

Green Paper

The future of the common fisheries policy

Volume II



**Implementation of the Community system for fisheries
and aquaculture over the period 1993–2000**

Economic and social situation of coastal regions

State of the resources and their expected development



European Commission

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Report on the

implementation of the
Community system for
fisheries and aquaculture over
the period 1993-2000

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Introduction

Article 14(2) of Council Regulation (EEC) No 3760/92 of 20 December 1992 establishing a Community system for fisheries and aquaculture ⁽¹⁾ provides that the Commission shall present, by 31 December 2001 at the latest, a report to the European Parliament and the Council on the implementation of that regulation.

The Commission has already issued two detailed reports on the implementation of Regulation (EEC) 3760/92. The first report was issued in 1996, covering the years 1993–95 ⁽²⁾ whereas the second report in 2000 reviewed the measures adopted during the years 1996–98 ⁽³⁾.

The present report presents a general overview of the implementation of Regulation (EEC) No 3760/92, as well as an overview of the major developments in the common fisheries policy (CFP) since the last reform in 1992.

Since 1992, the world of fisheries has witnessed many important changes and developments both at the European and at the global level. Fisheries policy, and the CFP in particular, is required to address problems and look for solutions under conditions which are very different from those of 10 years ago.

For example, there is much greater awareness now of the environmental dimension of fisheries. Such awareness is expressed both in legal instruments (such as Article 6 of the EC Treaty, the habitats directive, the Biodiversity Convention, etc.) and through the development and application of new concepts such as the precautionary approach or the ecosystem approach.

Moreover, the international legal dimension of fisheries has been significantly developed through *inter alia* the entry into force of the UN Convention on the Law of the Sea, the adoption of the UN Agreement on Straddling Fish Stocks and Highly Migratory Fish Stocks, the adoption of the code of conduct for responsible fisheries and the ongoing development of an international jurisprudence on fisheries through the case law of the International Tribunal for the Law of the Sea.

The problems that the CFP is facing are in many respects similar to what they were in 1992 but since they were not properly addressed they are more acute now, such as stocks being outside safe biological limits and fleet over-capacity. The emergence of new fishing nations and market globalisation threaten the competitiveness and the survival of many sectors of the European fishing industry. The spectacular development of aquaculture has created new opportunities but it has also brought with it new challenges related to consumer and environmental protection.

The Community framework for fisheries and aquaculture was devised under a quite different background than the one described above and therefore has not always managed to provide answers to the various challenges that

⁽¹⁾ OJ L 389, 31.12.1992, p. 1.

⁽²⁾ COM(96) 363 final, 22.7.1996.

⁽³⁾ COM(2000) 15 final, 24.1.2000.

emerged during the last 10 years. Stock conservation, for example, has been a weak point. The basic management tools were available but there was insufficient political will to make use of them despite the fact that the 1992 reform had enlarged the panoply of available tools mainly through the possibility to adopt multi-annual frameworks for management decisions and to link the conservation and the structural dimensions of the CFP.

The reform debate provides an opportunity for the identification of the shortcomings of the current system and for the adoption of the necessary reforms which will allow the CFP to address the challenges of the new millennium.

1. Management of resources and environmental issues

1.1. The new management tools

Regulation (EEC) No 3760/92 stipulates the use of fishing effort management regimes as a means to control exploitation rates and to link fleet policy with TACs and quotas. This, together with the setting up of a multi-annual framework for decisions on management (objectives and strategies), constituted a novelty at the time of adoption of this basic regulation.

Before a management system for fishing effort could be introduced, it was necessary to define instruments to limit access to fishing in general and to certain fisheries in particular. Thus rules on licences granting access to commercial fishing and on special fishing permits providing access to specific fisheries were adopted ⁽⁴⁾.

The basis for fishing effort regimes were subsequently adopted for western Community waters in the Atlantic ⁽⁵⁾ and a similar approach was initiated for the Baltic Sea ⁽⁶⁾.

The fishing effort regime applicable in western waters had a triple objective. The first was the establishment of conditions allowing the full integration of Spain and Portugal in the general arrangement of access to Community waters. This was fully achieved.

The second objective was the fixing of fishing effort ceilings for the fisheries targeting demersal species which should have also contributed, in synergy with the TAC and quota system, to a better conservation of fish stocks, especially for multi-species fisheries. But the finally agreed effort ceilings were only binding for Spain and since even these have not been revised to compensate for efficiency gains, they became higher than was necessary for the catching of quotas.

The third objective was the collection of necessary data for the further development of input management regimes. This was true in the Atlantic both for demersal and pelagic fisheries (Council Regulation (EC) No 2027/95) and later in the Baltic (Council Regulation (EC) No 779/97, established within the framework of the integration of Sweden and Finland to the CFP).

The implementation of arrangements for the communication of the deployed effort was delayed in several Member States and it has not worked in an efficient way. The necessity to collect effort data remains both for enforcement purposes and for setting the basis of future effort management regimes.

The failure to implement an efficient effort management scheme was due *inter alia* to a strong opposition against what was considered a duplication of instruments with reference to TACs and quotas and to a lack of specific

⁽⁴⁾ Council Regulation (EC) No 3690/93 of 20 December 1993 establishing a Community system laying down rules for the minimum information to be contained in fishing licences (OJ L 341, 31.12.1993, p. 93).

Council Regulation (EC) No 1627/94 of 27 June 1994 laying down general provisions concerning special fishing permits (OJ L 171, 6.7.1994, p. 7).

Council Regulation (EC) No 3317/94 of 22 December 1994 laying down general provisions concerning the authorisation of fishing in the waters of a third country under a fisheries agreement (OJ No L 350, 31.12.1994, p. 13).

⁽⁵⁾ Council Regulation (EC) No 685/95 of 27 March 1995 on the management of the fishing effort relating to certain Community fishing areas and resources (OJ L 71, 31.3.1995, p. 5).

Council Regulation (EC) No 2027/95 of 15 June 1995 establishing a system for the management of fishing effort relating to certain Community fishing areas and resources (OJ L 199, 24.8.1995, p. 1).

The system established was based on no increase in overall fishing-effort levels, full exploitation of Member States' fishing opportunities and maintaining the existing balance in sensitive areas.

⁽⁶⁾ Council Regulation (EC) No 779/97 of 24 April 1997 introducing arrangements for the management of fishing effort in the Baltic Sea (OJ No L 113, 30.4.1997, p. 1).

scientific advice establishing the proper quantitative basis for effort reductions. These difficulties should not hide the fact that apart from single-species fisheries no effective management can be achieved without combining input with output management. Therefore, the debate on the role of effort management schemes in the future should be reopened in the light of the experience acquired since 1995.

As far as the multi-annual framework for decision-taking is concerned, the Council failed to take a decision on the 1993 Commission proposal for management objectives and strategies ⁽⁷⁾. The proposal sought to lay down medium-term strategies for progressively reducing fishing mortality, while attempting to increase spawning biomass so that it attains — or to prevent it from falling below — a proposed lower limit. In order to limit variations in TACs, a rule was suggested that involved reducing fishing mortality preferably when there was adequate recruitment into the fishery, so making it possible to avoid reducing TACs or to reduce them only slightly.

The reasons behind the failure to adopt the proposal on medium-term strategies were the following:

- at the time, the scientific advice did not provide any explicit and precise bases, officially approved by the authorised bodies, for laying down objectives and multi-annual strategies;
- the industry had the impression that the approach proposed did not pay enough attention to their concerns regarding wide variations in TACs;
- many feared that TACs were set automatically in a way that prevented the Council from taking action as the need arose.

Although the Commission did not renew its proposal in the coming years, some progress has been achieved subsequently in that:

- rules concerning year-to-year flexibility in quotas have become fully operative (Council Regulation (EC) No 847/96 ⁽⁸⁾);
- MAGPs constitute in themselves a multi-annual approach to management, with specific targets of reduction of exploitation rates, although they have not been as ambitious as the Commission had originally proposed;
- mid-term objectives in accordance with the precautionary approach have been adopted and complied with for some stocks such as Atlanto-Scandian herring.

The need to lay down multi-annual procedures that take the precautionary approach into account is now widely accepted. The Commission presented in December 2000 a communication to the Council and the European Parliament on the application of the precautionary principle and the multi-annual arrangements for setting TACs ⁽⁹⁾ thus re-opening the debate on the adoption of multiannual management frameworks to rationalise the management process. Advances in scientific advice, especially mid-term risk analysis having facilitated setting mid-term objectives based on risk management, and the experience acquired, from the previous Commission proposal, on the dangers to be avoided, make a multiannual approach more feasible.

⁽⁷⁾ Proposal for a council regulation fixing management objectives and strategies for certain fisheries or groups of fisheries for the period 1994 to 1997 (COM(93) 663 final).

⁽⁸⁾ OJ L 115, 9.5.1996, p. 3.

⁽⁹⁾ COM(2000) 803 final.

1.2. The TAC regime (total allowable catches)

The Community continued to adopt annually the regulations setting up, for most exploited stocks, the TACs, the part of these corresponding to Member States and third countries, and its allocation to Member States in the form of fish quotas. Since 1996 the TAC regime has undergone some important developments:

- a reinforcement of the policy of reducing ‘paper fish’ ⁽¹⁰⁾ (mostly, for some precautionary ⁽¹¹⁾ TACs);
- adoption of new TACs in international waters covered by regional fisheries management organisations (redfish, Atlanto-Scandian herring, bluefin tuna, swordfish);
- adoption of new TACs in the North Sea in order to prevent expansion of fishing effort on non-regulated species (sandeel, some flatfish, spurdog, anglerfish and prawn);
- allocation of quotas for some stocks subject to TAC, but not yet distributed among Member States and therefore prone to overfishing (horse mackerel, North Sea blue whiting, sprat);
- setting up rules for flexibility in the year-to-year management of quotas (Council Regulation (EC) No 847/96).

This last regulation deserves special attention. Conferring the TAC and quota system with a certain degree of flexibility was a main requirement of the renewed CFP of 1992, linked to the setting up of objectives and strategies on a multi-annual basis. As said before, little progress was achieved on the latter proposal, but the flexibility system is proving to be an effective contribution to management of TACs and quotas. However, it would have better been a complement to the multi-annual framework which needs to be implemented in the future.

The annual pattern of the end-of-year negotiations to set the TACs for the year ahead has been a dominant feature of resource conservation policy under the CFP. The inevitability of this pattern has given rise to drawbacks that have worsened over the years.

- Negotiations in the Council have regularly resulted in the postponement, mainly on grounds of scientific uncertainty, of the stringent measures that are needed if stocks are to recover. The annual repetition of this process can only make the situation worse. It has resulted in a dilatory policy of stock management that has failed to safeguard or restore fish stocks.
- The fixing of TACs on an annual basis makes the adoption of medium-term perspectives almost impossible. Moreover it does not allow for the creation of the necessary links between conservation policy and fleet policy, which requires a medium- to long-term perspective.
- The annual fixing of TACs and their sharp fluctuations from one year to another in some cases has created many difficulties for the fishing industry in the programming of its activities.

⁽¹⁰⁾ This term is applied to TACs and quotas which are well in excess of the real fishing possibilities and have, therefore, little effect in limiting catch.

⁽¹¹⁾ ‘Analytical’ TACs are those set for stocks which are subject to a full scientific assessment followed by a catch forecast under diverse management scenarios. Otherwise, the TACs are called ‘precautionary’.

The current pattern cannot be continued. The CFP needs to introduce multi-annual decision-making mechanisms for TACs for all stocks, focusing on the precautionary approach, in order to avert the risks of crisis and also to rationalise fisheries management, as developed in the Commission's communication on the precautionary principle and multi-annual arrangements ⁽¹²⁾.

Globally TACs and quotas have been an efficient tool for managing mono-specific fisheries when there is adequate scientific advice which is taken into account and when there is strict enforcement. On the other hand, multi-species fisheries (like most demersal fisheries) cannot be efficiently managed through TACs and quotas as is the case now especially when technical measures are not properly designed and effectively implemented. The recent cod and hake crises perfectly illustrate this analysis.

1.3. Technical measures

Following the steps initiated in 1996, a consolidation of the key technical measures legislation (Council Regulation (EEC) No 3094/86 of 7 October 1986) was carried out, resulting in the adoption of Council Regulation (EC) No 894/97 of 29 April 1997 ⁽¹³⁾. This contributed to facilitating understanding and enforcement of the legislation, which had been dispersed over many regulations.

At the same time, the process of revision of this legislation continued and on 25 June 1996 the Commission submitted its proposal for a new Council regulation on technical conservation measures. The basic principles of the new proposal were:

- harmonisation of mesh sizes over the whole of the area covered by the regulation;
- significant reduction of the amount of mandatory discarding;
- increase of selectivity of fishing gears;
- simplification of the rules, making them easier to monitor and control.

The Council formally adopted, on 30 March 1998, Regulation (EC) No 850/98 ⁽¹⁴⁾ for the conservation of fishery resources through technical measures for the protection of juveniles of marine organisms. During 1999, two more Council regulations added to the set of measures by solving certain technical details such as setting up the rules applicable when using nets of different mesh sizes during the same trip. The new legislative framework became applicable on 1 January 2000.

Although the Council was not able to accept all of the changes proposed by the Commission, the new legal framework constitutes some improvement of fishing practices, in particular in respect of protection of young fish.

In early 1998 the debate on the Commission's original 1994 proposal for a ban on the use of drift nets was revived. In June 1998, after prolonged debate, the Council agreed on a progressive drift net ban, which will come fully into effect as of 1 January 2002 (Council Regulation (EC) No 1239/98 of 8 June 1998 ⁽¹⁵⁾). This worldwide ban for Community vessels (except for the Baltic Sea) will have a major beneficial effect for the conservation of

⁽¹²⁾ COM(2000) 803 final, 1.12.2000.

⁽¹³⁾ OJ L 132, 23.5.1997, p. 1.

⁽¹⁴⁾ OJ L 125, 27.4.1998, p. 1.

⁽¹⁵⁾ OJ L 171, 17.6.1998, p. 1.

small cetaceans and some species of fish. Up to 1 January 2002 the current maximum drift net length of 2.5 km will remain in force.

Despite all efforts, the technical measures regulations remain complex, difficult to understand and to enforce. In some cases this is almost unavoidable because simpler rules would be less adapted to specific cases. But biologically unjustifiable geographical disparities remain and the complexity of the current rules has resulted in unsatisfactory compliance.

The recently revised regulation has not been tested long enough to evaluate its effects. Much less ambitious than the Commission had proposed, the new regulation can only bring, at best, a partial remedy to existing problems. Much stronger measures are needed.

1.4. The conservation of Baltic fishery resources

Council Regulation (EEC) No 1866/86 of 12 June 1986 laying down certain technical measures for the conservation of fishery resources in the waters of the Baltic Sea, the Belts and the Sound was amended several times to incorporate technical rules adopted by the International Baltic Sea Fisheries Commission (IBSFC). These rules concerned mostly seasonal closures to protect the stocks of cod and salmon and technical specifications of the fishing gear (mesh sizes, escape windows in trawls) which are expected to contribute to the rebuilding of Baltic stocks. Subsequently, Regulation (EEC) No 1866/86 was consolidated in order to improve its clarity and enforcement. The new consolidated version is Council Regulation (EC) No 88/98 of 18 December 1997 ⁽¹⁶⁾. There is a well-established need to review the technical rules for the Baltic area but this process needs to take place within the framework of the IBSFC.

Despite significant improvements much still needs to be done. Cod and salmon stocks remain very fragile whereas several herring and sprat stocks have suffered from a recent drastic increase in their exploitation rates.

1.5. The conservation of Mediterranean fishery resources

Following extensive discussions in the early 1990s on the general principles of a conservation and management policy specifically for the Mediterranean, the Council adopted Regulation (EC) No 1626/94 of 27 June 1994 laying down certain technical measures for the conservation of fishery resources in the Mediterranean ⁽¹⁷⁾.

A number of amendments have been introduced to that regulation in order to implement recommendations issued by the International Commission for the Conservation of Atlantic Tunas (ICCAT) for the management of bluefin tuna and swordfish. These concerned minimum landing sizes, seasonal closures and restrictions on the use of aircraft as an aid to fishing operations.

As a consequence of problems encountered in the enforcement of minimum landing sizes for certain species, the Commission issued a proposal for

⁽¹⁶⁾ OJ L 9, 15.1.1998, p. 1.

⁽¹⁷⁾ OJ L 171, 6.7.1994, p. 1.

amending Regulation (EC) No 1626/94 with the aim of introducing progressive adaptation of fishing practices to legislation (COM(96) 128). Following a negative opinion by the European Parliament, the Council did not adopt the proposal. The problem of minimum landing sizes will also need to be dealt with in the context of the General Fisheries Commission for the Mediterranean (GFCM).

In 2000, the Council decided to prolong the derogations to Articles 3(1) and 6(1) of Regulation (EC) No 1626/94 until 31 December 2002, subject to technical conditions alleviating their impact on resources ⁽¹⁸⁾. The debate on the reform of the CFP should provide a basis for a long-standing solution to this and other problems of certain Mediterranean fisheries.

Until now the technical measures regulation for the Mediterranean has not been a success. There may be a need to seriously re-evaluate mesh-sizes and landing sizes. There is also a need to consider the introduction of an effort-control management scheme in the absence of TACs. The current inability of the GFCM to adopt such a scheme for the whole area should make the Community reflect on the initiatives that need to be taken on its part.

1.6. Environmental issues

In March 1997 a number of Member States and the Commission participated in the intermediate ministerial meeting on the integration of fisheries and environmental issues, in Bergen, Norway. This meeting took place in the framework of the North Sea Conference and resulted in the adoption of a statement of conclusions.

The Commission produced in 1998 and in 1999 follow-up reports on the implementation within the Community of the aforementioned statement of conclusions.

On 21 June 1998, the Council endorsed a Community strategy on biological diversity (COM(1998) 42). The strategy calls for the generation of sector-based action plans, the subsequent implementation of which will achieve the biodiversity objectives defined in the strategy. With regard to the fisheries sector, the objectives of the Commission biodiversity strategy are twofold:

- to conserve commercially fished species of marine finfish, in order to achieve sustainability of stocks, fishing opportunities and food supply, and
- to reduce the impact of fishing and aquaculture operations on other components of the ecosystem, i.e. non-target species (at all taxonomic levels) and marine habitats.

In 1999, the Commission adopted a communication on fisheries management and nature conservation in the marine environment, where it identifies some priorities and implementing measures that should benefit from increased coordination and coherence between fisheries and environment policies and that will be complementary and even synergistic to the conservation of fish stocks and to the conservation of marine nature ⁽¹⁹⁾.

⁽¹⁸⁾ Council Regulation (EC) No 2550/2000 of 17 November 2000 (OJ L 292, 21.11.2000, p. 7).

⁽¹⁹⁾ COM(1999) 363 final.

The forthcoming adoption of the biodiversity action plan for fisheries and of the strategy for the integration of environmental considerations into the CFP should form a good basis for discussion on the strengthening of the environmental dimension of the CFP.

1.7. The Scientific, Technical and Economic Committee for Fisheries (STECF)

The Commission gave a new impetus to the STECF by reinforcing its membership of qualified experts in the fields of fisheries economics and the environment. Following Article 16 of Regulation (EEC) No 3760/92, STECF was restructured in 1997 into four sub-groups, some of them of a permanent nature, dealing with the annual review of stock status, economic assessments, environmental issues and definition of research needs.

At the same time, STECF work was closely linked to a number of concerted actions promoted by the Commission in the framework of the AIR and FAIR research programmes. The improvements in the structure and functioning of STECF resulted in the production in 1998, for the first time ever, of an evaluation of the economic consequences of the state of fish stocks and, in early 1999, of the first comprehensive report on the state of all stocks of Community interest.

However, the STECF is now confronted with a considerable workload causing difficulties for its members in the programming of their activities.

1.8. Dialogue

In 1997 the Commission initiated a series of meetings on a regional basis with a view to exchanging ideas on the management of certain fisheries. Participants in these meetings included national authorities, the industry, scientists and economists. The Commission reported twice to the Council on these meetings. The Council welcomed this initiative and encouraged the Commission to continue and further develop it.

The Commission also adopted in 1999 an action plan aimed at creating the conditions needed for effective consultation and communication between all involved directly and indirectly in the CFP. Thus the Advisory Committee on Fisheries and Aquaculture (ACFA) was restructured with the introduction of representatives of interests such as the aquaculture sector, operators of auctions, scientific experts and environment and development NGOs ⁽²⁰⁾. Moreover, Council Regulation (EC) No 657/2000 of 27 March 2000 on closer dialogue with the fishing sector and groups affected by the common fisheries policy ⁽²¹⁾ provided for Community funding for some of the costs incurred by European trade organisations in preparing the meetings of ACFA and for the dissemination of information on the CFP to the industry and to groups concerned.

⁽²⁰⁾ Commission Decision 1999/478/EC.

⁽²¹⁾ OJ L 80, 31.3.2000, p. 7.

1.9. Research in support of the common fisheries policy

To promote fisheries research the Commission may allocate some of the funds made available under the research framework programmes to projects selected under calls for proposals.

Funds of the fourth framework programme were made available to fisheries and aquaculture research through the FAIR specific programme (research programme for agriculture and fisheries, including agro-industry, forestry, aquaculture and rural development). This programme aimed at promoting fisheries and aquaculture research to:

- assess the impact of environmental factors on aquatic resources, and, reciprocally, fisheries and aquaculture ecological impacts;
- improve stock assessment and fisheries management techniques as well as the selectivity of fish harvesting;
- analyse the socioeconomic aspects of the fisheries industry;
- promote aquaculture through the study of fish biology;
- increase the value of seafood products.

During this same period, the Commission was able to allocate significant financial resources to the support of scientific and technical studies in support of the CFP. These studies aimed either at collecting much-needed scientific information to feed into the databases needed to assess the condition of the stocks, in particular in relation to fish stocks for which precautionary TACs exist, or at addressing very specific questions, the answer to which was of direct relevance to the management of Community fisheries. However, it has not always been possible to focus Community funding on research on those issues that are of paramount importance for the running of the CFP.

In 2000 the Council adopted Regulation (EC) No 1543/2000 of 29 June 2000 establishing a Community framework for the collection and management of the data needed to conduct the common fisheries policy ⁽²²⁾ and a decision on a Community financial contribution towards the expenditure incurred by the Member States in collecting these data and for financing studies and pilot projects.

Under this framework, a minimum programme covering the information essential for scientific evaluations will be set up by the Commission. An extended programme will also be drawn up, including additional information likely to improve substantially scientific evaluations. Member States will draw up national programmes which will include, as far as possible, elements required by the minimum Community programme. These will be eligible for Community funding. Community financial assistance may also be available for additional elements of the national programme corresponding to the extended Community programme, once the provisions concerning the minimum programme have been fully met.

These programmes will cover six-year periods, except for the first, which will only cover the period 2002–06. For economic data, however, the obligation

⁽²²⁾ OJ L 176, 15.7.2000, p. 1.

to meet the provisions concerning the minimum programme will be delayed until 1 January 2006 for annual data on the processing industry. The Commission will carry out a review in 2003 examining whether the transmission of annual data on the processing industry effectively needs to be made compulsory from 2006.

Despite all efforts undertaken so far, the data collection necessary for the implementation of the CFP has been largely inadequate. The data required did not cover all areas (Mediterranean) and all domains (economic data) thus making the available scientific advice incomplete. There has been a lack of integration of the economic dimension, a lack of analysis integrating all species fished simultaneously and taking into account the impact of all TAC decisions on fleets. It has also been impossible to obtain adequate scientific advice for the management of inputs.

Moreover, relations between fishermen and scientists have not always been good enough to establish mutual trust. Fishermen complain that their knowledge is not taken into account by scientists.

2. Monitoring the common fisheries policy

A new control regime was established by the Council Regulation (EEC) No 2847/93 ⁽²³⁾. The system provided for overall and integrated monitoring covering all aspects of the CFP and applying to all operators in the fishing sector. It required Member States to apply dissuasive penalties and strengthened the Commission's supervisory functions in respect of the national fisheries inspectorates. The system also opened the door to the use of modern technology, in particular satellite-based continuous position-finding systems and computerised systems.

In 1995, the control regime was amended, adding to the existing provisions so as to include measures aimed at the monitoring and inspection of fishing activities subject to fishing-effort restrictions (Council Regulation (EC) No 2870/95 ⁽²⁴⁾).

The above measures were highlighted in the two previous reports of the Commission on the implementation of the Community system for fisheries and aquaculture, referred to in the introduction.

Other important modifications followed:

(a) Establishment of a vessel monitoring system (VMS)

Taking account of the experience gained from 1994, at the time of the implementation of pilot projects on satellite monitoring involving up to 350 Community vessels, Council Regulation (EC) No 686/97 ⁽²⁵⁾ amending Regulation (EEC) No 2847/93, as well as Commission Regulation (EC) No 1489/97 ⁽²⁶⁾ establishing the detailed implementing rules, envisage systematic satellite monitoring of Community vessels. Member States are required to set up such a system aiming to locate fishing vessels flying their flag and enabling the latter to communicate to the Member States in whose waters they are operating and to indicate their position at least once every two hours.

This monitoring applies to all fishing vessels exceeding 24 m length overall or 20 m between perpendiculars. This obligation should have been implemented gradually between 1998 and 2000. In fact, since 1 July 1998, only the vessels operating in sensitive fisheries, such as fishing on the high seas, except for the Mediterranean, and industrial fishing for fishmeal, have been monitored. As from 1 January 2000, all Community vessels exceeding the length mentioned above, wherever they operate, should have been equipped with a satellite tracking device. The same goes for the vessels of third countries operating in Community waters.

The European Community has participated in pilot projects on VMS with Norway and the Faeroe Islands during 1999. Bilateral arrangements on the operational use of VMS were concluded with these countries in 2000 and

⁽²³⁾ OJ L 261, 20.10.1993, p. 1.

⁽²⁴⁾ OJ L 301, 14.12.1995, p. 1.

⁽²⁵⁾ OJ L 102, 19.4.1997, p. 1.

⁽²⁶⁾ OJ L 202, 30.7.1997, p. 18.

subsequently put into operation. Furthermore, VMS is applied progressively in the framework of regional fisheries organisations to which the European Community is a contracting party, such as NAFO and NEAFC.

(b) Control of the fishing effort regime

The completion of the fishing effort regime required the adoption of a series of additional provisions during the period 1996–98:

- Council Regulation (EC) No 2205/97 ⁽²⁷⁾ amending Regulation (EEC) No 2847/93, which increased fishermen's obligations operating in 'western waters', by including the obligation to communicate the catches retained on board at the time of the communications of entry and of exit of the fishing effort areas (hail system).
- Commission Regulation (EC) No 1449/98 of 7 July 1998 laying down detailed rules for the application of Council Regulation (EEC) No 2847/93 as regards effort reports ⁽²⁸⁾.
- Some regulations introducing minor adaptations to the ceilings of fishing effort established by Regulation (EC) No 2027/95.
- Implementation of the fishing effort arrangement in the Baltic required the adoption of additional legislation, the most important being Council Regulation (EC) No 2635/97 ⁽²⁹⁾, amending Regulation (EEC) No 2847/93. It introduced rules on the registration of fishing effort data in the logbook, the gathering of the effort data by the Member States, and the transmission of those data to the Commission.

2.1. Reform of the control regime

Taking account, on the one hand, of important progress made since the adoption of the control regulation in 1993, and on the other hand, of the gaps noted by the communication from the Commission on fisheries monitoring under the CFP (COM(1998) 92 of 19 February 1998), the Council adopted, on 17 December 1998, Regulation (EC) No 2846/98 ⁽³⁰⁾ amending Regulation (EEC) No 2847/93.

The modifications were mainly centred on three main issues, as listed below, identified as priorities by the Commission.

- **The improvement of monitoring after landing:** this involved ensuring the 'traceability' of the fishing products from landing throughout the various stages of the marketing chain. Thus sale notes for the marketed products, transport documents for the products transported to a place other than that of landing for later sale and take-over declarations of responsibility for the products which are not marketed or whose sale is deferred are established and are to be presented by the holders of the products at the time of controls.
- **Monitoring of third country fishing vessels operating in Community waters:** monitoring, inspection and surveillance measures were extended to the fishing vessels flying the flag of a third country and operating in the Community fishing zone, in order to ensure that these vessels and the Community vessels are treated in the same manner. This involved, in

⁽²⁷⁾ OJ L 304, 7.11.1997, p. 1.

⁽²⁸⁾ OJ L 192, 8.7.1998, p. 4.

⁽²⁹⁾ OJ L 356, 31.12.1997, p. 14.

⁽³⁰⁾ OJ L 358, 31.12.1998, p. 5.

particular, strengthening the monitoring of landings carried out by these vessels and subjecting them to monitoring by satellite.

- **Cooperation between the Member States and with the Commission:** a general framework aiming to strengthen and facilitate cooperation between all the authorities involved was envisaged in the monitoring of fishing activities. This involves, in particular, facilitating requests for mutual assistance, the exchange of relevant information and the establishment of specific monitoring programmes.

The Commission had also proposed the strengthening of the powers of the Community inspectors who should have had access, within the framework of their observation missions, to files and documents, both in public and private buildings, under the same conditions as national inspectors. By this means they could have evaluated more precisely the effectiveness of the monitoring regimes set up by the Member States and the Commission could have fully guaranteed the transparency recognised by all as being essential for the credibility of the common fisheries policy. However, the Council followed the Commission on this point only partially, by requiring the presence of national inspectors at the time of the observation missions of the Community inspectors.

2.2. List of types of behaviour which seriously infringe the rules of the common fisheries policy

The heterogeneity of sanctions between Member States remains a major weak point for the credibility of Community control arrangements. Previous attempts to move towards a harmonisation of penalties did not succeed. It was decided therefore to focus more on the transparency as regards the follow-up of similar infringements within the Member States.

Council Regulation (EC) No 1447/99 of 24 June 1999 establishing a list of types of behaviour which seriously infringe the rules of the common fisheries policy ⁽³¹⁾ follows the last amendment of the control regulation. It aims to draw up a list of types of behaviour for which increased transparency regarding follow-up by the national authorities is necessary.

These types of behaviour constitute clear and obvious failures to meet the obligations imposed by Community legislation. The establishment of such a list does not involve the harmonisation of penalties at Community level. On the other hand, the establishment of this list and the obligation for the Member States to communicate to the Commission the action taken in respect of detected illegal behaviour aim to guarantee increased transparency so that the fishermen's confidence in the supervisory authorities and comparability of each national system's effectiveness are ensured.

Commission Regulation (EC) No 2740/1999 lays down the implementation rules for the communication to the Commission of the types of behaviour seriously infringing the CFP rules which have been discovered by the Member States' monitoring authorities and which have been the subject of an official report. Pursuant to this regulation, Member States are

⁽³¹⁾ OJ L 167, 2.7.1999, p. 5.

obliged to communicate, in specific terms and by electronic means, the type of proceeding initiated, the decision taken and the nature of the penalties imposed. For the first time, the Member States will communicate this information not later than 31 March 2001 for the cases discovered in 2000.

These arrangements will improve transparency but further progress is still needed as regards the need to harmonise administrative penalties for major infringements and the need to ensure the recognition and admissibility of evidence gathered in a Member State other than the one adopting a decision on a particular infringement.

2.3. Financial support

Enforcement of fisheries regulations requires considerable and often disproportionate expenditure in relation to the budgetary capacity of the Member States. Community support for the years 1996–2000 was organised on the basis of Council Decision 95/527/EC of 8 December 1995 on a Community financial contribution towards certain expenditure incurred by the Member States implementing the monitoring and control systems applicable to the common fisheries policy ⁽³²⁾. This Community participation was endowed with a budget of EUR 205 million.

In December 2000 the Council arrived at a common orientation on the Commission proposal for a further three-year support scheme with a budget of EUR 35 million per year.

2.4. Evaluation

During the reference period many shortcomings have been identified in the various reports published by the Commission on monitoring the CFP.

There have been deficiencies in inspections carried out by Member States, delays in implementing new control provisions, a lack of means and human resources deployed for control purposes, major discrepancies in the application of penalties which induce a feeling of unequal treatment between Community fishermen and a greater inclination to commit fraud, a lack of adequate information transmitted by Member States, and a lack of sufficient resources and legal powers for the Commission inspectorate.

Effective control has also been undermined by the complexity of the technical measures, the lack of commitment by fishermen to these measures and fleet over-capacity.

An International Conference on Fisheries Monitoring, Control and Surveillance was organised by the Commission in Brussels on 24 to 27 October 2000 with the participation of 250 delegates from all over the world. The conference achieved its goals and encouraged the exchange of experience and the examples of good practice. The increased cooperation of all operators involved in the fishing sector, the use of modern technologies and the improvement of cost-effectiveness were highlighted as key points for ensuring sustainable fisheries.

⁽³²⁾ OJ L 301, 14.12.1995, p. 30.

All CFP players recognise the need for an effective control regime. There is a need to give new impetus to the current dynamics in support of strengthening control arrangements, to fully exploit the possibilities offered by new technologies, to strengthen stakeholders' participation and commitment to the CFP and to be ready to envisage more profound changes, especially with regard to the sharing out of responsibilities between the Commission and the Member States.

3. Restructuring the fisheries sector

3.1. Multi-annual guidance programmes (MAGPs)

The problem of excess fishing capacity has been addressed by means of multi-annual guidance programmes (MAGPs) for the fishing fleets. These programmes set targets for fleet tonnage and power that must be met before the end of the period of the programme.

The period covered by the present report (1993–2000) coincides with the running of MAGP III and MAGP IV. The latter expires at the end of 2001. The Commission has issued in the past specific reports on these programmes. A report on the final results of MAGP III was submitted to the Council and the European Parliament in July 1997 (COM(97) 352 final) and a report on the mid-term review of MAGP IV was presented to the Council in May 2000 (COM(2000) 272 final).

The report on MAGP III indicated that during the period 1991–96 the EU fleet was reduced by about 15 % in GRT and 9.5 % in kW. By the end of the programme the capacity of the fleet was below global objectives for tonnage and power but these reductions were achieved by some Member States only. The results were not as ambitious as the Commission would have liked. There were important disparities between the Member States caused by the real difficulties some countries were experiencing in meeting the objectives and in some cases by the obvious lack of will to meet them.

The global objectives of MAGP IV, adopted in June 1997, were very much less ambitious than those proposed by the Commission, representing a reduction of approximately 5 % over the five-year period, i.e. about half the reduction achieved by MAGP III. At 1 January 2000 the Community fleet was already approximately 17 % below the final objectives in terms of tonnage and 6 % below the final objectives in terms of power. This is again explained by the modest ambitions of the programme. The reductions achieved are not enough to counter the increases in fishing effort due to technological progress over the reference period and must be contrasted with current experience which has shown that the problem of overcapacity is so large that the MAGPs provide only a fraction of the solution for overfishing and stock decline.

MAGP IV has two particular features. First, the reduction rates applied to the segments were weighted according to the proportion in total catches of depletion risk and over-fished stocks. Secondly, there are provisions for reducing fishing activity instead of fishing capacity. Both features have undermined the effectiveness of the programme in reducing fishing capacity. Moreover the programme has resulted in considerable complexity and a major administrative burden.

In 2000, the Commission suggested modifying the programme to achieve more substantial reductions over the remaining period by replacing the weighted reduction rates by unweighted rates and by achieving the additional reductions brought about by such replacement purely in terms of capacity. It also suggested the extension of the programme until the end of 2002. These ideas were, however, rejected by the majority of Member States in the Council.

The majority of Member States recognise however the need for a simpler and more transparent system, the need for stronger sanctions if objectives are not met and the need to deal more effectively with the effects of technological progress which causes an increase in fishing effort offsetting any benefits achieved by capacity reductions. Another problem that also needs to be tackled is the measurement and control of fleet capacity where further improvements are necessary especially given the fact that a 1 % change in capacity can mean the difference between eligibility or non-eligibility for public aid for modernisation and renewal ⁽³³⁾.

3.2. Structural aids

In 1993, fisheries' structural measures were integrated into the reformed Structural Funds under Council Regulations (EEC) 2080/93 and (EC) 3699/93. This made it possible to delegate to the Member States the responsibility (under the subsidiarity principle) for selecting investment projects in the sector, provided they comply with the measures adopted within the framework of sectoral programming for fisheries. Community financial assistance was also meant to comply with the principles of additionality and concentration of funds.

In addition to aid for the reduction of the fishing effort and for the renewal of the fleet, which has absorbed over half of the Community funds, the majority of the remaining funds were used for the processing industry and for the purpose of helping the sector to comply with Community standards as regards hygiene, public health, working conditions and respect for the environment. Community aid also contributed to the establishment of joint enterprises, to the protection and to the development of coastal areas, to measures for temporary cessation of fishing activities for specific cases, to the construction of collective harbour equipment and to the promotion of the fishery and aquaculture products.

In addition to the programmes specifically dedicated to the sector, coastal areas most dependent on fisheries also benefited from aid available under the Community initiative PESCA or under the development or regional conversion programmes (Objectives 1, 2 or 5b of the 1994–99 Structural Funds package).

Following the reform of the Structural Funds in 1999, the new Financial Instrument for Fisheries Guidance (FIFG) ⁽³⁴⁾ and the subsequent new FIFG implementing regulation ⁽³⁵⁾ were adopted in the same year.

The main point of debate in the Council on the FIFG implementing regulation concerned the conditions for granting public aid to the fleet. The Commission proposal was based on the principle that public funding must

⁽³³⁾ Commission's annual report to the Council and the European Parliament on the results of MAGPs for the fishing fleets at the end of 1999 (COM(2000) 738 final).

⁽³⁴⁾ Council Regulation (EC) No 1260/99 of 21 June 1999 (OJ L 161, 26.6.1999, p. 1).

⁽³⁵⁾ Council Regulation (EC) No 2792/99 of 17 December 1999 (OJ, L 337, 30.12.1999, p. 10).

not contribute to increasing fishing capacity. After extensive discussions, more stringent rules were agreed for the renewal of fleet within the framework of the MAGPs. Hence, for segments of the fleet where MAGP targets have not been met, Member States will have to withdraw without public aid capacity, which is 30 % greater than the capacity added with public aid. This provision will be in force until the end of 2001, when the current MAGP programme expires. For those Member States which have met their MAGP targets the rate will be 1 to 1. Finally, the sanctions in case of non-respect of the MAGP objectives and the obligation to provide data for the fishing fleet register have been strengthened.

Furthermore, the conditions regarding the creation and operation of joint ventures have been tightened. The premium for the creation of joint ventures has been set at 80 % of the premium for scrapping a vessel.

While retaining a wide range of measures available under the previous regime, the new FIG implementing regulation also includes innovations in favour of small-scale fisheries and innovations related to the socioeconomic measures (supporting fishermen for retraining/diversification outside maritime fisheries). Financial support is available for integrated collective projects to develop and modernise fishing activities in this sector, as well as for young fishermen. There are also new measures to encourage the creation of producers' organisations and support for the implementation of plans by these organisations to improve the quality of fisheries products. Greater emphasis has been put on measures of collective interest undertaken by the industry itself. The conditions under which various compensatory payments to fishermen and vessel owners may be available have been better defined and include temporary cessation of activities due to unforeseen circumstances or the non-renewal of a fisheries agreement or the introduction of a recovery plan for a resource threatened with exhaustion. Member States will also be able to grant financial compensation to fishermen and vessel owners when the Council imposes technical restrictions on the use of certain gear or fishing methods.

4. Market policy

Since its inception in 1970, the common organisation of the market in fisheries and aquaculture products has played an important role in supporting fishermen via a stabilisation of prices. Over recent years, the organisation has had to adapt to the changes witnessed in the market, which have included increased globalisation of markets, greater dependence on imports, continued scarcity of resources, changes in consumption patterns, and concentration and vertical integration within the distribution chain.

Therefore, in 1999, the Council agreed on a major revision of the common organisation of the market with the specific aims of minimising waste, strengthening the associations of fishermen, providing fuller information to consumers and to improve the balance between supply and demand.

The reform encourages fishermen to take a more pro-active, preventative role in managing supply to the market rather than simply intervening 'after the event' by the withdrawal of unsold products. This means that the role of producer organisations is strengthened and that in particular they will establish new operational programmes, designed to encourage these organisations to manage the landings of their members and take measures to avoid withdrawals. Simultaneously, there is a rebalancing of intervention mechanisms by reducing support for definitive withdrawals and instead favouring aid for stabilising and storing the products.

A major innovation of the reform was to introduce a new labelling requirement at the point of retail sale, which will improve product traceability and thereby reduce fraud concerning the origin and nature of the product sold. The commercial designation, the production method (aquaculture or wild) and the area of capture will be marked on all products on sale to the final consumer. Further down the fisheries chain, the needs of the processing sector have been recognised by the partial suspension of tariffs (or multi-annual tariff quotas) for products needed as raw materials for which there is insufficient Community supply.

The new regulation ⁽³⁶⁾ and most of its implementing regulations entered into force on 1 January 2001, with the exception of the provisions on information to consumers which will apply from 1 January 2002.

⁽³⁶⁾ Council Regulation (EC) No 104/2000 of 17 December 1999 on the common organisation of the markets in fishery and aquaculture products (OJ L17, 21.1.2000, p. 22).

5. External fisheries policy

5.1. Bilateral fisheries agreements

The Community continued to conclude and manage fisheries agreements over the period 1993–2000. The Community is now party to 23 bilateral agreements. These agreements concern approximately 2 800 vessels and provide direct and indirect employment to approximately 40 650 persons. The budgetary envelope dedicated to these agreements was EUR 276.1 million in 2000 (EUR 173.1 million in 1990). This amount represents approximately 28.5 % of the Community CFP budget.

The major development over this period was the adoption by Council, in October 1997, of its conclusions on the European Community fisheries agreements with third countries. The Council reiterated that the agreements are and will continue to be an essential and integral component of the CFP but it also agreed that they needed to adapt to changing circumstances flowing from international commitments and the general budgetary situation of the Union. It also stressed the need to ensure that agreements are concluded in accordance with a cost–benefit oriented approach and are coherent not only with the other components of the CFP but also with the other policies of the European Union.

Recent developments such as the emergence of the legitimate aspirations of many developing countries to develop their own fishing industry confirmed the need for the Community to rethink its policy in this field. The 2002 reform debate offers the opportunity for such a re-orientation.

5.2. Regional fisheries organisations (RFOs)

The Community takes an active part in international cooperation through the work of RFOs. The Community is now party to 10 RFOs. In 1999 the Commission submitted a communication to the Council and the European Parliament on the Community participation in RFOs. On the basis of this communication the Council considered that the effective participation of the Community in RFOs is a key element of the Community distant-water fishing policy. It also specified a number of modalities regarding the participation of the Community in these organisations, in particular with regard to scientific work, data transmission and the methodology required for the implementation of the recommendations adopted by the RFOs.

The Council, however, has not been able to adopt a position on the exercise of control of fishing activities in the framework of RFOs. The absence of a clear Community strategy on control and monitoring of fishing activities in international waters jeopardises efforts to ensure the continuation of the Community's fleet presence in those waters.

5.3. International agreements on fisheries

Over the period 1993–2000 there was a proliferation of international agreements and other instruments related to fisheries. The relevant international law was codified, developed and enhanced through *inter alia* the entry into force of the Law of the Sea Convention in 1994, the adoption of the UN Agreement on Straddling Fish Stocks and Highly Migratory Fish Stocks in 1995 and the adoption of the FAO code of conduct for responsible fisheries in the same year. Moreover, an international jurisprudence on fisheries related issues is slowly emerging through the work of the International Tribunal on the Law of the Sea.

The Community is a party to the Law of the Sea Convention, it has accepted the code of conduct and it has signed to the UN agreement in 1995. The Council has also approved the instrument of ratification of the latter agreement but it has not been possible to deposit it in the UN because not all Member States have finalised their internal ratification procedures.

6. Processing industry and aquaculture

Structural financial aid allocated to processing and marketing of fisheries products for the period 1994–99 amounted to EUR 529.39 million, which represents 21.9 % of the FIFG budget. This budget has been allocated to the construction of new production and marketing units or to the modernisation of the existing ones. It is estimated that this support has greatly contributed to the improvement of the sector. In particular, it has allowed the modernisation of the old equipment and the compliance of the industry with EU health legislation. An evaluation study is foreseen in order to assess the impact of the FIFG measures in support of the processing sector.

