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DATABASE REPORT OF THE STOMACH SAMPLING PROJECT 1991

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1 Introduction

It might be argued that in the final years of the second Millennium, when the storage, analysis and exchange of information have been more or less taken over by electronic technology, there is no longer any need for a publication consisting almost entirely of tables. However, although the coordinators of the Stomach Sampling Project in the North Sea in 1991 acknowledge gratefully the essential role now played by computers in handling as a matter of routine large and complex data sets that would have been regarded as unmanageable two or three decades ago, we believe that paper records are still valuable. Our reasons are as follows:

- It is important that large-scale coordinated exercises like the one described here are officially documented, if only as a benchmark in ICES history. To this end, it is appropriate to publish a permanent record of the project, in which the background, execution, problems encountered and some of the principal results are described.
- The main "deliverable" of the Stomach Sampling Project in the North Sea in 1991 was a rather small set of numbers that was fed to the ICES computer and voided in a more or less unrecognisable form as output from Multispecies Virtual Population Analysis (MSVPA). This application uses only part of the information collected in 1991. The complete data set is far more extensive and provide further insight into the ecology of and interactions between North Sea fish. A printed document is an effective way of advertising the existence of information which is available in digital form to workers unfamiliar with the project. It also provides the opportunity to document the limitations and the possible pitfalls in using the basic data, which will not be immediately apparent from the computer records.

Furthermore:

- Printed documents are a convenient and "user-friendly" way of comparing large sets of data.
- Last, but by no means least, a formal publication is a tangible memorial to the heroic efforts of those many members of the ICES community who assisted in the collection and analysis of nearly 100,000 fish stomachs.

We have adhered to the general layout of the Data Base Report of the Stomach Sampling Project 1981 (Daan (ed.) 1989 - ICES Cooperative Research Report 164). The object of this constructive plagiarism is to make it relatively easy to compare the results of these two major stomach sampling projects. However, there are some significant differences between the data presented in the two reports:

- Table 8 includes additional categories of commercially exploited prey.
- The analytical programs used to generate Tables 10, 11, 12 and 13 have been modified. When the 1981 data were processed, the programs applied to the cod and haddock stomach contents did not take partially identified prey into account. Most of the commercial fish prey that had been identified only to family level is now distributed over individual species, for all predators. Also, some of the sandeel data may not have been included in the earlier analyses. This omission has been rectified.
- Table 10 has been completely redesigned. In the previous report the size composition of each MSVPA fish prey species in the stomach of each predator age class was given, for each sampling area. We believe that the revised version, which gives the size composition of each of the MSVPA fish prey species in the stomach of each predator size class, has more ecological significance. Also, information is given for a wider spectrum of commercially exploited non-MSVPA fish species and crustaceans.
- Table 13 (estimated mean weights of MSVPA prey at the time of ingestion) is also fundamentally different from its predecessor. The weights in this report have been estimated by multiplying the observed weights in the stomachs by 1.6. A multiplying factor of 2.0 was used in all earlier reports.

Very few comparisons between 1981 and 1991 are made in the body of this report, other than to highlight similarities and differences between sampling levels and processing methods. It is to be hoped that the results of detailed analyses will eventually be published elsewhere.

Although we believe that the tables presented in this report are valuable in their own right, we must reiterate that they are only examples of the many possible uses which can be made of the database. One of our aims is to encourage other workers to obtain copies of the exchange tapes from the ICES Secretariat so that they can themselves explore the basic data. However, we recommend that they should first read the text of this document, and some of the reports cited herein, to gain an understanding of the underlying strengths and weaknesses of our work.

2 Background and chronology

The North Sea Stomach Sampling Project in 1981 ("the Year of the Stomach") is an excellent example of the large-scale, international, cooperative programmes of applied biological research at which fisheries scientists excel. A full description is given in Daan (ed.) 1989. The prime purpose of the 1981 project was to provide a set of feeding data which could be used to test the relatively

new art of multispecies virtual population analysis (MSVPA) (Sparre, 1991; Magnusson, 1995). The outputs from the first MSVPA trials provided fresh insights into the nature and extent of the predatory interactions between the principal exploited fish species in the North Sea. MSVPA revealed that commercially exploited species were eating very large numbers of other commercially exploited species. In particular, it was found that the mortality inflicted by the five predator species included in the MSVPA on small, short-lived species such as Norway pout, sprat and sandeels and on the youngest age classes of the larger species was extremely high. Larger fish were shown to be much less vulnerable to predation by fish.

Prior to the trials of MSVPA, most of the "traditional" virtual population analysis (VPA) single-species assessments of North Sea fish stocks were based on the assumption that the instantaneous rate of natural mortality, M , did not vary with age. A value of $M = 0.2$ was frequently assigned to each of the age cohorts included in the analysis. The initial trials with MSVPA indicated that it was unrealistic to assume that M is constant with age and demonstrated that M could be much larger than 0.2. Revised estimates of M , which take into account some of the findings of MSVPA, are now used in many of the single-species assessments.

Because the values of M used in routine stock assessments have in many cases been revised in the light of the results of MSVPA, the short-term predictions for many North Sea fish stocks given by VPA and MSVPA, respectively, are now in reasonably close agreement. However, there are discrepancies between the medium- and long-term forecasts, which have important implications for management strategies (Daan, 1987). Furthermore, multispecies considerations may even have an important bearing on short-term management advice in regions such as the Baltic, where the fish stocks are part of a relatively simple system, and changes can be rapid (Hilden, 1991).

Although additional information on the diet of cod, whiting and saithe was collected in the first and third quarters of 1985, 1986 and 1987 (ICES, 1988a), the MSVPAs carried out in the years 1983-1990 relied to a large extent on the feeding data collected in 1981. However, because it was already apparent in the mid-1980s that the relative abundance of some of the major exploited fish species had changed markedly with respect to 1981 the Multispecies Assessment Working Group recommended that a full-scale stomach sampling programme be repeated in 1991 in order to extend the basis for multispecies assessment (ICES, 1988b) and to test the hypothesis that prey suitabilities remain constant from year to year. This recommendation was endorsed during the 76th Statutory Meeting of the ICES, when it was resolved (C Res 1988/2:12) that a Planning Group would be established under the chairmanship of Dr N Daan to:

- a) define the requirements, priorities and logistics of a large-scale stomach sampling programme to be undertaken in 1991;
- b) to submit a detailed proposal to the Statutory Meeting in 1989.

The Planning Group met in Lowestoft in April 1989. It was agreed that the first aim of the new project should be to obtain a reliable new data set on the food composition of the five main predator species in the North Sea (cod, haddock, whiting, saithe and mackerel) for use in MSVPA, maintaining compatibility with the results from 1981. It was decided that sampling would be extended to include the 0-groups of these five priority species. This age class was incompletely sampled in 1981, but there is evidence that significant predatory interactions may take place both within and between species during the 0-group phase. In addition, the Planning Group recognised that a number of other predators might consume significant numbers of MSVPA species. They recommended accordingly that the stomachs of scad, *Trachurus trachurus*, grey gurnard, *Eutrigla gurnardus*, and all species of rays, *Rajidae*, should be sampled throughout 1991, on the grounds that these fish are known piscivores and their biomass in the North Sea is believed to be large. It was also agreed that herring and sandeels, which prey on the eggs and larvae of other MSVPA species, should be sampled in spring.

The logistics of sampling were discussed at some length. It was agreed that the priority predators could be adequately sampled by deploying a minimum of three vessels in each quarter. The first and third quarters of 1991 would be covered by ongoing or planned surveys, but it was recognised that additional bottom trawl cruises in the second and fourth quarters would be needed, as well as special cruises dedicated to sampling the pelagic 0-group phase of the primary predators. It was noted that there was no coordination of the various national bottom trawl surveys of the North Sea, except for the International Young Fish Survey (IYFS), which takes place in the first quarter of each year. The Group decided that ICES should be asked to establish a North Sea Bottom Trawl Survey Working Group to take the place of the existing "IYFS Working Group".

It was agreed that the Stomach Sampling Project should be managed by an overall Project Coordinator and a group of species coordinators. Dr J R G Hislop (UK Scotland) was chosen to coordinate the project and species coordinators were appointed as follows:

H J L Heessen (The Netherlands) - cod
 A P Robb (UK Scotland) - whiting
 D Skagen (Norway) - mackerel
 H Gislason (Denmark) - saithe
 P J Bromley (UK England) - 0-group gadoids
 H Sparholt (Denmark) - rays
 N Daan (The Netherlands) - gurnards, scad, other species

No coordinator for haddock was appointed during the meeting, but A Temming (Germany) subsequently volunteered to be responsible for this species.

The report of the Planning Group included the following recommendations (ICES, 1989):

- a) A stomach sampling programme comparable to that in 1981 be conducted in 1991 and that Dr J. R. G. Hislop acts as the project coordinator.
- b) Countries are strongly urged to make available i) extra ship time in order to achieve a quarterly coverage of the total North Sea; and ii) manpower to allow the analysis of the samples within a reasonable time span.
- c) The ICES gives consideration to the formation of an International Bottom Trawl Surveys Working Group to co-ordinate effort and standardise gears and methods of bottom trawl surveys within the North Sea, Skagerrak and Kattegat.
- d) The ICES Working Group is requested to consider the redeployment of some effort from the 1991 survey to the second and/or fourth quarter of that year to provide improved coverage to the Stomach Sampling Project.
- e) The species coordinators meet in Aberdeen at the end of 1990 or early in 1991 to prepare a revised version of the Manual for the North Sea Stomach Sampling Project.

These recommendations were endorsed during the 77th Statutory Meeting in 1989 (C Res 1989/4:9, C Res 1989/2:12, C Res 1989/2:13).

One outcome of C Res 1989/2:13 proved to be of great significance to the success of the stomach sampling project. During the first meeting (in Feb/March 1990) of the newly established International North Sea, Skagerrak and Kattegat Bottom Trawl Survey Working Group (the successor to the "IYFS Working Group", later renamed the International Bottom Trawl Survey Working Group (IBTS WG), it was proposed that four quarterly coordinated bottom trawl surveys should take place in the North Sea, Skagerrak and Kattegat for a period of five years, starting in 1991 (ICES, 1990). ICES adopted this proposal in 1990 and requested national laboratories to make available ship time for these surveys (C. Res. 1990/4:3). The quarterly surveys were the source of most of the stomachs sampled in 1991.

The Manual for the ICES North Sea Stomach Project in 1991 (ICES, 1991) was prepared by the species coordinators in Aberdeen in January 1991, just in time to be distributed to most of the participants in the International Young Fish Survey (IYFS). This document gives detailed instructions on sampling levels, size classes of predators and prey, the classification of stomachs,

sample documentation etc. It also includes the original specifications of a stomach data exchange tape (although these specifications were subsequently revised - see below). The Manual contains the following Recommendations:

The Planning Group should meet in IJmuiden during the period 23-28 April 1992, under the Chairmanship of Dr J. R. G. Hislop in order to:

- a) Prepare a progress report on the 1991 Stomach Sampling Project.
- b) Resolve logistical problems that may have emerged during the sampling, analysis and computerisation of the data.
- c) Compile the auxiliary information on age length keys, survey data etc needed for preparing the stomach data for the MSVPA model.

This Recommendation was adopted during the 79th Statutory Meeting at La Rochelle (C Res 1991/2:13).

In their Progress Report (ICES, 1992a), the Planning Group presented preliminary information on the numbers of stomachs that had been sampled in 1991, the numbers analysed to date and the whereabouts of samples that had not yet reached their final destination. The meeting provided the opportunity to discuss problems that had arisen during the collection of samples and in the analysis of stomach contents. These are documented in the Progress Report. The Progress Report also contains the definitive specifications of the data exchange tape (Appendix I), which were agreed during the meeting of the Study Group on the Analysis of Feeding Data in March 1992 (ICES, 1992b). The Report recommended that the species coordinators of the 1991 Stomach Sampling Project should meet again in IJmuiden in September 1993 to prepare the input data for MSVPA. This Recommendation was adopted by the ICES during the 80th Statutory Meeting (C Res 1992/2:14).

During their meeting in IJmuiden the species coordinators prepared most of the input data for MSVPA within the allotted time. The remaining loose ends were tidied up after the meeting and the MSVPA input data were sent to Copenhagen in October 1993. The species coordinators did not submit a formal report on their meeting to ICES, but they prepared a substantial working paper. That paper was tabled at the subsequent meeting of the Multispecies Assessment Working Group, which took place in Copenhagen (23 November-2 December 1993) under the chairmanship of Dr J. Rice. Parts of the working paper were included in the report of the MSVPA WG (ICES, 1994) and other parts have been incorporated into the present document.

Early in 1995, during the preparation of the present report, it was discovered that some of the data supplied to the MSVPA Working Group in 1993 were incorrect.

Extensive checks were made in IJmuiden, and an error was detected in the software used to generate the inputs to MSVPA. After some of the files and programs had been modified, new data were sent to Copenhagen in March 1995 and used during the meeting of the MSVPA WG in June, 1995 (ICES, 1996a). Further changes to the programs were made in 1996 (ICES, 1996b). These are described in Section 6.6.

3 Sampling methods

Only a brief description of the sampling methods will be given here. The Project Manual (ICES, 1991) should be consulted for a comprehensive account of the agreed protocol.

The primary purpose of the exercise was to determine the weights and numbers of each age class of each MSVPA species eaten by an average predator of each age over the course of the year. Because both the rate of food intake and the composition of the diet are likely to vary with respect to time of year, and the diet is likely to show spatial variation, samples were stratified by season (three-monthly period) and by area (ICES statistical rectangle, Figure 1). Furthermore, because it is not practicable to age large numbers of individual fish at sea, samples were stratified by predator size class, rather than by age class. The size strata used in 1981 were relatively coarse (most class intervals were 5 cm or more). In consequence, the transformations from size-stratified data to age-stratified data were rather crude. Several of the original size classes were sub-divided in 1985 and further refinements were made in 1991 (Table 4).

Very few predators measuring less than 10 cm were sampled prior to 1991. This was a deliberate decision, because it was thought unlikely that these small individuals would prey on fish to any great extent. However, the results of the earlier exercises indicated that even small fish may be piscivorous. It was therefore agreed that fish measuring 5 cm and above should be sampled in 1991. This provided full coverage of the size ranges occupied by the 1-group predators throughout the year and of the demersal phase of the 0-groups in the latter part of the year.

The overwhelming majority of the stomachs were collected during the quarterly International Bottom Trawl Surveys of the North Sea (IBTS), which involved nine research ships belonging to seven nations (ICES, 1992c). Participants were requested to sample stomachs from at least one haul in each statistical rectangle in each quarter. The sampling targets are given in Appendix II. The IBTS contributed very substantially to the success of the Stomach Sampling Project. Not only did they provide good spatial coverage of the North Sea in each quarterly period, but also the fact that there was a considerable degree of standardisation of gear and fishing methods meant that the auxiliary data derived from the surveys,

which are used to process the basic data (see Section 5) were reasonably homogeneous. Some stomachs were also collected during other research vessel surveys and on commercial vessels.

The weight and composition of the stomach contents of a typical member of the predator population is estimated by multiplying the average stomach contents of those fish that were still digesting a meal when captured (feeding fish) by a factor that accounts for the fact that not all members of the population are actively feeding at any one time (Section 5). It is therefore necessary to record how many of the sampled fish had empty stomachs (ie non-feeding fish).

However, in practice it is difficult to distinguish between feeding and non-feeding fish because some feeding fish may have regurgitated all or part of their stomach contents by the time they are examined. It is not always immediately obvious that regurgitation has occurred, and the classification of stomachs tends to be rather subjective. However, the presence of food remains in the mouth and gullet is direct evidence of regurgitation and aquarium experiments (Robb, 1992) have shown that the size and the colour of the gall bladder are a useful guide to the recent feeding history of whiting.

The usual sampling procedure was to select from the catch the numbers of fish to be sampled in each size class (Appendix II), rejecting any fish with everted stomachs. The fish were then opened and classified as either F (feeding, valid), R (feeding, regurgitated), SR (stomachs containing only indigestible skeletal remains, such as fish otoliths, molluscan opercula, polychaete chaetae etc) or E (empty). The sample kept for examination in the laboratory consisted of stomachs classed as F, SR or E. Regurgitated stomachs (R) were not retained, on the grounds that their contents, if any, were not fully representative of feeding fish. Whenever possible, stomachs in this category were replaced in the sample with an equivalent number of "valid" stomachs (F). If there were not enough F stomachs in the catch to permit this substitution, the number of regurgitated stomachs was recorded to ensure that the proportion of feeding fish in the sample was evaluated correctly.

It would have been highly desirable to store and analyse each stomach separately, so that the variance in the stomach contents could be calculated. However, the Planning Group realised that space and time were likely to be limiting factors. Although the species coordinators were encouraged to process individual stomachs, it was agreed that all stomachs within a size stratum could be stored in the same container and it would be acceptable to work them up as a pooled sample. In practice, many of the stomachs were worked up individually. Further information can be obtained from the species coordinators.

All the stomachs collected in 1981 were preserved in formaldehyde solution or (rarely) in alcohol. Since that

time there has been a growing recognition that exposure to formaldehyde may be a health risk and the use of this preservative has been either prohibited or strictly controlled in several national institutes. It was therefore necessary to use other means to preserve some of the stomachs sampled in 1991. For example, all the stomachs sampled aboard Norwegian vessels were preserved by freezing. Prey weights and lengths were not corrected for the effects of preservation.

4 Analysis of stomach contents

Every effort was made to identify commercially exploited fish and crustaceans to species level, and to record the numbers and weight within each prey size class. Although the main purpose of the exercise was to provide a new set of input data for MSVPA, the contents of fish stomachs can provide valuable ecological information on the geographical distribution of individual prey species and a detailed analysis is therefore highly desirable. However, the Planning Group recognised that if the material was to be worked up within a reasonably short period of time, some short cuts, such as identifying many of the invertebrate prey only to major taxonomic groups, might be necessary. The level to which these "other" food items were identified was left to the discretion of the species coordinators.

Prey names were coded using the ten-digit system devised in the USA by the National Oceanographic Data Center (NODC). A list of scientific names and their associated NODC codes was available at the start of the project (see ICES, 1991 for a list of the most important codes). When prey which had not been coded previously were identified during the analysis of the 1991 stomachs, their scientific names were forwarded to IJmuiden, where they were given provisional codes and added to a central data base. The names of these "new" items will be forwarded to the NODC where they will be assigned official codes. Although assigning temporary codes to "new" prey is necessary to ensure that data can be processed rapidly, it can lead to problems. In 1981 many species of fish and invertebrates that are common in the North Sea had not yet been included in the NODC list. Provisional codes, assigned on an *ad hoc* basis, were used to process the data. However, this pragmatic approach had some pitfalls; when an updated list was received from the NODC, it was discovered that the provisional 10-digit codes given to whiting, *Merlangius merlangus*, and poor cod, *Trisopterus minutus*, were now transposed. The stomach contents database was subsequently recoded to conform with the NODC classification.

5 Data processing

5.1 Basic Data Processing

There is no unequivocally "correct" way to transform the basic stomach contents data into the form required as input to MSVPA. In 1981 the species coordinators were left to their own devices and there were some fundamental differences between the methods employed to attain the required end product. Only cod and haddock were worked up in an identical manner. There was much more conformity in 1991. The individual species coordinators were free to use any method they chose to file the raw stomach contents data, but it was agreed that the data would have to be made available in a standard format on magnetic tape (Appendix B). These exchange tapes, which contain the basic data in a fully disaggregated state, were used to generate the files required as input to a suite of analytical software (the ISR programs) developed at RIVO-DLO by Niels Daan. These programs combine stomach contents with data on catch rates and age/size distributions to produce a number of standard summary tables, as well as generating the arrays of numbers and weights of prey of each age in the stomachs of predators of each age required as input to MSVPA. Most of the tables presented here are standard outputs from the ISR programs.

The first stage in the analysis is to calculate the average composition of the stomach contents of each predator species/size class combination on a haul (sample) basis. This was done by pooling the data from the individual stomachs and applying the following relationship:

$$W_S = \frac{W_{TOT}}{N_F} \cdot \frac{(N_F + N_{SR} + N_R)}{N} \quad (1)$$

where W_S = average weight of stomach contents in a haul (sample)
 W_{TOT} = weight of prey in all stomachs sampled
 N = number of stomachs sampled (= sample size)
 N_F = number of feeding (valid) stomachs
 N_{SR} = number containing only skeletal remains
 N_R = number of feeding (regurgitated) stomachs

When a statistical rectangle was sampled more than once, the rectangle value was calculated as the weighted mean of the haul (sample) values, the weighting factors being the numbers of stomachs from each haul that had been sampled. (NB: In the previous North Sea stomach sampling projects the rectangle value was obtained by applying Equation 1 to the pooled haul data (Daan, (ed.),

1989). However, the two methods give virtually identical results.).

The next step is to calculate the average composition of the stomach contents of a predator of a given size within a specified geographical area. The ISR programs permit four options:

- i) The statistical rectangle values are averaged, disregarding the numbers of stomachs sampled within each rectangle.
- ii) The statistical rectangle values are weighted by the sample size (number of stomachs examined within the rectangle).

Neither of these options takes predator abundance into account. The remaining options use the trawl survey catch rates as indicators of within-rectangle predator abundance:

- iii) The statistical rectangle values are weighted by the catch rates (mean number caught per hour fishing) within the rectangle.
- iv) The statistical rectangle values are weighted by the square root of the catch rates; this reduces the influence of occasional very large catches.

Any one of these area values can then be converted into arrays based on predator age, as indicated in Section 5.2.

The cod, haddock, whiting and mackerel data were processed using option iv. However, because the saithe samples were patchily distributed and the trawl catch rates were very variable, the data were weighted by sample size (option ii). This was the only difference between the methods used to process the five primary predators.

5.2 Age/length transformations

In order to provide the required input to MSVPA it was necessary to transform the original stomach contents data, which are based on the size classes of the predators and their prey, into age-based data. The basic information used to effect this transformation is given in Tables 3A-I. Most of the age/length data were collected during the quarterly research vessel surveys, using the ICES roundfish sampling areas (Figure 1) as otolith sampling strata. For saithe and sandeels, additional material was collected from the commercial fishery.

The average stomach content of a predator of a given age is estimated by calculating the weighted average of the stomach contents of all size classes occupied by that age class. The weighting factors, which are the proportional contributions of each size class to the total size distribution of the predator age class, are obtained by referring to the **columns** in Tables 3A-E. However, most

of the predator species also feature as prey. In this case it is necessary to determine the proportion of prey in each length class that must be assigned to each age class. These proportions can be calculated by referring to the **rows** in Tables 3A-E.

The conventional age/length keys of those species that featured only as prey (Norway pout, herring, sprat and sandeel) are given in Tables 3F-I. For Norway pout, herring and sprat, adequate keys for most area/quarter combinations are available. It should be noted that the ages of herring only go up to 5+, c.f. 6+ for the other prey species. This is because the computer programs developed at IJmuiden treat age groups of herring in exactly the same way as roundfish, assuming a "birthday" on 1 January. Under this convention, fish born in August 1989 (ie 1989 year class) become 1+ on 1 January 1990. North Sea herring biologist use a different convention, which does not classify these fish one-year-olds ("one-ringers") until 1 January 1991. When the data were translated into the ICES IYFS data base in IJmuiden, via an exchange tape, one age group was lost and the 6+ herring became 5+.

The age/length keys available for sandeels in 1991 are rather sparse, as in the previous North Sea stomach sampling programmes. This is regrettable. Not only are sandeels an important prey of many species of fish, as well as being the object of the largest single-species fishery in the North Sea, but also their growth rate exhibits considerable geographical variation within the North Sea. This means that a comprehensive analysis of the sandeel data requires regional and seasonal age-length keys. Unfortunately, sandeels are almost never caught in trawls during the winter, when the fish are reputed to spend most of their time buried in the sand, and even in the summer months, when the fish are feeding actively, they are seldom caught in representative numbers during routine bottom trawl surveys because they are able to pass through the meshes of most standard survey gears. However, sandeel otoliths were collected from Danish and Norwegian commercial landings in 1991, as well as on some dedicated research vessel cruises in the northwestern North Sea. Most of this material was collected in the second and third quarters. Only three roundfish areas were sampled in the first quarter, and none was sampled in the fourth quarter. Because many of the area ALKs obtained from the commercial landings were based on a large number of otoliths covering a small number of size classes and many of the research vessel ALKs consisted of a small number of otoliths distributed over a wide size range, it was decided to combine them over bigger areas. Otoliths from areas 1, 2, 3 and 7 were used to construct a "northern North Sea" key and those from areas 4, 5 and 6 contributed to a "southern North Sea" key. These keys were made by calculating the percentage age composition within each size class within each roundfish sampling area and averaging the percentages. This procedure gives equal weight to each sampled area. Fourth quarter data were processed using third quarter keys and keys for the second quarter were

used to calculate percentage age compositions of the larger size classes of sandeels in the first quarter.

The sandeel ALKs are for Raitt's sandeel (*Ammodytes marinus*), which makes up the great majority of the commercial fishery in the North Sea. Although it is likely that most of the sandeels in the stomachs of the predators were *A. marinus*, two other species (*Hyperoplus lanceolatus* and *Gymnammodytes semisquamatus*) were identified on a few occasions and the two other species of sandeel known to occur in the North Sea (*H. immaculatus* and *A. tobianus*) may have been present.

The weight of the stomach contents of an individual predator of given age, averaged over the whole North Sea, was calculated by weighting the average stomach contents in each roundfish sampling area (Figure 1) by:

- i) an estimator of predator abundance (area catch rate, Tables 1A-E), and
- ii) a factor representing the size of the area (the approximate number of statistical rectangles within the 200 m depth contour, Table 2).

6 Results

6.1 Sampling intensity

6.1.1 Primary species

Demersal Phase

The numbers of stomachs sampled in 1981 and 1991 are compared in Table 5. More haddock, whiting, mackerel and saithe stomachs were sampled than in 1981, but slightly fewer cod. The overall increases can be attributed mainly to the introduction of additional size classes of small and medium-sized fish in 1991; considerably fewer "large" predators were sampled than in 1981 (Table 5). The numbers of stomachs in each size class sampled in each roundfish sampling area in each quarter of 1991 are given in Tables 6A-E.

The numbers of cod, haddock, whiting, mackerel and saithe stomachs sampled in each rectangle in each quarter of 1991 are given in Figures 2-6. The spatial distribution of the samples of cod, haddock and whiting was satisfactory in each quarter, thanks mainly to the participants in the International Bottom Trawl Surveys. The more patchy distribution of saithe and mackerel in the North Sea (as revealed by demersal trawling) is reflected in the distributions of the stomach samples. The younger saithe age classes (0+, 1+, 2+) are known to occur close inshore, mainly along the east coast of Britain and the Norwegian coast. Very few saithe stomachs were obtained from these inshore grounds and only saithe aged 3+ and older are included in the MSVPA.

Pelagic 0-Group Phase

Samples of pelagic 0-group cod, haddock, whiting, saithe and, for comparison, Norway pout were obtained from the northern North Sea in June and July and from the southeastern North Sea in June. The results given in this report (Section 6.3.2, Figs 7 and 8) relate to fish sampled east of the Shetland Islands (60°00'N 00°00'W) in June 1991.

6.1.2 Other predators

The numbers of stomachs of "other" predators sampled in each quarter of 1991 are given in Table 6-F. With the exception of grey gurnard and the rays (*Raja spp.*), which have been worked up, these numbers are based on check lists sent to the Coordinator at the end of each cruise and must be regarded as preliminary estimates. Considerably more species were sampled than had been requested in the Manual. This undoubtedly reflects the enthusiasm of the sea-going participants in the project!

6.2 Empty stomachs

The percentages of empty stomachs in each predator size class in each quarter in each roundfish area are given in Tables 7A-E. For each of the five primary predators, the proportion of empty stomachs was highest in the first quarter of the year. In the second, third and fourth quarters, the percentages of empty stomachs were similar to, or lower than, the comparable values in 1981. However, in the first quarter the percentage of empty stomachs was higher than in 1981, for all five predators. The increase was small in the case of cod, but large for haddock, whiting, mackerel and saithe.

These results must be treated with caution. It seems highly likely that in 1991, as in the previous stomach sampling projects, difficulties were experienced in distinguishing between empty and regurgitated stomachs. There were marked between-ship differences in the proportions of grey gurnard stomachs classified as empty (de Gee and Kikkert, 1993). These differences cannot be attributed to environmental factors such as the depth and temperature of the water from which the samples were collected. It appears that different workers may have applied different criteria when classifying the stomachs. This is indeed disturbing. It is important that empty stomachs are identified correctly because the proportion of non-feeding fish in the sample has a direct bearing on the estimated mean stomach contents (Eqn 1).

6.3 Composition of the stomach contents

6.3.1 Primary predators

Demersal Phase

Information on the general composition of the diet of each age class in each quarter of 1991, on a total North

Sea basis, is given in Tables 8A-E. It should be noted that the data for 0-group fish given in the main tables in this report refer only to fish caught in demersal trawls. The pelagic 0-group samples were treated separately. The tables give the percentage contribution, by weight, of each major prey taxon to the stomach contents of each predator. Species of commercial importance, including the crustaceans *Crangon crangon*, *Nephrops norvegicus* and *Pandalus* spp. are shown separately.

Most of the food of cod, whiting, mackerel and saithe of all ages consisted of crustacea and fish and the greater part of the fish eaten by these predators were species of commercial importance. The diet of haddock was more varied, and included a larger proportion of echinoderms, annelids and molluscs.

Pelagic 0-Group Phase

It proved difficult to describe in detail the diet of the pelagic 0-group gadoids because the stomachs were very small and much of the food was in an advanced stage of digestion. Many of the fish prey could not be identified to species level and were categorised simply as "gadoid", "flatfish" or "sandeel". Often it was only possible to class the remains as "fish" and guess the number present. The results of the analyses are summarised in Figures 7-9.

Whereas a large part of the diet of Norway pout consisted of crustacea, the other species ate considerable quantities of fish (Figure 7). Indeed, more than 70% (by weight) of the food of cod and whiting consisted of fish. Haddock and saithe contained less fish than cod and whiting, but more than Norway pout. Most of the fish that could be identified were whiting and sandeels. Cannibalism was recorded; cod were found in the stomachs of cod and it was estimated that as much as 5% of the food in the whiting stomachs was whiting. Fish were an important component in the diet of even very small fish (Figure 8). The body lengths of some of the prey eaten by cod and whiting were surprisingly large (Figure 9).

6.3.2 Other predators

The only "other" predators that had been worked up completely by the end of 1996 are grey gurnard (de Gee and Kikkert, 1993) and four species of ray (Daan *et al.*, 1993). Summaries of the food of grey gurnard and starry ray *Raja radiata* (the only ray that was sampled in large numbers) are given in Tables 8F-G. These data, which are based on predator size classes, are copied directly from, (*R. radiata*) or adapted from, (*E. gurnardus*) the published reports cited above.

The diet of grey gurnard consists mainly of crustaceans and fish, fish generally predominating in medium-sized and large gurnards (>200 mm). A large proportion of the fish prey was commercially exploited species.

The starry ray is also a fish eater. Because rays chew their food, prey items were often difficult or impossible to identify to species level. However, commercially important species were found in the stomachs.

6.4 Size distribution of prey

The size distributions (percentages by number) of the prey of each size class of each predator in each quarter are given in Tables 9A-E. Fish prey and crustacean prey are presented separately. It is clear that bigger fish tend to eat bigger prey.

6.5 Size composition of exploited fish prey species

The size compositions of each commercially exploited prey in the stomachs of each predator size class in each roundfish sampling area in each quarter are given in Tables 10A-E.

6.6 Weights, numbers and estimated weight at ingestion of the exploited fish prey species

Tables 11-13A-E contain the main "end product" of the project, ie the feeding data used as input to MSVPA. It is important to note that these tables were prepared after modifications to the ISR software in 1995 and 1996. They differ from those supplied to the MSVPA WG in 1993 and they are not compatible with the equivalent tables for 1981 given in Daan (ed.) 1991. The major changes are described below.

Tables 11 and 12 include, respectively, the estimated weights and numbers of MSVPA prey species per thousand predator stomachs. Prior to their modification in 1996, the ISR programs extracted from the stomach contents data only those records in which the prey had been identified to species level. However, during the analysis of the stomach contents some prey were identified only to family level (eg Clupeidae, Gadidae). Records of this type were ignored by the programs. To obtain a better estimate of the contributions to the predators' diet by the MSVPA species and four commercially important species of flatfish, fish prey identified as Gadidae, Clupeidae, Pleuronectidae and Soleidae were redistributed within their family as follows:

Gadidae → Cod; haddock; Norway pout; saithe; whiting; non-commercial Gadidae
 Clupeidae → Herring; sprat; non-commercial Clupeidae
 Pleuronectidae → Plaice; common dab; lemon sole; non-commercial Pleuronectidae
 Soleidae → Sole; non-commercial Soleidae (usually only solenette)

If the prey item (eg Clupeidae) had been assigned to a particular size class (I), the redistribution was made over

all family members in this size class (eg herring [I], sprat [I]), for weights and numbers separately:

$$\text{Her}[i] = \text{Her}[i] + \{\text{Clu}[i] * (\text{Her}[i] / (\text{Her}[i] + \text{Spr}[i]))\}$$

If the prey item was well digested and the size classified as unknown (u), it was distributed over all recorded size classes of the species in the family:

$$\text{for } I = 1 \text{ to } n: \text{Her}[i] = \text{Her}[i] + \{\text{Clu}[u] * (\text{Her}[i..n] / (\text{Her}[i..n] + \text{Spr}[i..n]))\}$$

The redistribution was done for predator size classes. Prey were redistributed first at the statistical rectangle. The algorithm was then deployed at roundfish sampling level to distribute prey which could not be "matched" at rectangle level.

It should be noted that no attempt was made to redistribute prey in the category "unidentified fish". In consequence, the proportional contribution to the predators' diet by some or all of the MSVPA species will have been under-estimated to some degree.

Another modification to the programs was made in 1996 with respect to the treatment of Ammodytidae (sandeels). There are 10 NODC codes which can be applied to sandeels found in the stomachs of North Sea predators, depending on whether the prey item has been identified to the level of family, genus or species. Previous versions of the ISR programs did not search the stomach contents data sets for all of these possible records and in consequence the importance of sandeels in the diet has been underestimated in the past. The new programs extract all records of sandeels, but it should be noted that the data for Ammodytidae now include three genera (*Ammodytes*, *Hyperoplus*, *Gymnammodytes*) and at least four species. The modified programs will be used to reprocess all the pre-1991 stomach data before the next meeting of the MSVPA WG (August 1997).

The estimated mean weights at ingestion of the MSVPA fish prey (Table 13) are not directly comparable with the corresponding data for 1981 given in Daan (ed) 1989. In the first place, the 1991 data now include previously unallocated prey, as described above. In the second place, the estimation procedure has been revised. In the past, mean weights at ingestion were estimated by dividing the average weights of prey (Table 11) by the average numbers (Table 12) to calculate the mean weight of each prey in the stomach. The mean weights were then multiplied by a factor of two, on the assumption that items in the stomach were, on average, 50% digested. However, an analysis of the stomach contents data sets undertaken in 1996, in which the weights of "pristine" food items were compared with partially digested items, led to the conclusion that a multiplying factor of 1.6 should be used (ICES, 1996b). The values given in Table 13 were calculated using the new multiplying factor. It should be noted that the application of a constant multiplying factor to "raw" stomach contents data can

produce some unlikely estimates of mean weights at ingestion, particularly in cases when only a few prey items were found in the stomachs and these happened to be either virtually intact, or almost completely digested.

7 Summary and discussion

In many respects the 1991 stomach sampling project was an extremely successful exercise. In particular:

- Most of the sampling targets set by the Planning Group were attained or exceeded. Although fewer of the largest size classes of the predators were sampled than in 1981, this was largely a reflection of the fact that the size compositions of the predator populations had changed. Large fish were scarcer in the North Sea in 1991.
- For cod, haddock and whiting, good spatial coverage of the North Sea was achieved in each quarterly period. The less complete coverage of saithe and mackerel reflects the patchy distribution of the species.
- The analyses of the stomach contents were completed by the agreed deadline and the results were made available to the 1993 meeting of the MSVPA Working Group, as scheduled. By contrast, the results of the 1981 project were not available until 1984.
- The application of standard methods of data storage and analysis to all five primary predators ensured that the results were internally consistent.
- The sampling of additional predators in 1991 has revealed that at least two species (starry ray and grey gurnard) may be important predators of exploited species in the North Sea. Indeed, a preliminary estimate by de Gee and Kikkert (1993) indicates that grey gurnard may be consuming quantities of 0-group MSVPA species equal to or greater than those eaten by some of the primary predators included in the MSVPA.
- Examination of the stomach contents of the pelagic 0-group gadoids sampled in 1991 indicated that significant predation of MSVPA species, including cannibalism, occurs during this phase of the life history.

However, not everything went according to plan. In the first place, although the results were processed and made available to the MSVPA WG more quickly than in 1981, adherence to this rather tight schedule may be at least partly responsible for the fact that the data passed to the MSVPA WG in October 1993 contained errors.

