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DIRECTORATE-GENERAL FOR FISHERIES
Research and Scientific Analysis Unit (A4)

"CLASSIFICATION AND ANALYSIS OF THE SCIENTIFIC DOMAINS COVERED BY THE BIOLOGICAL STUDIES 1997-2000 IN SUPPORT OF THE CFP"

Name of Stagiaire:	Minna EPPS
Name of Supervisors:	Jacques FUCHS
	Mario LOPES Dos SANTOS
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The interpretation, analysis, and views are those of the author and do not purport to represent the position of the European Commission in any way.

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2 EXECUTIVE SUMMARY

The over-exploitation of fish stocks has had a significant negative effect on fishermen's income, the balance of the marine ecosystem and the supply of fish to the EU market. Reliable scientific advice is necessary to achieve sustainable fisheries. To improve the basis for advice, particular attention has been devoted to support studies on data collection by direct measures (research surveys) and indirect methods (market sampling, statistical analysis, biological sampling) and other areas such as gear selectivity, discards, CPUE, monitoring and control.

The Community Financial Support provided by DG FISH for the biological studies during the 1997-2000 period amounted to nearly €76 millions, corresponding to 182 RDT projects, selected on a yearly basis.

The selection of proposals in response to the calls for proposals was carried out by independent experts. The scientific quality of the research, the relevance to the call and the potential impact for the CFP were considered in priority allowing a certain degree of innovation in the proposals.

The main objective of this report is to create a comprehensible classification of the 182 Biological Studies into scientific domains. This was carried out in close consultation with the Scientific Officers in Unit A4 of the Directorate General of Fisheries and progressed in the four following steps:

1 - *Analysing the objectives and priorities of the yearly Call for proposals;*
2 - *Listing of scientific areas and merging of broad categories;*
3 - *Testing the classification system;*
4 - *Allocating the biological studies into domains.*

The Biological Studies were allocated into ten different scientific domains (listed below[1]) according to the methods employed and their primary objectives. Each domain was then further divided into sub-domains.

1. RESEARCH SURVEYS (39)
2. SAMPLING OF COMMERCIAL FISHERIES (53)
3. TECHNICAL MEASURES (21)
4. MISCELLANEOUS DATA COLLECTION (7)
5. FLEET STUDIES (10)
6. FISH STOCK POPULATION STUDIES (21)
7. INTEGRATION OF ENVIRONMENTAL REQUIREMENTS INTO THE CFP (17)
8. MONITORING AND CONTROL (1)
9. SOCIO-ECONOMIC DIMENSIONS OF FISHERIES ACTIVITY (7)
10. DISSEMINATION OF INFORMATION (6)

The classification in the present analysis was mainly based on the *Calls,* and there was a distinct coherence between the *Calls* and the selected projects. Furthermore, the methodologies employed in the biological studies to collect fisheries data were

[1] Number of projects is given in parentheses.

consistent. However, the scientific component varied greatly between the studies depending on their aims and objectives, and on the area of research.

The biological studies funded during the period 1997-2000 were diverse which is demonstrated by the ten different domains that emerged. Basic data collection (Domain 1: Research surveys and Domain 2: Sampling of commercial Fisheries) constituted 50% of the biological studies and 62% of the allocated budget. Technical measures (Domain 3) and fish stock population studies (Domain 6) were well represented, highlighting technical innovation and research on the biology of species. However, other domains such as dissemination of information (Domain 10) and the socio-economic dimension of the CFP (Domain 9) were not as well addressed although these topics were listed as a priority in each *Call for proposals*. Furthermore, studies on inspection, monitoring and control (Domain 8) were almost absent, as well as studies on legal provisions in the fishery sector.

During the period (1997-2000), the data collection was only supported by biological studies, limiting the capacity to collect all necessary data to improve scientific advice Thus, there was no guarantee of receiving the necessary scientific data for the assessment of the most important stocks. However, the studies helped identifying data needs and, in addition, provided the *Commission* with results of diverse and sometimes innovative studies.

Under the new Data collection regulation, entered in force in 2001, Member States are obliged to collect data in accordance with a Minimum and an Extended Programme. It is expected that this new regime will be more efficient in obtaining the data required. Studies and pilot projects are also promoted through Calls for Tenders. The *Call for Tenders* is produced yearly[2]. The Commission will give 100% funding for one study project under each specific task[3]. The number of tasks will depend on the number of areas where scientific advice is needed. However, the budget allocated to study and pilot projects is limited to € 3 million.

There are advantages and disadvantages with both the former and the reformed data collection system. The new system is more efficient in obtaining the data required. However, the C*alls for Tenders* for biological studies were limited by the budget. In addition, the use of tenders does not allow evaluation by external experts. The previous system, limited to Call for Biological studies, was not very performing for the regular collection of data. On the other hand, it may be argued that this system invited more involvement from the scientific research community. In addition the flexibility in the *calls for proposals* resulted in more innovative research.

In conclusion, biological studies funded during the period 1997-2000 have upgraded European scientific knowledge, spurred innovation, and increased the co-operation and coherence between research organisations, which will continue to contribute to meeting the goals and objectives of the reformed Common Fisheries Policy.

[2] In accordance with the Council decision 2000/439/EC (see appendix II) under *article 9*.
[3] However, the budget allocated for each task may be split between two projects in exceptional circumstances.

3 ACKNOWLEDGEMENTS:

Grateful thanks are due to the Scientific Officers in Unit A4 in the Directorate General for Fisheries for their incisive input and for providing me with information and sound advice, which I could not have done without.

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Finally, I would like to extend special thanks to my supervisors Jacques Fuchs, Mario Lopes Dos Santos and to Tore Jakobsen for their guidance and suggestions for improvements during the formation, development and execution of this project.

4 ABBREVIATIONS AND ACRONYMS:

BS	Biological Studies
CBFM	Community-Based Fisheries Management
CFCA	Community Fisheries Control Agency
CFP	Common Fisheries Policy
CFS	Community Financial Support
CPUE	Catch per unit of effort
EEZ	Exclusive Economic Zone
FAO	Food and Agriculture Organisation of the United Nations
FIFG	Financial Instrument for Fisheries Guidance
GFCM	General Fisheries Commission for the Mediterranean
IBTS	International Bottom Trawl Survey
ICCAT	International Commission for the Conservation of Atlantic Tunas
ICES	International Council for the Exploration of the Sea
IUU	Illegal, Unreported and Unregulated fisheries
JFIS	Joint Fisheries Inspection Structure
JIS	Joint Inspection Structure
JPA	Joint Programmes of Activities
MAGP	Multi-annual Guidance Programme within fishing fleets
MLS	Minimum Landing Size
MSY	Maximum Sustainable Yield
QoL	Quality of Life
RAC	Regional Advisory Council
RSP	Relative Stability Principle
RTD	Research and Technological Development
SCFA	Scientific Committee for Fisheries and Aquaculture
STECF	Scientific, Technical, and Economic Committee for Fisheries
TAC	Total Allowable Catch
UNCLOS	United Nations Convention on the Law of the Sea
VMS	Vessels Monitoring Systems

1 Introduction:

1.1 Background

Fisheries, including aquaculture, provide a vital source of food, employment, recreation, trade and economic well-being for people throughout the European Union. Decisions under the CFP are taken on the basis of scientific advice provided by fisheries advisory bodies such as ICES, ICCAT and GFCM, which provide the best available information on the state of fisheries resources.

Following the Council decision (EEC) No 3760/92 in 1992, €25 million per year was allocated by the European Commission (hereafter the Commission) to Biological studies in the light of the relevance of the proposals to the objectives and priorities described in each *Call for proposals*[4]. A scientific and technical assessment was conducted by independent external experts with no direct or indirect interest in the projects. The Commission provided part-financing[5] for the selected projects.

The purpose of the Biological studies was to gather scientific information, with a view to ensure the effective conservation, management and development of living aquatic resources. Particular attention has been devoted to support studies on data collection by direct measures (research surveys) and indirect methods (market sampling, statistical analysis, biological sampling) and other areas such as gear selectivity, discards, CPUE, monitoring and control.

In addition, the Directorate General for Fisheries has sought to make available the results of these studies in a non-technical language by presenting/publishing a synopsis of the biological studies during the 1994-1996 period[6]. Dissemination of the results of the biological studies of the 1997-2000 period is currently in preparation.

This report focuses on the biological studies funded by the Commission during the period 1997-2000.

1.2 Project Rationale

Although the main objectives of the Calls remained the same during the four years, a specific programme was established each year to reflect the research needed. Adjusting the topics of each call allowed for greater flexibility.

1.3 Aims and Objectives of the present analysis

The objective of this report is to propose a classification system of the Biological studies receiving Community Financial Support (CFS) during the

[4] See Annex I for the *Call for Proposal* 2000.
[5] The rate of part-financing covers up to 50% of the real costs. Rates of part-financing in excess of 50% are the exception.
[6] Entitled : Dissemination of the results of biological studies, (February 2001).

period 1997-2000 into different scientific domains. In addition to the classification, the objectives were:

- To assess and evaluate the scope and range of the outputs by compiling information gathered from the 182 final reports.
- To update information about the status of the research funded studies.

Besides the outlined objectives this report aims to;

- Support in drafting future *Call for tenders* based on the available biological and technical data, and socio-economic analyses.
- Contribute to the dissemination strategy by facilitating the preparation of the publication of a synopsis.

2 Research Methodology

2.1 Conceptional Framework

The 182 studies could be divided into two main categories; studies which aiming at collecting basic data for stock assessment and studies comprising innovative research. The latter were studies concerned with population dynamics, gear selectivity, improvement and standardisation of methods, development of new techniques, dissemination of information, and other themes.

2.2 Classification

The classification and allocation of the Biological Studies into scientific domains was carried out in close consultation with the Scientific Officers in Unit A4 and progressed in the four following steps;

Step 1: Each call for proposal was analysed and the objectives and priorities summarised to establish a common ground. Broad categories of coherent scientific areas derived from the calls were identified.

