

COMMISSION OF THE EUROPEAN COMMUNITIES

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REPORT FROM THE COMMISSION

**MAINTENANCE, EXTENSION AND CREATION OF DATA BASES
APPROPRIATE TO THE IMPLEMENTATION OF THE COMMON
FISHERIES POLICY**

1. Introduction

Following appraisal of the Communication from the Commission entitled "European Fisheries Research, Current Position and Prospects" (COM(93) 95 final, Brussels, 16 March 1993), the Council issued, *inter alia*, the following conclusions in document SN 3289/1/93 of 24 July 1993:

"The Council recognises the necessity to maintain, extend or create appropriate data bases, covering biological, ecological, technical and socio-economic aspects as vital for the implementation of the Common Fisheries Policy.

The Council confirms that the collection of basic data and associated analyses are first of all the responsibility of Member States in accordance with the Treaty. The Member States should ensure that research activities are conducted under an appropriate managerial system and that adequate funds are allocated to this end. The Commission has an important role to play in stimulating the planning of such work.

The Council invites the Commission to submit a report setting out, on a multiannual basis, perspectives for the development and maintenance of data bases within each Member State."

This report responds to these conclusions of the Council.

2. The Current Position with respect to National Databases

2.1 Background

2.1.1 *Meeting in 1992 of Directors of fisheries institutes of Member States.*

For several years an annual meeting of Directors of fisheries research institutes of Member States has been organised to allow interchange of information and opinions and to define problems and possibilities in their research areas.

At the third meeting of 1992, the Directors pointed out that because of reductions in funding, it is becoming increasingly difficult to maintain existing data bases and that, if present conditions are maintained, extension of them and/or creation of new data bases seemed very unlikely. It seems likely that the quality of the databases will decrease. This confirmed the pre-existing opinion of the Commission.

2.1.2 *Further meetings in 1992*

In response to this information, the Commission organised in 1992 three meetings to further review the present situation. Participants at these meetings comprised scientists familiar with their respective sampling programmes from which the major part of the information stored in the databases is obtained.

The meetings dealt, respectively, with sampling programmes in the following geographical areas:

- (a) North Sea, Skagerrak, Kattegat, Baltic, English Channel
- (b) West of Scotland, Rockall, Irish Sea, west and south of Ireland, Bay of Biscay, Atlantic coasts of Iberian Peninsula
- (c) Mediterranean.

The participants amplified the reasons for reduction in funding for the sampling programmes. These include:

- general restrictions on government expenditure
- reduction of public support for fisheries research due to perceived problems resulting from the application of the results of the research
- a shift in emphasis in research from the economic interests of the fishery to the protection of the ecosystem
- increasing competition from research projects that, at least in part, are financed by other agencies.

The main purpose of these meetings, however, was to evaluate the current costs of providing data for maintenance of the appropriate databases by the performance of the respective sampling schemes.

3. Sampling programmes and national and international databases

3.1 The purpose of the sampling programmes

A major component of the Community's fisheries conservation policy is, and will probably continue to be, the system of Total Allowable Catches (TAC's) and associated national quotas. There also exist regulations defining technical measures such as mesh sizes, closed areas and closed seasons. In addition, the Commission has recently been provided with the opportunity to propose multiannual and/or multispecies TAC's and to propose direct limitations on fishing effort.

To assess the probable effects of the application of any of these conservation measures it is necessary to analyse appropriate data. The provision of these data is accomplished by implementation of well-designed sampling schemes at national level.

At national administrative level, the data are often of use in analysing specified problems and at both national and international scientific level the databases are often employed in support of many areas of innovative scientific research.

3.2 Definition of the required data and the sampling activities required to produce them

3.2.1 *Length composition, age composition and mean weight-at-age of the catch.*

Ideally, data should be available on the total number of fish of each length (*length composition*) and of each age (*age composition*) caught by the total international fleet from each exploited stock. The total catch of fish can be subdivided into two major components. The first comprises those fish which are landed while the second consists of those which are discarded.

The age composition of the landings can be estimated by sampling at landing sites. In Europe, these are usually situated at a fish market and hence this area of sampling activity is referred to as "*market sampling*". The age composition of the discards can be most effectively estimated by sending technicians to sea on commercial fishing vessels to sample discards *in situ* ("*discard sampling*").

The sampling activities consist of measuring fish and removing from them either scales or ear-bones (otoliths) examination of which allows determination of the age of the fish. The sampling is conducted under a pre-defined protocol such that, to the extent possible, all important species, geographical areas and fleets are covered. The sampling programme is usually replicated either monthly or quarterly throughout the year.