In the second place, not all the difficulties encountered during the previous North Sea stomach sampling projects have been overcome. There are several problems that should be addressed before another large-scale stomach sampling exercise is undertaken:

- The targets set for 1991 were intended to maintain sampling at a level similar to that achieved in 1981. However, the numbers of cod, haddock and whiting stomachs sampled in 1981 considerably exceeded the numbers envisaged when the 1981 project was first discussed (a minimum of 6,000 stomachs per species). It must therefore be accepted that the targets set for 1991 were somewhat arbitrary. Although it seems inherently unlikely that too few stomachs were sampled (with the possible exception of the largest size classes) there is the very real possibility that far more stomachs were sampled than was necessary to describe adequately the diets of the predators and to satisfy the requirements of MSVPA. The planning of any future large-scale stomach sampling project should include a statistical analysis of the existing data sets with a view to devising a more rational sampling scheme.
- In spite of the guidance given in the Project Manual (ICES, 1991), it seems that it was still difficult to discriminate at sea between empty and regurgitated stomachs. There is circumstantial evidence that different sampling teams may have used different criteria.
- There are still problems in deciding what to do when "pristine" (ie completely undigested) prey are found in a stomach. This is not a trivial matter. Fresh fish prey items can be large and heavy. A single prey item of this type may have a considerable effect on the estimated stomach contents weight of a predator size class, even when the data are averaged over the total North Sea. Furthermore, because of the way in which the data are transformed from size classes to age classes, an aberrant value within one size class may effect several predator and prey age classes. The exclusion of all such prey items will result in the average stomach contents being underestimated, because some predators will have been captured almost immediately after they had taken a meal. However, some prey may have been eaten while the predators were swimming in the net (Bromley and Last, 1990). If these food items are included, the mean weight of the stomach contents will be overestimated.
- The age/size class keys for most of the prey species were of a higher quality than those available in 1981. However, the sandeel keys were still rather unsatisfactory. The reasons for this deficiency are fairly straightforward. Sandeels are rarely caught in any quantity during routine trawling surveys, because they pass through the meshes of standard trawls. In consequence, samples of sandeel otoliths have to be

obtained either from the commercial fishery, which is highly seasonal and takes place on a relatively small number of fishing grounds, or from dedicated surveys, using small-meshed trawls. This problem was anticipated in the 1991 project Manual, which reminded species coordinators of the possibility of constructing age/length keys using otoliths taken from prey that were in good condition. In the event, few sandeel otoliths were collected from predator stomachs and no attempt was made to use the limited information that was available.

- No satisfactory way of estimating the mean weights of each age class of each MSVPA prey at the time of their ingestion has yet been found. It is obviously unsafe to assume that each age group of each predator can exploit the entire size range of each prey age class. Although the largest predators may be able to handle all size classes of all age classes of some prey species, the smaller, younger predators may only be able to handle the smallest individuals of some prey age classes. Therefore the mean weight at age of prey in the sea cannot be used as a proxy for the mean weight of prey eaten by the predators. As indicated in Section 6.6, the mean weights at ingestion in 1991 were calculated by multiplying the mean weights of prey in the stomachs by a constant factor (1.6). Some of these weights are unrealistic (Tables 13A-E). Another way of addressing the problem would be to calculate the mean length of each prey age class in the stomach of each predator age class and to estimate the mean weight by means of a length/weight relationship.
- During the 1989 meeting of the Planning Group it was agreed that improved models of food consumption should be developed in parallel with the 1991 stomach sampling project (ICES, 1989). However, no real progress has been made and there is still considerable uncertainty as to the daily/quarterly/annual rations consumed by individual predators.

8 Acknowledgements

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TABLE LEGENDS

- Table 1 Catch rates (number per hour fishing) of each predator age class in each area in each quarter in 1991.
- Table 2 ICES roundfish area weighting factors.
- Table 3 Age/size distributions of predators, age/length keys of prey for each area in each quarter in 1991.
- Table 4 Predator size strata used in stomach sampling projects in 1981, 1985-87 and 1991.
- Table 5 Numbers of stomachs sampled in 1981 and 1991.
- Table 6 Numbers of stomachs of each predator size class sampled in each area in each quarter in 1991.
- Table 7 Percentage of empty stomachs in each predator size class in each area in quarter in 1991.
- Table 8 Composition of stomach contents (percentage by weight) of each predator age class in each quarter of 1991, total North Sea.
- Table 9 Size distribution (percentage by number) of stomach contents of each predator age class in each quarter of 1991, total North Sea.
- Table 10 Weights (per 1000 stomachs) of commercially exploited species of each size class in the stomach contents of each predator size class in each area and quarter in 1991.
- Table 11 Weights (per 1000 stomachs) of commercially exploited species of each age class in the stomach contents of each predator age class in each quarter in 1991. Total North Sea.
- Table 12 Numbers (per 1000 stomachs) of commercially exploited species of each age class in the stomach contents of each predator age class in each quarter in 1991. Total North Sea.
- Table 13 Estimated weights of commercially exploited prey of each age class at the time of ingestion by a predator of each age class in each quarter in 1991. Total North Sea.

FIGURE LEGENDS

- Figure 1 Boundaries of ICES roundfish sampling areas.
- Figure 2 Number of cod stomachs sampled in each statistical rectangle in each quarter in 1991.
- Figure 3 Number of haddock stomachs sampled in each statistical rectangle in each quarter in 1991.
- Figure 4 Number of whiting stomachs sampled in each statistical rectangle in each quarter in 1991.
- Figure 5 Number of mackerel stomachs sampled in each statistical rectangle in each quarter in 1991.
- Figure 6 Number of saithe stomachs sampled in each statistical rectangle in each quarter in 1991.
- Figure 7 Stomach contents (percentage by weight) of 0-group gadoids in the northern North Sea in June 1991.
- Figure 8 Percentage by weight of fish prey in the diet of 0-group gadoids in the northern North Sea in June 1991.
- Figure 9 Length of fish prey in the stomachs of 0-group gadoids of each size sampled in the northern North Sea in June 1991.

TABLE 1-A: Catch rates of **cod** in 1991 (number per hour fishing) by area, age class and quarter

Area	Age						
	0	1	2	3	4	5	6+
Quarter 1							
1		0.4	6.3	7.0	1.4	0.8	0.7
2		0.7	4.2	3.1	0.6	0.2	1.1
3		1.5	1.9	1.4	0.4	0.03	0.2
4		3.2	7.0	5.7	0.4	0.04	0.2
5		0.4	1.1	2.0	1.0	0.2	0.03
6		26.6	3.0	1.5	0.8	0.4	1.0
7		12.2	6.7	2.7	1.8	0.8	1.5
Quarter 2							
1		1.8	7.0	6.2	1.0	0.4	0.5
2	52.5	7.1	6.1	5.4	0.4	0.2	0.3
3	0.2	7.6	3.9	1.9	0.3	0.2	0.3
4		8.7	3.5	1.3	0.4	0.3	0.2
5		0.7	2.6	1.7	0.4		0.05
6	4.4	26.3	3.2	1.1	0.2	0.2	0.1
7	62.8	27.9	6.2	3.9	0.7	0.7	0.6
Quarter 3							
1	31.2	2.5	1.8	1.8	0.2	0.1	0.1
2	143.9	4.6	3.1	1.0	0.2	0.1	0.1
3	0.8	13.9	0.8	0.4			
4	2.6	6.7	2.4	0.5	0.3	0.1	0.1
5	0.1	1.6	0.5	0.2	0.1		
6	77.6	8.1	0.1	0.1	0		
7	138.9	10.8	4.7	1.3	0.3		
Quarter 4							
1	7.2	9.2	3.5	2.8	1.4	0.3	0.5
2	14.2	6.5	2.4	1.2	0.1	0.1	0.3
3	0.7	4.0	0.6		0.2		
4	3.0	2.7	2.9	0.6			
5	2.3	4.0	1.5		0.3		
6	215.5	6.6	0.7	0.2	0.1	0.03	
7	86.4	10.0	0.2	0.8			0.6
8	144.4	6.4	3.5	0.6	0.6	0.1	0.1

TABLE 1-B: Catch rates of **haddock** in 1991 (number per hour fishing) by area, age class and quarter

Area	Age						
	0	1	2	3	4	5	6+
Quarter 1							
1		406.0	91.2	25.4	5.0	12.0	3.8
2		1004.6	132.9	31.1	5.4	7.2	2.6
3		814.7	279.6	22.8	2.8	8.1	1.0
4		512.1	21.2	5.4	0.7	0.6	0.6
6		0.2	0.01	0.01	0.01	0.01	
7		270.4	35.2	8.5	0.9	0.4	0.1
Quarter 2							
1	0.01	493.8	59.4	10.8	3.0	4.3	1.7
2	4.0	970.1	103.2	17.8	2.6	3.7	3.1
3	1.2	1324.0	85.9	13.4	1.3	9.6	6.4
4		978.0	41.5	16.9	3.9	6.5	1.5
5		0.2	0.01	0.01	0.01	0.01	0.01
6		1.1	0.1				
7	16.5	159.8	16.8	4.6	1.4	0.6	0.5
Quarter 3							
1	733.3	131.0	13.3	1.9	0.4	1.0	0.2
2	370.0	253.2	19.1	1.4	0.3	0.8	0.1
3	172.8	412.9	40.2	5.4	1.0	4.7	0.8
4	5.2	146.8	4.5	2.0	0.2	1.6	0.1
6		0.1					
7	1171.9	62.5	30.4	3.8	0.3	0.5	
Quarter 4							
1	1454.2	308.9	30.0	6.9	1.4	2.7	1.4
2	998.7	566.7	39.2	5.9	0.8	2.2	0.3
3	578.5	1079.4	48.1	11.2	2.8	18.3	0.4
4	5.0	229.6	17.2		2.5	1.0	
6		0.7	0.2				
7	839.1	84.4					
8	324.7	18.4	0.7				

TABLE 1-C: Catch rates of **whiting** in 1991 (number per hour fishing) by area, age class and quarter

Area	Age						
	0	1	2	3	4	5	6+
Quarter 1							
1		41.9	549.8	738.1	51.6	50.5	12.0
2		422.1	1131.0	373.4	104.3	37.6	7.6
3		1708.0	713.0	632.6	55.0	22.2	3.0
4		2428.2	957.7	342.5	98.5	42.8	3.1
5		105.1	226.2	72.0	20.4	13.1	4.3
6		1759.2	385.3	192.6	72.5	26.1	5.0
7		511.6	53.8	26.0	7.3	2.1	0.1
Quarter 2							
1	1.0	17.5	122.1	119.3	18.4	8.9	4.0
2	4.2	583.0	348.2	129.2	36.8	17.5	11.0
3		769.3	399.4	337.7	44.5	10.8	6.0
4		3006.8	1335.4	827.7	352.5	99.5	78.3
5		687.8	153.4	52.7	53.4	13.3	
6	0.1	2995.4	315.0	127.4	70.9	58.5	6.8
7	13.5	984.4	76.8	13.8	3.4	1.0	0.8
Quarter 3							
1	114.6	9.7	70.2	70.5	7.7	3.5	1.3
2	262.8	121.0	99.8	35.3	8.9	4.6	0.7
3	349.0	601.4	224.8	179.9	14.8	5.0	0.5
4	54.4	1237.9	235.5	79.1	34.5	6.8	0.3
5	42.9	689.3	118.9	8.3	3.1	9.0	0.1
6	164.8	1849.7	211.5	66.9	21.3	6.0	1.5
7	3703.1	683.8	76.9	7.1	5.9	1.8	
Quarter 4							
1	308.0	198.6	173.4	146.6	11.3	3.6	1.4
2	1156.2	365.8	225.4	81.0	26.0	19.9	6.1
3	1053.3	1761.5	318.6	350.6	31.8	10.4	8.5
4	423.2	4609.6	1168.5	60.1	69.3	23.7	19.5
5	360.8	655.1	194.3	118.6	96.5	66.2	40.6
6	627.5	1297.2	189.3	25.4	21.0	8.2	1.5
7	632.2	276.3	62.9	11.3	2.7		
8	3653.8	501.9	9.5	0.03			

TABLE 1-D: Catch rates of **mackerel** in 1991 (number per hour fishing) 1991 by area, age class and quarter

Area	Age						
	0	1	2	3	4	5	6+
Quarter 1							
1		20.4	6.8	0.3	0.4	0.1	0.3
2		0.1					
Quarter 2							
1			2.8	0.8	0.5	0.2	0.2
2		7.5	17.3	4.9	4.5	2.3	3.9
3			11.2	0.3			0.5
4		0.1	37.6	26.8	3.5	10.1	15.8
5		1.9	30.0	5.0	5.6	1.6	0.8
6		31.6	172.1	24.2	25.1	9.8	29.6
7		13.5	11.7	4.8	1.8	0.4	0.8
Quarter 3							
1		1.0	42.7	11.8	2.9	1.0	1.3
2		0.7	2.6	0.5	0.4	0.1	0.1
3			1.8	1.7	1.5	1.2	0.8
4			0.7	0.3			3.5
5			0.1				
6		103.0	58.6	12.7	13.4	16.0	53.5
7		3.8	28.3	8.3	3.1	1.6	2.8
Quarter 4							
1		2.9	18.4	7.3	1.8	2.3	5.0
2	0.4	0.04					
3		509.2	451.8	89.4	28.3		8.8
4							
5	0.1	0.1	0.1				
6	0.03	6.5	4.3	3.1	5.5	3.3	13.7
7							

TABLE 1-E: Catch rates of **saithe** in 1991 (number per hour fishing) by area, age class and quarter

Area	Age						
	3	4	5	6	7	8	9+
Quarter 1							
1	3.0	3.2	0.6	0.4	0.2	0.1	0.1
2	0.04	0.04					
3	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1
5	1	1	1	1	1	1	1
6	1	1	1	1	1	1	1
7	1	1	1	1	1	1	1
Quarter 2							
1	3.5	4.1	0.2	0.1	0.1	0.1	0.1
2	0.04	0.04	0.04	0.04			0.04
3	0.05	0.05	0.05	0.05		0.05	0.05
4	1	1	1	1	1	1	1
5	1	1	1	1	1	1	1
6	1	1	1	1	1	1	1
7	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Quarter 3							
1	2.6	0.6	0.2	0.1	0.1	0.02	0.1
2	0.1	0.04	0.04		0.04	0.04	0.04
3	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1
5	1	1	1	1	1	1	1
6	1	1	1	1	1	1	1
7	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Quarter 4							
1	42.5	5.5	0.8	0.2	0.2	0.2	0.6
2	1.0	0.2					
3	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1
5	1	1	1	1	1	1	1
6	1	1	1	1	1	1	1
7	0.08	0.08					

TABLE 2: Area weighting factors, based on the number of statistical rectangles within each area that lie within the 200 m depth contour. No weighting factor is given for Area 8, which is outside the North Sea

Roundfish area	Weighting factor
1	45
2	25
3	19
4	11
5	10
6	33
7	12

TABLE 3-A-1: Age size distribution of **cod** in 1991 (number per hour fishing) by area and quarter

Quarter 1	Size class	Age class							Total
		0	1	2	3	4	5	6+	
Area 1	80	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.08
	100	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.03
	120	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.11
	150	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.14
	200	0.00	0.05	0.05	0.00	0.00	0.00	0.00	0.09
	250	0.00	0.00	0.59	0.00	0.00	0.00	0.00	0.59
	300	0.00	0.00	2.34	0.00	0.00	0.00	0.00	2.34
	350	0.00	0.00	2.47	0.08	0.02	0.00	0.00	2.57
	400	0.00	0.00	0.88	2.65	0.02	0.00	0.00	3.56
	500	0.00	0.00	0.00	3.20	0.26	0.00	0.00	3.46
	600	0.00	0.00	0.00	0.99	0.67	0.11	0.00	1.76
	700	0.00	0.00	0.00	0.10	0.34	0.18	0.07	0.68
	800	0.00	0.00	0.00	0.00	0.08	0.52	0.55	1.16
	1000	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04
	All	0.00	0.41	6.32	7.02	1.39	0.81	0.66	16.61
Area 2	100	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01
	120	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.03
	150	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.38
	200	0.00	0.15	0.02	0.00	0.00	0.00	0.00	0.17
	250	0.00	0.14	0.40	0.00	0.00	0.00	0.00	0.54
	300	0.00	0.00	1.49	0.02	0.00	0.00	0.00	1.51
	350	0.00	0.00	1.71	0.44	0.00	0.00	0.00	2.15
	400	0.00	0.00	0.55	1.76	0.02	0.00	0.00	2.33
	500	0.00	0.00	0.00	0.63	0.01	0.00	0.00	0.64
	600	0.00	0.00	0.00	0.21	0.34	0.05	0.03	0.62
	700	0.00	0.00	0.00	0.02	0.13	0.02	0.02	0.19
	800	0.00	0.00	0.00	0.00	0.06	0.11	0.58	0.75
	1000	0.00	0.00	0.00	0.00	0.00	0.03	0.43	0.46
	All	0.00	0.71	4.17	3.08	0.56	0.21	1.06	9.79
Area 3	120	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.10
	150	0.00	0.53	0.04	0.00	0.00	0.00	0.00	0.57
	200	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.60
	250	0.00	0.18	0.08	0.00	0.00	0.00	0.00	0.26
	300	0.00	0.06	0.49	0.00	0.00	0.00	0.00	0.55
	350	0.00	0.03	0.95	0.00	0.00	0.00	0.00	0.98
	400	0.00	0.00	0.39	0.48	0.00	0.00	0.00	0.87
	500	0.00	0.00	0.00	0.75	0.00	0.00	0.00	0.75
	600	0.00	0.00	0.00	0.13	0.25	0.00	0.00	0.38
	700	0.00	0.00	0.00	0.05	0.10	0.00	0.00	0.15
	800	0.00	0.00	0.00	0.00	0.03	0.03	0.08	0.14
	1000	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08
	All	0.00	1.50	1.95	1.41	0.38	0.03	0.16	5.43

Continued

Table 3-A-1 Continued

Quarter 1	Size class	Age class							Total
		0	1	2	3	4	5	6+	
Area 4	120	0.00	0.75	0.00	0.00	0.00	0.00	0.00	0.75
	150	0.00	1.42	0.00	0.00	0.00	0.00	0.00	1.42
	200	0.00	0.88	0.00	0.00	0.00	0.00	0.00	0.88
	250	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.58
	300	0.00	0.15	1.60	0.00	0.00	0.00	0.00	1.75
	350	0.00	0.00	2.11	1.31	0.00	0.00	0.00	3.42
	400	0.00	0.00	2.59	2.99	0.00	0.00	0.00	5.58
	500	0.00	0.00	0.08	1.17	0.00	0.00	0.00	1.25
	600	0.00	0.00	0.00	0.25	0.13	0.04	0.00	0.42
	700	0.00	0.00	0.00	0.04	0.13	0.00	0.00	0.17
	800	0.00	0.00	0.00	0.00	0.13	0.00	0.13	0.26
	1000	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08
	All	0.00	3.20	6.96	5.76	0.39	0.04	0.21	16.56
Area 5	120	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.10
	150	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.20
	200	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.20
	250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	300	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.20
	350	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.20
	400	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.20
	500	0.00	0.00	0.60	0.20	0.00	0.00	0.00	0.80
	600	0.00	0.00	0.25	0.75	0.00	0.00	0.00	1.00
	700	0.00	0.00	0.00	0.86	0.74	0.00	0.00	1.60
	800	0.00	0.00	0.00	0.00	0.27	0.20	0.03	0.50
	All	0.00	0.50	1.25	2.01	1.01	0.20	0.03	5.00
Area 6	100	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.08
	120	0.00	3.33	0.00	0.00	0.00	0.00	0.00	3.33
	150	0.00	14.39	0.00	0.00	0.00	0.00	0.00	14.39
	200	0.00	7.98	0.30	0.00	0.00	0.00	0.00	8.28
	250	0.00	0.86	0.02	0.02	0.00	0.00	0.00	0.90
	300	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.27
	350	0.00	0.00	0.55	0.04	0.00	0.00	0.00	0.60
	400	0.00	0.00	1.27	0.28	0.03	0.00	0.00	1.58
	500	0.00	0.00	0.52	0.38	0.08	0.00	0.00	0.98
	600	0.00	0.00	0.02	0.52	0.03	0.02	0.00	0.59
	700	0.00	0.00	0.00	0.28	0.24	0.02	0.02	0.55
	800	0.00	0.00	0.00	0.03	0.38	0.32	0.47	1.20
	1000	0.00	0.00	0.00	0.00	0.02	0.01	0.51	0.54
	All	0.00	26.64	2.95	1.55	0.78	0.37	1.00	33.29

Continued

Table 3-A-1 Continued

Quarter 1	Size class	Age class							Total
		0	1	2	3	4	5	6+	
Area 7	100	0.00	0.54	0.00	0.00	0.00	0.00	0.00	0.54
	120	0.00	2.50	0.00	0.00	0.00	0.00	0.00	2.50
	150	0.00	5.93	0.00	0.00	0.00	0.00	0.00	5.93
	200	0.00	2.72	0.00	0.00	0.00	0.00	0.00	2.72
	250	0.00	0.46	0.68	0.00	0.00	0.00	0.00	1.14
	300	0.00	0.00	3.03	0.00	0.00	0.00	0.00	3.03
	350	0.00	0.00	2.16	0.15	0.00	0.00	0.00	2.31
	400	0.00	0.00	0.78	0.97	0.00	0.00	0.00	1.75
	500	0.00	0.00	0.00	1.17	0.52	0.07	0.00	1.76
	600	0.00	0.00	0.00	0.22	0.89	0.11	0.06	1.28
	700	0.00	0.00	0.00	0.05	0.11	0.37	0.21	0.74
	800	0.00	0.00	0.00	0.06	0.26	0.24	0.62	1.18
	1000	0.00	0.00	0.00	0.00	0.00	0.05	0.61	0.66
	All	0.00	12.15	6.65	2.62	1.78	0.84	1.50	25.54
Area North Sea	80	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.08
	100	0.00	0.66	0.00	0.00	0.00	0.00	0.00	0.66
	120	0.00	6.91	0.00	0.00	0.00	0.00	0.00	6.91
	150	0.00	22.99	0.04	0.00	0.00	0.00	0.00	23.03
	200	0.00	12.58	0.37	0.00	0.00	0.00	0.00	12.95
	250	0.00	1.64	2.34	0.02	0.00	0.00	0.00	4.00
	300	0.00	0.21	9.42	0.02	0.00	0.00	0.00	9.65
	350	0.00	0.03	10.14	2.01	0.02	0.00	0.00	12.20
	400	0.00	0.00	6.47	9.34	0.08	0.00	0.00	15.89
	500	0.00	0.00	1.21	7.50	0.88	0.07	0.00	9.66
	600	0.00	0.00	0.27	3.07	2.30	0.33	0.08	6.05
	700	0.00	0.00	0.00	1.40	1.78	0.59	0.32	4.09
	800	0.00	0.00	0.00	0.09	1.20	1.42	2.46	5.17
	1000	0.00	0.00	0.00	0.00	0.02	0.10	1.74	1.86
	All	0.00	45.10	30.26	23.45	6.28	2.51	4.60	112.20

TABLE 3-A-2: Age size distribution of cod in 1991 (number per hour fishing) by area and quarter

Quarter 2	Size class	Age class							Total
		0	1	2	3	4	5	6+	
Area 1	120	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.04
	150	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.26
	200	0.00	0.72	0.00	0.00	0.00	0.00	0.00	0.72
	250	0.00	0.30	0.12	0.02	0.00	0.00	0.00	0.44
	300	0.00	0.30	1.07	0.00	0.00	0.00	0.00	1.37
	350	0.00	0.00	2.41	0.04	0.00	0.00	0.00	2.45
	400	0.00	0.00	2.66	1.25	0.02	0.00	0.00	3.93
	500	0.00	0.00	0.07	2.63	0.18	0.00	0.00	2.88
	600	0.00	0.00	0.02	1.41	0.27	0.02	0.00	1.72
	700	0.00	0.00	0.00	0.31	0.38	0.12	0.02	0.83
	800	0.00	0.00	0.00	0.01	0.06	0.24	0.24	0.55
	1000	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.14
	All	0.00	1.62	6.35	5.67	0.91	0.38	0.40	15.33
Area 2	10	26.23	0.00	0.00	0.00	0.00	0.00	0.00	26.23
	50	13.12	0.00	0.00	0.00	0.00	0.00	0.00	13.12
	60	13.12	0.00	0.00	0.00	0.00	0.00	0.00	13.12
	70	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	120	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01
	150	0.00	1.02	0.00	0.00	0.00	0.00	0.00	1.02
	200	0.00	3.62	0.00	0.00	0.00	0.00	0.00	3.62
	250	0.00	1.37	0.10	0.00	0.00	0.00	0.00	1.47
	300	0.00	0.25	0.79	0.00	0.00	0.00	0.00	1.04
	350	0.00	0.00	2.25	0.12	0.00	0.00	0.00	2.37
	400	0.00	0.00	2.50	1.33	0.08	0.00	0.00	3.91
	500	0.00	0.00	0.11	2.58	0.02	0.00	0.00	2.71
	600	0.00	0.00	0.02	1.15	0.04	0.00	0.00	1.21
	700	0.00	0.00	0.00	0.02	0.20	0.06	0.00	0.28
	800	0.00	0.00	0.00	0.00	0.00	0.14	0.15	0.29
	1000	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.12
	All	52.50	6.27	5.77	5.20	0.34	0.20	0.27	70.55
Area 3	50	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	60	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	100	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.07
	120	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.03
	150	0.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00
	200	0.00	2.25	0.00	0.00	0.00	0.00	0.00	2.25
	250	0.00	1.69	0.04	0.00	0.00	0.00	0.00	1.73
	300	0.00	0.46	0.37	0.00	0.00	0.00	0.00	0.83
	350	0.00	0.05	0.91	0.01	0.00	0.00	0.00	0.97
	400	0.00	0.00	2.14	0.29	0.00	0.00	0.00	2.43
	500	0.00	0.00	0.08	0.81	0.01	0.00	0.00	0.90
	600	0.00	0.00	0.00	0.49	0.01	0.00	0.00	0.50
	700	0.00	0.00	0.00	0.02	0.12	0.00	0.00	0.14
	800	0.00	0.00	0.00	0.00	0.13	0.18	0.04	0.35
	1000	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.17
	All	0.14	5.48	3.54	1.62	0.27	0.18	0.21	11.44

Continued

Table 3-A-2 Continued

Quarter 2	Size class	Age class							Total
		0	1	2	3	4	5	6+	
Area 4	150	0.00	1.92	0.00	0.00	0.00	0.00	0.00	1.92
	200	0.00	2.28	0.00	0.00	0.00	0.00	0.00	2.28
	250	0.00	0.99	0.06	0.00	0.00	0.00	0.00	1.05
	300	0.00	0.65	1.16	0.00	0.00	0.00	0.00	1.81
	350	0.00	0.04	0.96	0.12	0.00	0.00	0.00	1.12
	400	0.00	0.00	0.80	0.47	0.00	0.00	0.00	1.27
	500	0.00	0.00	0.00	0.31	0.12	0.00	0.00	0.43
	600	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.07
	700	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.11
	800	0.00	0.00	0.00	0.00	0.00	0.17	0.09	0.26
	1000	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03
	All	0.00	5.88	2.98	0.97	0.23	0.17	0.12	10.35
Area 5	250	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.19
	300	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.33
	350	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.10
	400	0.00	0.07	0.12	0.00	0.00	0.00	0.00	0.19
	500	0.00	0.00	1.70	0.08	0.00	0.00	0.00	1.78
	600	0.00	0.00	0.78	0.60	0.00	0.00	0.00	1.38
	700	0.00	0.00	0.00	0.95	0.00	0.00	0.00	0.95
	800	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.33
	1000	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05
	All	0.00	0.69	2.60	1.63	0.33	0.00	0.05	5.30
Area 6	10	2.20	0.00	0.00	0.00	0.00	0.00	0.00	2.20
	50	1.10	0.00	0.00	0.00	0.00	0.00	0.00	1.10
	60	1.10	0.00	0.00	0.00	0.00	0.00	0.00	1.10
	120	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01
	150	0.00	2.58	0.00	0.00	0.00	0.00	0.00	2.58
	200	0.00	10.34	0.05	0.00	0.00	0.00	0.00	10.39
	250	0.00	8.36	0.03	0.00	0.00	0.00	0.00	8.39
	300	0.00	3.69	0.16	0.00	0.00	0.00	0.00	3.85
	350	0.00	0.54	0.03	0.00	0.00	0.00	0.00	0.57
	400	0.00	0.00	0.79	0.02	0.00	0.00	0.00	0.81
	500	0.00	0.00	1.28	0.17	0.00	0.00	0.00	1.45
	600	0.00	0.00	0.70	0.40	0.00	0.02	0.00	1.12
	700	0.00	0.00	0.00	0.40	0.09	0.00	0.00	0.49
	800	0.00	0.00	0.00	0.02	0.10	0.00	0.01	0.13
	1000	0.00	0.00	0.00	0.00	0.00	0.02	0.06	0.08
	All	4.40	25.52	3.04	1.01	0.19	0.04	0.07	34.27

Continued

Table 3-A-2 Continued

Quarter 2	Size class	Age class							Total
		0	1	2	3	4	5	6+	
Area 7	10	30.72	0.00	0.00	0.00	0.00	0.00	0.00	30.72
	50	15.36	0.00	0.00	0.00	0.00	0.00	0.00	15.36
	60	15.36	0.00	0.00	0.00	0.00	0.00	0.00	15.36
	70	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.32
	80	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.65
	120	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.16
	150	0.00	7.52	0.00	0.00	0.00	0.00	0.00	7.52
	200	0.00	15.20	0.00	0.00	0.00	0.00	0.00	15.20
	250	0.00	4.68	0.33	0.00	0.00	0.00	0.00	5.01
	300	0.00	0.39	0.67	0.00	0.00	0.00	0.00	1.06
	350	0.00	0.00	2.49	0.00	0.00	0.00	0.00	2.49
	400	0.00	0.00	2.13	1.23	0.00	0.00	0.00	3.36
	500	0.00	0.00	0.19	1.93	0.23	0.07	0.00	2.42
	600	0.00	0.00	0.06	0.44	0.13	0.00	0.00	0.63
	700	0.00	0.00	0.00	0.20	0.20	0.12	0.08	0.60
	800	0.00	0.00	0.00	0.00	0.09	0.27	0.31	0.67
	1000	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.15
	All	62.41	27.95	5.87	3.80	0.65	0.46	0.54	101.68
Area North Sea	10	59.19	0.00	0.00	0.00	0.00	0.00	0.00	59.19
	50	29.60	0.00	0.00	0.00	0.00	0.00	0.00	29.60
	60	29.59	0.00	0.00	0.00	0.00	0.00	0.00	29.59
	70	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.35
	80	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.65
	100	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.07
	120	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.26
	150	0.00	14.31	0.00	0.00	0.00	0.00	0.00	14.31
	200	0.00	34.41	0.05	0.00	0.00	0.00	0.00	34.46
	250	0.00	17.58	0.68	0.02	0.00	0.00	0.00	18.29
	300	0.00	6.08	4.21	0.00	0.00	0.00	0.00	10.29
	350	0.00	0.72	9.05	0.29	0.00	0.00	0.00	10.06
	400	0.00	0.07	11.15	4.59	0.10	0.00	0.00	15.92
	500	0.00	0.00	3.43	8.50	0.57	0.07	0.00	12.57
	600	0.00	0.00	1.58	4.56	0.46	0.04	0.00	6.63
	700	0.00	0.00	0.00	1.91	1.11	0.31	0.10	3.42
	800	0.00	0.00	0.00	0.04	0.71	1.00	0.84	2.59
	1000	0.00	0.00	0.00	0.00	0.00	0.02	0.72	0.74
	All	119.45	73.43	30.15	19.91	2.95	1.44	1.66	248.99

TABLE 3-A-3: Age size distribution of cod in 1991 (number per hour fishing) by area and quarter

Quarter 3	Size class	Age class							Total
		0	1	2	3	4	5	6+	
Area 1	50	10.52	0.00	0.00	0.00	0.00	0.00	0.00	10.52
	60	10.52	0.00	0.00	0.00	0.00	0.00	0.00	10.52
	70	5.95	0.00	0.00	0.00	0.00	0.00	0.00	5.95
	80	3.42	0.00	0.00	0.00	0.00	0.00	0.00	3.42
	100	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.67
	120	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.06
	150	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.02
	200	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.36
	250	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.86
	300	0.00	0.73	0.07	0.00	0.00	0.00	0.00	0.80
	350	0.00	0.51	0.27	0.00	0.00	0.00	0.00	0.78
	400	0.00	0.07	1.11	0.19	0.01	0.00	0.00	1.38
	500	0.00	0.00	0.32	0.69	0.00	0.00	0.00	1.01
	600	0.00	0.00	0.03	0.63	0.03	0.01	0.00	0.70
	700	0.00	0.00	0.00	0.25	0.08	0.00	0.00	0.33
	800	0.00	0.00	0.00	0.03	0.04	0.05	0.09	0.21
	1000	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04
	All	31.16	2.53	1.80	1.79	0.16	0.06	0.13	37.63
Area 2	50	37.27	0.00	0.00	0.00	0.00	0.00	0.00	37.27
	60	37.26	0.00	0.00	0.00	0.00	0.00	0.00	37.26
	70	14.03	0.00	0.00	0.00	0.00	0.00	0.00	14.03
	80	30.73	0.00	0.00	0.00	0.00	0.00	0.00	30.73
	100	21.65	0.00	0.00	0.00	0.00	0.00	0.00	21.65
	120	2.77	0.00	0.00	0.00	0.00	0.00	0.00	2.77
	150	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.13
	200	0.05	0.37	0.00	0.00	0.00	0.00	0.00	0.42
	250	0.00	1.87	0.00	0.00	0.00	0.00	0.00	1.87
	300	0.00	2.00	0.15	0.00	0.00	0.00	0.00	2.15
	350	0.00	0.35	0.29	0.00	0.00	0.00	0.00	0.64
	400	0.00	0.05	2.18	0.08	0.00	0.00	0.00	2.31
	500	0.00	0.00	0.45	0.62	0.04	0.00	0.00	1.11
	600	0.00	0.00	0.00	0.22	0.02	0.00	0.00	0.24
	700	0.00	0.00	0.00	0.06	0.04	0.00	0.00	0.10
	800	0.00	0.00	0.00	0.02	0.10	0.08	0.05	0.25
	1000	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08
	All	143.89	4.64	3.07	1.00	0.20	0.08	0.13	153.01
Area 3	50	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.19
	60	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.20
	70	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.23
	80	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.17
	100	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	200	0.00	0.84	0.00	0.00	0.00	0.00	0.00	0.84
	250	0.00	6.47	0.00	0.00	0.00	0.00	0.00	6.47
	300	0.00	5.80	0.00	0.00	0.00	0.00	0.00	5.80
	350	0.00	0.78	0.06	0.00	0.00	0.00	0.00	0.84
	400	0.00	0.05	0.52	0.15	0.00	0.00	0.00	0.72
	500	0.00	0.00	0.20	0.13	0.00	0.00	0.00	0.33
	600	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.08
	700	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.06
	800	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.03
	All	0.83	13.94	0.78	0.45	0.00	0.00	0.00	16.00

Continued

Table 3-A-3 Continued

Quarter 3	Size class	Age class							Total
		0	1	2	3	4	5	6+	
Area 4	50	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.38
	60	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.39
	70	0.77	0.00	0.00	0.00	0.00	0.00	0.00	0.77
	80	0.82	0.00	0.00	0.00	0.00	0.00	0.00	0.82
	100	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.14
	120	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.09
	150	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.09
	200	0.00	2.68	0.00	0.00	0.00	0.00	0.00	2.68
	250	0.00	2.10	0.13	0.00	0.00	0.00	0.00	2.23
	300	0.00	1.48	0.25	0.00	0.00	0.00	0.00	1.73
	350	0.00	0.38	1.35	0.14	0.00	0.00	0.00	1.87
	400	0.00	0.00	0.39	0.20	0.05	0.00	0.00	0.64
	500	0.00	0.00	0.24	0.21	0.00	0.00	0.00	0.45
	700	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.09
	800	0.00	0.00	0.00	0.00	0.09	0.09	0.05	0.23
	All	2.59	6.73	2.36	0.55	0.23	0.09	0.05	12.60
Area 5	80	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.07
	300	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.14
	350	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.86
	400	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.57
	500	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.14
	600	0.00	0.00	0.33	0.17	0.00	0.00	0.00	0.50
	700	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.14
	All	0.07	1.57	0.47	0.17	0.14	0.00	0.00	2.42
Area 6	60	3.68	0.00	0.00	0.00	0.00	0.00	0.00	3.68
	70	12.20	0.00	0.00	0.00	0.00	0.00	0.00	12.20
	80	42.46	0.00	0.00	0.00	0.00	0.00	0.00	42.46
	100	15.50	0.00	0.00	0.00	0.00	0.00	0.00	15.50
	120	3.76	0.00	0.00	0.00	0.00	0.00	0.00	3.76
	200	0.03	1.29	0.00	0.00	0.00	0.00	0.00	1.32
	250	0.00	3.24	0.00	0.00	0.00	0.00	0.00	3.24
	300	0.00	1.57	0.00	0.00	0.00	0.00	0.00	1.57
	350	0.00	1.56	0.00	0.00	0.00	0.00	0.00	1.56
	400	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.41
	500	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.09
	700	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.03
	800	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.03
	All	77.63	8.07	0.09	0.06	0.00	0.00	0.00	85.85
Area 7	50	45.56	0.00	0.00	0.00	0.00	0.00	0.00	45.56
	60	45.57	0.00	0.00	0.00	0.00	0.00	0.00	45.57
	70	21.17	0.00	0.00	0.00	0.00	0.00	0.00	21.17
	80	11.44	0.00	0.00	0.00	0.00	0.00	0.00	11.44
	100	10.36	0.00	0.00	0.00	0.00	0.00	0.00	10.36
	120	4.79	0.00	0.00	0.00	0.00	0.00	0.00	4.79
	200	0.00	1.60	0.00	0.00	0.00	0.00	0.00	1.60
	250	0.00	5.71	0.00	0.00	0.00	0.00	0.00	5.71
	300	0.00	2.56	0.00	0.00	0.00	0.00	0.00	2.56
	350	0.00	0.82	0.00	0.00	0.00	0.00	0.00	0.82
	400	0.00	0.10	2.40	0.00	0.00	0.00	0.00	2.50
	500	0.00	0.00	2.17	0.48	0.00	0.00	0.00	2.65
	600	0.00	0.00	0.10	0.69	0.00	0.00	0.00	0.79
	700	0.00	0.00	0.00	0.08	0.08	0.00	0.00	0.16
	800	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.21

