterranean Spain, however, are no quotas assigned.

This case makes clear that an Atlantic institution cannot be copied without (severe) problems into the Mediterranean context. Though, a few POs do seem to function in the Mediterranean, namely in tuna, anchovy and sardines fisheries. Those POs probably only have to function as commercial organisations for fish producers and fall beyond the territorial responsibilities of Cofradias or other Mediterranean management regimes.

Since some Atlantic and North Sea EU Member States are experimenting with co-management it may be relevant to analyse the institutional design and management of the Cofradia system.

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APPENDICES

Species	nr. shared	FISHING AREAS WHERE QUOTAS ARE IN FORCE											nr. of stocks prec.		average countries							
		I,IIb	IIIaS	IIIaK	IIIbcd	IIa,IV	Vb,VI,XII,XIV	VIIa	VIIbk,VIII,IX,X,34.													
Cod	3																	8	4	4.9		
precaut,? countries			p 5	p 3	p 4	p 5	p 5	p 5	p 5													
Haddock	2	IIIa,IIIbcd	IIa,IV	Vb,VI,XII,XIV	VII,VIII,IX,X,34.														4	3	5.3	
precaut,? countries		p 5	7	p 5	p 4																	
Whiting	2	IIIa	IIa,IV	Vb,VI,XII,XIV	VIIa	VIIbk	VIII	IX,X,34.											7	5	3.9	
precaut,? countries		p 3	7	p 4	5	p 5	p 2	p 1														
Hake	0	IIIa,IIIbcd	IIa,IV	Vb,VI,VII,XII,XIV	VIIIabde	VIIIc,IX,X,34.													5	0	4.2	
precaut,? countries		2	6	6	4	3																
Saithe	1	IIa,IIIa,IIIbcd,IV	Vb,VI,XII,XIV	VII,VIII,IX,X,34.															3	1	5.0	
precaut,? countries		7	4	p 4																		
Pollack	0	Vb,VI,XII,XIV	VII	VIIIab	VIIIc	VIIIde	VIIIe	IX,X,34.											7	7	4.1	
precaut,? countries		p 4	5	p 2	2	1	13	2														
Plaice	2	IIIaS	IIIaK	IIIbcd	IIa,IV	Vb,VI,XII,XIV	VIIa	VIIbc	VIIde	VIIfg	VIIhk	VIII,IX,X,34.							11	7	3.8	
precaut,? countries		p 5	3	p 3	3	3	5	2	3	4	5	3										
Common sole	0	IIIa,IIIbcd	II,IV	Vb,VI,XII,XIV	VIIa	VIIbc	VIIde	VIIe	VIIfg	VIIhk	VIIlab	VIIIcde,IX,X,34.							11	5	3.6	
precaut,? countries		p 4	6	p 2	5	2	3	3	4	5	4	2										
Megrim	0	Vb,VI,XII,XIV	VII	VIIIabde	VIIIc,IX,X,34.														4	2	3.5	
precaut,? countries		p 4	5	2	3																	
Anglerfish	0	Vb,VI,XII,XIV	VII	VIIIabd	VIIIe	VIIIc,IX,X,34.													5	3	6.4	
precaut,? countries		p 7	7	2	13	3																
Norway pout	1	IIa,IIa,IV																	1	1	11.0	
precaut,? countries		p 11																				
Atlantic salmon	1	IIIbcd	sub32																2	0	2.5	
precaut,? countries		4	1																			
Herring	4	IIIa	IIIbcd	IIIcd3	IIa,IVab	IVc,VIIde	Vb,VIIaN,VIIb	VIIaS,VIIbc	VIIaC	VIIa	VIIef	VIIghjk							11	8	3.5	
precaut,? countries		p 3	4	2	6	6	5	2	1	2	2	5										
Sprat	3	IIIa	IIIbcd	IIa,IV	VIIde														4	3	6.3	
precaut,? countries		p 3	4	p 12	6																	
Anchovy	0	VIII	IX,X,34.																2	2	2.0	
precaut,? countries		p 2	p 2																			
Mackerel	2	IIaC,IIIa,IIIbcd,IV	IIaN,Vb,VI,VII,VIIIabde,XII,XIV	VIIIc,IX,X,34.															3	1	5.3	
precaut,? countries		7	6	p 3																		
Horse mackerel	2	IIa,IV	Vb,VI,VII,VIIIabde,XII,XIV	VIIIc,IX	X,Cec														4	3	7.0	
precaut,? countries		p 11	p 13	p 3	p 1																	
Blue whiting	2	IIa,IV	Vb,VI,VII	VIIIabd	VIIIe	VIIIc,IX,X,34.													5	5	10.0	
precaut,? countries		p 11	p 13	p 11	p 13	p 2																
Norway lobster	0	IIIa,IIIbcd	IIa,IV	Vb,VI	VII	VIIIab	VIIIc	VIIIde	IX,X,34.										8	8	3.0	
precaut,? countries		p 3	p 6	p 4	p 4	p 2	p 2	p 1	p 2													
Northern prawn	1	IIIa																	1	0	2.0	
precaut,? countries		2																				
demersal	11																		28	38	4.4	
pelagic	14																		9	31	5.4	
crustaceans	1																		1	9	2.9	
Total:	26																		38	106	68	4.6