Estimates of *mean weight-at-age* are readily produced as a further product of an appropriately designed sampling scheme.

3.2.2 *Data obtained from research vessel surveys*

To estimate the probable short-term effects of any proposed conservation measure for a given fish stock implies that, *inter alia*, catches next year for that stock can be predicted. Under present fishing intensity, many stocks, especially those of the demersal (bottom dwelling) species, consist predominantly of young fish. For this reason, the number of young fish likely enter the stock (recruitment) in the year for which a defined conservation measure is proposed is a significant determinant of the level of the catch. At present, the only way to determine probable recruitment is to sample the young fish at some time prior to recruitment. This sampling is achieved by research vessel surveys in which catches are taken using small-meshed nets and according to a pre-defined protocol.

Another important type of research vessel survey is concerned with obtaining samples of spawning products (eggs and/or larvae) of various stocks of fish. Such data are used to estimate the total quantities of eggs/larvae produced at spawning time by various stocks. Scientific investigations independent of the survey allow estimation of the number of eggs/larvae produced per unit weight of female fish during the spawning season. Division of the total number of eggs/larvae by the unit-weight egg production provides an estimate of the total weight of females in the sea at spawning time. This can be raised to the total weight of males+ females if the sex ratio of the stock is known. Such investigations are of importance for calibration of analyses defining the historical and current state of various stocks. In recent years the technique has been applied to the western mackerel stock and to herring in the North Sea.

3.2.3 Total weight landed and associated fishing effort

In addition to the statistics obtained from market sampling and discard sampling, data are also required on total weight of fish landed so that the sampling statistics can be raised to total values. Such data are required for each species, fleet, geographical area and time period incorporated in the sampling protocol.

Similarly disaggregated data on fishing effort, usually in the form of actual fishing time or days' absence from port, are also highly desirable to allow implementation of various analytical techniques.

Data of these types are often supplied by national administrations via their fishery inspectorates. However, in an appreciable number of instances, national fisheries institutes are responsible for the compilation of such data.

3.2.4 Economic data

Collection of economic data faces currently serious problems in terms of quality and comprehensiveness. In most Member States economic information is available only on ad hoc basis. Consequently, economic situation of the fleet or social impact of fishery management measures cannot be evaluated properly. Recent disturbances on the white fish market demonstrate the need for better understanding of the economics of the sector.

In order to meet these problems information has to be collected on characteristics of homogeneous fleet segments in specific fisheries, the composition of catch, fishing effort, detailed prices by species, market category and season, costs of production and numbers of fishermen involved. Ideally, the data base should also allow for regional analysis, assessment of secondary activities, international trade and aquaculture.

The main source of data on fleet performance will be panel surveys and random sampling. Information on market trends may be collected (on-line) from the main ports and auctions. Foreign trade data may be obtained from Eurostat. Fleet characteristics will be derived from the national or EC fleet registers. Data on

aquaculture and secondary industries will have to be obtained through regular surveys or from the sectoral organisations. Use will be made of market sampling for biologic purposes and the resulting information on composition of landings.

3.2.5 *National databases*

The data collected by national agencies are stored in respective national databases.

3.3 Analysis of the data collected by the sampling schemes

3.3.1 *International organisations*

For most of the fish stocks exploited by fishermen of Member States in the North Atlantic, analyses of the data collected in the sampling schemes are predominantly carried out under the auspices of the International Council for the Exploration of the Sea (ICES). For other stocks of interest to fishermen from Member States, a similar role is undertaken by the North Atlantic Fisheries Organisation (NAFO), the International Commission for the Conservation of Atlantic Tuna (ICCAT) and the General Fisheries Council for the Mediterranean (GFCM).

3.3.2 *International databases*

In the case of ICES, facilities for compilation and maintenance of data from national databases into international databases are provided. The required analytical facilities such as computers and computer programs are also provided together with secretarial and administrative facilities for preparation and distribution of reports. The other organisations operate in a basically similar fashion although their procedures may differ in detail.

3.3.3 *Working Groups*

Member States provide, at their own expense, scientists as participants in so-called "*working groups*" whose role, following pre-defined terms of reference, is to analyse the available data and to prepare associated reports. These reports are referred to a higher level committee (in the case of ICES this is the Advisory Committee on Fisheries Management - ACFM) which prepares a final report to be distributed to Member States and other interested parties as the definitive scientific advice.