Continued

Table 3-A-3 Continued

Quarter 3	Size class	Age class							Total
		0	1	2	3	4	5	6+	
	All	138.89	10.79	4.67	1.25	0.29	0.00	0.00	155.89
Area North Sea	50	95.77	0.00	0.00	0.00	0.00	0.00	0.00	95.77
	60	95.77	0.00	0.00	0.00	0.00	0.00	0.00	95.77
	70	54.35	0.00	0.00	0.00	0.00	0.00	0.00	54.35
	80	89.12	0.00	0.00	0.00	0.00	0.00	0.00	89.12
	100	48.36	0.00	0.00	0.00	0.00	0.00	0.00	48.36
	120	11.47	0.00	0.00	0.00	0.00	0.00	0.00	11.47
	150	0.16	0.09	0.00	0.00	0.00	0.00	0.00	0.25
	200	0.08	7.14	0.00	0.00	0.00	0.00	0.00	7.23
	250	0.00	20.23	0.13	0.00	0.00	0.00	0.00	20.36
	300	0.00	14.28	0.47	0.00	0.00	0.00	0.00	14.75
	350	0.00	5.25	1.96	0.14	0.00	0.00	0.00	7.35
	400	0.00	1.25	6.60	0.63	0.06	0.00	0.00	8.54
	500	0.00	0.00	3.62	2.14	0.04	0.00	0.00	5.78
	600	0.00	0.00	0.46	1.78	0.05	0.01	0.00	2.32
	700	0.00	0.00	0.00	0.48	0.43	0.00	0.00	0.91
	800	0.00	0.00	0.00	0.11	0.44	0.22	0.19	0.95
	1000	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.12
	All	395.08	48.24	13.24	5.28	1.02	0.23	0.31	463.40

TABLE 3-A-4: Age size distribution of cod in 1991 (number per hour fishing) by area and quarter

Quarter 4	Size class	Age class							Total
		0	1	2	3	4	5	6+	
Area 1	60	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.15
	70	1.18	0.00	0.00	0.00	0.00	0.00	0.00	1.18
	80	2.34	0.00	0.00	0.00	0.00	0.00	0.00	2.34
	100	2.15	0.00	0.00	0.00	0.00	0.00	0.00	2.15
	120	1.13	0.00	0.00	0.00	0.00	0.00	0.00	1.13
	150	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.24
	200	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.10
	250	0.00	1.28	0.00	0.00	0.00	0.00	0.00	1.28
	300	0.00	4.54	0.00	0.00	0.00	0.00	0.00	4.54
	350	0.00	2.57	0.15	0.00	0.00	0.00	0.00	2.72
	400	0.00	0.74	1.65	0.10	0.00	0.00	0.00	2.49
	500	0.00	0.00	1.59	0.67	0.00	0.00	0.00	2.26
	600	0.00	0.00	0.06	1.54	0.46	0.00	0.00	2.06
	700	0.00	0.00	0.00	0.35	0.84	0.11	0.06	1.36
	800	0.00	0.00	0.00	0.10	0.10	0.16	0.34	0.70
	1000	0.00	0.00	0.00	0.00	0.00	0.05	0.07	0.12
	All	7.19	9.23	3.45	2.76	1.40	0.32	0.47	24.82
Area 2	60	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	80	2.20	0.00	0.00	0.00	0.00	0.00	0.00	2.20
	100	4.79	0.00	0.00	0.00	0.00	0.00	0.00	4.79
	120	4.33	0.00	0.00	0.00	0.00	0.00	0.00	4.33
	150	2.80	0.00	0.00	0.00	0.00	0.00	0.00	2.80
	200	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.08
	250	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.51
	300	0.00	3.79	0.12	0.00	0.00	0.00	0.00	3.91
	350	0.00	1.47	0.07	0.00	0.00	0.00	0.00	1.54
	400	0.00	0.66	1.02	0.00	0.00	0.00	0.00	1.68
	500	0.00	0.00	0.70	0.58	0.00	0.00	0.00	1.28
	600	0.00	0.00	0.44	0.12	0.00	0.00	0.00	0.56
	700	0.00	0.00	0.04	0.36	0.00	0.00	0.00	0.40
	800	0.00	0.00	0.00	0.11	0.05	0.02	0.02	0.20
	1000	0.00	0.00	0.00	0.00	0.00	0.10	0.26	0.36
	All	14.16	6.51	2.39	1.17	0.05	0.12	0.28	24.68
Area 3	80	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.20
	100	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.10
	120	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.40
	200	1.35	0.05	0.00	0.00	0.00	0.00	0.00	1.40
	250	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.13
	300	0.00	1.40	0.00	0.00	0.00	0.00	0.00	1.40
	350	0.00	2.01	0.00	0.00	0.00	0.00	0.00	2.01
	400	0.00	0.43	0.33	0.00	0.00	0.00	0.00	0.76
	500	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.27
	600	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.07
	700	0.00	0.00	0.00	0.00	0.18	0.00	0.00	0.18
	All	2.05	4.02	0.67	0.00	0.18	0.00	0.00	6.92

Continued

Table 3-A-4 Continued

Quarter 4	Size class	Age class							Total
		0	1	2	3	4	5	6+	
Area 4	80	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.50
	100	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.33
	120	1.33	0.00	0.00	0.00	0.00	0.00	0.00	1.33
	150	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.67
	200	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.17
	250	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.33
	300	0.00	1.17	0.00	0.00	0.00	0.00	0.00	1.17
	400	0.00	1.25	2.25	0.00	0.00	0.00	0.00	3.50
	500	0.00	0.00	0.67	0.67	0.00	0.00	0.00	1.34
	All	3.00	2.75	2.92	0.67	0.00	0.00	0.00	9.34
Area 5	80	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.25
	120	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.25
	150	1.50	0.00	0.00	0.00	0.00	0.00	0.00	1.50
	200	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.25
	300	0.00	1.25	0.00	0.00	0.00	0.00	0.00	1.25
	350	0.00	2.25	0.00	0.00	0.00	0.00	0.00	2.25
	400	0.00	0.25	0.25	0.00	0.00	0.00	0.00	0.50
	500	0.00	0.25	0.50	0.00	0.00	0.00	0.00	0.75
	600	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.50
	700	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.50
	800	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.25
	All	2.25	4.00	1.75	0.00	0.25	0.00	0.00	8.25
Area 6	60	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	80	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.25
	100	3.70	0.00	0.00	0.00	0.00	0.00	0.00	3.70
	120	49.74	0.00	0.00	0.00	0.00	0.00	0.00	49.74
	150	151.26	0.00	0.00	0.00	0.00	0.00	0.00	151.26
	200	10.46	0.00	0.00	0.00	0.00	0.00	0.00	10.46
	250	0.07	0.37	0.00	0.00	0.00	0.00	0.00	0.44
	300	0.00	1.78	0.00	0.00	0.00	0.00	0.00	1.78
	350	0.00	2.43	0.00	0.00	0.00	0.00	0.00	2.43
	400	0.00	1.94	0.00	0.00	0.00	0.00	0.00	1.94
	500	0.00	0.12	0.23	0.00	0.00	0.00	0.00	0.35
	600	0.00	0.00	0.37	0.00	0.00	0.00	0.00	0.37
	700	0.00	0.00	0.08	0.21	0.02	0.00	0.00	0.31
	800	0.00	0.00	0.00	0.02	0.07	0.03	0.00	0.12
	All	215.51	6.64	0.68	0.23	0.09	0.03	0.00	223.18
Area 7	60	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.15
	70	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.08
	80	5.85	0.00	0.00	0.00	0.00	0.00	0.00	5.85
	100	9.46	0.00	0.00	0.00	0.00	0.00	0.00	9.46
	120	24.08	0.00	0.00	0.00	0.00	0.00	0.00	24.08
	150	35.92	0.00	0.00	0.00	0.00	0.00	0.00	35.92
	200	10.85	0.54	0.00	0.00	0.00	0.00	0.00	11.39
	250	0.00	4.31	0.00	0.00	0.00	0.00	0.00	4.31
	300	0.00	3.69	0.00	0.00	0.00	0.00	0.00	3.69
	350	0.00	1.08	0.00	0.00	0.00	0.00	0.00	1.08
	400	0.00	0.46	0.08	0.00	0.00	0.00	0.00	0.54
	500	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.15
	600	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.08
	700	0.00	0.00	0.00	0.62	0.00	0.00	0.00	0.62
	800	0.00	0.00	0.00	0.15	0.00	0.00	0.08	0.23
	1000	0.00	0.00	0.00	0.00	0.00	0.00	0.38	0.38

Continued

Table 3-A-4 Continued

Quarter 4	Size class	Age class							Total
		0	1	2	3	4	5	6+	
	All	86.39	10.08	0.23	0.85	0.00	0.00	0.46	98.01
Area 8	60	1.11	0.00	0.00	0.00	0.00	0.00	0.00	1.11
	70	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	80	19.37	0.00	0.00	0.00	0.00	0.00	0.00	19.37
	100	38.20	0.00	0.00	0.00	0.00	0.00	0.00	38.20
	120	47.26	0.00	0.00	0.00	0.00	0.00	0.00	47.26
	150	33.34	0.00	0.00	0.00	0.00	0.00	0.00	33.34
	200	4.13	1.10	0.00	0.00	0.00	0.00	0.00	5.23
	250	0.00	2.07	0.57	0.00	0.00	0.00	0.00	2.64
	300	0.00	2.45	0.18	0.00	0.00	0.00	0.00	2.63
	350	0.00	0.56	0.51	0.00	0.00	0.00	0.00	1.07
	400	0.00	0.24	0.89	0.00	0.00	0.00	0.00	1.13
	500	0.00	0.00	1.06	0.08	0.14	0.00	0.00	1.28
	600	0.00	0.00	0.30	0.31	0.06	0.00	0.00	0.67
	700	0.00	0.00	0.00	0.16	0.11	0.00	0.00	0.27
	800	0.00	0.00	0.00	0.06	0.28	0.00	0.06	0.40
	1000	0.00	0.00	0.00	0.00	0.00	0.06	0.06	0.12
	All	144.41	6.42	3.51	0.61	0.59	0.06	0.12	155.72
Area North Sea	10	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.37
	70	1.26	0.00	0.00	0.00	0.00	0.00	0.00	1.26
	80	11.58	0.00	0.00	0.00	0.00	0.00	0.00	11.58
	100	20.52	0.00	0.00	0.00	0.00	0.00	0.00	20.52
	120	81.27	0.00	0.00	0.00	0.00	0.00	0.00	81.27
	150	192.39	0.00	0.00	0.00	0.00	0.00	0.00	192.39
	200	23.07	0.77	0.00	0.00	0.00	0.00	0.00	23.84
	250	0.07	6.93	0.00	0.00	0.00	0.00	0.00	7.00
	300	0.00	17.63	0.12	0.00	0.00	0.00	0.00	17.75
	350	0.00	11.81	0.22	0.00	0.00	0.00	0.00	12.03
	400	0.00	5.74	5.58	0.10	0.00	0.00	0.00	11.42
	500	0.00	0.37	4.11	1.92	0.00	0.00	0.00	6.39
	600	0.00	0.00	1.44	1.74	0.46	0.00	0.00	3.64
	700	0.00	0.00	0.62	1.54	1.04	0.11	0.06	3.37
	800	0.00	0.00	0.00	0.39	0.47	0.21	0.44	1.51
	1000	0.00	0.00	0.00	0.00	0.00	0.15	0.72	0.87
	All	330.53	43.25	12.09	5.69	1.97	0.47	1.22	395.21

TABLE 3-B-1: Age size distribution of **haddock** in 1991 (number per hour fishing) by area and quarter

Quarter 1	Size class	Age class							Total
		0	1	2	3	4	5	6+	
Area 1	100	0.00	3.32	0.00	0.00	0.00	0.00	0.00	3.32
	120	0.00	96.11	0.00	0.00	0.00	0.00	0.00	96.11
	150	0.00	269.12	0.00	0.00	0.00	0.00	0.00	269.12
	200	0.00	36.74	5.65	0.00	0.00	0.00	0.00	42.39
	250	0.00	0.32	56.25	3.52	0.00	0.00	0.00	60.09
	300	0.00	0.34	28.53	11.23	0.00	1.99	0.00	42.09
	350	0.00	0.00	0.75	8.75	1.84	3.73	0.65	15.72
	400	0.00	0.00	0.00	1.91	3.13	5.51	1.78	12.33
	500	0.00	0.00	0.00	0.00	0.02	0.78	1.18	1.98
	600	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.18
	700	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
	All	0.00	405.95	91.18	25.41	4.99	12.01	3.80	543.34
Area 2	100	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.60
	120	0.00	63.75	0.00	0.00	0.00	0.00	0.00	63.75
	150	0.00	765.07	0.00	0.00	0.00	0.00	0.00	765.07
	200	0.00	173.81	4.41	0.00	0.00	0.00	0.00	178.22
	250	0.00	1.42	99.52	4.01	0.00	0.00	0.00	104.95
	300	0.00	0.00	28.54	16.57	1.44	1.62	0.21	48.38
	350	0.00	0.00	0.40	9.26	3.14	2.46	0.80	16.06
	400	0.00	0.00	0.05	1.21	0.76	2.47	1.10	5.59
	500	0.00	0.00	0.00	0.07	0.05	0.62	0.51	1.25
	600	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.03
	800	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
	All	0.00	1,004.65	132.92	31.12	5.39	7.20	2.63	1,183.91
Area 3	100	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.25
	120	0.00	33.30	0.00	0.00	0.00	0.00	0.00	33.30
	150	0.00	585.23	3.27	0.00	0.00	0.00	0.00	588.50
	200	0.00	184.46	79.04	0.00	0.00	0.00	0.00	263.50
	250	0.00	11.44	180.75	8.16	1.15	1.15	0.00	202.65
	300	0.00	0.00	16.40	10.37	1.06	2.73	0.21	30.77
	350	0.00	0.00	0.16	3.86	0.59	2.40	0.26	7.27
	400	0.00	0.00	0.00	0.45	0.00	1.75	0.43	2.63
	500	0.00	0.00	0.00	0.00	0.00	0.10	0.05	0.15
	All	0.00	814.68	279.62	22.84	2.80	8.13	0.95	1,129.02
Area 4	120	0.00	5.67	0.00	0.00	0.00	0.00	0.00	5.67
	150	0.00	390.33	0.00	0.00	0.00	0.00	0.00	390.33
	200	0.00	116.08	0.00	0.00	0.00	0.00	0.00	116.08
	250	0.00	0.00	10.54	0.63	0.00	0.00	0.00	11.17
	300	0.00	0.00	9.97	1.36	0.59	0.00	0.00	11.92
	350	0.00	0.00	0.63	2.54	0.00	0.26	0.02	3.45
	400	0.00	0.00	0.00	0.79	0.11	0.25	0.60	1.75
	500	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.08
	All	0.00	512.08	21.14	5.32	0.70	0.59	0.62	540.45

Continued

Table 3-B-1 Continued

Quarter 1	Size class	Age class							Total
		0	1	2	3	4	5	6+	
Area 7	120	0.00	15.50	0.00	0.00	0.00	0.00	0.00	15.50
	150	0.00	207.77	1.92	0.00	0.00	0.00	0.00	209.69
	200	0.00	46.74	3.43	0.00	0.00	0.00	0.00	50.17
	250	0.00	0.40	13.23	0.00	0.00	0.00	0.00	13.63
	300	0.00	0.00	14.93	5.44	0.00	0.00	0.00	20.37
	350	0.00	0.00	1.69	2.56	0.06	0.00	0.00	4.31
	400	0.00	0.00	0.00	0.50	0.65	0.08	0.00	1.23
	500	0.00	0.00	0.00	0.00	0.25	0.31	0.00	0.56
	600	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05
	All	0.00	270.41	35.20	8.50	0.96	0.39	0.05	315.51
Area North Sea	100	0.00	4.17	0.00	0.00	0.00	0.00	0.00	4.17
	120	0.00	214.33	0.00	0.00	0.00	0.00	0.00	214.33
	150	0.00	2,217.51	5.20	0.00	0.00	0.00	0.00	2,222.71
	200	0.00	557.85	92.53	0.00	0.00	0.00	0.00	650.38
	250	0.00	13.59	360.28	16.32	1.15	1.15	0.00	392.49
	300	0.00	0.34	98.37	44.97	3.08	6.34	0.42	153.52
	350	0.00	0.00	3.63	26.98	5.63	8.85	1.73	46.82
	400	0.00	0.00	0.05	4.85	4.65	10.06	3.90	23.51
	500	0.00	0.00	0.00	0.07	0.32	1.90	1.74	4.03
	600	0.00	0.00	0.00	0.00	0.00	0.03	0.23	0.26
	700	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
	800	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
	All	0.00	3,007.79	560.06	93.19	14.83	28.33	8.04	3,712.24

TABLE 3-B-2: Age size distribution of **haddock** in 1991 (number per hour fishing) by area and quarter

Quarter 2	Size class	Age class							Total
		0	1	2	3	4	5	6+	
Area 1	60	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	80	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	120	0.00	1.98	0.00	0.00	0.00	0.00	0.00	1.98
	150	0.00	240.57	0.00	0.00	0.00	0.00	0.00	240.57
	200	0.00	192.16	2.17	0.00	0.00	0.00	0.00	194.33
	250	0.00	10.16	20.64	0.84	0.00	0.00	0.00	31.64
	300	0.00	0.00	23.35	2.78	0.30	0.41	0.11	26.95
	350	0.00	0.00	4.02	3.42	0.63	0.70	0.14	8.91
	400	0.00	0.00	0.10	1.81	1.36	1.82	0.69	5.78
	500	0.00	0.00	0.00	0.00	0.10	0.38	0.23	0.71
	600	0.00	0.00	0.00	0.00	0.00	0.02	0.10	0.12
	700	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
	All	0.02	444.87	50.28	8.85	2.39	3.33	1.28	511.02
Area 2	60	1.73	0.00	0.00	0.00	0.00	0.00	0.00	1.73
	70	1.57	0.00	0.00	0.00	0.00	0.00	0.00	1.57
	80	0.64	0.00	0.00	0.00	0.00	0.00	0.00	0.64
	100	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	120	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.18
	150	0.00	118.89	0.86	0.00	0.00	0.00	0.00	119.75
	200	0.00	646.07	9.52	0.00	0.00	0.00	0.00	655.59
	250	0.00	86.82	46.01	2.17	0.00	0.00	0.00	135.00
	300	0.00	0.53	36.01	8.63	0.53	0.43	0.00	46.13
	350	0.00	0.00	3.46	4.73	0.82	1.99	0.25	11.25
	400	0.00	0.00	0.00	0.71	0.56	0.66	0.12	2.05
	500	0.00	0.00	0.00	0.00	0.00	0.17	0.13	0.30
	All	3.97	852.49	95.86	16.24	1.91	3.25	0.50	974.22
Area 3	60	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	70	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.10
	80	0.77	0.00	0.00	0.00	0.00	0.00	0.00	0.77
	100	1.56	0.00	0.00	0.00	0.00	0.00	0.00	1.56
	120	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.16
	150	0.00	242.88	0.00	0.00	0.00	0.00	0.00	242.88
	200	0.00	830.68	11.33	0.00	0.00	0.00	0.00	842.01
	250	0.00	54.13	55.75	3.71	0.52	0.52	0.97	115.60
	300	0.00	0.00	14.29	4.56	0.19	3.53	3.85	26.42
	350	0.00	0.00	0.81	2.39	0.34	3.12	0.42	7.08
	400	0.00	0.00	0.00	0.39	0.06	0.58	0.27	1.30
	All	2.46	1,127.85	82.18	11.05	1.11	7.75	5.51	1,237.91
Area 4	150	0.00	130.65	0.00	0.00	0.00	0.00	0.00	130.65
	200	0.00	641.01	6.06	0.00	0.00	0.00	0.00	647.07
	250	0.00	59.79	14.72	1.23	0.00	1.35	0.00	77.09
	300	0.00	0.00	18.51	11.27	2.44	0.30	0.00	32.52
	350	0.00	0.00	0.49	3.67	0.99	4.11	1.02	10.28
	400	0.00	0.00	0.00	0.40	0.43	0.56	0.45	1.84
	All	0.00	831.45	39.78	16.57	3.86	6.32	1.47	899.45

Continued

Table 3-B-2 Continued

Quarter 2	Size class	Age class							Total
		0	1	2	3	4	5	6+	
Area 7	60	11.69	0.00	0.00	0.00	0.00	0.00	0.00	11.69
	70	1.41	0.00	0.00	0.00	0.00	0.00	0.00	1.41
	80	3.40	0.00	0.00	0.00	0.00	0.00	0.00	3.40
	150	0.00	18.97	0.00	0.00	0.00	0.00	0.00	18.97
	200	0.00	115.28	1.13	0.00	0.00	0.00	0.00	116.41
	250	0.00	15.51	5.47	0.12	0.00	0.00	0.00	21.10
	300	0.00	0.00	5.24	0.67	0.00	0.00	0.00	5.91
	350	0.00	0.00	3.98	2.17	0.22	0.00	0.00	6.37
	400	0.00	0.00	0.11	1.42	0.87	0.23	0.30	2.93
	500	0.00	0.00	0.00	0.03	0.34	0.24	0.03	0.64
	600	0.00	0.00	0.00	0.00	0.00	0.02	0.04	0.06
	All	16.50	149.76	15.93	4.41	1.43	0.49	0.37	188.89
Area North Sea	60	13.47	0.00	0.00	0.00	0.00	0.00	0.00	13.47
	70	3.08	0.00	0.00	0.00	0.00	0.00	0.00	3.08
	80	4.81	0.00	0.00	0.00	0.00	0.00	0.00	4.81
	100	1.58	0.00	0.00	0.00	0.00	0.00	0.00	1.58
	120	0.00	2.39	0.00	0.00	0.00	0.00	0.00	2.39
	150	0.00	751.97	0.86	0.00	0.00	0.00	0.00	752.83
	200	0.00	2,426.19	30.21	0.00	0.00	0.00	0.00	2,456.40
	250	0.00	226.57	142.62	8.07	0.52	1.87	0.97	380.62
	300	0.00	0.53	97.41	27.91	3.46	4.66	3.97	137.95
	350	0.00	0.00	12.76	16.38	3.08	9.92	1.83	43.97
	400	0.00	0.00	0.21	4.74	3.28	3.84	1.82	13.89
	500	0.00	0.00	0.00	0.03	0.44	0.80	0.39	1.66
	600	0.00	0.00	0.00	0.00	0.00	0.04	0.15	0.19
	700	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
	All	22.94	3,407.65	284.07	57.13	10.78	21.13	9.14	3,812.84

TABLE 3-B-3: Age size distribution of **haddock** in 1991 (number per hour fishing) by area and quarter

Quarter 3	Size class	Age class							Total
		0	1	2	3	4	5	6+	
Area 1	50	21.75	0.00	0.00	0.00	0.00	0.00	0.00	21.75
	60	21.76	0.00	0.00	0.00	0.00	0.00	0.00	21.76
	70	68.91	0.00	0.00	0.00	0.00	0.00	0.00	68.91
	80	231.94	0.00	0.00	0.00	0.00	0.00	0.00	231.94
	100	258.56	0.00	0.00	0.00	0.00	0.00	0.00	258.56
	120	119.29	0.00	0.00	0.00	0.00	0.00	0.00	119.29
	150	11.06	2.95	0.00	0.00	0.00	0.00	0.00	14.01
	200	0.00	72.61	0.00	0.00	0.00	0.00	0.00	72.61
	250	0.00	53.27	1.77	0.00	0.00	0.00	0.00	55.04
	300	0.00	2.20	7.64	0.34	0.00	0.00	0.00	10.18
	350	0.00	0.00	3.58	0.86	0.13	0.24	0.03	4.84
	400	0.00	0.00	0.33	0.66	0.19	0.58	0.05	1.81
	500	0.00	0.00	0.00	0.00	0.12	0.14	0.10	0.36
	600	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03
	All	733.27	131.03	13.32	1.86	0.44	0.96	0.21	881.09
Area 2	50	1.77	0.00	0.00	0.00	0.00	0.00	0.00	1.77
	60	1.78	0.00	0.00	0.00	0.00	0.00	0.00	1.78
	70	5.16	0.00	0.00	0.00	0.00	0.00	0.00	5.16
	80	66.19	0.00	0.00	0.00	0.00	0.00	0.00	66.19
	100	93.66	0.00	0.00	0.00	0.00	0.00	0.00	93.66
	120	172.17	0.00	0.00	0.00	0.00	0.00	0.00	172.17
	150	29.25	0.28	0.00	0.00	0.00	0.00	0.00	29.53
	200	0.00	68.42	0.00	0.00	0.00	0.00	0.00	68.42
	250	0.00	178.49	2.20	0.00	0.00	0.00	0.00	180.69
	300	0.00	6.07	11.23	0.44	0.00	0.25	0.00	17.99
	350	0.00	0.00	5.49	0.56	0.18	0.22	0.02	6.47
	400	0.00	0.00	0.19	0.35	0.13	0.36	0.06	1.09
	500	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.03
	All	369.98	253.26	19.11	1.35	0.31	0.86	0.08	644.95
Area 3	50	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.02
	60	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	70	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.13
	80	14.16	0.00	0.00	0.00	0.00	0.00	0.00	14.16
	100	43.38	0.00	0.00	0.00	0.00	0.00	0.00	43.38
	120	98.19	0.00	0.00	0.00	0.00	0.00	0.00	98.19
	150	16.91	3.97	0.00	0.00	0.00	0.00	0.00	20.88
	200	0.00	148.43	2.67	0.00	0.00	0.00	0.00	151.10
	250	0.00	254.11	18.14	0.55	0.00	0.00	0.00	272.80
	300	0.00	6.42	16.62	2.38	0.58	3.08	0.22	29.32
	350	0.00	0.00	2.69	1.82	0.22	1.29	0.31	6.33
	400	0.00	0.00	0.03	0.64	0.21	0.31	0.28	1.47
	500	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.02
	600	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.03
	All	172.82	412.93	40.15	5.39	1.01	4.73	0.81	637.84

Continued

Table 3-B-3 Continued

Quarter 3	Size class	Age class							Total
		0	1	2	3	4	5	6+	
Area 4	70	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.05
	80	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.92
	100	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.32
	120	2.82	0.00	0.00	0.00	0.00	0.00	0.00	2.82
	150	1.09	1.32	0.00	0.00	0.00	0.00	0.00	2.41
	200	0.00	74.09	0.00	0.00	0.00	0.00	0.00	74.09
	250	0.00	70.45	0.27	0.00	0.00	0.00	0.00	70.72
	300	0.00	0.99	3.44	1.12	0.15	0.35	0.00	6.05
	350	0.00	0.00	0.85	0.85	0.00	1.01	0.06	2.77
	400	0.00	0.00	0.00	0.07	0.00	0.32	0.07	0.46
	All	5.20	146.85	4.56	2.04	0.15	1.68	0.13	160.61
Area 7	50	30.98	0.00	0.00	0.00	0.00	0.00	0.00	30.98
	60	30.98	0.00	0.00	0.00	0.00	0.00	0.00	30.98
	70	52.46	0.00	0.00	0.00	0.00	0.00	0.00	52.46
	80	182.08	0.00	0.00	0.00	0.00	0.00	0.00	182.08
	100	744.29	0.00	0.00	0.00	0.00	0.00	0.00	744.29
	120	127.38	0.00	0.00	0.00	0.00	0.00	0.00	127.38
	150	3.75	0.00	0.00	0.00	0.00	0.00	0.00	3.75
	200	0.00	6.42	0.00	0.00	0.00	0.00	0.00	6.42
	250	0.00	38.44	1.03	0.00	0.00	0.00	0.00	39.47
	300	0.00	16.85	2.96	0.00	0.00	0.00	0.00	19.81
	350	0.00	0.79	16.13	0.00	0.00	0.00	0.00	16.92
	400	0.00	0.00	10.29	2.52	0.36	0.00	0.00	13.17
	500	0.00	0.00	0.00	1.49	0.00	0.59	0.00	2.08
	600	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.08
	All	1,171.92	62.50	30.41	4.01	0.36	0.67	0.00	1,269.87
Area North Sea	50	54.53	0.00	0.00	0.00	0.00	0.00	0.00	54.53
	60	54.54	0.00	0.00	0.00	0.00	0.00	0.00	54.54
	70	126.70	0.00	0.00	0.00	0.00	0.00	0.00	126.70
	80	495.30	0.00	0.00	0.00	0.00	0.00	0.00	495.30
	100	1,140.21	0.00	0.00	0.00	0.00	0.00	0.00	1,140.21
	120	519.85	0.00	0.00	0.00	0.00	0.00	0.00	519.85
	150	62.06	8.51	0.00	0.00	0.00	0.00	0.00	70.57
	200	0.00	369.96	2.67	0.00	0.00	0.00	0.00	372.63
	250	0.00	594.78	23.42	0.55	0.00	0.00	0.00	618.75
	300	0.00	32.58	41.88	4.29	0.73	3.67	0.22	83.37
	350	0.00	0.79	28.74	4.09	0.54	2.76	0.43	37.35
	400	0.00	0.00	10.84	4.24	0.90	1.57	0.46	18.01
	500	0.00	0.00	0.00	1.49	0.12	0.77	0.10	2.48
	600	0.00	0.00	0.00	0.00	0.00	0.11	0.03	0.14
	All	2,453.19	1,006.62	107.55	14.66	2.29	8.88	1.24	3,594.43

TABLE 3-B-4: Age size distribution of **haddock** in 1991 (number per hour fishing) by area and quarter

Quarter 4	Size class	Age class							Total
		0	1	2	3	4	5	6+	
Area 1	80	25.65	0.00	0.00	0.00	0.00	0.00	0.00	25.65
	100	350.88	0.00	0.00	0.00	0.00	0.00	0.00	350.88
	120	781.74	0.00	0.00	0.00	0.00	0.00	0.00	781.74
	150	293.21	3.01	0.00	0.00	0.00	0.00	0.00	296.22
	200	2.74	52.09	0.00	0.00	0.00	0.00	0.00	54.83
	250	0.00	181.03	1.47	0.00	0.00	0.00	0.00	182.50
	300	0.00	71.79	9.66	1.32	0.00	0.00	0.00	82.77
	350	0.00	0.95	15.14	2.57	0.28	0.14	0.28	19.36
	400	0.00	0.00	3.68	2.59	0.82	1.02	0.14	8.25
	500	0.00	0.00	0.00	0.43	0.27	1.42	0.72	2.84
	600	0.00	0.00	0.00	0.00	0.00	0.13	0.31	0.44
	All	1,454.22	308.27	29.95	6.91	1.37	2.71	1.45	1,805.48
Area 2	80	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.32
	100	14.29	0.00	0.00	0.00	0.00	0.00	0.00	14.29
	120	181.61	0.00	0.00	0.00	0.00	0.00	0.00	181.61
	150	787.77	0.00	0.00	0.00	0.00	0.00	0.00	787.77
	200	14.71	27.43	0.00	0.00	0.00	0.00	0.00	42.14
	250	0.00	443.19	6.93	0.00	0.00	0.00	0.00	450.12
	300	0.00	94.87	15.63	1.08	0.24	0.52	0.00	112.34
	350	0.00	1.23	13.88	1.41	0.00	0.30	0.00	16.82
	400	0.00	0.00	2.71	3.04	0.26	1.23	0.28	7.52
	500	0.00	0.00	0.04	0.38	0.26	0.21	0.00	0.89
	600	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.08
	All	998.70	566.72	39.19	5.91	0.84	2.26	0.28	1,613.90
Area 3	100	3.08	0.00	0.00	0.00	0.00	0.00	0.00	3.08
	120	132.71	0.00	0.00	0.00	0.00	0.00	0.00	132.71
	150	423.81	2.88	0.00	0.00	0.00	0.00	0.00	426.69
	200	18.87	291.83	0.00	0.00	0.00	0.00	0.00	310.70
	250	0.00	691.86	20.29	0.00	0.00	0.00	0.00	712.15
	300	0.00	89.72	20.74	2.56	0.00	0.00	0.00	113.02
	350	0.00	3.08	6.92	6.73	2.77	2.64	0.00	22.14
	400	0.00	0.00	0.11	1.90	0.00	5.54	0.13	7.68
	500	0.00	0.00	0.00	0.00	0.00	0.13	0.27	0.40
	All	578.47	1079.27	48.06	11.19	2.77	8.31	0.40	1,728.57
Area 4	120	1.67	0.00	0.00	0.00	0.00	0.00	0.00	1.67
	150	3.33	0.00	0.00	0.00	0.00	0.00	0.00	3.33
	200	0.00	11.83	0.00	0.00	0.00	0.00	0.00	11.83
	250	0.00	169.67	0.00	0.00	0.00	0.00	0.00	169.67
	300	0.00	48.13	13.03	0.00	0.00	0.00	0.00	61.16
	350	0.00	0.00	4.17	0.00	0.83	1.00	0.00	6.00
	400	0.00	0.00	0.00	0.00	1.67	0.00	0.00	1.67
	All	5.00	229.63	17.20	0.00	2.50	1.00	0.00	255.33

Continued

Table 3-B-4 Continued

Quarter 4	Size class	Age class							Total
		0	1	2	3	4	5	6+	
Area 7	100	1.62	0.00	0.00	0.00	0.00	0.00	0.00	1.62
	120	77.31	0.00	0.00	0.00	0.00	0.00	0.00	77.31
	150	714.69	0.00	0.00	0.00	0.00	0.00	0.00	714.69
	200	45.46	0.00	0.00	0.00	0.00	0.00	0.00	45.46
	250	0.00	58.46	0.00	0.00	0.00	0.00	0.00	58.46
	300	0.00	25.62	0.00	0.00	0.00	0.00	0.00	25.62
	350	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.31
	500	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.08
	600	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.08
	All	839.08	84.39	0.00	0.00	0.00	0.16	0.00	923.63
Area 8	100	12.84	0.00	0.00	0.00	0.00	0.00	0.00	12.84
	120	122.48	0.00	0.00	0.00	0.00	0.00	0.00	122.48
	150	188.23	7.53	0.00	0.00	0.00	0.00	0.00	195.76
	200	1.23	6.79	0.00	0.00	0.00	0.00	0.00	8.02
	250	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.51
	300	0.00	3.31	0.13	0.00	0.00	0.00	0.00	3.44
	350	0.00	0.21	0.27	0.00	0.00	0.00	0.00	0.48
	400	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.27
	All	324.78	18.35	0.67	0.00	0.00	0.00	0.00	343.80
Area North Sea	80	25.97	0.00	0.00	0.00	0.00	0.00	0.00	25.97
	100	369.87	0.00	0.00	0.00	0.00	0.00	0.00	369.87
	120	1,175.04	0.00	0.00	0.00	0.00	0.00	0.00	1,175.04
	150	2,222.82	5.89	0.00	0.00	0.00	0.00	0.00	2,228.71
	200	81.78	383.19	0.00	0.00	0.00	0.00	0.00	464.97
	250	0.00	1,544.38	28.70	0.00	0.00	0.00	0.00	1,573.08
	300	0.00	330.61	59.15	4.96	0.24	0.52	0.00	395.48
	350	0.00	5.59	40.16	10.71	3.88	4.09	0.28	64.71
	400	0.00	0.00	6.50	7.52	2.75	7.79	0.55	25.11
	500	0.00	0.00	0.04	0.81	0.53	1.84	0.98	4.20
	600	0.00	0.00	0.00	0.00	0.08	0.13	0.31	0.52
	All	3,875.48	2,269.66	134.55	24.00	7.48	14.37	2.12	6,327.66

TABLE 3-C-1: Age size distribution of **whiting** in 1991 (number per hour fishing) by area and quarter

Quarter 1	Size class	Age class							Total
		0	1	2	3	4	5	6+	
Area 1	100	0.00	1.14	0.00	0.00	0.00	0.00	0.00	1.14
	120	0.00	6.00	0.00	0.00	0.00	0.00	0.00	6.00
	150	0.00	15.14	0.52	0.00	0.00	0.00	0.00	15.66
	200	0.00	19.60	229.78	104.85	2.49	0.00	0.00	356.71
	250	0.00	0.00	316.07	573.86	13.11	24.91	1.82	929.77
	300	0.00	0.00	3.38	57.56	31.55	19.48	8.57	120.53
	350	0.00	0.00	0.00	1.84	4.27	5.41	1.02	12.54
	400	0.00	0.00	0.00	0.04	0.21	0.67	0.53	1.44
	500	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.04
	All	0.00	41.88	549.75	738.15	51.63	50.49	11.96	1,443.83
Area 2	80	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.11
	100	0.00	3.80	0.00	0.00	0.00	0.00	0.00	3.80
	120	0.00	92.47	0.00	0.00	0.00	0.00	0.00	92.47
	150	0.00	284.65	11.02	0.00	0.00	0.00	0.00	295.67
	200	0.00	42.48	862.21	98.69	0.00	4.39	0.00	1,007.77
	250	0.00	0.00	257.07	261.97	86.69	23.57	3.53	632.83
	300	0.00	0.00	0.66	12.60	17.43	9.38	2.48	42.55
	350	0.00	0.00	0.00	0.10	0.22	0.28	0.09	0.69
	All	0.00	423.61	1,130.96	373.36	104.34	37.62	6.10	2,075.89
Area 3	80	0.00	2.25	0.00	0.00	0.00	0.00	0.00	2.25
	100	0.00	58.33	0.00	0.00	0.00	0.00	0.00	58.33
	120	0.00	910.25	0.00	0.00	0.00	0.00	0.00	910.25
	150	0.00	695.02	6.28	0.00	0.00	0.00	0.00	701.30
	200	0.00	42.12	487.22	141.97	0.00	0.00	0.00	671.31
	250	0.00	0.00	217.66	470.90	38.18	14.92	0.00	741.66
	300	0.00	0.00	1.85	19.75	15.62	6.94	2.99	47.15
	350	0.00	0.00	0.00	0.02	1.21	0.32	0.00	1.55
	All	0.00	1,707.97	713.01	632.64	55.01	22.18	2.99	3,133.80
Area 4	80	0.00	0.96	0.00	0.00	0.00	0.00	0.00	0.96
	100	0.00	24.96	0.00	0.00	0.00	0.00	0.00	24.96
	120	0.00	771.08	0.00	0.00	0.00	0.00	0.00	771.08
	150	0.00	1,495.63	0.00	0.00	0.00	0.00	0.00	1,495.63
	200	0.00	132.87	665.49	48.57	12.64	0.00	0.00	859.57
	250	0.00	2.65	290.09	281.51	72.61	37.06	0.00	683.92
	300	0.00	0.00	2.07	12.37	12.95	5.66	3.08	36.13
	350	0.00	0.00	0.06	0.00	0.30	0.11	0.03	0.50
	All	0.00	2,428.15	957.71	342.45	98.50	42.83	3.11	38,72.75
Area 5	80	0.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00
	100	0.00	5.35	0.00	0.00	0.00	0.00	0.00	5.35
	120	0.00	15.60	0.00	0.00	0.00	0.00	0.00	15.60
	150	0.00	40.47	0.53	0.00	0.00	0.00	0.00	41.00
	200	0.00	31.35	99.15	19.55	0.00	0.00	0.00	150.05
	250	0.00	11.36	120.64	42.66	12.75	10.95	3.14	201.50
	300	0.00	0.00	5.54	8.76	6.42	1.47	1.10	23.29
	350	0.00	0.00	0.30	0.85	0.83	0.52	0.00	2.50
	400	0.00	0.00	0.00	0.20	0.30	0.20	0.10	0.80
	500	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.10
	All	0.00	105.13	226.16	72.02	20.40	13.14	4.34	441.19