Appendix A2 Status of biological references in the Mediterranean area

Country	Species	Biology	Stock assessm.	Pop.dynam.	Distribution	
Italy	Sardine	B	B	C	A	
	Anchovy	B	A	C	A	
	Horse mackerel	C	C	C	C	
	Mackerel	C	C	C	C	
	Swordfish	B	B	B	B	
	Tuna	C	B	B	B	
	Hake	B	B	B	B	
	Red mullet	B	B	B	B	
	Striped mullet	D	D	D	D	
	Picarel	C	C	D		
	Bogue	C	C	D		
	Red seabream	C	C	C	B	
	Norway lobster	B	C	B	B	
Angler	B	C	B	B		
Greece	Sardine	C	B	D	B	
	Anchovy	C	B	D	B	
	Horse mackerel	B	D	B	D	
	Mackerel	D	D	D	D	
	Swordfish	B	B	A	C	
	Tuna	D	D	C	C	
	Hake	C	C	C	B	
	Red mullet	B	C	B	B	
	Striped mullet	C	D	D	D	
	Picarel	B	D	A	D	
	Bogue	B	C	A	D	
	Red seabream	B	C	B	D	
	Norway lobster	D	D	D	D	
Angler	B	C	A	D		
Spain	Sardine	B	B	B	B	
	Anchovy	B	B	B	B	
	Horse mackerel	C	C	B	D	
	Mackerel	C	C	D	D	
	Swordfish	C	B	C	C	
	Tuna	A	C	C	C	
	Hake	C	C	B	B	
	Red mullet	C	C	C	C	
	Striped mullet	D	C	D	C	
	Picarel	D	C	D	D	
	Bogue	D	C	D	D	
	Red seabream	D	C	D	B	
	Norway lobster	C	C	D	D	
Angler	C	C	D	D		
Criteria						
A = Good	C = Poor					
B = Possible	D = Elementary					

Appendix A3 Survey of biological knowledge in the mediterranean

PELAGIC

Country: GREECE

Indicators	Sardine	Anchovy	Horse mac.	Mackerel	Swordfish	Tuna
Biology						
Spawning age / size		+		+	+	
Growth rate	+		+		+	+
Fecundity		+	+			
Condition factor			+			
Stock assessment						
Egg/larvae survey		+				
Hydro-acoustic survey	+	+	+			
Trawl survey						
Sampling comm. catch	+	+	+		+	+
Population dynamics						
Natural mortality					+	
Fishing mortality					+	
Age class composition			+		+	+
Recruitment rate						
Spatial and temporal distribution						
Bathymetrical			+			
Absolute / relative abundance	+	+				
Spawning time / areas			+			
Seasonal migrations			+			