Step 2:
A list of areas covering the biological studies was proposed using the project titles and the abstracts. This list was then merged with the broad categories derived from the calls. From this the following ten domains emerged.

1. RESEARCH SURVEYS
2. SAMPLING OF COMMERCIAL FISHERIES
3. TECHNICAL MEASURES
4. MISCELLANEOUS DATA COLLECTION
5. FLEET STUDIES
6. FISH STOCK POPULATION STUDIES
7. INTEGRATION OF ENVIRONMENTAL REQUIREMENTS INTO THE CFP
8. MONITORING AND CONTROL
9. SOCIO-ECONOMIC DIMENSIONS OF FISHERIES ACTIVITY
10. DISSEMINATION OF INFORMATION

A detailed explanation of each Scientific Domain and their sub-domains is given in section 3.2

Step 3: *Testing the classification system* Each study was allocated to the provisional domains and the sub-domains were expanded where necessary. Closely linked domains containing only one or few studies were grouped together, when feasible.

Step 4: The *Allocation of the Biological studies* into scientific domains was determined by the research objectives and the methodologies used. This step required a thorough review of each projects' primary and secondary objective(s) and the mode of collecting the data. The results and outputs were frequently examined (when scientific and technical summaries were inadequate or insufficient to allocate a study to a domain). The scientific sub-domains were extended or modified to enable projects belonging to one or more domains, or falling outside a category, to be incorporated under a scientific domain. The allocation of the biological studies into sub-domains was carried out in close consultation with different Scientific Officers depending on their field of expertise.

2.3 Analysis

The basic analysis occurred in three steps; data organisation, presentation of data, and interpretation of results. The key findings are summarised and presented in chapter three.

Due to the wide diversity of scientific domains it was deemed more appropriate to analyse each domain separately. The geographical area and species covered by each scientific domain, as well as preference criteria and CFS were recorded. The correspondence of the subject needs to the calls and the level of dissemination were also evaluated. Where applicable the scientific component and consortium quality were assessed. These are presented/outlined in Annex II (A2).

2.4 Scope and Limitations

The scope of this report has been limited in several ways. The lack of any significant feedback mechanism such as survey questionnaires prevented evaluation of the outcome and the use of the results. Limited information of publications hindered any means of tracking the level of dissemination of information within the scientific community or between the scientific community and industry, which is an essential and vital part of research.
There has been no attempt to assess the quality of each individual project or to gauge stakeholder perceptions of the biological studies.

3 Overview of the Biological Studies 1997-2000

3.1 Yearly Breakdown of the Biological Studies

182 projects in the field of fisheries were reviewed for the present analysis. The Community Financial Support for the biological studies during the 1997-2000 period amounted to nearly €76 million (see table 1. below).

Table 1 - Yearly breakdown of projects and EU financial support.

Year	No of projects	Total cost (€)	CFS (€)*
1997	66	36 408 817	19 501 624
1998	49	47 468 885	26 068 247
1999	44	36 781 619	20 893 548
2000	23	15 976 504	9 094 242
Total	**182**	**136 635 825**	**75 557 661**

* CFS= Community Financial Support

The Council regulations (EEC) No 3760/92 community system for fisheries included fisheries resources and aquaculture. Nonetheless, the calls for 1997, 1998 and 1999 (97/C 205/08, 98/C 159/09, and 99/C 122/14, respectively) did not address aquaculture under any subject area or priority[7]. Consequently no aquaculture research proposals were received during this period.

3.2 The Scientific Domains

Below is a summary table of the ten scientific domains followed by a brief description of each of the ten domains and a summary table of their sub-domains. The scientific component, as well as geographical area and species covered varied greatly between the different domains. The scope and range of the scientific domains and their sub-domains are analysed in more detail in Annex II.

Table 2 - Number of projects and EU financial support by scientific domain.

Scientific Domain	No of Projects	Total cost (€)	CFS (€)[1]	(%)[2]
1. Research Surveys	39	43 532 251	22 699 887	30
2. Sampling of Commercial Fisheries	53	41 909 409	23 055 418	32
3. Technical Measures	21	10 540 824	6 074 887	8
4. Miscellaneous Data Collection	7	4 823 805	2 639 445	3
5. Fleet Studies	10	3 920 198	2 392 501	3
6. Fish stock population Studies	21	12 564 870	6 898 255	9
7. Environmental Integration	17	8 434 073	6 019 218	8
8. Monitoring and Control	1	564 694	282 347	0
9. Socio-economic dimensions	7	2 924 383	1 647 960	2
10. Dissemination of Information	6	7 421 318	3 847 743	5
Total	**182**	**136 635 825**	**75 557 661**	**100**

[1] CFS= Community Financial Support

[2] Percentage of the total budget allocated to the Biological Studies 1997-2000

[7] The 2000 Call for Proposals (2000/C 177/08) included exploratory data collection projects in the area of aquaculture, the relationship between aquaculture and fisheries (influences of fish farming on the coastal environment, and environmental hazards on fisheries and fish farming), and the capacity of fishing and aquaculture industries to create jobs (see Annex I).

Domain 1. *Research Surveys*

The mode of collecting the data in this domain was through scientific research surveys. Studies were allocated into sub-domains depending on the survey method used: ***1.1 Hydroacoustic Surveys***, ***1.2 Trawl Surveys***, and ***1.3 Egg-production based Biomass Surveys***. These annual surveys often formed a part of a continuous programme. The studies that involved a mixture of the above methodologies were allocated to the ***1.4 Multipurpose Surveys*** sub-domain. The latter sub-domain also included aerial surveys and a combination of other fisheries data. Studies aimed at evaluating, improving and standardising survey design and methods were subsequently allocated to the ***1.5 Improvement of Survey Design and standardisation of methods'*** sub-domain.

The breakdown of projects by sub-domain is presented in Table 3

Table 3 - Summary table of the Sub-domains

Sub-domains	No of projects	Total Cost (€)	CFS (€)
1.1 Hydroacoustic Surveys	5	4 113 513	**2 260 258**
1.2 Trawl Surveys	16	17 337 341	**8 548 501**
1.3 Egg-based Biomass Surveys	4	5 232 106	**3 247 845**
1.4 Multipurpose Surveys	4	6 382 602	**2 688 255**
1.5 Improvement of Survey design and Standardisation of Methods	10	10 466 689	**5 955 028**
Total	**39**	**43 532 251**	**22 699 887**

Domain 2*. Sampling of Commercial Fisheries*

The main objective of the biological studies in this domain was to collect data from commercial fisheries[8] from landings and at sea for stock assessment. The data collected in this scientific domain were dependent on fisheries catch data. The biological studies under this category were allocated to the following sub-domains; ***2.1 Biological Sampling***, ***2.2 Discard Sampling and Analysis***, ***2.3 Catch and Effort***, and ***2.4 Improvement and Standardisation of Methodologies***. Biological studies which collected data from commercial landings (e.g. length-frequency distributions, sex ratios, otoliths for age determination), through observer programmes and logbooks, were allocated to the biological sampling sub-domain. Studies under this sub-domain regularly contained a mixture of research methods (e.g. Market sampling and surveys) including genetic analysis. Biological Studies estimating and analysing discard[9] were grouped together in the *Discard Sampling and Analysis* sub-domain. Studies that investigated catch effort of specific fisheries and factors effecting catch effort were subsequently allocated to the *Catch and Effort* sub-domain. The *Improvement and Standardisation of sampling methodologies* sub-domain included studies that aimed to improve the methodologies through supplementary techniques and information such

[8] Estimates of the total volume of catches per stock, including discards. Data on landings and discards including estimate catch composition and biological parameters like; growth, sex, maturity and fecundity.

[9] Discard sampling and analysis in this context is mainly concerned with quantification for stock assessment.

as historical data, modelling,and establishing databases for dissemination of the data collected.
The breakdown of projects by sub-domain is presented in Table 4

Table 4 - Summary table of the Sub-domains

Sub-domains	No of Projects	Total Cost(€)	CFS(€)
2.1 Biological Sampling of Commercial Fisheries	20	15 537 093	**8 436 150**
2.2 Discard Sampling and Analysis	12	8 965 590	**4 957 650**
2.3 Catch and Effort	12	5 759 520	**3 334 204**
2.4 Improvements and Standardisation of Methodologies	9	11 647 206	**6 327 414**
Total	**53**	**41 909 409**	**23 055 418**

Domain 3*. Technical Measures- and alternative uses of fishing techniques*

Technical measures such as gear selectivity[10] and seasonal closures are aimed at reducing by-catch and protecting juveniles. As a consequence of the Council Decisions on technical measures the four *calls for proposals* address 'gear selectivity' and gave priority to the development of selective gear and techniques for reducing by-catch of juveniles. Studies with the objective to eliminate or mitigate incidental catches of porpoises and other non-targeted species through technical measures are listed under the ***3.1 Fishing methods and gear selectivity to reduce by-catches of marine mammals, non-target species and undersized fish*** sub-domain[11]. Studies comparing and evaluating the outcome[12] for different fishing gear are listed under the ***3.2 Gear evaluation and the influence of the features of the gear*** sub-domain. Technical innovation and alternative uses of techniques studies are listed under ***3.3 Seasonal and spatial closures*** *and* **3.4** ***Alternative Fishing Techniques***. Studies assessing the environmental impact of different fishing gear were allocated to the Environmental Integration domain.

The breakdown of projects by sub-domain is presented in Table 5

Table 5 - Summary table of the Sub-domains

Sub-domains	No of Projects	Total Cost(€)	CFS(€)
3.1 Fishing Methods and Gear Selectivity	14	5 749 837	**3 627 522**
3.2 Gear Evaluation	3	1 226 673	**639 842**
3.3 Seasonal and Spatial Closures	1	122 406	**61 203**
3.4 Alternative Fishing Techniques	3	3 564 314	**1 807 523**
Total	**21**	**10 540 824**	**6 074 887**

[10] Towed gear and passive gear (net and mesh size, and number of hooks).
[11] The sub-domain also incorporates improving and estimating gear selectivity.
[12] Quantification and species composition.