Continued

Table 3-C-1 Continued

Quarter 1	Size class	Age class							Total
		0	1	2	3	4	5	6+	
Area 6	60	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.02
	70	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.06
	80	0.00	1.41	0.00	0.00	0.00	0.00	0.00	1.41
	100	0.00	62.94	0.00	0.00	0.00	0.00	0.00	62.94
	120	0.00	540.51	0.00	0.00	0.00	0.00	0.00	540.51
	150	0.00	959.43	2.64	0.00	0.00	0.00	0.00	962.07
	200	0.00	141.10	152.45	12.06	2.62	0.00	0.00	308.23
	250	0.00	52.88	195.77	140.08	39.69	13.60	2.48	444.50
	300	0.00	0.83	32.71	37.92	27.25	11.33	2.15	112.19
	350	0.00	0.00	1.62	2.40	2.85	0.95	0.30	8.12
	400	0.00	0.00	0.09	0.12	0.11	0.24	0.03	0.59
	All	0.00	1,759.18	385.28	192.58	72.52	26.12	4.96	2,440.64
Area 7	80	0.00	2.79	0.00	0.00	0.00	0.00	0.00	2.79
	100	0.00	29.61	0.00	0.00	0.00	0.00	0.00	29.61
	120	0.00	243.13	0.00	0.00	0.00	0.00	0.00	243.13
	150	0.00	226.24	5.60	0.00	0.00	0.00	0.00	231.84
	200	0.00	9.86	27.04	1.87	0.25	0.00	0.00	39.02
	250	0.00	0.00	20.51	18.67	2.83	0.46	0.00	42.47
	300	0.00	0.00	0.64	5.21	3.59	1.37	0.12	10.93
	350	0.00	0.00	0.00	0.25	0.56	0.25	0.00	1.06
	400	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.13
	All	0.00	511.63	53.79	26.00	7.36	2.08	0.12	600.98
Area North Sea	60	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.02
	70	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.06
	80	0.00	8.51	0.00	0.00	0.00	0.00	0.00	8.51
	100	0.00	186.12	0.00	0.00	0.00	0.00	0.00	186.12
	120	0.00	2,579.04	0.00	0.00	0.00	0.00	0.00	2,579.04
	150	0.00	3,716.57	26.59	0.00	0.00	0.00	0.00	3,743.16
	200	0.00	419.37	2,523.34	427.55	18.01	4.39	0.00	3,392.66
	250	0.00	66.89	1,417.81	1,789.64	265.86	125.47	10.97	3,676.64
	300	0.00	0.83	46.85	154.18	114.81	55.62	20.50	392.77
	350	0.00	0.00	1.97	5.46	10.23	7.84	1.44	26.95
	400	0.00	0.00	0.09	0.36	0.74	1.11	0.66	2.97
	500	0.00	0.00	0.00	0.00	0.10	0.02	0.02	0.14
	All	0.00	6,977.41	4,016.65	2,377.19	409.75	194.45	33.59	14,009.04

TABLE 3-C-2: Age size distribution of **whiting** in 1991 (number per hour fishing) by area and quarter

Quarter 2	Size class	Age class							Total
		0	1	2	3	4	5	6+	
Area 1	60	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	120	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.07
	150	0.00	5.95	0.00	0.00	0.00	0.00	0.00	5.95
	200	0.00	7.73	28.10	3.99	0.00	0.00	0.00	39.82
	250	0.00	0.00	67.07	76.06	7.95	1.44	1.05	153.57
	300	0.00	0.00	2.52	20.84	5.48	4.24	1.31	34.39
	350	0.00	0.00	0.00	1.30	2.27	2.09	0.86	6.52
	400	0.00	0.00	0.00	0.00	0.38	0.46	0.26	1.10
	All	0.01	13.75	97.69	102.19	16.08	8.23	3.48	241.43
Area 2	50	2.04	0.00	0.00	0.00	0.00	0.00	0.00	2.04
	60	2.04	0.00	0.00	0.00	0.00	0.00	0.00	2.04
	70	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.13
	100	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.07
	120	0.00	1.58	0.00	0.00	0.00	0.00	0.00	1.58
	150	0.00	327.01	3.76	0.00	0.00	0.00	0.00	330.77
	200	0.00	208.90	188.80	20.41	3.41	0.00	0.00	421.52
	250	0.00	31.19	146.26	96.48	27.01	9.65	6.65	317.24
	300	0.00	0.26	3.10	10.26	5.48	7.14	3.85	30.09
	350	0.00	0.00	0.13	0.18	0.38	0.42	0.24	1.35
	400	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05
	All	4.21	569.01	342.05	127.33	36.28	17.21	10.79	1,106.88
Area 3	120	0.00	14.44	0.00	0.00	0.00	0.00	0.00	14.44
	150	0.00	412.57	0.00	0.00	0.00	0.00	0.00	412.57
	200	0.00	228.02	222.40	44.39	0.00	0.00	0.00	494.81
	250	0.00	32.71	141.71	251.05	32.63	4.14	4.30	466.54
	300	0.00	0.00	2.05	15.96	5.54	5.06	0.53	29.14
	350	0.00	0.00	0.00	0.15	0.51	0.36	0.04	1.06
	400	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.03
	All	0.00	687.74	366.16	311.55	38.68	9.59	4.87	1,418.59
Area 4	120	0.00	33.28	0.00	0.00	0.00	0.00	0.00	33.28
	150	0.00	1943.69	48.54	0.00	0.00	0.00	0.00	1992.23
	200	0.00	671.19	794.53	210.69	0.00	0.00	14.71	1691.12
	250	0.00	101.31	331.84	494.88	260.84	65.26	30.80	1284.93
	300	0.00	1.71	9.76	23.08	49.55	23.13	19.06	126.29
	350	0.00	0.00	0.00	0.00	1.60	0.00	4.74	6.34
	All	0.00	2751.18	1184.67	728.65	311.99	88.39	69.31	5134.19
Area 5	100	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.05
	120	0.00	16.26	0.00	0.00	0.00	0.00	0.00	16.26
	150	0.00	327.17	0.00	0.00	0.00	0.00	0.00	327.17
	200	0.00	201.93	72.58	7.47	10.04	0.00	0.00	292.02
	250	0.00	20.85	63.56	35.90	27.94	9.16	0.00	157.41
	300	0.00	1.44	10.18	7.03	12.79	3.08	0.00	34.52
	350	0.00	0.00	2.69	1.06	0.72	0.34	0.00	4.81
	400	0.00	0.00	0.05	0.10	0.57	0.43	0.00	1.15
	All	0.00	567.70	149.06	51.56	52.06	13.01	0.00	833.39

Continued

Table 3-C-2 Continued

Quarter 2	Size class	Age class							Total
		0	1	2	3	4	5	6+	
Area 6	50	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	60	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	80	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01
	100	0.00	7.13	0.00	0.00	0.00	0.00	0.00	7.13
	120	0.00	310.30	0.00	0.00	0.00	0.00	0.00	310.30
	150	0.00	2,042.54	0.00	0.00	0.00	0.00	0.00	2,042.54
	200	0.00	490.11	195.55	39.82	6.73	2.12	0.00	734.33
	250	0.00	29.50	101.96	74.21	51.11	48.05	3.10	307.93
	300	0.00	0.55	4.62	7.91	9.10	5.29	3.21	30.68
	350	0.00	0.00	0.44	0.45	0.86	0.41	0.09	2.25
	400	0.00	0.00	0.04	0.02	0.08	0.07	0.10	0.31
	All	0.06	2,880.14	302.61	122.41	67.88	55.94	6.50	3,435.54
Area 7	50	5.86	0.00	0.00	0.00	0.00	0.00	0.00	5.86
	60	5.86	0.00	0.00	0.00	0.00	0.00	0.00	5.86
	70	1.79	0.00	0.00	0.00	0.00	0.00	0.00	1.79
	100	0.00	1.96	0.00	0.00	0.00	0.00	0.00	1.96
	120	0.00	143.73	0.00	0.00	0.00	0.00	0.00	143.73
	150	0.00	761.10	5.27	0.00	0.00	0.00	0.00	766.37
	200	0.00	56.78	38.69	1.76	0.00	0.00	0.00	97.23
	250	0.00	2.28	25.32	9.10	2.22	0.52	0.07	39.51
	300	0.00	0.00	0.32	1.07	0.63	0.27	0.49	2.78
	350	0.00	0.00	0.00	0.09	0.09	0.03	0.13	0.34
	400	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.05
	All	13.51	965.85	69.60	12.02	2.94	0.87	0.69	1,065.48
Area North Sea	50	7.93	0.00	0.00	0.00	0.00	0.00	0.00	7.93
	60	7.94	0.00	0.00	0.00	0.00	0.00	0.00	7.94
	70	1.92	0.00	0.00	0.00	0.00	0.00	0.00	1.92
	80	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01
	100	0.00	9.21	0.00	0.00	0.00	0.00	0.00	9.21
	120	0.00	519.66	0.00	0.00	0.00	0.00	0.00	519.66
	150	0.00	5,820.02	57.57	0.00	0.00	0.00	0.00	5,877.59
	200	0.00	1,864.65	1,540.65	328.54	20.19	2.12	14.71	3,770.86
	250	0.00	217.83	877.72	1,037.68	409.69	138.21	45.96	2,727.09
	300	0.00	3.96	32.55	86.15	88.59	48.21	28.43	287.89
	350	0.00	0.00	3.26	3.22	6.42	3.65	6.09	22.64
	400	0.00	0.00	0.09	0.12	1.03	1.04	0.41	2.69
	All	17.79	8,435.34	2,511.84	1,455.71	525.92	193.23	95.60	13,235.43

TABLE 3-C-3: Age size distribution of whiting in 1991 (number per hour fishing) by area and quarter

Quarter 3	Size class	Age class							Total
		0	1	2	3	4	5	6+	
Area 1	50	13.37	0.00	0.00	0.00	0.00	0.00	0.00	13.37
	60	13.38	0.00	0.00	0.00	0.00	0.00	0.00	13.38
	70	2.08	0.00	0.00	0.00	0.00	0.00	0.00	2.08
	80	22.07	0.00	0.00	0.00	0.00	0.00	0.00	22.07
	100	34.92	0.00	0.00	0.00	0.00	0.00	0.00	34.92
	120	27.37	0.00	0.00	0.00	0.00	0.00	0.00	27.37
	150	1.41	0.00	0.00	0.00	0.00	0.00	0.00	1.41
	200	0.00	4.91	1.63	0.36	0.00	0.00	0.00	6.90
	250	0.00	4.82	55.14	37.08	2.29	0.00	0.00	99.33
	300	0.00	0.00	13.28	31.27	4.35	2.41	0.93	52.24
	350	0.00	0.00	0.10	1.74	0.94	0.95	0.25	3.98
	400	0.00	0.00	0.01	0.01	0.12	0.13	0.07	0.34
	500	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.04
	All	114.60	9.73	70.16	70.46	7.72	3.49	1.27	277.43
Area 2	50	8.29	0.00	0.00	0.00	0.00	0.00	0.00	8.29
	60	8.29	0.00	0.00	0.00	0.00	0.00	0.00	8.29
	70	16.01	0.00	0.00	0.00	0.00	0.00	0.00	16.01
	80	95.10	0.00	0.00	0.00	0.00	0.00	0.00	95.10
	100	80.82	0.00	0.00	0.00	0.00	0.00	0.00	80.82
	120	53.05	0.00	0.00	0.00	0.00	0.00	0.00	53.05
	150	1.24	2.33	0.00	0.00	0.00	0.00	0.00	3.57
	200	0.00	108.99	18.64	0.73	0.00	0.00	0.00	128.36
	250	0.00	9.69	72.54	21.92	3.53	2.01	0.00	109.69
	300	0.00	0.00	8.56	12.41	4.59	2.35	0.57	28.48
	350	0.00	0.00	0.00	0.20	0.70	0.18	0.11	1.19
	400	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.05
	All	262.80	121.01	99.74	35.26	8.87	4.54	0.68	532.90
Area 3	50	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.23
	60	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.24
	70	1.63	0.00	0.00	0.00	0.00	0.00	0.00	1.63
	80	72.56	0.00	0.00	0.00	0.00	0.00	0.00	72.56
	100	156.19	0.00	0.00	0.00	0.00	0.00	0.00	156.19
	120	113.23	0.00	0.00	0.00	0.00	0.00	0.00	113.23
	150	4.89	34.05	0.00	0.00	0.00	0.00	0.00	38.94
	200	0.00	498.14	61.95	13.47	0.00	0.00	0.00	573.56
	250	0.00	69.23	159.72	138.93	12.38	3.91	0.00	384.17
	300	0.00	0.00	3.19	27.12	2.07	0.87	0.38	33.63
	350	0.00	0.00	0.00	0.36	0.35	0.20	0.16	1.07
	400	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.03
	All	348.97	601.42	224.86	179.88	14.83	4.98	0.54	1,375.48
Area 4	50	4.66	0.00	0.00	0.00	0.00	0.00	0.00	4.66
	60	4.67	0.00	0.00	0.00	0.00	0.00	0.00	4.67
	70	25.68	0.00	0.00	0.00	0.00	0.00	0.00	25.68
	80	17.92	0.00	0.00	0.00	0.00	0.00	0.00	17.92
	100	1.45	0.00	0.00	0.00	0.00	0.00	0.00	1.45
	150	0.00	129.62	0.00	0.00	0.00	0.00	0.00	129.62
	200	0.00	1,078.92	98.12	13.13	3.28	0.00	0.00	1,193.45
	250	0.00	29.39	131.85	51.62	22.29	2.37	0.00	237.52
	300	0.00	0.00	5.57	13.98	8.45	3.89	0.29	32.18
	350	0.00	0.00	0.00	0.34	0.52	0.55	0.00	1.41
	400	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.05
	All	54.38	1,237.93	235.54	79.07	34.59	6.81	0.29	1,648.61

Continued

Table 3-C-3 Continued

Quarter 3	Size class	Age class							Total
		0	1	2	3	4	5	6+	
Area 5	50	10.60	0.00	0.00	0.00	0.00	0.00	0.00	10.60
	60	10.60	0.00	0.00	0.00	0.00	0.00	0.00	10.60
	70	10.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00
	80	11.64	0.00	0.00	0.00	0.00	0.00	0.00	11.64
	100	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.07
	120	0.00	0.64	0.00	0.00	0.00	0.00	0.00	0.64
	150	0.00	132.29	0.00	0.00	0.00	0.00	0.00	132.29
	200	0.00	487.93	20.07	0.00	0.00	0.00	0.00	508.00
	250	0.00	66.56	83.82	2.23	0.00	6.61	0.00	159.22
	300	0.00	1.29	13.89	3.46	1.96	1.96	0.00	22.56
	350	0.00	0.64	1.16	2.21	0.95	0.25	0.00	5.21
	400	0.00	0.00	0.00	0.43	0.21	0.14	0.14	0.92
	All	42.91	689.35	118.94	8.33	3.12	8.96	0.14	871.75
Area 6	50	1.76	0.00	0.00	0.00	0.00	0.00	0.00	1.76
	60	1.76	0.00	0.00	0.00	0.00	0.00	0.00	1.76
	70	14.36	0.00	0.00	0.00	0.00	0.00	0.00	14.36
	80	49.35	0.00	0.00	0.00	0.00	0.00	0.00	49.35
	100	77.62	0.00	0.00	0.00	0.00	0.00	0.00	77.62
	120	19.99	1.47	0.00	0.00	0.00	0.00	0.00	21.46
	150	0.00	722.93	0.00	0.00	0.00	0.00	0.00	722.93
	200	0.00	1,016.00	72.75	12.56	5.84	0.00	0.00	1,107.15
	250	0.00	108.03	124.21	45.23	8.26	4.32	1.35	291.40
	300	0.00	1.26	14.29	8.85	6.48	1.41	0.13	32.42
	350	0.00	0.00	0.23	0.21	0.63	0.30	0.00	1.37
	400	0.00	0.00	0.00	0.04	0.09	0.00	0.07	0.20
	All	164.84	1,849.69	211.48	66.89	21.30	6.03	1.55	2,321.78
Area 7	50	87.84	0.00	0.00	0.00	0.00	0.00	0.00	87.84
	60	87.85	0.00	0.00	0.00	0.00	0.00	0.00	87.85
	70	317.07	0.00	0.00	0.00	0.00	0.00	0.00	317.07
	80	2,197.14	0.00	0.00	0.00	0.00	0.00	0.00	2,197.14
	100	843.25	0.00	0.00	0.00	0.00	0.00	0.00	843.25
	120	169.90	0.00	0.00	0.00	0.00	0.00	0.00	169.90
	150	0.00	272.61	0.00	0.00	0.00	0.00	0.00	272.61
	200	0.00	392.40	4.21	0.00	0.00	0.00	0.00	396.61
	250	0.00	18.77	54.99	3.11	2.43	0.77	0.00	80.07
	300	0.00	0.00	17.64	3.06	3.27	0.99	0.00	24.96
	350	0.00	0.00	0.09	1.01	0.22	0.09	0.00	1.41
	All	3,703.05	683.78	76.93	7.18	5.92	1.85	0.00	4,478.71
Area North Sea	50	126.78	0.00	0.00	0.00	0.00	0.00	0.00	126.78
	60	126.78	0.00	0.00	0.00	0.00	0.00	0.00	126.78
	70	386.84	0.00	0.00	0.00	0.00	0.00	0.00	386.84
	80	2,465.78	0.00	0.00	0.00	0.00	0.00	0.00	2,465.78
	100	1,194.33	0.00	0.00	0.00	0.00	0.00	0.00	1,194.33
	120	383.54	2.11	0.00	0.00	0.00	0.00	0.00	385.65
	150	7.55	1,293.83	0.00	0.00	0.00	0.00	0.00	1,301.38
	200	0.00	3,587.30	277.37	40.26	9.12	0.00	0.00	3,914.05
	250	0.00	306.49	682.27	300.12	51.18	19.98	1.35	1,361.30
	300	0.00	2.55	76.41	100.15	31.17	13.89	2.30	226.47
	350	0.00	0.64	1.60	6.03	4.33	2.53	0.54	15.67
	400	0.00	0.00	0.01	0.48	0.54	0.28	0.29	1.60
	500	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.04
	All	4,691.60	5,192.92	1,037.66	447.04	96.36	36.68	4.50	11,506.76

TABLE 3-C-4: Age size distribution of **whiting** in 1991 (number per hour fishing) by area and quarter

Quarter 4	Size class	Age class							Total
		0	1	2	3	4	5	6+	
Area 1	80	3.29	0.00	0.00	0.00	0.00	0.00	0.00	3.29
	100	65.75	0.00	0.00	0.00	0.00	0.00	0.00	65.75
	120	147.26	0.00	0.00	0.00	0.00	0.00	0.00	147.26
	150	87.47	0.00	0.00	0.00	0.00	0.00	0.00	87.47
	200	4.24	44.39	0.31	0.00	0.00	0.00	0.00	48.94
	250	0.00	126.68	95.98	52.29	0.00	0.00	0.00	274.95
	300	0.00	27.49	74.50	84.72	6.99	1.85	0.00	195.55
	350	0.00	0.00	2.62	9.28	3.95	1.50	0.76	18.11
	400	0.00	0.00	0.00	0.37	0.36	0.28	0.60	1.61
	All	308.01	198.56	173.41	146.66	11.30	3.63	1.36	842.93
Area 2	50	1.42	0.00	0.00	0.00	0.00	0.00	0.00	1.42
	70	4.75	0.00	0.00	0.00	0.00	0.00	0.00	4.75
	80	35.95	0.00	0.00	0.00	0.00	0.00	0.00	35.95
	100	200.28	0.00	0.00	0.00	0.00	0.00	0.00	200.28
	120	501.57	0.00	0.00	0.00	0.00	0.00	0.00	501.57
	150	404.52	1.63	0.00	0.00	0.00	0.00	0.00	406.15
	200	7.75	233.56	53.25	0.00	0.00	0.00	0.00	294.56
	250	0.00	130.66	150.04	56.05	16.09	14.13	1.22	368.19
	300	0.00	0.00	22.06	24.41	9.32	5.24	4.77	65.80
	350	0.00	0.00	0.07	0.53	0.56	0.46	0.08	1.70
	400	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.08
	All	1,156.24	365.85	225.42	80.99	25.97	19.91	6.07	1,880.45
Area 3	70	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.53
	80	30.76	0.00	0.00	0.00	0.00	0.00	0.00	30.76
	100	193.83	0.00	0.00	0.00	0.00	0.00	0.00	193.83
	120	508.29	0.00	0.00	0.00	0.00	0.00	0.00	508.29
	150	314.48	7.19	0.00	0.00	0.00	0.00	0.00	321.67
	200	5.41	1,146.29	48.25	0.00	0.00	0.00	0.00	1,199.95
	250	0.00	603.50	234.81	278.53	28.95	6.03	6.03	1,157.85
	300	0.00	4.57	35.53	70.35	2.30	4.21	2.45	119.41
	350	0.00	0.00	0.00	1.74	0.58	0.13	0.00	2.45
	All	1,053.30	1,761.55	318.59	350.62	31.83	10.37	8.48	3,534.74
Area 4	60	1.83	0.00	0.00	0.00	0.00	0.00	0.00	1.83
	70	3.33	0.00	0.00	0.00	0.00	0.00	0.00	3.33
	80	35.33	0.00	0.00	0.00	0.00	0.00	0.00	35.33
	100	60.00	0.00	0.00	0.00	0.00	0.00	0.00	60.00
	120	191.50	0.00	0.00	0.00	0.00	0.00	0.00	191.50
	150	131.17	0.00	0.00	0.00	0.00	0.00	0.00	131.17
	200	0.00	3,401.45	541.05	0.00	0.00	0.00	0.00	3,942.50
	250	0.00	1,208.20	595.74	46.65	62.14	23.68	19.59	1,956.00
	300	0.00	0.00	31.65	12.92	6.26	0.00	0.00	50.83
	350	0.00	0.00	0.00	0.50	0.83	0.00	0.00	1.33
	All	423.16	4,609.65	1,168.44	60.07	69.23	23.68	19.59	6,373.82
Area 5	60	2.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00
	70	1.50	0.00	0.00	0.00	0.00	0.00	0.00	1.50
	80	14.88	0.00	0.00	0.00	0.00	0.00	0.00	14.88
	100	86.63	0.00	0.00	0.00	0.00	0.00	0.00	86.63
	120	148.13	0.00	0.00	0.00	0.00	0.00	0.00	148.13
	150	107.71	11.29	0.00	0.00	0.00	0.00	0.00	119.00
	200	0.00	517.18	80.19	0.00	0.00	0.00	0.00	597.37
	250	0.00	126.61	87.98	111.11	65.83	27.32	20.52	439.37

Continued

Table 3-C-4 Continued

Quarter 4	Size class	Age class							Total
		0	1	2	3	4	5	6+	
Area 5 (cont)	300	0.00	0.00	24.02	7.50	29.96	29.58	18.44	109.50
	350	0.00	0.00	2.13	0.00	0.50	9.00	1.38	13.01
	400	0.00	0.00	0.00	0.00	0.25	0.25	0.25	0.75
	All	360.85	655.08	194.32	118.61	96.54	66.15	40.59	1,532.14
Area 6	60	2.74	0.00	0.00	0.00	0.00	0.00	0.00	2.74
	70	2.08	0.00	0.00	0.00	0.00	0.00	0.00	2.08
	80	17.70	0.00	0.00	0.00	0.00	0.00	0.00	17.70
	100	41.33	0.00	0.00	0.00	0.00	0.00	0.00	41.33
	120	150.93	0.00	0.00	0.00	0.00	0.00	0.00	150.93
	150	286.15	101.35	1.75	0.00	0.00	0.00	0.00	389.25
	200	126.53	929.00	61.68	0.00	4.68	0.00	0.00	1,121.89
	250	0.00	261.03	105.57	20.70	11.05	7.62	1.16	407.13
	300	0.00	5.72	19.05	4.07	4.83	0.38	0.38	34.43
	350	0.00	0.08	1.23	0.58	0.35	0.23	0.00	2.47
	400	0.00	0.00	0.03	0.04	0.06	0.03	0.01	0.17
	All	627.46	1,297.18	189.31	25.39	20.97	8.26	1.55	2,170.12
Area 7	50	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.10
	60	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.21
	70	2.23	0.00	0.00	0.00	0.00	0.00	0.00	2.23
	80	15.88	0.00	0.00	0.00	0.00	0.00	0.00	15.88
	100	79.04	0.00	0.00	0.00	0.00	0.00	0.00	79.04
	120	247.77	0.00	0.00	0.00	0.00	0.00	0.00	247.77
	150	271.82	52.68	0.00	0.00	0.00	0.00	0.00	324.50
	200	15.09	187.07	11.65	0.00	0.00	0.00	0.00	213.81
	250	0.00	32.17	46.55	7.55	0.99	0.00	0.00	87.26
	300	0.00	3.67	4.16	2.86	1.39	0.00	0.00	12.08
	350	0.00	0.70	0.56	0.86	0.26	0.01	0.00	2.39
	All	632.14	276.29	62.92	11.27	2.64	0.01	0.00	985.27
Area 8	70	6.26	0.00	0.00	0.00	0.00	0.00	0.00	6.26
	80	170.70	0.00	0.00	0.00	0.00	0.00	0.00	170.70
	100	569.02	0.00	0.00	0.00	0.00	0.00	0.00	569.02
	120	1,244.62	0.00	0.00	0.00	0.00	0.00	0.00	1,244.62
	150	1,511.91	36.01	0.00	0.00	0.00	0.00	0.00	1,547.92
	200	149.10	293.94	0.00	0.00	0.00	0.00	0.00	443.04
	250	1.88	168.37	7.30	0.00	0.00	0.00	0.00	177.55
	300	0.00	3.21	1.32	0.00	0.00	0.00	0.00	4.53
	350	0.00	0.36	0.76	0.03	0.00	0.00	0.00	1.15
	400	0.00	0.00	0.07	0.00	0.00	0.00	0.04	0.11
	All	3,653.49	501.89	9.45	0.03	0.00	0.00	0.04	4,164.90
Area North Sea	50	2.07	0.00	0.00	0.00	0.00	0.00	0.00	2.07
	60	6.23	0.00	0.00	0.00	0.00	0.00	0.00	6.23
	70	14.43	0.00	0.00	0.00	0.00	0.00	0.00	14.43
	80	153.79	0.00	0.00	0.00	0.00	0.00	0.00	153.79
	100	726.86	0.00	0.00	0.00	0.00	0.00	0.00	726.86
	120	1,895.44	0.00	0.00	0.00	0.00	0.00	0.00	1,895.44
	150	1,603.32	174.14	1.75	0.00	0.00	0.00	0.00	1,779.21
	200	159.04	6,458.94	796.38	0.00	4.68	0.00	0.00	7,419.04
	250	0.00	2,488.84	1,316.66	572.88	185.06	78.79	48.53	4,690.76
	300	0.00	41.44	210.97	206.82	61.06	41.26	26.03	587.58
	350	0.00	0.79	6.60	13.49	7.03	11.34	2.22	41.47
	400	0.00	0.00	0.03	0.41	0.66	0.64	0.86	2.60
	All	4,561.18	9,164.15	2,332.39	793.60	258.49	132.03	77.64	17,319.48

TABLE 3-D-1: Age size distribution of **mackerel** in 1991 (number per hour fishing) by area and quarter

Quarter 1	Size class	Age class							Total
		0	1	2	3	4	5	6+	
Area 1	150	0.00	6.27	0.00	0.00	0.00	0.00	0.00	6.27
	200	0.00	14.17	0.00	0.00	0.00	0.00	0.00	14.17
	250	0.00	0.00	5.91	0.00	0.00	0.00	0.00	5.91
	300	0.00	0.00	0.87	0.28	0.34	0.01	0.00	1.50
	350	0.00	0.00	0.00	0.00	0.02	0.07	0.13	0.22
	400	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.13
	All	0.00	20.44	6.78	0.28	0.36	0.08	0.26	28.20
Area North Sea	150	0.00	6.30	0.00	0.00	0.00	0.00	0.00	6.30
	200	0.00	14.31	0.00	0.00	0.00	0.00	0.00	14.31
	250	0.00	0.00	6.12	0.00	0.00	0.00	0.00	6.12
	300	0.00	0.00	0.87	0.28	0.36	0.01	0.00	1.52
	350	0.00	0.00	0.00	0.00	0.02	0.11	0.16	0.29
	400	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.13
	All	0.00	20.61	6.99	0.28	0.38	0.12	0.29	28.67

TABLE 3-D-2: Age size distribution of **mackerel** in 1991 (number per hour fishing) by area and quarter

Quarter 2	Size class	Age class							Total
		0	1	2	3	4	5	6+	
Area 2	200	0.00	7.09	0.00	0.00	0.00	0.00	0.00	7.09
	250	0.00	0.40	5.40	0.00	0.13	0.00	0.00	5.93
	300	0.00	0.00	11.84	4.72	2.82	0.87	0.16	20.41
	350	0.00	0.00	0.00	0.14	1.44	1.39	2.20	5.17
	400	0.00	0.00	0.00	0.00	0.00	0.00	1.36	1.36
	All	0.00	7.49	17.24	4.86	4.39	2.26	3.72	39.96
Area 4	200	0.00	3.75	0.00	0.00	0.00	0.00	0.00	3.75
	250	0.00	0.50	10.84	0.00	0.00	0.00	0.00	10.84
	300	0.00	0.00	28.88	20.88	3.33	4.50	0.00	57.59
	350	0.00	0.00	0.00	5.52	1.00	5.52	16.91	28.95
	400	0.00	0.00	0.00	0.00	0.00	0.00	0.97	0.97
	All	0.00	4.25	39.72	26.40	4.33	10.02	17.88	102.10
Area 5	200	0.00	1.76	0.00	0.00	0.00	0.00	0.00	1.76
	250	0.00	0.00	23.10	0.00	0.00	0.00	0.00	23.10
	300	0.00	0.00	6.67	4.93	3.02	1.05	0.00	15.67
	350	0.00	0.00	0.00	0.00	2.60	0.55	0.29	3.44
	400	0.00	0.00	0.00	0.00	0.00	0.00	0.52	0.52
	All	0.00	1.76	29.77	4.93	5.62	1.60	0.81	44.49
Area 6	150	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.02
	200	0.00	23.36	0.00	0.00	0.00	0.00	0.00	23.36
	250	0.00	8.14	136.37	7.50	0.00	0.00	0.00	152.01
	300	0.00	0.00	29.84	14.48	20.72	5.63	5.00	75.67
	350	0.00	0.00	0.51	1.37	4.35	4.23	16.62	27.08
	400	0.00	0.00	0.00	0.00	0.00	0.00	6.72	6.72
	All	0.00	31.52	166.72	23.35	25.07	9.86	28.34	284.86
Area 7	150	0.00	3.95	0.00	0.00	0.00	0.00	0.00	3.95
	200	0.00	16.29	0.00	0.00	0.00	0.00	0.00	16.29
	250	0.00	0.90	4.67	0.21	0.00	0.00	0.00	5.78
	300	0.00	0.13	6.98	4.26	1.41	0.20	0.20	13.18
	350	0.00	0.00	0.00	0.34	0.42	0.25	0.48	1.49
	400	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.12
	All	0.00	21.27	11.65	4.81	1.83	0.45	0.80	40.81
Area 8	200	0.00	34.00	0.00	0.00	0.00	0.00	0.00	34.00
	250	0.00	4.00	76.00	4.00	0.00	0.00	0.00	84.00
	300	0.00	0.00	38.00	18.00	12.00	0.00	0.00	68.00
	All	0.00	38.00	114.00	22.00	12.00	0.00	0.00	186.00
Area North Sea	150	0.00	4.02	0.00	0.00	0.00	0.00	0.00	4.02
	200	0.00	52.57	0.00	0.00	0.00	0.00	0.00	52.57
	250	0.00	10.11	185.69	7.84	0.15	0.00	0.00	203.79
	300	0.00	0.13	99.83	51.97	33.00	12.89	5.66	203.48
	350	0.00	0.00	0.51	7.90	9.63	12.84	36.72	67.60
	400	0.00	0.00	0.00	0.00	0.00	0.00	9.84	9.84
	All	0.00	66.83	286.03	67.71	42.78	25.73	52.22	541.30

TABLE 3-D-3: Age size distribution of **mackerel** in 1991 (number per hour fishing) by area and quarter

Quarter 3	Size class	Age class							Total
		0	1	2	3	4	5	6+	
Area 1	200	0.00	0.65	0.04	0.00	0.00	0.00	0.00	0.69
	250	0.00	0.34	12.86	0.75	0.00	0.00	0.00	13.95
	300	0.00	0.00	29.78	10.87	1.35	0.65	0.28	42.93
	350	0.00	0.00	0.00	0.13	1.52	0.33	0.77	2.75
	400	0.00	0.00	0.00	0.00	0.05	0.00	0.23	0.28
	All	0.00	0.99	42.68	11.75	2.92	0.98	1.28	60.60
Area 2	250	0.00	0.29	0.39	0.05	0.16	0.05	0.05	0.99
	300	0.00	0.40	2.03	0.20	0.21	0.00	0.00	2.84
	350	0.00	0.00	0.24	0.27	0.00	0.00	0.00	0.51
	400	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02
	All	0.00	0.69	2.66	0.52	0.37	0.05	0.07	4.36
Area 3	250	0.00	0.00	0.72	0.00	0.00	0.00	0.00	0.72
	300	0.00	0.00	0.96	1.70	0.87	1.03	0.40	4.96
	350	0.00	0.00	0.23	0.00	0.71	0.23	0.45	1.62
	400	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05
	All	0.00	0.00	1.91	1.70	1.58	1.26	0.90	7.35
Area 5	200	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.29
	250	0.00	39.76	9.24	0.00	0.00	0.00	0.00	49.00
	300	0.00	1.15	10.57	2.60	1.58	1.04	0.55	17.49
	350	0.00	0.00	0.00	0.03	0.04	0.10	0.40	0.57
	400	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.14
	All	0.00	41.20	19.81	2.63	1.62	1.14	1.09	67.49
Area 6	200	0.00	1.83	0.00	0.00	0.00	0.00	0.00	1.83
	250	0.00	98.20	23.14	0.00	0.00	0.00	0.00	121.34
	300	0.00	3.03	34.57	9.67	9.77	5.52	6.66	69.22
	350	0.00	0.00	0.92	3.07	3.59	10.48	34.18	52.24
	400	0.00	0.00	0.00	0.00	0.00	0.00	12.68	12.68
	All	0.00	103.06	58.63	12.74	13.36	16.00	53.52	257.31
Area 7	200	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.50
	250	0.00	3.34	20.84	0.24	0.00	0.00	0.00	24.42
	300	0.00	0.00	6.98	7.36	1.84	0.34	0.77	17.29
	350	0.00	0.00	0.49	0.76	1.26	1.26	0.98	4.75
	400	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00
	All	0.00	3.84	28.31	8.36	3.10	1.60	2.75	47.96
Area North Sea	80	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	100	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	200	0.00	3.26	0.04	0.00	0.00	0.00	0.00	3.30
	250	0.00	142.29	67.28	1.04	0.16	0.05	0.05	210.87
	300	0.00	4.60	85.92	32.74	15.66	8.60	9.16	156.68
	350	0.00	0.00	1.81	4.20	7.09	12.42	39.91	65.43
	400	0.00	0.00	0.00	0.00	0.05	0.00	14.12	14.17
	All	0.06	150.15	155.05	37.98	22.96	21.07	63.24	450.51

TABLE 3-D-4: Age size distribution of **mackerel** in 1991 (number per hour fishing) by area and quarter

Quarter 4	Size class	Age class							Total
		0	1	2	3	4	5	6+	
Area 3	200	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.19
	250	0.00	238.73	0.00	0.00	0.00	0.00	0.00	238.73
	300	0.00	270.46	396.07	55.78	11.49	0.00	0.00	733.80
	350	0.00	0.00	55.71	33.63	16.80	0.00	0.00	106.14
	400	0.00	0.00	0.00	0.00	0.00	0.00	8.87	8.87
	All	0.00	509.38	451.78	89.41	28.29	0.00	8.87	1,087.73
Area 6	150	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.46
	200	0.00	1.21	0.00	0.00	0.00	0.00	0.00	1.21
	250	0.00	5.10	0.68	0.00	0.00	0.00	0.00	5.78
	300	0.00	0.61	2.63	2.10	2.49	0.96	2.23	11.02
	350	0.00	0.00	1.02	1.02	3.07	2.31	10.22	17.64
	400	0.00	0.00	0.00	0.00	0.00	0.00	1.28	1.28
	All	0.46	6.92	4.33	3.12	5.56	3.27	13.73	37.39
Area North Sea	150	1.99	0.00	0.00	0.00	0.00	0.00	0.00	1.99
	200	0.42	2.29	0.00	0.00	0.00	0.00	0.00	2.71
	250	0.00	244.25	0.87	0.00	0.00	0.00	0.00	245.12
	300	0.00	273.96	416.19	63.22	15.02	1.00	2.76	772.15
	350	0.00	0.00	57.83	36.82	20.74	4.30	13.13	132.82
	400	0.00	0.00	0.00	0.00	0.00	0.31	11.73	12.04
	All	2.41	520.50	474.89	100.04	35.76	5.61	27.62	1,166.83