The structure of the sector is evolving to face the problems related to the supply of raw material and to the global market. Many small and medium enterprises have disappeared or have been absorbed by big companies. In spite of this concentration process which is leading the industry to move to other areas, including third countries, the processing industry constitutes a considerable part of the local economic activity in certain EU areas.

The Community's aquaculture industry has experienced steady growth and for some species impressive growth in production over the last years and decades. Its annual output, all species together, exceeds 1.2 million tonnes; the annual economic value amounts to more than EUR 2.2 billion. It provides approximately 60 000 full-time-equivalent jobs, including upstream and downstream activities, increasing by 3 % a year during this decade. Aquaculture is the only segment of the fisheries industry in the Community which has seen an increase of employment over recent years. Plausible scenarios for the medium-term future suggest that the number of jobs could increase even further.

At a global level, the Community represents only 3 % of worldwide aquaculture production but for most of the species farmed on its territory it is a world leader.

Because aquaculture is geographically concentrated in a limited number of areas with suitable natural conditions, these global parameters do not adequately reflect the importance of the industry for certain coastal regions of the European Community where aquaculture businesses and associated activities make up a considerable part of the local economy and where alternative employment opportunities are limited.

The aquaculture industry in the European Community is made up of:

- long-established species and products such as mussels and oysters, trout and carp;
- species for which cultivation techniques have improved impressively and which have seen a tremendous growth in output over the last two decades, such as salmon, seabream and seabass; and finally

- a wide range of species (both shellfish and finfish) for which cultivation is still at an experimental or pre-development stage.

There are products largely intended for export markets as well as species almost exclusively for the domestic market. We can find high-value species and products for niche markets as well as what can almost be defined as commodities.

As far as the aquaculture businesses are concerned, there are many small to medium-sized, but well-established companies which occupy a specific market niche, as well as bigger companies which have been able to achieve a level of diversification or vertical integration which allows them to attenuate the effects of fluctuations in prices and consumer habits. Many businesses are exposed to competition (often from non-Community countries) and pressure from distributors which tend to reduce their margins. Lacking the necessary capital, they find it rather difficult to finance the investments required to renew their production tools and, thus, to maintain their profitability.

All segments of the aquaculture industry have to address some common issues: on the production side, the pressures in relation to food safety, the increasing constraints from environmental concerns and from competition for space and aquatic resources, the threats from external factors such as water pollution; and, on the other side, the rapidly changing conditions of the market.

In recent years, the aquaculture industry has been required to make significant investments and these are still continuing today. The globalisation of trade in the fisheries and aquaculture sector has led companies to adapt and rationalise their operations in order to remain competitive and profitable within this new and difficult environment.

Since the beginning of 1994, the Community interventions for the sector of aquaculture have been carried out by the Financial Instrument for Fisheries Guidance (FIFG), integrated into the mechanism of the Structural Funds. During the period 1994–99, the FIFG devoted EUR 280 million (11 % of its budget) to aquaculture.

ANNEX I

Glossary of abbreviations used

ACFA	Advisory Committee on Fisheries and Aquaculture
CFP	common fisheries policy
FIFG	Financial Instrument for Fisheries Guidance
GFCM	General Fisheries Commission for the Mediterranean
GRT	gross registered tonnage
ICCAT	International Commission for the Conservation of Atlantic Tunas
ICES	International Council for the Exploration of the Sea
MAGPs	multi-annual guidance programme
NAFO	North-West Atlantic Fisheries Organisation
NEAFC	North-East Atlantic Fisheries Commission
NGOs	non-governmental organisations
RFOs	regional fisheries organisations
STECF	Scientific, Technical and Economic Committee for Fisheries
TAC	total allowable catch
VMS	vessel monitoring systems

Report on the

economic and
social situation
of coastal regions

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1. Community overview ⁽¹⁾

1.1. Economic overview of EU fisheries

Introduction: availability of data

In contrast to the situation regarding the management of fisheries resources, where statistical data is regularly collected and transmitted to the Commission according to Community regulations and the Commission works closely with a well-established international scientific organisation (ICES), there is no systematic collection and analysis of economic data relating to the fisheries sector, apart from price data for certain fish species coming under the common market organisation for fisheries products. The Council agreed in June 2000 to include economic data within the scope of Council Regulation (EC) No 1543/2000 on the collection of data essential to the management of the common fisheries policy but this part of the regulation will not become mandatory until 2004.

As a result, much of the data presented in this section, particularly in relation to the situation in individual Member States, is based on information available to the Commission through its own desk research or ad hoc external studies. This data is sometimes incomplete and there may also be problems of comparability of data from different Member States; nevertheless, the Commission considers that it is possible to identify clear trends from it. Improved availability of economic data is a priority for improved economic management of the fisheries sector.

1.1.1. Economic importance of fisheries

The EU is the world's third fishing power and the first market of processed products and of aquaculture. In 1998, the value of the whole production chain, namely fishing, aquaculture, processing and marketing reached approximately EUR 20 billion, i.e. 0.28 % of EU GDP. In 1990, the value of production was EUR 18 billion, also 0.28 % of EU GDP.

1.1.2. Fleet structure

In 1998, there were 99 170 registered fishing vessels in EU Member States. Total fishing power was just under 8 million kW, and the total tonnage was just over 2 million grt. Table 1 highlights the enormous variation in structural characteristics of the EU fleet. Greece had the largest fleet in terms of numbers, with over 20 000 vessels (20 % of the total), but over 93 % of these vessels were under 12 m in length. Spain has the second largest fleet with almost 29 % of the total tonnage of the EU. This is despite 75 % of the vessels being under 12 m in length.

⁽¹⁾ Dr Ian Goulding of Megapesca Lda (www.megapesca.com) contributed to this document.

Outside the Mediterranean and the Baltic regions, the pattern of a small modern segment of the fleet representing a large percentage of the capacity is common. For the EU as a whole, 80 % of the vessels are under 12 m and 53 % under 9 m. In Germany for example, out of a total of 2 373 vessels, 12 large trawlers represent almost 50 % of the fleet tonnage. Only in the Netherlands and Belgium are there greater numbers of vessels over 12 m than under. On the whole, the EU fleet is an ageing fleet, with few vessels introduced in recent years — only 16 % of the total EU fleet had been purchased in the 10 years previous to 1998. The regions with relatively newer fleets are the Netherlands, northern France, Finland and Belgium.

Between 1991 and 1998, there was a nominal reduction in the registered EU fleet capacity of 4.5 % in tonnage and 9.1 % in power, but during this period, the EU fleet was also increased by the accession of two maritime nations, Sweden and Finland, and the unification of Germany. Based on the fleet of the EU-12 in 1991, by 1998 tonnage had declined by 8 % and power by 14.7 %.

Table 1 **EU fleet structure, 1998**

	No of vessels	Capacity ⁽³⁾	Power kW	Av. tonnage ⁽³⁾	Av. power (kW)	
Belgium	148		23 082	64 896	156	438
Denmark	4 648		97 932	380 877	21	82
Germany	2 373		75 103	171 457	32	72
Greece	20 243		111 933	654 199	6	32
Spain	17 972		589 359	1 474 421	33	82
France	8 836		209 460	1 141 528	24	129
Ireland	1 246		61 082	190 625	49	153
Italy ⁽¹⁾	16 325		260 603	1 513 677	16	93
Netherlands	1 040		174 344	482 263	168	464
Portugal	11 579		123 923	393 671	11	34
Finland	3 979		24 170	219 745	6	55
Sweden ⁽²⁾	2 123		48 840	256 542	20	103
UK	8 658		253 409	1 047 690	29	121
EU-15	99 170		2 053 240	7 991 591	21	81

Based on Marsource (derived from the Community register of fishing vessels, 1 January 1998).

⁽¹⁾ 1997 data.

⁽²⁾ 1997 data for tonnage and power, 1999 data for number of vessels.

⁽³⁾ Statistical tonnage (mixture of GRT, GT and national standards).

1.1.3. Landings of marine fish

In the 15 Member States of the EU, landings of fish in 1990 were 6.38 million tonnes, rising to 7.45 million tonnes in 1995. Since then they have declined slightly to 6.3 million tonnes in 1998, with an estimated value of ECU 7.3 billion. Overall, the EU fleet accounts for about 7.5 % (by quantity) of global marine capture fisheries.

Although Denmark lands some 30 % of the EU total by volume (1.9 million tonnes) most of this is used for reduction, and is of relatively low unit value. With the exception of Sweden, in most other regions the landings are utilised mainly for human consumption, and have much higher unit value. After Denmark, Spain had the next highest landings, with 964 603 tonnes, followed by the UK, France, the Netherlands and Italy. EU vessels landed 423 000 tonnes outside the EU in 1998, particularly from UK and Spanish vessels.

There is a growing gap between Community supply and demand for fish and fish products, which generates increasing dependence of the European market on imports from third countries. The deficit increased between 1990 and 1999 by 63 % to reach EUR 8.6 billion, i.e. an amount equivalent to the value of the EU landings. Insofar as the imported quantities increased only by 32 %, this reveals that those are high-value imports. In 1997, the average value of the tonnes landed by Member States was EUR 995, that of Community aquaculture EUR 1 850, that of the tonnes exported by the EU EUR 1 167, while the average of the imported tonnes amounted to EUR 2 208.

1.1.4. Processing

The processing sector provides markets for fish caught by EU fishermen, as well as an important source of employment in fishery dependent areas. The sector has been relatively stable throughout the last decade, with an output of about ECU 10.3 billion in 1998. Spain and France have the largest processing sectors by value (corresponding to 22 % and 20 % of output) but Germany and Denmark also produce over ECU 1 billion of output per year.

1.1.5. Aquaculture

The aquaculture sector is an important part of the EU fishery industry, with an output in 1998 of 1.1 million tonnes (up from 0.94 million tonnes in 1990). The EU accounted for 4 % of total world aquaculture in production in 1997, and 8 % of marine aquaculture production.

A recent study to characterise the sector ⁽²⁾ found that in 1997/98 the production from marine aquaculture was 845 905 tonnes, with a value of over ECU 1.36 billion. The major producers are France (208 065 tonnes), Spain (208 065 tonnes), Italy (157 719 tonnes) and the UK (113 425 tonnes) but in terms of value, France and UK are the most important, with outputs of ECU 359.1 million and ECU 350 million respectively.

About one third of the marine aquaculture production by value comprises bivalve molluscs. The major producing regions are found in Galicia in

⁽²⁾ MacAlister Elliott and Partners, 'Forward study of Community aquaculture', European Commission, Directorate-General for Fisheries, December 1999.

northern Spain (mussel production) and the west coast of France (oyster production). The main species of fish produced by marine aquaculture are salmon, seabass and bream, eel and turbot. Total production of these species was 181 929 tonnes with a value ECU 793.8 million. The sector is dominated by the production of salmon (mainly in Scotland), followed by seabass and seabream in Greece; Ireland is the only other producer of note (mainly producing salmon). Greek hatcheries are also a major supplier of juvenile fish, generating revenues of another ECU 31.4 million, all of which is consumed by the aquaculture sector.

Inland aquaculture production is widely practised, with some production in all EU Member States. The output of inland aquaculture was estimated to be ECU 605 million in 1997/98, corresponding to 261 858 tonnes. The main species produced are trout and carp. Italy produces 22.4 % of EU output value and Germany 14.5 %, with France and Denmark (mainly trout and eels) also being significant producers, followed by the UK, with trout production accounting for 10 % of EU output value.

1.1.6. Inland capture fisheries

Unlike marine fish landings, there is no formal recording of catches from inland fisheries. However, the sector is not of major economic importance compared to other fishery sub-sectors, with an estimated total production of 106 600 tonnes in 1997. Production appears to have increased by about 17 000 tonnes throughout the last decade. Inland capture fishing is of significance in only a few EU countries. Germany is by far the largest producer, with 52 000 tonnes (nearly 50 % of the total), although much of this is derived from re-stocking from aquaculture facilities. The main species are carp, trout, eels and members of the perch family.

1.1.7. Profitability of the fishing fleet

The economic and financial situation and the performances of the Community fishing fleet during the period 1994–99 ⁽³⁾ can be summarised according to certain general characteristics, which have then to be specified in view of the important differences between countries and fleet segments. The period selected corresponds to the period of application of the FIG programme and is characterised by a complete economic cycle, namely two years, 1994 and 1995, marked by particularly low prices; one year of transition and three years of more favourable economic situation thanks to a continuous increase in prices which more than compensated stagnant or falling landing volumes.

Globally, from an economic and financial point of view, the Community fleet is characterised by the following.

- **High capital intensity:** invested capital ⁽⁴⁾ per job in the fisheries sector as such is, in general, very high (Table 2, col. 1). There is no comparable data in other economic sectors. As a comparison, the GFCF ⁽⁵⁾ level per job for the economy as a whole is indicated (Table 2, col. 2). Invested capital in the fisheries sector is on average 10 to 20 times the average 1999 GFCF.

⁽³⁾ The economic and financial data on the fisheries sector of this chapter has as a source the annual report 2000 'Economic performance of selected European fishing fleets', established within the framework of concerted Action FAIR PL97-3541. This report does not cover at the present time all the Community fleet, but an important sample sufficiently representative of it.

⁽⁴⁾ Invested capital: amount of the capital invested in the vessel at a certain moment. The book value, based on the replacement value is a measure for the invested capital; in a number of cases, the insured value of the vessel has been taken as an approach for the invested capital. This does not involve therefore annual investments carried out.

⁽⁵⁾ GFCF: gross fixed capital formation.

– **Very high value added per job:** there is a close relation in this sector between the level of the invested capital per job and the value added per job. With some exceptions, the value added generated per job in fishing is higher not only than in agriculture but also than in industry (Table 2, cols. 3–5) or in the economy as a whole, despite the relatively low qualification levels for jobs in the fisheries sector. In general, however, the higher the invested capital, the less relative value added is generated.

Table 2

Capital intensity indicators and added value/employment, 1999

1 000 EUR

Country	Segment	Inv. cap./empl.	FBCF/empl.	Added value/employment				
		Fisheries	Tot. econ.	Fisheries	Agriculture	Industry		
		1	2	3	4	5		
Belgium						13	38	69
	Beam trawlers		167		70			
Denmark(*)						12	40	59
	Trawlers > 200 gt		268		137			
	Trawlers < 200 gt		93		58			
	Danish seiner		83		67			
	Gill netters		61		41			
Germany						11	22	53
	Nea w. and coastal fl.		63		59			
	Shrimp trawlers		66		57			
	Fish trawlers		60		61			
Greece						7	12	23
	Deepwater trawl		98		31			
	Coastal trawl		112		25			
Spain						9	19	38
	300s fleet EU waters				36			
	Med. trawlers		47		11			
	Med. purse seiners		14		3			
France						11	34	62
	Bottom trawlers 16–30 m		89		58			
	Gill netters > 16 m		39		39			
Italy						9	27	45
	Trawlers		94		26			
	Purse seiners		39		20			
	Midw. pair trawl		93		25			

Dredgers	73	24	
Multi-purpose trawl	54	23	
Small-scale fishery	20	14	
Tuna fleet	133	22	
Swordfish fleet	43	13	
The Netherlands		10	34 61
Eurocutters 191–221 kW	158	82	
Beamtrawl > 811 kW	304	110	
Portugal		5	7 20
Coastal trawlers	21	12	
Coastal purse seiners	8	14	
NAFO vessels	19	24	
Finland		8	27 61
Pelagic trawlers	71	19	
Sweden		9	36 n.a.
Pelagic v. > 20m	233	48	
Pelagic v. < 20m	107	16	
Shrimp trawlers	134	36	
Demersal trawl. > 20m	191	48	
Demersal trawl. < 20m	164	51	
Nephrops	140	49	
Net/hook fishery	119	29	
United Kingdom		9	26 60
Scottish demersal < 24 m	122	62	
Scot. dem. trawl. > 24 m	261	107	
Scot. <i>Nephrops</i> trawl,	50	32	
Scottish dem. seiners	165	73	
N. Irel. <i>Nephrops</i> trawl.	39	31	

(¹) 1998 data.

Sources: 'Economic performance of selected European fleets', annual report 2000, Joint Action FAIR PL 97-3541 and AMECO (DG ECFIN).

– **Poor financial profitability:** over the period 1994–99, the net profit ⁽⁶⁾ of fishing fleets, often negative or very weak, did not allow to remunerate the capital normally. In other words, despite the high level of value added per job, it remained insufficient to cover at the same time the crew's share and the financial costs related to high-capital-intensive equipment. The rather exceptional economic trend in 1999 showed that in particularly favourable price circumstances and with a favourable development of the landing volumes for some countries, a clear profit allowing a return on the capital was realisable. Increases in the price of fuel during 2000, however, have radically modified the favourable situation recorded in 1999.

Table 3

Profitability indicators 1999 and 1994–99

Profitability indicators 1999 and 1994–99 Prices and quantities evolution in 1994–99

Country	Segment	Net profit/ invested capital 1999 (%)	Net profit/ invested capital Average 1994–99 (%)	Prices 1999 (1) (1994 = 100)	Volume of landings 1999 (1994 = 100)
		1	2	3	4
Belgium	Beam trawlers	4.7	2.2	131	88
Denmark ⁽²⁾	Trawlers > 200 gt	7.4	2.1	151 ⁽³⁾	92 ⁽³⁾
	Trawlers < 200 gt	– 0.1	– 3.7	132 ⁽³⁾	80 ⁽³⁾
	Danish seiner	5.1	– 3.3	131	85
	Gill netters	– 12.2	– 15.4	120	84
Germany	Near w. and coastal fl.	14.5	– 4.9	n.a.	n.a.
	Shrimp trawlers	10.4	– 3.6	n.a.	n.a.
	Fish trawlers	19	– 5.2	n.a.	n.a.
Greece	Deepwater trawl.	– 2.3	– 3.8	104	156
	Coastal trawl.	– 4.9	– 4.7	98	119
Spain	300s fleet EU waters				
	Medit. trawlers ⁽⁶⁾	– 2.6	– 8.5	142	106
	Medit. purse seiners ⁽⁶⁾	– 6.4	1.7	105	58
France	Bottom trawlers 16–30 m	2.1	– 1.1	132	94
	Gill netters > 16 m	5.1	1.1	136	100
Italy	Trawlers	4.6	9.1	128	99
	Purse seiners	20.5	10.2	103	140
	Midw. pair trawl.	4.0	7.8	80	137
	Dredgers	9.1	9.5	91	98
	Multi-purpose trawl.	7.9	14.2	117	84
	Small-scale fishery	41.3	37	94	145
	Tuna fleet	– 2.5	3.7	125	119

⁽⁶⁾ Net profit: value of landings minus all costs, including depreciation and an imputed interest amount. This balance is the reward for entrepreneurship.

	Swordfish fleet	3.3	19.5	104	37
The Netherlands	Eurocutters 191–221 kW	10.7	1.9	138	119
	Beam trawl. > 811 kW	7.3	2.0	141	69
Portugal	Coastal trawlers ⁽⁴⁾	12.5	18.7	151	89
	Coastal purse seiners ⁽⁵⁾	29.2	26.8	175	86
Finland	Pelagic trawlers ⁽⁴⁾	– 5.1	– 2.1	94	99
United Kingdom	Scottish demersal	4.9	0.1	n.a.	n.a.
	Scot. <i>Nephrops</i> trawl.	8.2	12.4	n.a.	n.a.

(¹) Value of landings/volume of landings.

(²) Data regard 1995 and 1998.

(³) Data regard 1996–98.

(⁴) Data regard 1996–99.

(⁵) Data regard 1997–99.

(⁶) Data regard 1995–99.

Table 3 shows clearly that the long-term financial viability of the majority of the Community fleets concerned was compromised under the conditions which prevailed during the period 1994–99.

During this period, only the Italian fleet and certain segments of the Portuguese fleet show clear profits likely to remunerate the capital but these are two fleets for which value added and capital invested per job are among the weakest. It seems inappropriate to compare the situation of these two countries with that of the majority of the other Community countries, because the share reserved in these two countries for the crews' remuneration appears very low compared with the other countries.

– **Insufficient utilisation rate of equipment:** in a situation of very high capital intensity, the utilisation rate of equipment is a key parameter of profitability. A high activity ratio by production unit makes it possible to cover depreciation and financial costs by a higher production level. In this area the potential for improvement within the EU is enormous.

Between 1994 and 1999, numerous Community fleets carried out significant reductions of capacity by decommissioning (Table 4, col. 4), but these adjustments were insufficient insofar as they often did not compensate for reductions in activity and productivity increases of the remaining vessels (Table 4, col. 3).

Table 4

Utilisation rate ⁽⁷⁾ of the available fishing capacity ⁽⁸⁾, 1994–99

Country	Segment	Utilisation rate (%)		KW/vessel Available	
		1994 (1994=100)	1999 (1994=100)	1999	capacity 1999
		1	2	3	4
Belgium	Beam trawlers	102	86	102	94
Denmark	Trawlers > 200 gt	90	86	105 ⁽²⁾	100
	Trawlers < 200 gt	61	66	942	84
	Danish seiner	59	57	122 ⁽²⁾	61
	Gill netters	54	46	132 ⁽²⁾	71
Greece	Deepwater trawl.	73	62	100	111
	Coastal trawl.	70	70	100	95
Spain	300s fleet EU waters	95	100	95	79
	Med. trawlers	76	77	98	91
	Med. purse seiners	68	62	110	95
France	Bottom trawlers 16–30 m	69	72	104	78
	Gill netters	53	52	122	98
Italy	Trawlers	63	62	99	124
	Purse seiners	48	48	98	81
	Midw. pair trawl.	60	56	104	101
	Dredgers	37	34	129	95
	Multi-purpose trawl.	57	59	95	101
	Small-scale fishery	61	71	90	102
	Tuna fleet	43	28	101	118
	Swordfish fleet	38	29	120	42
The Netherlands	Eurocutters 191–221 kW	57	51	104	113
	Beam trawl. > 811 kW	72	67	106	82
Portugal	Coastal trawlers	118	85	104	151
	Coastal purse seiners	99	64	106	89
Finland	Pelagic trawlers	24	22	115	83
Sweden	Pelagic > 20 m	73	59	124	70
	Trawl. cod > 20 m	63	54	102	77
	Prawn	45	60	105	67
	Cod < 20 m	42	42	111	57
	<i>Nephrops</i>	59	41	97	140
	Net/hook fishery	21	53	97	71
United Kingdom	Scottish demersal	72	84	104	93
	Scot. <i>Nephrops</i> trawl.	70	63	118	74

⁽¹⁾ Data regard 1995–98.

⁽²⁾ Gt/vessel.

⁽³⁾ Data regard 1996–98.

⁽⁷⁾ The utilisation rate of capacity is calculated by comparing the total number of days at sea actually recorded to the available capacity. To take account of the structural changes that occurred between 1994 and 1999, a coefficient reflecting the rising or declining power by vessel corrects the 1999 available capacity. In concrete terms, the 1999 available capacity is multiplied by the index kW per boat 1999/94.

⁽⁸⁾ The available capacity is assumed to be 265 days' effort per vessel per year.

One may conclude from the above tables that the profitability of trawlers in particular, owing to the importance of the invested capital, involves very high use of capacity. For the period 1994–99, except in Italy and Portugal, no trawler fleet reached a satisfactory profitability threshold.

What lessons to draw from this analysis?

Beyond the adjustments made to the size of the Community fleet, further adjustments were realised by a reduction in fishing effort, expressed in days at sea/vessel. Effort reductions were very significant for several fleet segments, as shown in column 4 of Table 4.

Resorting in large measure to the reduction in the fishing effort rather than reduction in the fleet, is a solution which satisfies the conservation constraint, even if pressure on the resource remains high. From the point of view of economic and financial viability in the long-term, however, the relevance of such an approach may be questioned. In a sector with high capital intensity, with significant overcapacity and where the capital cannot be remunerated owing to the excessive charges borne by each unit of production, it is important to improve profitability by reducing costs.

Better adjustment of the fleet capacity to available fishing would have important direct and indirect effects on the economic and financial situation of the fishing fleet. It would make it possible to reduce the fixed overheads (depreciation and financing costs) linked with the installed capital and to lower certain operation costs, in particular by permitting economies of scale.

A reduction of the fleet will also have effects on the level of employment, but these could be compensated, at least partially, by the increase in the activity of the remaining boats. The adaptation of the level of employment to the structure of the fleet will have as a counterpart improvement of the productivity of employment.

The discussion of this problem at Community level is all the more necessary as each Member State has established its FIGG financing plan for the period 2000–06 without necessarily having taken into account the situation which will arise from application by the other Member States of their plans. Taken as a whole, the Member States are planning to reduce their level of aid for fleet reduction and increase it for vessel construction or modernisation. In other words, present national intentions will further increase the capital intensity of the fleet instead of reducing it ⁽⁹⁾.

1.1.8. Aid to the fisheries sector

Financial Instrument for Fisheries Guidance (FIGG)

As indicated in Table 5, aid granted until now under the structural programme 1994–99 has mainly concerned the fleet (more than 55 %), 60 % of this aid going to the financing of the adjustment of the fleet and, 40 % to its modernisation. For the period 2000–06, an increase in aid to aquaculture and in particular, to the downstream processing industries is envisaged and consequently a relative decrease of the aid to the fleet from 57 % to 41 %. Nevertheless, the intended expenditure for the fleet is in relative terms centred on an intensification of modernisation rather than decommissioning. If these expressed intentions are carried out, one must therefore expect a further increase in the capital intensity of the fleet.

⁽⁹⁾ It should be noted, however, that the Member States which are favouring modernisation/construction are the ones that have accomplished their MAGP objectives for fishing effort reduction. In this particular case, modernisation/construction is neutral in terms of capacity increase (with the exception of technological progress) because it is conditional upon the withdrawal of equivalent capacity without Community aid.

Table 5

Community and national aid to the fisheries sector

Area	Provisional data of 1994–99 programme (in progress)						Estimated expenditure 2000–06					
	EU contribution (FIFG)		National contribution		Total public aid		EU contribution (FIFG)		National contribution		Total public aid	
	EUR million	%	EUR million	%	EUR million	%	EUR million	%	EUR million	%	EUR million	%
Decommissioning			542.3	29.96	351.8	41.12	894.10	33.54	652.8	18.1		
Renewal and modernisation of fleet			459.28	25.38	134.22	15.69	593.50	22.27	839.3	23.2		
Aquaculture			125.25	6.92	44.13	5.16	169.38	6.35				
Marine areas/port facilities			118.47	6.55	58.98	6.89	177.45	6.66	2 116.9	58.7		
Processing/marketing			376.21	20.79	143.98	16.83	520.19	19.52				
Others (promotion, technical assistance, etc.)			188.43	10.41	122.44	14.31	310.87	11.66				
Total			1 809.94	100	855.55	100	2 665.49	100	3 609.0	100		

Table 6

Community and national aid to the fisheries sector

Distribution by Member State	Provisional data of 1994-99 programme (in progress)		Total public aid											
	Decommissioning modernisation		Renewal/ port facilities		Aquaculture marketing		Marine areas/ Others		Processing/		EU		Nat	
Member State	EU	Nat	EU	Nat	EU	Nat	EU	Nat	EU	Nat	EU	Nat	EU	Nat
Belgium	2.03	2.03	4.54	5.91	0.21	0.10	0.36	0.08	4.09	1.53	0.87	0.81	12.10	10.46
Denmark	21.79	20.72	22.74	4.56	5.42	1.09	4.49	2.28	26.27	5.28	14.47	14.47	95.18	48.40
Germany	3.51	2.61	21.79	8.87	5.32	1.39	17.80	4.93	40.20	21.83	2.27	2.71	90.89	42.34
Greece	39.21	11.91	5.76	2.47	20.49	6.06	0.20	0.07	15.50	4.57	1.06	0.34	82.22	25.42
Spain	329.54	203.17	293.81	69.15	37.12	9.22	49.36	24.52	173.16	44.46	71.33	26.84	954.32	377.36
France	19.80	19.17	19.39	17.93	13.11	10.33	4.22	5.17	24.55	22.38	8.08	8.22	89.15	83.20
Ireland	1.53	0.51	5.26	1.20	8.23	1.42	9.70	7.87	1.64	0.55	11.25	3.75	37.61	15.30
Italy	41.05	32.48	18.96	5.84	14.78	5.17	4.12	2.87	25.20	16.73	55.00	55.12	159.11	118.21
The Netherlands	7.36	10.72	0.00	0.00	0.54	0.22	0.00	0.00	2.02	3.09	1.00	0.56	10.92	14.59
Austria	0.00	0.00	0.00	0.00	1.09	2.20	0.00	0.00	0.69	1.32	0.02	0.06	1.80	3.58
Portugal	36.71	12.09	45.23	9.28	5.37	1.57	17.78	4.41	22.28	7.76	12.04	3.71	139.41	38.82
Finland	2.13	2.13	2.24	1.01	2.14	1.27	2.36	2.20	7.43	3.98	2.28	2.27	18.58	12.86
Sweden	2.26	2.26	10.12	2.98	3.56	0.94	3.78	2.78	8.75	2.95	3.23	3.04	31.70	14.95
United Kingdom	35.38	32.00	9.44	5.02	7.87	3.15	4.30	1.8	24.43	7.55	5.53	0.54	86.95	50.06
European Union	542.30	351.80	459.28	134.22	125.25	44.13	118.47	58.98	376.21	143.98	188.43	122.44	1809.94	855.55

– National aid

Table 7 indicates the amounts (in million euro) of direct aid identified in each Member State (Austria and Luxembourg do not have specific mechanisms). The overall amount over the period 1994–98 was about EUR 450 million, more than half provided by national and regional authorities in Italy.

Table 7 **Direct aid granted by sector in the Member States between 1994 and 1998**

(million ECU/EUR)

Country	Total 1994–98	Aquaculture	Fishing	Transformation
Belgium	0.11			0.11
Denmark	1.00			1.00
Germany	36.09		36.04	0.05
Greece	13.00	13.00		
Spain	28.78	0.18	28.60	
France	47.34	4.58	42.76	
Ireland	15.15	9.59	3.40	2.16
Italy	229.71	9.42	220.29	
The Netherlands	0.50			0.50
Portugal	6.29		6.29	
Finland	10.26	2.49	7.69	0.08
Sweden	5.88		5.66	0.22
United Kingdom	53.91	16.32	24.50	12.55
Total	448.01	55.58	376.84	15.05

Table 8 shows how direct national aid for the fisheries sector was distributed according to four main categories: effort reduction (temporary cessation of fishing, decommissioning), investment (construction, modernisation, purchase second-hand), earnings aid (calamity compensation, market crisis), and help towards charges (only support for insurance in Finland). The effort reduction category is the most important one, with 59 % of the total, before investment aid (modernisation mainly) with 28 %, and income support (financial aid for companies in difficulties in France in particular) with 11 %.

Table 8

Distribution of direct aid for fishing by main category between 1994 and 1998

(million ECU/EUR)

Country	Total 1994–98	Effort reduction	Investment	Aid in respect of earnings	Aid on charges
Belgium	0.11		0.11		
Denmark	1.00		1.00		
Germany	36.04	23.98	11.98	0.08	
Spain	28.60	18.58	9.18	0.85	
France	42.76	0.03	8.55	34.18	
Ireland	3.40		0.39	3.01	
Italy	220.29	179.35	38.97	1.98	
The Netherlands	0.50	0.50			
Portugal	6.29		6.29		
Finland	7.69	0.77	0.19	0.54	6.19
Sweden	5.66		5.66		
United Kingdom	24.50		24.50		
Total	376.84	223.21	106.81	40.63	6.19

Indirect aid reached approximately EUR 93 million (Table 9). Support for development/construction of harbour infrastructures is the principal expenditure for aid for fishing. Aid for all sectors incorporates mainly expenditure connected with the promotion of the sea products.

Table 9

Indirect aid granted between 1994 and 1998 by the Member States according to the sector to which they are mainly addressed

(million ECU/EUR)

Country	Total 1994–98	Aquaculture	Fishing	Transformation	All
Denmark	1.50		1.50		
Spain	0.05		0.05		
France	21.33		15.51		5.82
Ireland	1.67		0.60	0.27	0.80
Italy	41.61		39.14	0.17	
The Netherlands	0.09	0.09			
Finland	13.74		4.90		8.84
Sweden	1.74		1.74		
United Kingdom	11.01	0.09	10.27	0.64	
Total	92.74	0.18	73.71	1.08	15.47

Concerning tax treatment, Table 10 indicates by Member State the main types of aid. The total remission of fuel tax is the only measure common to all the Member States. Few cases are noted on the whole, but two countries are distinguished: the Netherlands, with original provisions connected with the inheritance of quotas, and France, where a series of specific provisions are made for economic operators and the potential investors (individual and companies) as an incentive for capital placement in the fishing enterprises.

Table 10 **Tax treatments particular to the fisheries sector in the Member States**

Recipient	Type of tax treatment	B	DK	D	EL	ES	F	IRL	I	NL	P	FIN	S	UK
Companies	Remission of tax of the fuel	X	X	X	X	X	X	X	X	X	X	X	X	X
Companies	Accelerated depreciation investments			X	X							X		
Companies	Depreciation of the value of the quotas									X				
Companies	Inheritance tax exemption for catch quotas									X				
Companies	VAT payment exemption					X	X		X				X	
Companies	Reduction of income tax				X		X							
Companies	Exemption from insurance tax						X							
Companies	Exemption from CCI						X							
Companies	Exemption from professional taxes						X							
Companies	Reduction of tax on profits						X							
Companies	Tax reduction											X		
Investors	Income tax reduction						X							
Employees	Deductions of taxes for day of sea		X										X	

Source: 'Les aides prévues par l'État membre pour les investissements dans le secteur de la pêche', Cofrepeche, 2001.

— Social systems particular to the fisheries sector in the Member States

The majority of the Member States support the fisheries sector through individual social systems, at least for certain aspects.

The provisions on social security and other incentives to employment can be divided into 12 categories:

- sickness insurance;
- retirement;
- unemployment;
- other incentives to employment and/or activity judgment;
- industrial accidents and occupational diseases;
- other insurance;

- apprenticeship;
- continuing vocational training;
- technical activity stops;
- temporary activity stops;
- family benefits;
- special treatment of the sector of the processing or of marketing.

In descending order of importance, the four countries which have set up most arrangements and individual measures are Spain, Italy, France and Finland and, to a lesser extent, Portugal.

Special treatments are largely based on benefits, such as for temporary activity stops, further training, unemployment, apprenticeship and other incentives to employment.

Specific arrangements for coverage of technical activity stops, of insurance other than sickness insurance and of industrial accidents are only seldom set up. Sweden has an old practice of support for technical and temporary activity stops: that is explained mainly by its geographical situation and weather, which makes compensation for activity stops necessary for the maintenance of fishermen's income.

Only Finland supports the sector of processing and marketing.

Country	Field benefiting from special treatment
Belgium	Sickness insurance, unemployment
Denmark	No
Germany	No
Greece	Apprenticeship, continuing vocational training, temporary activity stops
Spain	Industrial accidents/occupational disease, sickness insurance, other insurance, continuing vocational training, apprenticeship, temporary activity, unemployment
France	Industrial accidents/occupational disease, precaution, apprenticeship, technical activity stops, other incentive to employment/activity stops
Ireland	Sickness insurance, retirement, unemployment
Italy	Apprenticeship, other incentives to employment/activity, retirement, continuing vocational training, unemployment stops, temporary activity stops
The Netherlands	No
Austria	No
Portugal	Continuing vocational training, apprenticeship, temporary activity stops, technical activity stops
Finland	Industrial accidents/occupational disease, other insurance, sickness insurance, retirement, special treatment on the sector of the processing or of marketing
Sweden	Temporary activity stops, technical activity stops
United Kingdom	Unemployment, continuing vocational training

Source: 'Étude des dispositions en matière de sécurité sociale et des autres incitations à l'emploi prévues par État membre dans le secteur de la pêche', Price-WaterhouseCoopers, 2001.

— International comparisons

It is not easy to obtain data about aid to the fishing industry in third countries. The Commission has recently organised a study of aid schemes in both developed and developing countries, but this data is not necessarily complete (particularly in respect of local or regional government aids) and the differences between countries makes any comparison difficult.

The Fisheries Committee of OECD, however, carried out in 1999–2000 an analysis of government financial transfers to the fisheries sector, based on data presented by member governments and the European Union, which represents a first attempt to measure various forms of government financial support. This data, too, may be incomplete and approximate in parts and actually misleading in one or two cases; nevertheless the estimates provided in the following two tables (for the year 1997) are the only ones available based on official statistics and using a common methodology.

Table 11

Estimates of government financial transfers to marine capture fisheries in OECD countries, 1997 ⁽¹⁾

(million USD)

	Direct payments (A)	Cost reducing transfers (B)	General services (C)	Total transfers (D)	Total landed value (TL)	(A + B)/TL (%)	D/TL (%)
Belgium	-	3	2	5	99	3	5
Denmark	20	-	62	82	521	4	16
Germany	8	3	52	63	194	5	32
Greece	12	-	38	50	387	3	13
Spain	205	81	59	345	3 443 ⁽⁴⁾	8	10
France	22	14	104	139	756 ⁽⁴⁾	5	18
Ireland	5	3	96	104	220	3	47
Italy	24	5	64	92	1 749	2	5
Netherlands	4	-	32	36	466	1	8
Portugal	32	0	34	66	319 ⁽⁴⁾	10	21
Finland	3	2	21	26	29	18	90
Sweden	9	-	45	54	129	7	42
United Kingdom	23	4	101	128	1 012	3	13
European Union ⁽³⁾	366	358	710	1 434	9 324	8	15
Australia ⁽²⁾	5	7	11	24	259	5	9
Canada	252	18	135	405	1 621	17	25
Iceland	-	18	18	36	877	2	4
Japan	25	22	2 899	2 946	14 117	0	21
Korea	30	59	253	342	4 929	2	7
Mexico	-	-	17	17	1 017	-	1
Norway	3	62	98	163	1 343	5	12
New Zealand	-	-	17	17	475 ⁽⁵⁾	-	4
Poland	-	-	8	8	215	-	4
Turkey	-	1	27	29	212	1	13
United States	21	194	662	877	3 644	6	24
OECD total	702	740	4 856	6 298	38 032	4	17

- zero.

0 value less than 0.5 of the unit of measure.

⁽¹⁾ The table does not reflect any assessment of whether individual transfers programmes have positive or negative implications for fisheries resource sustainability. Therefore, proper care should be applied in interpreting this summary information to consult the country case studies provided in the following section that discusses these implications.

⁽²⁾ Commonwealth fisheries only.

⁽³⁾ European Union values are the sum of all EU Member State values. The exception to this is cost-reducing transfers, where payments for access for third-country waters are not allocated among each Member State. In this case, the value is added to the EU total figure.

⁽⁴⁾ Does not include national landings in foreign ports.

⁽⁵⁾ 1996 figure.

Table 12

Estimates of government financial transfers to marine capture fisheries in OECD countries — Classification by programme objectives, 1997 ⁽¹⁾

(million USD)

	Fisheries infrastructure	Management, research, enforcement and enhancement	Access to other countries' waters	Decommissioning of vessels and licence retirement	Investment and modernisation	Income support and unemployment insurance	Taxation exemptions	Other	Total
Belgium	-	2	-	-	3	-	-	0	5
Denmark	3	49	-	8	12	-	-	10	82
Germany	6	46	-	2	2	-	-	8	63
Greece	1	36	-	9	4	-	-	1	50
Spain	16	37	-	196	80	-	-	15	345
France	6	74	-	5	13	-	-	41	139
Ireland	2	92	-	1	3	-	3	2	104
Italy	2	62	-	17	9	-	-	2	92
Netherlands	7	25	-	3	1	-	-	0	36
Portugal	7	25	-	21	9	-	-	4	66
Finland	0	21	-	1	1	-	-	3	26
Sweden	1	42	-	2	3	4	-	1	54
United Kingdom	15	83	-	23	4	-	-	4	128
European Union ⁽³⁾	67	592	245	288	144	4	3	91	1 434
Australia ⁽²⁾	-	11	-	3	-	-	7	2	24
Canada	35	100	-	0	-	248	-	22	405
Iceland	-	18	-	-	-	-	18	0	36
Japan	2 165	628	-	25	21	-	-	107	2 946
Korea	164	73	-	30	-	-	-	75	342
Mexico	-	17	-	-	-	-	-	0	106
Norway	-	98	-	0	14	3	34	14	163
New Zealand	-	17	-	-	-	-	-	0	17
Poland	-	8	-	-	-	-	-	0	8
Turkey	27	-	-	-	-	-	-	1	29
United States	11	664	-	4	30	-	150	18	877
OECD total	2 470	2 227	245	350	206	255	213	330	6 298

- zero

0 value less than 0.5 of the unit of measure.

⁽¹⁾ The table does not reflect any assessment of whether individual transfers programmes have positive or negative implications for fisheries resource sustainability. Therefore, proper care should be applied in interpreting this summary information to consult the country case studies provided in the following section that discusses these implications.

⁽²⁾ Commonwealth fisheries only.

⁽³⁾ European Union values are the sum of all EU Member State values. The exception to this is payment for access for third-country waters; these payments are not allocated to each Member State. In this case, the value is added to the EU total figure.

Subject to further clarification, these data suggest that while the EU is certainly not alone in making direct payments and cost-reducing transfers to the fisheries sector, it appears to be the main donor of direct transfers (Table 11), is by far the main donor of aid for investment and modernisation of the fishing fleet (Table 12) and is the only OECD member that directly subsidises access by its fishing fleets to other countries' waters (Table 12).

1.2. Social dimension of fisheries

1.2.1. Overview

In 1998 the various parts of the EU fishery sector provided a total gross output of about ECU 20 billion and provided direct employment for at least 514 054 people. Table 13 provides a summary of output and employment by sector, with full-time equivalent (FTE) and gender breakdown estimates also shown. Net sector output will be somewhat less since a significant proportion of output is consumed within the fisheries branch. For example, the outputs of marine fishing are partially consumed by fish processing and, to an extent, by the aquaculture sector. Because of the nature of fishing, numbers employed in this activity are difficult to record and are often underestimated, and the number employed in the sector is likely to be higher than indicated above. By applying known employment multipliers calculated for the EU fisheries sector (see Section 1.2) we can estimate total sector employment in 1998 to be about 550 000 ⁽¹⁰⁾.

⁽¹⁰⁾ Includes 241 010 fishers, plus (241 010 x 0.8) up- and downstream fishing related jobs, plus 116 153 employed in aquaculture, inland fishing and processing of imported fish (assumed to be 50 % of all processing jobs).

Table 13

Principal economic dimensions of the EU fishery sector

Sector	Sector output 1 000 tonnes	Number employed		FTE ⁽²⁾	Men ⁽²⁾	Women ⁽²⁾	Number	%	Number	%
		Volume Million ECU	Value FT + PT							
Marine fishing		6 301	7 273	241 010	224 152	226 065	94	14 943	6	
Fish processing		n.a.	10 265	89 468	80 521	36 503	41	52 965	59	
Marine aquaculture		845	1 370	50 329	41 043	36 035	72	14 294	28	
Inland aquaculture		261	605	11 569	10 181	9 856	85	1 713	15	
Inland fishing		104	258 ³	9 521	6 760	n.a.		n.a.		
Other fishery sector ⁽¹⁾		n.a.	n.a.	112 147	n.a.	n.a.		n.a.		
Total		7 511	19 771 ⁽³⁾	514 054	362 657	308 460	78	83 914	22	

Source: National statistical sources and 'Regional socioeconomic studies on employment and the level of dependency on fishing', European Commission, Directorate-General for Fisheries, 2000.

⁽¹⁾ Other is 1996/97 estimate and includes distribution, mollusc gathering, vessel construction and repair; it is likely to underestimate employment.

⁽²⁾ FTE and gender estimates are based on the data factors from the 1997 figures, assuming no change in employment departments between 1996 and 1998.

⁽³⁾ A significant proportion of primary output from fishing and aquaculture is consumed by other branches of the fishery sector (such as processing).

⁽⁴⁾ 1996/97 data.

1.2.2. Employment in fisheries

Marine fishing accounts for the largest share of direct employment in the sector (241 010 jobs). Fish processing provides employment for a further 89 468 individuals. Aquaculture provides another 61 898 jobs and over 80 % of these are in marine aquaculture where bivalve mollusc culture provides the most employment. The inland fishing sector is small in comparison with marine fishing and fish processing, employing only 9 521.