PELAGIC
Country: ITALY

Indicators	Sardine	Anchovy	Horse mac.	Mackerel	Swordfish	Tuna
Biology						
Spawning age / size	+	+			+	+
Growth rate	+	+	+	+	+	+
Fecundity	+	+				
Condition factor						
Stock assessment						
Egg/larvae survey	+	+				
Hydro-acoustic survey	+	+				
Trawl survey						
Sampling comm. catch	+	+	+	+	+	+
Population dynamics						
Natural mortality	+					
Fishing mortality	+					
Age class composition	+	+		+	+	+
Recruitment rate						
Spatial and temporal distribution						
Bathymetrical	+	+	+			
Absolute / relative abundance	+	+				
Spawning time / areas	+	+				+
Seasonal migrations	+	+		+		+

PELAGIC
Country: SPAIN

Indicators	Sardine	Anchovy	Horse mac.	Mackerel	Swordfish	Tuna
Biology						
Spawning age / size	+	+				+
Growth rate	+	+				+
Fecundity	+	+				+
Condition factor						+
Stock assessment						
Egg / larvae survey	+	+				
Hydro-acoustic survey	+	+	+			
Trawl survey						
Sampling comm. catch	+	+			+	+
Population dynamics						
Natural mortality						
Fishing mortality						
Age class composition	+	+	+		+	+
Recruitment rate	+	+	+			
Spatial and temporal distribution						
Bathymetrical	+	+				
Absolute / relative abundance						
Spawning time / areas		+				+
Seasonal migrations	+	+			+	+

DEMERSAL
Country: GREECE

Indicators	Hake	Red mullet	Striped mullet	Picarel	Bogue	Red seabream	Norway lobster	Angler
Biology								
Spawning age / size	+	+	+	+	+	+		+
Growth rate	+	+	+	+	+	+		+
Fecundity	+	+		+	+	+		+
Condition factor	+			+	+	+		+
Stock assessment								
Egg/larvae survey								
Hydro-acoustic survey								
Trawl survey	+	+	+	+	+	+	+	+
Sampling comm. catch	+	+	+	+	+	+	+	+
Population dynamics								
Natural mortality	+	+	+		+	+		
Fishing mortality	+	+	+	+		+	+	
Age class composition	+	+		+	+	+	+	+
Recruitment rate					+			
Spatial and temporal distribution								
Bathymetrical	+	+		+	+	+	+	+
Absol. / rel. abundance	+	+	+	+	+	+	+	
Spawning time / areas	+			+	+			+
Seasonal migrations	+			+	+	+		+

DEMERSAL
Country: ITALY

Indicators	Hake	Red mullet	Striped mullet	Picarel	Bogue	Red seabream	Norway lobster	Angler
Biology								
Spawning age / size		+	+			+	+	
Growth rate	+	+	+			+	+	
Fecundity							+	
Condition factor		+	+					
Stock assessment								
Egg / larvae survey		+						
Hydro-acoustic survey	+	+						
Trawl survey	+	+	+			+	+	+
Sampling comm. catch	+	+	+		+	+	+	
Population dynamics								
Natural mortality	+	+						+
Fishing mortality	+	+						
Age class composition	+	+	+			+	+	
Recruitment rate	+							
Spatial and temporal distribution								
Bathymetrical	+	+	+			+	+	
Absol. / rel. abundance	+	+				+		
Spawning time / areas								
Seasonal migrations	+	+	+			+	+	