TABLE 3-E-1: Age size distribution of *saithe* in 1991 (number per hour fishing) by area and quarter

Quarter 1	Size class	Age class							Total
		3	4	5	6	7	8	9+	
Area 1	300	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.33
	350	1.46	0.22	0.00	0.00	0.00	0.00	0.00	1.68
	400	1.22	2.59	0.11	0.01	0.00	0.00	0.00	3.94
	500	0.01	0.41	0.34	0.14	0.03	0.00	0.00	0.93
	600	0.00	0.02	0.10	0.18	0.10	0.04	0.00	0.44
	700	0.00	0.00	0.01	0.04	0.07	0.08	0.02	0.21
	800	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.05
	1000	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05
	1200	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	All	3.02	3.24	0.56	0.38	0.20	0.14	0.09	7.63
Area North Sea	300	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.33
	350	1.53	0.23	0.00	0.00	0.00	0.00	0.00	1.75
	400	1.23	2.62	0.11	0.01	0.00	0.00	0.00	3.98
	500	0.01	0.41	0.34	0.14	0.03	0.00	0.00	0.93
	600	0.00	0.02	0.10	0.18	0.10	0.04	0.00	0.44
	700	0.00	0.00	0.01	0.04	0.07	0.08	0.02	0.21
	800	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.05
	1000	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05
	1200	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	All	3.10	3.28	0.56	0.37	0.20	0.14	0.09	7.74

TABLE 3-E-2: Age size distribution of **saithe** in 1991 (number per hour fishing) by area and quarter

Quarter 2	Size class	Age class							Total
		3	4	5	6	7	8	9+	
Area 1	300	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.05
	350	0.88	0.02	0.00	0.00	0.00	0.00	0.00	0.90
	400	2.47	3.53	0.05	0.00	0.00	0.00	0.00	6.05
	500	0.03	0.54	0.13	0.03	0.00	0.00	0.00	0.73
	600	0.00	0.02	0.05	0.03	0.01	0.00	0.00	0.11
	700	0.00	0.00	0.01	0.05	0.06	0.06	0.00	0.18
	800	0.00	0.00	0.00	0.00	0.02	0.07	0.05	0.14
	1000	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
	1200	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	All	3.43	4.11	0.24	0.11	0.09	0.13	0.06	8.17
Area North Sea	200	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	300	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.05
	350	0.95	0.02	0.00	0.00	0.00	0.00	0.00	0.97
	400	2.47	3.53	0.05	0.00	0.00	0.00	0.00	6.05
	500	0.03	0.54	0.19	0.03	0.00	0.00	0.00	0.79
	600	0.00	0.02	0.05	0.03	0.01	0.00	0.00	0.11
	700	0.00	0.00	0.01	0.06	0.07	0.07	0.00	0.21
	800	0.00	0.00	0.00	0.00	0.02	0.13	0.08	0.23
	1000	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03
	1200	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	All	3.51	4.11	0.30	0.12	0.10	0.20	0.11	8.45

TABLE 3-E-3: Age size distribution of *saithe* in 1991 (number per hour fishing) by area and quarter

Quarter 3	Size class	Age class							Total
		3	4	5	6	7	8	9+	
Area 1	350	0.59	0.01	0.00	0.00	0.00	0.00	0.00	0.60
	400	1.90	0.19	0.00	0.00	0.00	0.00	0.00	2.09
	500	0.03	0.32	0.08	0.00	0.00	0.00	0.00	0.43
	600	0.00	0.02	0.07	0.04	0.01	0.00	0.00	0.14
	700	0.00	0.00	0.01	0.01	0.02	0.01	0.00	0.05
	800	0.00	0.00	0.00	0.00	0.02	0.02	0.04	0.08
	1000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1200	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	All	2.52	0.54	0.16	0.05	0.05	0.03	0.04	3.39
Area North Sea	350	0.59	0.01	0.00	0.00	0.00	0.00	0.00	0.60
	400	1.98	0.19	0.00	0.00	0.00	0.00	0.00	2.17
	500	0.04	0.33	0.09	0.00	0.00	0.00	0.00	0.46
	600	0.00	0.03	0.07	0.04	0.01	0.00	0.00	0.15
	700	0.00	0.00	0.01	0.01	0.02	0.02	0.00	0.06
	800	0.00	0.00	0.00	0.00	0.02	0.03	0.04	0.09
	1000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1200	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	All	2.61	0.56	0.17	0.05	0.05	0.05	0.04	3.53

TABLE 3-E-4: Age size distribution of **saithe** in 1991 (number per hour fishing) by area and quarter

Quarter 4	Size class	Age class							Total
		3	4	5	6	7	8	9+	
Area 1	350	2.37	0.00	0.00	0.00	0.00	0.00	0.00	2.37
	400	38.11	2.00	0.00	0.00	0.00	0.00	0.00	40.11
	500	1.94	2.71	0.19	0.00	0.00	0.00	0.00	4.84
	600	0.08	0.70	0.45	0.09	0.00	0.00	0.00	1.32
	700	0.00	0.13	0.06	0.11	0.10	0.01	0.00	0.41
	800	0.00	0.00	0.08	0.05	0.11	0.15	0.37	0.76
	1000	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.19
	1200	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	All	42.50	5.54	0.78	0.25	0.21	0.16	0.56	50.00
Area North Sea	350	2.77	0.00	0.00	0.00	0.00	0.00	0.00	2.77
	400	40.31	2.10	0.00	0.00	0.00	0.00	0.00	42.41
	500	2.08	2.90	0.19	0.00	0.00	0.00	0.00	5.17
	600	0.08	0.75	0.48	0.09	0.00	0.00	0.00	1.40
	700	0.00	0.15	0.08	0.13	0.12	0.01	0.00	0.49
	800	0.00	0.00	0.08	0.05	0.11	0.15	0.37	0.76
	1000	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.19
	1200	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	All	45.24	5.90	0.83	0.27	0.23	0.16	0.56	53.19

TABLE 3-F-1: Age size keys (percent) of **Norway pout** in 1991 by area and quarter

Quarter 1	Size class	Age class						
		0	1	2	3	4	5	6+
Area 1	20	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	25	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	30	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	100	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	120	0.00	51.71	48.29	0.00	0.00	0.00	0.00
	150	0.00	0.00	78.08	21.92	0.00	0.00	0.00
	200	0.00	0.00	3.45	96.55	0.00	0.00	0.00
	250	0.00	0.00	0.00	0.00	100.00	0.00	0.00
Area 2	20	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	25	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	30	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	100	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	120	0.00	99.75	0.17	0.08	0.00	0.00	0.00
	150	0.00	4.30	72.35	23.34	0.00	0.00	0.00
	200	0.00	0.00	0.00	100.00	0.00	0.00	0.00
	250	0.00	0.00	0.00	0.00	100.00	0.00	0.00
Area 3	20	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	25	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	30	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	100	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	120	0.00	97.92	2.08	0.00	0.00	0.00	0.00
	150	0.00	3.88	87.38	8.74	0.00	0.00	0.00
	200	0.00	0.00	18.12	81.88	0.00	0.00	0.00
	250	0.00	0.00	0.00	0.00	100.00	0.00	0.00
Area 4	20	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	25	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	30	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	100	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	120	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	150	0.00	97.55	1.63	0.82	0.00	0.00	0.00
	200	0.00	0.00	10.81	89.19	0.00	0.00	0.00
	250	0.00	0.00	0.00	0.00	100.00	0.00	0.00
Area 7	20	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	25	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	30	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	100	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	120	0.00	89.05	10.95	0.00	0.00	0.00	0.00
	150	0.00	0.00	84.93	15.07	0.00	0.00	0.00
	200	0.00	0.00	3.45	96.55	0.00	0.00	0.00
	250	0.00	0.00	0.00	0.00	100.00	0.00	0.00
Area North Sea	20	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	25	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	30	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	100	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	120	0.00	89.02	10.95	0.02	0.00	0.00	0.00
	150	0.00	2.76	77.39	19.85	0.00	0.00	0.00
	200	0.00	0.00	3.45	96.55	0.00	0.00	0.00
	250	0.00	0.00	0.00	0.00	100.00	0.00	0.00

TABLE 3-F-2: Age size keys (percent) of **Norway pout** in 1991 by area and quarter

Quarter 2	Size class	Age class						
		0	1	2	3	4	5	6+
Area 1	<60	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	70	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	80	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	100	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	120	0.00	96.16	3.84	0.00	0.00	0.00	0.00
	150	0.00	19.13	72.31	7.25	1.30	0.00	0.00
	200	0.00	0.00	0.00	94.15	5.85	0.00	0.00
	250	0.00	0.00	0.00	0.00	100.00	0.00	0.00
Area 2	50	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	<60	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	70	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	80	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	100	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	120	0.00	91.74	8.26	0.00	0.00	0.00	0.00
	150	0.00	73.77	23.67	2.56	0.00	0.00	0.00
	200	0.00	0.00	23.53	58.82	17.65	0.00	0.00
	250	0.00	0.00	0.00	0.00	100.00	0.00	0.00
Area 3	<60	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	70	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	80	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	100	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	120	0.00	97.17	2.83	0.00	0.00	0.00	0.00
	150	0.00	79.18	19.97	0.85	0.00	0.00	0.00
	200	0.00	0.00	42.86	57.14	0.00	0.00	0.00
	250	0.00	0.00	0.00	0.00	100.00	0.00	0.00
Area 4	<60	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	70	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	80	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	100	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	120	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	150	0.00	74.28	23.15	2.42	0.15	0.00	0.00
	200	0.00	0.00	49.11	50.89	0.00	0.00	0.00
	250	0.00	0.00	0.00	0.00	100.00	0.00	0.00
Area North Sea	<60	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	70	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	80	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	100	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	120	0.00	94.80	5.20	0.00	0.00	0.00	0.00
	150	0.00	61.21	35.29	3.17	0.33	0.00	0.00
	200	0.00	0.00	25.46	70.99	3.55	0.00	0.00
	250	0.00	0.00	0.00	0.00	100.00	0.00	0.00

TABLE 3-F-3: Age size keys (percent) of **Norway pout** in 1991 by area and quarter

Quarter 3	Size class	Age class						
		0	1	2	3	4	5	6+
Area 1	<80	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	100	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	120	0.02	99.98	0.00	0.00	0.00	0.00	0.00
	150	0.00	73.87	24.95	1.17	0.00	0.00	0.00
	200	0.00	0.00	43.69	56.31	0.00	0.00	0.00
	250	0.00	0.00	0.00	100.00	0.00	0.00	0.00
Area 2	<80	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	100	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	120	0.28	99.72	0.00	0.00	0.00	0.00	0.00
	150	0.00	96.36	3.64	0.00	0.00	0.00	0.00
	200	0.00	0.00	100.00	0.00	0.00	0.00	0.00
	250	0.00	0.00	0.00	100.00	0.00	0.00	0.00
Area 3	<80	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	100	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	120	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	150	0.00	86.95	13.05	0.00	0.00	0.00	0.00
	200	0.00	0.00	40.43	59.57	0.00	0.00	0.00
	250	0.00	0.00	0.00	100.00	0.00	0.00	0.00
Area 4	<80	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	100	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	120	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	150	0.00	57.95	42.05	0.00	0.00	0.00	0.00
	200	0.00	0.00	0.00	100.00	0.00	0.00	0.00
	250	0.00	0.00	0.00	100.00	0.00	0.00	0.00
Area North Sea	<80	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	100	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	120	0.13	99.87	0.00	0.00	0.00	0.00	0.00
	150	0.00	86.88	12.81	0.31	0.00	0.00	0.00
	200	0.00	0.00	60.24	39.76	0.00	0.00	0.00
	250	0.00	0.00	0.00	100.00	0.00	0.00	0.00

TABLE 3-F-4: Age size keys (percent) of **Norway pout** in 1991 by area and quarter

Quarter 4	Size class	Age class						
		0	1	2	3	4	5	6+
Area 1	<80	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	100	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	120	46.68	53.32	0.00	0.00	0.00	0.00	0.00
	150	0.00	95.57	4.21	0.22	0.00	0.00	0.00
	200	0.00	0.00	100.00	0.00	0.00	0.00	0.00
	250	0.00	0.00	0.00	100.00	0.00	0.00	0.00
Area 2	<80	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	100	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	120	97.45	2.55	0.00	0.00	0.00	0.00	0.00
	150	0.00	89.34	10.66	0.00	0.00	0.00	0.00
	200	0.00	46.53	53.47	0.00	0.00	0.00	0.00
	250	0.00	0.00	0.00	100.00	0.00	0.00	0.00
Area 3	<80	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	100	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	120	97.50	2.50	0.00	0.00	0.00	0.00	0.00
	150	0.00	93.84	6.16	0.00	0.00	0.00	0.00
	200	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	250	0.00	0.00	0.00	100.00	0.00	0.00	0.00
Area 4	<80	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	100	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	120	91.57	8.43	0.00	0.00	0.00	0.00	0.00
	150	0.00	70.53	29.47	0.00	0.00	0.00	0.00
	200	0.00	0.00	100.00	0.00	0.00	0.00	0.00
	250	0.00	0.00	0.00	100.00	0.00	0.00	0.00
Area 5	<80	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	100	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	120	88.95	11.05	0.00	0.00	0.00	0.00	0.00
	150	0.00	92.68	7.16	0.16	0.00	0.00	0.00
	200	0.00	4.94	95.06	0.00	0.00	0.00	0.00
	250	0.00	0.00	0.00	100.00	0.00	0.00	0.00
Area 6	<80	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	100	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	120	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	150	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	200	0.00	4.94	95.06	0.00	0.00	0.00	0.00
	250	0.00	0.00	0.00	100.00	0.00	0.00	0.00
Area 7	<80	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	100	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	120	72.10	27.90	0.00	0.00	0.00	0.00	0.00
	150	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	200	0.00	4.94	95.06	0.00	0.00	0.00	0.00
	250	0.00	0.00	0.00	100.00	0.00	0.00	0.00
Area North Sea	<80	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	100	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	120	88.95	11.05	0.00	0.00	0.00	0.00	0.00
	150	0.00	92.68	7.16	0.16	0.00	0.00	0.00
	200	0.00	4.94	95.06	0.00	0.00	0.00	0.00
	250	0.00	0.00	0.00	100.00	0.00	0.00	0.00

TABLE 3-G-1: Age size keys (percent) of herring in 1991 by area and quarter

Quarter 1	Size class	Age class					
		0	1	2	3	4	5+
Area 1	50	100.00	0.00	0.00	0.00	0.00	0.00
	60	100.00	0.00	0.00	0.00	0.00	0.00
	70	0.00	100.00	0.00	0.00	0.00	0.00
	80	0.00	100.00	0.00	0.00	0.00	0.00
	100	0.00	100.00	0.00	0.00	0.00	0.00
	120	0.00	100.00	0.00	0.00	0.00	0.00
	150	0.00	75.89	24.11	0.00	0.00	0.00
	200	0.00	0.06	45.48	44.47	9.57	0.41
	250	0.00	0.00	3.02	22.92	40.24	33.82
	300	0.00	0.00	0.00	0.00	2.92	97.08
	350	0.00	0.00	0.00	0.00	0.00	100.00
Area 2	50	100.00	0.00	0.00	0.00	0.00	0.00
	60	100.00	0.00	0.00	0.00	0.00	0.00
	70	0.00	100.00	0.00	0.00	0.00	0.00
	80	0.00	100.00	0.00	0.00	0.00	0.00
	100	0.00	100.00	0.00	0.00	0.00	0.00
	120	0.00	100.00	0.00	0.00	0.00	0.00
	150	0.00	85.64	14.36	0.00	0.00	0.00
	200	0.00	5.09	88.20	6.28	0.44	0.00
	250	0.00	0.00	12.15	63.94	19.96	3.94
	300	0.00	0.00	0.00	0.00	0.00	100.00
	350	0.00	0.00	0.00	0.00	0.00	100.00
Area 3	50	100.00	0.00	0.00	0.00	0.00	0.00
	60	100.00	0.00	0.00	0.00	0.00	0.00
	70	0.00	100.00	0.00	0.00	0.00	0.00
	80	0.00	100.00	0.00	0.00	0.00	0.00
	100	0.00	100.00	0.00	0.00	0.00	0.00
	120	0.00	100.00	0.00	0.00	0.00	0.00
	150	0.00	13.54	86.12	0.33	0.00	0.00
	200	0.00	0.86	96.17	2.52	0.45	0.00
	250	0.00	0.00	10.08	61.43	19.66	8.84
	300	0.00	0.00	0.00	0.00	0.00	100.00
	350	0.00	0.00	0.00	0.00	0.00	100.00
Area 4	50	100.00	0.00	0.00	0.00	0.00	0.00
	60	100.00	0.00	0.00	0.00	0.00	0.00
	70	0.00	100.00	0.00	0.00	0.00	0.00
	80	0.00	100.00	0.00	0.00	0.00	0.00
	100	0.00	100.00	0.00	0.00	0.00	0.00
	120	0.00	100.00	0.00	0.00	0.00	0.00
	150	0.00	79.37	20.63	0.00	0.00	0.00
	200	0.00	0.27	82.26	16.33	0.88	0.26
	250	0.00	0.00	12.37	39.34	37.73	10.56
	300	0.00	0.00	0.00	0.00	0.00	100.00
	350	0.00	0.00	0.00	0.00	0.00	100.00

Continued

Table 3-G-1 Continued

Quarter 1	Size class	Age class					
		0	1	2	3	4	5+
Area 5	50	100.00	0.00	0.00	0.00	0.00	0.00
	60	100.00	0.00	0.00	0.00	0.00	0.00
	70	0.00	100.00	0.00	0.00	0.00	0.00
	80	0.00	100.00	0.00	0.00	0.00	0.00
	100	0.00	100.00	0.00	0.00	0.00	0.00
	120	0.00	100.00	0.00	0.00	0.00	0.00
	150	0.00	93.67	6.33	0.00	0.00	0.00
	200	0.00	1.09	66.97	23.20	7.21	1.53
	250	0.00	0.00	0.00	43.14	21.36	35.50
	300	0.00	0.00	0.00	0.00	0.00	100.00
	350	0.00	0.00	0.00	0.00	0.00	100.00
Area 6	50	100.00	0.00	0.00	0.00	0.00	0.00
	60	100.00	0.00	0.00	0.00	0.00	0.00
	70	0.00	100.00	0.00	0.00	0.00	0.00
	80	0.00	100.00	0.00	0.00	0.00	0.00
	100	0.00	100.00	0.00	0.00	0.00	0.00
	120	0.00	100.00	0.00	0.00	0.00	0.00
	150	0.00	96.19	3.81	0.00	0.00	0.00
	200	0.00	0.74	69.86	26.97	2.43	0.00
	250	0.00	0.00	1.57	47.93	34.91	15.59
	300	0.00	0.00	0.00	0.00	0.00	100.00
	350	0.00	0.00	0.00	0.00	0.00	100.00
Area 7	50	100.00	0.00	0.00	0.00	0.00	0.00
	60	100.00	0.00	0.00	0.00	0.00	0.00
	70	0.00	100.00	0.00	0.00	0.00	0.00
	80	0.00	100.00	0.00	0.00	0.00	0.00
	100	0.00	100.00	0.00	0.00	0.00	0.00
	120	0.00	100.00	0.00	0.00	0.00	0.00
	150	0.00	94.52	5.10	0.38	0.00	0.00
	200	0.00	2.93	87.65	7.12	1.49	0.82
	250	0.00	0.00	8.52	27.14	25.47	38.87
	300	0.00	0.00	0.00	0.00	13.04	86.96
	350	0.00	0.00	0.00	0.00	0.00	100.00
Area North Sea	50	100.00	0.00	0.00	0.00	0.00	0.00
	60	100.00	0.00	0.00	0.00	0.00	0.00
	70	0.00	100.00	0.00	0.00	0.00	0.00
	80	0.00	100.00	0.00	0.00	0.00	0.00
	100	0.00	100.00	0.00	0.00	0.00	0.00
	120	0.00	100.00	0.00	0.00	0.00	0.00
	150	0.00	82.79	17.05	0.14	0.02	0.00
	200	0.00	1.73	85.27	11.48	1.39	0.13
	250	0.00	0.00	4.55	31.02	38.11	26.32
	300	0.00	0.00	0.00	0.00	3.82	96.18
	350	0.00	0.00	0.00	0.00	0.00	100.00

TABLE 3-G-2: Age size keys (percent) of **herring** in 1991 by area and quarter

Quarter 2	Size class	Age class					
		0	1	2	3	4	5+
Area 1	<80	100.00	0.00	0.00	0.00	0.00	0.00
	100	100.00	0.00	0.00	0.00	0.00	0.00
	120	0.00	100.00	0.00	0.00	0.00	0.00
	150	0.00	59.90	40.10	0.00	0.00	0.00
	200	0.00	3.56	75.22	18.26	1.66	1.30
	250	0.00	0.00	18.37	39.24	15.83	26.57
	300	0.00	0.00	0.00	1.78	5.79	92.43
	350	0.00	0.00	0.00	0.00	0.00	100.00
Area 2	<80	100.00	0.00	0.00	0.00	0.00	0.00
	100	100.00	0.00	0.00	0.00	0.00	0.00
	120	0.00	100.00	0.00	0.00	0.00	0.00
	150	0.00	93.32	6.68	0.00	0.00	0.00
	200	0.00	12.64	63.19	19.42	3.04	1.71
	250	0.00	0.00	32.64	36.35	12.90	18.10
	300	0.00	0.00	0.00	0.00	0.00	100.00
	350	0.00	0.00	0.00	0.00	0.00	100.00
Area 3	<80	100.00	0.00	0.00	0.00	0.00	0.00
	100	100.00	0.00	0.00	0.00	0.00	0.00
	120	0.00	100.00	0.00	0.00	0.00	0.00
	150	0.00	96.69	3.31	0.00	0.00	0.00
	200	0.00	0.66	91.73	4.39	2.04	1.17
	250	0.00	0.00	30.75	37.37	10.55	21.32
	300	0.00	0.00	0.00	0.00	0.00	100.00
	350	0.00	0.00	0.00	0.00	0.00	100.00
Area 4	<80	100.00	0.00	0.00	0.00	0.00	0.00
	100	100.00	0.00	0.00	0.00	0.00	0.00
	120	0.00	100.00	0.00	0.00	0.00	0.00
	150	0.00	57.65	35.35	7.00	0.00	0.00
	200	0.00	18.20	44.06	26.37	3.17	8.20
	250	0.00	0.00	7.30	28.37	11.08	53.25
	300	0.00	0.00	0.00	0.00	0.00	100.00
	350	0.00	0.00	0.00	0.00	0.00	100.00
Area 5	<80	100.00	0.00	0.00	0.00	0.00	0.00
	100	0.00	100.00	0.00	0.00	0.00	0.00
	120	0.00	100.00	0.00	0.00	0.00	0.00
	150	0.00	89.87	9.58	0.56	0.00	0.00
	200	0.00	5.93	52.47	33.21	3.08	5.31
	250	0.00	0.00	3.07	30.75	24.29	41.90
	300	0.00	0.00	0.00	0.00	0.00	100.00
	350	0.00	0.00	0.00	0.00	0.00	100.00

Continued

Table 3-G-2 Continued

Quarter 2	Size class	Age class					
		0	1	2	3	4	5+
Area 6	<80	100.00	0.00	0.00	0.00	0.00	0.00
	100	96.58	3.43	0.00	0.00	0.00	0.00
	120	0.00	100.00	0.00	0.00	0.00	0.00
	150	0.00	92.55	7.46	0.00	0.00	0.00
	200	0.00	66.08	23.34	9.64	0.79	0.15
	250	0.00	0.00	1.40	38.44	22.57	37.59
	300	0.00	0.00	0.00	0.00	0.00	100.00
	350	0.00	0.00	0.00	0.00	0.00	100.00
Area 7	<80	100.00	0.00	0.00	0.00	0.00	0.00
	100	100.00	0.00	0.00	0.00	0.00	0.00
	120	0.00	100.00	0.00	0.00	0.00	0.00
	150	0.00	90.75	9.25	0.00	0.00	0.00
	200	0.00	51.43	38.99	6.63	2.72	0.24
	250	0.00	0.00	38.43	17.23	33.76	10.57
	300	0.00	0.00	0.00	0.00	0.00	100.00
	350	0.00	0.00	0.00	0.00	0.00	100.00
Area North Sea	<80	100.00	0.00	0.00	0.00	0.00	0.00
	100	99.17	0.83	0.00	0.00	0.00	0.00
	120	0.00	100.00	0.00	0.00	0.00	0.00
	150	0.00	81.74	16.15	2.11	0.00	0.00
	200	0.00	22.29	46.12	22.40	2.86	6.33
	250	0.00	0.00	16.85	32.41	12.28	38.47
	300	0.00	0.00	0.00	0.69	2.24	97.07
	350	0.00	0.00	0.00	0.00	0.00	100.00

TABLE 3-G-3: Age size keys (percent) of **herring** in 1991 by area and quarter

Quarter 3	Size class	Age class					
		0	1	2	3	4	5+
Area 1	<100	100.00	0.00	0.00	0.00	0.00	0.00
	120	100.00	0.00	0.00	0.00	0.00	0.00
	150	0.00	100.00	0.00	0.00	0.00	0.00
	200	0.00	41.23	38.89	14.37	4.58	0.93
	250	0.00	0.00	11.39	14.98	33.33	40.30
	300	0.00	0.00	0.00	5.42	16.97	77.61
	350	0.00	0.00	0.00	0.00	0.00	100.00
Area 2	<100	100.00	0.00	0.00	0.00	0.00	0.00
	120	100.00	0.00	0.00	0.00	0.00	0.00
	150	0.00	100.00	0.00	0.00	0.00	0.00
	200	0.00	51.71	45.06	3.23	0.00	0.00
	250	0.00	0.45	49.96	22.65	11.51	15.44
	300	0.00	0.00	0.00	3.91	6.13	89.96
	350	0.00	0.00	0.00	0.00	0.00	100.00
Area 3	<100	100.00	0.00	0.00	0.00	0.00	0.00
	120	100.00	0.00	0.00	0.00	0.00	0.00
	150	0.00	98.30	1.53	0.00	0.17	0.00
	200	0.00	64.92	32.45	2.63	0.00	0.00
	250	0.00	0.00	29.94	34.47	19.69	15.90
	300	0.00	0.00	0.00	1.05	10.89	88.06
	350	0.00	0.00	0.00	0.00	0.00	100.00
Area 4	<100	100.00	0.00	0.00	0.00	0.00	0.00
	120	100.00	0.00	0.00	0.00	0.00	0.00
	150	0.00	100.00	0.00	0.00	0.00	0.00
	200	0.00	65.32	25.43	8.17	0.37	0.71
	250	0.00	0.00	38.95	21.75	18.21	21.09
	300	0.00	0.00	0.00	0.00	5.95	94.05
	350	0.00	0.00	0.00	0.00	0.00	100.00
Area 6	<100	100.00	0.00	0.00	0.00	0.00	0.00
	120	100.00	0.00	0.00	0.00	0.00	0.00
	150	0.60	99.40	0.00	0.00	0.00	0.00
	200	0.00	92.51	7.48	0.01	0.00	0.00
	250	0.00	0.00	59.74	24.95	12.19	3.13
	300	0.00	0.00	0.00	0.00	0.00	100.00
	350	0.00	0.00	0.00	0.00	0.00	100.00
Area 7	<100	100.00	0.00	0.00	0.00	0.00	0.00
	120	100.00	0.00	0.00	0.00	0.00	0.00
	150	0.93	99.07	0.00	0.00	0.00	0.00
	200	0.00	89.30	6.65	2.99	1.06	0.00
	250	0.00	19.08	34.45	21.74	6.72	18.01
	300	0.00	0.00	0.00	0.00	0.00	100.00
	350	0.00	0.00	0.00	0.00	0.00	100.00
Area North Sea	<100	100.00	0.00	0.00	0.00	0.00	0.00
	120	100.00	0.00	0.00	0.00	0.00	0.00
	150	0.73	99.27	0.01	0.00	0.00	0.00
	200	0.00	81.23	14.75	3.39	0.43	0.21
	250	0.00	0.26	35.05	21.79	19.76	23.14
	300	0.00	0.00	0.00	3.51	11.60	84.90
	350	0.00	0.00	0.00	0.00	0.00	100.00

TABLE 3-G-4: Age size keys (percent) of herring in 1991 by area and quarter

Quarter 4	Size class	Age class					
		0	1	2	3	4	5+
Area 1	<100	100.00	0.00	0.00	0.00	0.00	0.00
	120	100.00	0.00	0.00	0.00	0.00	0.00
	150	55.27	44.73	0.00	0.00	0.00	0.00
	200	0.00	51.79	48.22	0.00	0.00	0.00
	250	0.00	0.00	12.82	18.86	36.66	31.65
	300	0.00	0.00	0.00	3.10	12.68	84.23
	350	0.00	0.00	0.00	0.00	0.00	100.00
Area 2	<100	100.00	0.00	0.00	0.00	0.00	0.00
	120	100.00	0.00	0.00	0.00	0.00	0.00
	150	77.52	22.48	0.00	0.00	0.00	0.00
	200	0.00	94.39	5.34	0.27	0.00	0.00
	250	0.00	2.80	52.19	15.81	8.73	20.46
	300	0.00	0.00	0.00	0.00	0.00	100.00
	350	0.00	0.00	0.00	0.00	0.00	100.00
Area 3	<100	100.00	0.00	0.00	0.00	0.00	0.00
	120	100.00	0.00	0.00	0.00	0.00	0.00
	150	85.84	14.16	0.00	0.00	0.00	0.00
	200	0.00	74.48	25.52	0.00	0.00	0.00
	250	0.00	4.78	73.19	15.15	4.83	2.05
	300	0.00	0.00	0.00	0.00	0.00	100.00
	350	0.00	0.00	0.00	0.00	0.00	100.00
Area 4	<100	100.00	0.00	0.00	0.00	0.00	0.00
	120	100.00	0.00	0.00	0.00	0.00	0.00
	150	93.45	6.55	0.00	0.00	0.00	0.00
	200	0.00	79.53	15.12	4.10	1.24	0.00
	250	0.00	6.35	45.24	12.70	2.78	32.94
	300	0.00	0.00	0.00	0.00	0.00	100.00
	350	0.00	0.00	0.00	0.00	0.00	100.00
Area 5	<100	100.00	0.00	0.00	0.00	0.00	0.00
	120	100.00	0.00	0.00	0.00	0.00	0.00
	150	94.12	5.88	0.00	0.00	0.00	0.00
	200	0.00	43.75	0.00	0.00	56.25	0.00
	250	0.00	0.00	14.71	0.00	40.19	45.10
	300	0.00	0.00	0.00	0.00	0.00	100.00
	350	0.00	0.00	0.00	0.00	0.00	100.00
Area 6	<100	100.00	0.00	0.00	0.00	0.00	0.00
	120	100.00	0.00	0.00	0.00	0.00	0.00
	150	28.33	71.67	0.00	0.00	0.00	0.00
	200	0.00	95.90	2.30	1.67	0.13	0.00
	250	0.00	6.61	46.80	26.70	5.37	14.52
	300	0.00	0.00	0.00	0.00	19.59	80.41
	350	0.00	0.00	0.00	0.00	0.00	100.00
Area 7	<100	100.00	0.00	0.00	0.00	0.00	0.00
	120	100.00	0.00	0.00	0.00	0.00	0.00
	150	57.74	42.26	0.00	0.00	0.00	0.00
	200	0.00	100.00	0.00	0.00	0.00	0.00
	250	0.00	3.36	36.66	20.11	16.85	23.02
	300	0.00	0.00	0.00	0.00	0.00	100.00
	350	0.00	0.00	0.00	0.00	0.00	100.00

Continued

Table 3-G-4 Continued

Quarter 4	Size class	Age class					
		0	1	2	3	4	5+
Area North Sea	<100	100.00	0.00	0.00	0.00	0.00	0.00
	120	100.00	0.00	0.00	0.00	0.00	0.00
	150	55.27	44.73	0.00	0.00	0.00	0.00
	200	0.00	97.00	1.88	0.73	0.39	0.00
	250	0.00	3.36	36.66	20.11	16.85	23.02
	300	0.00	0.00	0.00	3.00	12.54	84.45
	350	0.00	0.00	0.00	0.00	0.00	100.00

TABLE 3-H-1: Age size keys (percent) of **sprat** in 1991 by area and quarter

Quarter 1	Size class	Age class						
		0	1	2	3	4	5	6+
Area 3	<70	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	80	0.00	80.84	19.16	0.00	0.00	0.00	0.00
	100	0.00	1.43	88.55	10.02	0.00	0.00	0.00
	120	0.00	0.00	78.51	20.23	0.98	0.28	0.00
	150	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Area 4	<70	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	80	0.00	99.51	0.49	0.00	0.00	0.00	0.00
	100	0.00	71.57	28.43	0.00	0.00	0.00	0.00
	120	0.00	0.00	85.94	14.06	0.00	0.00	0.00
	150	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Area 5	50	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	60	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	<70	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	80	0.00	92.31	7.69	0.00	0.00	0.00	0.00
	100	0.00	40.54	55.95	3.51	0.00	0.00	0.00
	120	0.00	0.00	67.57	29.56	2.39	0.48	0.00
	150	0.00	0.00	0.00	22.22	11.11	0.00	66.67
Area 6	<70	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	80	0.00	99.82	0.18	0.00	0.00	0.00	0.00
	100	0.00	73.53	24.43	2.04	0.00	0.00	0.00
	120	0.00	0.00	52.29	41.77	4.09	1.85	0.00
	150	0.00	0.00	0.00	0.00	16.67	0.00	83.33
Area 7	<70	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	80	0.00	98.64	1.36	0.00	0.00	0.00	0.00
	100	0.00	84.84	14.30	0.86	0.00	0.00	0.00
	120	0.00	0.00	80.84	16.43	0.00	2.73	0.00
	150	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Area North Sea	<70	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	80	0.00	98.22	1.77	0.00	0.00	0.00	0.00
	100	0.00	59.33	37.68	3.00	0.00	0.00	0.00
	120	0.00	0.00	63.62	32.46	2.73	1.19	0.00
	150	0.00	0.00	0.00	8.38	7.41	0.00	84.21

TABLE 3-H-2: Age size keys (percent) of **sprat** in 1991 by area and quarter

Quarter 2	Size class	Age class						
		0	1	2	3	4	5	6+
Area 2	50	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	60	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	70	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	80	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	100	0.00	49.27	50.73	0.00	0.00	0.00	0.00
	120	0.00	3.49	57.95	37.16	1.40	0.00	0.00
	150	0.00	0.00	56.30	31.18	0.00	0.00	12.53
Area 3	50	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	60	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	70	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	80	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	100	0.00	60.85	39.15	0.00	0.00	0.00	0.00
	120	0.00	8.43	89.87	1.70	0.00	0.00	0.00
	150	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Area 4	50	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	60	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	70	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	80	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	100	0.00	74.43	24.00	1.57	0.00	0.00	0.00
	120	0.00	12.64	58.76	26.85	1.18	0.56	0.00
	150	0.00	0.00	17.67	45.51	35.34	0.00	1.49
Area 5	50	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	60	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	70	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	80	0.00	71.78	28.22	0.00	0.00	0.00	0.00
	100	0.00	67.78	26.46	5.76	0.00	0.00	0.00
	120	0.00	3.38	37.71	53.49	4.07	1.35	0.00
	150	0.00	0.00	0.00	47.86	15.95	0.00	36.19
Area 6	50	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	60	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	70	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	80	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	100	0.00	76.86	23.14	0.00	0.00	0.00	0.00
	120	0.00	18.75	45.27	27.40	4.31	4.27	0.00
	150	0.00	0.00	0.00	0.00	37.22	62.29	0.49
Area 7	50	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	60	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	70	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	80	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	100	0.00	97.09	2.91	0.00	0.00	0.00	0.00
	120	0.00	0.00	89.19	10.81	0.00	0.00	0.00
	150	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Area North Sea	50	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	60	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	70	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	80	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	100	0.00	73.68	24.35	1.98	0.00	0.00	0.00
	120	0.00	11.58	48.03	35.30	3.09	2.00	0.00
	150	0.00	0.00	8.26	36.18	22.85	12.77	19.94

TABLE 3-H-3: Age size keys (percent) of **sprat** in 1991 by area and quarter

Quarter 3	Size class	Age class						
		0	1	2	3	4	5	6+
Area 4	50	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	60	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	70	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	80	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	100	0.00	90.60	9.40	0.00	0.00	0.00	0.00
	120	0.00	43.05	43.23	11.23	1.19	1.29	0.00
	150	0.00	0.00	25.83	67.71	0.00	6.46	0.00
Area 5	50	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	60	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	70	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	80	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	100	0.00	84.51	15.49	0.00	0.00	0.00	0.00
	120	0.00	48.06	42.58	9.35	0.00	0.00	0.00
	150	0.00	0.00	30.89	69.11	0.00	0.00	0.00
Area 6	50	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	60	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	70	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	80	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	100	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	120	0.00	57.47	27.55	14.98	0.00	0.00	0.00
	150	0.00	0.00	91.31	0.00	8.69	0.00	0.00
Area North Sea	50	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	60	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	70	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	80	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	100	0.00	97.92	2.08	0.00	0.00	0.00	0.00
	120	0.00	51.02	35.25	12.86	0.42	0.45	0.00
	150	0.00	0.00	43.55	50.01	2.29	4.15	0.00