Spain has most fishers, employing 68 297 in 1996 (about a quarter of the EU total) followed by Italy with 18 % and Greece with 17 % of the total. Other Member States with relatively large numbers employed at sea are Portugal (27 197), France (19 163) and the UK (17 847). Ireland, Germany, Denmark, Belgium, Finland, Sweden and Netherlands all have less than 7 000 fishers. There is no employment in marine fishing in land-locked Austria and Luxembourg.

Between 1990 and 1998, the numbers of fishers in the EU fell by about 66 000 from a nominal 306 961 to 241 010, corresponding to an overall decrease of 21 %. The last decade has seen a net reduction of about 8 000 fishers in the sector each year. Three countries (Spain, Portugal and Italy) showed quite substantial declines in the number employed with the greatest fall in employment being recorded in the Spanish industry. Here the number employed declined by over 24 000, about one quarter of the 1990 total of 92 424, with the main decline experienced in the North and Atlantic coast regions. Part of this fall can be attributed to the reduced access to the Moroccan fishery under successive fisheries agreements between the EU and Morocco.

Portugal, with 27 197 fishers, was the country to show the next largest decline in fishing employment with a fall of over 10 000 (since 1981). Fishing employment in Italy also fell by 9 194 fishers, to 43 289 (a 17.4 % decline). Some regions in the EU have shown an apparent slight increase in numbers of fishers since 1991 (such as the Azores). The majority of other areas experienced a smaller decline in employment in marine fishing, and in several regions (e.g. Greece, Sicily and Sardinia, Finland, and Scotland and Northern Ireland) there were no significant changes in fishing employment.

1.2.3. Developments in fisheries-dependent regions

On the first 100 FDA (fishing dependent areas) identified in 1990 (on various territorial scales), the degree of dependence decreased for 51 FDA, increased for 35 FDA, stagnated for 14 FDA. The vast majority of the FDA of 1990 remained dependent in 1997. The decrease of dependence towards captures/landings was often compensated by an increase in dependence with respect to aquaculture. It is noted indeed that the aquaculture channels (salmon, sparidae and clams), having known the most spectacular progressions in the EU during the 1990s especially, developed in the peripheral areas with reduced economic activity alternatives. In this context, aquaculture represents an important factor of the reinforcement of socioeconomic cohesion.

The map of the most dependent areas nevertheless strongly evolved. Spain, which had in 1990 the 11 most dependent areas on fishing of the EU saw 9

of them reducing their dependence rate from 15 to 50 %. This fall may be related to the reduction in fishing employment in Spain of 25 % between 1990 and 1997. These regions remain, nevertheless, among the most dependent ones.

In the areas where the dependence rate increased, the increase was relatively minor, except in four Greek areas where it reaches between 17 and 70 %. It must be noted here that Greece is the country of the EU which lost less jobs in fishing (– 5 %).

In the majority of the areas most dependent on fishing; alternative activity to fishing is rare. In other words, the situation of dependence is the most marked in the areas which in addition suffer from a general problem of economic development. A concentration of efforts to diversify economic activities in these areas has to be a top priority.

1.2.4. Employment in fish processing

The distribution of employment in fish processing is quite different to that of employment in marine fishing. Fish processing is more evenly distributed throughout the EU, with the UK accounting for 18 140 jobs (20 % of the EU total in this activity). France, with 11 899 (13 %) and Spain with 15 449 (17 %) employed also have significant employment in fish processing. Italy and Greece, despite having relatively high numbers employed in fishing (18 % and 17 % of fishers) have only relatively low levels of employment in processing (accounting for 7 % and 3 % of processing employment). This is the converse of the situation in Germany, which has a relatively large processing sector of 11 280 (13 % of the EU processing employment), compared to employment in fishing of only 2 932 (1 % of fishers).

Despite expansion of the EU, employment in fish processing fell from 104 316 in 1990 to 89 468 in 1998 (a decline of just over 14 %). Portugal and Denmark experienced the largest apparent declines in employment in processing. Significant declines were also suffered in Italy, France and the UK (around 20 % over the period). Spain experienced a lesser decline (around 12 %) and numbers employed in fish processing appear to have increased slightly in Belgium and in Germany.

1.2.5. Dependency of the processing sector on the EU fishing industry

Whereas numbers employed in processing have fallen by 14 %, employment in fishing has declined by 21 % over the same period. In many sectors of the EU processing industry there is no directly proportional link between employment at sea and employment in processing. It is known that the EU imports substantial quantities of fish to be used as raw material for processing and the importance of imported raw material in sustaining employment in the fish processing industry is recognised by the common fisheries policy in the establishment of import tariffs for fishery products.

Some of the major imports are white-fish fillet blocks, herring, tuna for canning and frozen crustacea. Overall, only an estimated 53 % of processing

jobs appeared to be dependent on EU landings in 1996/97. Sectors of the EU processing industry which are considered to be still substantially dependent on EU landings are tuna and sardine canning, and the primary processing of white fish.

The tuna canning sectors of Spain, France and Portugal are respectively substantially dependent on EU landings into Galicia, Brittany and the Azores. The Italian tuna canning industry is considered to be exceptional, since it is now almost 100 % dependent on imported raw material from third countries.

Sardine canning provides employment linked exclusively to local landings in Spain (Huelva in the South), Portugal (mainland) and France (Brittany and the Bay of Biscay). In Italy about 35 % of fish processing employment is linked to local landings, mainly in the sardine-canning and anchovy-conserving sectors.

In most of the more northern EU countries such as Belgium, Germany, Denmark, Sweden, and in parts of the UK, the EU-landing related employment in processing is limited to primary processing of white fish and some shellfish processing (e.g. shrimp processing in the Netherlands and Denmark). In Germany, nearly 100 % of the processing inputs (fillet blocks and herring) are imported, and there are few, if any, links to landings. In Belgium also, the larger industrial processors rely on imports. In Denmark although the fishmeal industry does rely exclusively on local landings, it provides little employment relative to the volume of material processed.

1.2.6. Employment in other fisheries related activities

The aquaculture sector accounts for 61 898 of the fishery-related jobs in the EU (about 15 %) and more than 80 % of these are in marine aquaculture. Spain and France are the two countries with substantial employment in marine aquaculture, with 14 500 employed in the former and 14 055 in the latter, between them accounting for 57 % of employment in that sector. Most of these jobs are in the culture of bivalve mollusca. Italy also has substantial employment in this activity (8 665 jobs). Greece and the UK (in particular Scotland) are the two regions where there is a substantial production of fish (seabass/seabream and salmon respectively). Here employment is lower at 2 910 (5.8 % of EU employed in the sector) and 1 617 (3.24 %) respectively, despite the relatively higher value of production. Inland aquaculture in the EU employs 11 569 with the major centres of employment found in Germany (2 825), Austria (2 300) and Italy (2 142). Although all other regions have some employment in this activity, France is the only other country in which employment exceeds 1 000.

Inland fishing accounts for only 2.3 % of fishery sector employment. However there is no data for some regions and under-recording is suspected in the regions where zero employment is reported. Greece (2 701 employed), France (2 501 employed), Portugal (1 939 employed) and Finland (995) are the regions in which substantial numbers are recorded.

1.2.7. Women in EU fisheries

An estimated 84 000 jobs in the fisheries sector were held by women throughout the EU in 1998, as indicated in Table 13. Even in fishing, which is traditionally regarded as a male preserve, women hold about 6 % of the jobs. Female participation is recorded in harvesting of bivalve molluscs in Spain and Portugal, in an on-shore capacity in fishing enterprises in Belgium and Spain, and in gear repair and preparation in Greece. Women also hold the majority of jobs in fish processing (53 000 employed) and also fill an estimated 30 % of the 47 000 jobs in aquaculture, especially those related to the production of bivalve mollusca.

The proportion of women in fish-processing jobs shows some regional variations, the highest levels being in Italy (about 87 %). Employment of women in the Portuguese processing sector is also high (over 70 %). Lower levels of female employment in the sector are found in the Netherlands (39 %) and Greece (32 %). High levels of female employment are particularly associated with the (labour intensive) processing of canned tuna and sardines. It is important to note that these sectors of the processing industry are those which are most dependent on EU landings for their raw material inputs.

1.2.8. Employment multipliers

All industrial activities support jobs in related up- and down-stream industries. Employment multipliers give a measure of the relative numbers of dependent jobs in these related industries. In the EU fishery sector, it has been estimated ⁽¹¹⁾ that for every job at sea, there are a further 0.8 related jobs on land. However, there are many land-based fisheries jobs that are not at all related to fishing (such as processing of imported raw material, aquaculture and inland fisheries). When these jobs are included, for every fishing job at sea, there are, on average, a further 1.15 jobs directly related to fisheries on land. The apparent employment multipliers are notably higher by a factor of 3 or 4 in the Netherlands, Belgium, Germany and Denmark compared to countries such as Greece, Spain and Portugal. The former countries are characterised by relatively low fleet employment in labour-efficient, capital-intensive fishing operations, and a high level of processing employment, mainly in enterprises utilising imported raw materials. These regions therefore show relatively higher apparent employment multipliers, even though the real linkages between the jobs in fishing and jobs on land are much weaker than in the regions with lower apparent values.

⁽¹¹⁾ By the 'Regional socioeconomic studies on employment and the level of dependency on fishing'.

2. Regional profiles

2.1. Austria

The Austrian fishery sector is small, comprising fish farming and inland fishing only. The production from aquaculture (which concentrates on carp and trout) was 4 274 tonnes (value about ECU 12.7 million) in 1997 and the sector provided employment for some 300 full-time employees, 500 part-time jobs and around 1 500 seasonal jobs. There are a further 100 people employed in processing and related activities. In 1998, inland capture fisheries produced 454 tonnes, with a value of ECU 2.7 million. Employment extended to about 150 part-time jobs.

2.2. Belgium

In 1998 the Belgian fleet consisted of 148 vessels with a gross tonnage of 23 082 gt and power of 64 896 kW. The average size of vessel is relatively larger than the rest of the EU fleet, with some 57 vessels longer than 30 m. A significant part of the Belgian fleet is under Dutch ownership. Since 1991 the Belgian fleet numbers have dropped from 205 to 148 vessels, corresponding to a 25 % decrease in vessel numbers. Vessel numbers in 1998 fell by four compared to 1997 figures.

Belgian vessels caught about 30 325 tonnes of fish in 1998 (value ECU 103.4 million). Of this 72 % was landed in Belgian harbours whilst the rest was sold at foreign auctions (mainly in the Netherlands). The Belgian fishing sector provided employment for 745 people in 1997, of which 87 were estimated to work part-time. Employment in fishing is largely concentrated around the Bruges region, where 410 fishers were located.

There is no coastal aquaculture in Belgium although pilot projects for turbot and oyster farming have started recently. The Belgian inland aquaculture (trout and carp production) provided employment for 137 people. About half (64) of these worked part-time. Inland fisheries yielded 511 tonnes in 1998, but numbers employed in the sector are not significant.

Processing output was ECU 236.6 million in 1997. The larger processing firms are generally not dependent on local landings but rely on imports of frozen fish. In 1997 there were 1 261 people employed in the Belgian processing industry; this number includes wholesale traders and importers due to the fact that small-scale processing and wholesaling are substantially integrated. Employment is concentrated in the Ostend and Bruges region. It is estimated that almost half (569) of the workers are female.

2.3. Denmark

In 1998 the Danish fleet consisted of 4 648 vessels with a gross tonnage of 97 932 gt and power of 380 877 kW. Of the total, 70 % of fishing vessels are less than 10 m in length and only 5 % over 20 m in length. Total

numbers of crew and skippers employed on fishing vessels was 6 361 people in 1998 (see Table 14). The larger vessels in the Danish fleet target herring for human consumption and sprat destined for fishmeal. Traditional fishing grounds are located in the North Sea, Skagerrak/Kattegat and the Baltic Sea, with the main fishing ports located along the north and west coasts of Jutland. Bornholm Island in the Baltic Sea is the centre for landing from the Baltic Sea. Cod, flatfish, *Nephrops*, mackerel and herring account for more than 60 % of the value of landings in Danish ports.

Table 14 **Employment in the Danish fishery sector, 1998**

	Full-time	Total
Fishing	2 710	6 361
Smoking	1 250	1 931
Processing	4 323	5 220
Fishmeal	433	499
Wholesale	2 282	3 399
Retail	335	901
Total	11 333	18 311

Table 15 **Landings of fish in Denmark by source and destination, 1998**

Destination	Danish vessels		Other EU vessels		Foreign vessels		All vessels	
	Tonnes	ECU	Tonnes	ECU	Tonnes	ECU	Tonnes	ECU
Human consumption	355 965	295 017 935	79 670	41 724 694	122 259	65 709 066	557 894	402 451 695
Fishmeal	1 106 682	152 389 690	145 165	17 051 992	95 844	11 684 424	1 347 691	181 126 105
Total	1 462 647	447 407 625	224 835	58 776 686	218 103	77 393 490	1 905 585	583 577 801

Sources: 'Yearbook of Fishery Statistics 1998', Danish Ministry of Fisheries, Directorate of Fisheries, 1999.

Landings in Denmark in 1998 are shown in Table 15. Total landings were 1.9 million tonnes with a value of ECU 583 million. Of this total, 70 % is destined for reduction to fishmeal and oil. Landings by other EU and non-EU vessels in Danish ports are also significant, and are principally made by Sweden (mainly of fish for industrial purposes) and the United Kingdom.

In 1998, 32 607 tonnes of fish were produced from freshwater aquaculture, and 7 089 tonnes of trout were produced in marine culture systems. Estimated employment in marine aquaculture was 200–300 in 1997. This figure includes slaughter, gutting, filleting, cooling/freezing and packing and sales for further processing. It is estimated that 613 people are employed in freshwater trout production. A further 85 people (FTEs) are estimated to be employed in eel farming. The inland fishery is estimated to provide employment for five people or less (FTE).

The Danish processing industry is highly capitalised. In 1998 there were a total of 193 fish processing and preservation factories with a total production output value of ECU 1.19 billion. The processing industry (all sectors including fishmeal) in Denmark employed a total of 7 650 people in 1998.

2.4. Finland

In 1998 the Finnish fleet comprised 3 979 vessels with a total capacity of 24 170 grt and power of 219 745 kW. The majority of these vessels were small with an average size of 6 grt and power of 55 kW. In terms of numbers, the coastal fishery constitutes the largest segment with 3 640 vessels. In terms of volume and value of catches the pelagic trawler segment (which consists of 239 vessels) is the most important. This segment targets herring and sprat and operates throughout the Baltic Sea but the main fishing grounds are in the Bothnian Sea.

Key features of the Finnish fisheries are shown in Table 16. In 1998, there were 2 950 registered fishers, of which about 1 000 are full-time. For Finland as a whole 92 % of the fishing workforce is male; however in some areas, such as Varsinais-Suomi the percentage of female fishers is as high as 18 %.

In 1998 the Finnish catch totalled 115 178 tonnes valued at ECU 20.3 million. In terms of volume and value the Baltic herring was the most important with total landing of 85 545 tonnes valued at ECU 11.9 million. Other important species were salmon, vendace, sprat and cod.

Table 16 **Output and employment in the Finnish fishery sector, 1998**

Activity	Production		Employment
	Tonnes	Million ECU	
Marine fishing	115 178	20.3	2 950
Marine aquaculture	13 269	32.1	381
Inland aquaculture	2 755	6.7	270
Inland fishing	4 568	5.8	995
Processing	38 711 ⁽¹⁾	80.0	560

Source: 'Professional marine fishery 1998 and professional inland fishery 1998', Finnish Game and Fisheries Research Institute, 2000.

⁽¹⁾ Raw material usage.

Coastal aquaculture is concentrated in south-western Finland and produced 13 269 tonnes, mainly rainbow trout, in 1998. Inland aquaculture produced a further 2 755 tonnes. The aquaculture industry employed 651 people. Freshwater fisheries in Finland yielded 4 568 tonnes of fish (ECU 5.8 million) with the main species fished being vendace. There are almost 995 registered commercial fishers in inland waters, but for only 230 of these was fishing the principle source of income.

In 1998 there were around 172 establishments engaged in fish processing. The industry is highly concentrated with the 10 largest companies accounting for over 50 % of the production volume. The total amount of fish (mainly Baltic herring and farmed rainbow trout) processed for human consumption was 38 711 tonnes, of which 85 % tonnes was domestic production and the rest was imported raw material.

2.5. France

In France there were 8 836 registered fishing vessels in 1998, with a tonnage of 209 460 grt and power of 1 141 528 kW. Around 75 % of the vessels were less than 12 m in length. Fishing employed an estimated 19 136 (FTE) persons in 1998, including 3 687 professional fishers in the overseas departments of Guadeloupe, Martinique, French Guiana and Réunion (where there is also a large informal fishing sector for which there are no statistics).

The main production and employment data relating to the French fishery sector are shown in Table 17.

Table 17 **Output and employment in the French fishery sector, 1998**

Activity	Production		Employment
	Tonnes	Million ECU	
Marine fishing	550 198	932.4	19 163
Marine aquaculture	208 065	359.1	14 055
Inland aquaculture	57 706	151.6	1 213
Inland fishing	4 540	14.4	2 501
<i>Mareyage</i>	n.a.	1 367.0	4 007
Secondary processing ⁽¹⁾	400 900	2 100.6	11 899
Auctions	n.a.	652.9	819

Source: 'Données économiques maritimes françaises', Ifremer.

⁽¹⁾ 1997.

Marine capture fisheries landed a total of 550 198 tonnes valued at ECU 932.4 million in 1998. Around 18 % of the value landed was in frozen form (processed at sea). In addition the overseas departments recorded landings of 27 008 tonnes in 1998.

Processing is split into primary processing and wholesaling (*mareyage*) and secondary processing. The output value of *mareyage* in 1998 was recorded as ECU 1.4 billion. This activity employed 4 007 people registered in over 300 enterprises, with the majority (42 %) being located in Brittany. Secondary processing in 1997 produced a further ECU 2.1 billion of output value and employed 11 899 people in 173 enterprises. Auction hall and fish market employment in 1998 totalled 819 FTE in 43 establishments and sales amounted to ECU 652.9 million.

2.6. Germany

In 1998 the German fleet consisted of 2 373 vessels with a gross tonnage of 75 103 gt and power of 171 457 kW. Of the total, 76 % of fishing vessels were less than 10 m in length and only 5 % over 20 m in length. The majority of the vessels (approximately 1 800) were small coastal fishing boats under 12 m in length, fishing for demersal species and herring in the Baltic and North Seas. The deep-sea segment based in Bremerhaven, Cuxhaven and Rostock consisted of 12 vessels, and fishes in EU and international waters. The cutter segment accounted for another 477 vessels. A majority of the vessels within this segment are beam trawlers, fishing for flatfish and shrimps in the North Sea.

The main production and employment data relating to the German fishery sector are shown in Table 18.

Table 18 **Output and employment in German fishery sector, 1998**

Activity	Production		Employment (¹)
	Tonnes	Million ECU	
Marine fishing	94 272	84.4	2 932
Marine aquaculture	22 405	11.5	40
Inland aquaculture (¹)	36 664	88.0	2 825
Inland fishing (¹)	52 338	n.a.	329
Processing (¹)	n.a.	1 273	11 280

Source: Bundesministerium für Ernährung, Landwirtschaft und Forsten, 1999. Annual Report on German Fisheries 1999, BMELF infomiert.

(¹) 1997 data.

In 1998 the German fleet landed 94 272 tonnes of fish; the most important catches were cod (10 398 tonnes) and brown shrimp (11 151 tonnes). Most fishers are full-time. Employment in the ancillary industries such as construction and repair of fishing vessels was estimated to total 633 in 1997. Coastal aquaculture consists of mussel production, and the number of personnel employed is likely to be under-estimated in the above table. Inland aquaculture production (mainly trout and carp) employed 2 825 persons in 1997, in the production of nearly 37 000 tonnes of trout and carp. The total catch from inland fisheries in 1998 was 52 338 tonnes, mainly of vendace, pike and pikeperch.

Germany has a large fish-processing industry with a total production output value of 1 273 million ECU in 1997. The processing industry is relatively independent of the German and EU landings, as it relies largely on imported raw materials from third countries, and in particular, Norway. The North Sea centres of Bremerhaven, Cuxhaven and Hamburg account for almost 70 % of the 11 280 processing jobs recorded in 1997.

2.7. Greece

In 1998 the Greek fleet consisted of 20 243 vessels with a gross tonnage of 111 933 gr and power of 654 199 kW. An estimated 94 % of registered vessels are less than 12 m in length. Between 1991 and 1997 there was an 8 % decrease in the number of vessels. The decrease in the number of smaller boats was relatively modest; less than 2 %, but the trawler segment experienced a 23 % decline, and vessels fishing in the Atlantic a 55 % decline.

The main production and employment data relating to the fisheries sector are shown in Table 19.

Table 19 **Output and employment in the Greek fisheries sector, 1997**

Activity	Production		Employment
	Tonnes	Million ECU	
Marine fishing	124 386	458.2	41 251
Marine aquaculture	52 263	169.4	2 910
Inland aquaculture	2 684	8.7	254
Inland fishing	16 000 ⁽¹⁾	n.a.	2 701
Processing	n.a.	89.8	2 409

Sources: <http://www.statistics.gr/en/data/tables/table78.htm>

'Regional socioeconomic studies on employment and the level of dependency on fishing, Lot 11 — Greece', European Commission, Directorate-General for Fisheries, 1999.

⁽¹⁾ 1998 data.

Landings totalled some 124 386 tonnes in 1997. Of the 41 251 employed in marine capture fishing, an estimated 81 % work in inshore fisheries, 17 % in the offshore fisheries and 2 % overseas ⁽¹²⁾. An estimated 8 % of the fishing sector workforce are female, engaged in net repair and gear preparation. Marine farming of bass and bream is a significant economic activity in Greece. About 65 % of the production of 52 263 tonnes is exported, mainly to Italy. Fish processing is relatively less important in Greece than in other EU Member States. The majority of the fish processing takes place in Thessaloniki, Attica and Kavala. Most processing facilities are old and rely on both local production and imports from abroad. The processing sector in Greece provided employment for 1 455 full-time and 954 part-time workers. Women made up 32 % of those employed in this sector.

2.8. Ireland

In Ireland there were 1 246 registered fishing vessels in 1998. Total tonnage in the fleet in 1998 was 61 082 grt with a power of 190 625 kW. Approximately 70 % of all registered vessels are classed as inshore vessels (less than 15 m in length and operating within 12 miles of the coast).

⁽¹²⁾ 'Regional socioeconomic studies on employment and the level of dependency on fishing, Lot 11 — Greece', final report, MacAlister Elliott and Partners, 1999.

The main production and employment data relating to the fisheries sector are shown in Table 20.

Table 20

Output and employment in the Irish fisheries sector, 1998

Activity	Production		Employment
	Tonnes	Million ECU	
Marine fishing	324 843 ⁽¹⁾	193.9	6 274
Marine aquaculture	39 980	77.3	2 198 ⁽²⁾
Inland aquaculture	1 799 ⁽²⁾	4.6 ⁽²⁾	n.a.
Inland fishing	895	3.4	150
Processing	145 000	285	2 746

Sources: 'Fishery statistics, 1998', Department of Marine and Natural Resources, Central Statistics Office, Ireland, 1999

<http://www.cso.ie/principalstats/pristat6.html>

⁽¹⁾ Excluding oysters, clams and farmed mussels.

⁽²⁾ 1997 data.

The number of fishers employed in marine capture fishing in 1997 totalled 6 274 (5 494 FTE). The majority of these fishers were located on the west coast of Ireland. Over half of Ireland's fishers are classified as working in inshore fisheries. Total landings volume increased from 225 000 tonnes in 1989 to 324 843 in 1998. Approximately 22 % of landings (by value) were made to foreign ports, mainly in Northern Ireland. The Irish fleet targets a variety of species; the main ones are cod, whiting, herring, horse mackerel, mackerel, crab, *Nephrops* and lobster. In recent years demersal and pelagic species have been equally important in value terms, but with the bulk of the landings coming from the pelagic sector.

The Irish marine aquaculture industry has grown from a production of 5 815 tonnes (ECU 3.3 million) in 1980 to 39 980 tonnes, worth ECU 194 million, in 1998. Production of salmon has accounted for 82 % by value of this expansion. Rope culture of mussels and oyster production have also steadily increased; shellfish production was recorded as 23 200 tonnes (ECU 17 million) in 1998. In 1997 marine aquaculture sector provided employment for 2 198 persons (estimated to be 1 092 FTE). There are approximately 150 people employed in fishing for eels in inland waters.

The Irish fish processing industries had a throughput of 145 000 tonnes in 1998 with a total value of ECU 285 million. Ireland is a net exporter of fish products, with exports predominately in mackerel, horse mackerel and salmon. The processing sector employed 2 746 people in 1998; 57 % of these workers are part-time and the largest concentration of processing employment is in County Donegal, where over 1 000 people are involved.

2.9. Italy

In 1997 the Italian fleet consisted of 16 325 vessels with a gross tonnage of 260 603 gt and power of 1 513 677 kW. Many of the vessels are small; some 87 % are less than 25 gt. Only 5 % of vessels are less than five years old.

The main production and employment data relating to the fisheries sector are shown in Table 21. In 1997 the Italian fleet landed 441 241 tonnes of fish valued at ECU 1 523.6 million. Around 85 000 tonnes of the landings were molluscs. The landings of the purse seining fleet consisted mainly of sardines and anchovies, about half of which go to processing. The catch from the smaller vessels is mainly for human consumption, comprises a wide variety of species and is often sold direct to local fish markets or to restaurants without processing or going through wholesalers. The main centres of the fishing industry are Naples, Venice, Bari and Trapani.

Table 21 **Output and employment in the Italian fisheries sector, 1997**

Activity	Production		Employment
	Tonnes	Million ECU	
Marine fishing	441 241	1 523.6	43 289
Marine aquaculture	157 719	221.4	8 665
Inland aquaculture	54 200	135.6	2 142
Inland fishing	10 393	n.a.	n.a.
Processing	n.a.	582.2	6 447

Source: 'Regional socioeconomic studies on employment and the level of dependency on fishing, Lots 12, 13 and 14 — Italy', European Commission, Directorate-General for Fisheries, 1999.

Mussel, eel, seabass and seabream are the main species farmed in marine aquaculture, whilst inland aquaculture consists mainly of trout farms, which are relatively small (with on average only two or three people working at each). Some carp and tench are also produced. Inland fishing is relatively unimportant, with an output of just over 10 000 tonnes.

The Italian fish processing sector is broadly divided into small-scale artisanal processing and larger-scale industrial processing. There were 393 processing firms in Italy in 1997, plus 40 industrial canning firms, concentrating on tuna and sardines. Production of processed tuna products amounted to 34 000 tonnes in 1997. Anchovy processing occurs mainly on the Adriatic coastline. The tuna-canning sector is coming under pressure from cheaper third country imports, and many factories now use frozen imported loins to reduce labour costs. Sardine processing is also under pressure from imports; production in 1997 was only 2 000 tonnes. In 1997 the processing sector provided employment for 6 447 people. In contrast to the harvesting sector, many of these are women (up to 87 % in the case of Sardinia and Sicily) and significant numbers are part-time workers (in some regions up to 28 % of the total employed).

2.10. Luxembourg

The Luxembourg fishery sector is very small, comprising only one fish farm (employing five persons) and some importers.

2.11. Netherlands

In 1998 the Dutch fleet consisted of 1 040 vessels with a gross tonnage of 174 344 gt and power of 482 263 kW. The fleet included 416 cutters, 14 distant water freezer trawlers and 22 inland cockle vessels. Since 1991 the cutter fleet has decreased by 25 % in number (from 556). In addition, vessel numbers in the cockle fleet have halved, but the number of freezer trawlers has increased by one vessel. Dutch vessels are large relative to the fleets of some other EU Member States; some 55 % of vessels are over 24 m in length.

The main production and employment data relating to the fisheries sector are shown in Table 22.

Table 22 **Output and employment in the Dutch fisheries sector, 1997**

Activity	Production		Employment
	Tonnes	Million ECU	
Marine fishing	546 477 ⁽¹⁾	358.1	2 572
Marine aquaculture	95 640	60.5	312
Inland aquaculture	2 000	15.3	92
Inland fishing	2 293	n.a.	530
Processing	n.a.	464.5	6 051 ⁽²⁾

Sources: 'Regional socioeconomic studies on employment and the level of dependency on fishing, Lot 16 — Netherlands', European Commission, Directorate-General for Fisheries, 1999; Personal communication, Central Bureau of Statistics, 2000.

⁽¹⁾ 1998.

⁽²⁾ Includes 2 751 employed in fish distribution.

In 1998, landings amounted to 546 477 tonnes (70 % of which was landed by the cutter sector). The main species were herring, horse mackerel and mackerel. High-value landings include cod, plaice and sole. In 1997, there were 2 572 people employed in the capture-fishing sector in the Netherlands. The majority of these fishers (1 880) were employed on board cutters.

Mussel production is the main marine aquaculture activity and, along with some oyster cultivation, provided employment for 312 people in 1997. A total of 92 people (of whom 11 are female) are employed in inland aquaculture production. One third are part-time. The main species produced are eel and catfish. Inland fishing (mainly for eels) employs 530 persons (on the IJsselmeer and in inland waterways and lakes). In 1997 there were an estimated 6 051 involved in the processing and distribution sectors. About one

third of process workers are women. The main activities are in the processing of flatfish and shellfish.

2.12. Portugal

In 1998, in mainland Portugal there were 11 579 registered vessels with a tonnage of 123 923 grt and power of 393 671 kW. This includes 2 214 vessels registered in the Azores Islands and Madeira. Multipurpose vessels constitute the majority of the fleet (96 %). Most vessels of this type are small (with an average size of 4 grt and power of 19.5 kW) and catch a wide range of species using different gears in almost exclusively coastal operations.

The main production and employment data relating to the fisheries sector are shown in Table 23.

Table 23 **Output and employment in the Portuguese fisheries sector, 1998**

Activity	Production		Employment
	Tonnes	Million ECU	
Marine fishing	189 529	252.4	27 197
Marine aquaculture	7 081 ⁽¹⁾	47.5 ⁽¹⁾	5 257
Inland aquaculture	1 700 ⁽¹⁾	6.2 ⁽¹⁾	83
Inland fishing	1 320	3.1	1 939 ⁽³⁾
Processing	149 820 ⁽²⁾	503.7	6 294

Sources: Estatísticas da Pesca 1999, INE 2000 and Departamento de Emprego Trabalho e Formação Profissional, 2000.

⁽¹⁾ 1997 data.

⁽²⁾ Finished product.

⁽³⁾ 1996 data.

Landings for mainland Portugal were in the region of 164 313 tonnes and those in the Portuguese islands were about 25 216 tonnes in 1998. The most important landings are sardine (19 %), octopus and cuttlefish (13 % of the value of mainland landings). Tuna accounts for half the catch in the islands. There were 21 402 fishers registered in mainland Portugal in 1999, 3 966 in the Azores (60 % on the island of São Miguel) and 1 292 in Madeira.

In the south of Portugal, marine aquaculture is undertaken by *viveiros* who manage the natural production of clams in estuarine waters; there were about 4 800 people involved in this sector, mostly situated in the south. In addition there are 130 finfish enterprises on the mainland providing employment for 457 people. Production is mostly of seabass and seabream. Freshwater aquaculture involved 27 freshwater fish farms employing a total of 83 people. In 1996, there were 1 939 professional fishing licences issued to inland fishers in Portugal. There are no significant aquaculture or inland fishing activities on the island groups of Azores and Madeira.

In 1997 there were 136 processing establishments on the mainland, of which 29 produce canned or other preserved fish, and the remainder undertake processing and distribution of salted, fresh and frozen fish.

Processing is dominated by the production of *bacalbau* (dry salted cod), which account for 37 % of output by volume and 46 % by value (and, almost exclusively, uses imported raw material). Total value of processing output (sales) in 1998 was ECU 503.7 million, corresponding to 138 653 tonnes of finished product. Industrial canning on the mainland uses mainly imported tuna, and in the Azores uses both locally caught and imported fish.

2.13. Spain

In 1998 the Spanish fleet consisted of 17 972 vessels with a gross tonnage of 589 359 gt and power of 1 474 421 kW. Although it has fewer vessels than Greece, Spain has one of the largest fishing capacities in the EU, accounting for 29 % of tonnage and 18 % of power. The greatest part of the Spanish fleet is made up of inshore vessels, with 76.5 % of vessels being less than 12 m in length in 1998.

The main production and employment data relating to the fisheries sector are shown in Table 24.

Table 24 **Output and employment in the Spanish fisheries sector, 1997**

Activity	Production		Employment ⁽²⁾
	Tonnes	Million ECU	
Marine fishing	964 603 ⁽¹⁾	1 842.5 ⁽³⁾	68 297
Marine aquaculture	208 427	168.6	14 500
Inland aquaculture	25 266	43.4	300
Inland fishing	10 000	n.a.	n.a.
Processing	n.a.	2 241.2	15 449

Sources: 'Regional socioeconomic studies on employment and the level of dependency on fishing, Lots 4, 5 and 6 — Spain', European Commission, Directorate General for Fisheries, 1999; 'Encuesta industrial de productos de 1998', Instituto Nacional de Estadística, 1999.

⁽¹⁾ Excludes non-EU landings (124 000 t).

⁽²⁾ 1996 data.

⁽³⁾ Estimates based on 1996 unit values.

In 1996, recorded fish landings were 964 603 tonnes. The main centres are Galicia, Huelva and Cadiz, and the Canary Islands. The catches are characterised by a wide range of species, reflecting the global reach of the Spanish fleet. Tuna is caught in the Indian Ocean and west Africa; south Atlantic fisheries yield hake and squid, and the north Atlantic, cod, halibut and redfish. In the Mediterranean, the main landings by volume are of mackerel, horse mackerel and sardine. In 1996 there were 68 297 fishers in Spain (including shore-based employees of fishing companies). By far the heaviest concentration of these fishers is in the region of Galicia where there 25 710

fishers, one the main European centres of the fishing industry. Collection and culture of shellfish also employs a large number of persons in Galicia, where in 1996, over 9 000 licences were issued to individuals for collection of shellfish.

Marine aquaculture is dominated by the small-scale culture of mussels, which is an important source of employment for an estimated 14 500 persons, again mainly in Galicia. Marine aquaculture in other regions is limited to relatively few mollusc and cage culture sites. Professional inland fishing is not pursued extensively in Spain. Inland aquaculture comprises mainly trout production. An estimated 300 persons are employed in northern Spain in this activity.

Traditionally the Spanish fish processing sector was based on fish canning (mainly tuna and sardine). Nowadays, however, the production of frozen value-added fish products is the major activity. In 1996, there were 15 449 persons employed in the fish-processing sector; more than 79 % were located in Galicia and the Basque Country. An estimated 56 % of employees in fish processing are women.

2.14. Sweden

In 1998, the Swedish fleet comprised of some 2 123 vessels. Around 60 % (by tonnage) of the vessels were located in the west coast area of West Goetland, fishing both in the North Sea and the Baltic. In 1998 the Swedish landings amounted to 400 945 tonnes valued at ECU 117.2 million, mostly from the Baltic Sea. In terms of value, cod was the most important species accounting for about 30 % of the value. Catches of fish targeted for reduction to fishmeal and oil (mostly Baltic herring and sprat) amounted to 80 % by volume, but only 30 % by value of the catch. Around 35 % of catches by Swedish vessels are landed abroad, mostly in Denmark. In 1999 there were 2 132 commercial fishers in Sweden.

Marine aquaculture in Sweden comprises blue mussel production (1 425 tonnes) and cage farming of rainbow trout (5 040 tonnes, which includes some freshwater production of this species). The production value of the aquaculture sector was ECU 13.9 million. In 1998 the total number of persons employed in aquaculture amounted to 794 people. There are also about 221 commercial fishers on Swedish inland waters. The main species caught are pike, perch, vendace species, eel and crayfish.

There were 160 processing establishments in Sweden in 1997, mainly processing cod and herring. The Swedish processing industry imports 55 % of its raw material, which includes substantial amounts of frozen whitefish fillet blocks. Total production value in 1997 was ECU 346.8 million. The processing sector in Sweden employs 1 933 persons and women make up 52 % of the persons employed.

2.15. United Kingdom

In 1998 the United-Kingdom's fleet consisted of 8 658 vessels with a gross tonnage of 253 409 gt and power of 1 047 690 kW. Of these vessels 63 % were less than 10 m in length. In England, the largest concentration of

vessels is in the south-west and Humberside, and in Scotland the main centres are Peterhead and Fraserburgh.

The main production and employment data relating to the fisheries sector are shown in Table 25.

Table 25 **Output and employment in the UK fisheries sector, 1997**

Activity	Production		Employment
	Tonnes	Million ECU	
Marine fishing ⁽¹⁾	613 900	803.0	17 847
Marine aquaculture	113 425	350.9	1 617
Inland aquaculture	16 109	33.6	850
Inland fishing	1 481	n.a.	n.a.
Processing ⁽²⁾	433 000	873.0	18 140

Sources: 'Sea Fisheries Statistics, 1998', MAFF, United Kingdom Government Statistical Service, The Stationery Office, 1999; 'Sea and inland fisheries report 1998', Department of Agriculture and Rural Development, Fisheries Division, 2000; 'Marine aquaculture and trout production', Department of Agriculture and Rural Development, Fisheries Division, 2000.

⁽¹⁾ Excludes non-EU landings (205 000 t).

⁽²⁾ 1997.

In 1998, total landings were 613 900 tonnes. The main species caught were haddock (83 400 tonnes), cod (77 200 tonnes), mackerel (179 700 tonnes) and herring (104 600 tonnes). The main landing sites were Peterhead (112 100 tonnes) and Lerwick (66 500 tonnes), in north-east Scotland and the Shetland Islands respectively. UK vessels land over 40 % of their catch in other countries (mainly Denmark, Norway and Germany); this includes substantial volumes of pelagic fish and shellfish caught by Scottish vessels. Employment within the UK capture fishing sector totals 17 847 (including 14 394 full-time and 3 453 part-time fishers).

The main marine aquaculture activity is salmon farming, which takes place in west Scotland and the Shetland Islands. Production of this species in 1997 was 99 197 tonnes, value ECU 339.4 million. In addition there was some mussel production in England and Wales (about 13 000 tonnes per annum). The marine aquaculture industry in Scotland employs 1 617 people, of which 1 183 are full-time and 434 are part-time. Inland aquaculture in the UK mainly concerns trout farming. In 1998 this produced 16 109 tonnes and employed about 850 FTE in England and Wales. Freshwater aquaculture in Scotland consists of both trout production and salmon smolt production.

The UK has one of the EU's largest fish-processing industries. Demersal species account for 83 % of the total volume of fish (433 000 tonnes) processed in England and Wales. The main processing activities include primary processing of white fish derived from North Sea fisheries and value-

added processing of fish and shellfish. Salmon processing is also a significant activity in the west of Scotland. The main locations for the fish processing sector are Humberside in north of England and north-east Scotland. In 1997 the processing industry in the UK employed 18 140. About 9 598 were employed in England and Wales (mainly Grimsby, with 2 300 FTE) and about 8 500 were employed in Scotland. An estimated 83 % of jobs are full time; women occupied an estimated 49 % of all jobs in this sector.

Report on the

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1. Introduction and description of the data

The development of a fish stock is dependent of four basic biological factors: recruitment, growth, natural mortality and fishing mortality. A fish stock, counted as a number of fish, will increase by the number of incoming recruits and the stock biomass by the combined effect of these numbers and the individual growth of all fish in the stock. Stocks will decrease by the amount that die of natural causes (such as by being eaten or through disease) and by fishing, the latter generally being the main reason for the decrease of most stocks. The net balance between factors that promote the increase of a stock, such as recruitment and growth on the one hand, and factors that causes the stock to decrease, such as natural and fishing mortality, on the other hand, will determine the development of the stock over time. If the removal is consistently higher than the recruitment and growth the stock will decline and vice versa.

ICES provides yearly assessments of these four factors and its assessment of the landings for a large number of stocks. The attached graphs provide time series for a number of key stocks, based on the ICES data. There are clear relations between spawning stock and recruitment, as large number of spawners provide a better chance of good recruitment and good recruitment will boost the spawning stock in subsequent years. Recruitment and spawning stocks are therefore presented in the same graph. Likewise there are clear relations between landings and fishing mortality and these are given in one graph. In order to facilitate understanding of the information contained in the graphs the following description provides more detailed information about these four factors.

- **Recruitment (R)** is the number of new fish produced each year by the mature part of the stock. R is normally assessed as the number of a specific age, normally 1 to 2 years old, being added to the stock at a specific time each year.
- The mature part of the stock is labelled **spawning biomass (SSB)**. This is a measure of the cumulative biomass of all fish that will spawn in a given year.
- **Fishing mortality (F)** is an expression of the proportion of the fish stock that is removed by fishing activities within one year. F is an exponential value and can therefore not directly be converted to percentage. However at low values of F, it is almost equal to the percentage value ($F \sim 0.1$ is very close to 10 %) but $F \sim 1.0$ is not equal to 100 % (it means that approximately 65 % of the fish are removed within one year). Hence F can be above 1, as in the case of some cod stocks.
- **Landings** correspond to ICES's estimate of the most likely removal from the stock. These figures can deviate from the official statistics as the scientists try to correct for misreporting by area and species and in some cases

an estimate of the amount of fish discarded (legally or illegally) is included.

By comparing trends over time in recruitment, SSB, landings and fishing mortality, a fairly reliable picture of stock development can be derived. However, the assessment of these factors is subject to considerable uncertainty as it is dependent on accurate catch statistics, good sampling of catches and results from survey activities. The largest uncertainties are associated with the most recent estimates of SSB and fishing mortality and the mid- to long-term trends of these factors are more reliable.

With the introduction of the precautionary approach, ICES has proposed 'reference points' for fishing mortality and spawning stock biomass. The most important reference points are those which are associated with recruitment failure or stock collapse. These reference points are labelled biomass limit (BLIM) and fishing mortality limit (FLIM). The BLIM defines a SSB level where recruitment may be impaired and threaten the sustainability of the stock. Fishing at or above the FLIM will lead to the SSB falling towards the BLIM and possibly to stock collapse.

As mentioned above, the estimates of F and SSB are uncertain and even if, as an example, the SSB is estimated as being 30 % higher than the BLIM it might in fact be at the latter level. In order to allow for this imprecision, ICES has proposed that managers apply a safety margin or a buffer zone. The corresponding reference points are labelled BPA for biomass and FPA for fishing rate. The difference between these reference points, PA (precautionary approach), is a measure of the uncertainties estimated in the assessment. The difference between the BLIM and BPA and between the FLIM and FPA is generally in excess of 30 % for many stocks. It should be noted that although these differences appear to be large they may be underestimated, as all sources of uncertainty are not included. However, by comparing the stock development against the PA reference points the best available information and knowledge are utilised.

The BPA and FPA can therefore be utilised to judge if the stock is in a sustainable state and if the exploitation is such then there is a good probability these conditions will be maintained. It should be stressed that if the SSB falls below the BPA but the fishing mortality is still at or below the FPA the stock would be judged to be in a sustainable condition. If, however, fishing mortality were consistently above this level, the stock would be at risk of falling outside sustainable conditions. These reference points should not be regarded as targets for biological or economic optimisation of yield, they are signposts for sustainability.

Deciding on reference points such as BPA and FPA is a task for managers and not for scientists. Within the EU, such reference points have been decided for about 10 stocks. For the purpose of judging the state of these agreed reference points ICES proposals have been used. This shall not prejudice future decision by managers. The proposed reference points are indicated in the graphs for a number of stocks from the Atlantic area. Such information is not available for the Mediterranean stocks.

Stock assessment analyses are not conducted on a regular basis and research outputs are fragmented and dispersed on a temporal and spatial scale. Assess-

ments of stocks and fisheries have not been conducted either on a yearly basis or with the appropriate geographical scale; therefore several assessments are only of local value. However, in the last 15 years national administrations, financially supported by EC, have tried to overcome this situation and research and monitoring activities mainly based on scientific surveys have been carried out. Unfortunately, less effort has been devoted to monitoring commercial catches/landings. A consequence of this is the low number of spawning stock biomass estimates and of exploitation patterns for all the most important stocks.