DEMERSAL
Country: SPAIN

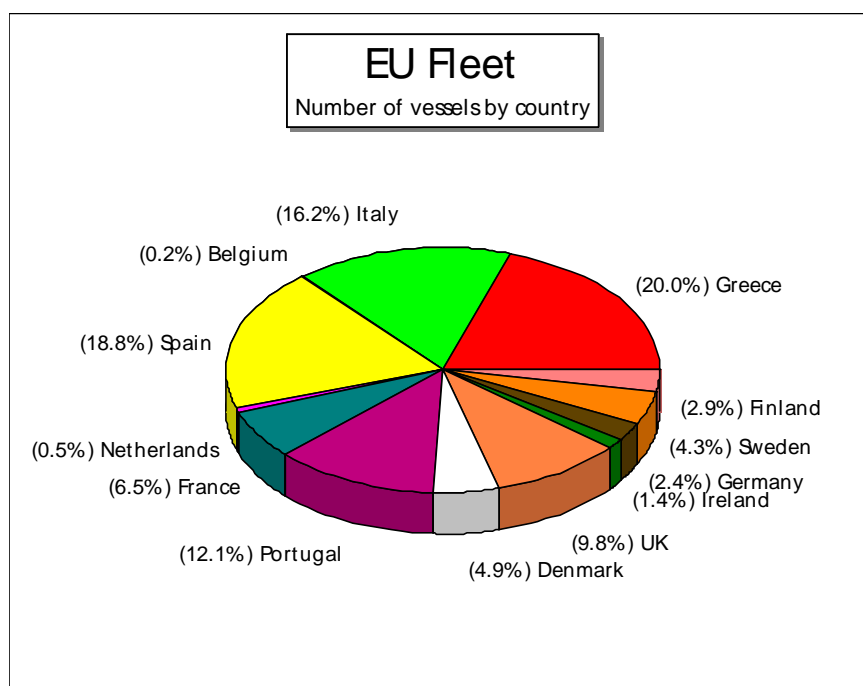
Indicators	Hake	Red mullet	Striped mullet	Picarel	Bogue	Red seabream	Norway lobster	Angler
Biology								
Spawning age / size	+	+				+	+	
Growth rate	+	+				+	+	
Fecundity							+	
Condition factor								
Stock assessment								
Egg / larvae survey								
Hydro-acoustic survey					+			
Trawl survey	+	+				+	+	+
Sampling comm. catch	+	+	+		+	+	+	+
Population dynamics								
Natural mortality	+							
Fishing mortality	+							
Age class composition	+							
Recruitment rate	+							
Spatial and temporal distribution								
Bathymetrical	+		+			+		
Absol. / rel. abundance								
Spawning time / areas	+	+				+		
Seasonal migrations						+		

Appendix B Fleet structure and MAGP objectives

Table B1 Characteristics of EU Member States' fleets (1995)

	Number of vessels	Tonnage	Power (kW)	Tonnage per vessel	Power per vessel	kW/GRT
Belgium	157	22912	65668	145.9	418.3	2.9
Denmark	4993	98773	412723	19.8	82.7	4.2
Finland	2959	27698	328686	9.4	111.1	11.9
France	6650	181760	997548	27.3	150.0	5.5
Germany	2452	76890	167692	31.4	68.4	2.2
Greece	20318	120325	662768	5.9	32.6	5.5
Ireland	1421	55235	190501	38.9	134.1	3.4
Italy	16434	259980	1513871	15.8	92.1	5.8
Netherlands	508	152928	436197	301.0	858.7	2.9
Portugal	12317	131123	416010	10.6	33.8	3.2
Spain	19103	613495	1849993	32.1	96.8	3.0
Sweden	4349	59642	174608	13.7	40.1	2.9
UK	9983	239884	1104406	24.0	110.6	4.6
Total	101644	2040645	8320671	20.1	81.9	4.1

Source: European Commission, DG XIV (1995).