TABLE 3-H-4: Age size keys (percent) of sprat in 1991 by area and quarter

Quarter 4	Size class	Age class						
		0	1	2	3	4	5	6+
Area 1	50	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	60	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	70	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	80	84.01	15.99	0.00	0.00	0.00	0.00	0.00
	100	2.09	93.42	4.37	0.12	0.00	0.00	0.00
	120	0.00	65.49	22.79	11.46	0.26	0.00	0.00
	150	0.00	0.00	10.85	78.20	4.24	2.02	4.69
Area 2	50	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	60	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	70	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	80	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	100	17.40	82.60	0.00	0.00	0.00	0.00	0.00
	120	0.00	96.40	2.22	1.38	0.00	0.00	0.00
	150	0.00	0.00	3.83	96.17	0.00	0.00	0.00
Area 3	50	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	60	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	70	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	80	84.01	15.99	0.00	0.00	0.00	0.00	0.00
	100	2.09	93.42	4.37	0.12	0.00	0.00	0.00
	120	0.00	65.49	22.79	11.46	0.26	0.00	0.00
	150	0.00	0.00	10.85	78.20	4.24	2.02	4.69
Area 4	50	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	60	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	70	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	80	90.40	9.60	0.00	0.00	0.00	0.00	0.00
	100	0.00	99.00	1.00	0.00	0.00	0.00	0.00
	120	0.00	65.77	26.86	4.79	2.58	0.00	0.00
	150	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Area 5	50	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	60	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	70	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	80	53.13	46.87	0.00	0.00	0.00	0.00	0.00
	100	0.00	96.10	2.68	1.21	0.00	0.00	0.00
	120	0.00	75.92	19.01	5.07	0.00	0.00	0.00
	150	0.00	0.00	6.44	41.92	10.48	16.92	24.24
Area 6	50	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	60	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	70	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	80	93.09	6.91	0.00	0.00	0.00	0.00	0.00
	100	2.30	93.04	4.66	0.00	0.00	0.00	0.00
	120	0.00	64.64	23.22	11.87	0.27	0.00	0.00
	150	0.00	0.00	11.97	83.17	4.03	0.83	0.00
Area North Sea	50	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	60	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	70	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	80	84.01	15.99	0.00	0.00	0.00	0.00	0.00
	100	2.09	93.42	4.37	0.12	0.00	0.00	0.00
	120	0.00	65.49	22.79	11.46	0.26	0.00	0.00
	150	0.00	0.00	10.85	78.20	4.24	2.02	4.69
	200	0.00	0.00	0.00	0.00	0.00	0.00	100.00
	250	0.00	0.00	0.00	0.00	0.00	0.00	100.00

TABLE 3-I-1: Age size keys (percent) of **sandeels** in 1991 by area and quarter

Quarter 1	Size class	Age class						
		0	1	2	3	4	5	6+
Northern North Sea (Areas 1,2,3,7)	50	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	60	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	70	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	80	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	100	0.00	99.70	0.30	0.00	0.00	0.00	0.00
	120	0.00	87.00	11.70	1.00	0.30	0.00	0.00
	150	0.00	21.70	43.50	24.10	3.70	4.70	2.30
	200	0.00	0.00	0.00	42.70	5.10	36.00	16.20
	250	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Southern North Sea (Areas 4,5,6)	50	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	60	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	70	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	80	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	100	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	120	0.00	98.51	1.49	0.00	0.00	0.00	0.00
	150	0.00	40.00	39.00	14.00	4.00	2.00	1.00
	200	0.00	0.00	0.00	42.00	25.00	8.00	25.00
	250	0.00	0.00	0.00	0.00	0.00	0.00	100.00

TABLE 3-I-2: Age size keys (percent) of **sandeels** in 1991 by area and quarter

Quarter 2	Size class	Age class						
		0	1	2	3	4	5	6+
Northern North Sea (Areas 1,2,3,7)	50	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	60	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	70	50.00	50.00	0.00	0.00	0.00	0.00	0.00
	80	48.63	51.37	0.00	0.00	0.00	0.00	0.00
	100	10.72	88.36	0.86	0.06	0.00	0.00	0.00
	120	0.00	71.85	22.19	5.07	0.89	0.00	0.00
	150	0.00	21.64	43.46	24.05	3.74	4.68	2.43
	200	0.00	0.00	0.00	42.65	5.13	35.98	16.24
	250	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Southern North Sea (Areas 4,5,6)	50	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	60	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	70	50.00	50.00	0.00	0.00	0.00	0.00	0.00
	80	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	100	0.00	73.34	26.66	0.00	0.00	0.00	0.00
	120	0.00	50.30	49.59	0.11	0.00	0.00	0.00
	150	0.00	2.59	36.51	39.39	9.24	4.76	7.51
	200	0.00	0.00	0.00	41.67	25.00	8.33	25.00
	250	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Area 8	40	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	50	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	60	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	70	50.00	50.00	0.00	0.00	0.00	0.00	0.00
	80	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	100	0.00	100.00	0.00	0.00	0.00	0.00	0.00
	120	0.00	94.83	3.45	1.72	0.00	0.00	0.00
	150	0.00	95.83	4.17	0.00	0.00	0.00	0.00
	250	0.00	0.00	0.00	0.00	0.00	0.00	100.00

TABLE 3-I-3: Age size keys (percent) of **sandeels** in 1991 by area and quarter

Quarters 3 and 4	Size class	Age class						
		0	1	2	3	4	5	6+
Northern North Sea (Areas 1,2,3,7)	50	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	60	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	70	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	80	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	100	91.08	8.92	0.00	0.00	0.00	0.00	0.00
	120	56.54	39.27	2.78	1.19	0.22	0.00	0.00
	150	12.14	50.25	17.00	16.38	2.88	0.93	0.42
	200	0.00	50.00	1.35	4.06	10.81	13.52	20.26
	250	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Southern North Sea (Areas 4,5,6)	50	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	60	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	70	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	80	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	100	91.03	8.97	0.00	0.00	0.00	0.00	0.00
	120	50.00	25.00	0.00	25.00	0.00	0.00	0.00
	150	0.00	0.00	4.55	29.55	26.51	18.18	21.21
	200	0.00	0.00	0.00	0.00	0.00	0.00	100.00
	250	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Area 8	50	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	60	100.00	0.00	0.00	0.00	0.00	0.00	0.00
	70	99.19	0.81	0.00	0.00	0.00	0.00	0.00
	80	82.20	17.80	0.00	0.00	0.00	0.00	0.00
	100	47.61	52.39	0.00	0.00	0.00	0.00	0.00
	120	14.39	85.61	0.00	0.00	0.00	0.00	0.00
	150	0.00	35.40	33.63	21.24	9.73	0.00	0.00
	200	0.00	0.00	0.00	0.00	0.00	0.00	100.00
	250	0.00	0.00	0.00	0.00	0.00	0.00	100.00

TABLE 4: Predator size strata (cm) used during the stomach sampling projects in the North Sea in 1981, 1985-87 and 1991

1981																
5-6	7-9	10-14	15-19	20-24	25-29	30-39	40-49	50-69	70-99	>100						
1985-1987																
5	6	7	8-9	10-14	15-19	20-24	25-29	30-34	35-39	40-49	>100					
1991																
5	6	7	8-9	10-11	12-14	15-19	20-24	25-29	30-34	35-39	40-49	50-59	60-69	70-79	80-99	100-119

TABLE 5: Number of stomachs of cod, haddock, whiting, mackerel and saithe, sampled in the North Sea (areas 1-7) 1981 and 1991

Species	All size classes		"Large" fish		
	Year		Size	Year	
	1981	1991		1981	1991
Cod	11,418	9,734	>69 cm	1,717	968
Haddock	17,396	*20,250	>49 cm	276	241
Whiting	19,217	38,393	>39 cm	516	215
Mackerel	4,945	6,123	>39 cm	1,097	289
Saithe	**2,190	3,210	>69 cm	706	261

*only 13,000 stomachs analysed to date (Table 6-B)

**1980-1982

TABLE 6-A: Number of cod stomachs sampled in 1991 by predator size class, area and quarter

Size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1,000	1,200	Total
Quarter 1																			
Area 1					1	2	1	5	14	66	65	89	125	76	28	50	4		526
Area 2					1	1	9		7	44	35	34	28	23	8	20	22		232
Area 3					2	5	19	13	4	7	26	18	32	8	1	1	6		142
Area 4							4		1	13	26	51	15	5	2	3	1		121
Area 5							1	3			2	2	7	10	15	4			44
Area 6						21	57	80	25	28	29	111	94	152	119	156	36	2	910
Area 7						13	26	22	10	14	24	22	19	7	13	24	12	1	207
Area 8													4	2					6
Total					4	42	117	123	61	172	207	327	324	283	186	258	81	3	2,188
Quarter 2																			
Area 1					1	3	12	37	19	54	130	208	161	101	38	33	9		806
Area 2						1	48	141	64	39	104	169	115	51	14	9	5		769
Area 3		1				1	25	38	18	5	10	34	17	12	3	7	3		173
Area 4							16	26	16	16	10	11	6		1	2			104
Area 5									2	3		4	13	25	9	4	1		61
Area 6							74	209	180	117	34	83	71	46	36	28	7		927
Area 7		15	7			1	41	47	32	14	46	55	45	10	11	13	4		334
Area 8		3																	
Total	40	19	7		1	6	216	498	331	248	334	564	428	245	112	96	29		3,174
Quarter 3																			
Area 1	13	27	42	57	33	6	2	28	63	53	35	97	69	55	16	15	3		614
Area 2	1	7	43	87	75	27		27	86	78	23	94	49	12	5	9	3	1	627
Area 3	5	11	9	9	2			15	116	88	18	11	9	1	2		2		298
Area 4	3	8	10	12	1	1	1	40	31	19	21	9	5		2	1			164
Area 5									1	1	6	4	1	18	10	7			47
Area 6		14	26	40	40	9		5	36	46	40	14	3	1	1	1			276
Area 7		5	10	49	42	12	1	34	60	35	15	34	29	12	5	3	1		347
Area 8																			
Total	22	72	140	254	193	55	4	149	392	320	158	263	165	99	41	36	9	1	2,373

Continued

Table 6-A Continued

Size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1,000	1,200	Total
Quarter 4																			
Area 1		1	8	21	33	21	6	3	41	119	96	86	84	68	48	20	2		657
Area 2		1		11	19	37	12	2	8	36	22	23	14	18	4	6	4		217
Area 3				1		3		1	1	19	6	4	2		1	1			39
Area 4				2	2	5	2	1		1		3	1						17
Area 5				1		1	6			2	5	2	2	2	1				22
Area 6				3	124	48	244	72	21	66	94	83	15	19	15	4			808
Area 7			1	22	34	50	65	23	9	13	7	4	1		4	2	3	1	239
Area 8			3	60	82	110	143	47	32	33	25	26	21	10	7	8	3		610
Total		2	12	121	294	275	478	149	112	289	255	231	140	117	80	41	12	1	2,609
Total Year																			
Area 1	13	28	50	78	68	32	21	73	137	292	326	480	439	300	130	118	18		2,603
Area 2	9	9	43	98	95	66	69	170	165	197	184	320	206	104	31	44	34	1	1,845
Area 3	5	11	9	10	4	9	44	67	139	119	60	67	60	21	7	9	11		652
Area 4	3	8	10	14	3	6	23	67	48	49	57	74	27	5	5	6	1		406
Area 5				1		1	7	3	2	6	13	12	23	55	35	15	1		174
Area 6	20	29	33	43	164	78	375	366	262	257	197	291	183	218	171	189	43	2	2,921
Area 7	12	8	11	71	76	76	133	126	111	76	92	115	94	29	33	42	20	2	1,127
Area 8			3	60	82	110	143	47	32	33	25	26	25	12	7	8	3		616
Total	62	93	159	375	492	378	815	919	896	1,029	954	1,385	1,057	744	419	431	131	5	10,344

TABLE 6-B: Number of haddock stomachs sampled in 1991 by predator size class, area and quarter

Size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	Total
Quarter 1																
Area 1					14	160	185	130	150	168	117	101	39	1		1,065
Area 2				1	1	76	177	156	91	85	63	16	3			669
Area 3					2	47	135	131	83	58	42	29	3			530
Area 4						1	15	8		2	1	1				28
Area 5								1		1						2
Area 6						5	8	12	4	6	3					38
Area 7																
Area 8																
Total				1	17	289	520	438	328	320	226	147	45	1		2,332
Quarter 2																
Area 1				3		28	209	211	184	183	139	142	33	10	1	1,143
Area 2			2	5		4	152	151	164	147	96	56	7			784
Area 3			1	5	1	1	66	94	107	72	65	29				441
Area 4							39	51	25	17	15	8				155
Area 5					1			1		1	1					3
Area 6								9	6	1						16
Area 7						1	16	38	40	42	29	31	11	2		210
Area 8																
Total			3	13	2	34	482	555	526	462	345	266	51	12	1	2,752
Quarter 3																
Area 1	1	12	35	227	317	327	165	336	361	264	179	134	35	4		2,397
Area 2			5	39	86	142	95	145	216	132	98	44	1			1,003
Area 3				81	133	113	83	167	164	150	91	37	1	1		1,021
Area 4			1	14	6		5	90	78	41	30	7	2			274
Area 5																
Area 6										1						1
Area 7				17	43	20	25	25	42	31	21	15	7			246
Area 8																
Total	1	12	41	378	585	602	373	763	861	619	419	237	46	5		4,942

Continued

Table 6-B Continued

Size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	Total
Quarter 4																
Area 1				42	137	192	211	196	247	258	164	119	51	14		1,631
Area 2					22	49	115	81	135	143	58	28	11	2		644
Area 3					16	48	73	74	95	87	61	21				475
Area 4						5	6	7	20	25	16	6				85
Area 5																
Area 6									6	2	3					11
Area 7					5	5	4	1	4	10	2		1	1		33
Area 8					1	23	58	29	39	36	16	3				205
Total				42	181	322	467	388	546	561	320	177	63	17		3,084
Total Year	1	12	35	272	468	708	770	873	942	873	599	496	158	29	1	6,236
Area 1				45	109	279	539	533	606	507	315	144	22	2		3,100
Area 2			7	86	152	202	357	466	447	368	259	116	4	1		2,467
Area 3			1	14	6	6	65	156	123	85	62	22	2			542
Area 4					1			1			1					3
Area 5								10	12	5	3					30
Area 6				17	48	31	53	76	90	89	55	46	19	3		527
Area 7					1	23	58	29	39	36	16	3				205
Area 8																
Total	1	12	44	434	785	1,247	1,842	2,144	2,260	1,963	1,310	827	205	35	1	13,110

TABLE 6-C: Number of whiting stomachs sampled in 1991 by predator size class, area and quarter

Size class	50	60	70	80	100	120	150	200	250	300	350	400	500	Total
Quarter 1														
Area 1					36	74	151	341	430	382	106	26		1,546
Area 2				2	30	254	337	281	226	89	15			1,234
Area 3				19	120	261	256	248	240	80	17	1		1,242
Area 4						17	93	59	33	25	1			228
Area 5				9	9	37	49	38	37	22	6	1		208
Area 6		1		6	33	160	286	213	199	155	54	7		1,114
Area 7				13	64	88	169	104	97	36	6	2		579
Area 8														
Total		1		49	292	891	1,341	1,284	1,262	789	205	37		6,151
Quarter 2														
Area 1					1	4	130	496	1,024	691	204	59	9	2,618
Area 2					6	38	492	719	692	233	16	1		2,197
Area 3						31	187	392	357	158	8	1		1,134
Area 4					3	14	190	207	261	153	16			844
Area 5						35	128	153	146	82	28	8		580
Area 6					71	237	773	842	774	359	50	9		3,115
Area 7					11	136	248	201	168	66	9	3		842
Area 8														
Total					92	495	2,148	3,010	3,422	1,742	331	81	9	11,330
Quarter 3														
Area 1	5	5	21	284	408	333	48	218	974	981	185	10		3,472
Area 2	1	27	45	140	175	183	92	387	450	325	43	2		1,870
Area 3			2	88	165	180	212	604	615	232	18	1		2,117
Area 4		10	15	23	13		92	292	367	164	14	1		991
Area 5			10	13	1	3	66	150	136	65	35	3		482
Area 6	13	22	24	43	52	22	362	417	383	193	27	6		1,564
Area 7		24	30	77	69	33	189	319	159	124	22			1,046
Area 8														
Total	19	88	147	668	883	754	1,061	2,387	3,084	2,084	344	23		11,542

Continued

Table 6-C Continued

Size class	50	60	70	80	100	120	150	200	250	300	350	400	500	Total
Quarter 4														
Area 1	2			5	96	131	408	252	632	697	325	46		2,594
Area 2				12	83	140	319	239	256	199	35	1		1,284
Area 3				6	38	73	228	304	278	158	46			1,131
Area 4		2	4	8	35	41	66	112	99	42				409
Area 5				23	39	57	114	124	125	59	25			566
Area 6		4	12	38	205	160	475	743	646	406	112	17		2,818
Area 7	1	3		6	52	71	145	136	100	45	8	1		568
Area 8			3	48	101	136	249	211	205	81	13			1,047
Total	3	9	19	146	649	809	2,004	2,121	2,341	1,687	564	65		10,417
Total Year														
Area 1	7	5	21	289	541	542	737	1,307	3,060	2,751	820	141	9	10,230
Area 2	1	27	45	154	294	615	1,240	1,626	1,624	846	109	4		6,585
Area 3			2	113	323	545	883	1,548	1,490	628	89	3		5,624
Area 4		12	19	31	51	72	441	670	760	384	31	1		2,472
Area 5			10	45	49	132	357	465	444	228	94	12		1,836
Area 6	13	27	36	87	361	579	1,896	2,215	2,002	1,113	243	39		8,611
Area 7	1	27	30	96	196	328	751	760	524	271	45	6		3,035
Area 8			3	48	101	136	249	211	205	81	13			1,047
Total	22	98	166	863	1,916	2,949	6,554	8,802	10,109	6,302	1,444	206	9	39,440

TABLE 6-D: Number of **mackerel** stomachs sampled in 1991 by predator size class, area and quarter

Size class	50	60	70	80	100	120	150	200	250	300	350	400	Total
Quarter 1													
Area 1							71	134	47	33	4		289
Area 2									1				1
Area 3											1		1
Area 4													
Area 5													
Area 6													
Area 7													
Area 8													
Total							71	134	48	33	5		291
Quarter 2													
Area 1							1	4	63	144	23	5	240
Area 2								53	63	257	112	35	520
Area 3									32	53	15	3	103
Area 4								4	12	42	39	5	102
Area 5								18	39	57	21	2	137
Area 6							1	100	279	311	228	74	993
Area 7								28	66	106	30	5	235
Area 8													
Total							2	207	554	970	468	129	2,330
Quarter 3													
Area 1								25	252	670	237	60	1,244
Area 2								4	61	227	94	10	396
Area 3								6	34	155	61	3	259
Area 4	1									12	33		46
Area 5										1			1
Area 6								17	171	213	173	50	624
Area 7								14	98	81	31	3	227
Area 8													
Total	1							66	616	1,359	629	126	2,797
Quarter 4													
Area 1								1	4	136	83	11	235
Area 2							4	20					24
Area 3									25	25	25		75
Area 4													
Area 5							5			3			8
Area 6							13	29	71	110	117	23	363
Area 7													
Area 8													
Total							22	50	100	274	225	34	705
Total Year													
Area 1							72	164	366	983	347	76	2,008
Area 2							4	77	125	484	206	45	941
Area 3								6	91	233	102	6	438
Area 4	1							4	12	54	72	5	148
Area 5							5	18	39	61	21	2	146
Area 6							14	146	521	634	518	147	1,980
Area 7								42	164	187	61	8	462
Area 8													
Total	1						95	457	1,318	2,636	1,327	289	6,123

TABLE 6-E: Number of *saithe* stomachs sampled in 1991 by predator size class, area and quarter

Size class	150	200	250	300	350	400	500	600	700	800	1000	1200	Total
Quarter 1													
Area 1			2	89	150	354	65	28	19	9	3		719
Area 2					1	3				2			6
Area 3													
Area 4													
Area 5													
Area 6													
Area 7				8	24	12	5	9	1				59
Area 8													
Total			2	97	175	369	70	37	20	11	3		784
Quarter 2													
Area 1			3	6	241	431	196	84	72	65	7		1,105
Area 2			1	1	3	4		2	1	2	1		15
Area 3					1	2	2	4		1	2		12
Area 4													
Area 5													
Area 6		1	1		1								3
Area 7		2		2	8	16	6	3	2	4			43
Area 8													
Total		3	5	9	254	453	204	93	75	72	10		1,178
Quarter 3													
Area 1	1			3	56	187	66	27	15	9			364
Area 2						11	3			14			28
Area 3													
Area 4				1									1
Area 5													
Area 6		1											1
Area 7													
Area 8													
Total	1	1		4	56	198	69	27	15	23			394
Quarter 4													
Area 1	2			3	67	480	193	49	12	13	5		824
Area 2				1		2					1		4
Area 3													
Area 4													
Area 5													
Area 6					1								1
Area 7					5	17	1	1	1				25
Area 8													
Total	2			4	73	499	194	50	13	13	6		854
Total Year													
Area 1	3		5	101	514	1,452	520	188	118	96	15		3,012
Area 2			1	2	4	20	3	2	1	18	2		53
Area 3					1	2	2	4		1	2		12
Area 4				1									1
Area 5													
Area 6		2	1		2								5
Area 7		2		10	37	45	12	13	4	4			127
Area 8													
Total	3	4	7	114	558	1,519	537	207	123	119	19		3,210

TABLE 6-F: Number of stomachs of **other predators** sampled in each quarter of 1991

Species		Quarter				Total
		1	2	3	4	
Tope	<i>Galeorhinus galeus</i>	1	3	11	17	32
Starry smooth hound	<i>Mustelus asterias</i>	0	3	3	1	7
Lesser spotted dogfish	<i>Scyliorhinus canicula</i>	35	43	93	4	175
Spurdog	<i>Squalus acanthias</i>	49	336	58	75	518
Starry ray	<i>Raja radiata</i>	637	651	1,475	438	3,201
Thornback ray	<i>R. clavata</i>	109	18	72	7	206
Cuckoo ray	<i>R. naevus</i>	83	54	51	4	192
Spotted ray	<i>R. montagui</i>	45	13	29	46	133
Pollack	<i>Pollachius pollachius</i>	0	58	15	8	81
Ling	<i>Molva molva</i>	52	71	33	48	204
Hake	<i>Merluccius merluccius</i>	54	176	226	93	549
Torsk	<i>Brosme brosme</i>	3	14	5	5	27
Bib	<i>Trisopterus luscus</i>	56	17	0	29	102
Blue whiting	<i>Micromesistius poutassou</i>	0	0	7	0	7
Angler (monkfish)	<i>Lophius piscatorius</i>	29	54	111	66	260
Norway haddock	<i>Sebastes viviparus</i>	0	0	7	0	7
Grey gurnard	<i>Eutrigla gurnardus</i>	1,916	4,128	3,955	1,701	11,700
Scad (horse mackerel)	<i>Trachurus trachurus</i>	31	941	1,555	986	3,513
Red gurnard	<i>Aspitrigla cuculus</i>	132	19	17	2	170
Tub gurnard	<i>Trigla lucerna</i>	0	106	148	137	391
Red mullet	<i>Mullus surmuletus</i>	0	26	0	0	26
Catfish (wolf-fish)	<i>Anarhichas lupus</i>	1	2	0	0	3
Greater sandeel	<i>Hyperoplus</i> sp.	3	779	8	4	794
Unspecified sandeels	Ammodytidae	0	65	0	0	65
Turbot	<i>Scophthalmus maximus</i>	13	25	17	33	88
Brill	<i>S. rhombus</i>	14	10	1	2	27
Megrim	<i>Lepidorhombus whiffiagonis</i>	60	40	128	16	244
Long rough dab	<i>Hippoglossoides platessoides</i>	574	414	1,172	353	2,513
Halibut	<i>Hippoglossus hippoglossus</i>	2	7	0	2	11

TABLE 7-A. Percentage of empty **cod** stomachs in 1991 by predator size class, area and quarter

Size class																			
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	Total
Quarter 1																			
Area 1					0.00	0.00	0.00	20.00	7.14	15.15	10.77	20.22	9.60	14.47	17.86	14.00	0.00		13.69
Area 2					0.00	0.00	0.00		14.29	9.09	11.43	17.65	17.86	17.39	12.50	20.00	54.55		17.67
Area 3					0.00	40.00	21.05	23.08	25.00	14.29	26.92	22.22	25.00	12.50	0.00	0.00	0.00		21.83
Area 4							25.00		0.00	7.69	3.85	25.49	33.33	20.00	0.00	0.00	0.00		18.18
Area 5							100.00	33.33			0.00	0.00	14.29	10.00	13.33	25.00			15.91
Area 6						19.05	14.04	12.50	4.00	7.14	3.45	12.61	17.02	24.34	17.65	17.31	30.56	0.00	16.70
Area 7						23.08	38.46	0.00	30.00	7.14	16.67	4.55	10.53	0.00	15.38	8.33	0.00	0.00	13.53
Area 8													0.00	0.00					0.00
Total					0.00	21.43	20.51	12.20	11.48	11.05	11.59	17.13	15.12	19.43	16.67	15.89	28.40	0.00	16.13
Quarter 2																			
Area 1					0.00	0.00	25.00	13.51	21.05	14.81	10.77	10.10	8.07	11.88	7.89	0.00	0.00		10.30
Area 2	12.50	0.00				100.00	18.75	10.64	3.13	5.13	8.65	10.65	4.35	1.96	0.00	0.00	20.00		8.32
Area 3						0.00	4.00	10.53	11.11	0.00	0.00	2.94	11.76	0.00	0.00	0.00	0.00		5.78
Area 4							0.00	3.85	12.50	6.25	10.00	18.18	0.00	0.00	0.00	0.00			6.73
Area 5									0.00	0.00		0.00	7.69	4.00	0.00	0.00	0.00		3.28
Area 6	10.00	6.67	0.00				18.92	15.79	8.89	9.40	11.76	15.66	7.04	6.52	5.56	0.00	0.00		11.22
Area 7	8.33	0.00				0.00	19.51	8.51	15.63	28.57	6.52	3.64	2.22	0.00	18.18	0.00	25.00		9.28
Area 8																			
Total	10.00	5.26	0.00		0.00	16.67	16.20	12.45	9.37	10.48	9.28	10.11	6.31	6.94	6.25	0.00	6.90		9.48
Quarter 3																			
Area 1	30.77	29.63	4.76	17.54	12.12	16.67	100.00	10.71	3.17	1.89	8.57	5.15	5.80	9.09	0.00	6.67	0.00		8.96
Area 2	0.00	14.29	34.88	16.09	14.67	3.70		11.11	6.98	12.82	0.00	2.13	2.04	0.00	0.00	11.11	0.00	0.00	10.37
Area 3	0.00	18.18	0.00	22.22	0.00			20.00	6.90	3.41	5.56	9.09	0.00	0.00	0.00	0.00	0.00		6.71
Area 4	0.00	25.00	10.00	8.33	0.00	0.00	0.00	5.00	6.45	5.26	0.00	11.11	0.00		0.00	0.00			6.10
Area 5										0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00
Area 6		21.43	30.77	15.00	2.50	0.00		20.00	11.11	8.70	22.50	0.00	66.67	0.00	0.00	0.00			13.77
Area 7		20.00	20.00	16.33	7.14	16.67	0.00	2.94	13.33	14.29	6.67	0.00	10.34	0.00	0.00	0.00	0.00		9.80
Area 8																			
Total	18.18	23.61	20.00	16.14	9.84	7.27	50.00	8.72	7.65	7.50	8.86	3.42	6.06	5.05	0.00	5.56	0.00	0.00	9.36

Continued

Table 7-A Continued

	Size class																		
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	Total
Quarter 4																			
Area 1		0.00	12.50	14.29	12.12	14.29	50.00	33.33	19.51	15.97	8.33	2.33	4.76	2.94	2.08	15.00	0.00		9.44
Area 2		0.00		18.18	26.32	10.81	0.00	0.00	0.00	13.89	22.73	21.74	0.00	0.00	0.00	0.00	0.00		11.98
Area 3				0.00		0.00		0.00	0.00	15.79	33.33	25.00	0.00	0.00	0.00	0.00			15.38
Area 4				0.00	50.00	40.00	50.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00				23.53
Area 5				0.00		0.00	0.00			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		5.20
Area 6				33.33	7.26	14.58	6.56	5.56	4.76	1.52	3.19	0.00	0.00	0.00	0.00	0.00	0.00		9.62
Area 7			0.00	9.09	11.76	12.00	12.31	8.70	11.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.36
Area 8			0.00	8.33	10.98	1.82	13.29	6.38	9.38	15.15	12.00	7.69	0.00	0.00	0.00	0.00	0.00		
Total		0.00	8.33	10.74	10.88	8.73	9.83	6.71	11.61	11.42	8.24	4.33	2.86	1.71	1.25	7.32	0.00	0.00	8.20
Total Year																			
Area 1	30.77	28.57	6.00	16.67	11.76	12.50	38.10	13.70	10.95	13.01	9.82	9.58	7.52	10.00	6.92	9.32	0.00		10.45
Area 2	11.11	11.11	34.88	16.33	16.84	9.09	13.04	10.59	5.45	10.66	9.78	9.69	5.34	4.81	3.23	11.36	38.24	0.00	10.62
Area 3	0.00	18.18	0.00	20.00	0.00	22.22	11.36	14.93	7.91	5.88	16.67	10.45	16.67	4.76	0.00	0.00	0.00		10.28
Area 4	0.00	25.00	10.00	7.14	33.33	33.33	8.70	4.48	8.33	6.12	3.51	21.62	18.52	20.00	0.00	0.00	0.00		10.59
Area 5				0.00		0.00	14.29	33.33	0.00	0.00	0.00	0.00	8.70	3.64	5.71	6.67	0.00		5.17
Area 6	10.00	13.79	24.24	16.28	6.10	14.10	10.13	13.11	8.40	7.00	8.63	9.28	12.57	18.35	13.45	14.29	25.58	0.00	11.50
Area 7	8.33	12.50	18.18	14.08	9.21	14.47	19.55	5.56	15.32	13.16	8.70	2.61	6.38	0.00	12.12	4.76	5.00	0.00	10.29
Area 8			0.00	8.33	10.98	1.82	13.29	6.38	9.38	15.15	12.00	7.69	0.00	0.00	0.00	0.00	0.00		8.28
Total	12.90	19.35	18.24	14.40	10.37	10.05	13.25	10.88	9.04	9.91	9.43	9.53	8.51	10.62	9.31	10.67	19.08	0.00	10.54

TABLE 7-B: Percentage of empty **haddock** stomachs in 1991 by predator size class, area and quarter

	Size class															
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	Total
Quarter 1																
Area 1					28.57	9.38	10.27	18.46	14.67	17.86	21.37	21.78	20.51	0.00		15.85
Area 2				0.00	0.00	15.79	4.52	14.74	20.88	27.06	41.27	56.25	33.33			18.09
Area 3					0.00	2.13	14.07	15.27	36.14	27.59	45.24	51.72	33.33			22.83
Area 4						100.00	26.67	12.50		50.00	100.00	0.00				28.57
Area 5								0.00		0.00						0.00
Area 6						80.00	37.50	0.00	0.00	33.33	0.00					23.68
Area 7																
Area 8																
Total				0.00	23.53	11.42	10.19	15.53	21.65	22.50	31.42	31.29	22.22	0.00		18.35
Quarter 2																
Area 1				0.00		3.57	4.78	2.84	3.80	0.00	2.88	0.00	0.00	10.00	0.00	2.53
Area 2			0.00	0.00		25.00	11.84	4.64	8.54	8.16	6.25	1.79	14.29			7.65
Area 3			0.00	0.00	0.00	0.00	1.52	5.32	2.80	8.33	3.08	6.90				4.31
Area 4							15.38	7.84	8.00	23.53	20.00	0.00				12.26
Area 5					0.00			100.00			0.00					33.33
Area 6								22.22	50.00	0.00						31.25
Area 7						0.00	0.00	15.79	12.50	21.43	6.90	12.90	0.00	0.00		12.38
Area 8																
Total			0.00	0.00	0.00	5.88	7.26	5.59	6.46	6.71	4.93	2.63	1.96	8.33	0.00	5.78
Quarter 3																
Area 1	0.00	8.33	22.86	18.94	3.47	2.14	7.88	10.42	6.09	6.82	7.26	7.46	5.71	0.00		7.63
Area 2			0.00	15.38	15.12	10.56	10.53	8.28	7.87	11.36	6.12	4.55	100.00			9.67
Area 3				9.88	3.76	4.42	16.87	7.78	7.98	9.27	4.40	2.70	0.00	0.00		7.54
Area 4			0.00	7.14	0.00		0.00	2.22	6.41	7.32	6.67	0.00	0.00			4.74
Area 5										0.00						0.00
Area 6						30.00	32.00	16.00	33.33	22.58	0.00	13.33	14.29			20.73
Area 7				23.53	11.63											
Area 8																
Total	0.00	8.33	19.51	16.40	5.81	5.48	12.06	8.65	8.26	9.19	5.97	6.33	8.70	0.00		8.43

Continued

Table 7-B Continued

	Size class															
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	Total
Quarter 4																
Area 1				9.52	3.65	2.08	6.16	5.61	10.12	6.59	6.10	8.40	5.88	0.00		6.25
Area 2					0.00	12.24	11.30	17.28	20.74	19.58	13.79	10.71	18.18	50.00		15.99
Area 3				0.00	6.25	2.08	5.48	9.46	8.42	9.20	3.28	0.00	0.00			6.53
Area 4						0.00	16.67	0.00	50.00	36.00	12.50	0.00				25.88
Area 5																
Area 6									0.00	0.00	66.67					18.18
Area 7					0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		0.00
Area 8					100.00	26.09	10.34	48.28	25.64	8.33	0.00	0.00				19.51
Total				9.52	3.87	5.28	7.92	11.86	14.84	11.59	7.50	7.34	7.94	5.88		9.73
Total Year	0.00	8.33	22.86	17.28	4.27	3.82	7.14	8.71	8.07	7.45	8.68	8.47	8.23	3.45	0.00	7.75
Area 1			0.00	13.33	11.93	12.55	9.09	10.51	12.87	15.38	14.60	10.42	22.73	50.00		12.29
Area 2			0.00	9.30	3.95	3.35	10.64	9.66	12.05	11.96	10.42	15.52	25.00	0.00		10.05
Area 3			0.00	7.14	0.00	16.67	16.92	4.49	13.82	20.00	12.90	0.00	0.00			11.44
Area 4					0.00			100.00			0.00					33.33
Area 5								20.00	25.00	0.00	66.67					23.33
Area 6								13.16	21.11	20.22	3.64	13.04	5.26	0.00		16.32
Area 7				23.53	10.42	32.26	20.75	48.24	25.64	8.33	0.00	0.00				19.51
Area 8					100.00	26.09	10.34									
Total	0.00	8.33	18.18	15.21	5.73	6.82	9.23	9.84	11.37	11.46	10.46	9.79	9.76	5.71	0.00	9.98

TABLE 7-C: Percentage of empty **whiting** stomachs in 1991 by predator size class, area and quarter

Size class														
	50	60	70	80	100	120	150	200	250	300	350	400	500	Total
Quarter 1														
Area 1					13.89	13.51	33.11	61.88	60.00	60.47	60.38	34.62		54.20
Area 2				0.00	3.33	24.80	33.53	51.60	62.83	52.81	73.33			42.30
Area 3				15.79	34.17	29.89	39.06	61.69	59.58	62.50	52.94	0.00		46.46
Area 4						64.71	41.94	57.63	51.52	76.00	0.00			52.63
Area 5				22.22	33.33	54.05	40.82	34.21	43.24	13.64	16.67	0.00		37.50
Area 6		0.00		16.67	12.12	41.88	40.21	46.95	53.27	40.65	38.89	42.86		43.09
Area 7				15.38	21.88	28.41	21.30	37.50	39.18	38.89	50.00	0.00		29.53
Area 8														
Total		0.00		16.33	23.29	30.75	35.27	54.13	57.05	54.12	53.17	32.43		45.29
Quarter 2														
Area 1					0.00	0.00	13.08	8.27	9.28	7.96	8.33	5.08	0.00	8.71
Area 2					0.00	5.26	7.11	8.07	9.39	16.31	12.50	0.00		9.10
Area 3						0.00	5.88	3.32	4.76	6.33	25.00	100.00		4.76
Area 4					0.00	7.14	13.16	20.29	11.11	9.80	18.75			13.63
Area 5						14.29	16.41	18.95	20.55	18.29	7.14	50.00		18.28
Area 6					11.27	25.74	16.17	14.96	15.37	16.16	14.00	22.22		16.24
Area 7					18.18	10.29	17.34	20.40	24.40	15.15	0.00	0.00		17.93
Area 8														
Total					10.87	16.77	12.90	11.63	11.57	11.54	9.97	12.35	0.00	12.00
Quarter 3														
Area 1	0.00	0.00	9.52	31.34	10.05	2.70	16.67	10.55	10.27	11.52	17.30	20.00		12.07
Area 2	0.00	0.00	0.00	2.14	6.29	5.46	17.39	14.21	12.89	15.38	11.63	0.00		11.12
Area 3			0.00	0.00	4.85	4.44	12.74	12.58	11.38	19.83	33.33	0.00		11.38
Area 4		30.00	26.67	17.39	7.69		4.35	10.27	9.54	13.41	7.14	0.00		10.49
Area 5			20.00	0.00	100.00	33.33	16.67	8.00	7.35	18.46	17.14	66.67		11.83
Area 6	69.23	50.00	20.83	4.65	36.54	18.18	17.68	19.66	14.88	22.80	7.41	0.00		19.12
Area 7		33.33	16.67	14.29	13.04	6.06	6.88	10.66	6.29	14.52	18.18			10.90
Area 8														
Total	47.37	25.00	12.24	16.32	10.19	4.51	13.48	13.07	11.02	14.64	16.28	17.39		12.49