No precautionary reference points have been yet defined for the Mediterranean stocks.

Fish stocks in third-country waters or beyond EU waters have not been included in the evaluation.

2. Stock development by areas

For each area examples of roundfish stocks, flatfish stocks, pelagic stocks or groundfish stocks are selected to demonstrate characteristic developments for each area. These stocks are the major stocks exploited in the area. Some of the stocks are widely distributed, such as mackerel and hake, and these are given under separate headings. The Mediterranean stocks are also dealt with as a separate area. Deep-sea species are not analytically assessed and the concern about the development of these stocks is expressed in the concluding remarks.

As mentioned above, for each stock the two graphs show the longest possible time series of landings and fishing mortality, spawning biomass and recruitment. For some stocks agreed or proposed reference points are included that will serve as benchmarks to judge sustainability. Relative changes in SSB and landings between the period prior to the introduction of the CFP and the most recent five-year period, expressed as percentages, are given in Table 1. For the North Sea, the main stocks that are targeted by fleets fishing for industrial purposes are included.

Due to the data sources on the Mediterranean, a different approach has been adopted for this area.

2.1. The Baltic Sea (ICES area IIIb–d)

There are two separate cod stocks in the Baltic. The large stock (cod SD 25–32, Figure 1) shows a considerable decline with low recruitment and is in a critical state. The other stock in the western part (cod SD 22–24, not included) continues to produce good recruitment. Both stocks have been subjected to high fishing mortality in the last 10 years.

The pelagic stocks reveal very different development, with the herring stock in the main basin (herring SD 25–29S, 32, Figure 2) declining over several years and at the same time the sprat stock (sprat 22–32, Figure 3) reaching historic high levels of biomass and landings. Most of the stocks appear to be outside sustainable limits.

2.2. The North Sea, Skagerrak/Kattegat, Eastern Channel (ICES areas IIIa, IV, VIId and IIa EU waters)

The cod (Figure 4) and whiting (Figure 5) stocks are in a severely depleted state whereas haddock (Figure 6) and saithe (Figure 7) have performed better. All stocks are heavily fished. The flatfish stocks plaice (Figure 8) and sole (Figure 9) are outside or close to sustainable levels and exploitation has increased.

Herring (Figure 10) was close to a second collapse in the mid-1990s but strong management action in 1996 has meant that the stock is recovering.

2.3. West of Scotland (ICES area VI)

Cod (Figure 11) and whiting (Figure 12) stocks have declined under high fishing pressure and are in a critical state. Haddock (Figure 13) although fished at very high level is in a better shape.

2.4. The Irish Sea (ICES area VIIa)

The cod stock in the Irish Sea (Figure 14) is in an emergency situation and strong management action was imposed in 2000. The whiting stock (Figure 15) is also in a critical state. The flatfish stocks have stabilised but at a lower level than in the past and F has been reduced (plaice VIIa, Figure 16).

2.5. Celtic Sea, West Channel and the northern part of the Bay of Biscay (ICES areas VIIe–k and VIIIa, b, d and e)

Cod in area VIIe–k (Figure 17) will approach a critical state if fishing mortality is not reduced. Whiting in area VIIe–k (Figure 18) appears to have an opposite development of the SSB with decreasing F but F seems to have increased in recent years. Almost all flatfish stocks such as plaice VIIe and f (Figure 19) and sole VIIe and f (Figure 20) are heavily exploited but some stocks such as anglerfish and megrim (Figures 21 and 22) are stable or fluctuating. Most of the herring stocks in this area are increasing or stable, such as herring in the Celtic Sea (Figure 23).

2.6. Iberian Peninsula (ICES areas VIIIc and IX)

The southern hake stock (Figure 24) shows a clear trend of declining landings and SSB (about 50 %) and F is at the same level as for the northern hake stock. The megrim stock (Figure 25) shows a similar trend in landings and SSB. Both stocks seem to have stabilised at a lower level in recent years. The development of the sardine stock is given in Figure 26. The SSB has fluctuated and the rapid increase in F in the late 1990s seems to have halted.

2.7. Widely distributed stocks (ICES areas II–IX)

Stocks such as mackerel, blue whiting and northern hake straddle several of the above-mentioned areas. Among these stocks the development of northern hake (Figure 27) and, recently, blue whiting (Figure 28) are of most concern. Mackerel, as for most other pelagic stocks, shows a stable and possibly a sustainable trend (Figure 29).

2.8. The Mediterranean area

Evaluations of small pelagic and demersal species are derived from summaries compiled and adopted by STECF and the Sub-committee on

Stock Assessment of GFCM-SAC. Results coming from MEDITS (Mediterranean trawl survey) are included although the time series is not yet long enough to show sound and reliable time-trend modifications of recruitment indexes and of relative abundance of the available demographic fractions. Assessments of large pelagic species are derived from ICCAT.

Management areas have not yet been adopted by the GFCM in the Mediterranean; therefore this description is presented on a species basis.

Anchovy (*Engraulis encrasicolus*). The state of anchovy in the Mediterranean basin varies according to management area. In the northern part of the Alboran region, the evolution of the catches and of the CPUEs indicates a decline in the resource. In the Catalonia and Valencia region, the results of acoustic surveys have indicated that recruitment in the last four years has been poor. Furthermore, in the Alicante region the situation cannot be considered good, although recruitment has increased in the last year. In the Gulf of the Lion, the acoustic biomass estimates have increased during the last two summers. In the Adriatic Sea the CPUE (catch per unit area) trend indicates a decrease from 1978 to 1987 and then a stable or slight upward trend to 1996. The estimated biomass from analytical assessments shows a marked increase over the last 10 years. Recruitment is also highly variable and correlates with catch rates, indicating the importance of recruitment for catch rates in this fishery.

Sardine (*Sardina pilchardus*) occurs everywhere in the Mediterranean and is exploited by fleets from all countries bordering it. Sardine is a coastal pelagic species, which is exploited both at juvenile and adult stages by purse-seiners and mid-water pair trawlers. There is a traditional and localised fishery of fry of Sardine (termed whitebait) by beach seines and mainly boat seines, during winter. However it is a species with a low overall level of exploitation.

The existing assessments in waters off the Spanish continental coast, excluding the Alboran Sea, indicate that sardine seems to be underexploited or moderately exploited. In the Gulf of the Lion the stock is considered moderately exploited.

In the Adriatic Sea the catch trend in the last 15 years indicates a decrease in sardine availability. It seems that fishing effort has not had a significant effect on stock biomass over the period for which data is available. Results from a projection model, indicate that biomass would continue to increase even assuming a 30 % increase of the fishing effort.

Red mullet (*Mullus barbatus*) is a highly exploited resource in Mediterranean waters. Fleets from Greece, Spain, France and Italy fish these species. The species is widely dispersed over the entire Mediterranean Basin. Assessments carried out regionally indicate that the stocks appear to be overexploited and subject to growth overfishing. MEDITS catch rates, although highly variable among areas, are consistent and quite stable in time within areas.

Norway lobster (*Nephrops norvegicus*) is a very valuable resource. Specialised otter-bottom trawlers from Greece, Spain, France and Italy exploit this species. The fishery is characterised by a seasonal pattern, with catches declining during the winter and increasing during spring and summer. The fisheries are subject to technical measures, such as minimum landing size

and, in some areas, by no take zones, but these measures are not adequately enforced. In several areas the state of the stock(s) is unknown. In general, however, different analyses indicate situations from moderate exploitation to weakly overexploited.

Red shrimps (*Aristeus antennatus* and *Aristeomorpha foliacea*) are exploited in deep bottom trawl fisheries targeting both these species and Norway lobster (*A. antennatus*) is more abundant in the western Mediterranean while *A. foliacea* is caught more frequently in the central Mediterranean (Italian waters). Historical but local records in some areas indicate that these resources show large fluctuations in stock abundance.

The state of the stocks of red shrimps in the Mediterranean is not known. Assessments have been carried out regionally for *A. antennatus*, but there is no information on the overall state of the stocks. In northern Spanish waters and the Gulf of the Lion *A. antennatus* is fully or underexploited. In the Ligurian and Tyrrhenian Seas, Corsica and Sardinia, it is overexploited. For the Strait of Sicily and Tunisia, the stock of *A. antennatus* appears fully exploited.

Hake (*Merluccius merluccius*) is caught all over the Mediterranean and is the most important commercially exploited demersal resource in the area. A significant proportion of the landings of hake from the Mediterranean is composed of juveniles smaller than the minimum legal landing size (20 cm TL).

Assessments have been carried out locally, but there is no information on the overall state of the stocks. In northern Spanish waters and the Gulf of the Lion the stock appears overexploited. In the Ligurian and Tyrrhenian Seas, Corsica and Sardinia, the stock is fully or overexploited. For the Strait of Sicily and Tunisia the stock appears overexploited. In the Adriatic Sea all indicators point to overexploitation of hake. For the Ionian Sea the information available indicates overexploitation of hake in the north-west Ionian Sea and full exploitation in the south-western part. For the Aegean Sea the available information is somewhat contradictory but the majority of studies conclude that it is over- or fully exploited. MEDITS catch rates, although highly variable among areas, are consistent and quite stable in time within areas.

Bluefin (*Thunnus thynnus*), eastern Atlantic and Mediterranean. Eastern bluefin are taken by a variety of vessels and types of fishing gears, with landing sites located in many countries. Catches reached an average of 30 000 million tonnes in the 1950–65 period, and then decreased to an average of 14 000 million tonnes during the period 1965–80. Since then, there has been a huge and continuous increase of bluefin catches, especially due to purse seine activity in the Mediterranean Sea, but also due to long liners and other gears. The annual landings were probably over 50 000 tonnes during the last three years.

Many of the inputs to the assessment of this stock are highly uncertain (including large uncertainties in the total recent catches and in the abundance trends).

Fishing mortality rates have greatly increased during the 1970–97 period, particularly in the most recent years for the older age groups. This corre-

sponds with a severe decline of the spawning stock since 1970. Projections made by the SCRS during the 1998 meeting indicated that current catch level is not sustainable, and a reduction to 75 % of the 1994 level is not sufficient to halt a continuing decline in the spawning stock biomass. A catch of 25 000 tonnes could halt the decline of the spawning stock in the medium term, but the spawning stock biomass is not expected to return to its estimated historic levels. The only positive point in the present stock status is that the recruitment levels remain quite high, despite the low level of the spawning stock (i.e. still no clear evidence of recruitment over-fishing).

Bluefin tuna is a long-living species (about 20 year classes exploited) with quite a large biomass, but a quite low biological productivity. These biological characteristics and the lack of reliable stock assessment should lead to more precautionary management.

Albacore (*Thunnus alalunga*), Mediterranean Sea. Greece and Italy are the main countries involved in the albacore fishery in the Mediterranean. French purse-seiners, Spanish coastal fleets and sport fishery, also occasionally catch albacore. Since 1985, the Spanish baitboat fleet based in the Atlantic has also been catching albacore in the western Mediterranean and in the Alboran Sea in autumn. Reported albacore catches in the Mediterranean are still small, fluctuating between 2 000 and 4 000 tonnes since 1984. The recent catch data are very incomplete due to the lack of reporting by many countries (including EU Member States), hampering any stock assessment by ICCAT. Until now no attempt has been made to analyse the status of this stock due to insufficient data.

Swordfish (*Xiphias gladius*), Mediterranean Sea. Fishing has been carried out in the Mediterranean using harpoons and drift nets since ancient times. Landings showed an upward trend from 1965 to 1972, stabilised between 1973 and 1977, and then resumed an upward trend reaching a peak of 20 000 tonnes in 1988. Since then, the reported landings have declined and since 1990 they have fluctuated between 12 000 and 16 000 tonnes. The biggest producers of swordfish in the Mediterranean Sea in 1997 were Italy (43 %), Morocco (33 %) and Spain (7 %). Other countries have also reported incidental catches of swordfish. At present, long line and drift net are the main gears used. No stock assessment has been conducted since 1995 partly because of a lack of sufficient improvements to input data. The unknown status of the stock, the probable high exploitation rate (taking into account the very large catch of nearly 15 000 tonnes taken in a small area), the probably large catch of very small fish and warning signs from the fishery are causes for serious concern.

3. The most threatened stocks

The species-by-area review clearly indicates a drastically declining trend in SSB and landings over several years for almost all cod stocks, as shown in Figures 30 and 31. The development for hake is also a matter for grave concern (Figure 32).

Similar trends can also be seen for the cumulated SSB and landings of major roundfish species in the North Sea (Figure 33), west of Scotland (Figure 34) and the Irish Sea (Figure 35).

4. Global assessment

The stock development since the early 1970s up to the most recent period could be summarised as follows:

- almost all roundfish stocks have declined and the current harvest is in most cases not sustainable;
- several flatfish stocks are harvested at excessively high levels but some are close to sustainable levels;
- pelagic species and species subject to fishing for industrial purposes are in better condition but harvest rates need to be maintained at current levels or reduced to secure sustainability;
- several deep-sea species show signs of overexploitation and some might have reached critical levels;
- generally speaking, economical and biological benefits would accrue from lower exploitation of most stocks.

Figures and tables attached:

Figures 1–29: SSB, landings and fishing mortality by selected stocks and areas

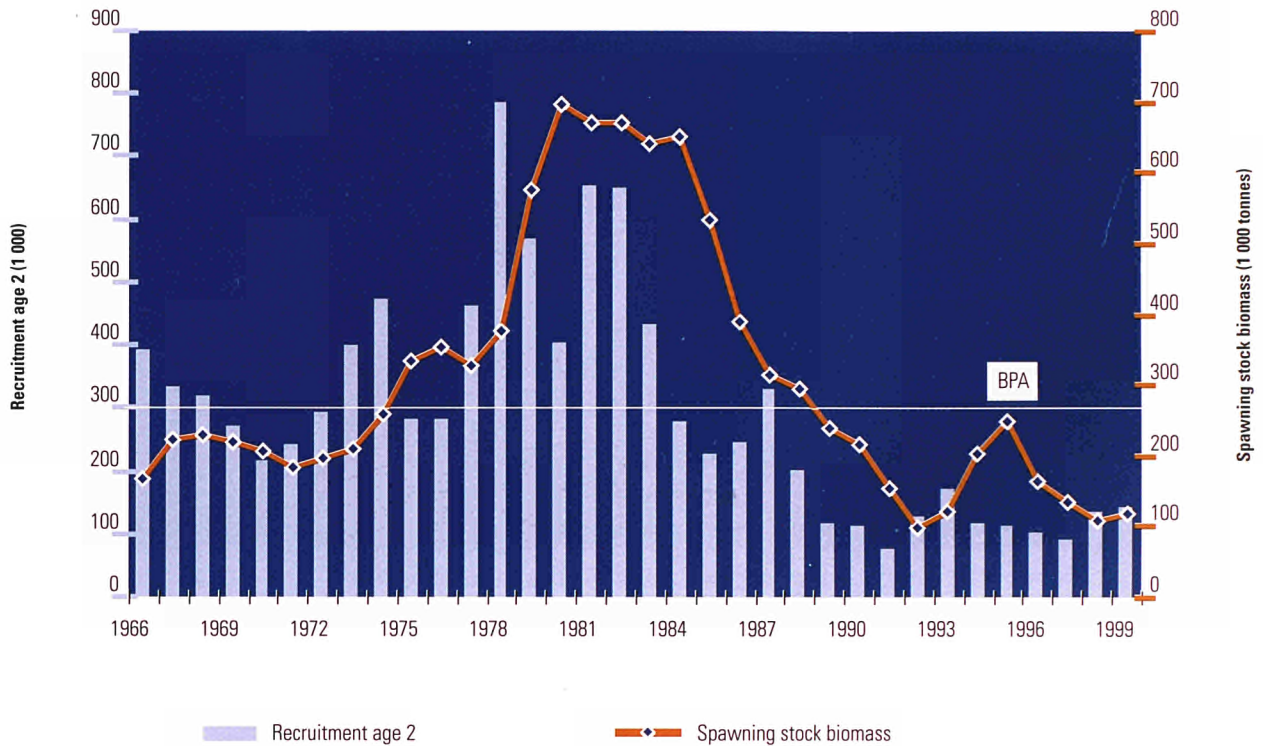
Figures 30–35: Development of SSB and landings by fish groups and areas

Table 1: Relative changes in SSB, landings and fishing mortality for some key species, by area.

Figure 1

COD SD 25-32

Recruitment age 2 and SSB



Landings and fishing mortality, age 4-7

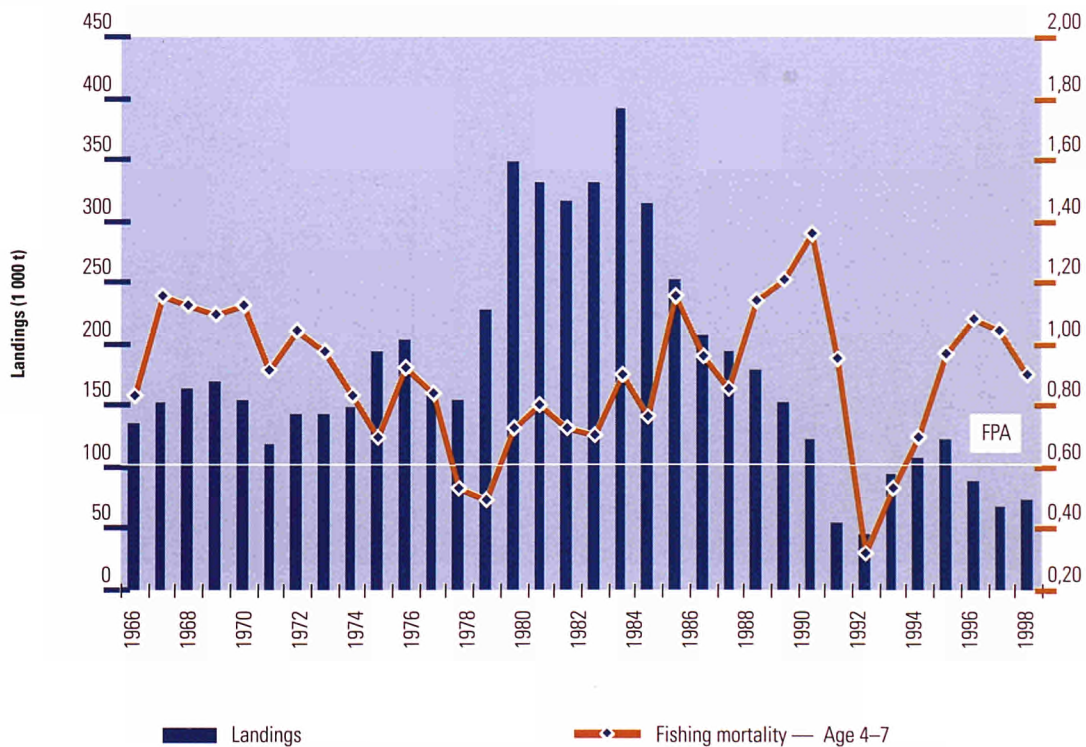
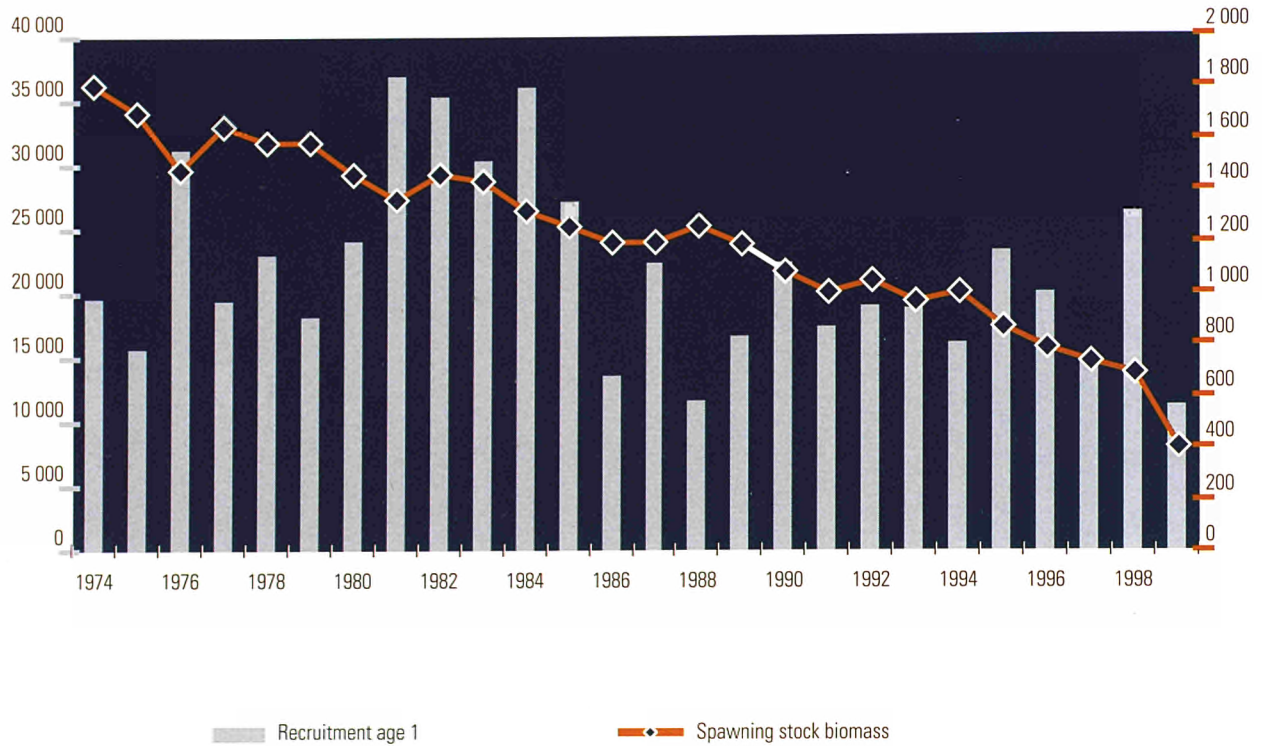


Figure 2

Herring SD 25-29 S, 32

Recruitment, age 1 and SSB



Landings and fishing mortality age 3-5

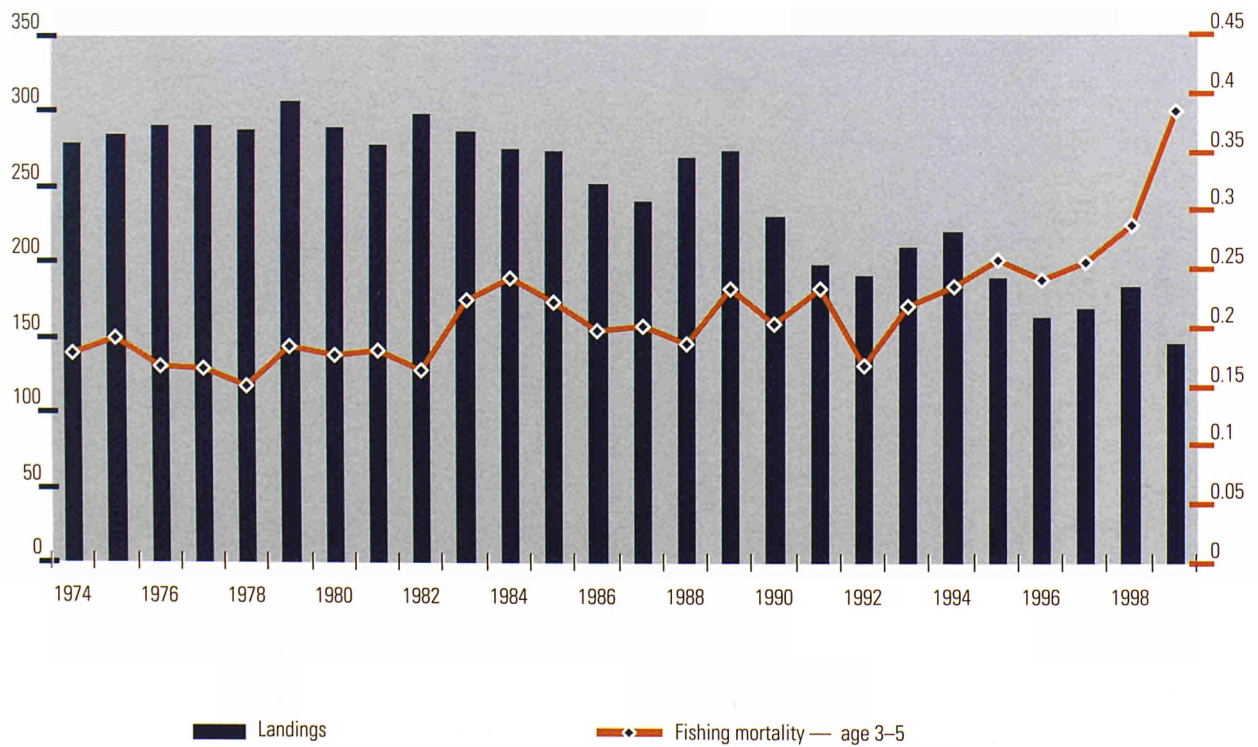
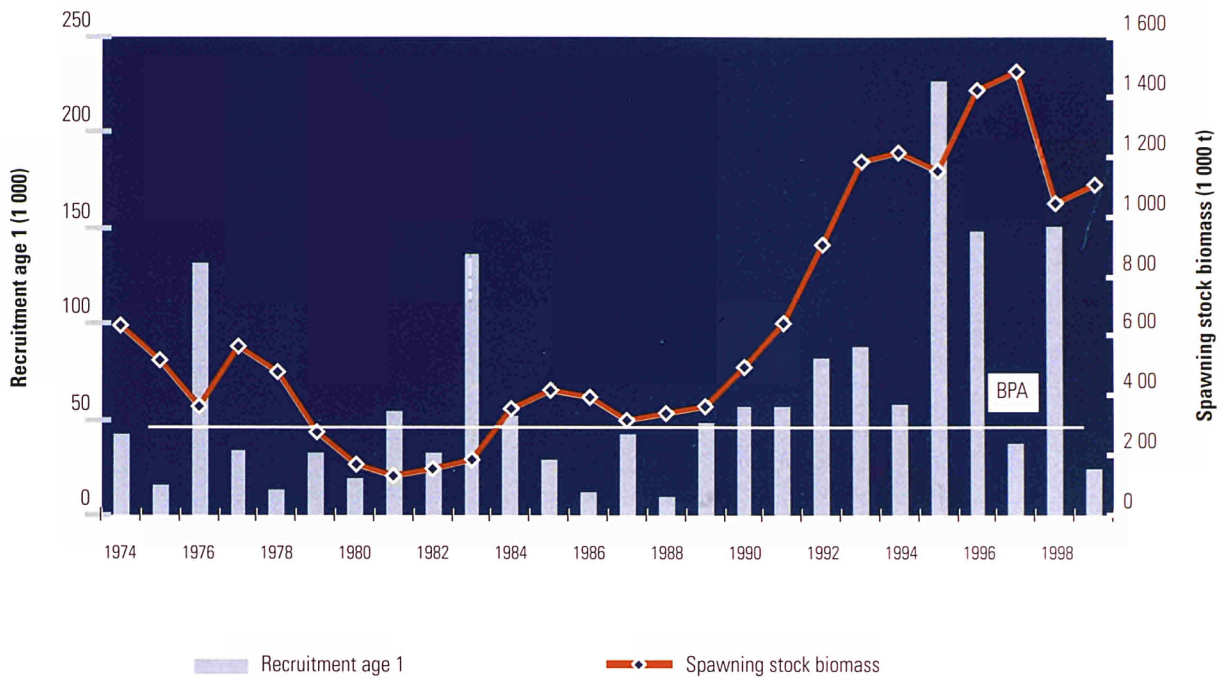


Figure 3

Sprat sub22-32

Recruitment age 1 and SSB



Landings and fishing mortality age 3-5

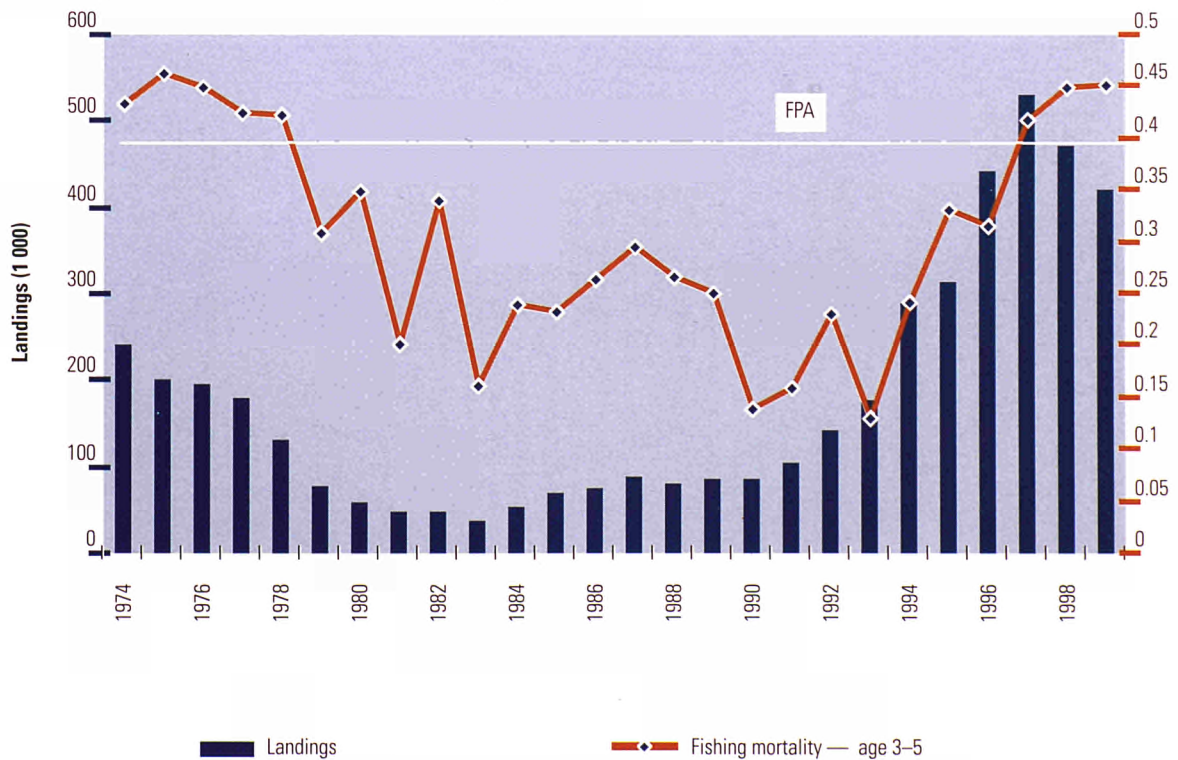
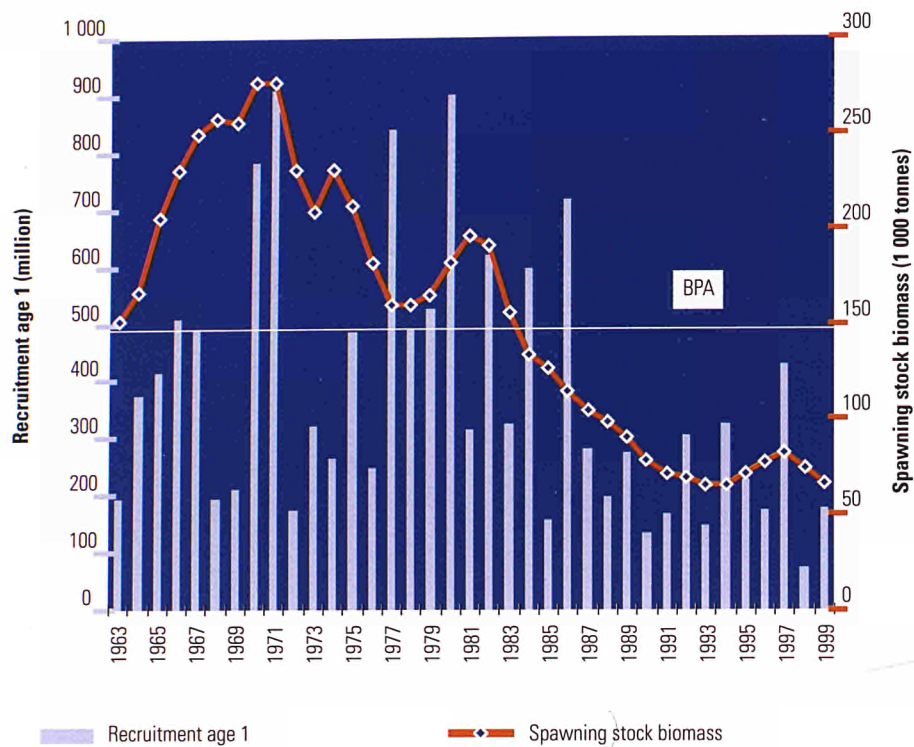


Figure 4

Cod North Sea (IIIa, IV and VIId)

Recruitment age 1 and SSB



Landings and fishing mortality age 2-8

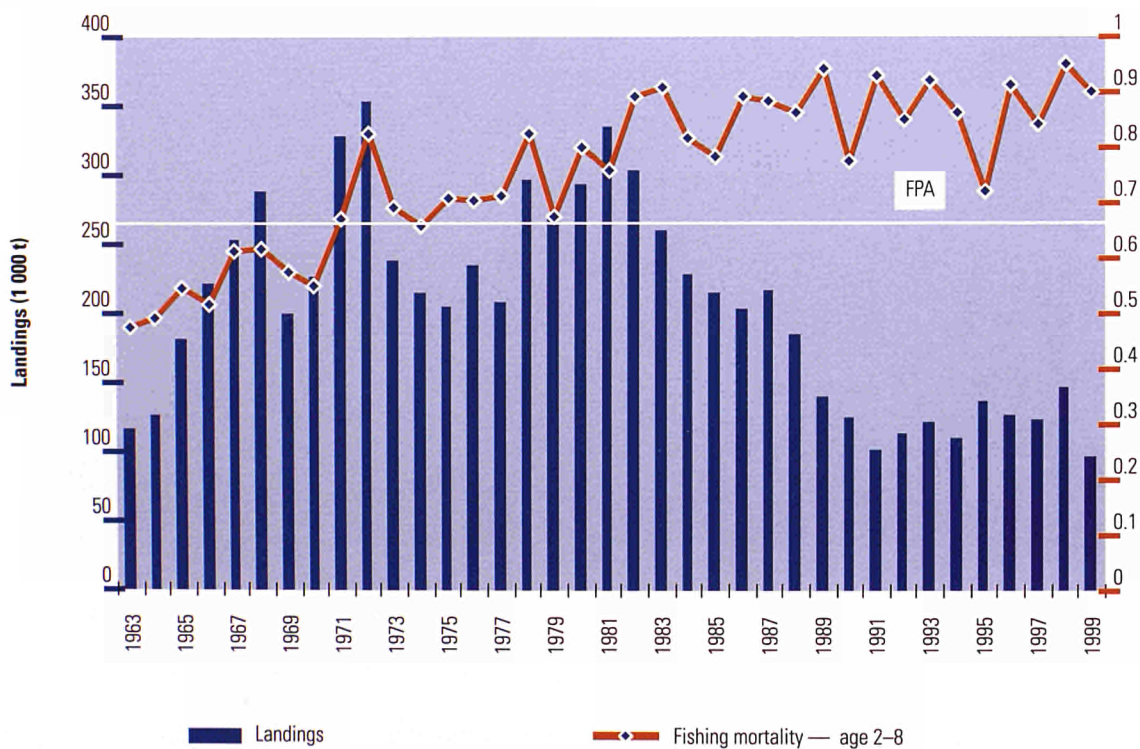
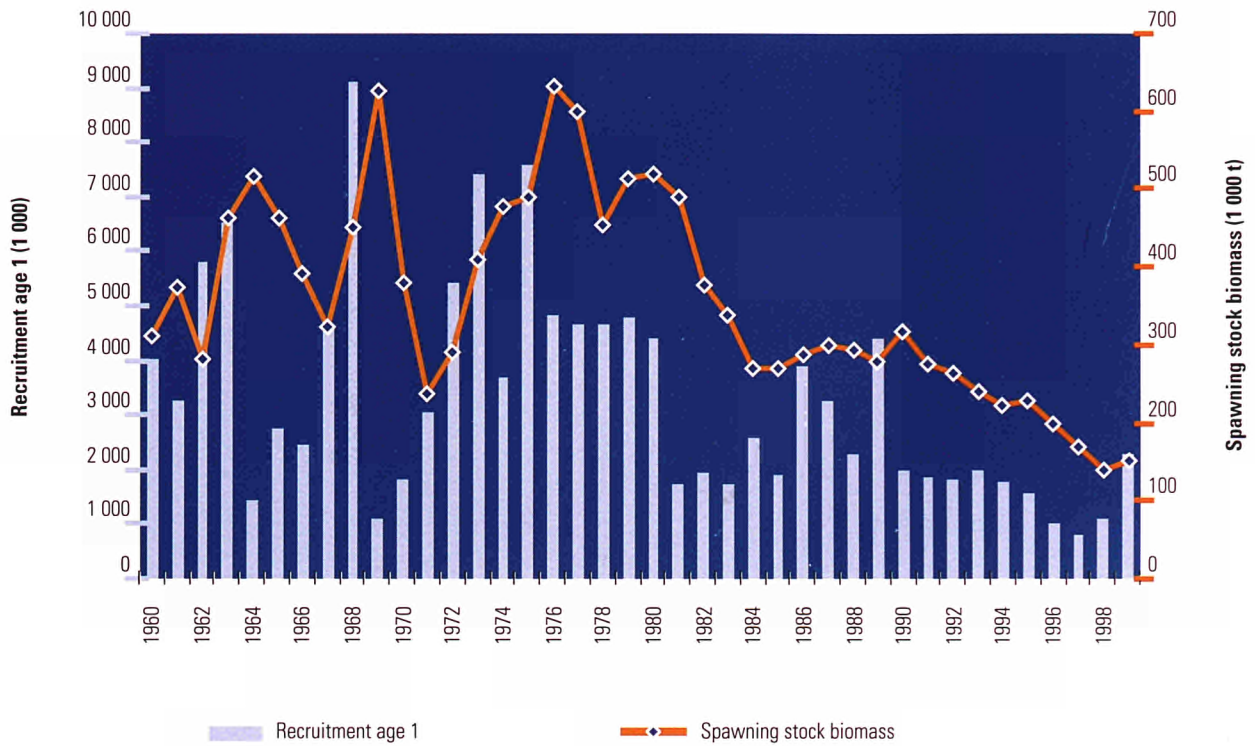


Figure 5

Whiting IV, VIId

Recruitment age 1 and SSB



Landings and fishing mortality age 2-6

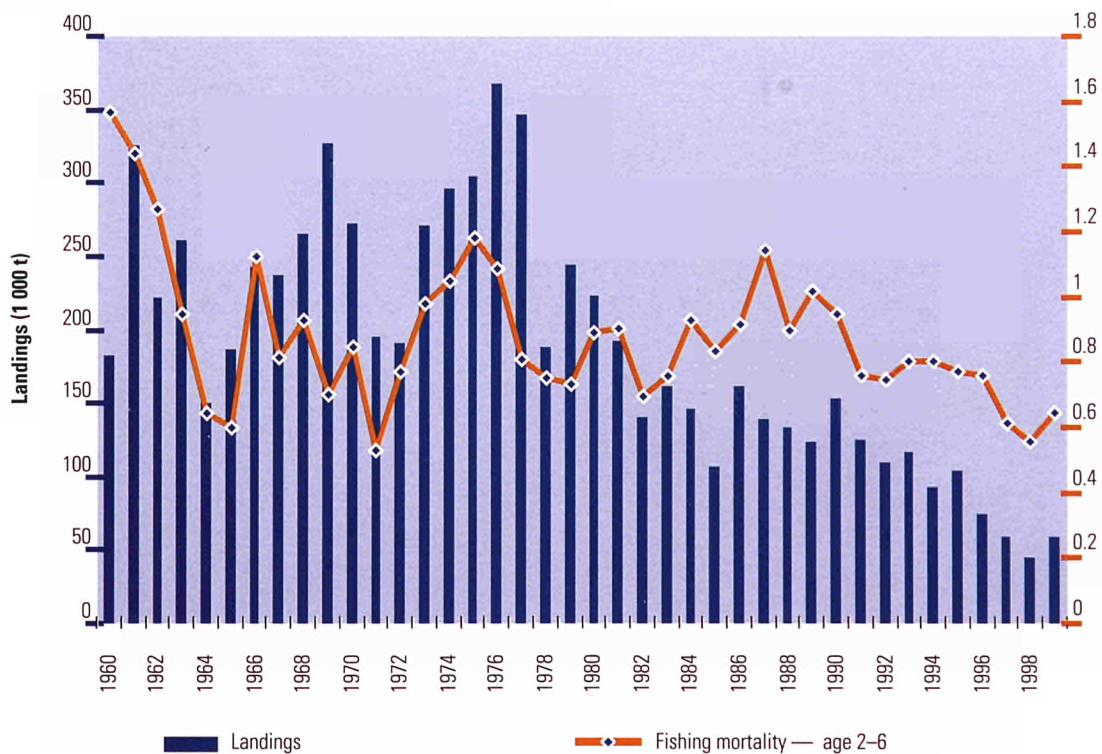
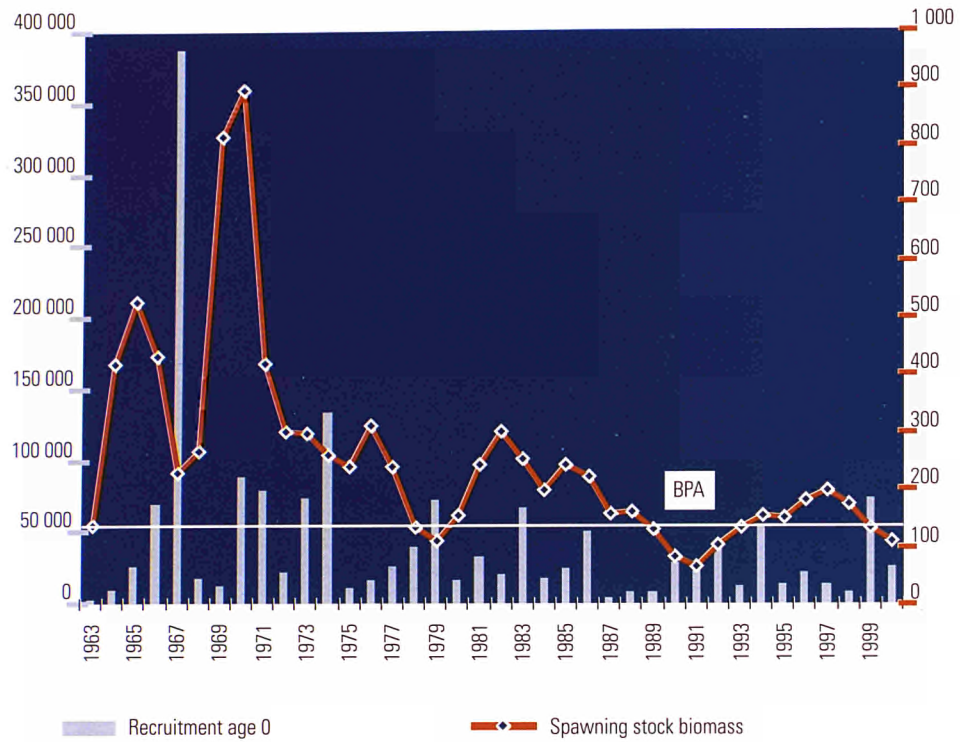


Figure 6

HAD_Nsea (IV + IIIa)