3.3.4 *Particularities of the Mediterranean area*

In the Mediterranean, the system of working groups is not yet well developed and analysis of the historical and probable future state of the stocks is often carried out within individual research institutes. Furthermore, the relatively diffuse nature of the sites at which fish are landed and the current absence of a log-book system in the Mediterranean gives rise to problems in collection of accurate statistics on landings and fishing effort and the research institutes devote considerable resources to this end.

Market sampling and research vessel surveys are also carried out but sampling of discards on a routine basis is minimal.

3.3.5 *Economic and social analysis*

Up to date regular economic surveys are carried out only in a few Member States. Working groups on economic analysis do not exist. There is no Community wide organizational framework comparable to ICES.

4. Costs of maintaining existing sampling schemes and associated analysis of data

From the preceding text it will be appreciated that for stocks in the North Atlantic, costs can be allocated to four major areas of activity.

- (a) Market sampling
- (b) Discard sampling
- (c) Research vessel surveys
- (d) Working groups for analysis of data

In the Mediterranean, costs can be allocated to:

- (a) Market sampling
- (b) Research vessel surveys
- (c) Laboratory investigations
- (d) Collection and compilation of basic statistics

4.1 Origin of the costs

The costs of market sampling arise because appropriately trained staff often must be sent to fish markets from their home base in which case travel and per diem expenses are incurred in addition to salaries. Alternatively, part- or full-time staff may be employed on site. In either case, costs may also arise because fish sometimes need to be purchased to allow collection of the appropriate data.

The costs of discard sampling are incurred because trained staff must be sent to sea on commercial fishing vessels. Salary, travel and per diem expenses are paid to the staff involved and, in some instances, the fishing vessels are paid for the inconvenience and added costs to them of the presence of scientific staff on board.

The cost of research vessel surveys is high because it is intrinsically costly to own, maintain and operate a research vessel. In addition, salaries and per diem expenses of scientific staff manning the surveys must also be paid.

Costs of analysing data arise from the requirement to carry out in-house data processing at national level, to convey national results to international organisations

and to attend working groups and/or higher level committee meetings. Attendance at working groups incurs travel and per diem expenses.

4.2 Specification of costs

Tables 2 to 5 indicate the costs for all Member States combined of carrying out each of the specified activities indicated above on fish stocks in the North Atlantic. Table 1 provides information on the total costs for all activities combined. The costs are defined by geographical area and by species or groups of species.

The areas are those defined by ICES and reference should be made to Figure 1 for their geographical position. It should be noted that, in reality, many of the sampling schemes are directed to subdivisions of the areas indicated in the Tables. This is especially true of area VII where separate sampling schemes exist for fish stocks in the the Irish Sea and Bristol Channel (VIIa,f), West of Ireland (VIIb,c), English Channel (VII d,e) and the Celtic Sea (VIIg,h,i,k).

Within the groups of species, many individual species are sampled. For example, the "roundfish" group incorporates such species as cod, haddock, hake, saithe and whiting while "flatfish" incorporate plaice, sole and two species of megrim and "industrial species" include Norway pout, sandeels and sprats.

Table 6 provides total costs to Member States of sampling in the Mediterranean. As indicated above, procedures in the analysis of the state of fish stocks in this area are somewhat different to those employed for the North Atlantic and costs have been specified accordingly.

4.3 Distribution of costs between sampling activities

The total cost to Member States of maintaining the existing data bases is approximately of 26 million Ecu (22 million for the North Atlantic and 4 million for the Mediterranean). Of this total, 53% is spent in performing research vessel surveys, 23% is spent on market sampling, 2% is devoted to sampling discards and the remaining 18% is devoted to analytical procedures and attendance at meetings.

In addition to the costs specifically referred to in this document, it should not be forgotten that at least a part of the costs of collection of data on total landings and fishing effort incurred by the fishery inspectorates of Member States should be allocated to the sampling schemes and associated data bases. Although the Commission does not possess specific data on such costs it is believed that a "guesstimate" of 5 million Ecu would be conservative in this respect.

As already indicated in Section 3.2.4 of this report, it would be highly desirable to establish databases for economic analyses of the fisheries and the probable economic effects of the implementation of various conservation measures. A preliminary estimate of 5 million Ecu is probably appropriate.

Thus, to maintain the existing sampling schemes requires expenditure of 30 million Ecu and to augment the existing databases with economic data will require total expenditure of 35 million Ecu.