Domain 4. *Miscellaneous Data Collection*

The calls for proposals emphasise the need for scientific information on not previously researched species or subject areas, and optimisation and standardisation of data collection in general. The studies under this scientific domain are divided into two sub-domains; ***4.1 Data Collection of poorly studied species and areas*** (exploratory studies collecting data on poorly studied areas and species such as deep-sea species and elasmobranchs), and ***4.2 Optimisation and Standardisation of Data Collection for Management Models*** -assessment and development of fisheries management models in general (revising and updating information, and development of new software).

The breakdown of projects by sub-domain is presented in Table 6

Table 6 - Summary table of the Sub-domains

Sub-domains	No of Projects	Total Cost(€)	CFS(€)
4.1 Data Collection of Poorly studied Species and Areas	3	3 054 280	**1 775 259**
4.2 Optimisation of data collection	4	1 769 525	**864 186**
Total	**7**	**4 823 805**	**2 639 445**

Domain 5. *Fleet Studies (fleet behaviour)*

This domain includes studies on the relationship between fishing effort, capacity, mortality, examination of trends in catch capability and fishing power, and economic analysis of fisheries.

5.1 Economic Performance and Analysis – includes data on economic performance of specific fisheries (fleets, resources and fishing activities).

5.2 Fleet Capacity- evaluates and estimates the capacity of fishing industries.

5.3 Assessment and Development of Fishing Power- involves technical analysis of fishing power/effort (tonnage, engine power, and fuel consumption of fishing vessels).

The breakdown of projects by sub-domain is presented in Table 7

Table 7 - Summary table of the Sub-domains

Sub-domains	No of Projects	Total Cost(€)	CFS(€)
5.1 Economic Performance/Analysis	1	1 452 823	**733 998**
5.2 Fleet Capacity	4	1 027 357	**605 139**
5.3 Assessment and Development of Fishing Power	5	1 440 018	**1 053 364**
Total	**10**	**3 920 198**	**2 392 501**

Domain 6. *Fish stock population Studies*

The aim of the studies under this scientific domain was to enhance the biological knowledge of commercial and non-commercial species and their habitats. The domain was sub-divided into the following two sub-domains:

6.1 Biological Studies on reproductive biology, spawning, migration patterns of commercial and non-commercial species, and population dynamics *(modelling and simulations)*

6.2 Genetic Studies (includes a genetic characterisation of the stocks/species).

The breakdown of projects by sub-domain is presented in Table 8

Table 8 - Summary table of the Sub-domains

Sub-domains	No of Projects	Total Cost(€)	CFS(€)
6.1 Reproductive biology	18	10 271 386	5 735 963
6.2 Genetic studies	3	2 293 484	1 162 292
Total	**21**	**12 564 870**	**6 898 255**

Domain 7. *Integration of Environmental Requirements into the CFP*

The calls during the period concerning the present analysis stipulate the importance of integrating environmental requirements into the CFP by funding studies that estimate and assess the environmental impacts of fisheries activities on marine ecosystems. The Integration of Environmental requirements into the CFP was further split into three sub-domains:

7.1 Incidental by-catches and strandlings- assesses the impacts of fisheries on small cetaceans and other marine mammals, and includes observer studies to monitor by-catch.

7.2 Impact of Fishing Activities on Marine Ecosystems- this sub-domain mainly include studies assessing and comparing the environmental impacts of towed gear on benthic communities.

7.3 Effect of Environmental Variables on Fisheries Resources- physical factors determining the annual variation in spatial and temporal distribution of stocks.

The breakdown of projects by sub-domain is presented in Table 9

Table 9 - Summary table of the Sub-domains

Sub-domains	No of Projects	Total Cost(€)	CFS(€)
7.1 Incidental By-catch and Strandlings	4	1 803 212	**1 331 746**
7.2 Impact of Fishing on Marine Ecosystem	10	4 622 547	**3 497 134**
7.3 Effect of Environmental Variables on Fisheries Resources	3	2 008 314	**1 190 338**
Total	**17**	**8 434 073**	**6 019 218**

Domain 8. *Monitoring and Control*

8.1 Application of modern techniques- Development of satellite technology such as VMS and ArcGIS for recording and reporting of data on fishing activities (including future potential applications).

The breakdown of projects by sub-domain is presented in Table 10

Table 10 - Summary table of the Sub-domains

Sub-domains	No of Projects	Total Cost(€)	CFS(€)
8.1 Incidental Application of Modern Techniques	1	564 694	282 347

Domain 9. *Social and Economic Dimensions of Fisheries Activity*

This domain incorporates review and evaluation studies of fisheries in an economic and social context and was divided into the two following sub-domains:

9.1 Social and Economical Implications of policies and technical measures- this sub-domain includes studies on small coastal fisheries within an economical and social framework, as well as the applicability and effectiveness of technical measures.

9.2 Recreational Fisheries- includes biological, economic, social and demographic data to portray the state of recreational fisheries, and the creation of data bases for present and future monitoring needs for recreational fishing activities.

The breakdown of projects by sub-domain is presented in Table 11

Table 11 - Summary table of the Sub-domains

Sub-domains	No of Projects	Total Cost	CFS
9.1 Social and Economic Implications of Policy and Technical measures	6	3 154 347	1 762 942
9.2 Recreational Fisheries	1	334 730	167 365
Total	**7**	**2 924 383**	**1 647 960**

Domain 10. *Dissemination of Information*

The studies in this domain aim to increase the flow of scientific information and to improve communication between fisheries research and the industry to ensure effective implementation of the CFP. In addition, they include methodological studies to optimise and to standardise the collection of data and communication through data bases.

The breakdown of projects by sub-domain is presented in Table 12

Table 12 - Summary table of the Sub-domains

Sub-domain	No of Projects	Total Cost	CFS
10.1 Dissemination of Scientific Data and communication	6	7 421 318	3 847 743

3.3 Overview of the Scientific Domains

The relative proportions of each scientific domain by number of projects and by Community funding, respectively, are illustrated in Figures 1 and 2
.

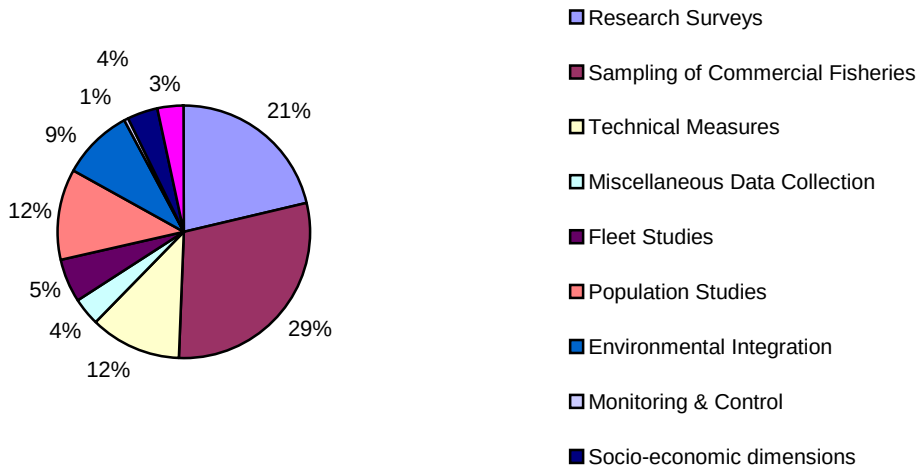

Figure 1 - Relative proportion of each scientific domain by number of projects.

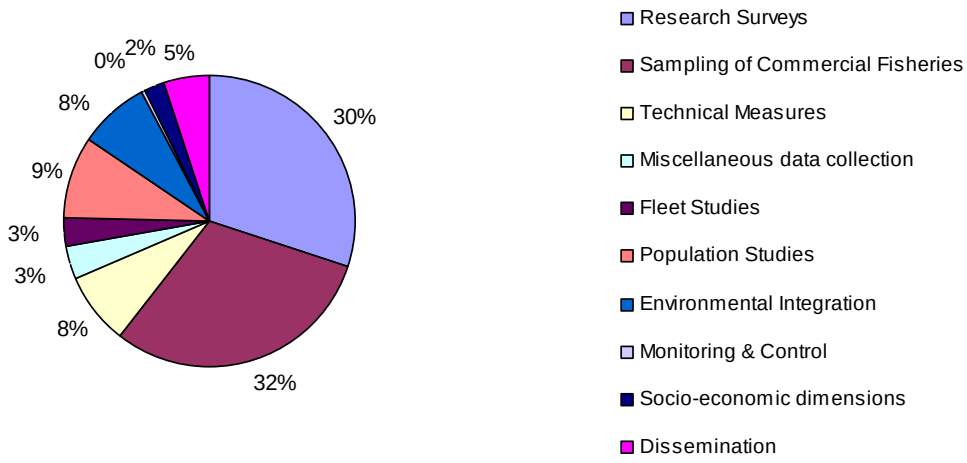

Figure 2 - Relative proportion of each scientific domain by percentage Community Financial Support.

Research Surveys (Domain 1) and Sampling of commercial fisheries studies (Domain 2) alone constitute 50% of the Biological Studies and 62% of the allocated budget. Of the 92 projects in these scientific domains 19 projects (21%) were studies aimed at improving and standardising basic data collection methods.

After these two domains, fish stock population studies (Domain 6) received the third largest proportion of the budget allocated (9%) to the biological studies. The dissemination of information (Domain 10) received 5% of the total budget despite only containing six study projects. This was reflected by

each call giving high priority to the improvement of dissemination of information.