Recruitment age 0 and SSB



Landings and fishing mortality age 2-6

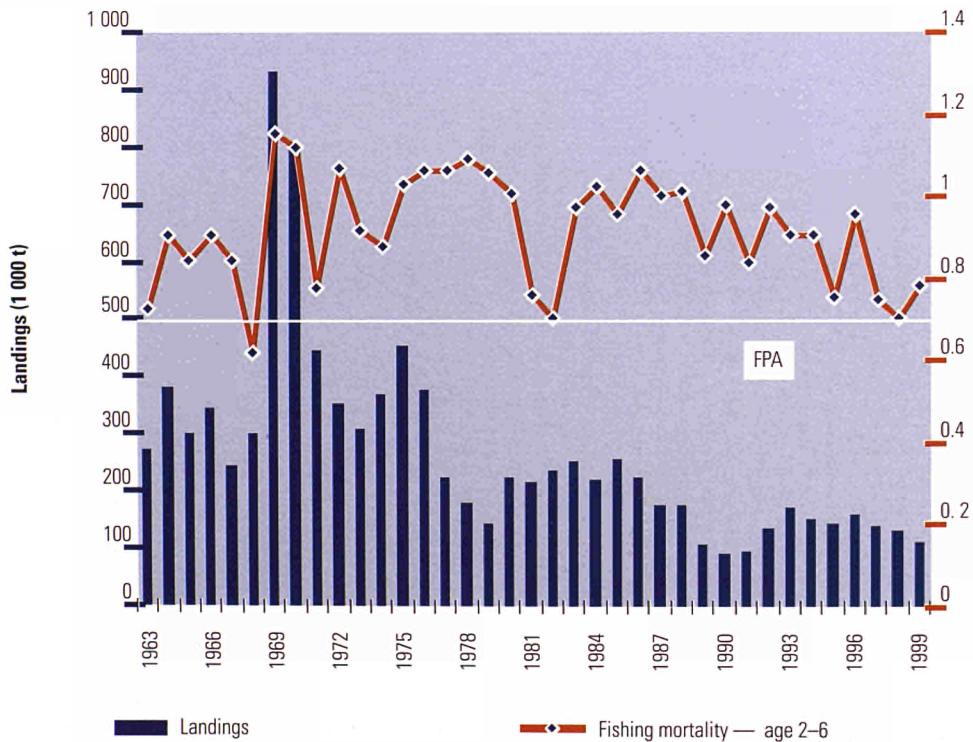
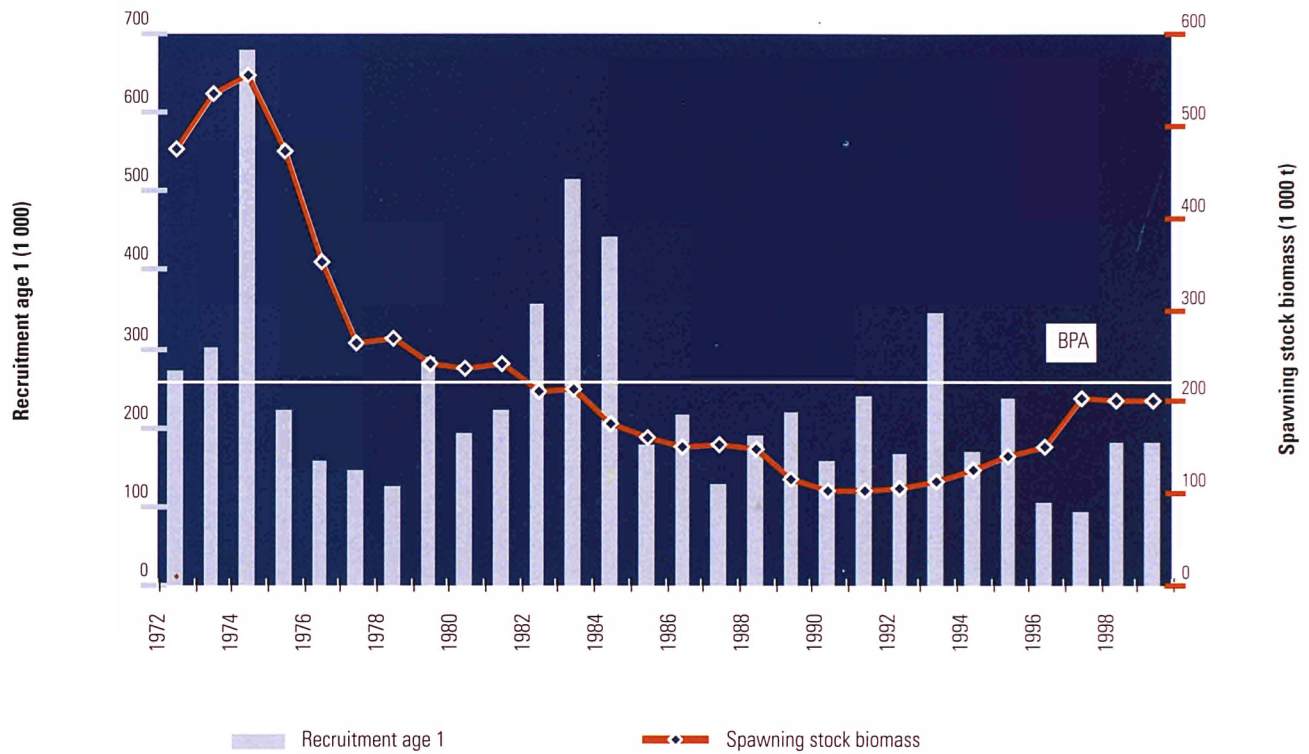


Figure 7

Saithe III, IV, IV

Recruitment age 1 and SSB



Landings and fishing mortality age 3-6

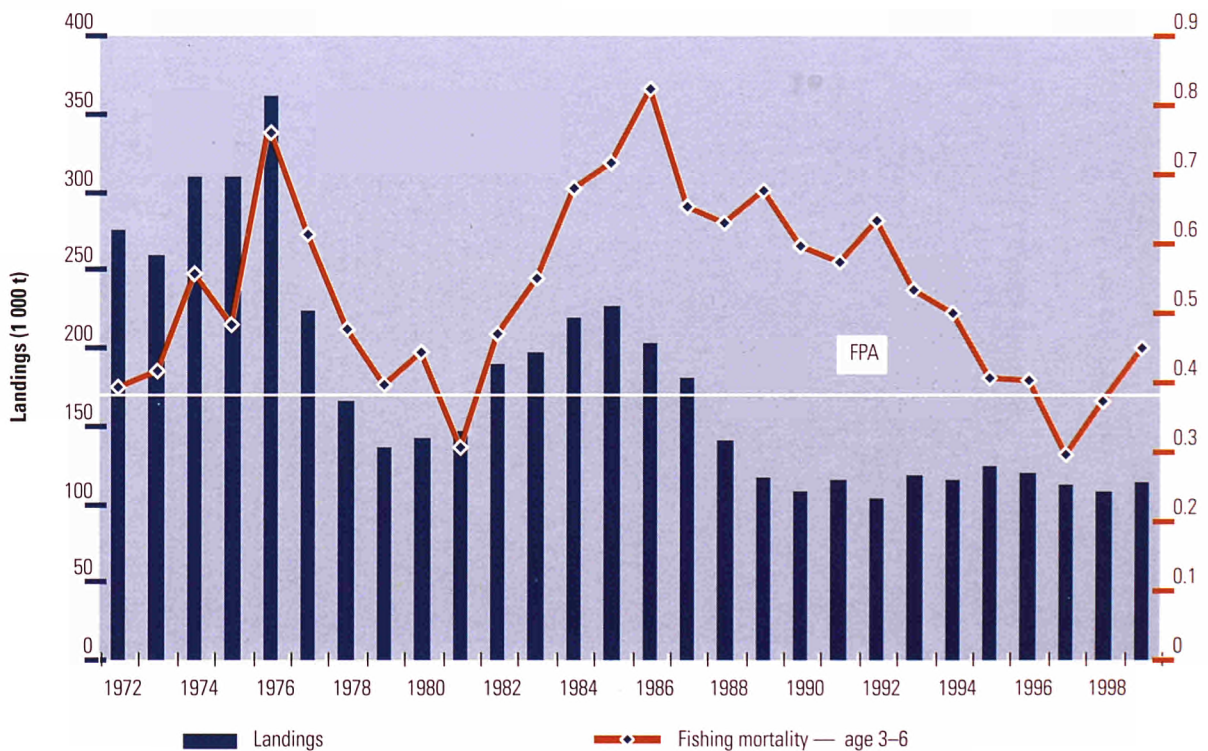
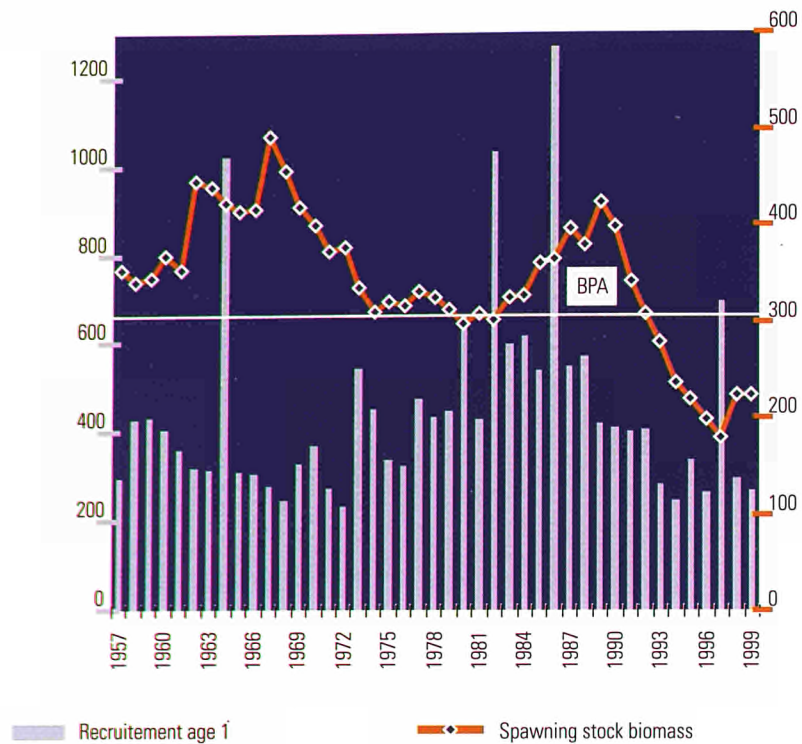


Figure 8
Plaice_Nsea

Recruitment age 1 and SSB



Landings and fishing mortality age 2-10

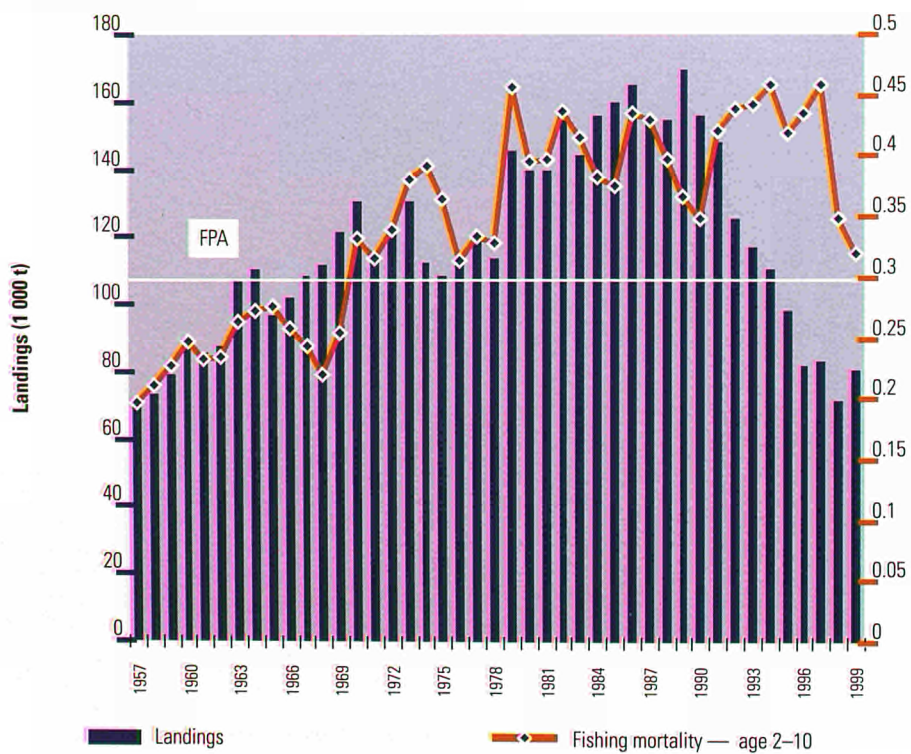
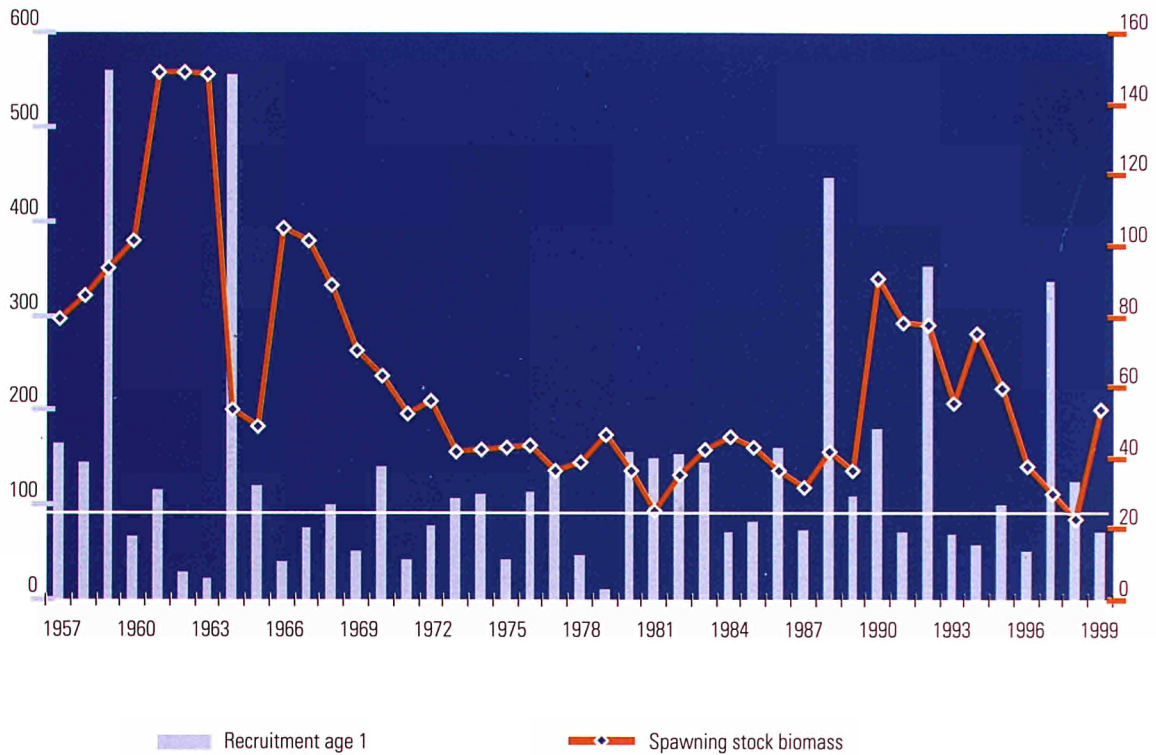


Figure 9

SOL_North Sea

Recruitment age 1 and SSB



Landings and fishing mortality age 2-8

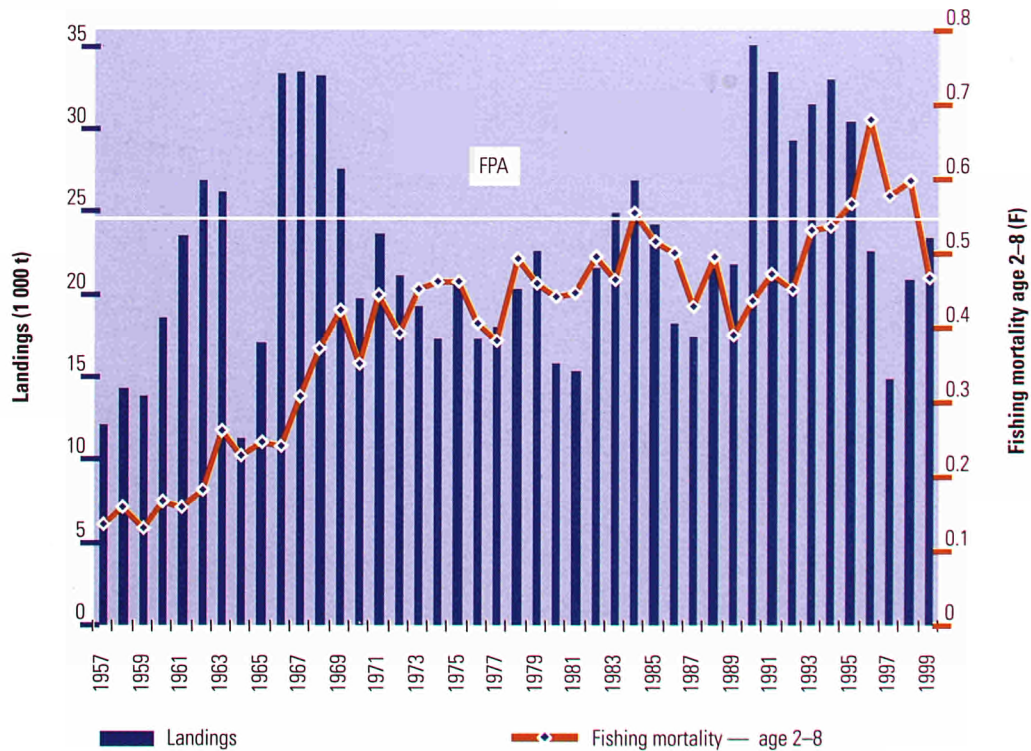
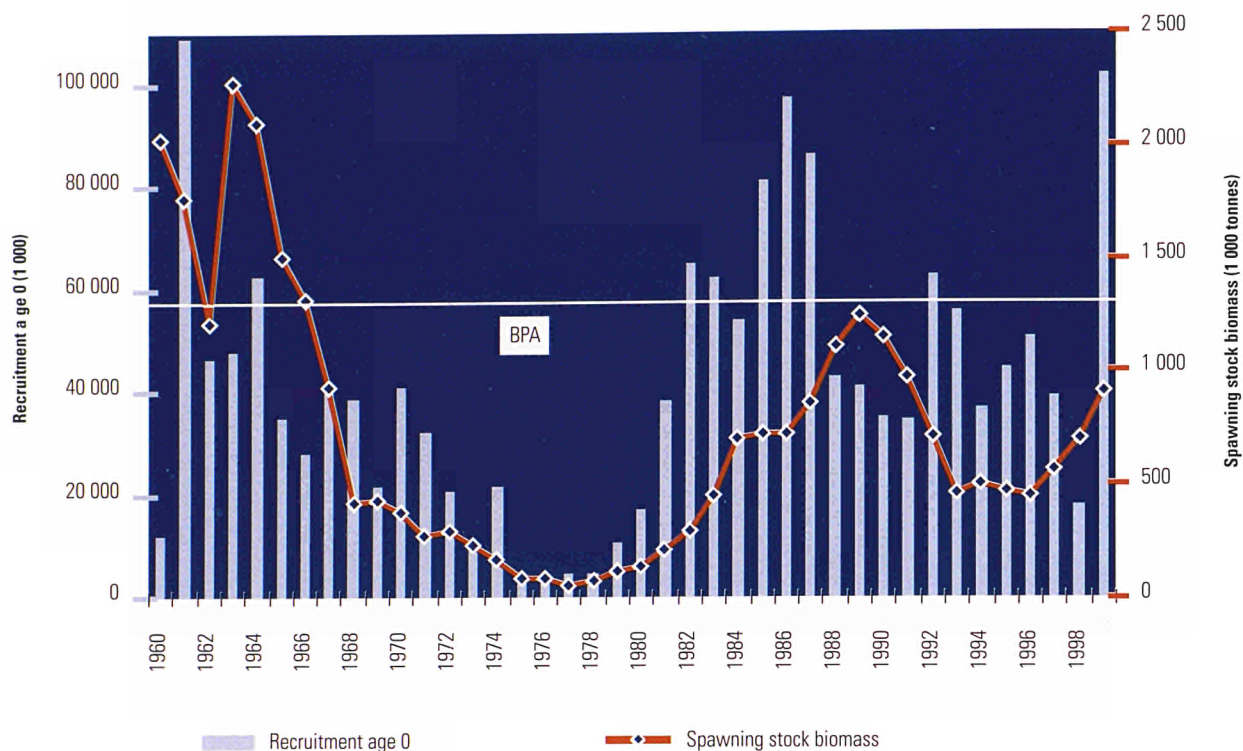


Figure 10

Her_IV

Recruitment age 0 and SSB



Landings and fishing mortality, age 2-6

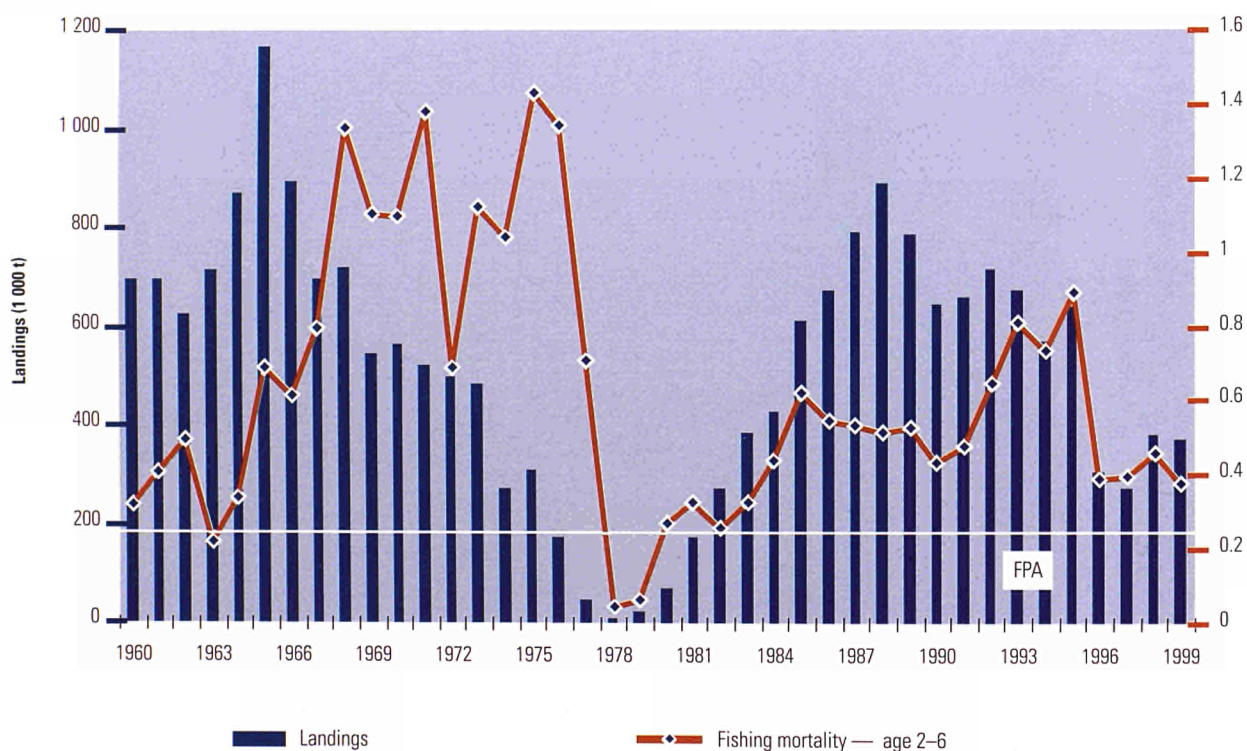
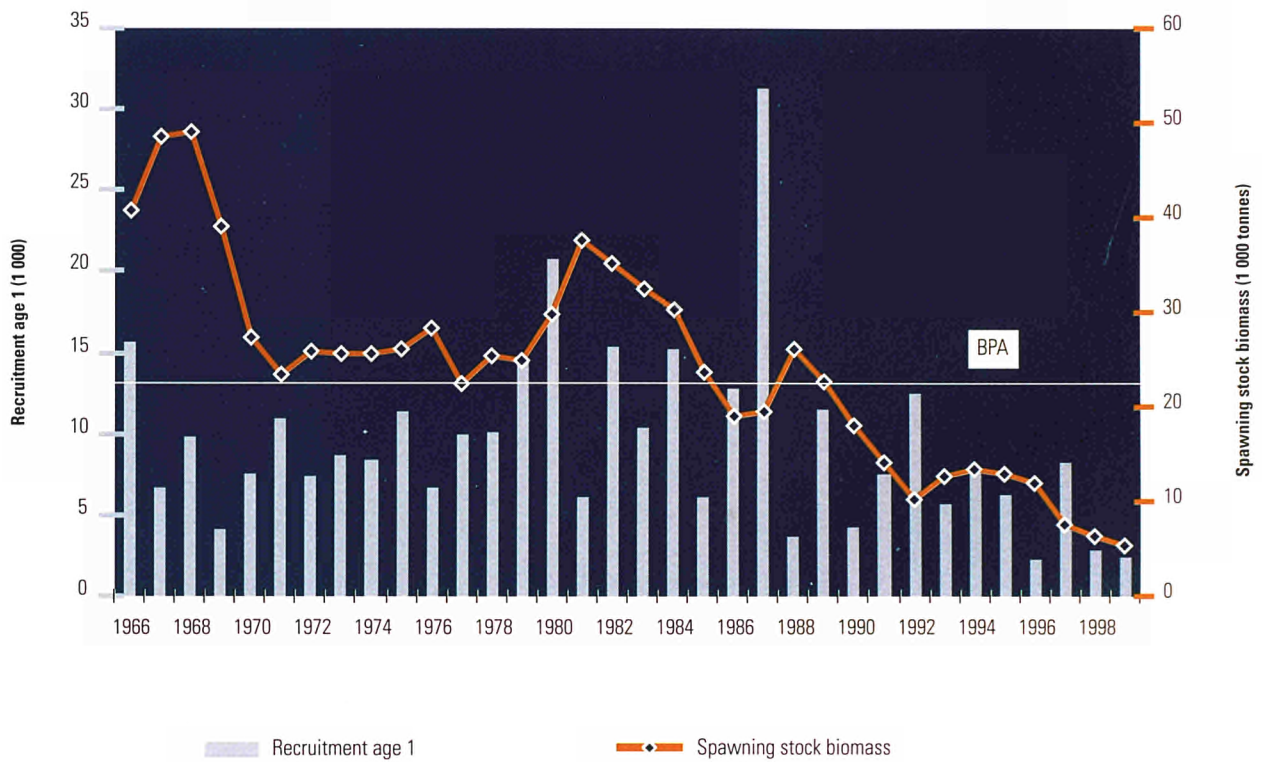


Figure 11

COD_Via

Recruitment age 1 and SSB



Landings and fishing mortality, age 2-5

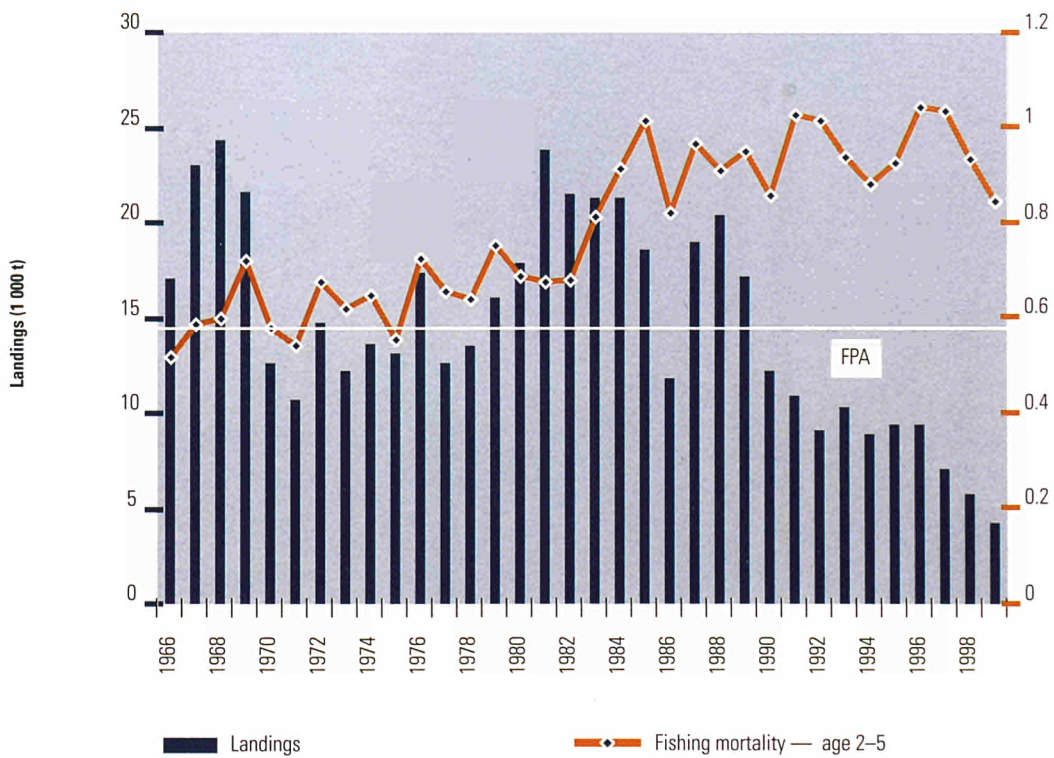
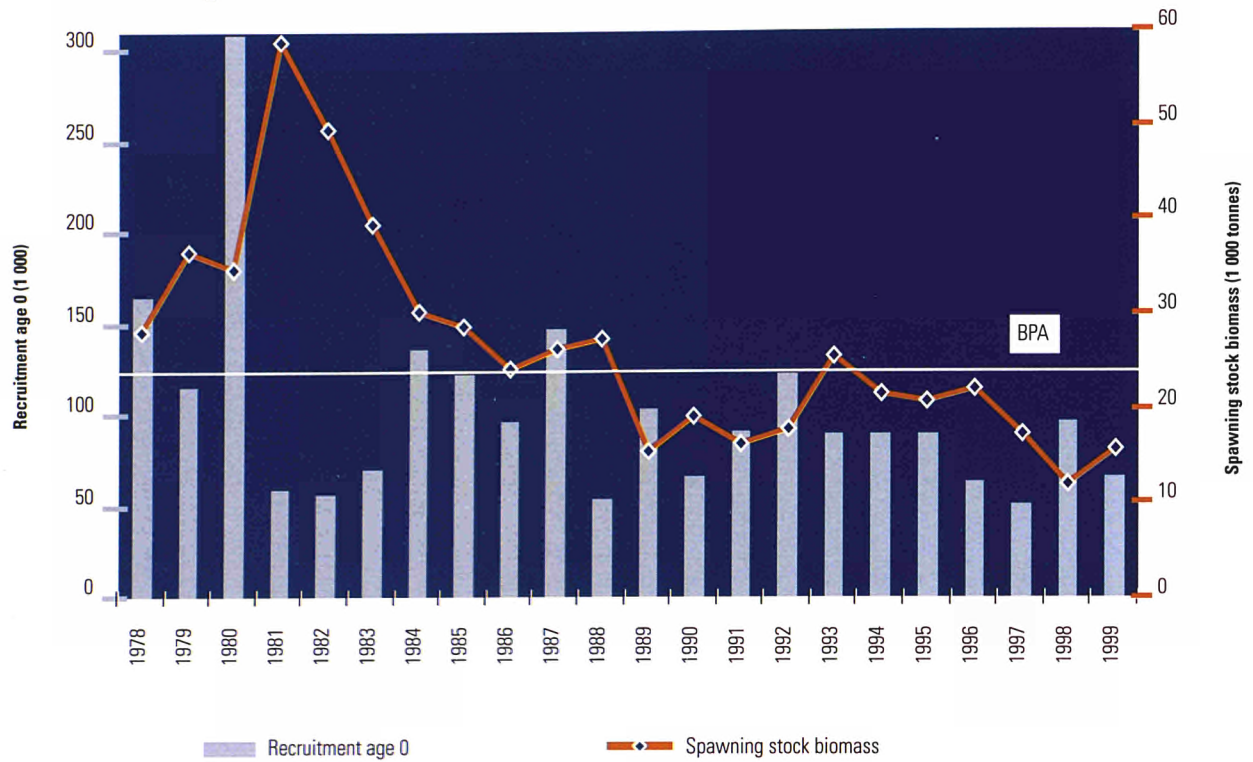


Figure 12

WHI_Via

Recruitment age 0 and SSB



Landings and fishing mortality, age 2-4

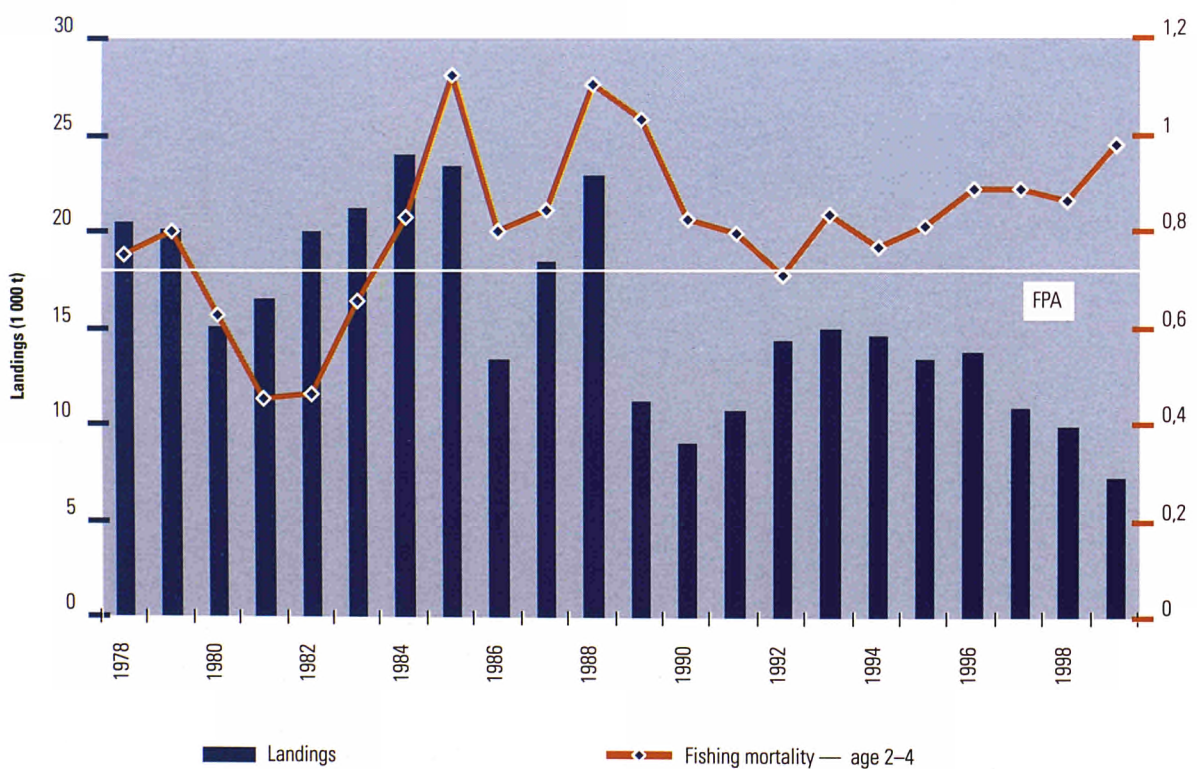
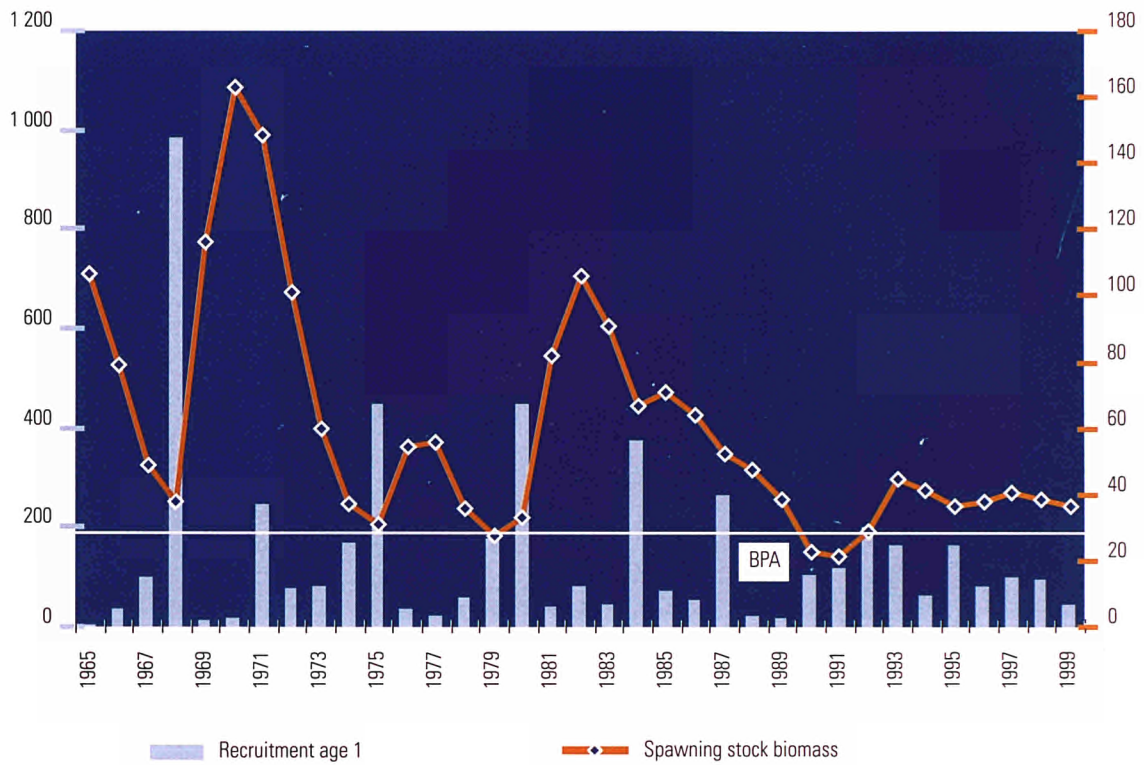


Figure 13

Haddock area Via

Recruitment age 1 and SSB



Landings and fishing mortality, age 2-6

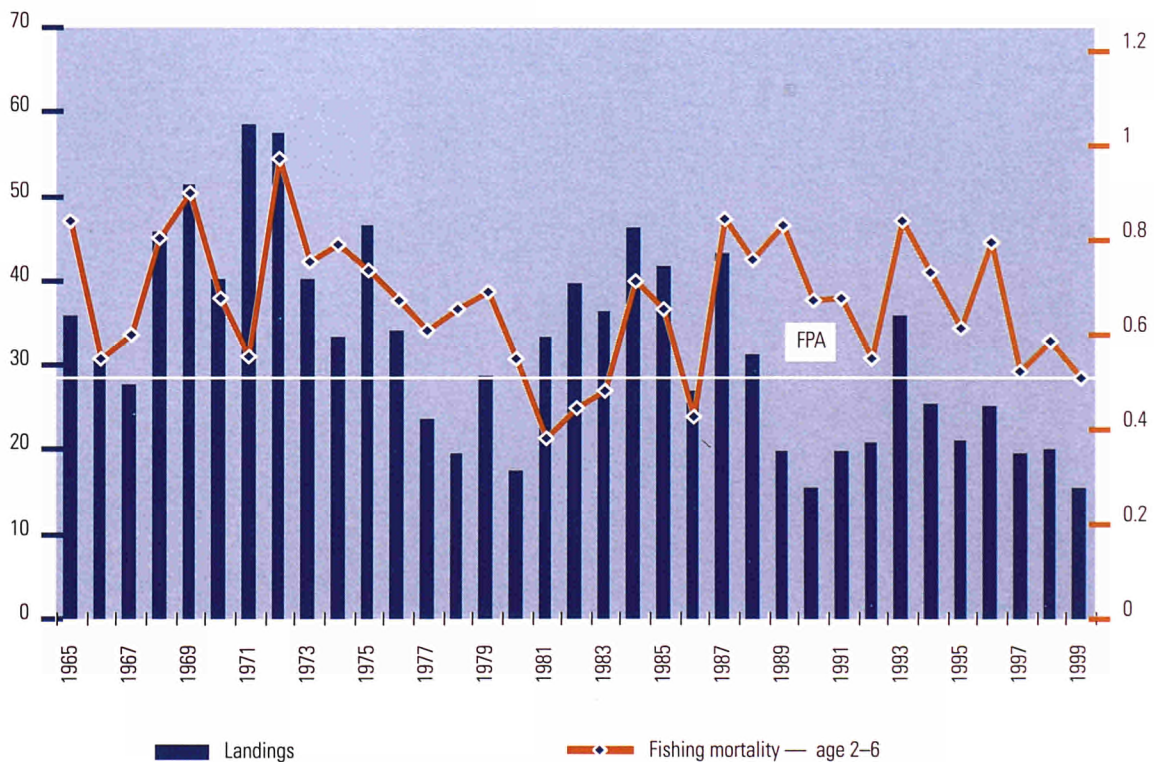
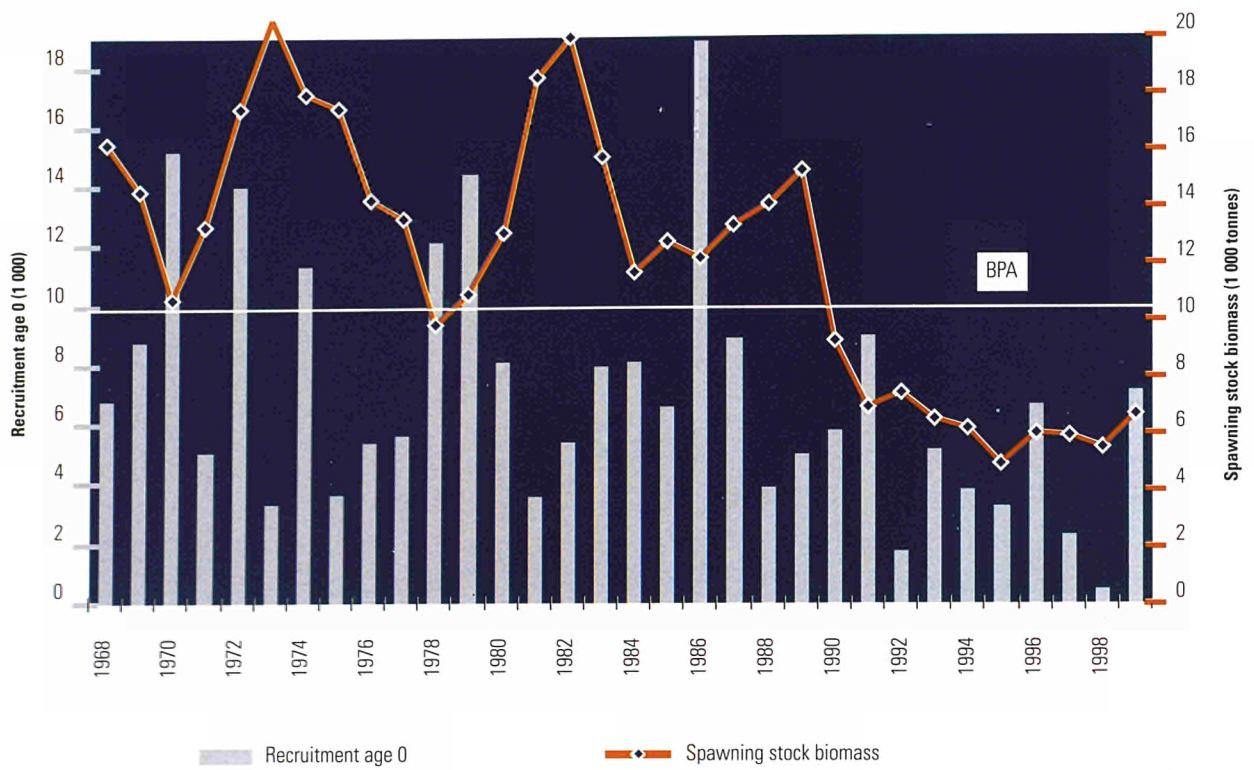