5. Multiannual perspectives for the development and maintenance of the databases within each Member State.

One of the conclusions of the Council cited in Section 1 of this report specifically requests consideration to be given to these topics. However, it is difficult to be specific in the present circumstances.

With respect to maintenance of the databases, it has already been made clear in Sections 2.1.1 and 2.1.2 of this report that Directors of research institutes and scientists directly involved with the sampling schemes believe that funding to support these schemes will be reduced in the foreseeable future. On this basis, unless some counteracting initiatives can be taken, there appears to be little prospect of development of the databases. On the contrary, and as stated previously, it appears that the quality of the databases will deteriorate. If this occurs, the quality of the advice available to the Commission will also deteriorate and hence the Commission's proposals with respect to the conservation of fish stocks will become increasingly insecure.

In this context, it is also important to be aware that complete cessation of sampling of a stock in only one year will have effects which will persist for many following years. This is because the analytical procedures currently available demand a lengthy and continuous time series of data. Interruptions in the time series give rise to major problems for analysis.

It is also important to maintain and, if possible and where necessary, to augment each of the national sampling schemes. Gears and practices employed by fishermen to catch fish from a given fish stock often differ between Member States and it is important that these differences are reflected within the databases. It is also necessary to maintain expertise in performing the required tasks within each Member State.

6. Possible initiatives on the part of the Commission

The Commission is by far the major customer of ICES and is also one of the major customers of the other international organisation indicated in Section 3.1 of this report. In the light of the present position, the Commission is considering possibilities for establishing financial assistance towards the performance of the relevant sampling schemes.

The Commission wishes to make it clear that neither the existing budgets for studies nor any possible new budget are intended to support innovative research. The tasks supported are now, and will continue to be, those for which techniques are well understood and widely practised. The objective of the work is to enhance or maintain

the provision of information of direct application to the implementation and support of the Common Fisheries policy.

6.1 Budget implications

6.1.1 *Existing budget lines*

For 1993, there exist three budget lines for various study programmes in support of the Common Fisheries Policy. These are:

B2 - 2303 - Mediterranean Studies - 3.0 MECU

B2 - 2349 - Bioeconomic Studies - 4.3 MECU

B2 - 2350 - Protection of Marine Species - 1.0 MECU

Total - 8.3 MECU

In addition to these specific budget lines funds are available for the proposed development and maintenance of the databases within the budget devoted to the Structural Policy, in particular funds allocated at present to exploratory fishing and/or modernisation of fishing vessels.

6.1.2 *Possibilities for the future*

Administratively, the simplest approach to provide the required budget for the maintenance and development of sampling schemes might be to allocate a specific budget for this purpose.

An alternative way might be to consolidate and reallocate the existing budgets mentioned in section above.

A part of the consolidated budget could be devoted to the maintenance and development of sampling. A guaranteed minimum part of this total consolidated budget could be devoted to studies in the Mediterranean, bioeconomic studies and the protection of marine species. A residual amount could be devoted to the same topics.

The Commission is of the opinion that the latter procedure would not only allow support of the routine sampling activities but would also permit greater flexibility in funding the better quality proposals made under the currently existing budget lines for studies.

6.1.3 *Multi-annual basis*

The maintenance of the databases and the associated sampling programmes are continuous and long-term activities. Any interruption of such work might invalidate or at least make the existing time series less useful.

For this reason it is paramount that any initiative to provide for a contribution from the Community towards the expenditure incurred by Member States will be on a multi-annual basis of at least five years.

6.2 Probable method of distribution of the budget for sampling schemes.

The Commission considers that the most appropriate way to distribute the budget would be by means of direct contract with the long-established fisheries institutes of Member States. These are experienced in performing the required activities and appropriately skilled personnel are immediately available. Ideally, the contract should be of more than one year duration to provide assurance that the sampling programmes will be continued, at least in the medium term.

For market sampling and discard sampling, the contracts will specify the expected number of individuals to be measured and aged for each stock and fishing fleet to be sampled.

For research vessel surveys the expected number of days at sea, the expected numbers of individuals of each sampled stock to be aged and measured will be specified.

Costs of other activities such as data processing, attendance at working groups will also be considered for support.

The Commission considers that assistance of the order of 20 to 30 % is appropriate. This implies that , based on the assumptions presented in Section 4, 7 to 10.5 MECU are required.

6.3 Consequences of provision of financial support to sampling schemes

If financial support is provided in the manner indicated above, it is implicit that Member States will have committed themselves to continuation of their sampling programmes for the duration of the contract. Furthermore, the Commission, having reviewed all proposals for contracts, may be in a position to suggest ways in which international collaboration may be improved to avoid unnecessary replication of work.