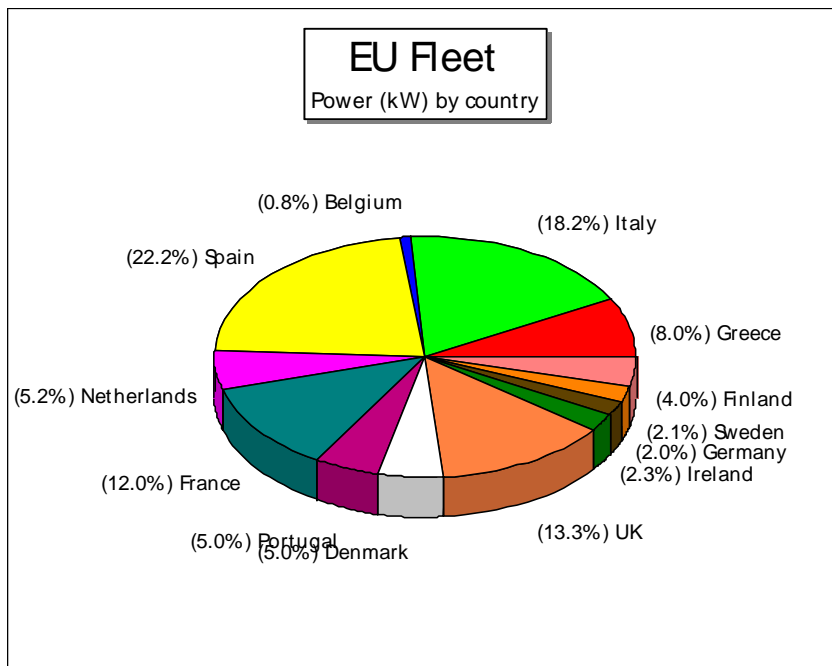
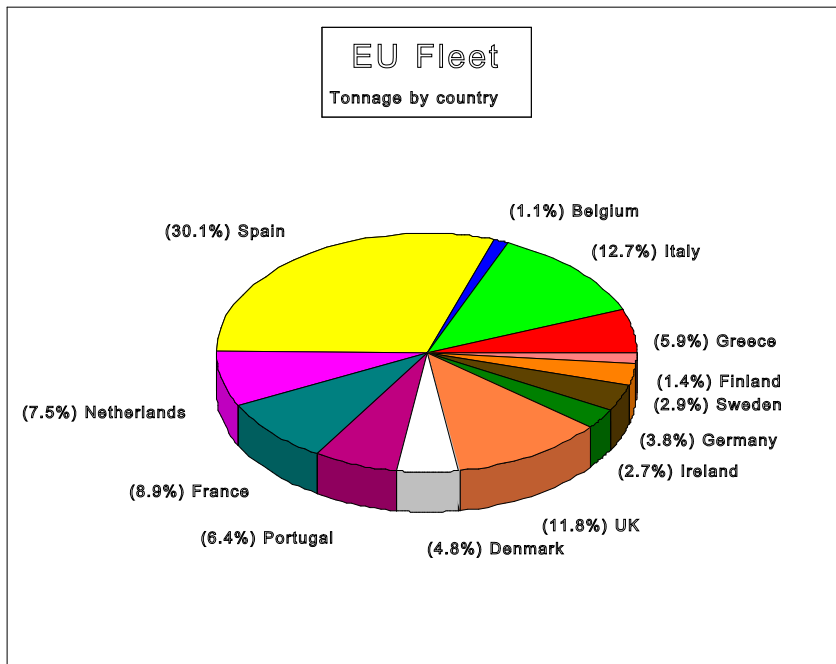


Table B2 Number of vessels by length group (1995)

	<10m	10-15m	15-24m	>24m	No details supplied	Total
Belgium	0	14	69	74	0	157
Denmark	3379	813	498	221	82	4993
Finland					2959	2959
France	3981	1335	1051	283	0	6650
Germany	1885	257	248	61	1	2452
Greece	17937	1625	548	200	8	20318
Ireland	637	393	306	82	3	1421
Italy	8742	4125	2771	790	6	16434
Netherlands	9	16	185	298	0	508
Portugal	10769	773	508	256	11	12317
Spain	13715	2030	2121	1228	9	19103
Sweden					4349	4349
UK	6988	1431	1057	499	8	9983
Total	68042	12812	9362	3992	7436	101644

Source: European Commission, DG XIV (1995).