The histogram below shows the Community Financial Support (CFS) by scientific domain and sub-domain.

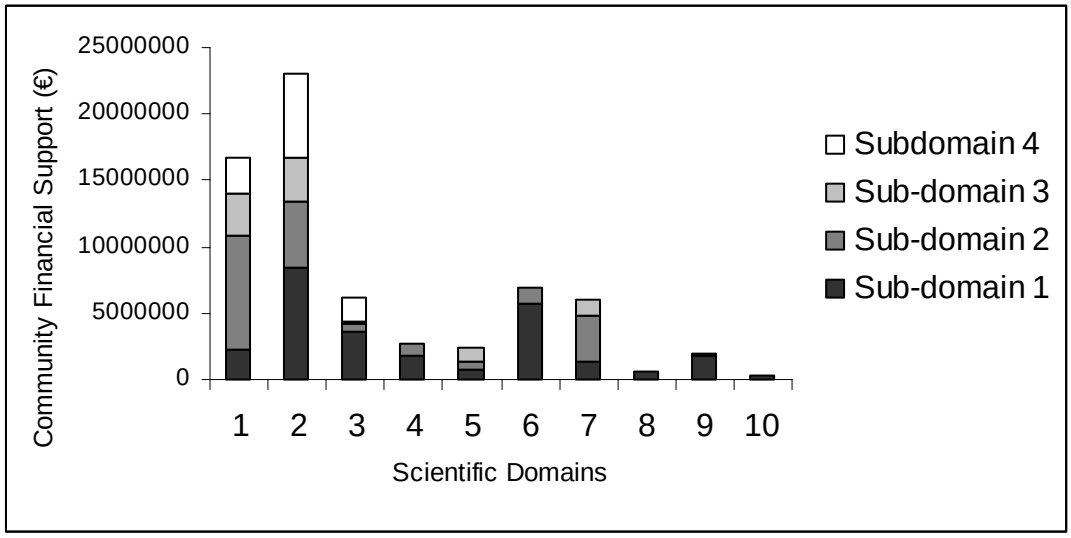

Figure 3 - Community Financial Support by scientific domain and sub-domain.

3.4 Degree of Innovation

Approximately 6 percent of all the studies were literature-based evaluation of the efficiency of different methods, and dissemination of information[13]. About 40 percent of the biological studies were basic data collection for stock assessment[14]. The remaining 54% were biological research projects and studies aimed at standardising or improving research methods for collecting data, developing new techniques and alternative uses, as well as research on poorly studied species and areas, with varying degrees of innovation. Of these, 11 percent were considered as highly innovative (Figure 4).

[13] Some of the dissemination projects did however include a qualitative research component.
[14] The basic data collection was confined to two domains namely, research surveys and sampling of commercial fisheries.

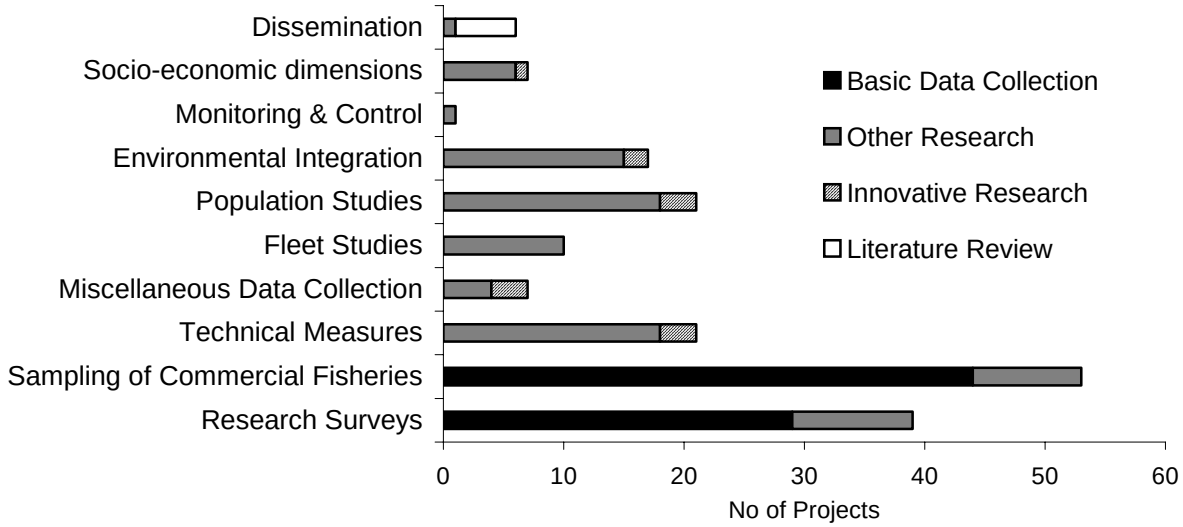

Figure 4 : Number of projects under each Scientific Domain by four categories of research.

Criteria
Literature Review- literature based research method not containing a quantitative component.
Basic Data Collection - pure data collection by direct and indirect measures.
Other Research - has a scientific and analytical component
Innovative Research- technical innovation, and alternative uses of techniques, integrative research on previously neglected species and areas with high level of dissemination.

3.5 Detailed list of Projects funded by DG-FISH between 1997-2000 by Scientific Domain

This section lists the study projects by scientific domain and sub-domain. The project/contract numbers are written in the left margin and the titles are followed by an English translation where necessary.

1. Research Surveys:

1.1 Hydroacoustic Surveys

97/001 Hydroacoustic survey for Atlanto-scandian herring in the Norwegian Sea in 1997
97/005 Hydroacoustic Survey of Atlanto Scandian Herring in the Norwegian Sea, 1998-2000 (ASH - II)
98/085 Surveying the pelagic fish resources and establish an acoustic database in the Baltic Sea
99/053 Hydroacoustic Survey of Atlanto-Scandian Herring in the Norwegian Sea, 1999-2000
00/005 MEDIANE (MÉDIterranée Anchois Evaluation). Analyse de l'abondance et de la répartition de l'anchois et des petits pélagiques dans le golfe du Lion. (*Analysis of the abundance and distribution of anchovy and small pelagic fish in the Golf of Lion*).

1.2 Trawl Surveys

97/013 International bottom trawl survey in the Mediterranean (Espagne)
97/025 International bottom trawl survey in the Mediterranean
97/041 International Bottom trawl survey in the Mediterranean (Grèce): Medits Gr
97/069 International Bottom trawl survey in the Mediterranean
98/058 Campagnes d'évaluation des ressources halieutiques en Mer du Nord et Manche Orientale, (*Evaluation Survey of Fisheries Resources in the North Sea and the Orientale Channel*)
98/086 Scottish Bottom Trawl Surveys in the North Sea
99/014 International bottom trawl survey in the Mediterranean (Spain): MEDITS ES
99/026 International bottom trawl survey in the Mediterranean (France): MEDITS FR1
99/038 International bottom trawl survey in the Mediterranean (Greece): MEDITS GR
99/046 International bottom trawl survey in the Mediterranean (Italy): MEDITS IT
99/047 Stock Assessment in the MEDiterranean (SAMED)
00/006 International bottom trawl survey in the Mediterranean (France): MEDITS FR
00/008 Monitoring of Stocks in the North Sea and Skagerrak
00/010 International bottom trawl survey in the Mediterranean (Greece): MEDITS GR
00/028 Study of exploited fish stocks on the Flemish Cap III
00/041 International bottom trawl survey in the Mediterranean (Italy): MEDITS IT 2001

1.3 Egg- production based Biomass Surveys

97/017 Ichthyoplankton-based indices of spring spawning commercial fish population in Western European Waters

98/040 Estimation of the Mediterranean anchovy (ENGRAULIS ENCRASICOLUS) biomass by the daily egg production method in the Thracian Sea (Greece) and South Western Adriatic Sea (Italy)
00/013 Population estimates of the Bay of Biscay anchovy by the daily egg production method in 2001
00/038 Mackerel and Horse Mackerel Egg Survey 2001

1.4 Multi-purpose Surveys

97/008 Herring surveys in the North Sea and West of Scotland
97/048 Evaluation of the Southern Greek anchovy stocks
98/077 Research vessel SURveys for stock ASSessment (ASSUR3)
99/006 Herring surveys in the North Sea and West Scotland

1.5 Improvement of Survey design and Standardisation of Methods

97/009 The use of Multivariate Date for Improving the Quality of Survey-Based Stock Estimation in the North Sea (MIQES)
97/097 Evaluation and development of spatio-temporal models and survey designs for efficient assessment of mackerel and horse mackerel
98/029 Survey-based abundance indices that account for fine spatial scale information for North Sea stocks (FINE)
98/057 International program of standardized bottom trawl surveys off North-western Europe
98/062 Thons échantillonnage systèmes statistiques (TESS). (*Tuna sampling statistical system*)
98/090 Development and validation of egg-production based biomass estimates, using cod and plaice stocks in the Irish Sea
98/099 Improvement of stock assessment and data collection by continuation, standardisation and design improvement of the Baltic international bottom trawl surveys for fishery resource assessment (ISDBITS)
99/010 Direct abundance estimation and distribution of pelagic fish species in North East Atlantic Waters. Improving acoustic and daily egg production methods for sardine and anchovy (PELASSES)
99/011 Calibration of abundance indices estimated from southwestern Atlantic and western Mediterranean groundfish surveys.
99/080 Using environmental variables with improved DEPM methods to consolidate the series of sardine and anchovy estimates

2. Sampling of Commercial Fisheries - assessment and management

2.1 Biological sampling of commercial fisheries

97/003 Belgian fish sampling programme and associated activities in support of the common fisheries policy
97/004 Sampling of 8 German Commercial Fisheries
97/026 Structures démographiques des débarquements français des principaux stocks exploités en Mer du Nord et manche Orientale (*Demographic structures of French landings of main exploited stocks in the North Sea and the Oriental trench)*
97/066 Mediterranean landings pilot project (MEDLAND)
97/068 Monitoring of the trawl and gillnet landings in the Central and Northern Tyrrhenian Sea