Figure 14

COD VIIa

Recruitment age 0 and SSB



Landings and fishing mortality, age 2-4

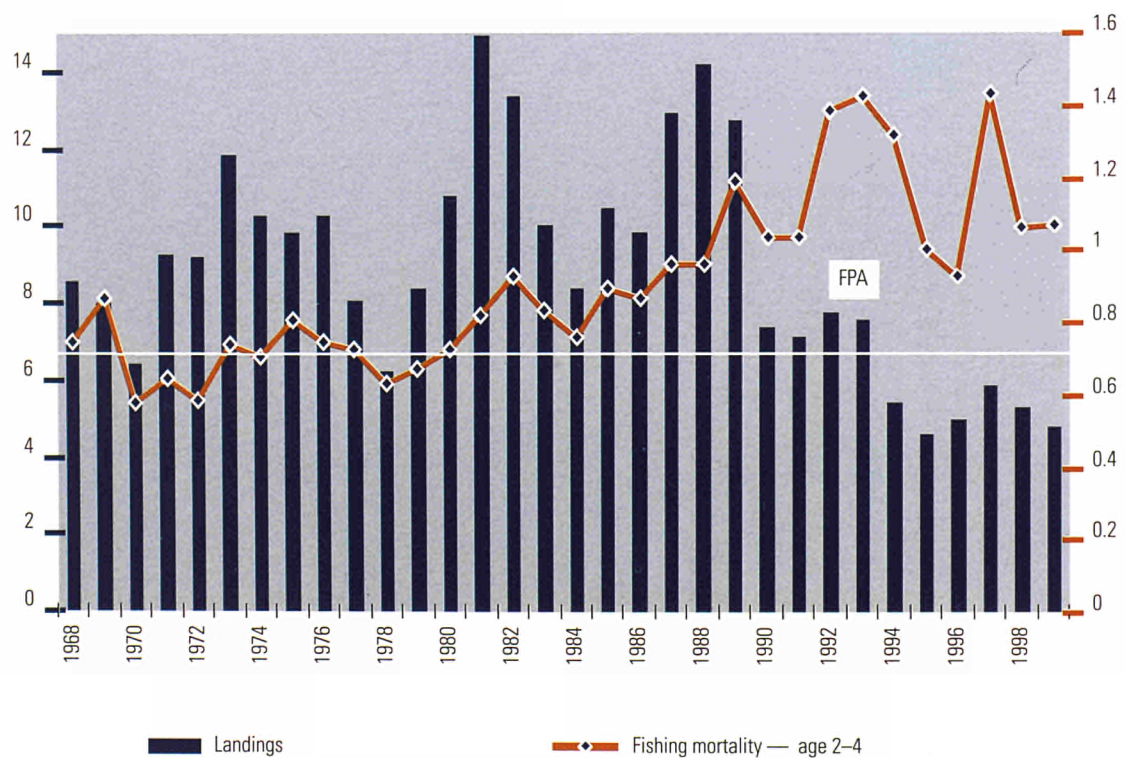
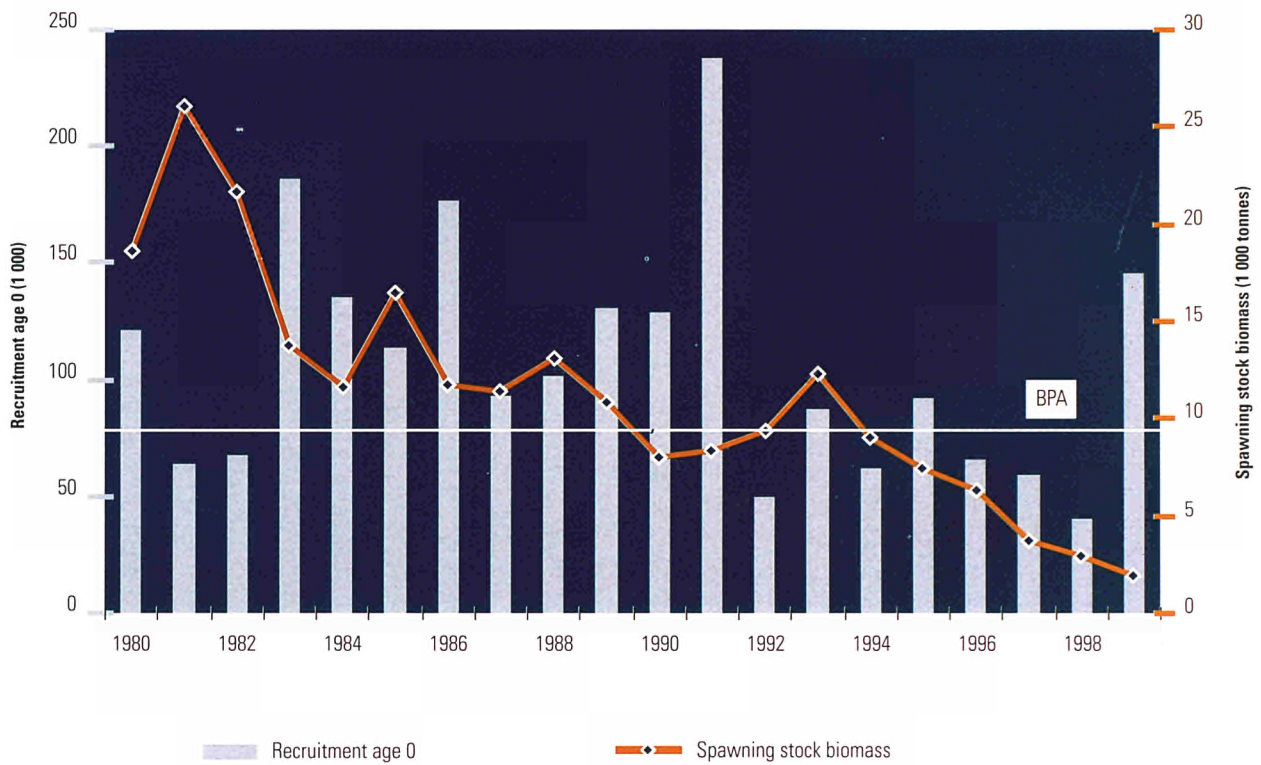


Figure 15

WHI_IrishSea (VIIa)

Recruitment age 0 and SSB



Landings and fishing mortality, age 1-3

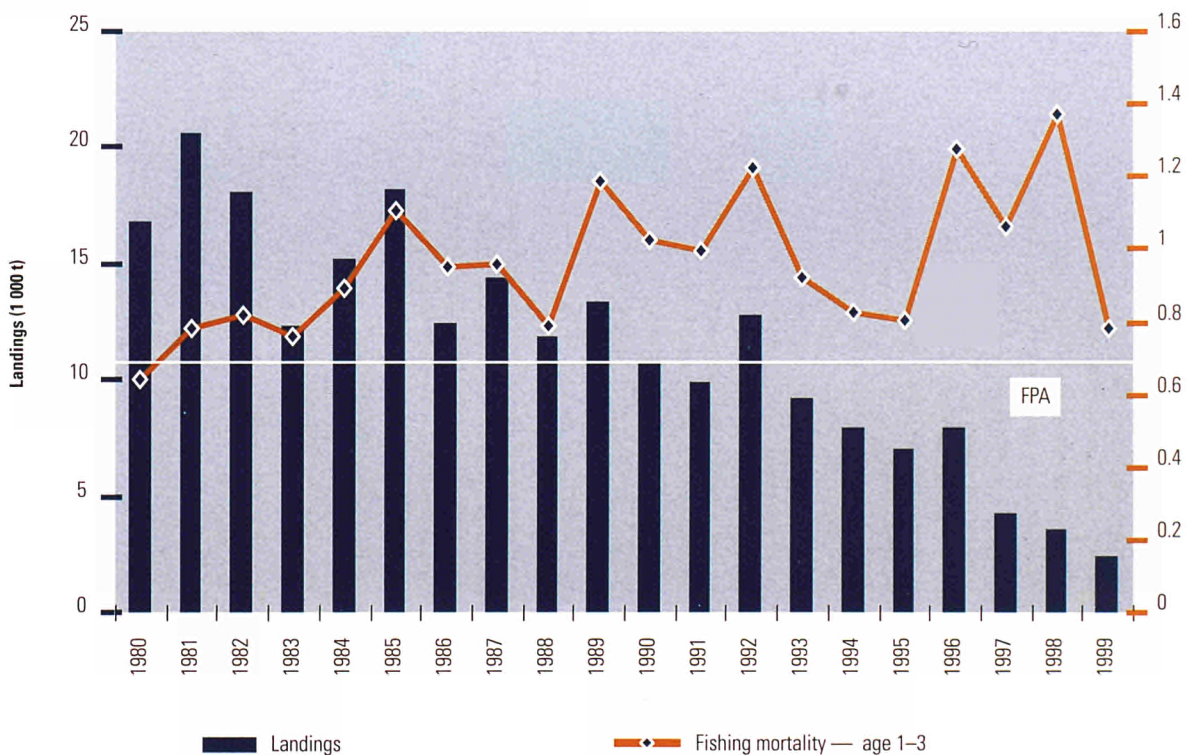
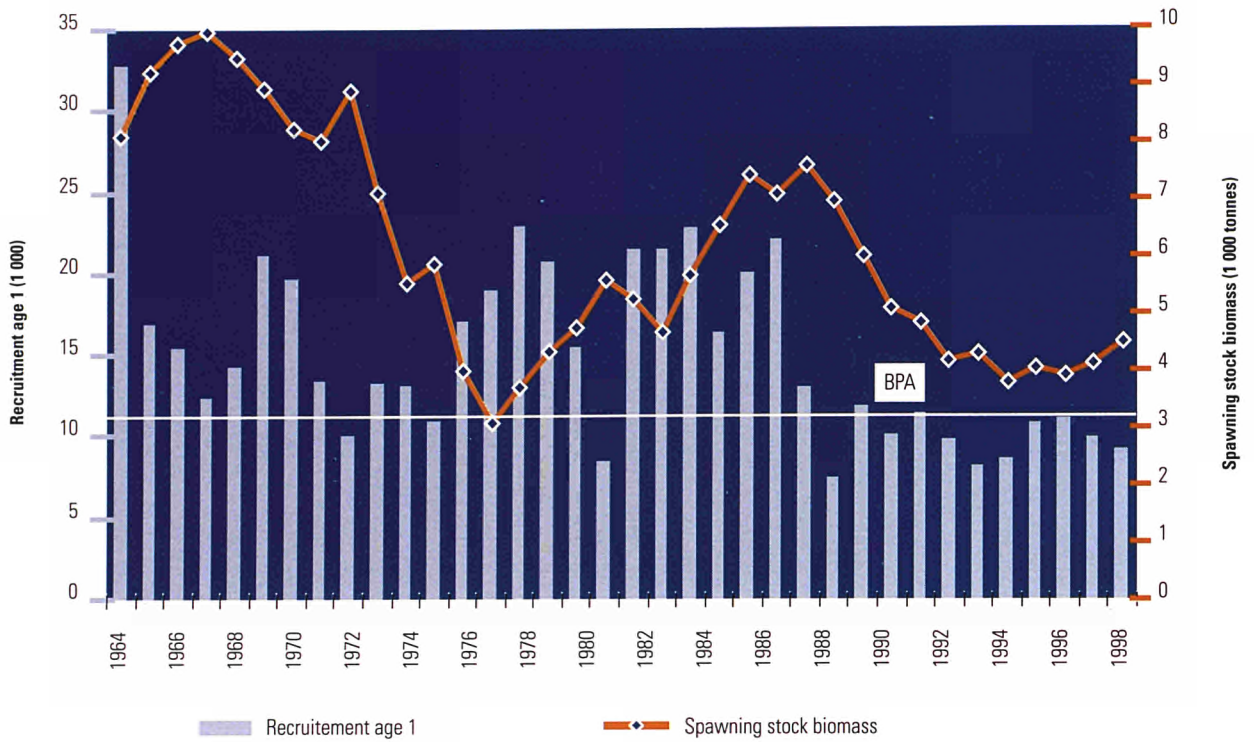


Figure 16

PLE_VIIa

Recruitment age 1 and SSB



Landings and fishing mortality, age 3-6

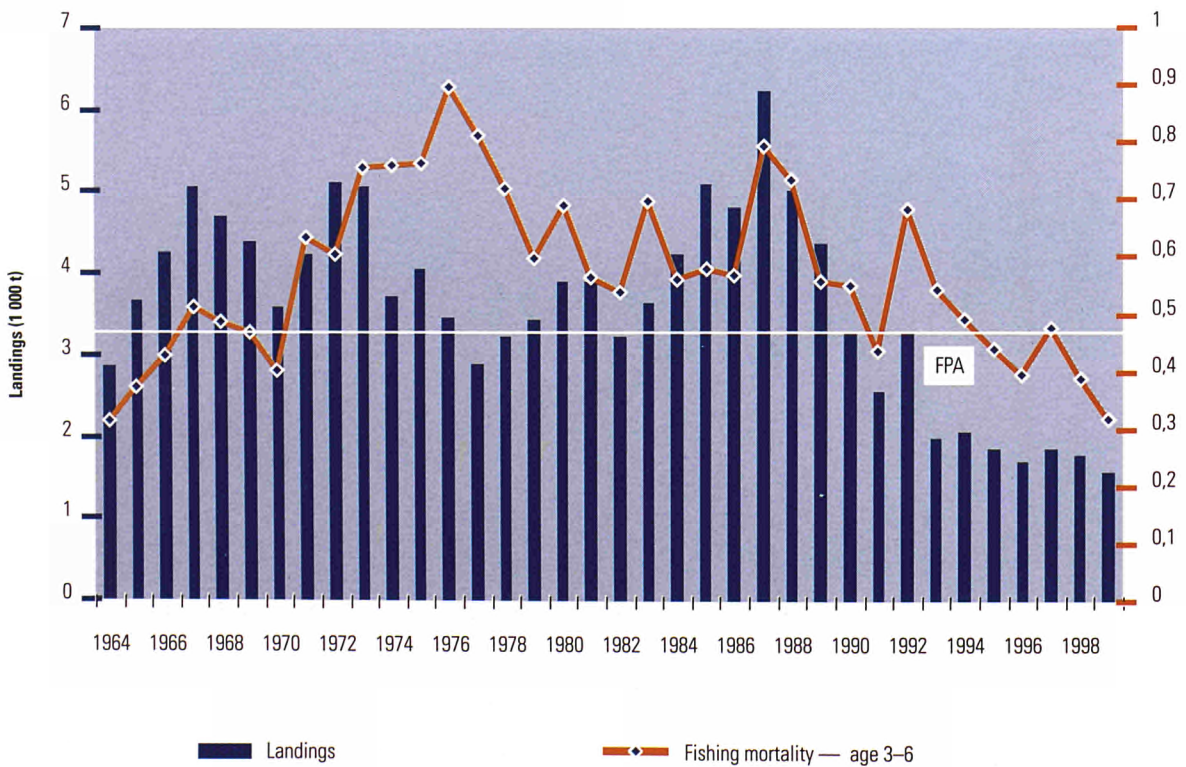
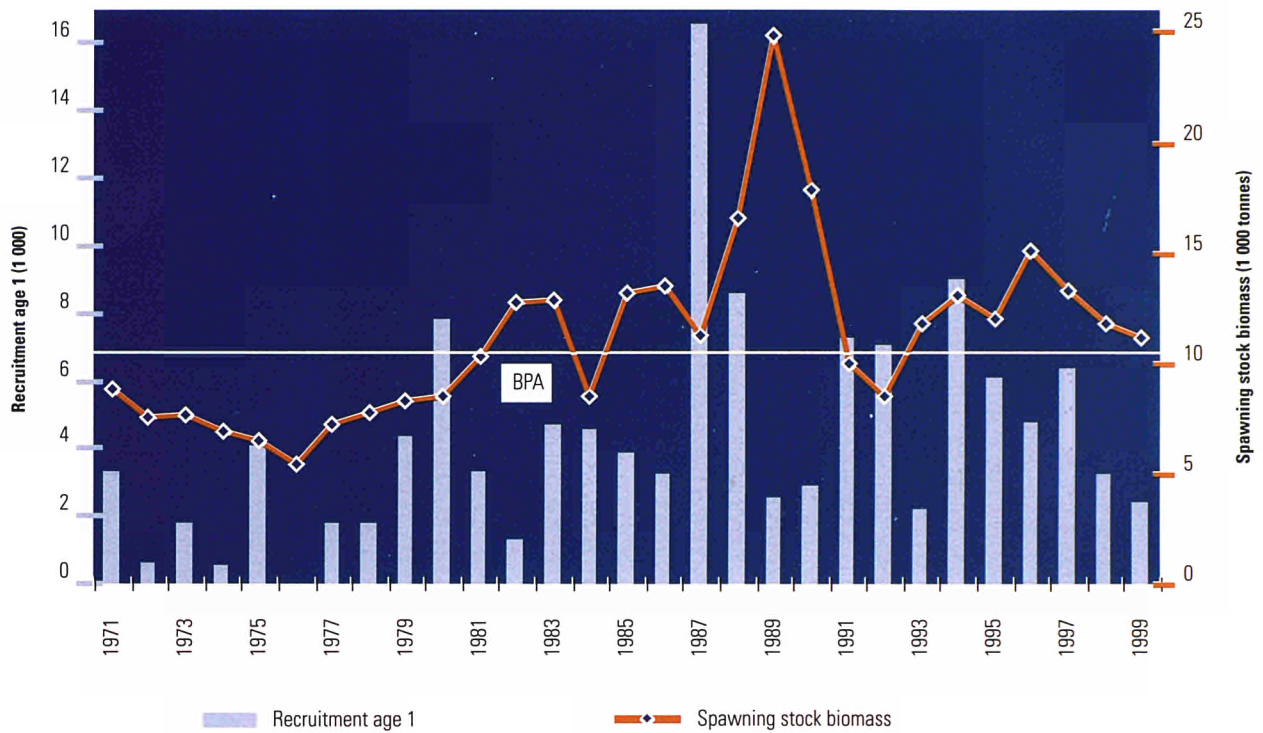


Figure 17

COD_VIle-k

Recruitment age 1 and SSB



Landings and fishing mortality, age 2-5

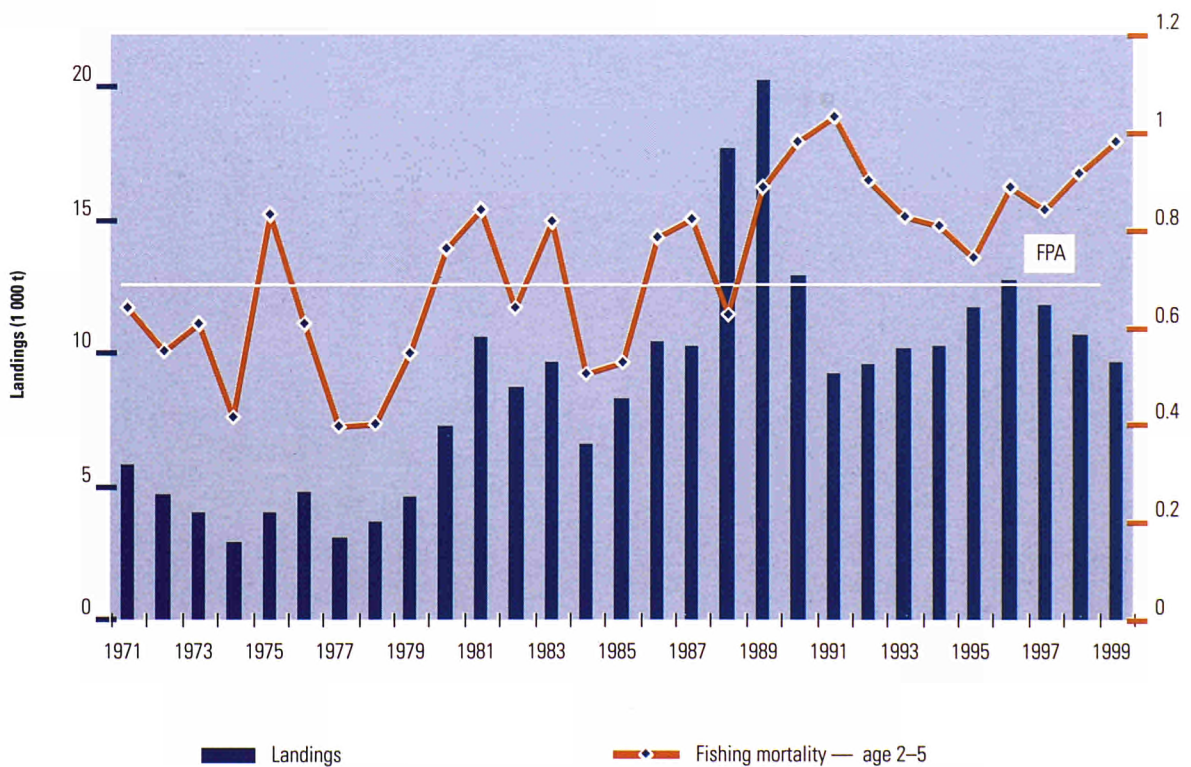
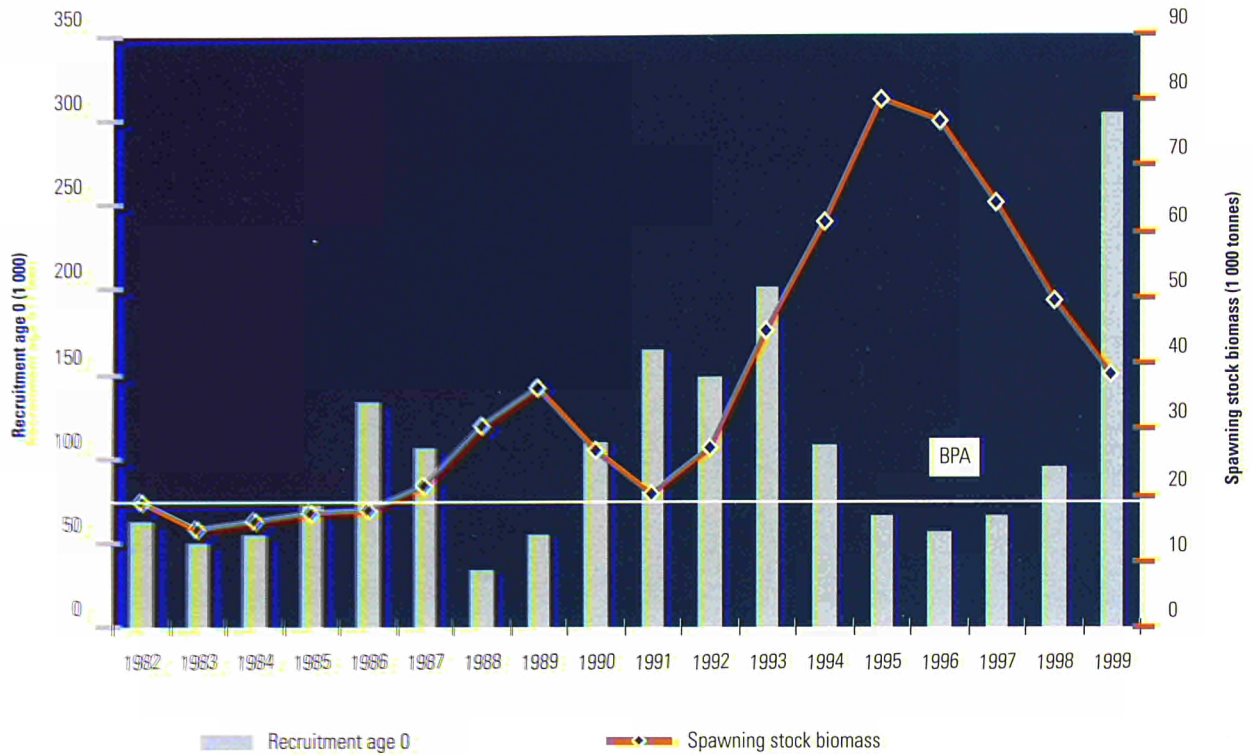


Figure 18

WHL_VIIe-k

Recruitment age 0 and SSB



Landings and fishing mortality, age 2-5

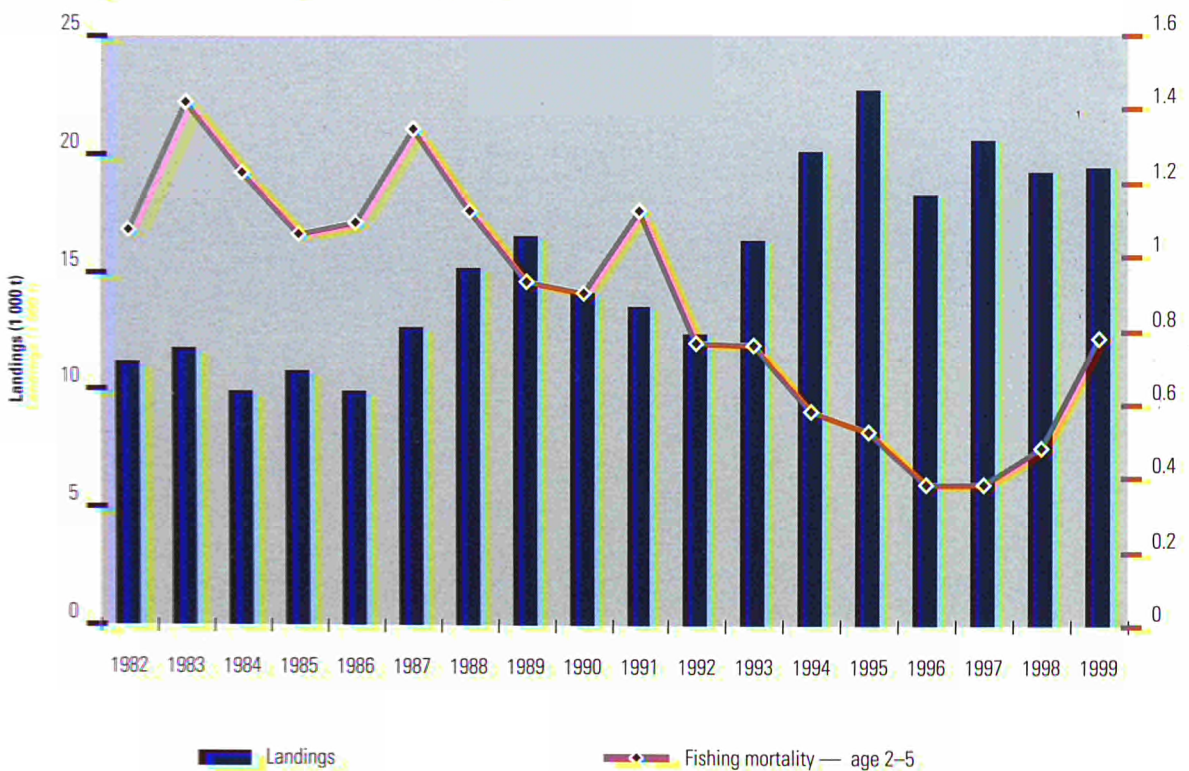
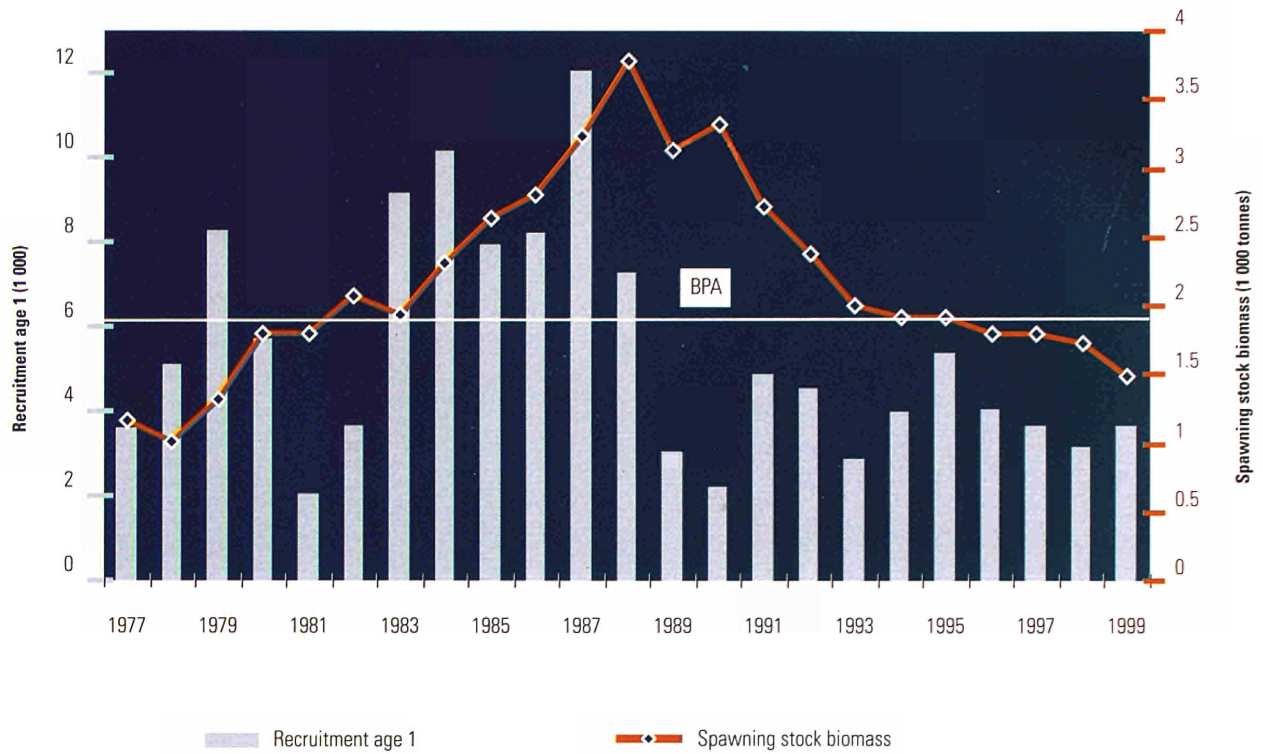


Figure 19

Plaice VII f,g

Recruitment age 1 and SSB



Landings and fishing mortality, age 2-4

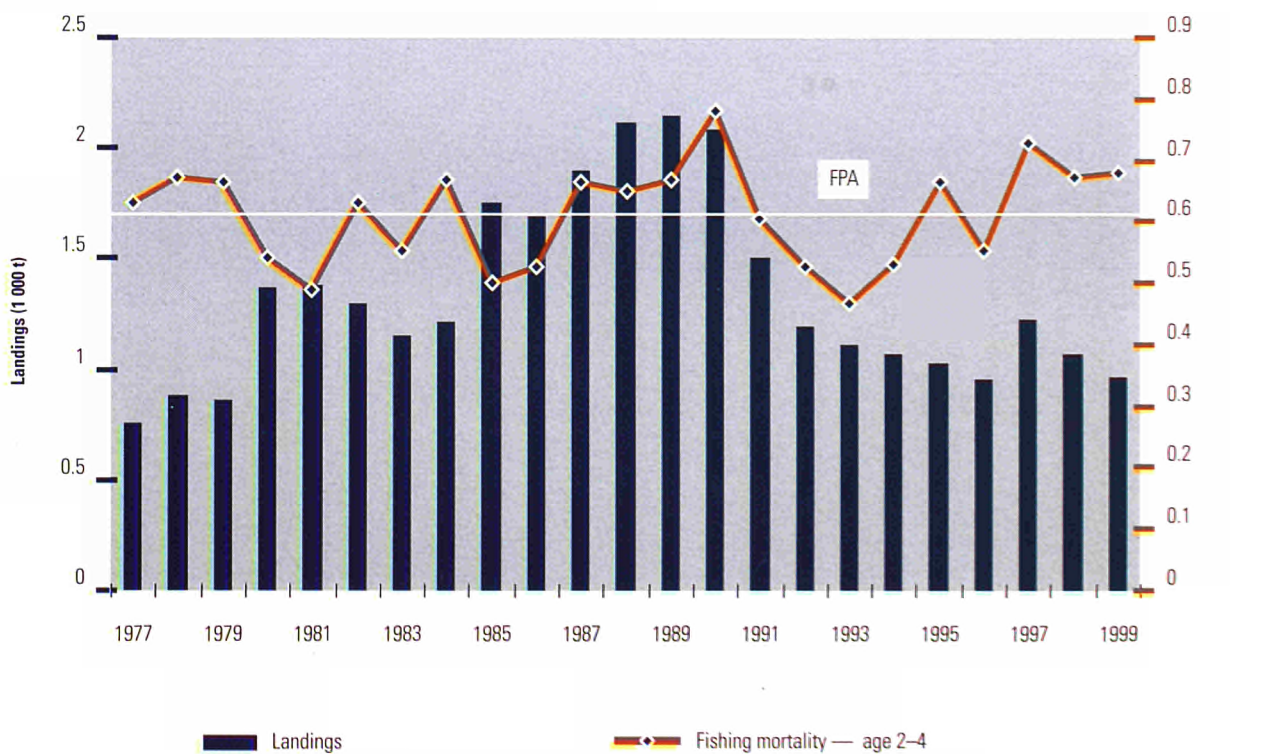
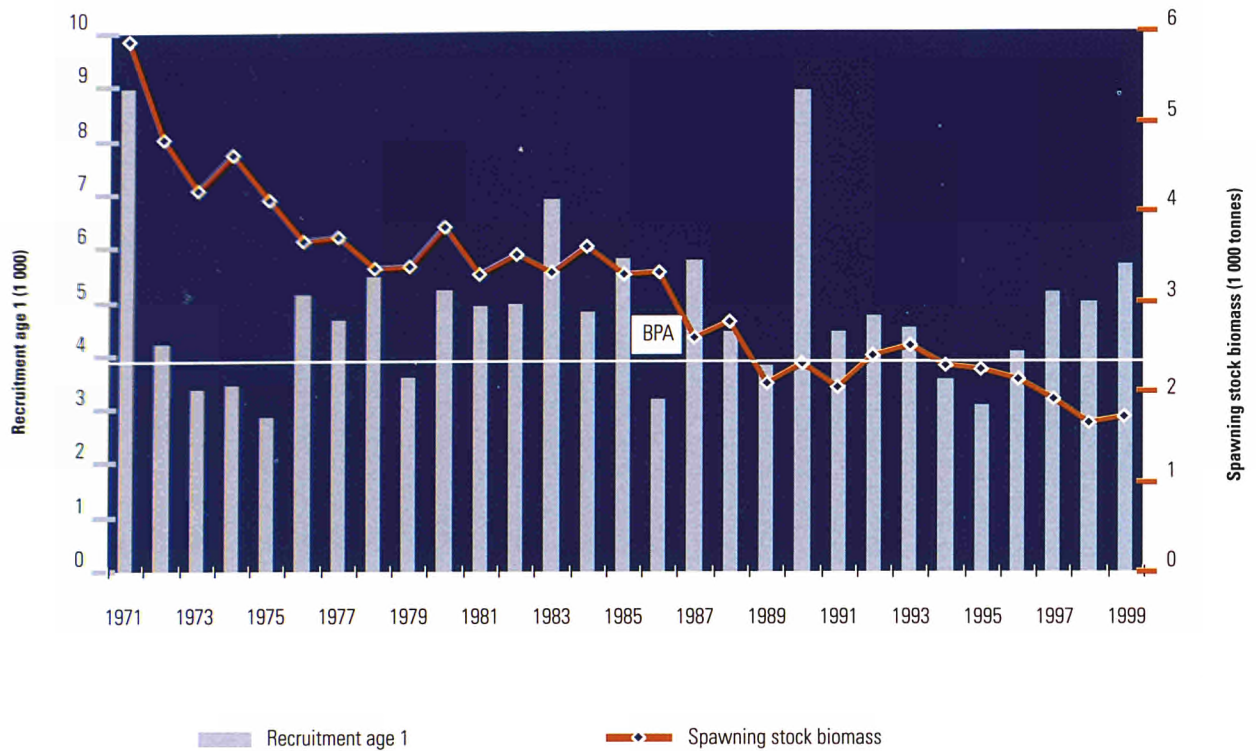


Figure 20

Sole VII f,g

Recruitment age 1 and SSB



Landings and fishing mortality, age 4-8

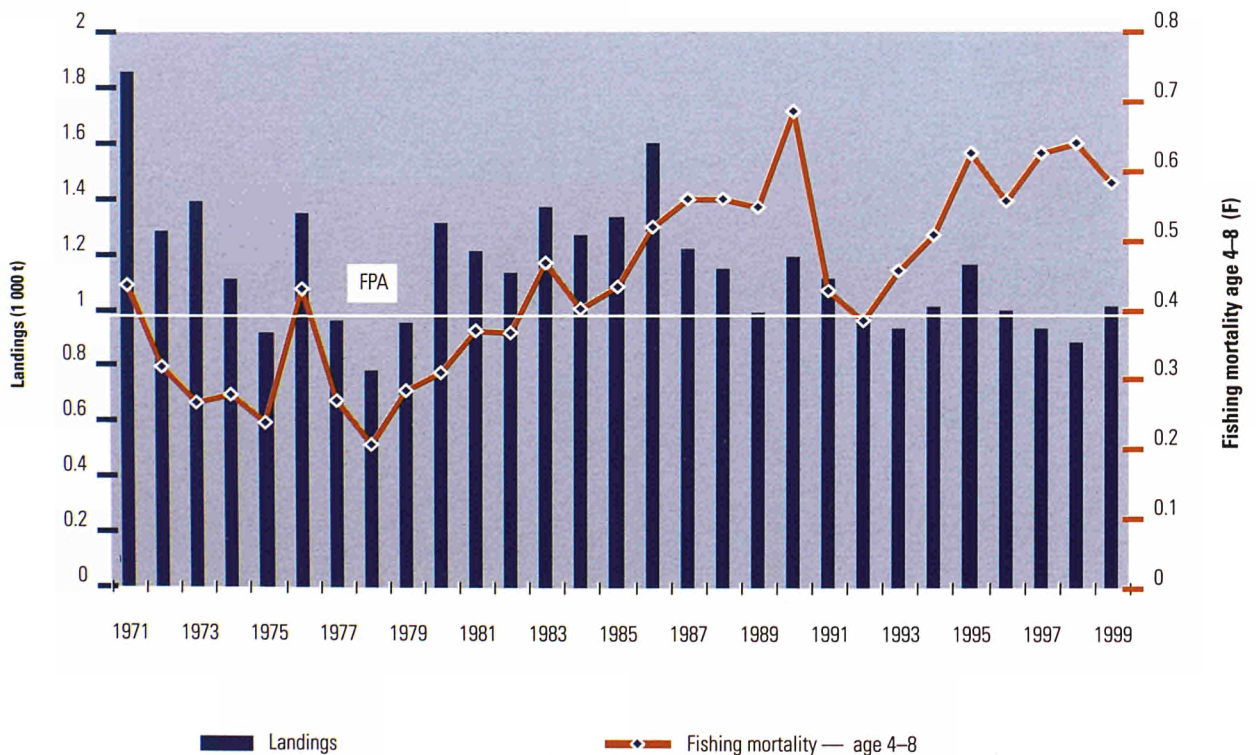
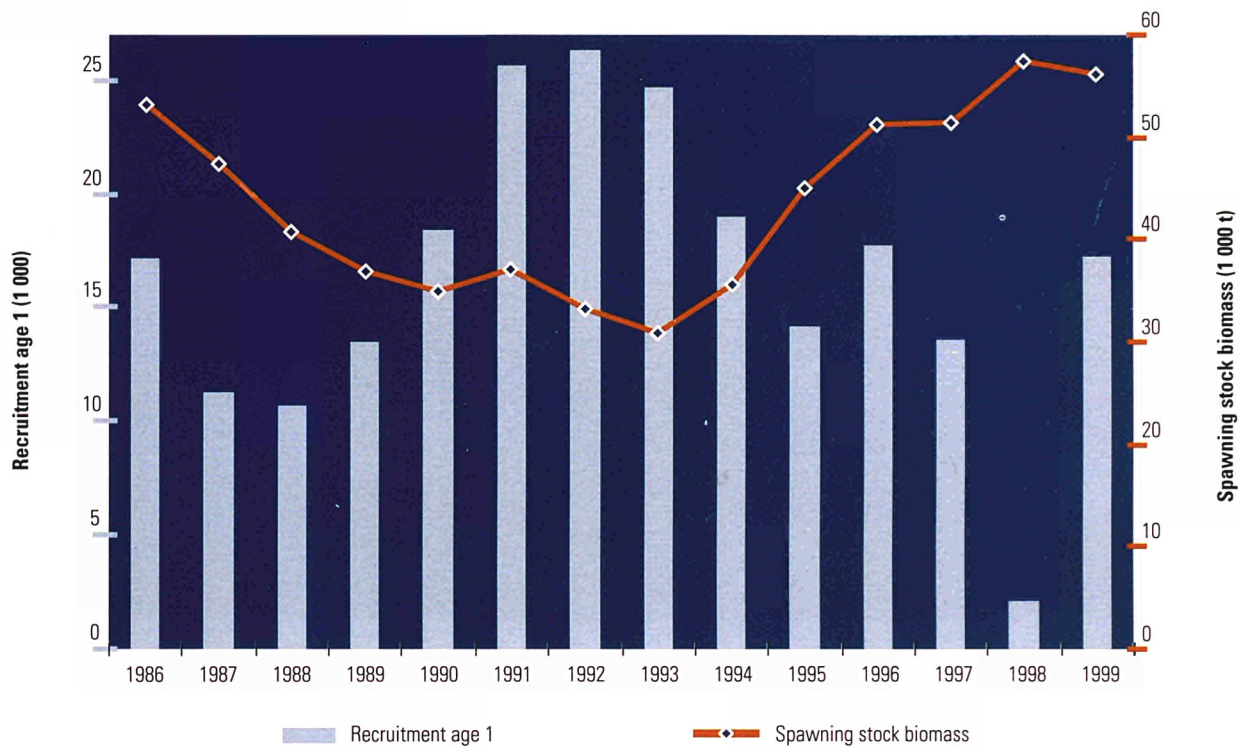