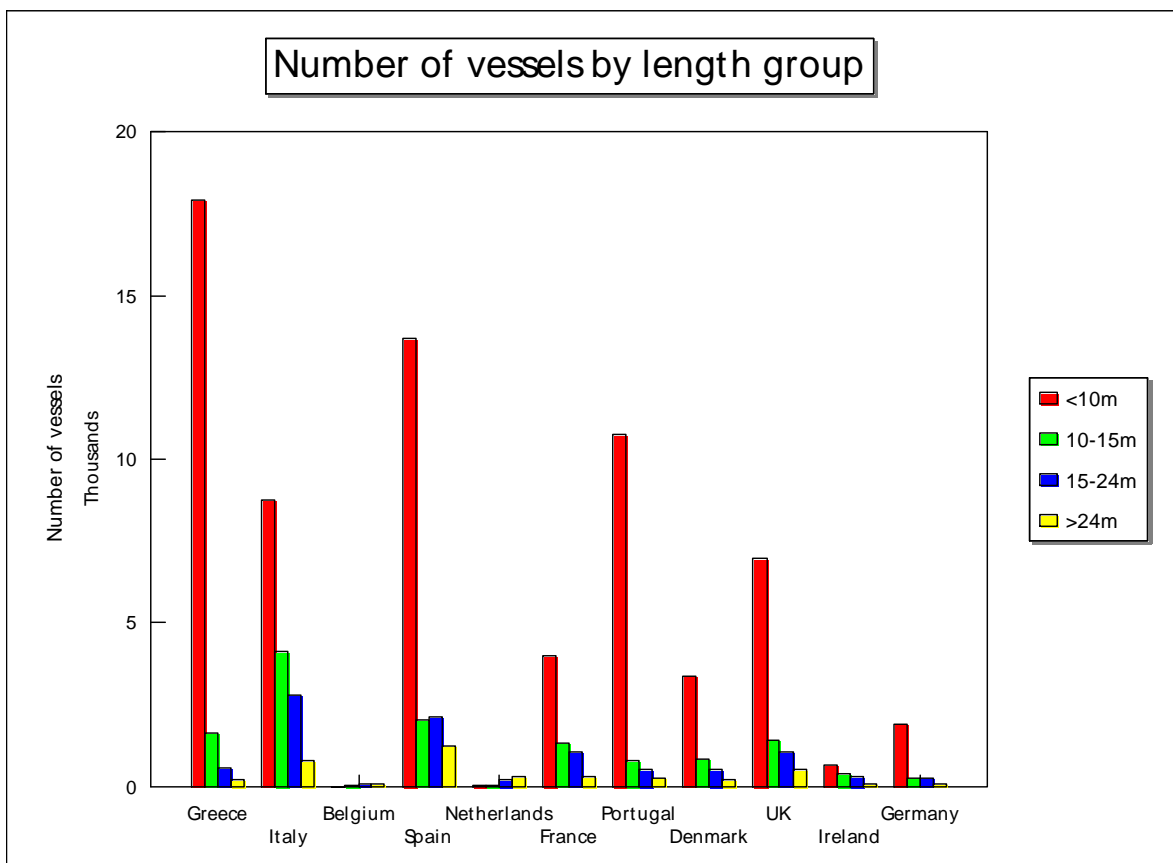


Table B3 Tonnages by length groups (1995)

	10m	10-15m	15-24m	>24m	No details supplied	Total
Belgium	0	419	4640	17853	0	22912
Denmark	9131	12318	20098	57061	165	98773
Finland					27698	27698
France	14872	19319	54664	92905	0	181760
Germany	3632	4914	14778	53564	2	76890
Greece	35376	20778	28279	35820	72	120325
Ireland	2860	5887	22585	23790	113	55235
Italy	17753	39268	96902	105915	142	259980
Netherlands	53	299	9776	142800	0	152928
Portugal	11362	9501	24970	85280	10	131123
Spain	32425	33011	137325	410214	520	613495
Sweden					59642	59642
UK	19936	18971	75547	125331	99	239884
Total	147400	164685	489564	1150533	88463	2040645

Source: European Commission, DG XIV (1995).