97/074 Regulatory discard of swordfish (*Xiphias gladius L*.): Effectiveness of the EU regulation regarding the catch minimum size of swordfish in the Mediterranean
97/076 Market sampling of Dutch landings of commercial species (MARSAM2)
97/078 By-catch species in the North Sea flatfish fishery (dab, turbot, brill): preliminary assessment (DATUBRAS)
97/086 Cephalopod resources Dynamics & Fisheries Trends in the Algarve and Gulf of Cadiz (ALCACEPH)
97/101 Collection of fisheries data and development of a basic management model for the Shetland sandeel stock
98/024 International Baltic Sea sampling Program II (IBSSP II)
98/026 A new sampling regime for resource assessment of herring in the Skagerrak, Kattegat and SW Baltic
98/048 Study of exploited fish in stocks on the Flemish Cap II
98/082 Fisheries biology and assessment of demersal species (SPARIDAE) from the south of Portugal
98/093 Utilising Fishermen's Knowledge - Pilot-scale trials and evaluation of a system for collecting biological and management information from commercial fishermen.
98/098 Collection of biological data for stock assessment in support of the Common Fisheries Policy
99/003 Belgian fish sampling programme and associated activities in support of the common fisheries policy
99/032 The swordfish fishery in the Mediterranean
99/052 Market Sampling of Dutch landings of commercial species
00/037 Sampling of German Commercial Fisheries

2.2 Discard Sampling and analysis

97/024 Rédaction d'une publication sur les rejets et les prises accessoires des navires de pêche communautaires opérant dans le NE Atlantique. (*Drafting a publication of the discards and by-catches of community fishing vessels operating in the NE Atlantic*)
97/044 Analysis of trawls discard operation in the central and Eastern Mediterranean Sea
97/065 Discards from the Adriatic small pelagic fishery
97/087 Analysis of Fisheries Discards from the south coast of Portugal (DISCARDS - Portugal II)
97/098 Monitoring of Scottish landings and discards form the North Sea
97/103 Creation of a Scottish Multi-species Discard Data Base
98/081 The efficacy of releasing caught Nephrops as Management measure
98/095 Monitoring of discarding and retention by trawl fisheries in Western Waters and the Irish Sea in relation to stock assessment and technical measures
98/097 Monitoring discarding and retention on fishing vessels towing demersal gears in the North Sea and Skagerrak
99/068 Monitoring discarding and retention of the Danish gillnet in the North Sea and Skagerrak
99/071 PDEN - Investigation of Pelagic Discarding - Extent and Nature
00/009 Estimation of trawl discards in the Western Mediterranean. European hake (Merluccius merluccius) as case study

2.3 Catch and effort

97/018 Analysis of the Mediterranean (including North Africa) Deep-Sea shrimps fishery: evolution, catches, efforts and economics.

97/046 The swordfish fishery in the central and eastern Mediterranean
98/027 On the applicability of economic indicators to improve the understanding of the relationship between fishing effort and mortality. Examples from the flat and roundfish fisheries of the North Sea.
98/045 The bluefin tuna fishery in the Eastern Mediterranean
98/053 Factors Affecting Catch rates of Northwest Mediterranean Trawl Fleets and Derivation of Standardized Abundance Indices
98/061 Efficacité des Senneurs Thoniers et des Efforts Réels
99/059 Use of Satellite GPS data to map effort and landings of the Portuguese crustacean fleet
99/065 The relationship between fleet capacity, landings, and the component parts of fishing effort
00/018 Patterns and propensities in Greek fishing effort and catches
00/019 Collection and management of data from commercial fisheries in Greece
00/021 Collection and management of data for assessment of the Spanish and French Mediterranean
00/044 Investigation of the bluefin tuna fishery in the eastern Mediterranean

2.4 Improvement and standardisation of methodologies

97/007 At Sea Sampling from the Danish Fishing Fleets in the North Sea and Skagerrak
97/034 The optimization of the sampling strategies of the biological sample surveys and surveys of discards of the commercial catches in Greece and definition of their efficiency expressed in terms of costs: accuracy ratio
97/100 Improvement of Nephrops stock assessment by use of micro-scale mapping of effort and landings
98/075 Evaluation of MArket Sampling strategies for a number of commercially exploited stocks in the North Sea and development of procedures for consistent data storage and retrieval
99/009 Improving sampling of western and southern European Atlantic fisheries samfish
99/016 Data collection for assessment of the main finfish stocks in the Patagonian shelf (SW Atlantic)
99/019 Echantillonnage biologique des captures des thoniers tropicaux européens dans les océans Atlantique et Indien. (*Biological sampling of European tropical tuna catches in the Atlantic and Indian Ocean*)
99/064 Probabilistic modelling of Baltic salmon stocks
00/036 Monitoring of stocks in the Kattegat and the Baltic Sea

3. Technical Measures (including alternative uses of techniques)

3.1 Fishing Methods and Gear Selectivity to reduce by-catches of marine mammals, non-target species and undersized fish.

97/006 Elimination of harbour porpoise incidental catches (EPIC)
97/016 Etude sur le régime d'exploitation et la sélectivité du chalut de fond à grande ouverture verticale et du chalut pélagique dans la pêcherie du merlu dans le golfe de Gascogne (A *study of the rate of exploitation and the selectivity of bottom trawls with large vertical openings and the pelagic trawls in hake fisheries in the Golf of Gascoigne*)
97/043 Fishermen's effects on selectivity by strategic decisions (gear choice and handling, selection of fishing grounds)
97/095 Reduction of porpoise by-catch in bottom set gillnet fisheries

98/001 Improving and estimating the selectivity of codends for the pelagic Baltic cod fishery
98/002 Development and testing of a grid system to reduce by-catches in Norway pout trawls
98/012 Reduction of discards in crangon trawls (DISCRAN)
98/014 Trammel net selectivity studies in the Algarve (Southern Portugal), Gulf of Cadiz (Spain), Basque country (Spain) and Cyclades islands (Greece)
98/020 Long-Duration comparative evaluation of the effects on commercial fishing operations of fitting square-mesh sections to demersal trawls
99/007 Selectivity of square mesh top and side panels in the North Sea whitefish fisheries
99/008 Fishing power and selectivity of net and vessels types
99/058 Managing by-catch & discards: a multidisciplinary approach (BYDISCARD)
99/067 Automated detection of dolphins around pelagic trawls
00/046 *Pagellus bogaraveo* gill net metier in Ionian Sea: Gill net selectivity, assessment and biology

3.2 Gear evaluation and the influence of the features of the gear

97/064 Hake set gears fisheries in Mediterranean and Eastern Atlantic waters
98/069 *Sepia Officinalis*: impact of three set gear fishing techniques in the Adriatic and the Ligurian Sea
99/035 The purse seine landing composition in Eastern and Central Mediterranean Sea

3.3 Seasonal & spatial closures

97/031 Evaluation du stock de crevettes *Penaeus subtilis* du plateau continental de Guyane française de nouvelles contraintes. Influence des fermetures spatiales et saisonnières. (*Evaluation of shrimp Penaeus subtilis stocks on the plateau of French Guyana. Influences of spatial and seasonal closures*)

3.4 Alternative Fishing Techniques

98/009 Mise au point de techniques de pêche alternatives pour la capture du thon germon (Thunnus alalunga) en Atlantique Nord-Est, (*Mise au point alternative fishing techniques for tuna (Tunnus alalunga) in the North-east Atlantic*).
98/010 Diversification trials with alternative tuna fishing techniques including the use of remote sensing technology
99/030 Fish aggregating device (FAD) fisheries in the Eastern Mediterranean: An alternative technique to enhance pelagic fish catches and diversify fishing effort?

4. Miscellaneous Data Collection and Assessment

4.1 Data Collection of Poorly Studied Species and Areas

99/055 Development of Elasmobranch Assessments (DELASS)
99/063 Data collection for assessment of cephalopod fisheries
00/039 Exploratory survey to collect data of the exploited and virgin stocks of deep-sea shrimp *A. antennatus*, of interest to the CFP

4.2 Optimisation and Standardisation of Data Collection for Management models

97/075 Preparation of a proposal to revise and update the ICES 'Atlas of North Sea fishes'
97/107 Development of software to estimate unreported or misreported catch and effort data and to apply fishery management models
99/002 Alternative uses of data from satellite monitoring of fishing vessel activity in fisheries management: II extending cover to areas fished by UK beamers
99/040 Collection and evaluation of assessment data for key European edible crab (*Cancer pagurus L*.) stocks

5. Fleet studies (fleet behaviour)

5.1 Economic Performance/analysis

00/032 Data on economic performance of fisheries sector

5.2 Fleet Capacities

97/033 Evaluation et évolution des puissances de pêche des fileyeurs français. (*The evaluation and evolution of fishing power a on French fleets*)
97/047 Investigation of the intensity of fishing activity and the corresponding catches of the Greek fishing fleet
99/005 Measuring Capacity of Fishing Industries using the data Envelopment Analysis (DEA) Approach
00/024 Standardisation of the Spanish bait boat crue series for Eastern Atlantic juvenile bluefin tuna

5.3 Assessment and Development of Fishing Power

97/027 Puissance de pêche et relations avec les caractéristiques techniques des navires. Exemple de flotilles pratiquant les arts traînant en Manche Ouest, Atlantique et Méditerranée, (*The Relationship between fishing power and the technical measures of vessels.*
97/073 Il consumo di carburante quale metodo di misura dello sforzo di pesca (*Fuel consumption based method to measure the fishing effort*)
97/092 An economic and technical analysis for improving the effectiveness of effort control in the CFP
98/046 The impact of characteristics passive gear on fishing power
99/077 Technical improvements in the assessment of Scottish Nephrops and Adriatic clam fisheries