Figure 21

Anglerfish VIIb-k, VIIIab

Recruitment age 1 and SSB



Landings and fishing mortality age 3-8

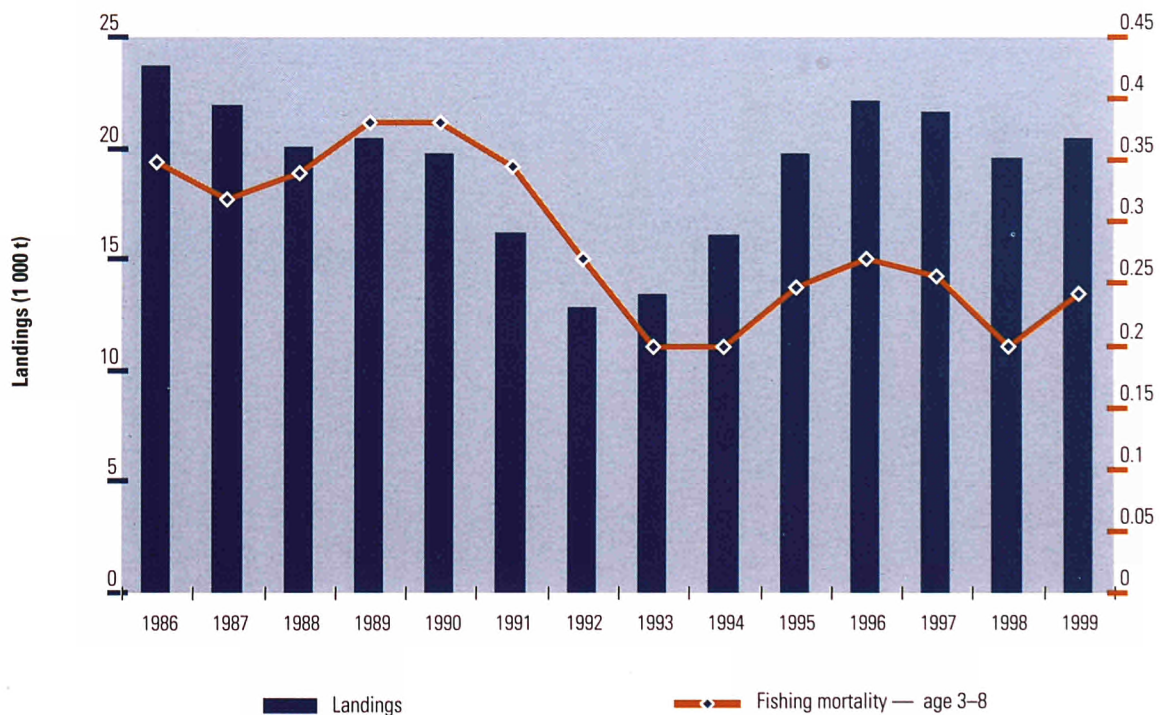
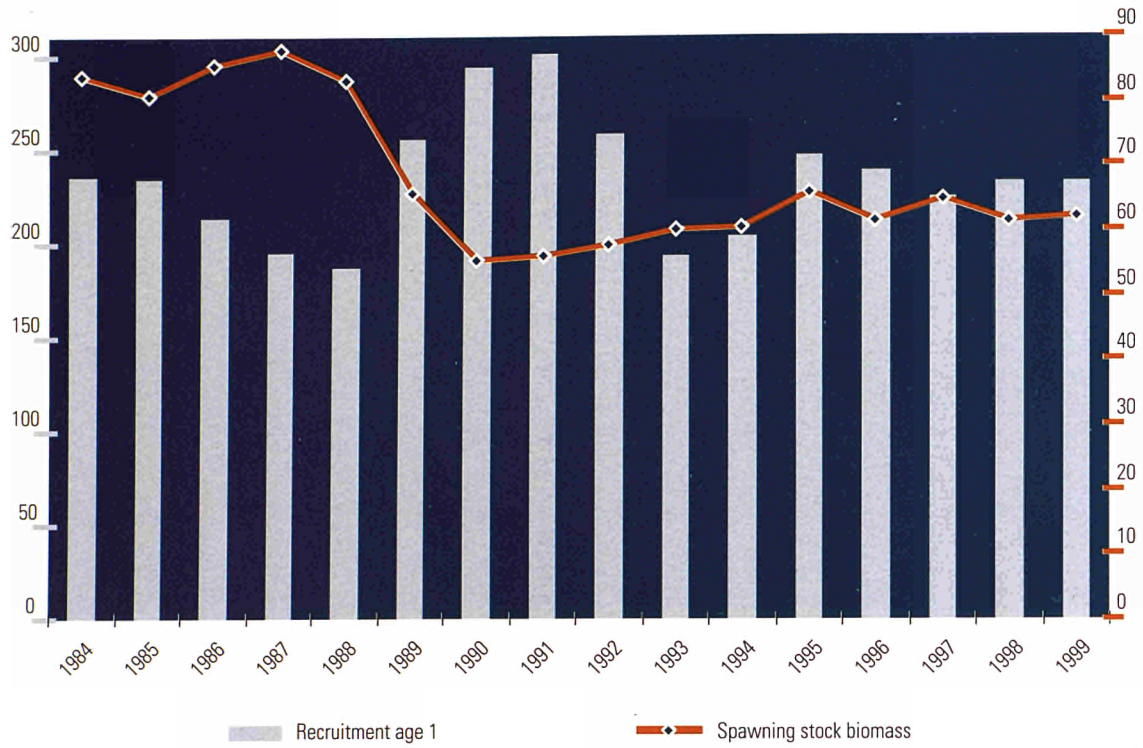


Figure 22

Megrim VIII a,b

Recruitment age 1 and SSB



Landings and fishing mortality age 3-6

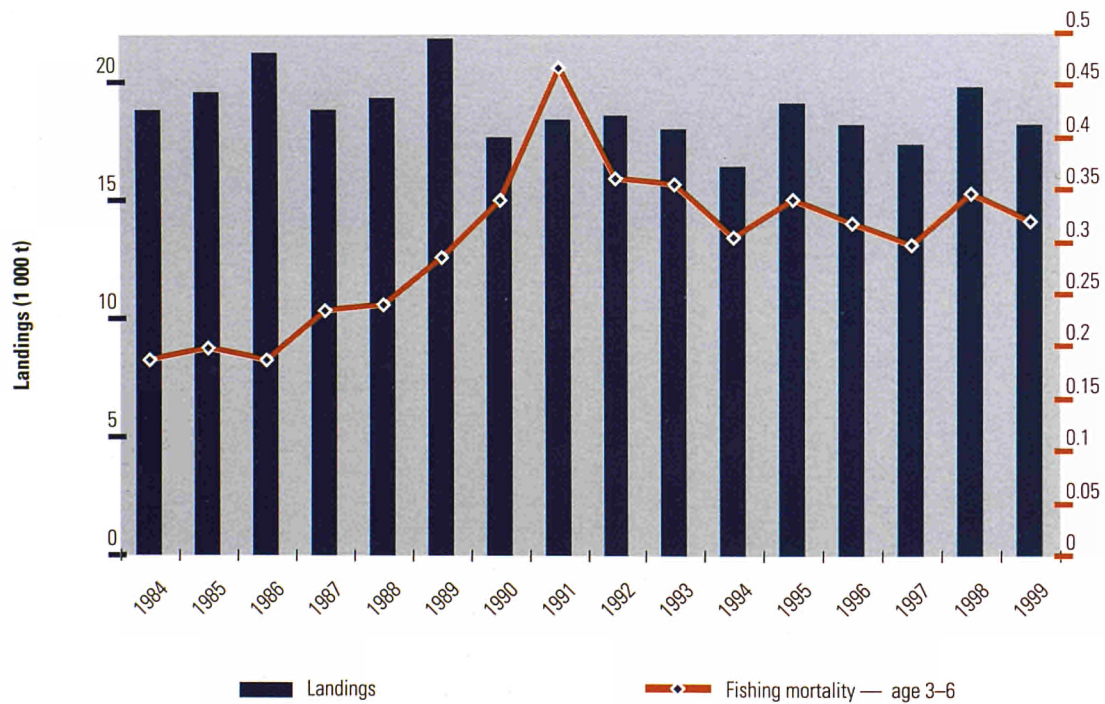
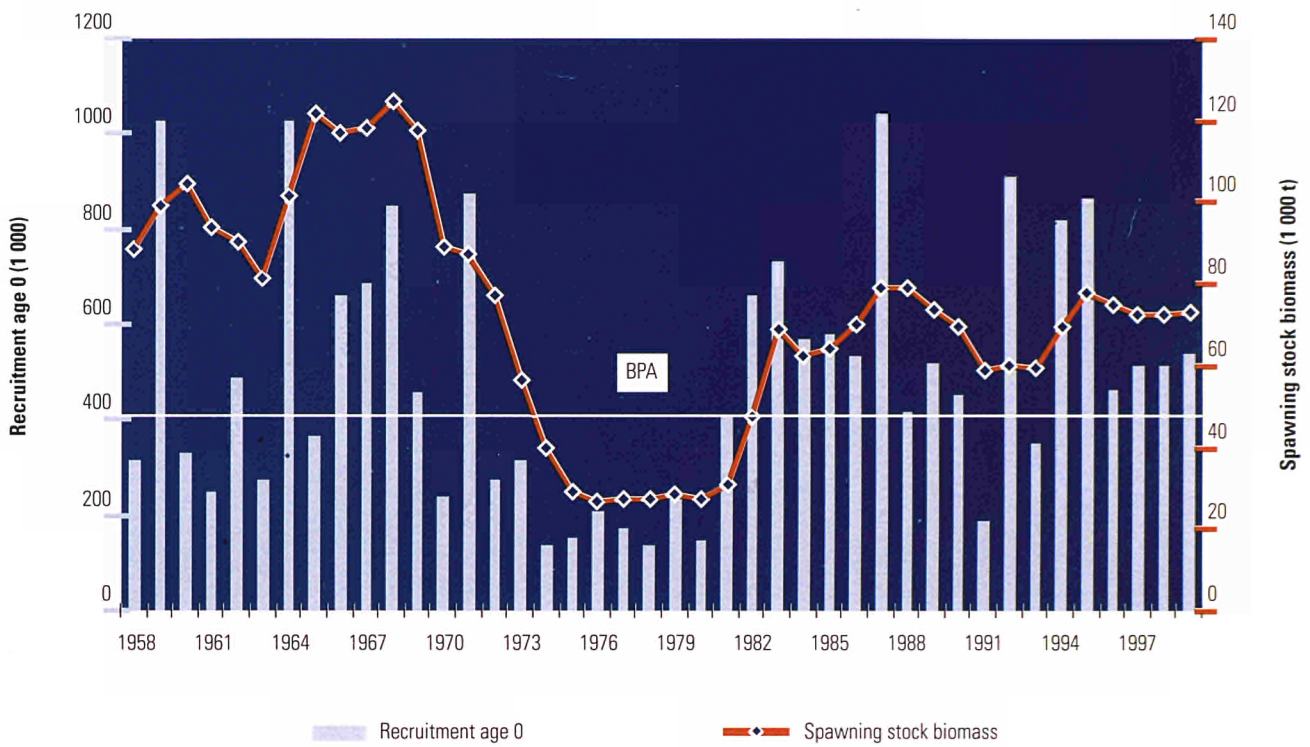


Figure 23

Herring Celtic Sea and VIIj

Recruitment age 0 and SSB



Landings and fishing mortality age 2-7

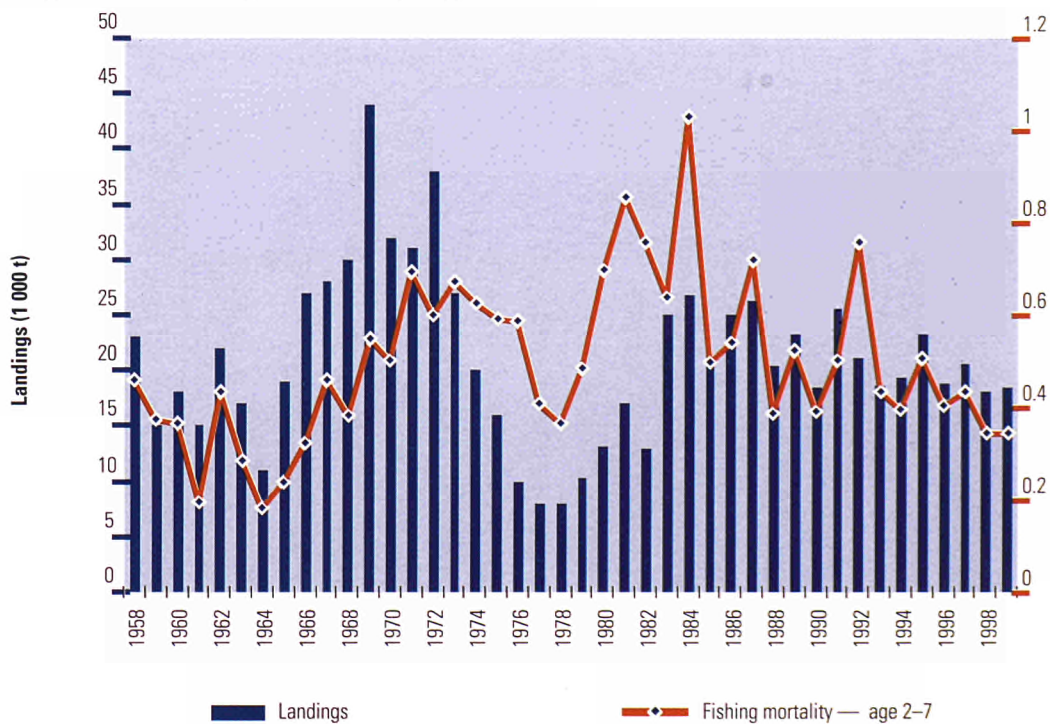
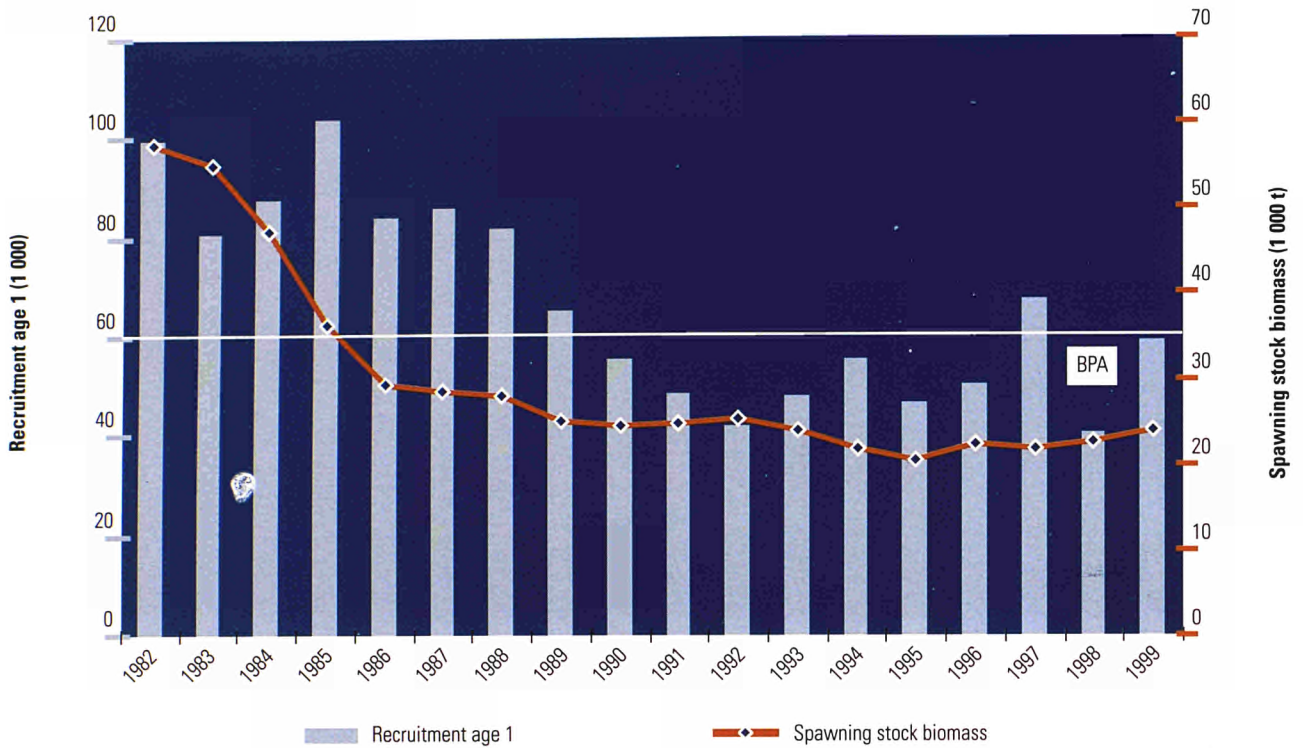


Figure 24

HAKE_Southern Stock

Recruitment age 1 and SSB



Landings and fishing mortality age 2-5

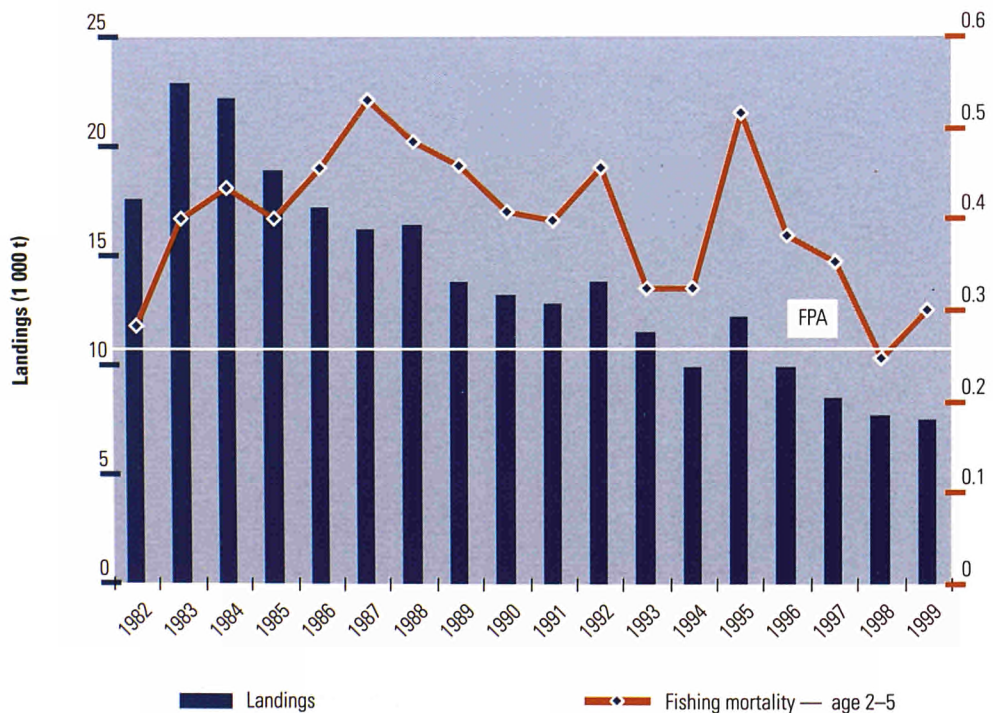
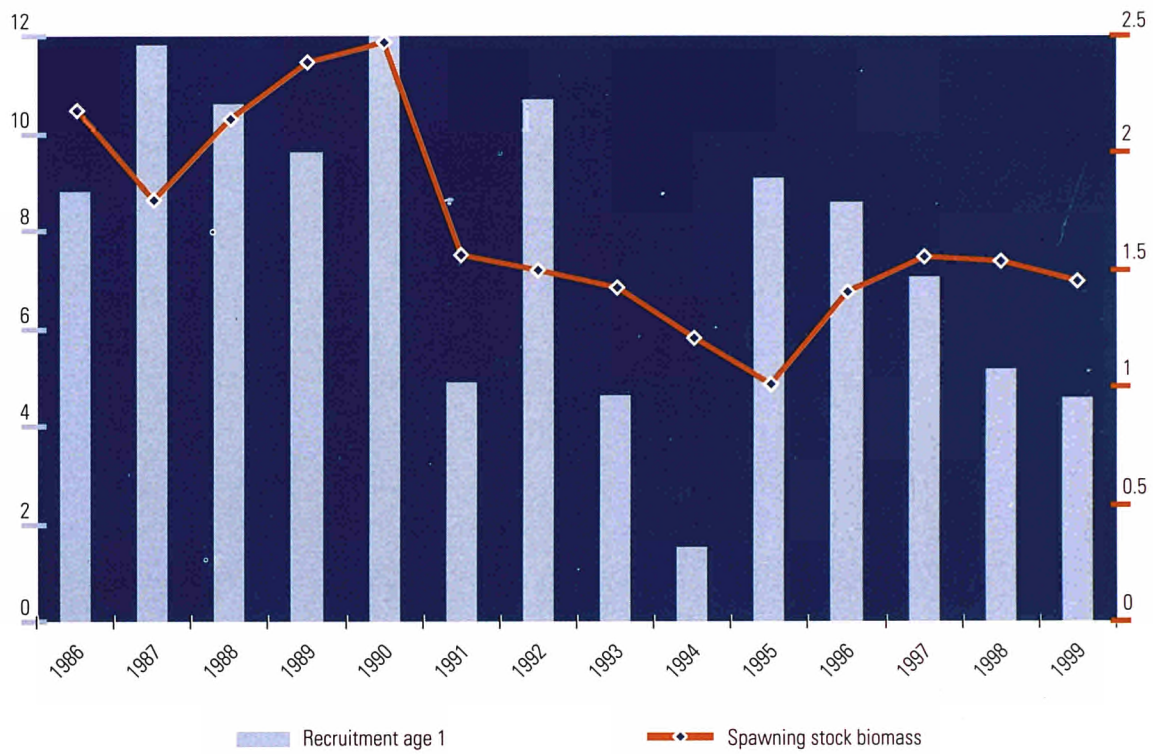


Figure 25

Megrim VIIc and Xa

Recruitment age 1 and SSB



Landings and fishing mortality age 2-4

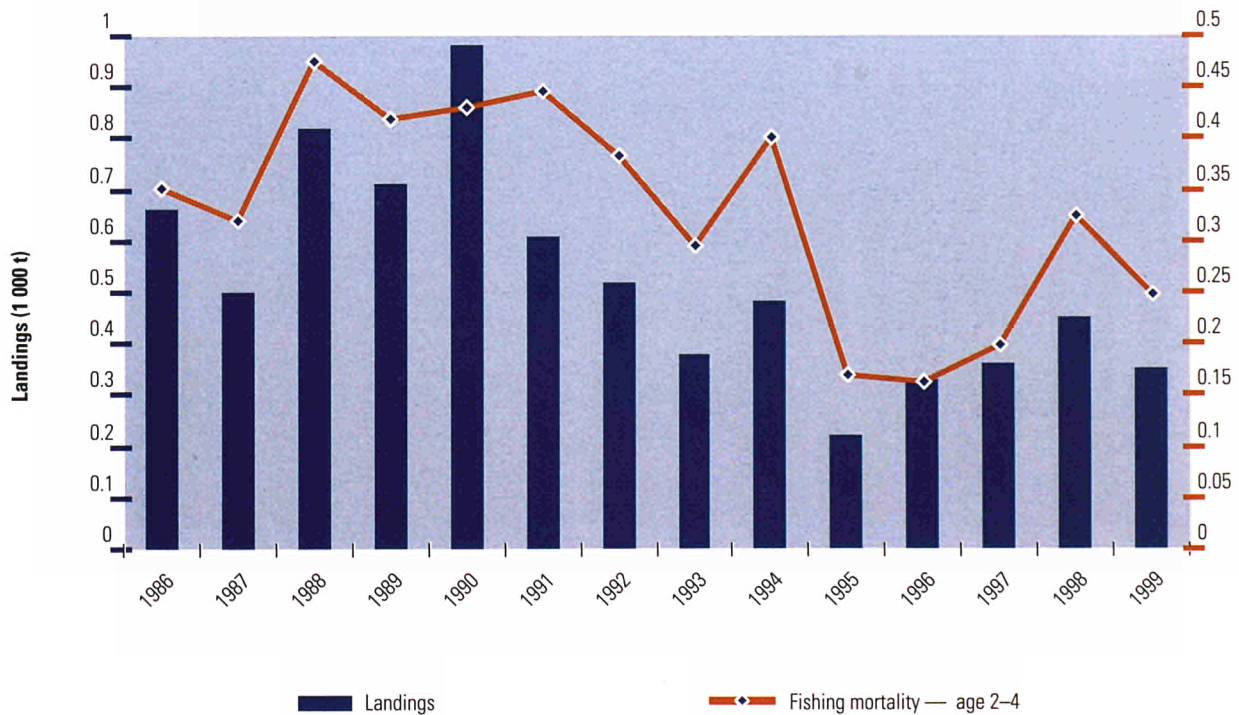
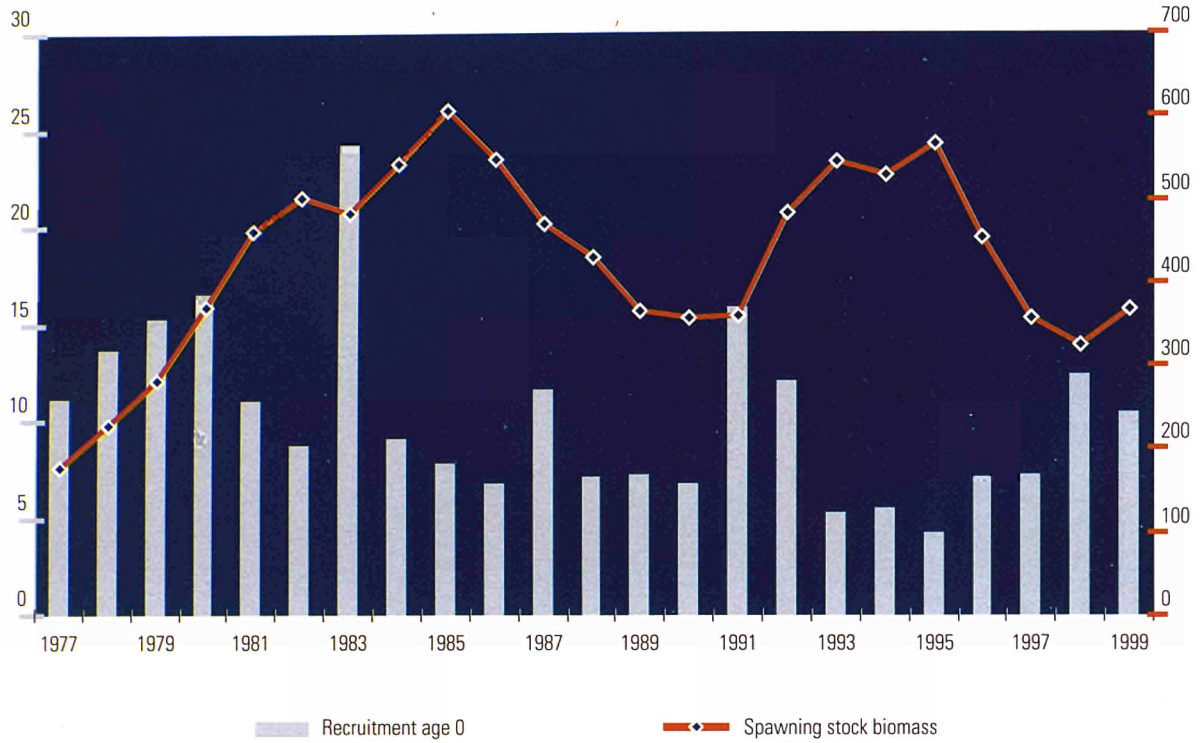


Figure 26

SARDINE VIIIc IXa

Recruitment age 0 and SSB



Landings and fishing mortality age 2-5

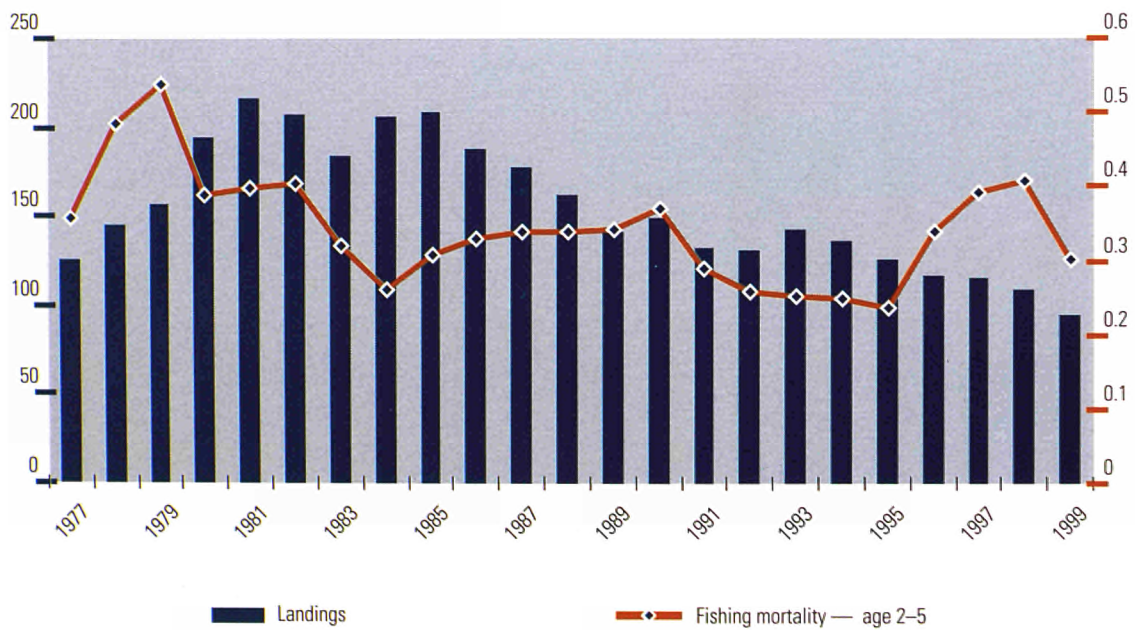
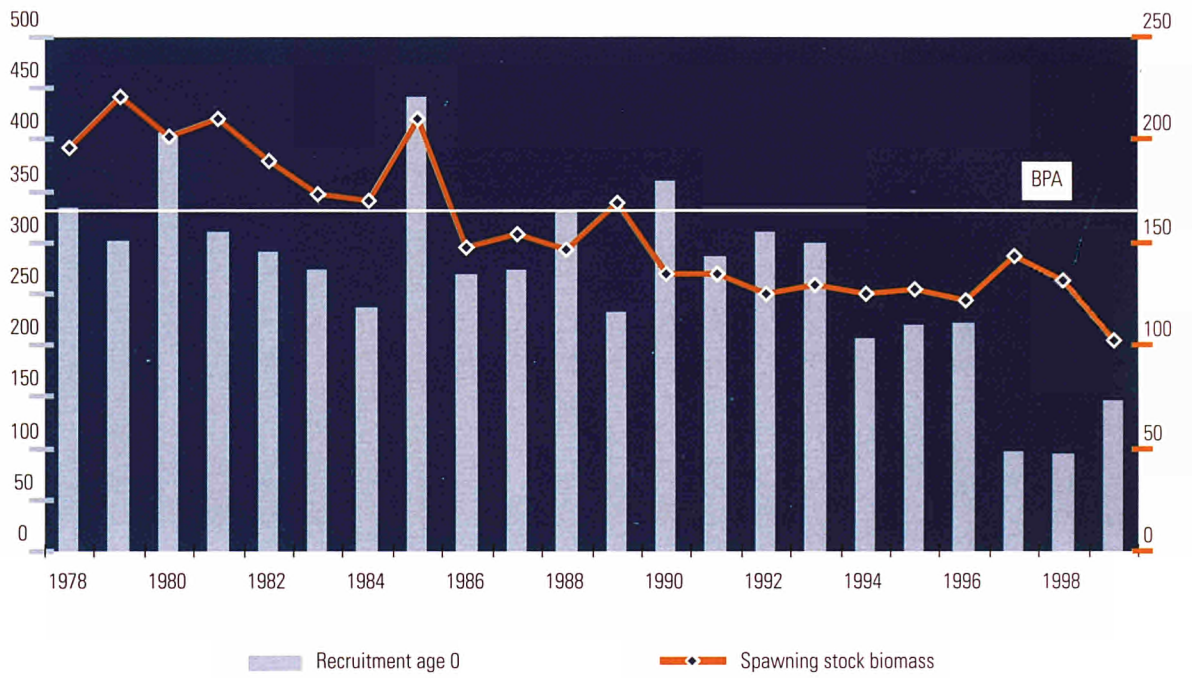


Figure 27

Hake in Northern Area (IIIa, IVa, VII, VIIIab)

Recruitment age 0 and SSB



Landings and fishing mortality age 2-6

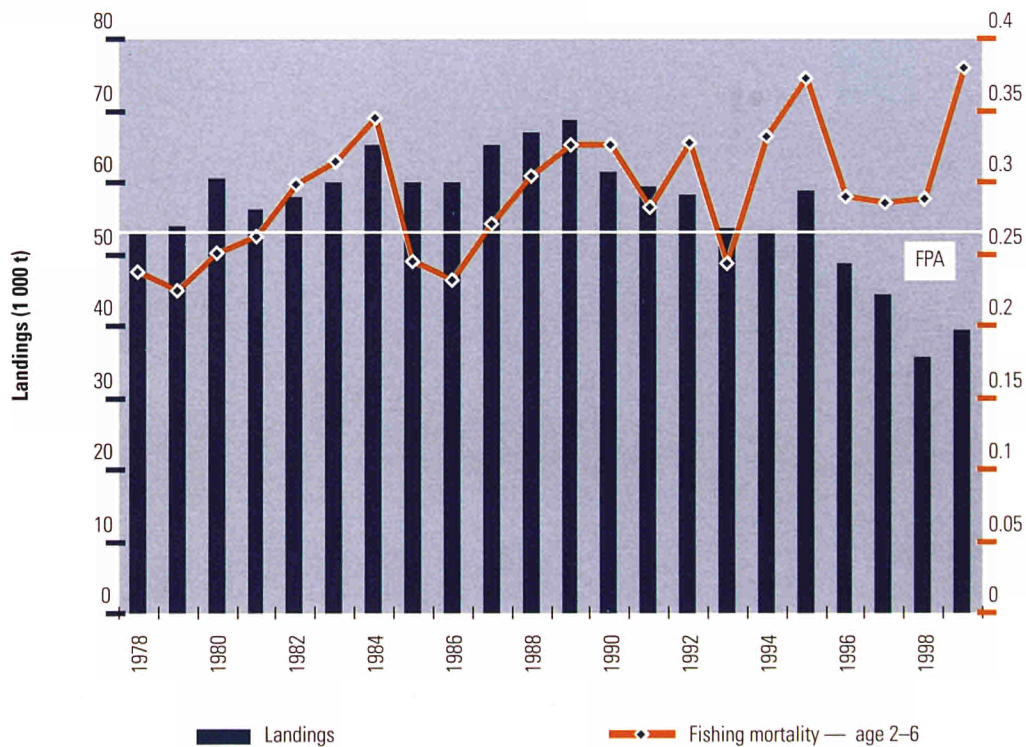
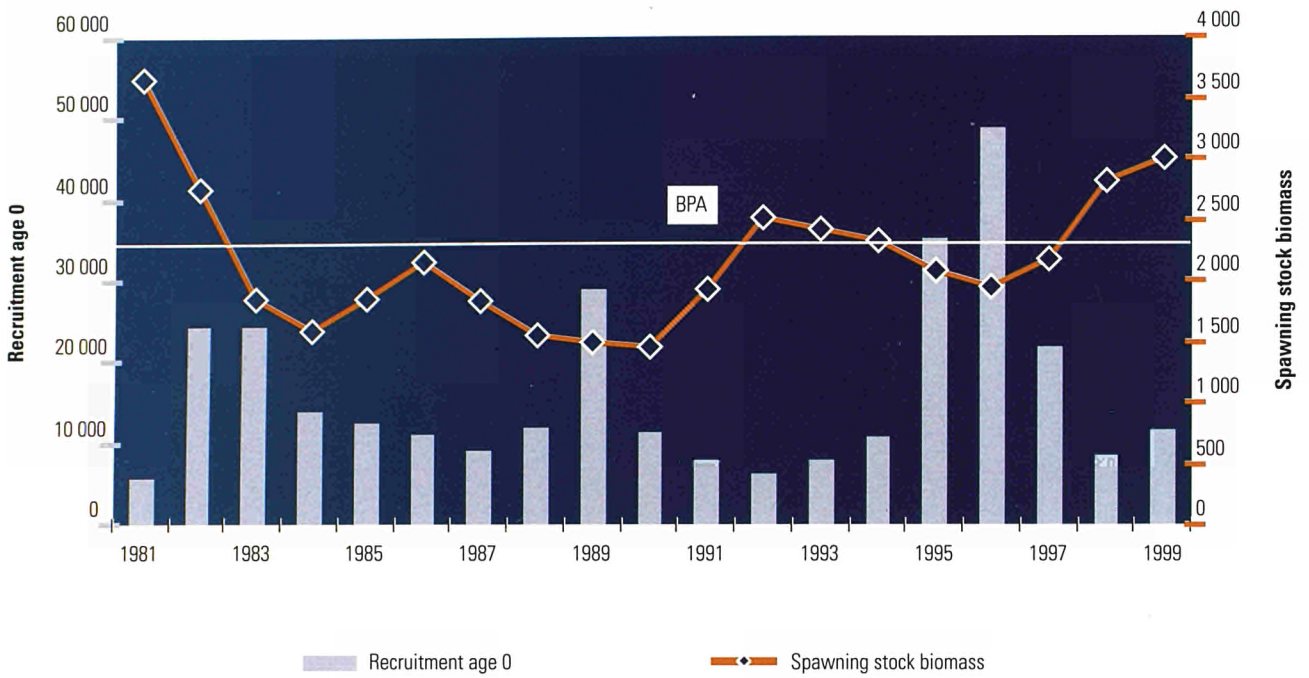


Figure 28

Blue Whiting (I-IX, XII, XIV)

Recruitment age 0 and SSB



Landings and fishing mortality age 3-7

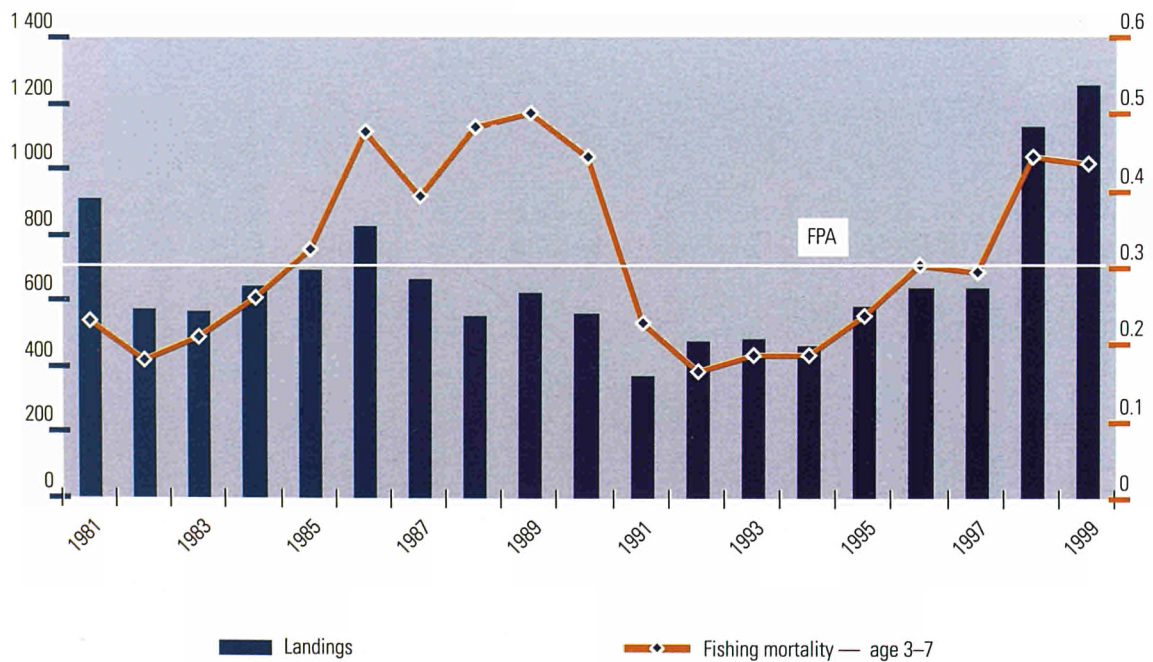
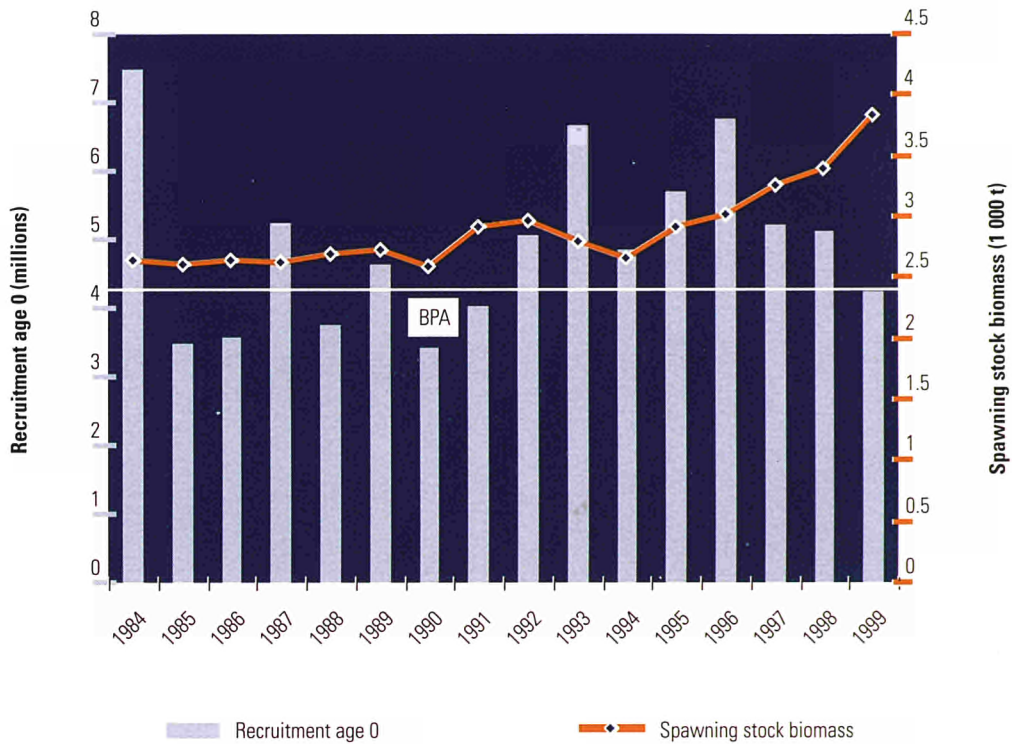


Figure 29

Mackerel Age 0 and SSB

Recruitment age 0 and SSB



Landings and fishing mortality age 4-8

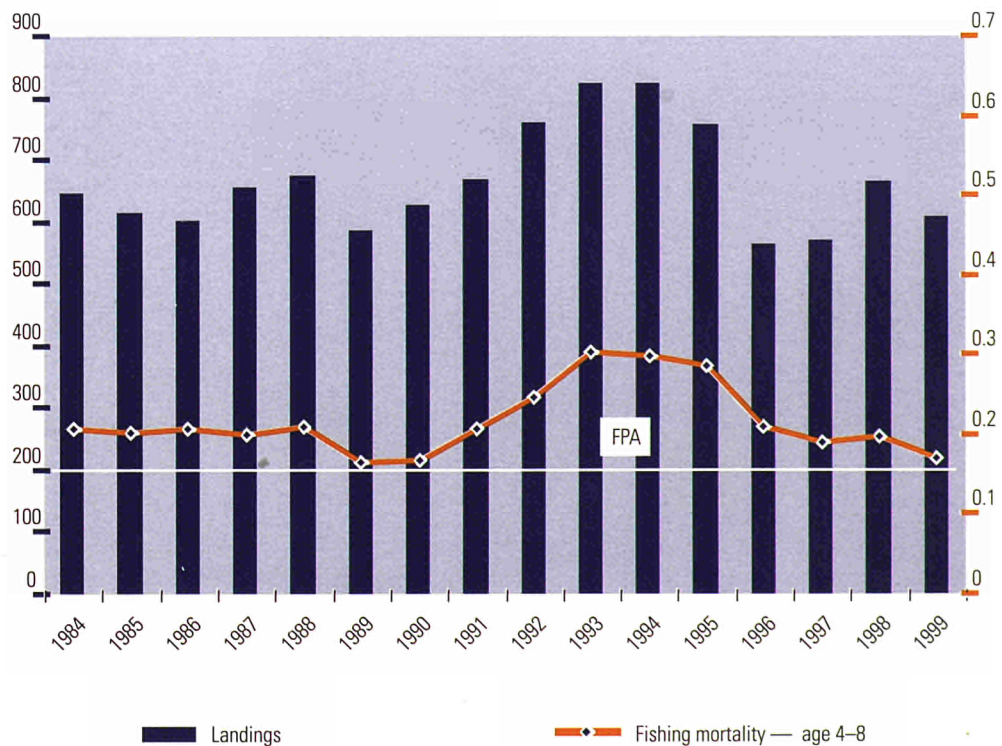
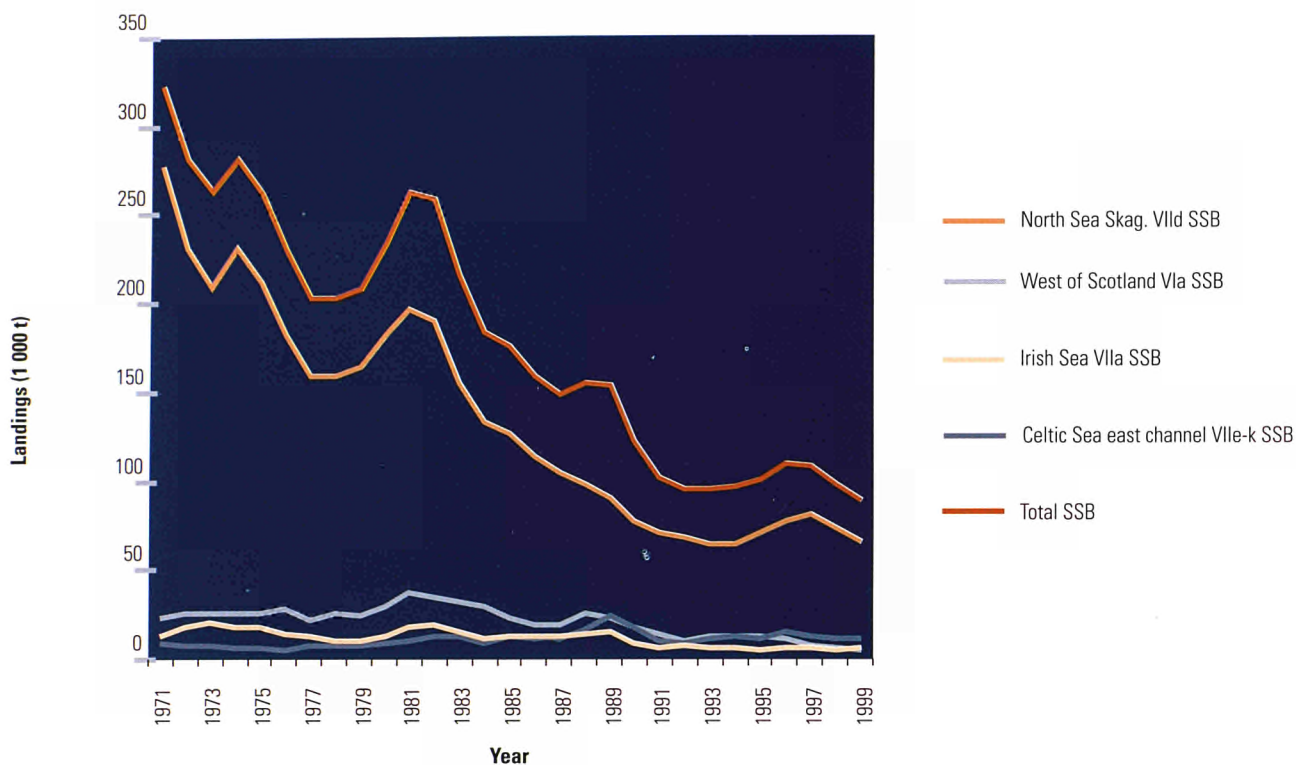