Continued

Table 7-C Continued

	Size class													
	50	60	70	80	100	120	150	200	250	300	350	400	500	Total
Quarter 4	0.00			60.00	18.75	19.85	0.74	2.38	0.95	0.57	0.62	0.00		2.62
Area 1				0.00	13.25	14.29	5.64	14.23	10.94	13.07	17.14	0.00		11.14
Area 2				0.00	5.26	16.44	0.44	4.93	2.52	5.06	10.87			4.42
Area 3		0.00	25.00	0.00	5.71	4.88	3.03	4.46	4.04	7.14				4.65
Area 4				17.39	20.51	22.81	4.39	3.23	12.00	6.78	0.00			9.36
Area 5		25.00	25.00	10.53	18.05	10.63	4.84	6.33	7.89	10.59	11.61	11.76		8.55
Area 6		0.00		16.67	17.31	11.27	6.21	5.15	16.00	20.00	0.00	0.00		10.39
Area 7			0.00	33.33	17.82	18.38	20.48	17.06	17.56	12.35	0.00			18.34
Area 8														
Total	0.00	11.11	21.05	19.18	16.18	15.20	5.59	7.26	6.96	6.34	4.61	3.08		7.92
Total Year														
Area 1	0.00	0.00	9.52	31.83	11.83	8.30	10.58	21.50	15.00	14.65	14.02	9.93	0.00	15.18
Area 2	0.00	0.00	0.00	1.95	7.82	15.45	14.68	17.96	18.04	19.03	22.02	0.00		16.29
Area 3			0.00	2.65	15.79	17.98	15.74	16.60	15.91	18.15	24.72	33.33		16.39
Area 4		25.00	26.32	12.90	5.88	19.44	15.87	16.57	11.18	15.36	12.90	0.00		14.48
Area 5			20.00	13.33	24.49	29.55	15.97	12.47	15.99	14.91	9.57	50.00		16.01
Area 6	69.23	44.44	22.22	8.05	18.84	25.73	17.25	16.03	16.63	18.69	17.70	17.95		17.72
Area 7	0.00	29.63	16.67	14.58	17.35	14.94	13.45	15.92	20.04	18.82	15.56	0.00		16.31
Area 8			0.00	33.33	17.82	18.38	20.48	17.06	17.56	12.35	0.00			18.34
Total	40.91	23.47	13.25	16.80	14.25	17.43	15.33	17.17	16.02	16.50	15.51	13.59	0.00	16.26

TABLE 7-D: Percentage of empty **mackerel** stomachs in 1991 by predator size class, area and quarter

	Size class												
	50	60	70	80	100	120	150	200	250	300	350	400	Total
Quarter 1													
Area 1							8.45	41.79	91.49	93.94	100.00		48.44
Area 2									0.00				0.00
Area 3											0.00		0.00
Area 4													
Area 5													
Area 6													
Area 7													
Area 8													
Total							8.45	41.79	89.58	93.94	80.00		48.11
Quarter 2													
Area 1							0.00	0.00	4.76	5.56	8.70	20.00	5.83
Area 2								1.89	3.17	1.95	0.89	0.00	1.73
Area 3									3.13	3.77	0.00	0.00	2.91
Area 4								25.00	0.00	0.00	0.00	20.00	1.96
Area 5								5.56	0.00	3.51	9.52	50.00	4.38
Area 6							100.00	12.00	5.73	5.47	4.82	8.11	6.34
Area 7								0.00	1.52	0.00	0.00	0.00	0.43
Area 8													
Total							50.00	7.25	4.15	3.51	3.42	6.98	4.21
Quarter 3													
Area 1								12.00	5.16	5.97	5.49	13.33	6.19
Area 2								25.00	14.75	9.69	23.40	20.00	14.14
Area 3								0.00	2.94	2.58	1.64	0.00	2.32
Area 4	0.00									0.00	3.03		2.17
Area 5										0.00			0.00
Area 6								17.65	7.60	7.04	5.78	6.00	7.05
Area 7								21.43	20.41	32.10	25.81	0.00	25.11
Area 8													
Total	0.00							15.15	9.09	7.87	8.74	10.32	8.62
Quarter 4													
Area 1								0.00	25.00	5.88	21.69	72.73	14.89
Area 2							0.00	0.00					0.00
Area 3									96.00	100.00	96.00		97.33
Area 4													
Area 5							20.00			0.00			12.50
Area 6							0.00	10.34	11.27	2.73	5.13	17.39	6.61
Area 7													
Area 8													
Total							4.55	6.00	33.00	13.14	21.33	35.29	18.87
Total Year													
Area 1							8.33	35.98	16.39	8.85	10.66	22.37	13.25
Area 2							0.00	2.60	8.80	5.58	11.17	4.44	6.91
Area 3								0.00	28.57	13.30	24.51	0.00	18.72
Area 4	0.00							25.00	0.00	0.00	1.39	20.00	2.03
Area 5							20.00	5.56	0.00	3.28	9.52	50.00	4.79
Area 6							7.14	12.33	7.10	5.52	5.21	8.84	6.62
Area 7								7.14	12.80	13.90	13.11	0.00	12.55
Area 8													
Total	0.00						8.42	18.38	11.76	7.89	9.27	11.76	10.00

TABLE 7-E: Percentage of empty **saithe** stomachs in 1991 by predator size class, area and quarter

	Size class										
	150	200	250	300	350	400	500	600	700	800	Total
Quarter 1											
Area 1			100.00	41.57	18.00	27.68	27.69	25.00	42.11	44.44	28.23
Area 2					0.00	100.00				50.00	66.67
Area 3											
Area 4											
Area 5											
Area 6											
Area 7				0.00	8.33	0.00	20.00	0.00	0.00		5.08
Area 8											
Total			100.00	38.14	16.57	27.37	27.14	18.92	40.00	45.45	26.79
Quarter 2											
Area 1			0.00	16.67	1.66	0.70	4.59	0.00	1.39	1.54	1.72
Area 2			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Area 3				0.00	0.00	0.00	0.00	25.00	0.00	0.00	8.33
Area 4											
Area 5											
Area 6		0.00			0.00		0.00	0.00	0.00		0.00
Area 7		100.00		50.00	25.00	18.75	0.00	0.00	0.00	0.00	18.60
Area 8											
Total		66.67	0.00	22.22	2.36	1.32	4.41	1.08	1.33	1.39	2.38
Quarter 3											
Area 1	0.00			0.00	7.14	19.79	13.64	25.93	6.67	0.00	15.93
Area 2						0.00	0.00			0.00	0.00
Area 3											
Area 4				0.00							0.00
Area 5											
Area 6											
Area 7		0.00									0.00
Area 8											
Total	0.00	0.00		0.00	7.14	18.69	13.04	25.93	6.67	0.00	14.72

Continued

Table 7-E Continued

	Size class										
	150	200	250	300	350	400	500	600	700	800	Total
Quarter 4											
Area 1	50.00			0.00	19.40	9.17	10.36	4.08	16.67	0.00	10.07
Area 2				0.00		0.00				20.00	0.00
Area 3										0.00	
Area 4											
Area 5					100.00	17.65	100.00	0.00	0.00		100.00
Area 6					40.00						24.00
Area 7											
Area 8											
Total	50.00			0.00	21.92	9.42	10.82	4.00	15.38	0.00	10.54
Total Year											
Area 1	33.33		40.00	37.62	9.34	12.53	10.77	8.51	10.17	5.21	12.05
Area 2			0.00	0.00	0.00	15.00	0.00	0.00	0.00	5.56	7.55
Area 3					0.00	0.00	0.00	25.00	0.00	0.00	8.33
Area 4				0.00							0.00
Area 5					50.00						20.00
Area 6		0.00	0.00		16.22	13.33	16.67	0.00	0.00	0.00	13.39
Area 7		100.00		10.00							
Area 8											
Total	33.33	50.00	28.57	34.21	9.86	12.57	10.80	8.21	9.76	5.04	12.02

TABLE 8-A-1: Summary of the stomach contents of **cod** in 1991 (percentage by weight) by predator age class, area and quarter, Total North Sea

Quarter 1	Age class						
	0	1	2	3	4	5	6+
General results							
Mean length, cm		18.38	37.14	51.92	70.00	81.70	96.64
Number of stomachs sampled		312	566	686	280	119	218
% empty stomachs		16.35	13.07	16.76	17.14	15.97	20.18
Total weight all prey		0.93	8.27	25.14	62.82	90.01	115.10
Total number of prey items		2.32	3.28	3.26	4.05	4.59	5.39
Average weight per prey		0.40	2.52	7.71	15.53	19.60	21.34
Weight % by major taxa							
Phaeophyta		0.02	0.01	0.00	0.00	0.00	0.00
Porifera		0.00	0.04	0.00	0.00		
Cnidaria		0.10	0.56	0.00	0.00	0.00	0.00
Rhynchocoela				0.00	0.00	0.00	0.00
Annelida		7.05	5.16	2.96	2.44	1.53	1.01
Gastropoda		0.16	2.27	0.58	0.15	0.14	0.09
Bivalvia		3.96	0.35	0.14	0.02	0.01	0.00
Scaphopoda			0.00	0.00	0.00		
Cephalopoda		0.02	1.70	1.17	5.24	10.92	10.09
Crustacea		51.42	20.73	12.80	8.72	6.93	6.23
Echiura				0.00	0.00	0.00	0.00
Echinodermata		0.53	0.04	0.02	0.01	0.01	0.03
Gnathostomata		36.72	69.14	82.32	83.41	80.46	82.56
Unknown		0.02	0.01	0.01	0.00	0.00	
Weight % commercial species of fish and crustacea							
<i>Gadus morhua</i>			0.20	0.85	1.29	1.09	0.88
<i>Melanogrammus aeglefinus</i>			1.47	2.56	2.32	2.19	2.14
<i>Merlangius merlangus</i>		0.27	18.05	27.37	24.35	23.79	24.97
<i>Trisopterus esmarki</i>		1.12	11.35	7.40	4.87	3.03	1.41
<i>Clupea harengus</i>		0.04	5.86	11.54	15.22	14.33	11.64
<i>Sprattus sprattus</i>		5.88	0.84	0.67	0.44	0.26	0.24
Ammodytidae		8.81	3.80	1.27	0.30	0.36	0.25
<i>Pleuronectes platessa</i>				0.12	0.28	0.38	1.45
<i>Solea solea</i>			0.58	1.07	1.17	1.04	1.49
<i>Limanda limanda</i>		0.04	3.50	7.67	10.09	10.79	17.41
<i>Scomber scomber</i>			0.76	5.59	11.92	12.39	7.56
<i>Nephrops norvegicus</i>		0.03	2.59	1.72	2.01	2.41	3.20
<i>Crangon crangon</i>		2.29	0.14	0.09	0.03	0.02	0.01
<i>Pandalus</i> sp.		0.00	0.05	0.02	0.03	0.01	0.00
Unidentified Soleidae		0.09	0.06	0.03	0.00	0.00	0.00
Unidentified Gadidae		0.07	1.62	1.34	0.67	0.57	0.43
Unidentified Clupeidae		2.18	0.55	0.18	0.06	0.05	0.04
Non-commercial Pleuronectidae		0.29	0.40	0.22	0.26	0.82	
Non-commercial Gadidae		0.56	9.24	4.00	2.09	1.48	2.12
Non-commercial Clupeidae		0.29	0.40	0.22	0.26	0.82	

Continued

Table 8-A-1 Continued

Quarter 1	Age class						
	0	1	2	3	4	5	6+
Weight % crustacean taxa							
Mysida		0.11	0.01	0.00	0.00	0.00	0.00
Cumacea		0.05	0.00				
Flabellifera			0.00	0.00	0.00	0.00	0.00
Valvifera		0.00	0.02	0.01	0.01	0.00	0.00
Gammaridea		0.07	0.03	0.00	0.00	0.00	0.00
Hyperiidea		0.02	0.00				
Euphausiacea		0.00	0.09	0.01	0.00		
Caridea		34.43	3.10	1.36	0.73	0.31	0.10
Astacidea		0.03	2.59	1.72	2.02	2.42	3.20
Anomura		12.77	6.99	3.17	1.47	0.89	0.35
Oxyrhyncha		0.29	1.32	0.43	0.23	0.22	0.13
Cancridea		0.49	0.49	0.53	0.65	0.70	0.44
Brachyrhyncha		2.21	5.68	5.31	3.46	2.34	1.99

TABLE 8-A-2: Summary of the stomach contents of **cod** in 1991 (percentage by weight) by predator age class, area and quarter, Total North Sea

Quarter 2	Age class						
	0	1	2	3	4	5	6+
General results							
Mean length, cm	4.99	23.65	42.57	56.86	70.93	84.43	97.25
Number of stomachs sampled	67	1210	984	695	102	51	62
% empty stomachs	7.46	11.98	9.25	7.34	3.92	1.96	3.23
Total weight all prey	0.03	2.20	20.78	52.56	121.55	195.64	243.53
Total number of prey items	3.71	23.11	21.14	10.46	8.99	11.42	11.56
Average weight per prey	0.01	0.10	0.980	5.02	13.52	17.13	21.06
Weight % by major taxa							
Porifera		0.01	0.00	0.01	0.00	0.00	0.02
Cnidaria		0.03	0.14	0.12	0.04	0.01	0.00
Rhynchocoela		0.00	0.08	0.02	0.08	0.14	0.08
Annelida	0.73	5.58	4.36	2.75	2.43	2.75	2.85
Gastropoda		0.73	1.02	0.35	0.09	0.05	0.04
Bivalvia		4.05	2.76	1.84	1.20	1.54	0.83
Scaphopoda		0.00	0.00	0.00	0.00	0.00	
Cephalopoda		0.49	0.27	0.19	0.10	0.10	0.38
Pycnogonida		0.00	0.00	0.00	0.00	0.00	
Crustacea	45.01	56.67	23.91	14.69	14.44	15.99	14.75
Echiura			0.00	0.00	0.00	0.00	
Priapulida		0.00	0.01	0.00	0.00		
Echinodermata		0.57	0.79	0.57	0.18	0.05	0.04
Urochordata			0.00	0.00	0.00	0.00	
Gnathostomata	54.26	31.87	66.65	79.45	81.45	79.38	81.01
Unknown		0.00					
Weight % commercial species of fish and crustacea							
<i>Gadus morhua</i>		0.10	0.20	0.49	5.14	8.79	4.85
<i>Melanogrammus aeglefinus</i>		0.04	1.39	2.97	7.22	9.09	9.25
<i>Merlangius merlangus</i>		0.16	5.87	7.75	7.07	5.98	12.13
<i>Trisopterus esmarki</i>		5.04	13.56	10.51	4.67	2.88	3.86
<i>Clupea harengus</i>		0.47	7.99	16.35	15.58	13.32	13.77
<i>Sprattus sprattus</i>		0.17	0.39	0.45	0.22	0.24	0.36
Ammodytidae	6.28	13.54	13.54	8.38	7.79	6.41	4.85
<i>Pleuronectes platessa</i>				0.02	1.06	1.94	1.08
<i>Solea solea</i>		0.36	0.31	0.83	1.73	1.73	3.68
<i>Limanda limanda</i>		0.51	7.73	12.80	13.98	15.69	15.73
<i>Scomber scomber</i>						0.03	0.78
<i>Nephrops norvegicus</i>		3.20	5.56	3.48	5.45	7.14	8.82
<i>Crangon crangon</i>		0.81	0.03	0.02	0.00	0.00	0.00
<i>Pandalus</i> sp.	0.49	0.05	0.00	0.00	0.00	0.00	
Unidentified Soleidae		0.23	0.01	0.01	0.00	0.00	
Unidentified Gadidae	0.64	0.44	1.34	0.67	0.27	0.11	0.27
Unidentified Clupeidae		0.17	0.49	0.05	0.11	0.17	0.10
Non-commercial Pleuronectidae	0.67	2.26	7.25	11.55	11.63	8.91	6.52
Non-commercial Gadidae		1.67	1.78	1.97	1.96	2.00	1.06

Continued

Table 8-A-2 Continued

Quarter 2	Age class						
	0	1	2	3	4	5	6+
Weight % crustacean taxa							
Calanoida	4.20						
Balanidae		0.09	0.00	0.00			
Mysida	0.61	0.17	0.00	0.00	0.00		
Cumacea		0.00	0.00				
Valvifera		0.05	0.01	0.01	0.00	0.00	
Oniscoidea		0.04	0.00	0.00	0.00	0.00	0.00
Gammaridea		0.27	0.01	0.00	0.00	0.00	
Hyperiidea	19.55	7.27	0.88	0.09	0.01	0.00	
Euphausiacea		0.05	0.54	0.13	0.03	0.03	0.02
Caridea	16.26	4.58	0.67	0.36	0.13	0.13	0.07
Astacidea		3.20	5.56	3.48	5.45	7.14	8.82
Anomura	0.81	23.91	5.74	2.17	0.70	0.53	0.26
Oxystomata		0.02	0.02	0.00	0.00	0.00	
Oxyrhyncha		3.50	1.22	0.39	0.10	0.08	0.13
Cancridea		1.78	3.61	4.41	4.84	4.92	2.89
Brachyrhyncha		10.61	5.49	3.62	3.17	3.16	2.56

TABLE 8-A-3: Summary of the stomach contents of cod in 1991 (percentage by weight) by predator age class, area and quarter, Total North Sea

Quarter 3	Age class						
	0	1	2	3	4	5	6+
General results							
Mean length, cm	7.63	29.71	46.82	52.99	76.22	87.93	101.07
Number of stomachs sampled	741	998	381	185	41	8	16
% empty stomachs	15.38	7.82	4.99	4.86	2.44		
Total weight all prey	0.07	4.49	21.82	49.18	96.57	103.46	148.41
Total number of prey items	5.54	4.39	5.12	6.99	8.77	6.75	7.55
Average weight per prey	0.01	1.02	4.26	7.04	11.01	15.32	19.65
Weight % by major taxa							
Annelida	5.95	4.25	3.13	2.76	2.12	1.37	5.24
Gastropoda	0.02	0.51	0.46	0.23	0.02	0.00	0.00
Bivalvia	0.00	1.47	0.06	0.04	0.00	0.00	
Scaphopoda		0.00	0.00	0.00	0.00		
Cephalopoda		0.31	0.16	0.16	0.31	0.00	
Crustacea	77.25	35.41	19.82	17.80	16.89	16.71	19.85
Ectoprocta		0.00	0.00	0.00			
Echinodermata	0.29	0.10	0.13	0.18	0.31	0.62	0.49
Gnathostomata	16.50	57.94	76.24	78.82	80.36	81.30	74.42
Unknown		0.01	0.00				
Weight % commercial species of fish and crustacea							
<i>Gadus morhua</i>	1.09	5.36	2.52	1.01	0.20	0.13	0.91
<i>Melanogrammus aeglefinus</i>	0.00	4.43	5.54	4.55	0.65	0.86	3.52
<i>Merlangius merlangus</i>	0.56	4.32	3.56	7.45	6.26	5.90	2.49
<i>Trisopterus esmarki</i>	0.93	12.54	18.96	14.52	11.29	4.76	3.83
<i>Clupea harengus</i>		1.47	15.49	25.92	41.98	46.73	25.06
<i>Sprattus sprattus</i>		0.50	0.68	2.30	0.48	0.13	
Ammodytidae	0.17	20.23	8.06	5.18	2.40	0.27	0.05
<i>Pleuronectes platessa</i>		0.00	0.00				
<i>Solea solea</i>			0.04	0.03	0.00		2.17
<i>Limanda limanda</i>	0.13	0.15	6.02	7.93	6.38	9.29	9.26
<i>Scomber scomber</i>				0.00	0.05	0.10	0.04
<i>Nephrops norvegicus</i>	0.02	4.09	4.49	3.60	6.31	7.02	7.46
<i>Crangon crangon</i>				0.00	0.00	0.00	0.00
<i>Pandalus</i> sp.	1.33	0.04	0.00	0.00	0.00		0.00
Unidentified Soleidae				0.01	0.06	0.13	0.06
Unidentified Clupeidae	0.59	0.85	0.09	0.02		0.03	
Non-commercial Pleuronectidae	3.95	1.64	4.02	3.25	4.48	7.26	13.36
Non-commercial Gadidae	0.02	1.57	5.80	4.12	3.91	3.25	9.82

Continued

Table 8-A-3 Continued

Quarter 3	Age class						
	0	1	2	3	4	5	6+
Weight % crustacean taxa							
Calanoida	0.46						
Mysida	0.38	0.02	0.00	0.00	0.00		
Cumacea	0.02						
Anthuridea	0.05						
Valvifera	1.58	0.01	0.00				
Oniscoidea		0.02	0.00	0.00	0.00		
Gammaridea	1.82	0.01	0.00	0.00	0.00		
Hyperiidea	7.36	0.02	0.00	0.00	0.00	0.01	0.00
Euphausiacea	8.64	0.30	0.02	0.01	0.00	0.00	0.00
Caridea	33.18	2.42	0.52	0.49	0.86	0.74	0.33
Astacidea	0.02	4.09	4.49	3.60	6.31	7.02	7.46
Anomura	9.05	12.48	3.48	1.50	0.35	0.10	0.85
Oxystomata		0.06	0.00	0.00	0.00		
Oxyrhyncha	0.03	2.42	1.17	0.68	0.19	0.13	0.05
Cancridea	0.49	2.53	3.07	2.62	2.15	1.49	1.23
Brachyrrhyncha	6.46	10.39	7.00	8.88	7.01	7.23	9.93

TABLE 8-A-4: Summary of the stomach contents of **cod** in 1991 (percentage by weight) by predator age class, area and quarter, Total North Sea

Quarter 4	Age class						
	0	1	2	3	4	5	6+
General results							
Mean length, cm	15.85	34.55	51.93	65.79	75.25	91.35	102.26
Number of stomachs sampled	882	672	238	131	47	9	18
% empty stomachs	10.09	8.93	3.36	2.29	2.13		5.56
Total weight all prey	0.66	7.14	27.37	57.03	88.46	233.68	338.94
Total number of prey items	3.23	4.28	6.83	8.12	8.81	9.31	9.77
Average weight per prey	0.20	1.67	4.00	7.03	10.04	25.09	34.69
Weight % by major taxa							
Phaeophyta		0.06	0.00				
Porifera		0.00	0.00				
Cnidaria		0.01	0.01	0.01	0.01		
Ctenophora	0.03	0.01	0.06	0.09	0.09	0.01	0.00
Annelida	9.51	2.52	2.68	2.38	1.43	0.16	0.06
Gastropoda	0.06	1.21	0.08	0.07	0.10	0.04	0.02
Bivalvia	0.03	0.72	0.17	0.36	0.58	0.30	0.15
Scaphopoda		0.00	0.01	0.00	0.00		
Cephalopoda	0.10	0.17	0.51	0.41	0.20	0.02	0.00
Pycnogonida		0.01	0.00				
Crustacea	75.18	40.44	28.74	18.93	13.33	3.48	1.77
Echiura		0.00	0.01	0.01			
Echinodermata	0.00	0.53	0.64	0.82	0.51	0.12	0.12
Cephalochordata			0.00	0.00	0.00		
Gnathostomata	15.09	54.31	67.10	76.91	83.75	95.87	97.87
Weight % commercial species of fish and crustacea							
<i>Gadus morhua</i>	0.00	0.66	0.38	0.28	0.29	0.17	0.09
<i>Melanogrammus aeglefinus</i>	0.00	12.47	11.16	11.10	11.76	5.17	3.55
<i>Merlangius merlangus</i>	0.00	6.89	14.55	14.98	17.59	8.05	4.51
<i>Trisopterus esmarki</i>	0.01	14.21	13.05	13.25	14.08	5.51	3.04
<i>Clupea harengus</i>		0.27	1.96	2.76	2.48	40.25	50.93
<i>Sprattus sprattus</i>	0.66	3.35	0.23	0.22	0.22	0.35	0.41
Ammodytidae	0.65	2.55	1.76	0.56	0.14	0.01	0.01
<i>Pleuronectes platessa</i>						9.71	12.37
<i>Solea solea</i>		0.03	0.47	0.52	0.47	0.10	0.02
<i>Limanda limanda</i>	0.05	0.85	8.08	14.36	15.82	13.20	12.72
<i>Scomber scomber</i>			1.26	5.50	9.20	4.36	2.15
<i>Nephrops norvegicus</i>	8.61	2.14	2.18	2.39	1.54	0.34	0.17
<i>Crangon crangon</i>	16.10	6.89	4.26	1.23	0.26	0.03	0.01
<i>Pandalus</i> sp.	0.06	0.08	0.02	0.00			
Unidentified Gadidae	0.08	1.06	0.92	0.85	0.87	0.49	0.29
Unidentified Clupeidae		0.02	0.03	0.09	0.05	0.01	0.00
Non-commercial Pleuronectidae	0.40	3.13	3.71	3.39	2.74	4.58	5.27
Non-commercial Gadidae		1.25	3.12	2.09	0.58	0.01	0.00

Continued

Table 8-A-4 Continued

Quarter 4	Age class						
	0	1	2	3	4	5	6+
Weight % crustacean taxa							
Mysida	0.22	0.03	0.01	0.00			
Cumacea	0.06						
Valvifera	0.00	0.00	0.00	0.00			
Asellota	0.00						
Oniscoidea		0.00	0.00	0.00			
Gammaridea	0.28	0.02	0.00	0.00			
Hyperiidea	0.02						
Euphausiacea	3.23	0.41	0.25	0.04	0.02	0.01	0.01
Caridea	38.86	11.42	6.05	2.67	1.62	0.35	0.13
Astacidea	8.61	2.14	2.18	2.39	1.54	0.34	0.17
Anomura	11.97	9.69	4.09	3.10	2.99	0.54	0.14
Oxystomata	0.01	0.01	0.00				
Oxyrhyncha	0.15	0.92	0.23	0.27	0.18	0.07	0.07
Cancridea	1.58	2.25	2.89	1.43	0.99	0.43	0.29
Brachyrhyncha	9.66	13.26	12.94	8.99	5.97	1.73	0.96

TABLE 8-B-1: Summary of the stomach contents of **haddock** (percentage by weight) by predator age class, area and quarter, Total North Sea

Quarter 1	Age class						
	0	1	2	3	4	5	6+
General results							
Mean length, cm		18.16	27.49	33.63	37.86	39.37	45.71
Number of stomachs sampled		1213	587	269	67	141	53
% empty stomachs		12.37	21.64	27.41	29.85	29.08	27.78
Total weight all prey		0.25	0.50	0.90	1.40	1.58	2.80
Total number of prey items		9.43	6.23	6.15	7.05	7.49	9.51
Average weight per prey		0.03	0.08	0.15	0.20	0.21	0.29
Weight % by major taxa							
Porifera		0.33	0.45	0.45	0.38	0.29	0.13
Cnidaria		0.47	0.12	0.09	0.09	0.09	0.07
Rhynchocoela		0.06	0.17	0.03	0.02	0.02	0.02
Annelida		28.77	31.99	32.15	23.89	21.55	13.32
Gastropoda		0.63	0.38	0.32	0.26	0.31	1.60
Polyplacophora		0.01	0.05	0.06	0.06	0.05	0.03
Bivalvia		2.12	2.58	1.86	1.47	1.57	3.96
Scaphopoda		0.00	0.01	0.01	0.00	0.00	0.00
Cephalopoda		11.21	4.64	1.66	2.06	2.11	1.69
Pycnogonida			0.00	0.00	0.00	0.01	0.00
Crustacea		18.58	22.30	19.37	15.47	14.39	11.25
Sipuncula		0.14	0.00				
Priapulida		0.01	0.57	0.15	0.07	0.09	0.09
Ectoprocta		0.01	0.00	0.00	0.00	0.00	0.00
Echinodermata		25.89	16.10	11.33	14.59	15.61	13.76
Chaetognatha		0.00	0.00	0.00	0.00	0.00	0.00
Urochordata		0.04	0.14	0.06	0.17	0.17	0.13
Gnathostomata		5.76	15.00	28.07	37.63	40.12	51.41
Unknown		5.21	5.41	4.33	3.80	3.60	2.44
Weight % commercial species of fish and crustacea							
<i>Trisopterus esmarki</i>		0.00	1.34	6.05	5.87	5.44	3.71
<i>Clupea harengus</i>			0.02	6.38	24.65	24.83	19.17
Ammodytidae		3.70	10.19	10.53	3.07	2.84	0.41
<i>Solea solea</i>		0.00	0.09	0.25	0.16	0.13	0.05
<i>Nephrops norvegicus</i>		0.04	0.68	2.06	1.73	1.52	0.79
<i>Crangon crangon</i>		0.47	0.17	0.01	0.00	0.00	0.00
<i>Pandalus</i> sp.		0.00	0.00				
Unidentified Pleuronectidae		0.25	0.24	0.36	0.30	0.21	0.08
Unidentified Gadidae			0.00	0.15	0.57	0.57	0.44
Non-commercial Pleuronectidae		0.12	0.50	0.15	0.09	0.06	0.02

Continued

Table 8-B-1 Continued

Quarter 1	Age class						
	0	1	2	3	4	5	6+
Weight % crustacean taxa							
Myodocopa		0.00	0.00	0.00	0.00	0.00	0.00
Calanoida		0.00	0.00	0.00	0.00	0.00	0.00
Lepadomorpha			0.00	0.00	0.01	0.01	0.01
Leptostraca		0.00	0.00	0.00	0.00	0.00	0.00
Mysida		0.00	0.02	0.02	0.01	0.01	0.00
Cumacea		0.17	0.06	0.02	0.01	0.01	0.00
Tanaidacea dikonophora		0.01	0.00	0.00	0.00	0.00	0.00
Gnathiidae		0.00	0.00	0.00	0.00	0.00	0.00
Flabellifera		0.42	1.02	1.07	1.25	1.74	4.28
Valvifera		0.00	0.13	0.02	0.01	0.00	0.00
Asellota			0.00	0.00	0.00	0.00	0.00
Gammaridea		1.37	1.18	1.02	0.75	0.66	0.38
Hyperiididae		0.05	0.02	0.01	0.01	0.01	0.00
Caprellidae		0.03	0.01	0.00	0.00	0.00	0.00
Euphausiacea		0.21	0.06	0.07	0.03	0.03	0.01
Caridea		9.69	6.01	4.07	2.98	2.70	1.51
Astacidea		0.60	2.39	2.91	2.22	1.89	0.92
Anomura		2.60	4.38	3.58	3.38	2.99	1.75
Oxyrhyncha		0.03	0.13	0.12	0.40	0.40	0.31
Cancridea		0.38	0.01				
Brachyrrhyncha		1.10	1.69	1.73	2.16	1.99	1.32

TABLE 8-B-2: Summary of the stomach contents of **haddock** (percentage by weight) by predator age class, area and quarter, Total North Sea

Quarter 2	Age class						
	0	1	2	3	4	5	6+
General results							
Mean length, cm	6.97	21.66	28.95	34.08	37.92	37.36	36.93
Number of stomachs sampled	18	1373	641	324	107	199	91
% empty stomachs	0.00	6.41	6.24	4.63	3.74	3.52	4.40
Total weight all prey	0.02	1.02	2.04	3.41	4.90	4.47	3.81
Total number of prey items	4.82	111.56	166.26	201.75	205.40	181.19	187.37
Average weight per prey	0.00	0.01	0.01	0.02	0.02	0.02	0.02
Weight % by major taxa							
Porifera		0.39	0.22	0.10	0.11	0.08	0.12
Cnidaria		0.39	0.07	0.40	1.01	0.68	0.67
Rhynchocoela		0.01	0.02	0.03	0.03	0.04	0.03
Annelida	0.92	7.73	9.09	7.86	7.60	7.40	7.79
Gastropoda	2.10	2.17	1.71	1.47	1.51	1.28	1.43
Polyplacophora		0.00	0.00	0.01	0.01	0.01	0.00
Bivalvia		0.57	5.29	6.99	8.23	6.26	6.56
Scaphopoda		0.00	0.00	0.00	0.01	0.00	0.00
Cephalopoda		0.00	0.00	0.00	0.00	0.00	0.00
Crustacea	25.65	45.27	37.78	32.99	29.85	29.98	30.30
Priapulida		0.00	0.02	0.04	0.03	0.04	0.02
Ectoprocta		0.00	0.00	0.00	0.00	0.00	0.00
Echinodermata		9.01	13.91	16.03	18.03	17.89	17.33
Chaetognatha		0.08	0.03	0.07	0.05	0.09	0.04
Urochordata	3.89	1.41	0.30	0.20	0.15	0.16	0.21
Gnathostomata	62.97	29.00	29.49	31.86	31.02	33.75	33.25
Unknown	4.44	3.87	1.96	1.86	2.31	2.25	2.17
Weight % commercial species of fish and crustacea							
<i>Gadus morhua</i>		0.01	0.03	0.01	0.00	0.00	0.00
<i>Trisopterus esmarki</i>		0.02	0.07	0.14	0.35	0.22	0.22
<i>Pollachius virens</i>			0.00	0.00	0.01	0.01	0.01
<i>Clupea harengus</i>						0.06	0.56
<i>Sprattus sprattus</i>			0.00	0.08	0.22	0.14	0.13
Ammodytidae	56.95	25.26	26.95	29.36	27.34	29.17	23.80
<i>Pleuronectes platessa</i>		0.04	0.00	0.00	0.00	0.00	0.00
<i>Solea solea</i>		0.01	0.00				
<i>Nephrops norvegicus</i>				0.00	0.04	0.05	0.06
<i>Crangon crangon</i>		0.00	0.00	0.00	0.00	0.00	0.00
<i>Pandalus</i> sp.		0.01	0.01	0.00	0.00	0.00	0.00
Unidentified Pleuronectidae		0.30	0.08	0.05	0.08	0.06	0.07
Unidentified Gadidae		0.00	0.00	0.00	0.00	0.00	0.00
Unidentified Clupeidae		0.00	0.01	0.00	0.00	0.00	0.00
Non-commercial Pleuronectidae		0.83	0.33	0.06	0.01	0.03	0.08
Non-commercial Gadidae			0.00	0.01	0.25	0.37	0.98

Continued

Table 8-B-2 Continued

Quarter 2	Age class						
	0	1	2	3	4	5	6+
Weight % crustacean taxa							
Myodocopa		0.00	0.00	0.00	0.00	0.00	0.00
Calanoida	3.28	3.47	2.18	1.53	0.95	0.94	1.20
Harpacticoida		0.00	0.00				
Leptostraca		0.00	0.00	0.00	0.00	0.00	0.00
Mysida		0.00	0.00	0.00	0.00	0.00	0.00
Cumacea	0.55	0.04	0.04	0.01	0.01	0.01	0.01
Tanaidacea dikonophora		0.00	0.00	0.00	0.00	0.00	0.00
Gnathiidea		0.00	0.00				
Flabellifera		0.29	0.21	0.22	0.22	0.25	0.29
Valvifera		0.01	0.03	0.03	0.01	0.01	0.02
Gammaridea	4.41	0.83	0.34	0.26	0.27	0.25	0.30
Hyperiidea	11.39	31.44	27.74	23.72	21.14	21.42	20.73
Caprellidea	1.85	0.00	0.00	0.00	0.00	0.00	0.00
Euphausiacea		4.13	2.95	2.11	0.99	0.81	1.66
Caridea	1.54	2.23	0.87	0.57	0.54	0.60	0.76
Astacidea		0.04	0.12	0.40	0.98	0.66	0.67
Anomura		1.72	1.93	3.02	4.01	4.26	3.82
Oxyrhyncha		0.00	0.02	0.03	0.03	0.03	0.02
Cancridea		0.01	0.00	0.01	0.00	0.01	0.00
Brachyrrhyncha		0.03	0.37	0.32	0.15	0.13	0.21

TABLE 8-B-3: Summary of the stomach contents of **haddock** (percentage by weight) by predator age class, area and quarter, Total North Sea

Quarter 3	Age class						
	0	1	2	3	4	5	6+
General results							
Mean length, cm	10.88	25.70	33.66	39.39	39.56	37.99	41.02
Number of stomachs sampled	1945	1878	813	163	25	97	16
% Empty stomachs	9.14	8.61	7.37	7.36	4.00	7.22	
Total weight all prey	0.10	1.12	2.44	4.47	4.05	4.47	5.24
Total number of prey items	17.53	38.89	30.65	26.69	26.03	28.05	24.41
Average weight per prey	0.01	0.03	0.08	0.17	0.16	0.16	0.21
Weight % by major taxa							
Phaeophyta		0.01	0.04	0.07	0.10	0.04	0.08
Porifera	0.15	0.38	0.11	0.03	0.03	0.04	0.01
Cnidaria	0.04	0.10	0.39	0.38	0.52	0.30	0.38
Rhynchocoela		0.04	0.04	0.03	0.03	0.02	0.02
Annelida	24.13	12.42	12.42	10.56	11.47	9.80	9.10
Gastropoda	1.05	0.86	0.81	1.07	1.28	0.80	1.02
Polyplacophora	0.00	0.19	0.01	0.00	0.00	0.00	0.00
Bivalvia	1.89	2.48	2.02	1.25	1.46	1.20	1.14
Scaphopoda		0.03	0.02	0.01	0.01	0.01	0.01
Cephalopoda	0.70	0.39	0.09	0.02	0.02	0.02	0.01
Pycnogonida	0.01	0.00	0.00	0.00			
Crustacea	35.22	16.70	12.24	8.61	10.09	8.40	8.09
Sipuncula	0.01	0.01	0.04	0.02	0.02	0.02	0.01
Priapulida		0.05	0.42	0.41	0.53	0.35	0.36
Ectoprocta	0.00	0.00	0.14	0.21	0.31	0.13	0.23
Echinodermata	6.54	11.40	15.37	16.00	17.20	13.99	14.03
Chaetognatha	0.97	0.03	0.00				
Urochordata	0.91	0.09	0.21	0.11	0.10	0.12	0.12
Gnathostomata	16.85	49.27	51.48	58.05	53.04	62.01	62.35
Unknown	11.20	5.25	3.77	2.63	3.29	2.26	2.57
Weight % commercial species of fish & crustacea							
<i>Gadus morhua</i>				0.10	0.05	0.08	0.06
<i>Melanogrammus aeglefinus</i>		0.94	1.74	1.93	2.77	1.34	2.03
<i>Trisopterus esmarki</i>	0.16	2.54	3.19	2.37	2.65	9.61	14.60
<i>Ammodytidae</i>	12.16	43.45	45.22	52.89	46.75	50.24	44.98
<i>Pleuronectes platessa</i>		0.00	0.00	0.00			
<i>Solea solea</i>		0.05	0.00				
<i>Nephrops norvegicus</i>	0.00	0.76	0.91	0.36	0.44	0.47	0.20
<i>Crangon crangon</i>	0.18	0.03	0.02	0.01	0.01	0.01	0.01
<i>Pandalus</i> sp.		0.01	0.00	0.00			
Unidentified Pleuronectidae	0.28	0.04	0.06	0.03	0.03	0.04	0.03
Unidentified Gadidae	0.10	0.48	0.17	0.05	0.05	0.05	0.02
Non-commercial Pleuronectidae	0.59	0.14	0.04	0.04	0.05	0.02	0.03
Non-commercial Gadidae			0.01	0.02	0.02	0.01	0.02