6. Fish stock population Studies

6.1 Biological Studies on reproductive biology, spawning and migration patterns of commercial and non-commercial species, and population dynamics (modelling and simulations)

97/011 Campaña de marcadode pez espada y especies asociadas en el Atl. En : SW098 (*Tagging Survey of Swordfish and Associated species in the NE Atlantic*)

97/015 New assessment and Biology of the main commercial fish species : Hake and Anglerfishes of the Southern shelf demersal stocks in the South Western Europe
97/029 Major improvement in our knowledge of eastern Atlantic bluefin tuna in the Mediterranean Sea
97/030 Nursery grounds in the coastal zone of the eastern English Channel; Typology and management measures
97/054 Analysis and evaluation of the fisheries of the most commercially important cephalopod species in the Mediterranean Sea
97/061 Options for optimising effort per recruit performance in Irish lobster (*Homarus gammarus*) fisheries.
97/081 Seasonal changes in biological and ecological traits of demersal and deepwater fish species in the Azores
97/106 Biological assessment of the bivalve stocks of "*Ruditapes Decussatus"* and "*Cardium Edule*" in the South of Portugal (Ria Formosa)
97/021 Monitoring biodiversity of demersal fish and epibenthos in the North Sea and Skagerrak
98/025 Modelling population dynamics of sandeel (*Ammodytes Marinus*) populations in the North Sea on a spatially resolved level
98/034 Analysis of swordfish fisheries data series in the Central and Eastern Mediterranean Sea.
98/076 Management of the European eel: Establishement of a recruitement monitoring system (GLASS EEL)
98/096 Distribution and biology of anglerfish and megrim in waters to the west of Scotland
99/022 STROMBOLI: Spatial and temporal trends in catch of Mediterranean bluefin tuna: historical observations and latest inquiries
99/023 Historique des captures de civelles, intensité actuelle de leur exploitation (relation entre effort de pêche et taux d'exploitation), variation de leur captativité par la pêche professionnelle maritime et indices de colonisation sur le bassin de l'Adour
99/029 Exploration of pristine red shrimp resources and comparison with exploited ones in the Ionian Sea (RESHIO)
99/034 Fisheries & population structure of *Scomber spp*. in the Mediterranean and S. Iberian Atlantic waters
99/061 Recruitment of sea breams (*sparidae*) and other commercially important species in the Algarve (Southern Portugal)

6.2 Genetic Studies

98/039 Evaluation of the Southern Greek sardine stocks
98/041 State of the stocks of European wreckfish *(Polyprion americanus*)
99/013 Genetic characterisation and stock structure of the two species of anglerfish (*Lophius piscatorius* and *L. budegassa*) of the Northeast Atlantic

7. Integration of Environmental Requirements into the CFP

7.1 Incidental By-catches and Strandlings.

97/050 By-catches and discards of sharks in large pelagic fisheries in the Mediterranean Sea
97/089 Impacts of fisheries on small cetaceans in coastal waters of northwest Spain and Scotland

98/008 Assessing marine Turtle by-catch in European drifting long-lines and trawl fisheries for identifying fishing regulations
00/027 Pelagic fisheries in Scotland (UK) and Galicia (Spain): observer studies to collect fishery data and monitor by-catches of small cetaceans.

7.2 Impact of Fishing on Marine Ecosystems.

97020 Environmental Impact of trawling on the benthic system on two different sea beds of the NW Mediterranean
98/006 Etude de la mortalité des cétacés échoués sur les côtes des Iles Canaries : Impact de la pêche artisanale. (Study of the mortality of stranded cetaceans on the Canary Islands; an its impact on artisinal fishery
98/017 Comparison of rapid methodologies for quantifying environmental impacts of otter trawls
98/018 Impact caused by toothed dredges requantified on a panEuropean scale
98/019 Acoustic Deterrents to Eliminate Predation in Trammel - nets (ADEPTS)
99/036 A new method for the quantitative measurement of the effects of otter trawling on benthic nutrient fluxes and sediment biogeochemistry
99/051 Study on the mixed-species catches of the rapido trawl fishery along the Italian coasts
99/062 Assessing the impact of bivalve fisheries on the benthic ecosystems of the Ria Formosa lagoon (Portugal), Venice lagoon (Italy), Aegean Sea (Kavala-Greece) and on the juvenile flatfish in the South coast of Portugal (IMPACTO).
99/078 Assessments of the impact and efficiency of hydraulic dredging in Scottish and Italian waters
00/031 Mitigation of small cetacean bycatch; development of new fishing technology and evaluation of acoustic alarms

7.3 Effect of Environmental Variables on Fisheries Resources

97/083 Collection of biological data of 5 flatfish species from Iberian waters (Portuguese coast and Gulf of Cadiz)
97/084 Environment and biology of deep-water species *Aphanopus carbo* in NE Atlantic: basis for its management (BASBLACK)
98/070 The Sicilian Channel anchovy and the underlying oceanographic and biological processes conditioning their inter-annual fluctuations

8. Monitoring and Control

8.1 Application of modern techniques

98/023 Alternative uses of data from satellite monitoring of fishing vessel activity in fisheries management

9. Social and Economic dimensions of fisheries activity

9.1 Social and Economic Implications of Policy and Technical measures

97/051 Coastal fisheries practiced by vessels bellow 20 hp in Greece: biological, economic and social framework
97/063 Trawling ban in the Gulf of Castellammare: effects on the small-scale fishery economics and on the abundance of fish

98/016 Evaluation of the effectiveness and applicability of technical measures in fisheries management (TECMES)
98/037 Comparative studies on the current state of fishery of the native PENAEUS KERATHURUS shrimp populations of North Mediterranean
99/024 Caractéristiques des petites pêches côtières et estuariennes de la côte atlantique du Sud de l'Europe.
00/022 A pilot study for estimation of data from local fisheries in the Canary Islands

9.2 Recreational Fisheries

00/003 "Sport Fisheries" in Eastern and Central Mediterranean: Design, implementation and economic evaluation of an integrated monitoring system

10. Dissemination of Information

10.1 Dissemination of Scientific Data and Techniques and Methodological studies to Optimise and to Standardise the Collection of Data and Communication

97/021 Sensibilisation des professionnels au problème des rejets de pêche
97/022 Les équivoques entre scientifiques et professionnels de la pêche : nature et moyens de les résoudres
97/028 Pêcheries Bigoudène : Bilan des connaissances
97/037 Laggon Information System
97/059 Providing a framework to improve the assessment of the main Demersal and pelagic fisheries in western European Waters
97/067 Communication and dissemination of scientific papers in the Central Mediterranean

4 Conclusion

In accordance with the four *Calls for proposals*[15], the main objective of the Biological Studies during the period 1997-2000 was to encourage and assist Member States to collect basic data, required for assessment of common fisheries resources.

The 182 biological studies funded during this period were diverse which is demonstrated by the ten different domains that emerged. Top priority, was the "basic data collection" which are data absolutely needed for scientific analytical methods (current methods as well as possible future development of analysis and statistical procedures). Second priority was "innovative research" such as technical measures and population studies, which if used in scientific analysis can enhance the quality of the results obtained as well as increase the scientific knowledge of the dynamics and factors influencing fisheries resources, and the environmental implications. Other domains such as dissemination of information and the socio-economic dimensions were not as well represented, despite being listed as a priority in each *Call for proposals*. Studies on inspection, monitoring and control were almost absent, as well as studies on legal provisions in the fishery sector.

There was no pre-agreed plan and Member States were not obliged to provide data on specific subject areas or species during this period (1997-2000). The data collection was only supported by biological studies, limiting the capacity to collect all necessary data to improve scientific advice Thus, there was no guarantee of receiving the necessary scientific data for the assessment of the most important stocks. However, the studies helped identifying data needs and, in addition, provided the *Commission* with results of diverse and sometimes innovative studies.

Under the new Data collection regulation, entered in force in 2001, Member States are obliged to collect data in accordance with a Minimum and an Extended Programme. It is expected that this new regime will be more efficient in obtaining the data required. Studies and pilot projects are also promoted through Calls for Tenders. The *Call for Tenders* is produced yearly[16]. The Commission will give 100% funding for one study project under each specific task[17]. The number of tasks will depend on the number of areas where scientific advice is needed. However, the annual budget allocated to study and pilot projects is limited to € 3 million. The Study Projects funded by the Commission in 2001/2002 through the call for tenders are presented in Annex IV.

There are advantages and disadvantages with both the former and the reformed data collection system. The new system is more efficient in

[15] 97/C 205/08, 98/C 159/09, 99/C 122/14, and 2000/C 177/08
[16] In accordance with the Council decision 2000/439/EC (see appendix II) under *article 9*.
[17] However, the budget allocated for each task may be split between two projects in exceptional circumstances.

obtaining the data required. However, the C*alls for Tenders* for biological studies were limited by the budget. In addition, the use of tenders does not include an evaluation by external experts. The previous system, limited to Call for Biological studies, was not very performing for the regular collection of data. On the other hand, it may be argued that this system invited more involvement from the scientific research community. In addition the flexibility in the *calls for proposals* resulted in more innovative research.

In conclusion, the biological studied funded from 1997 to 2000 have upgraded European scientific knowledge, spurred innovation, and increased the co-operation and coherence between research organisations, which will continue to contribute to meeting the goals and objectives of the reformed Common Fisheries Policy.

5 ANNEXES

ANNEX I

A1 Call for Proposal 2000

EN C 177/14 Official Journal of the European Communities 27.6.2000

2000 Call for proposals for basic data collection, studies and pilot projects within the framework of the Common Fisheries Policy
(2000/C 177/08)

In accordance with Council Regulation (EEC) No 3760/92 establishing a Community system for fisheries and aquaculture[18], measures to be taken to achieve the objectives of the Common Fisheries Policy (CFP) must be based on available biological, socioeconomic and technical analyses.