The data collected within the contracts will , depending on the geographical areas, be made available to different data bases. Information concerning the areas traditionally covered by ICES will be made available to this organisation. For the Mediterranean area a regional data base will have to be established, probably co-financed by the Community. For the economic and social analysis a database will also have to be created.

7. Concluding comments

The Commission seeks the approval of Council for this report and urges the Council to request proposals by the Commission to establish, on a multiannual basis, precise budget conditions for the maintenance and, if possible, development of appropriate data bases within each Member State and the associated funding mechanisms, combining national and Community budget allocations.

Table 1: Total Cost ('000 Ecu) of all Specified Activities in the North Atlantic

	ICES AREA					All
	III	IV	VI	VII	VIII + IX	
Roundfish	1118	4728	635	2037	456	8974
Flatfish	63	1988	12	1988	192	4243
Anglers + Rays			30	268	287	585
Sea Breams					42	42
Herring	275	2246	136	401		3058
Mackerel H.Mackerel B.whiting		309	In IV	682	563	1554
Sardine					195	195
Anchovy					312	312
Tunas					46	46
Crustacea		308	160	296	290	1054
Molluscs						
Industrial Species	80	293		4		377
Deep water Species			8		7	15
Others					161	161
All Unspecified	1536	9872	981	5676	2551	20614
		See Note 1				1207
TOTAL						21823

Note 1: 1207Kecu are spent by one Member State in performing research vessel cruises and activities associated with working groups. This quantity has not been allocated to species or area.

Table 2: Cost ('000 Ecu) of Market Sampling in the North Atlantic

	ICES AREA					All
	III	IV	VI	VII	VIII + IX	
Roundfish	359	953	191	757	105	2365
Flatfish	32	664	11	1011	74	1792
Anglers + Rays			29	86	89	204
Sea Breems					18	18
Herring	69	190	73	109		441
Mackerel H.Mackerel B.whiting		58	In IV	133	136	327
Sardine					39	39
Anchovy					13	13
Tunas					35	35
Crustacea		186	119	124	27	456
Molluscs						
Industrial Species	80	183		4		267
Deep water Species			8		7	15
Others					38	38
All	540	2234	431	2224	581	6010

Table 3: Cost ('000 Ecu) of Discard Sampling in the North Atlantic

	ICES AREA					All
	III	IV	VI	VII	VIII + IX	
Roundfish	6	295	61	80	3	445
Flatfish		59		39	3	101
Anglers + Rays				14	6	20
Sea Breems						
Herring		61				61
Mackerel H.Mackerel B.whiting						
Sardine						
Anchovy						
Tunas						
Crustacea		22	15	7	3	47
Molluscs						
Industrial Species						
Deep water Species						
Others						
All	6	437	76	140	15	674

Table 4: Cost ('000 Ecu) of Research Vessel Surveys in the North Atlantic

	ICES AREA					All
	III	IV	VI	VII	VIII + IX	
Roundfish	712	3347	346	1099	341	5845
Flatfish	27	1181		792	109	2109
Anglers + Rays				161	187	348
Sea Breems					24	24
Herring	183	1934	52	269		2438
Mackerel H.Mackerel B.whiting		216	In IV	529	423	1168
Sardine					154	154
Anchovy					298	298
Tunas						
Crustacea		67		118	255	440
Molluscs						
Industrial Species		57				57
Deep water Species						
Others					122	122
All	922	6802	398	2968	1913	13003

Table 5: Cost ('000 Ecu) of Working Groups dealing with fish stocks in the North Atlantic

	ICES AREA					All
	III	IV	VI	VII	VIII + IX	
Roundfish	41	133	37	101	7	319
Flatfish	4	84	1	146	6	241
Anglers + Rays			1	7	5	13
Sea Breams						
Herring	23	61	11	23		118
Mackerel H.Mackerel B.whiting		35	??	20	4	59
Sardine					2	2
Anchovy					1	1
Tunas					11	11
Crustacea		33	26	47	5	111
Molluscs						
Industrial Species		53				53
Deep water Species						
Others					1	1
All	68	399	76	344	42	929

Table 6: Cost ('000ecu) of Performing Routine Sampling Activities and Associated Analysis in the Mediterranean