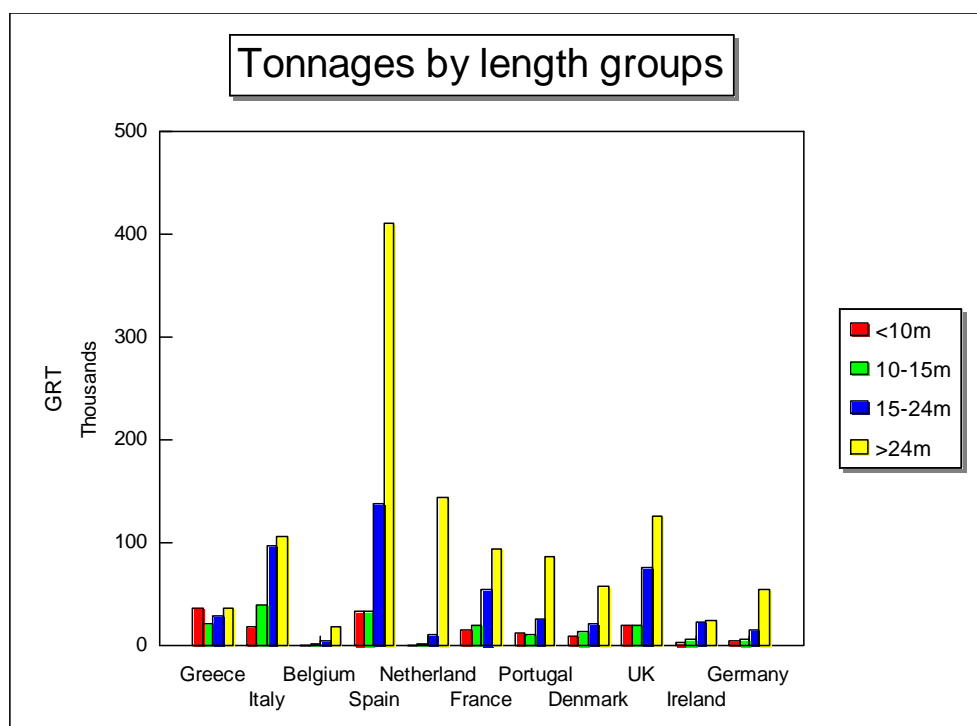


Table B4 Power (kW) per length group (1995)

	<10m	10-15m	15-24m	>24m	No details supplied	Total
Belgium	0	2342	14367	48959	0	65668
Denmark	71626	94425	106087	139645	940	412723
Finland					174608	174608
France	221583	193633	328766	253566	0	997548
Germany	23929	27429	47980	68350	4	167692
Greece	306859	139477	131231	84868	333	662768
Ireland	18702	30741	75615	65126	317	190501
Italy	220734	406398	564219	322085	435	1513871
Netherlands	1158	1767	33051	400221	0	436197
Portugal	90148	56226	106551	162989	96	416010
Spain	206137	194923	533352	914138	1443	1849993
Sweden					328686	328686
UK	306257	172797	264203	360666	483	1104406
Total	1467133	1320158	2205422	2820613	507345	8320671

Source: European Commission, DG XIV (1995).