Figure 30

Development of total SSB for all cod stocks in EU waters except the Baltic area



Development of landings for all cod stocks in EU waters except the Baltic area

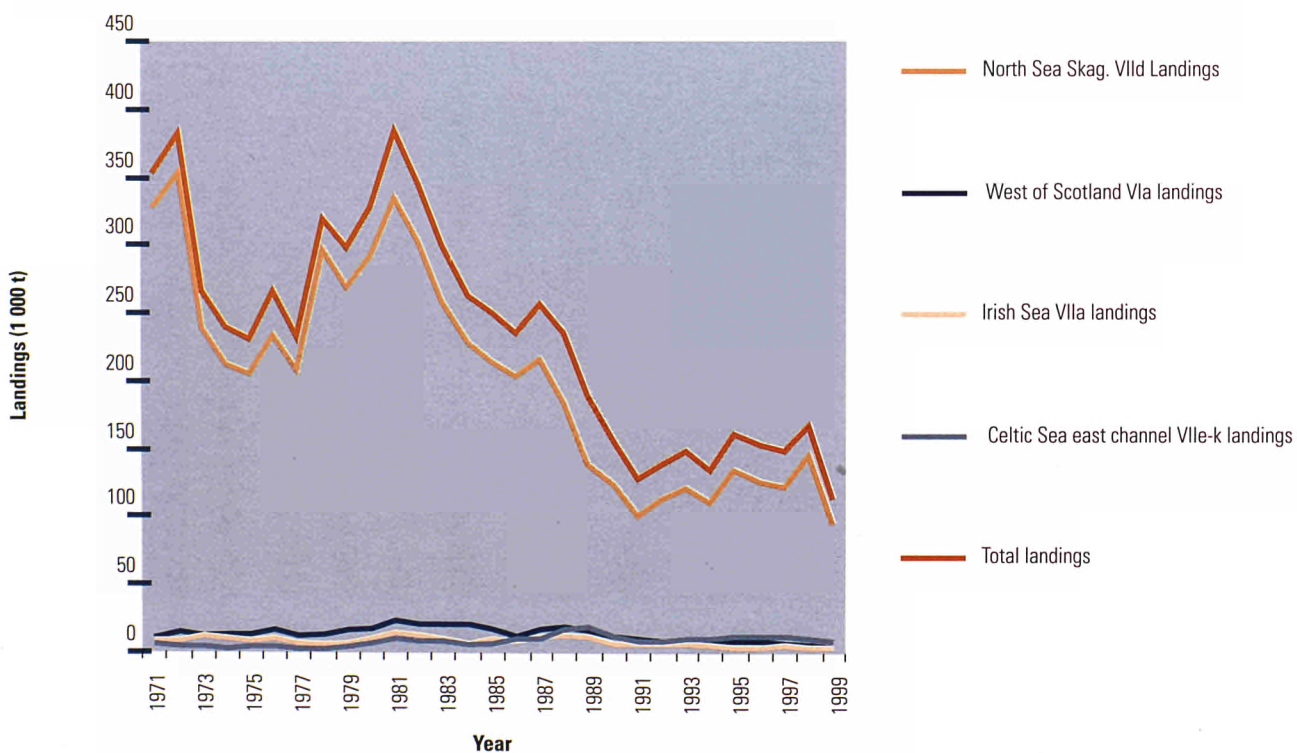
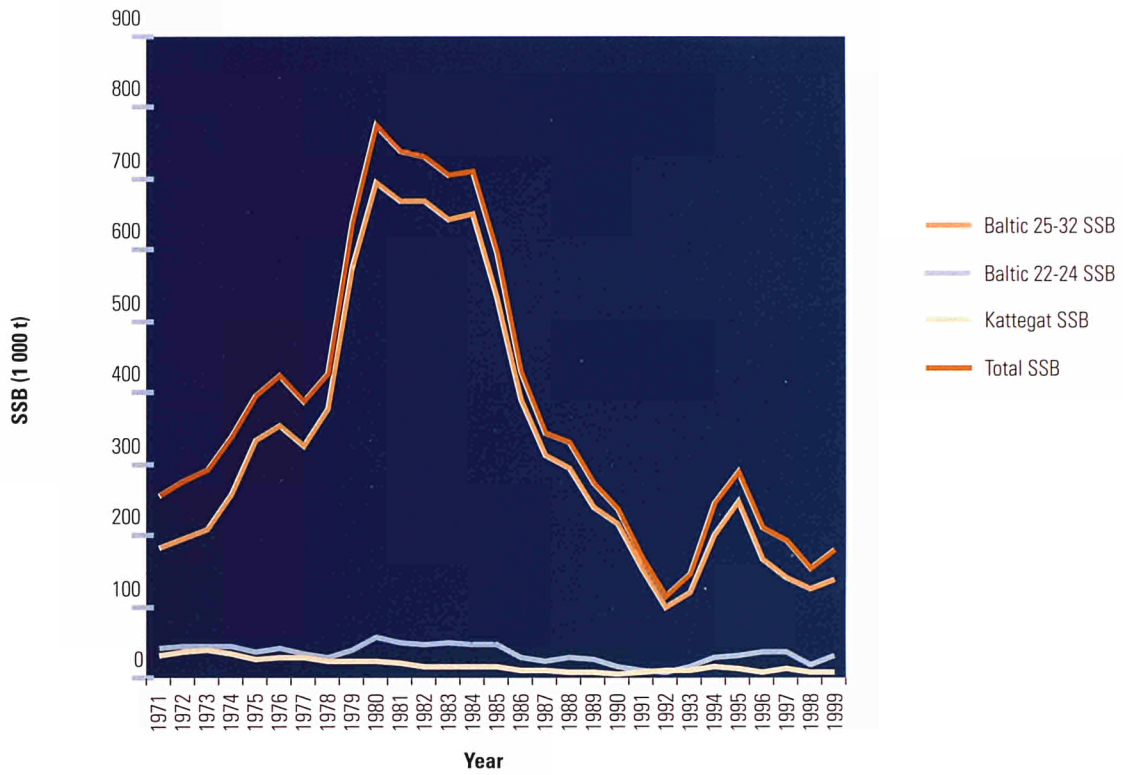


Figure 31

Development of the SSB for cod stocks in the Baltic and Kattegat



Development of landings for cod stocks in the Baltic and Kattegat

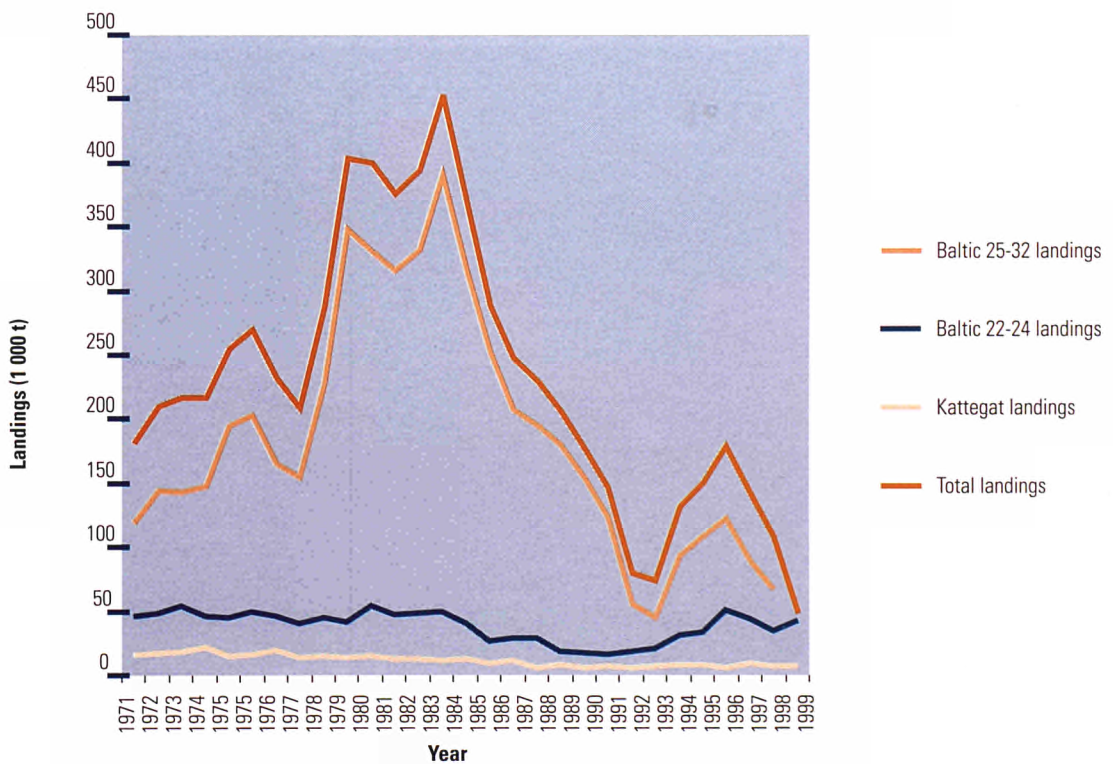
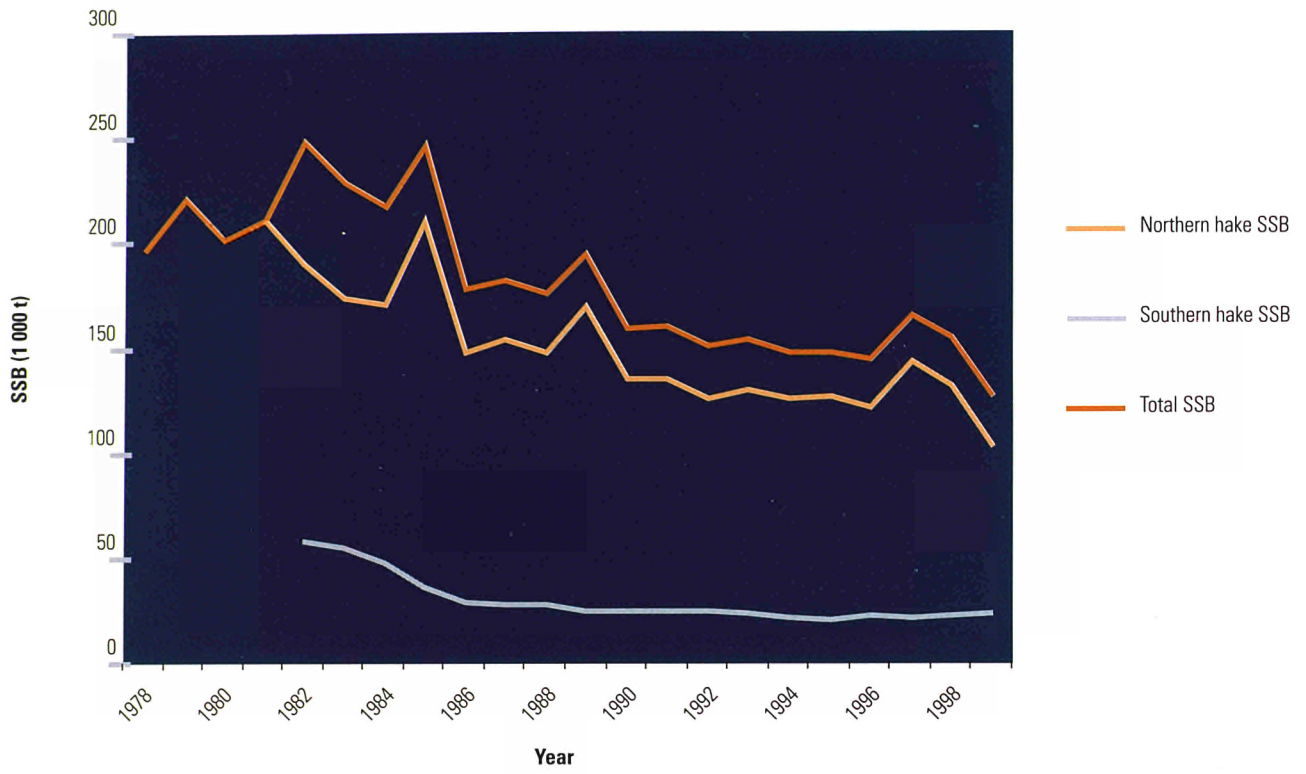


Figure 32

Development of the SSB for northern and southern hake



Development of landings for northern and southern hake

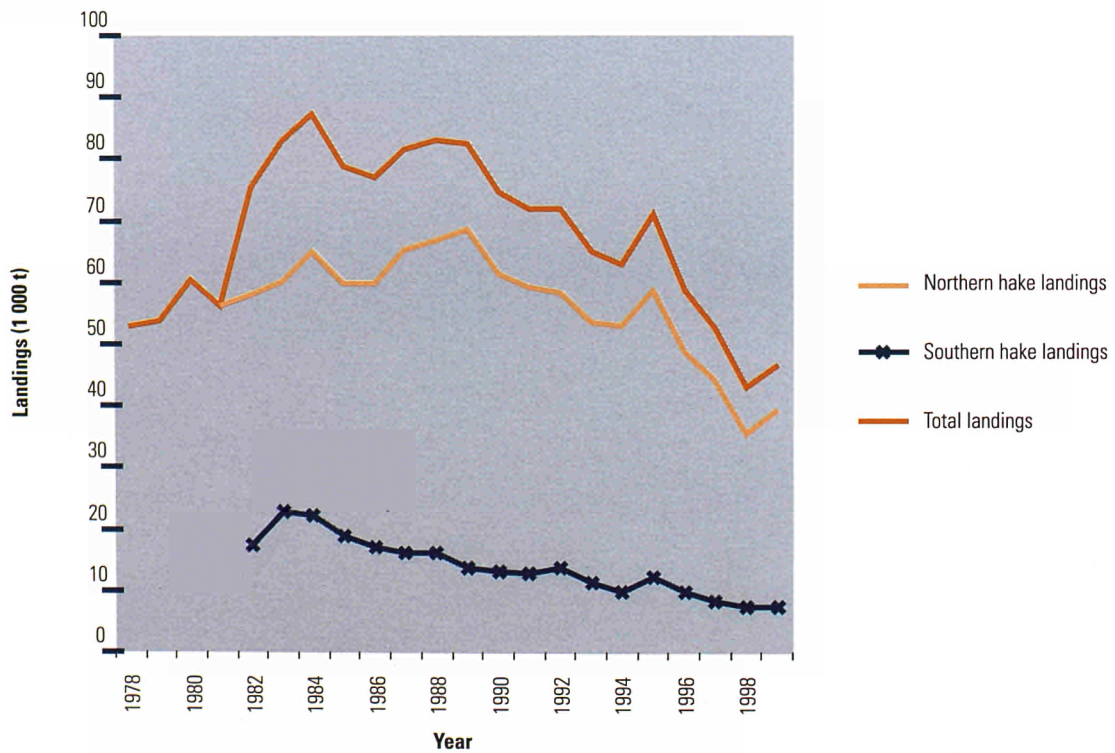
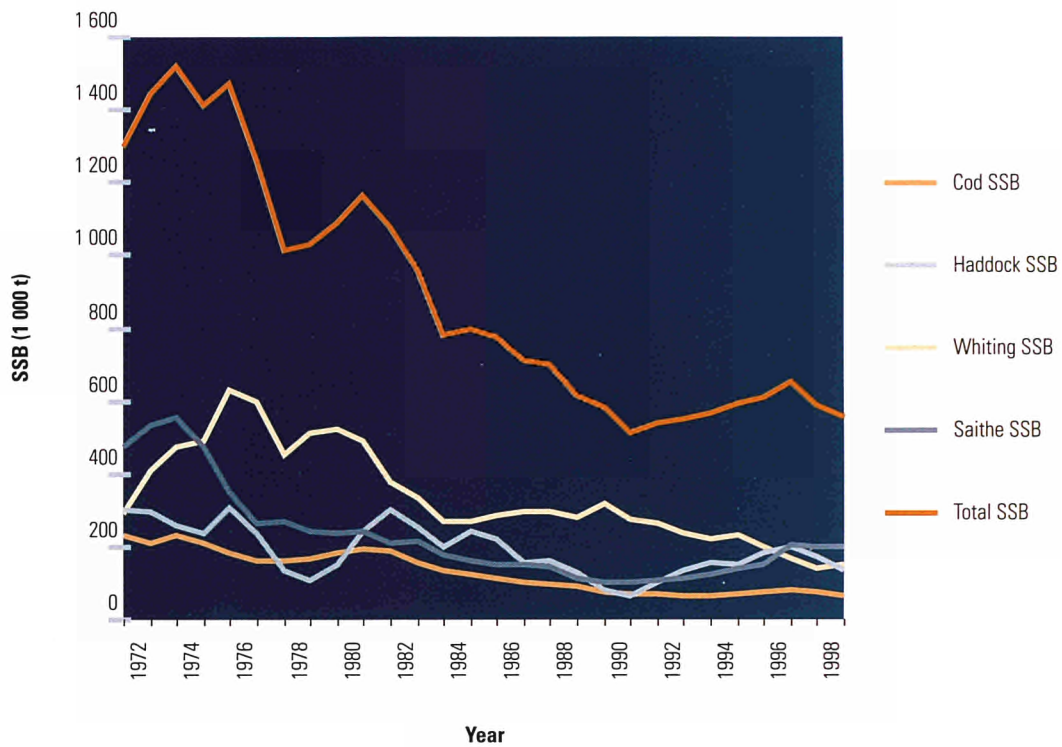


Figure 33

Total SSB of cod, haddock, whiting and saithe for each stock in the North Sea, Skagerrak and Eastern Channel



Total and individual landings of cod, haddock, whiting and saithe from the North Sea, Skagerrak and Eastern Channel

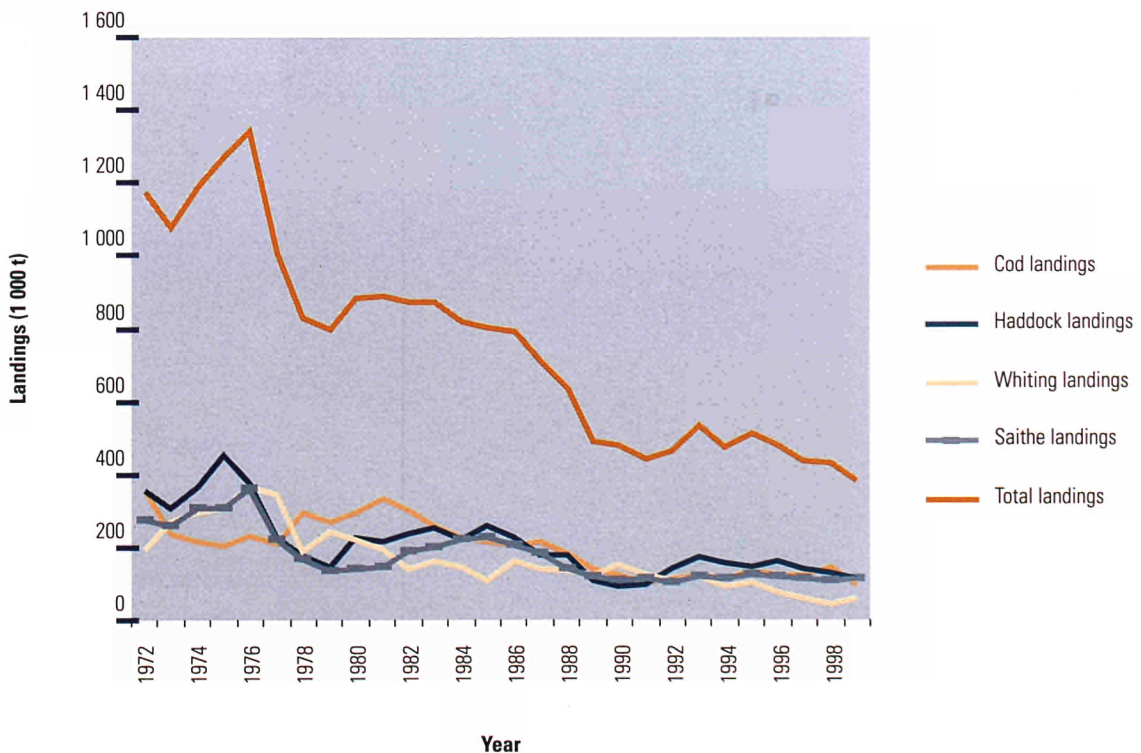
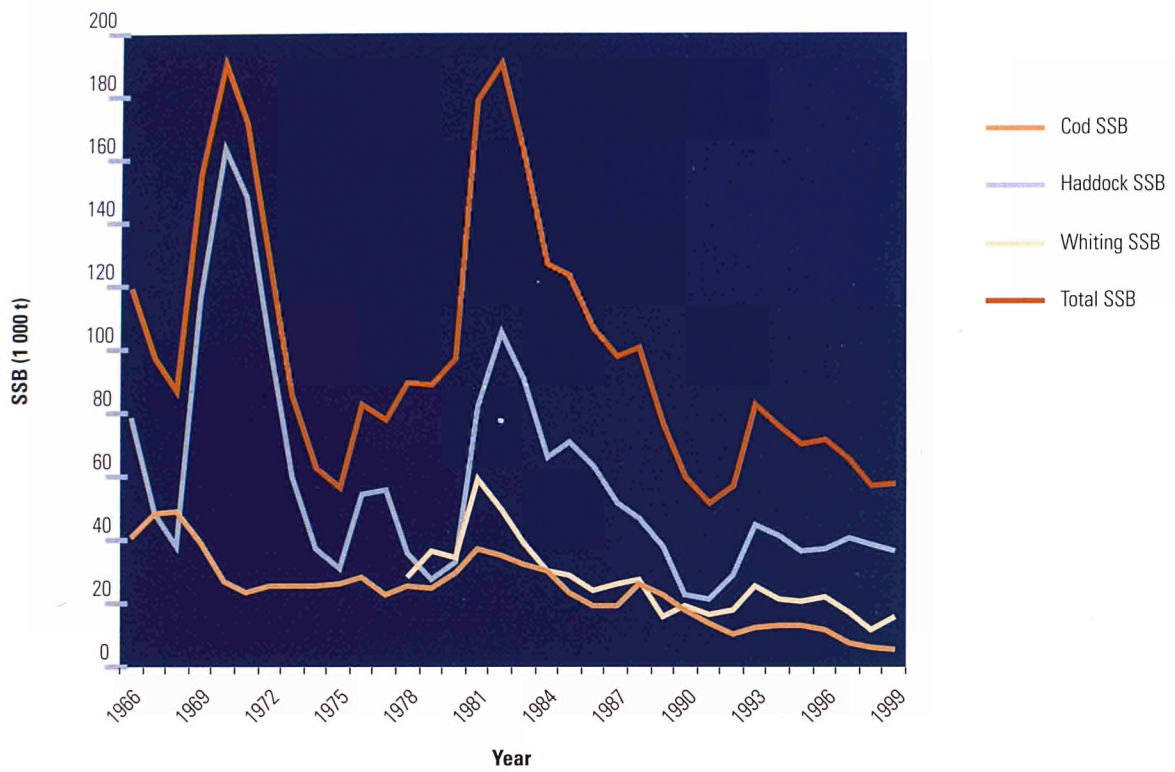


Figure 34

Development of SSB for cod, haddock and whiting from west of Scotland



Development of landings of cod, haddock, whiting from west of Scotland

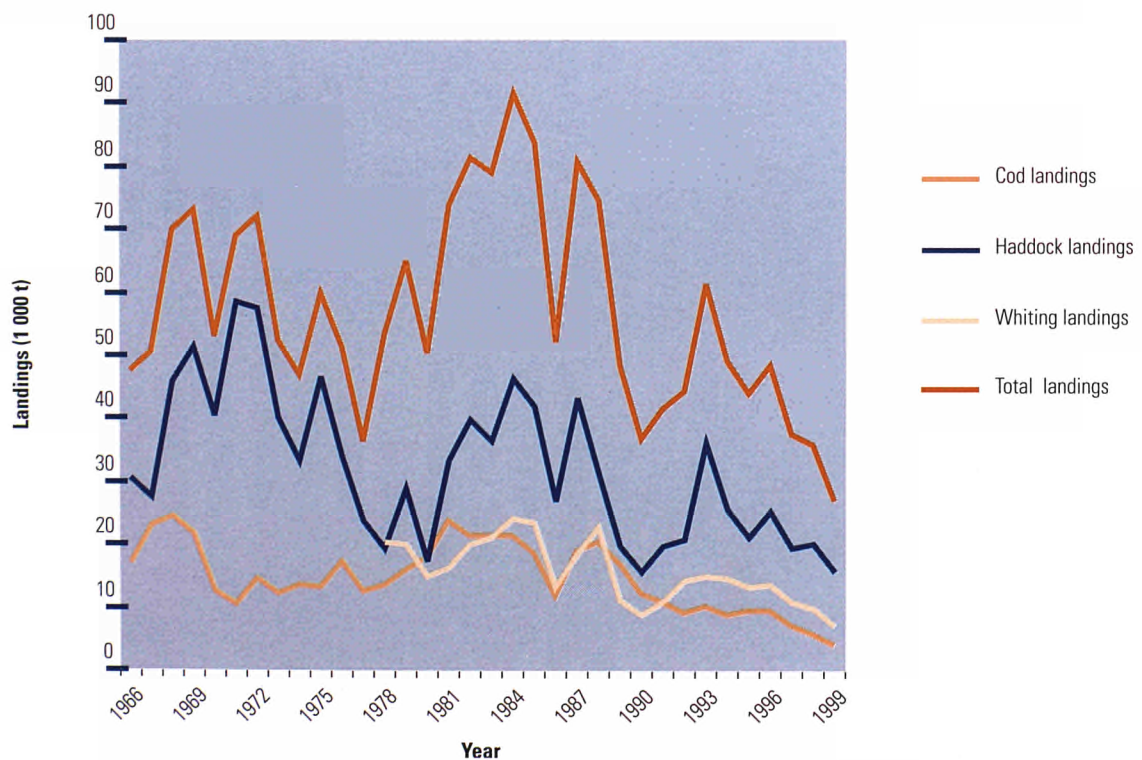
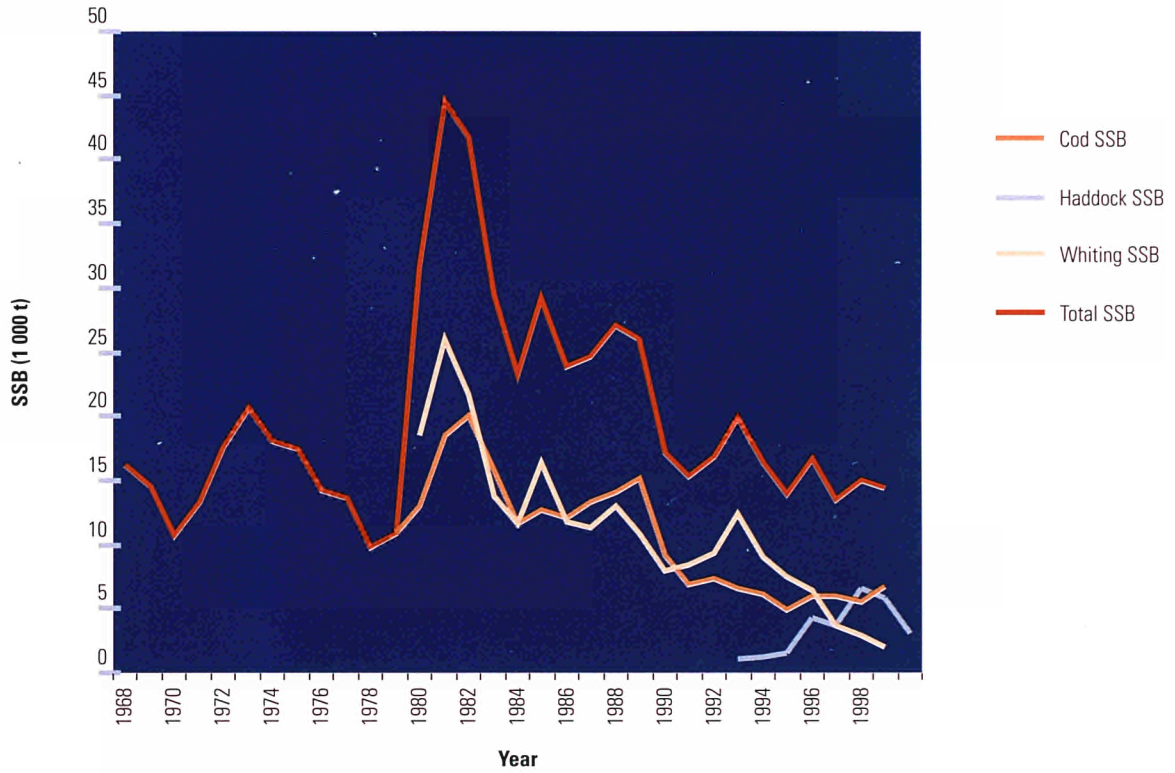


Figure 35

Development of the SSB of cod, haddock and whiting from the Irish Sea



Development of landings of cod, haddock and whiting from the Irish Sea

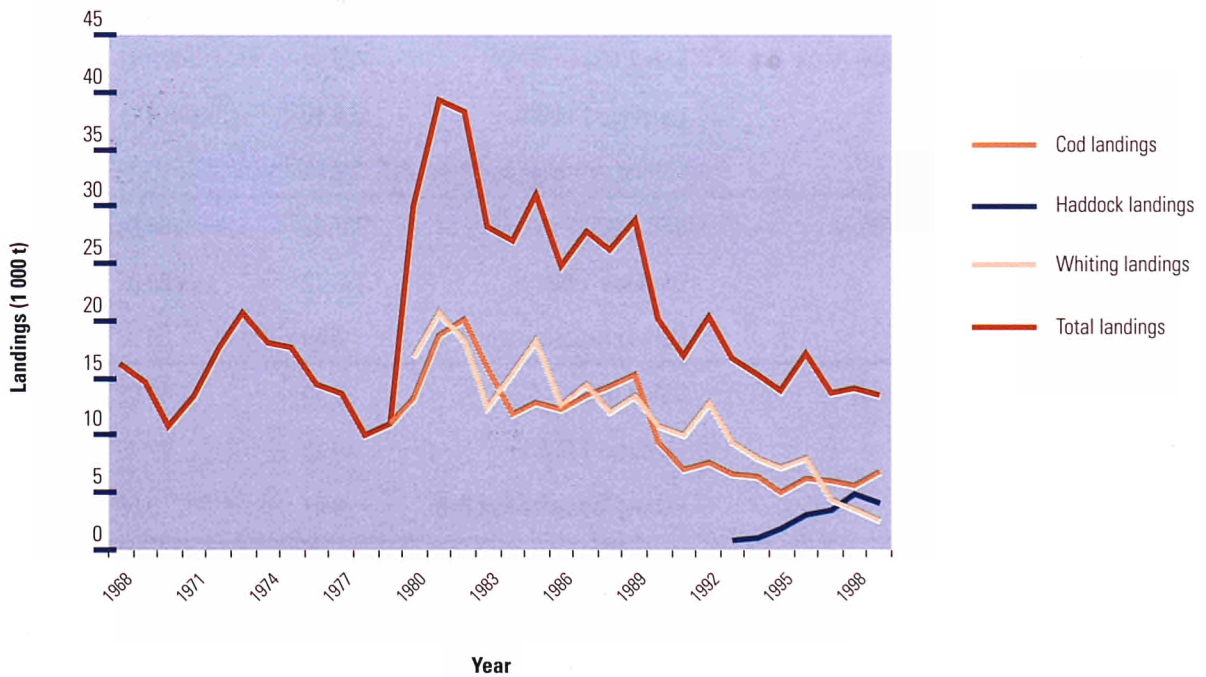


Table 1

Relative changes in SSB, landings and fishing mortality between time periods

		Demersal stocks (Roundfish, flatfish, stocks, etc.)			Pelagic stocks (Herring, sprat, mackerel, etc.)						
Area	Stock		Average for period(s)		Difference (%)	Stock	Average for period(s)		Difference (%)		
			1978-82	1995-99			1978-82	1995-99			
Baltic Sea	COD SD 25-32	SSB 1 000 t	596.47	164.00	-72.51	Herring 25-29S, 32	SSB 1 000 t	1494.77	695.82	-53.45	
		Landings 1 000 t	275.22	96.39	-64.98		Landings 1 000 t	291.72	169.54	-41.88	
		Fishing mortality age 4-7	0.65	0.86	31.86		Fishing mortality age 4-7	0.17	0.29	70.59	
	North Sea div IIIa, VIId	Cod IV Skag. VIId	SSB 1 000 t	178.34	73.97	-58.52	Sprat 22-32	SSB 1 000 t	289.74	1 148.63	296.43
			Landings 1 000 t	299.88	125.76	-58.06		Landings 1 000 t	73.11	408.59	458.87
			Fishing mortality age 2-8	0.79	0.87	10.13		Fishing mortality age 3-5	0.27	0.40	48.15
Haddock IV Skag.		SSB 1 000 t	348.91	186.85	-46.45	Industrial species	Herring IV Div IIIa	SSB 1 000 t	164.46	619.37	276.61
		Landings 1 000 t	308.89	200.95	-34.94			Landings 1 000 t	111.36	394.09	253.89
		Fishing mortality age 2-6	0.84	0.92	9.52			Fishing mortality age 4-7	0.19	0.5	163.16
Whiting IV VIId	SSB 1 000 t	470.53	177.28	-62.32	Sandeel IV		SSB 1 000 t	615.8	1195.8	94.19	
	Landings 1 000 t	197.56	67.96	-65.60			Landings 1 000 t	653.8	911.4	39.40	
	Fishing mortality age 2-6	0.79	0.67	-15.19			Fishing mortality age 3-6	0.70	0.46	-35.00	
Saithe IV div IIIa	SSB 1 000 t	239.14	179.41	-24.98	Norway pout IV	SSB 1 000 t	244.6	239.4	-2.13		
	Landings 1 000 t	156.10	116.11	-25.62		Landings 1 000 t	336	150	-55.36		
	Fishing mortality age 3-6	0.42	0.39	-7.14		Fishing mortality age 2-6	0.99	0.42	-57.32		
Plaice IV	SSB 1 000 t	307.92	208.68	-32.23	Sprat IV	Landings 1 000 t	288.8	189.8	-34.28		
	Landings 1 000 t	138.72	83.05	-40.13							
	Fishing mortality age 2-10	0.40	0.40	0.00							
Sole IV	SSB 1 000 t	36.10	40.62	12.52							
	Landings 1 000 t	19.13	22.46	17.41							
	Fishing mortality age 2-8	0.47	0.58	23.40							
West of Scotland	Cod VIa	SSB 1 000 t	30.49	8.80	-71.14						
		Landings 1 000 t	18.57	7.16	-61.44						
		Fishing mortality age 2-5	0.69	0.96	39.13						

Demersal stocks (Roundfish, flatfish, stocks, etc.)						Pelagic stocks (Herring, sprat, mackerel, etc.)					
Area	Stock		Average for period(s)		Difference (%)	Stock	Average for period(s)		Difference (%)		
			1978-82	1995-99			1978-82	1995-99			
	Haddock VIa	SSB 1 000 t	56.78	38.03	-33.02						
		Landings 1 000 t	27.77	20.32	-26.83						
		Fishing mortality age 2-6	0.55	0.61	10.91						
	Whiting VIa	SSB 1 000 t	41.60	17.54	-57.84						
		Landings 1 000 t	18.44	11.00	-40.35						
		Fishing mortality age 2-4	0.62	0.88	41.94						
Irish Sea VIIa	Cod VIIa	SSB 1 000 t	14.47	5.80	-59.92						
		Landings 1 000 t	10.74	5.10	-52.51						
		Fishing mortality age 2-4	0.75	1.10	46.67						
	Whiting VIIa (1)	SSB 1 000 t	18.31	4.48	-75.53						
		Landings 1 000 t	16.62	5.04	-69.68						
		Fishing mortality age 1-3	0.78	1.06	35.90						
	Plaice VIIa	SSB 1 000 t	4.73	4.07	-13.95						
		Landings 1 000 t	3.54	1.76	-50.28						
		Fishing mortality age 3-6	0.62	0.4	-35.48						
Celtic Sea, West Channel and northern part of Bay of Biscay	Cod VII b-k	SSB 1 000 t	9.51	12.64	32.91	Herring Celtic Sea VIIj	SSB 1 000 t	32.26	78.10	142.10	
		Landings 1 000 t	6.98	11.34	62.46		Landings 1 000 t	12.31	20.03	62.71	
		Fishing mortality age 2-5	0.64	0.87	35.94		Fishing mortality age 4-7	0.63	0.39	-38.10	
	Whiting VIIe-k (2)	SSB 1 000 t	17.03	61.87	263.30						
		Landings 1 000 t	10.76	20.02	86.06						
		Fishing mortality age 2-5	1.18	0.51	-56.78						
	Plaice VIIf, g	SSB 1 000 t	1.59	1.74	9.43						
		Landings 1 000 t	1.16	1.05	-9.48						
		Fishing mortality age 3-6	0.60	0.66	10.00						
	Plaice VIIe	SSB 1 000 t	2.09	1.69	-19.14						
		Landings 1 000 t	1.21	1.14	-5.79						
		Fishing mortality age 3-7	0.51	0.62	21.57						
	Sole VIIfg	SSB 1 000 t	3.48	1.93	-44.54						
		Landings 1 000 t	1.08	1.00	-7.41						
		Fishing mortality age 4-8	0.31	0.61	96.77						

Demersal stocks (Roundfish, flatfish, stocks, etc.)

Area	Stock		Average for period(s)		Difference (%)
			1978-82	1995-99	
	Sole VIII a, b ⁽³⁾	SSB 1 000 t	13.33	13.83	3.75
		Landings 1 000 t	4.84	6.08	25.62
		Fishing mortality age 2-6	0.35	0.47	34.29
	Megrin VIIIa, b, d, e ⁽³⁾	SSB 1 000 t	84.34	63.04	-25.25
		Landings 1 000 t	19.56	18.48	-5.52
		Fishing mortality age 4-8	0.21	0.32	52.38
	Anglerfish VIIb-k, VIIIa, b ⁽⁴⁾	SSB 1 000 t	69.08	74.97	8.53
		Landings 1 000 t	29.86	28.94	-3.08
		Fishing mortality age 6-10, 3-8	0.30	0.24	-20.00
Iberian Peninsula	Hake southern stock ⁽²⁾	SSB 1 000 t	45.2	22.32	-50.62
		Landings 1 000 t	19.76	9.17	-53.59
		Fishing mortality age 2-5	0.40	0.36	-10.00
	Megrin VIIIc, IXa ⁽⁵⁾	SSB 1 000 t	2.2	1.39	-36.82
		Landings 1 000 t	0.73	0.34	-53.42
		Fishing mortality age 4-8	0.4	0.22	-45.00
Widely distributed stocks	Hake northern stock	SSB 1 000 t	203.86	125.26	-38.56
		Landings 1 000 t	56.3	45.34	-19.47
		Fishing mortality age 2-6	0.25	0.32	28.00

Pelagic stocks (Herring, sprat, mackerel, etc.)

Stock		Average for period(s)		Difference (%)
		1978-82	1995-99	
Sardine VIIIc, IXa	SSB 1 000 t	368.52	412.99	12.07
	Landings 1 000 t	184.22	112.17	-39.11
	Fishing mortality age 2-5	0.44	0.34	-22.73
Mackerel NE Atlantic ⁽²⁾	SSB 1 000 t	2640	3280	24.24
	Landings 1 000 t	639	633.2	-0.91
	Fishing mortality age 4-8	0.20	0.21	5.00
Blue whiting all areas ⁽²⁾	SSB 1 000 t	2038.08	2399.02	17.71
	Landings 1 000 t	662.17	846.44	27.83
	Fishing mortality age 3-7	0.29	0.34	17.24

⁽¹⁾ Time period, 1980-84 and 1995-99

⁽²⁾ Time period, 1982-86 and 1995-99

⁽³⁾ Time period, 1984-88 and 1995-99

⁽⁴⁾ Time period, 1986-90 and 1995-99, two species of anglerfish combined.

⁽⁵⁾ Time period, 1986-90 and 1995-99

Pelagic stocks (Herring, sprat, mackerel, etc.)

Area	Stock		Average for period(s)		Difference (%)
			1978–82	1995–99	
Baltic Sea	Herring 25–29S,32	SSB 1 000 t	1 494.77	695.82	–53.45
		Landings 1 000 t	291.72	169.54	–41.88
		Fishing mortality age 3–5	0.17	0.29	70.59
	Sprat 22–32	SSB 1 000 t	289.74	1 148.63	296.43
		Landings 1 000 t	73.11	408.59	458.87
		Fishing mortality age 3–5	0.27	0.40	48.15
North Sea	Herring IV div IIIa	SSB 1 000 t	164.46	619.37	276.61
		Landings 1 000 t	111.36	394.09	253.89
		Fishing mortality age 4–7	0.19	0.5	163.16
West of Scotland	Herring VIa	SSB 1 000 t			#DIV/0!
		Landings 1 000 t			#DIV/0!
		Fishing mortality age 4–7			#DIV/0!
Celtic Sea, West Channel and northern part of Bay of Biscay	Herring Celtic Sea VIIj	SSB 1 000 t	32.26	78.10	142.10
		Landings 1 000 t	12.31	20.03	62.71
		Fishing mortality age 4–7	0.63	0.39	–38.10
Iberian Peninsula	Sardine VIIIc, IXa	SSB 1 000 t	368.52	412.99	12.07
		Landings 1 000 t	184.22	112.17	–39.11
		Fishing mortality age 2–5	0.44	0.34	–22.73
Widely distributed stocks	Mackerel NE Atlantic (1)	SSB 1 000 t	2640	3280	24.24
		Landings 1 000 t	639	633.2	–0.91
		Fishing mortality age 4–8	0.20	0.21	5.00
	Hake northern stock	SSB 1 000 t	203.86	125.26	–38.56
		Landings 1 000 t	56.3	45.34	–19.47
		Fishing mortality age 2–6	0.25	0.32	28.00
	Blue whiting all areas (2)	SSB 1 000 t	2 038.08	2 399.02	17.71
		Landings 1 000 t	662.17	846.44	27.83
		Fishing mortality age 3–7	0.29	0.34	17.24

(1) Time periods 1982–86 and 1995–99.

(2) Time periods 1982–86 and 1995–99.

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