Species	Work	Cost
Demersal	Market sampling	164
	Research surveys	781
	Laboratory analysis	663
	Statistics	456
	ALL	2064
Pelagic	Market sampling	115
	Research surveys	819
	Laboratory analysis	555
	Statistics	343
	ALL	1832
ALL	Market sampling	279
	research surveys	1600
	Laboratory sampling	1218
	Statistics	799
	ALL	3896
Bivalve Molluscs		140
TOTAL		4036

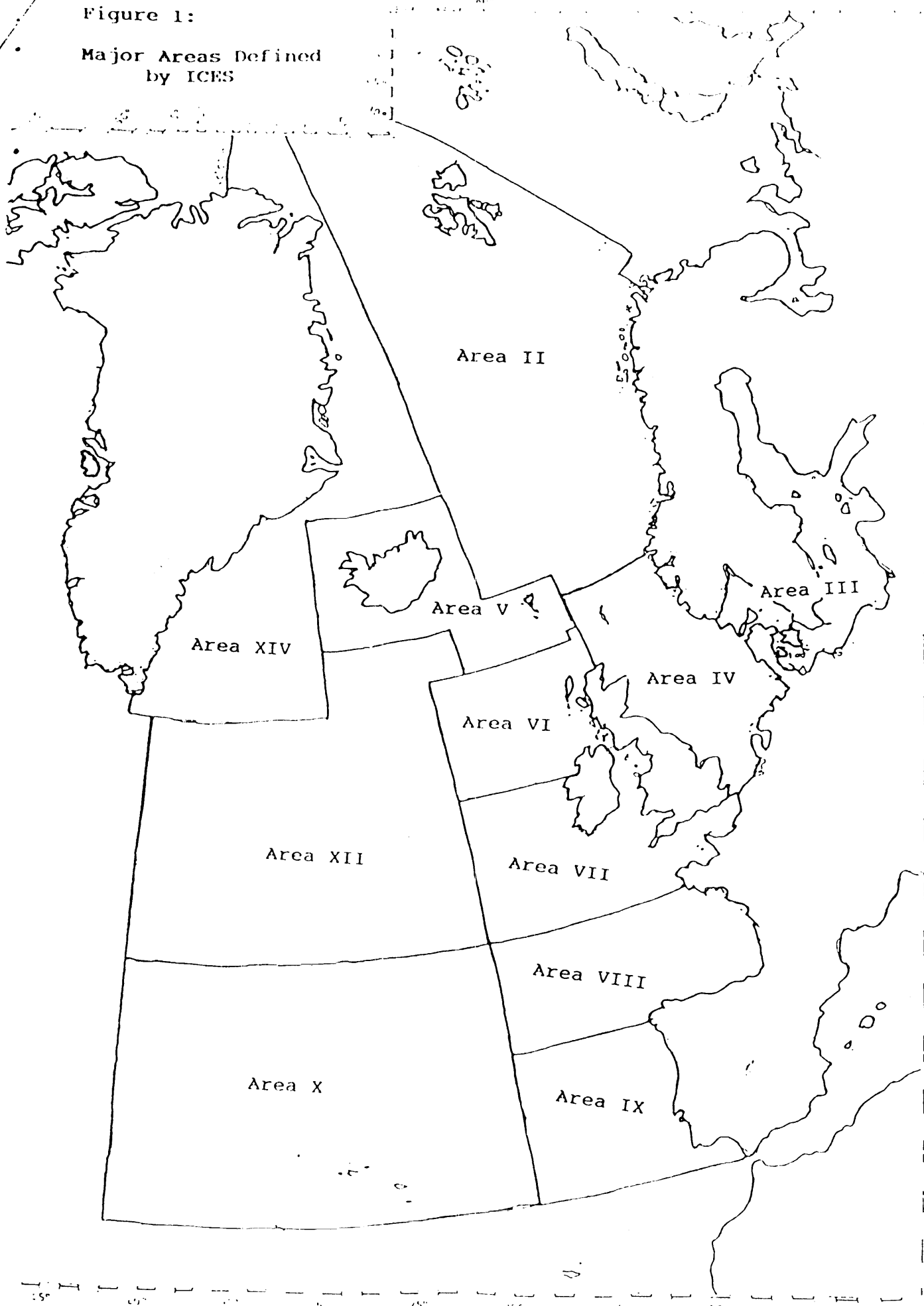
Notes: Demersal - all demersal species including hake, red mullet and red shrimp

Pelagic - all pelagics large and small including sardine and anchovy

Cost of fish purchase included with market sampling

Figure 1:

Major Areas Defined
by ICES



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