Two basic subjects have been established for the present call:

Subject A: Collection and management of data for the assessment of fisheries of interest to the CFP.

Subject B: Studies and pilot projects related to the implementationor the development of the CFP.

Projects must be completed by the end of August 2001.

Selection of proposals

The selection of proposals will take place as follows: During an initial phase Commission services will check proposals eligibility in the light of the subject areas set out in this call for proposals. Proposals that fail to address any of the subject areas described below will be considered ineligible and not be assessed.

The scientific and technical assessment of the proposals deemed eligible will then be made by independent external experts having no direct involvement in the proposals examined.

- With regards to Subject A, the technical assessment will focus on the following:

  - definition of the objectives and description of the project,

  - proposed methodology and technical merits of the proposal,

  - management of the project, including the proposed timetable, participant's experiences and contribution of partners.

- With regards to Subject B, special attention will be drawn on the innovative aspects of the proposal, the added value of the project and the dissemination of the findings.

In a second phase, proposal's relevance to the CFP will be assessed on the basis of a number of criteria.

- the information gathered will have to be directly connected with the implementation of the management tools used for the conservation of resources (TACs and quotas, technical measures, effort restrictions) or to mitigate the interactions between fishing and the marine environment;

- the degree of biological vulnerability of the stocks concerned, the direct economic and social importance of the fisheries involved and their place in the socioeconomic structure;

- the essential contribution of a project to the strengthening of cooperation between Member States. To encourage cooperation, the Commission will give preference to projects carried out jointly by partners from two or more Member States, with each partner making a significant contribution to the project.

Particularly for Subject B, the value of a proposal will be all the greater if the information collected makes it possible to optimise the application of a decision taken under the CFP or to throw light on a problem still to be resolved.

At the end of this second phase, proposals that fail to measure up adequately to each of the above mentioned headings will be rejected.

In the third phase, the final selection will consider the opportunities for synergies and the likelihood of duplication between projects submitted under this call for proposals and projects benefiting from Community assistance under other arrangements. Care will be taken to establish a balance between the various subjects eligible, in particular considering different areas, bearing in mind that around 85 % of the budget corresponding to the present call for proposals will be spent on subject A.

Community financial support

[18] (1) OJ L 389, 31.12.1992, p. 1.

Appropriations have been set aside for this measure in the Commission's budget for 2000, however, the Commission reserves the right not to allocate the entire amount of these appropriations.

The Commission will grant support in the form of partfinancing for the projects selected. As a rule the rate of partfinancing can cover up to 50 % of the total cost of each project selected. University establishments, and public research bodies whose accounting structure under national or other law requires charging to be made on the basis of marginal costs, may present proposals applying for up to 100 % of the marginal costs incurred for a project.

Recipients of Community part-financing will be asked to sign the ëDeclaration by beneficiaryí shown in the specimen attached to the project application form. Proposers are asked to take note of the new provisions on securities contained in it.

Reference documents relating to this call for proposals and Priorities.
The reference documents include the following, although this list is not exhaustive: the 1992 framework Regulation referred to above, Council Regulation (EC) No 894/97 (1), Council Regulation
(EC) No 850/98 of 30 March 1998 for the conservation of fishery resources through technical measures for the protection of juveniles of marine organisms (2), Council Regulation (EC) No 1626/94 of 27 June 1994 laying down certain technical measures for the conservation of fishery resources in the Mediterranean (3) and Regulation (EC) No 88/98 of 18 December 1997 laying down certain technical measures for the conservation of fishery resources in the waters of the

Baltic Sea, the Belts and the Sound (4). Mention should be made to Council Regulation (EC) No 48/1999 of 18 December 1998 fixing, for certain fish stocks and groups of fish stocks, the total allowable catches for 1999 and certain conditions under which they may be fished (5) and Council Regulation (EC) No 847/96 of 6 May 1996 introducing additional conditions for year-to-year management of TACs and quotas (6). There is a Council Decision 97/413/EC of 26 June 1997 concerning the objectives and detailed rules for restructuring the Community fisheries sector for the period from 1 January 1997 to 31 December 2001 with a view to achieving a balance on a sustainable basis between resources and their exploitation (MAP IV) (7), Council Regulation (EC) No 2792/1999 (8) of 17 December 1999 laying down the detailed rules and arrangements regarding Community structural assistance in the fisheries sector. There is also a Council Regulation
(EC) No 104/2000 of 17 December 1999 on the common organisation of the markets in fishery and aquaculture products. Finally, the report from Scientific, Technical and Economic Committee for Fisheries (STECF) (9) with reference to the proposal for a Council regulation to provide documentation for the sampling requirements for both biological and economic data to be collected for monitoring the fisheries of the European Union. With regards to priorities a preference criteria will be defined, if necessary, taking into account the biological vulnerability of the different stocks, the economical value of the corresponding landings, the fleet activity, and the absence of recent assessments. In the context of this call for proposals the Commission's priorities for each of the subjects described below are as follows:
Subject A Collection and management of data required for fisheries assessment

1. Evaluation of various fishing fleets activities and changes in fishing power, information on number of vessels, gross tonnage (GT), engine power (kW), age of vessel, gear used and time spent at sea during the year.

2. Data from commercial fisheries: estimates of the total volume of catches per stock, including discards, and classification of these catches by vessel group, geographic area and time period. Data on the landings and discards including estimate catch composition and biological parameters like growth, sex, maturity and fecundity for the stocks defined by the previously mentioned STECF Report. 3. Data from scientific research at sea in order to evaluate the abundance and distribution of stocks independently of the data provided by the commercial fisheries in the case of stocks for which such evaluations are possible and useful.

4. Collection of summarised and grouped data in order to allow the prices associated with the various landings, and their formation, to be monitored. Collection of additional data to reflect all landings at ports inside and outside the
Community, as well as imports. 5. Data for economic monitoring of fishing enterprises and the processing industry in order to evaluate the economic state of the industry on the basis of studies and samples sufficiently large to ensure the reliability of the estimates. Two main sectors are to be considered:
(i) Fishing fleets: the income from sales and other revenue (subsidies, interest received, etc.); the production costs (data enabling the jobs at sea to be counted and classified e.g. crew, fuel, repair and maintenance); fixed costs; financial position, investments; prices by species; employment data);
(ii) Fish processing industry: Raw material; turn-over; production costs expressed in volume and value (labour, energy, raw material, packaging); fixed costs; financial position; investment; price/product; employment; capacity of utilisation.

6. Methodological studies and projects aimed at optimising and standardising methods of collecting the data. Exploratory data collection projects in the areas of aquaculture, the relationship of fisheries and aquaculture with the environment, and the capacity of fishing and aquaculture industries to create jobs.

Subject B.1

Economic, bio-economic analyses and simulations
Studies connected with decisions planned under the CFP and the evaluation of their impacts.

(9) STECF-Fisheries Data 2000 WG Final Report.
Subject B.2 Selectivity; Links between catch capacity, fishing effort and mortality

1. Selectivity:

- Priorities: Reduction of discards, protection of juveniles of endangered stocks.

1. Assessment and development of fishing efforts.

- Priorities (1) estimations of specific effort corresponding to the various towed gears (dredges, beam trawl, mid water trawl, pair trawl, twin trawl, etc); (2) for passive gear, the impact of the characteristics of the gear (net sizes, number of hooks, etc.), and recent changes of the various passive gears.

2. Observed relationships between fishing effort and mortality.

- Priority: examination of detailed results of analytical assessments using catch per unit of effort (cpues) and/or effort, form commercial fleets.

Subject B.3
Interactions between fisheries, aquaculture and the marine environment

1. Impact of fisheries on marine mammals, sea birds, sharks and marine reptiles:
   - Priority: impact of mid water trawlers, gill nets and trammel nets on small cetaceans.

2. Influence of fish farming practices on coastal environment.

3. Influence of environment hazards on fisheries and fish farming. Timetable and general information

The Commission must receive proposals by 5 p.m. on 1 September 2000. Detailed information on arrangements for applying will be found attached to the application form, the use of which is mandatory; this form can be obtained from the following address:

European Commission
Directorate-General for Fisheries
Research and scientific analysis DG XIV/C/2
Office 6/9 Rue de la Loi/Wetstraat 200
B-1049 Brussels

Prospective applicants with Internet access may obtain the documents and further information from:

http://europa.eu.int/comm/dg14/dg14.html

Invitation to submit proposals issued by the Commission of the European Communities for projects financed by the European Community Budget line B7-6000 Cofinancing of operations with European non-governmental development organisations (NGDO's) in fields of interest to the developing countries (2000/C 177/09)
Financing sources and fields of activity for which proposals are sought

(a) Cofinancing of development operations undertaken by European NGOs in developing countries: projects, block grants and programmes.

(b) Cofinancing of operations to raise public awareness of development issues undertaken by European NGOs: projects/work programmes and capacity building packages. Type and size of projects

(a) Projects should be within geographical and thematic areas covered by the budget line as described in further details in the Application Guidelines and Application Forms.

(b) The overall budget available to finance actions under this scheme will be EUR 60 million under B7-6000. The intention is to award u to a maximum of 175 grants.

ANNEX II

A2 Analysis of the Scientific Domains

* Domain 1 – Research surveys

The research surveys' domain contained projects in which data were collected on a regular basis to estimate the abundance and distribution of commercially exploited stocks. These annual surveys often formed a part of a continuous sampling programme such as the MEDITS programme, which began in 1993 with the aim of creating a standardised protocol for large-scale button trawl surveys in the Mediterranean. Concurrently, the scientific teams involved in the programme have analysed the obtained data to improve the biological knowledge about demersal resources in the area in view of supporting sustainable fishery policies in the Mediterranean.