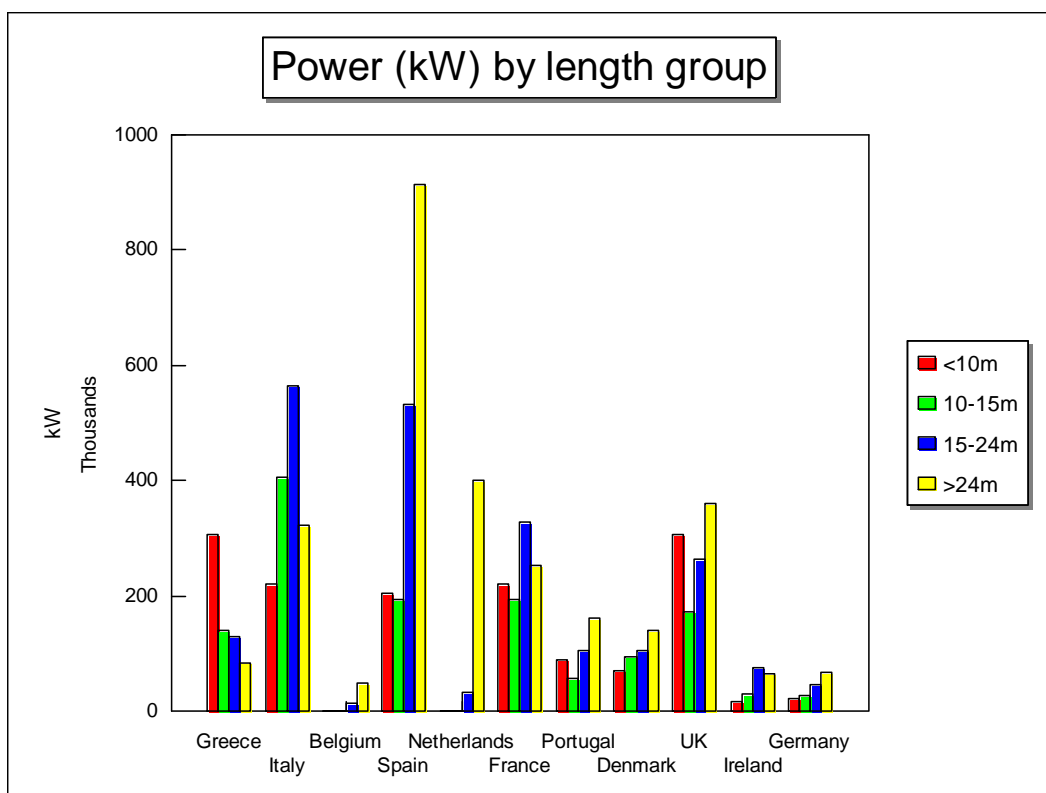


Table B5 MAGP targets in GRT's and actual situation of EU fleets

	Objective 31 Dec 91 (a)	Situation 31 Dec 91 (a)	Objective 31 Dec 96 (a)	Situation June 95 (b)
Belgium	21,551	27,687	20,914	22,912
Denmark	119,188	114,621	111,639	98,772
France	201,604	198,803	180,557	181,760
Germany	85,336	79,155	74,780	76,890
Greece	126,528	130,373	117,056	120,325
Netherlands	95,496	142,827	91,035	152,928
Portugal	186,449	160,520	167,118	131,123
Ireland	48,750	50,693	51,195	55,235
Italy	268,198	267,471	249,182	259,981
Spain	673,303	645,103	618,174	613,521
UK	193,027	214,733	176,981	239,783

Source: (a): OJ No L166/1-45 Commission Decisions 95/238-248/EC; (b): European Commission, DG XIV (1995).

Table B6 MAGP targets in kW's and actual situation of EU fleets

	Objective 31 Dec 91 (a)	Situation 31 Dec 91 (a)	Objective 31 Dec 96 (a)	Situation June 95 (b)
Belgium	70,069	81,431	67,875	65,668
Denmark	514,717	472,146	471,762	412,723
France	1,055,050	1,088,949	948,591	997,548
Germany	206,465	189,801	185,940	167,629
Greece	688,203	664,193	657,547	662,768
Ireland	197,011	176,075	179,732	190,501
Italy	1,541,664	1,536,518	1,464,680	1,513,871
Netherlands	412,988	446,615	374,707	436,197
Portugal	472,986	438,090	439,054	416,010
Spain	1,955,372	1,917,442	1,803,927	1,849,993
UK	1,095,206	1,228,922	1,015,214	1,104,406

Source: (a): OJ No L166/1-45 Commission Decisions 95/238-248/EC; (b): European Commission, DG XIV (1995).

LIST OF ABBREVIATIONS

CFP	Common Fisheries Policy
CPUE	Catch Per Unit Effort
CSEM	Council of the Scientific Exploration of the Mediterranean
EC	European Commission
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FAIR	EU Research programme in the Field of Agriculture and Fisheries
FO	Fishermen organization
GFCM	General Fisheries Council for the Mediterranean
G(R)T	Gross (Registered) Tonnage
HP	Horse power
IBSFC	International Baltic Sea Fisheries Commission
ICCAT	International Council for the Conservation of Atlantic Tunas
ICES	International Council for the Exploitation of the Sea
kW	Kilowatt
m	meter
mi	Nautical mile
mm	millimeter
NAFO	North Atlantic Fisheries Organization
NEI	Not Elsewhere Identified
PO	Producers organization
ST(E)CF	Scientific, Technical and (Economic) Committee on Fisheries
TAC	Total Allowable Catch