Although the majority of trawl surveys were carried out in the Mediterranean surveys were also carried out in the North Sea and the Flemish cap. The hydroacoustic surveys were mainly confined to Atlanto-Scandian herring (*Clupea harengus*) in the Norwegian Sea. The daily egg production method (DEPM) surveys involved a mixture of commercial Species and areas not covered by the trawl survey programmes. Furthermore, the analysis and interpretation of the data were reinforced through complementary initiatives of studies aimed at improving the quality and to standardise the data presented to the ICES working groups (26% of the research survey domain). These projects have contributed to the strengthening of the partnership developed through the programmes and provided a basis for the implementation of a scientific network for the assessment of demersal fishery resources.

* Domain 2 – Sampling of commercial Fisheries

The sampling of commercial fisheries mainly constituted of multi-partnership sampling programmes, sampling commercial landings and fisheries independent data, such as the Baltic Sea sampling programme, and the Mediterranean landings pilot project. Discard data are an essential component of the stock assessment process. The sub-domain *discard sampling and analysis* constituted 23% of the number of projects and 21% of the CFS to the sampling of commercial fisheries. Discarding at sea is a serious problem in fisheries and a major source of uncertainty in the management of resources. So far, landing data alone have been readily relied upon in stock assessment and is likely to be biased downward. Inclusion of discards reduces the inaccuracies and improves the potential quality of assessments.

The biological studies in this present analysis attempt to quantify, limit and reduce the uncertainty of discards taking into account economic and market factors[19]. The studies included monitoring of commercially important species (target species), like hake (*Merluccius merluccius*), mullets (*Mullus surmuletus, Mullus barbatus*), and different types of shrimps (*Pagellus erythrinus, Aristeus antennatus* and *Parapenaeus longristis*). However, this

[19] (cost of fishing, sorting of catch, preservation, packaging, unloading, storage, and marketing)

varied depending on the different fishing operations[20] investigated in the study concerned. Non-commercial species investigated in this sub-domain included chub mackerel (*Scomber* japonicus) and dogfish (*Scyliorhinus canicula*).

Catch and effort studies constituted an equal amount of funded projects as the studies quantifying discards, but only received 14% of the CFS for sampling of commercial fisheries, and were mainly concerned with tuna and swordfish fisheries.

Further, the calls for proposals as aforementioned gave priority to studies aiming to improve, optimisise and standardise the collection of data and its methodologies. Studies falling under the latter category subsequently constituted 17% of the studies and received approximately 1/3 of the budget for the sampling of commercial fisheries domain.

* Domain 3 - Technical measures:
All the *calls* included technical measures as a subject area and gave priority to gear selectivity to reduce by-catch in particular. Consequently, 67% of the selected projects in this domain were studies on gear selectivity. Despite the narrow/specific objective of the gear selectivity, the studies were very diverse in the type of gear investigated ranging from gear selectivity in bottom trawlers, cod-ends, and bottom set gillnets to square mesh selectivity and automated detection of dolphins.

* Domain 4: Miscellaneous data collection and assessment:
No sub-domain has been created for fisheries management as this was frequently incorporated in the various domains. For example, the biological studies that focused on more specific aspects of fisheries, which was then put in the wider concept of fisheries management. Studies that collected data, developed software and databases for fisheries management models were allocated to sub-domain 4.2[21].

* Domain 6: Fish Stock Population Studies
It was more difficult to draw general conclusions and to categories the population studies domain in terms of objectives, areas and species due to the great diversity and uniqueness of the approach and scientific/biological content. The study projects in this domain had a significant spread of areas and species sampled and various methodologies were employed.

[20] (crustacean trawlers, fish trawlers, demersal purse seine and pelagic purse seine nets)
[21] Miscellaneous data collection.

ANNEX III

A3 The Reformed Data Collection System

A3.1 Introduction

The Community framework for data collection and management of data needed to conduct the CFP during the fiscal period 1997-2000 data collection was achieved through launching call for proposals. Since Member States were not obliged to collect data on specific subject areas or species to reflect current priorities there was effectively no guarantee that the Commission received the scientific data necessary for assessment of the state of resources by research organisations. Consequently, the Commission did not have complete control of the data collected by each Member State. As a consequence a new data collection system entered into force. The new system aimed to improve the efficiency of data collection by the different Member States. A Council decision on financial contribution from the Community towards the expenditure incurred by Member State in collecting data, and for financing studies and pilot projects for carrying out the CFP, was taken in 2000. Data Collection was carried out in accordance with the Minimum and Extended Programmes. Studies and pilot projects proposals were received through *Call for Tenders*.

A3.2 Minimum Programmes and Extended Programmes

Minimum Programmes (MP) is the basic requirements and the absolute minimum, and is not all inclusive of what is needed for European stock assessment. Member states must comply with the MP a 100% and will receive 50% contribution / subsidies by the European Commission (DG Fish). The MP is the yearly requirement (e.g. yearly surveys or commercial sampling) and is subject to change each year.

The Extended Programme (EP) does not differ much from the MP, but are more detailed studies, and can be carried out on a weekly, monthly or seasonal basis. Member states receive 35% contribution of the total cost by DG fish[22].

The EP allows for more flexibility in the system e.g. if a Member State's industry is based on one particular species, the Member State is more inclined to get CFS for the EP.

The sampling required by the MP is not necessarily sufficient from a scientific perspective, but from a more financial aspect. Any additional data collection acquired for a sound scientific advice must be at a national expense. Species not covered by the MP[23] are still likely to be sample by certain Member States where the species in question exerts financial importance.

[22] Provided that they have carried out 100% of the compulsory MP.

[23] e.g. Cephalopods, and in addition, no TAC's exists for Skates, Rays

A3.3 Criteria, Evaluation and Budget

The former data collection system did not allow for a thorough quality control of the selected projects. In addition, the external evaluation by experts was not feasible. All proposals are now being sent to external consultants for evaluation. The Commission conducts bilateral programmes which they go through with each member state's national programme, and are given 2-3 days to improve the programme.

The role of the commission is to reassure that each member state gets finances for the same things based on the same criteria. If per se the request is too high than financial support will be taken out from that particular domain, e.g. surveys. To create full transparency all documentation and National programmes are official except for the budgets and finance which is confidential. A lot of problems exist at the national level, and there is a strong need for coordination. As a result, the commission pays for one national meeting.

ANNEX IV

A4. Call for Tenders

The *Call for tenders* recognises the economic, social, environmental and cultural importance of fisheries and the interests of all those concerned with the fishery sector. It also takes into account the biological characteristics of the resources and their environment. States involved in fisheries should encourage their national research institutions to apply for partial funding by the Commission and give effect to the CFP. Priority should be given to more integrated study projects. The *call for tenders* is produced yearly in accordance with the Council decision 2000/439/EC under *article 9*. The Commission will give 100% funding for one study project under each specific task[24]. The number of tasks set will depend on the number of areas in which scientific advice is needed.
Below is a tabulated list of the Study Projects funded by the Commission after the 1997-2000 period.

Table 13 - List of selected study projects in 2001 and 2002.

Group	Reference	Title	Total cost	CFS
TENDERS 2001	FISH/2001/01	Evaluation of Member States' National Programmes for the collection and management of data needed to conduct the CFP*	€ 91 500	100%
TENDERS 2001	FISH/2001/01	Influences of different marine research surveys on the quality of scientific evaluations of the state of fisheries.	€ 824 813	100%
TENDERS 2001	FISH/2001/02	Analysis of possibilities of limiting the annual fluctuation in TAC's	€ 918 228	100%
TENDERS 2002	FISH/2002/02	Evaluation of Member States' National Programmes for the collection and management of data needed to conduct the CFP.	€ 99 000	100%
TENDERS 2002	FISH/2002/21	Indicators of environmental integration.	€ 124 500	100%
TENDERS 2002	FISH/2002/25	Analysis of the information on the inventory and utilisation of control means.	€ 140 000	100%
TOTAL			**€2.491291**	**100%**

*Evaluation of the National Programmes is carried out each year.

[24] However, the budget allocated for each task may be split between two projects in exceptional circumstances.

A4.1 Studies and Pilot Projects

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TITLE II

Studies and pilot projects

Article 9

1. The Commission may carry out studies and pilot projects.

2. The spheres of activity which may be covered shall include:

(a) methodological studies and projects aimed at optimising and standardising methods of collecting the data defined in Article 1 of Regulation (EC) No 1543/2000;
(b) exploratory data collection projects in the areas defined in Article 10(3) of Regulation (EC) No 1543/2000;
(c) economic and bio-economic analyses and simulations connected with decisions planned under the CFP and the evaluation of the impact of the CFP;
(d) selectivity of fishing techniques and examination of the links between catch capacity, fishing effort and mortality in each fishery;
(e) improving the enforcement of the CFP, particularly in terms of cost-effectiveness,
(f) evaluating and controlling the links between fishing activities and aquaculture and aquatic ecosystems.

3. Pilot projects and studies may not cover measures which are:

(a) eligible under the European Framework Programme on Research;
(b) covered by Title I of this Decision;
(c) covered by Articles 21 and 22 of Council Regulation (EC) No 1260/1999 of 21 June 1999 laying down general provisions on the Structural Funds[25].

4. The Commission shall publish each year a list of the priority topics for studies and pilot projects.

5. The financial contribution from the Community for studies and pilot projects shall not exceed:

(a) in the case of measures carried out following a call for proposals, 50 % of the total eligible costs. Universities and public research bodies which, under the law of the country to which they are subject, are required to defray marginal costs, may submit proposals in respect of up to 100 % of the marginal costs incurred in carrying out a project;
(b) 100 % of eligible expenditure incurred in carrying out studies and pilot projects at the Commission's initiative as a result of a procedure other than a call for proposals.

6. The financing of all studies and pilot projects carried out pursuant to paragraph 2(c) to (f) may not exceed 15 % of the annual appropriations authorised for the measures financed under this Decision.

[25] (1) OJ L 161, 26.6.1999, p. 1.