Continued

Table 8-B-3 Continued

Quarter 3	Age class						
	0	1	2	3	4	5	6+
Weight % crustacean taxa							
Myodocopa	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Calanoida	0.79	0.28	0.02	0.00	0.00	0.00	0.00
Harpacticoida	0.04						
Lepadomorpha		0.00	0.00	0.01	0.01	0.01	0.01
Leptostraca	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mysida	0.01	0.00	0.01	0.00	0.00	0.00	0.00
Cumacea	0.87	0.06	0.02	0.01	0.01	0.01	0.01
Tanaidacea dikonophora	0.03	0.00	0.00	0.00	0.00	0.00	0.00
Gnathiidea	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Flabellifera	0.06	0.86	1.03	0.69	0.87	0.64	0.63
Valvifera	0.00	0.00	0.01	0.00	0.01	0.01	0.00
Asellota			0.00	0.00	0.00	0.00	0.00
Gammaridea	2.62	1.05	1.06	0.89	1.02	0.81	0.83
Hyperiidea	9.50	6.03	2.86	1.03	1.15	1.30	0.59
Caprellidea	0.23	0.01	0.01	0.00	0.00	0.00	0.00
Euphausiacea	8.87	0.18	0.13	0.24	0.23	0.20	0.19
Caridea	3.39	2.31	0.81	0.33	0.37	0.45	0.47
Astacidea	0.23	1.00	0.99	0.39	0.47	0.51	0.22
Anomura	1.41	2.92	3.35	3.36	3.96	2.79	3.12
Oxyrhyncha	0.05	0.03	0.18	0.23	0.29	0.26	0.37
Cancridea	0.02	0.13	0.32	0.30	0.32	0.26	0.29
Brachyrhyncha	0.52	0.38	0.34	0.42	0.54	0.46	0.69

TABLE 8-B-4: Summary of the stomach contents of **haddock** (percentage by weight) by predator age class, area and quarter, Total North Sea

Quarter 4	Age class						
	0	1	2	3	4	5	6+
General results							
Mean length, cm	15.44	27.33	33.61	38.93	40.99	42.75	51.16
Number of stomachs sampled	1028	1299	328	122	48	107	29
% empty stomachs	7.10	12.78	8.84	8.20	6.25	7.48	6.90
Total weight all prey	0.21	1.01	1.91	3.07	4.07	4.87	13.30
Total number of prey items	13.63	11.88	11.37	11.64	11.94	12.32	14.94
Average weight per prey	0.02	0.08	0.17	0.26	0.34	0.40	0.89
Weight % by major taxa							
Phaeophyta		0.01	0.00				
Porifera	0.06	0.00	0.01	0.02	0.02	0.03	0.00
Cnidaria	0.01	0.80	1.75	4.86	5.83	6.72	7.31
Ctenophora	0.08						
Rhynchocoela			0.00	0.01	0.02	0.04	0.05
Annelida	25.32	19.02	18.73	13.29	10.13	8.64	3.71
Gastropoda	0.76	1.04	1.57	3.20	3.08	3.60	1.89
Polyplacophora	0.00	0.00					
Bivalvia	1.27	1.41	1.47	1.34	1.32	1.05	1.05
Scaphopoda	0.02	0.04	0.05	0.05	0.04	0.03	0.01
Cephalopoda	0.98	0.80	0.93	0.50	0.34	0.47	0.44
Crustacea	29.13	24.45	21.03	21.58	20.17	20.21	14.04
Sipuncula	0.44	0.68	0.17	0.13	0.16	0.19	0.22
Priapulida	0.00						
Ectoprocta	0.03	0.00	0.01	0.01	0.01	0.00	0.00
Echinodermata	21.17	14.28	11.70	12.74	14.15	14.47	17.86
Urochordata	0.06	0.04	0.05	0.02	0.00	0.00	
Gnathostomata	16.01	30.55	37.84	37.92	41.21	41.12	52.50
Unknown	4.31	6.68	4.37	3.89	3.12	3.02	0.74
Weight % commercial species of fish and crustacea							
<i>Melanogrammus aeglefinus</i>			0.02	1.43	2.26	3.39	4.51
<i>Trisopterus esmarki</i>	3.07	15.73	18.67	18.85	21.21	18.65	26.61
<i>Clupea harengus</i>		0.01	0.03	1.03	1.62	2.44	3.24
Ammodytidae	0.52	8.96	14.53	9.83	7.57	5.36	3.40
<i>Nephrops norvegicus</i>	0.05	1.36	2.97	2.03	1.56	0.74	0.14
<i>Crangon crangon</i>		0.03	0.00	0.00	0.00	0.00	0.00
<i>Pandalus</i> sp.	0.47	0.00					
Unidentified Pleuronectidae	0.06	0.11	0.15	0.13	0.12	0.08	0.05
Unidentified Gadidae	0.02	2.00	2.56	1.32	1.03	1.49	1.88
Non-commercial Pleuronectidae	1.09	1.56	0.56	0.33	0.30	0.41	0.40

Continued

Table 8-B-4 Continued

Quarter 4	Age class						
	0	1	2	3	4	5	6+
Weight % crustacean taxa							
Myodocopa	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Calanoida	0.02	0.00					
Harpacticoida	0.01						
Leptostraca	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mysida	0.02	0.00	0.00	0.00	0.00	0.00	
Cumacea	0.28	0.04	0.02	0.01	0.01	0.01	0.00
Tanaidacea dikonophora	0.04	0.00	0.00	0.00	0.00	0.00	0.01
Gnathiidea	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Flabellifera	0.64	0.96	1.08	1.21	1.06	1.10	0.60
Valvifera	0.01	0.00	0.07	0.07	0.06	0.03	0.01
Asellota	0.17	0.00	0.00	0.00	0.00	0.00	0.00
Gammaridea	3.86	3.57	3.62	3.58	3.28	3.05	1.99
Hyperidea	0.18	0.02	0.01	0.01	0.00	0.00	0.00
Caprellidea	0.12	0.01	0.00	0.00	0.00	0.00	0.00
Euphausiacea	3.38	3.89	1.37	1.68	1.47	1.62	0.32
Caridea	9.15	2.13	1.28	2.54	2.89	3.73	3.48
Astacidea	0.61	2.64	3.44	2.12	1.58	0.76	0.14
Anomura	4.46	7.99	5.41	6.14	6.16	7.27	6.33
Oxystomata		0.00	0.02	0.02	0.02	0.01	0.00
Oxyrhyncha	0.04	0.30	0.20	0.20	0.19	0.17	0.08
Cancridea	0.25	0.25	1.33	1.08	0.89	0.43	0.07
Brachyrhyncha	0.83	1.00	1.56	1.29	1.08	0.73	0.26

TABLE 8-C-1: Summary of the stomach contents of **whiting** (percentage by weight) by predator age class, area and quarter, Total North Sea

Quarter 1	Age class						
	0	1	2	3	4	5	6+
General results							
Mean length, cm		15.93	24.46	26.80	28.88	29.28	29.84
Number of stomachs sampled		2748	1562	1132	416	231	64
% empty stomachs		33.48	54.87	55.57	53.96	52.81	51.56
Total weight all prey		0.42	1.07	1.44	1.81	1.89	2.34
Total number of prey items		7.82	2.15	1.41	1.19	1.16	1.10
Average weight per prey		0.05	0.50	1.02	1.52	1.63	2.12
Weight % by major taxa							
Cnidaria		0.00	0.00	0.00	0.00	0.00	
Annelida		10.59	4.80	3.37	2.82	2.75	2.33
Gastropoda		0.00	0.00	0.00	0.00	0.00	0.00
Bivalvia		0.33	0.67	0.45	0.27	0.25	0.11
Cephalopoda		9.35	2.88	4.10	4.14	4.17	3.67
Crustacea		25.56	10.25	7.46	6.96	6.81	6.91
Echiura		0.01	0.01	0.05	0.16	0.16	0.27
Echinodermata		0.08	0.11	0.04	0.02	0.02	0.01
Chaetognatha		0.02	0.04	0.01	0.00	0.00	
Urochordata		0.14	0.03	0.04	0.03	0.03	0.01
Gnathostomata		53.45	81.19	84.47	85.58	85.81	86.68
Unknown		0.49	0.01	0.00	0.00	0.00	
Weight % commercial species of fish and crustacea							
<i>Melanogrammus aeglefinus</i>		0.02	0.35	0.65	0.99	1.06	1.22
<i>Merlangius merlangus</i>		0.77	6.52	9.29	13.07	13.02	16.23
<i>Trisopterus esmarki</i>		14.61	22.92	24.22	26.64	27.06	28.94
<i>Pollachius virens</i>			0.00	0.01	0.12	0.37	1.03
<i>Clupea harengus</i>		0.79	2.97	3.66	3.56	3.79	3.67
<i>Sprattus sprattus</i>		4.64	13.40	14.77	12.25	11.80	8.89
Ammodytidae		19.47	19.13	16.07	12.10	11.56	8.07
<i>Crangon crangon</i>		2.58	1.90	1.22	0.92	0.87	0.70
<i>Pandalus</i> sp.		0.10	0.16	0.18	0.02	0.11	0.04
Unidentified Pleuronectidae		0.16	0.74	0.89	0.94	0.90	0.94
Unidentified Soleidae			0.00	0.01	0.09	0.14	0.12
Unidentified Gadidae		0.24	1.50	2.28	2.14	2.11	1.74
Unidentified Clupeidae		2.46	3.64	3.25	4.13	4.43	6.06
Non-commercial Pleuronectidae		0.27	0.03	0.06	0.11	0.11	0.16
Non-commercial Gadidae		1.00	0.60	0.54	1.54	1.82	2.75

Continued

Table 8-C-1 Continued

Quarter 1	Age class						
	0	1	2	3	4	5	6+
Weight % crustacean taxa							
Calanoida		0.01	0.00	0.00	0.00	0.00	
Mysida		0.49	0.03	0.03	0.08	0.08	0.13
Cumacea		0.01	0.00	0.00	0.00	0.00	
Tanaidacea Dikonophora		0.00					
Flabellifera		0.09	0.40	0.38	0.38	0.37	0.36
Valvifera		0.00	0.07	0.11	0.07	0.07	0.03
Gammaridea		0.68	0.13	0.09	0.07	0.07	0.06
Hyperidea		0.83	0.22	0.05	0.01	0.01	0.00
Euphausiacea		5.73	0.52	0.50	0.34	0.32	0.16
Caridea		12.40	7.37	4.89	4.04	3.93	3.50
Anomura		1.14	0.68	0.67	1.28	1.26	1.91
Cancridea		0.01	0.01	0.02	0.01	0.01	0.00
Brachyrrhyncha		0.26	0.07	0.07	0.11	0.15	0.29

TABLE 8-C-2: Summary of the stomach contents of **whiting** (percentage by weight) by predator age class, area and quarter, Total North Sea

Quarter 2	Age class						
	0	1	2	3	4	5	6+
General results							
Mean length, cm		18.47	24.31	26.59	28.09	28.94	29.11
Number of stomachs sampled		4470	2608	2149	1196	553	344
% empty stomachs		12.77	11.54	11.54	11.54	11.57	11.34
Total weight all prey		1.00	1.98	2.64	3.22	3.52	3.61
Total number of prey items		114.17	121.38	122.80	115.46	108.29	98.79
Average weight per prey		0.01	0.02	0.02	0.03	0.03	0.04
Weight % by major taxa							
Cnidaria		0.00	0.01	0.02	0.02	0.02	0.01
Rhynchocoela		0.00	0.01	0.02	0.05	0.06	0.07
Annelida		8.90	4.45	3.79	3.45	3.30	3.25
Gastropoda		0.77	0.34	0.21	0.15	0.13	0.13
Bivalvia		0.01	0.04	0.06	0.05	0.04	0.03
Cephalopoda		2.07	0.69	0.45	0.33	0.29	0.29
Crustacea		25.03	19.71	16.84	15.09	14.36	14.00
Echiura		0.01	0.01	0.02	0.03	0.03	0.02
Echinodermata		0.01	0.04	0.11	0.23	0.30	0.35
Chaetognatha		0.69	0.28	0.16	0.11	0.10	0.11
Urochordata		1.05	0.57	0.38	0.27	0.22	0.21
Cephalochordata		0.03	0.00				
Gnathostomata		60.81	73.83	77.94	80.22	81.14	81.52
Unknown		0.23	0.02	0.01	0.01	0.01	0.02
Weight % commercial species of fish and crustacea							
<i>Gadus morhua</i>		1.15	0.93	0.60	0.40	0.32	0.30
<i>Melanogrammus aeglefinus</i>		0.13	0.25	0.37	0.33	0.27	0.18
<i>Merlangius merlangus</i>		0.18	0.37	0.65	1.09	1.35	1.74
<i>Trisopterus esmarki</i>		1.28	5.87	8.59	9.92	10.43	11.25
<i>Clupea harengus</i>		0.15	0.93	1.68	2.42	2.93	3.00
<i>Sprattus sprattus</i>		3.12	5.23	4.38	4.46	4.70	5.14
Ammodytidae		44.49	46.00	47.18	47.35	47.08	46.55
<i>Microstomus kitt</i>		0.00	0.00	0.00	0.00	0.00	0.00
<i>Limanda limanda</i>		0.08	0.00				
<i>Crangon crangon</i>		0.36	0.18	0.10	0.07	0.07	0.07
<i>Pandalus</i> sp.		0.22	0.15	0.05	0.02	0.01	0.03
Unidentified Pleuronectidae		0.23	0.35	0.33	0.40	0.46	0.54
Unidentified Gadidae		0.38	0.53	0.49	0.58	0.67	0.71
Unidentified Clupeidae		2.55	3.95	4.16	4.09	3.99	3.74
Non-commercial Pleuronectidae		0.17	0.40	0.50	0.58	0.62	0.61
Non-commercial Gadidae		0.80	1.32	0.98	0.79	0.74	0.69

Continued

Table 8-C-2 Continued

Quarter 2	Age class						
	0	1	2	3	4	5	6+
Weight % crustacean taxa							
Calanoida		1.07	0.51	0.42	0.32	0.26	0.21
Mysida		0.17	0.09	0.04	0.02	0.02	0.02
Cumacea		0.08	0.01	0.01	0.00	0.00	0.01
Flabellifera		0.42	0.82	0.71	0.64	0.60	0.58
Valvifera		0.00	0.00	0.01	0.02	0.02	0.03
Gammaridea		0.25	0.04	0.02	0.01	0.01	0.01
Hyperiid		15.14	10.25	8.04	6.58	5.92	5.51
Caprellidea		0.00	0.00	0.00	0.00	0.00	0.00
Euphausiacea		0.99	2.54	2.99	3.20	3.27	3.28
Caridea		2.16	1.18	0.92	0.79	0.74	0.73
Anomura		1.38	2.12	2.27	2.44	2.53	2.57
Cancridae		0.13	0.32	0.34	0.29	0.24	0.19
Brachyrrhyncha		0.93	0.73	0.32	0.21	0.24	0.36

TABLE 8-C-3: Summary of the stomach contents of **whiting** (percentage by weight) by predator age class, area and quarter, Total North Sea

Quarter 3	Age class						
	0	1	2	3	4	5	6+
General results							
Mean length, cm	9.55	21.41	26.54	28.30	29.40	30.71	32.80
Number of stomachs sampled	2561	3978	2453	1766	512	233	40
% empty stomachs	11.05	12.82	12.27	13.36	14.06	14.59	15.00
Total weight all prey	0.20	1.30	2.66	3.37	3.84	4.27	5.75
Total number of prey items	31.03	23.62	17.22	14.96	14.22	12.86	11.04
Average weight per prey	0.01	0.06	0.15	0.23	0.27	0.33	0.52
Weight % by major taxa							
Cnidaria		0.02	0.02	0.02	0.02	0.02	0.01
Annelida	1.28	4.34	3.59	3.24	2.87	2.68	1.91
Gastropoda	0.68	0.04	0.01	0.00	0.00	0.00	0.00
Bivalvia	0.00	0.09	0.08	0.07	0.06	0.05	0.03
Cephalopoda	0.02	0.22	0.05	0.03	0.04	0.04	0.04
Crustacea	29.44	17.21	9.15	7.09	5.97	5.28	3.55
Echiura		0.34	0.31	0.28	0.25	0.23	0.17
Echinodermata	0.02	0.03	0.05	0.04	0.04	0.03	0.02
Chaetognatha	1.70	0.31	0.10	0.06	0.05	0.04	0.02
Urochordata	0.21	0.02	0.03	0.02	0.01	0.01	0.00
Gnathostomata	66.63	77.38	86.62	89.15	90.68	91.61	94.23
Unknown	0.02						
Weight % commercial species of fish and crustacea							
<i>Gadus morhua</i>		0.15	0.58	0.64	0.59	0.58	0.45
<i>Melanogrammus aeglefinus</i>	0.54	2.30	4.01	4.09	4.09	4.24	3.89
<i>Merlangius merlangus</i>	1.80	3.10	3.67	3.89	4.31	4.43	7.56
<i>Trisopterus esmarki</i>	21.08	18.27	24.83	26.41	27.16	27.74	28.07
<i>Clupea harengus</i>	0.00	1.38	7.18	11.20	14.17	15.43	21.24
<i>Sprattus sprattus</i>	0.00	4.45	8.52	8.50	7.97	7.97	6.20
Ammodytidae	13.59	31.23	24.11	22.08	20.80	19.98	16.77
<i>Limanda limanda</i>		0.05	0.01	0.00	0.00		
<i>Nephrops norvegicus</i>		0.55	0.31	0.20	0.15	0.11	0.05
<i>Crangon crangon</i>	0.47	0.32	0.05	0.03	0.02	0.02	0.01
<i>Pandalus</i> sp.		0.02	0.03	0.04	0.05	0.05	0.05
Unidentified Pleuronectidae	0.55	0.87	0.22	0.11	0.09	0.05	0.03
Unidentified Soleidae	0.00	0.14	0.11	0.08	0.05	0.04	0.02
Unidentified Gadidae	7.08	2.77	3.89	3.55	3.22	3.16	3.19
Unidentified Clupeidae	0.03	1.41	2.02	2.17	2.33	2.43	2.62
Non-commercial Pleuronectidae	0.13	0.02	0.17	0.38	0.47	0.49	0.48
Non-commercial Gadidae		0.00	0.08	0.19	0.24	0.26	0.26

Continued

Table 8-C-3 Continued

Quarter 3	Age class						
	0	1	2	3	4	5	6+
Weight % crustacean taxa							
Calanoida	2.53	0.24	0.03	0.02	0.01	0.01	0.00
Harpacticoida	0.15						
Mysida	0.29	0.03	0.01	0.01	0.01	0.01	0.00
Cumacea	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Flabellifera	0.04	0.07	0.18	0.15	0.12	0.11	0.06
Gammaridea	0.12	0.01	0.00	0.00	0.00	0.00	0.00
Hyperiidea	10.54	2.85	1.30	0.93	0.75	0.62	0.36
Caprellidea	0.00	0.02	0.00	0.00	0.00	0.00	0.00
Euphausiacea	5.72	2.75	1.05	0.83	0.79	0.70	0.55
Caridea	1.65	1.59	0.77	0.72	0.70	0.66	0.54
Astacidea		0.55	0.31	0.20	0.15	0.11	0.05
Anomura	0.15	4.90	3.50	2.69	2.15	1.91	1.22
Cancridea	0.01	1.02	0.61	0.49	0.42	0.37	0.24
Brachyrrhyncha	2.41	2.31	1.08	0.86	0.74	0.67	0.46

TABLE 8-C-4: Summary of the stomach contents of **whiting** (percentage by weight) by predator age class, area and quarter, Total North Sea

Quarter 4	Age class						
	0	1	2	3	4	5	6+
General results							
Mean length, cm	14.40	24.08	26.42	28.82	29.15	30.27	29.72
Number of stomachs sampled	2970	3104	1481	1023	365	318	146
% empty stomachs	8.75	5.90	5.94	5.67	5.48	5.03	4.79
Total weight all prey	0.56	2.17	2.92	3.72	3.69	3.92	3.91
Total number of prey items	18.04	8.74	7.33	5.74	5.85	5.28	5.34
Average weight per prey	0.03	0.25	0.40	0.65	0.63	0.74	0.73
Weight % by major taxa							
Cnidaria		0.00	0.00	0.00	0.00	0.01	0.00
Annelida	1.93	2.93	2.85	2.91	3.00	3.39	3.11
Gastropoda	0.06	0.00	0.00	0.01	0.01	0.01	0.01
Bivalvia	0.01	0.03	0.03	0.05	0.05	0.07	0.06
Cephalopoda	4.14	0.26	0.25	0.25	0.25	0.22	0.26
Crustacea	27.74	14.29	11.47	9.44	9.54	8.99	8.90
Echiura		0.01	0.02	0.03	0.03	0.03	0.03
Echinodermata	0.10	0.01	0.01	0.01	0.01	0.02	0.01
Chaetognatha	0.05	0.00	0.01	0.01	0.01	0.01	0.01
Urochordata	0.20	0.02	0.02	0.03	0.03	0.03	0.03
Agnatha		0.01	0.07	0.17	0.15	0.19	0.21
Gnathostomata	65.72	82.34	85.21	87.09	86.91	87.03	87.35
Unknown	0.04	0.00	0.01	0.01	0.01	0.00	0.00
Weight % commercial species of fish and crustacea							
<i>Gadus morhua</i>	0.07	0.41	0.19	0.05	0.06	0.04	0.04
<i>Melanogrammus aeglefinus</i>	3.55	1.30	1.97	2.71	2.84	3.58	3.46
<i>Merlangius merlangus</i>	0.48	1.33	2.41	3.42	3.28	3.52	3.68
<i>Trisopterus esmarki</i>	35.68	44.27	42.12	41.21	41.37	42.07	41.53
<i>Clupea harengus</i>	0.05	0.75	1.33	1.91	1.82	2.00	2.06
<i>Sprattus sprattus</i>	3.45	5.43	6.90	7.23	7.19	6.57	6.74
Ammodytidae	5.83	9.89	11.18	11.31	11.23	10.46	10.58
<i>Solea solea</i>	0.03	0.02	0.09	0.16	0.15	0.17	0.19
<i>Limanda limanda</i>	0.03	0.00	0.01	0.02	0.02	0.02	0.02
<i>Nephrops norvegicus</i>		0.00	0.05	0.13	0.13	0.20	0.16
<i>Crangon crangon</i>	2.37	2.72	2.05	1.57	1.59	1.46	1.46
<i>Pandalus</i> sp.	0.31	0.11	0.17	0.18	0.19	0.19	0.19
Unidentified Pleuronectidae	0.23	0.35	0.29	0.34	0.32	0.38	0.40
Unidentified Soleidae	0.11	0.01	0.02	0.03	0.03	0.04	0.04
Unidentified Gadidae	0.78	1.46	1.69	1.88	1.86	1.90	1.96
Unidentified Clupeidae	1.33	3.32	4.72	5.71	5.61	5.62	6.02
Non-commercial Pleuronectidae	0.11	0.16	0.16	0.21	0.21	0.26	0.28
Non-commercial Gadidae		0.06	0.13	0.18	0.17	0.18	0.20

Continued

Table 8-C-4 Continued

Quarter 4	Age class						
	0	1	2	3	4	5	6+
Weight % crustacean taxa							
Calanoida	0.05	0.00	0.00	0.00	0.00	0.00	0.00
Mysida	0.39	0.04	0.02	0.01	0.01	0.01	0.01
Cumacea	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Flabellifera	0.08	0.03	0.04	0.05	0.05	0.06	0.06
Valvifera		0.00	0.00	0.00	0.00	0.00	0.00
Gammaridea	0.51	0.03	0.02	0.02	0.02	0.01	0.01
Hyperidea	2.50	0.60	0.35	0.18	0.19	0.15	0.15
Caprellidea	0.00						
Euphausiacea	6.01	0.62	0.46	0.40	0.39	0.39	0.40
Caridea	9.36	5.48	4.12	3.17	3.21	2.94	2.97
Astacidea		0.00	0.05	0.13	0.13	0.20	0.16
Anomura	4.95	4.43	3.87	3.33	3.35	3.06	3.08
Cancridea	0.11	0.27	0.22	0.17	0.17	0.15	0.16
Brachyrrhyncha	1.93	2.27	1.91	1.65	1.68	1.68	1.56

TABLE 8-D-1: Summary of the stomach contents of **mackerel** (percentage by weight) by predator age class, area and quarter, Total North Sea

Quarter 1	Age class						
	0	1	2	3	4	5	6+
General results							
Mean length, cm		20.57	28.86	32.00	33.99	36.20	39.40
Number of stomachs sampled		205	67	6	8	2	4
% empty stomachs		30.24	91.04	100.00	87.50	50.00	75.00
Total weight all prey		0.44	0.32	0.35	0.38	0.41	0.43
Total number of prey items		31.25	6.29	0.51	0.65	1.65	1.79
Average weight per prey		0.01	0.05	0.69	0.57	0.25	0.24
Weight % by major taxa							
Cnidaria			0.00	0.00	0.00	0.00	
Gastropoda			0.30	2.13	1.89	0.08	
Cephalopoda					8.77	76.74	79.88
Crustacea		94.19	86.09				
Gnathostomata		3.45	13.61	97.87	89.33	23.18	20.12
Unknown		2.36					
Weight % commercial species of fish and crustacea							
Ammodytidae			13.61	97.87	87.12	3.85	
Unidentified Gadidae		1.21					
Non-commercial Gadidae		1.19					
Weight % crustacean taxa							
Calanoida		12.93					
Mysida		0.08					
Gammaridea		0.00					
Hyperiidea		5.42					
Euphausiacea		75.52	75.91				
Caridea		0.21	10.18				

TABLE 8-D-2: Summary of the stomach contents of **mackerel** (percentage by weight) by predator age class, area and quarter, Total North Sea

Quarter 2	Age class						
	0	1	2	3	4	5	6+
General results							
Mean length, cm		23.38	29.28	32.27	34.08	34.83	37.56
Number of stomachs sampled		236	985	325	222	147	415
% empty stomachs		7.20	3.86	3.69	3.60	3.40	4.58
Total weight all prey		1.05	2.42	3.17	3.51	4.11	5.26
Total number of prey items		50.09	319.60	563.19	662.77	820.59	905.35
Average weight per prey		0.02	0.01	0.01	0.01	0.01	0.01
Weight % by major taxa							
Phaeophyta		0.00	0.00	0.00	0.00	0.00	0.00
Cnidaria		1.03	0.57	0.27	0.22	0.21	0.15
Ctenophora		0.64	2.10	1.82	1.68	1.43	0.90
Rhynchocoela		0.06					
Annelida		0.08	1.22	2.07	2.06	1.68	1.00
Gastropoda		1.64	0.29	0.60	0.65	0.64	0.49
Cephalopoda		0.03	0.11	0.90	1.52	2.84	3.44
Crustacea		27.68	36.59	32.32	30.48	27.35	24.32
Chaetognatha		0.51	0.61	0.47	0.50	0.63	1.11
Urochordata		2.50	1.88	2.87	2.96	2.81	2.73
Gnathostomata		40.07	34.59	41.38	43.98	48.09	53.60
Unknown		25.74	22.04	17.30	15.96	14.31	12.26
Weight % commercial species of fish and crustacea							
<i>Gadus morhua</i>		0.27	0.60	0.21	0.13	0.08	0.42
<i>Melanogrammus aeglefinus</i>		0.02	0.03	0.00	0.00		
<i>Trisopterus esmarki</i>		0.29	0.76	0.48	0.44	0.44	0.44
<i>Clupea harengus</i>		0.00	0.34	0.88	1.07	1.37	1.26
<i>Sprattus sprattus</i>		2.77	0.23	1.89	3.10	5.64	6.81
Ammodytidae		25.70	20.01	26.34	28.10	30.19	35.22
<i>Scomber scomber</i>		0.00	0.00	0.01	0.01	0.00	0.00
Unidentified Gadidae		0.07	0.40	0.05	0.10	0.05	0.01
Non-commercial Pleuronectidae		0.00	0.00	0.00	0.00		
Non-commercial Gadidae		0.00	0.03	0.08	0.28	0.49	0.52
Non-commercial Clupeidae		0.27	0.53	0.16	0.06	0.30	0.34
Weight % crustacean taxa							
Calanoida		8.10	14.53	15.07	14.83	13.96	14.24
Mysida		0.01	0.00	0.00	0.00	0.00	0.00
Cumacea		0.00	0.01	0.01	0.01	0.01	0.00
Flabellifera		0.00					
Gammaridea		0.01	0.02	0.03	0.03	0.02	0.02
Hyperidea		9.63	7.11	6.82	6.60	6.14	4.92
Caprellidea		0.01	0.02	0.00	0.00		
Euphausiacea		2.45	6.03	6.88	6.57	5.43	3.89
Caridea		0.00	0.00	0.01	0.01	0.02	0.03
Astacidea		0.00	0.00	0.00	0.00	0.00	0.00
Anomura		0.00	0.01	0.01	0.00	0.00	0.00

TABLE 8-D-3: Summary of the stomach contents of **mackerel** (percentage by weight) by predator age class, area and quarter, Total North Sea

Quarter 3	Age class						
	0	1	2	3	4	5	6+
General results							
Mean length, cm		27.34	30.35	32.62	34.46	35.79	37.79
Number of stomachs sampled		521	960	327	204	194	589
% empty stomachs		9.79	8.23	7.95	8.33	8.25	9.00
Total weight all prey		2.56	2.80	3.11	3.46	3.92	4.89
Total number of prey items		178.48	316.62	436.34	454.73	470.65	613.22
Average weight per prey		0.01	0.01	0.01	0.01	0.01	0.01
Weight % by major taxa							
Phaeophyta		0.01	0.00	0.00	0.00	0.00	0.00
Porifera		0.00	0.00	0.00	0.00	0.00	0.00
Cnidaria		0.01	0.13	0.34	0.59	0.87	1.04
Ctenophora		1.49	1.10	0.92	1.07	1.26	1.23
Annelida		0.05	0.05	0.04	0.03	0.01	0.00
Gastropoda		0.20	1.25	1.85	1.68	1.48	0.92
Bivalvia		0.00	0.00	0.00	0.00	0.00	0.15
Cephalopoda		0.17	0.31	0.37	0.32	0.25	0.21
Crustacea		52.68	53.59	51.16	45.13	38.34	36.57
Echinodermata		0.00	0.00	0.01	0.01	0.02	0.01
Chaetognatha		1.49	0.91	0.50	0.46	0.42	0.44
Urochordata		1.28	1.47	1.58	1.55	1.53	1.04
Gnathostomata		34.05	32.16	34.20	40.67	47.94	50.58
Unknown		7.82	8.69	8.98	8.47	7.87	7.81
Weight % commercial species of fish and crustacea							
<i>Gadus morhua</i>		0.00	0.06	0.09	0.07	0.04	0.07
<i>Merlangius merlangus</i>		0.00	0.01	0.02	0.04	0.06	0.05
<i>Trisopterus esmarki</i>		3.41	4.73	7.50	11.13	15.15	16.04
<i>Clupea harengus</i>		0.01	0.20	0.34	0.39	0.43	0.46
<i>Sprattus sprattus</i>		0.00	0.02	0.08	0.17	0.27	0.23
Ammodytidae		26.11	21.40	19.83	22.91	26.48	27.95
<i>Pleuronectes platessa</i>		0.00	0.06	0.08	0.06	0.03	0.01
<i>Scomber scomber</i>		0.00	0.00	0.00	0.00	0.00	0.00
<i>Crangon crangon</i>		0.01	0.01	0.00	0.00	0.00	0.00
Unidentified Pleuronectidae			0.00	0.00	0.00	0.00	0.00
Unidentified Gadidae		0.36	0.18	0.06	0.05	0.05	0.04
Unidentified Clupeidae		0.02	0.01	0.01	0.01	0.00	0.00
Non-commercial Pleuronectidae		0.00	0.02	0.03	0.02	0.01	0.00
Non-commercial Gadidae		0.03	0.84	1.14	0.85	0.50	0.19
Non-commercial Clupeidae		0.00	0.05	0.07	0.06	0.03	0.33

Continued

Table 8-D-3 Continued

Quarter 3	Age class						
	0	1	2	3	4	5	6+
Weight % crustacean taxa							
Calanoida		10.46	11.22	11.46	10.97	10.46	8.21
Harpacticoida		0.00	0.00	0.00	0.00	0.00	0.00
Mysida		0.04	0.02	0.01	0.01	0.01	0.01
Cumacea		0.01	0.00	0.00	0.01	0.01	0.01
Gammaridea		0.00	0.00	0.00	0.00	0.01	0.02
Hyperiidea		9.95	11.30	11.01	8.81	6.35	4.29
Caprellidea		0.00	0.00	0.00	0.00	0.00	0.00
Euphausiacea		25.87	25.35	23.66	20.91	17.72	21.42
Caridea		0.02	0.02	0.02	0.03	0.04	0.04
Anomura		0.02	0.01	0.01	0.01	0.01	0.01
Brachyrrhyncha		0.00	0.02	0.03	0.02	0.01	0.00

TABLE 8-D-4: Summary of the stomach contents of **mackerel** (percentage by weight) by predator age class, area and quarter, Total North Sea

Quarter 4	Age class						
	0	1	2	3	4	5	6+
General results							
Mean length, cm	18.03	30.49	33.25	34.52	35.17	37.42	38.69
Number of stomachs sampled	30	239	246	84	40	8	56
% empty stomachs	3.33	20.50	16.26	19.05	20.00	25.00	30.36
Total weight all prey	1.14	1.34	1.65	1.77	1.87	2.12	3.06
Total number of prey items	13.64	1253.31	1405.14	1435.00	1460.25	1421.70	980.64
Average weight per prey	0.08	0.00	0.00	0.00	0.00	0.00	0.00
Weight % by major taxa							
Cnidaria		0.91	1.50	1.58	1.65	1.51	0.64
Annelida		0.03	0.04	0.03	0.02	0.01	0.00
Gastropoda		0.15	0.25	0.27	0.29	0.32	0.40
Cephalopoda	6.47	0.63	0.55	0.49	0.43	0.34	0.14
Crustacea	24.38	51.95	47.65	47.93	48.16	46.40	37.89
Ectoprocta			0.00	0.00	0.00	0.00	0.00
Echinodermata		0.06	0.09	0.06	0.04	0.02	0.01
Chaetognatha	0.21	0.39	0.40	0.34	0.29	0.22	0.09
Urochordata		2.05	3.32	3.40	3.47	3.30	2.32
Gnathostomata	68.65	35.69	37.90	38.46	38.88	42.39	55.72
Unknown	0.29	8.08	8.25	7.38	6.72	5.45	2.77
Weight % commercial species of fish and crustacea							
<i>Trisopterus esmarki</i>		10.40	8.06	10.31	12.02	12.08	5.14
<i>Clupea harengus</i>		6.16	8.38	5.74	3.72	2.77	7.11
<i>Sprattus sprattus</i>	27.82	9.55	13.91	11.52	9.68	10.31	20.70
<i>Ammodytidae</i>	13.79	0.53	1.11	3.12	4.66	7.28	12.15
<i>Crangon crangon</i>		0.00	0.00	0.00	0.00	0.00	0.00
Unidentified Clupeidae		2.32	0.01				
Non-commercial Gadidae			0.00	0.01	0.02	0.02	0.01
Non-commercial Clupeidae	24.57	0.00					
Weight % crustacean taxa							
Calanoida	0.12	33.62	32.95	35.92	38.19	39.19	34.01
Harpacticoida		0.00	0.00	0.00	0.00	0.00	0.00
Mysida		0.05	0.03	0.02	0.01	0.00	0.00
Cumacea		0.14	0.20	0.15	0.11	0.06	0.03
Gammaridea	0.00						
Hyperiidea	5.31	9.68	3.18	2.20	1.47	0.67	0.30
Caprellidea			0.01	0.02	0.03	0.04	0.02
Euphausiacea	14.88	0.66	0.70	0.48	0.31	0.12	0.05
Caridea		0.01	0.01	0.01	0.01	0.00	0.00
Anomura		1.20	1.63	1.10	0.70	0.27	0.11

TABLE 8-E-1: Summary of the stomach contents of **saithe** (percentage by weight) by predator age class, area and quarter, Total North Sea

Quarter 1	Age class						
	3	4	5	6	7	8	9+
General results							
Mean length, cm	39.20	45.12	55.26	61.59	67.24	73.90	96.27
Number of stomachs sampled	371	304	46	32	18	16	10
% empty stomachs	26.15	26.32	26.09	25.00	33.33	37.50	50.00
Total weight all prey	3.26	5.19	12.91	17.26	21.35	24.08	165.92
Total number of prey items	11.84	7.33	4.12	4.45	4.21	3.24	4.31
Average weight per prey	0.28	0.71	3.13	3.88	5.07	7.44	38.48
Weight % by major taxa							
Cnidaria	0.24	0.30	0.03	0.00			
Annelida	0.08	0.10	0.01	0.00			
Gastropoda	0.09	0.12	0.01	0.00			
Bivalvia	0.00	0.01	0.00	0.00			
Cephalopoda	14.42	1.82	0.29	0.12	0.04	0.00	
Crustacea	12.36	9.20	4.16	4.55	3.91	2.68	0.08
Urochordata	0.10	0.13	0.01	0.00			
Gnathostomata	72.74	87.77	95.44	95.32	93.06	97.32	99.92
Unknown	0.46	0.55	0.05	0.01			
Weight % commercial species of fish and crustacea							
<i>Trisopterus esmarki</i>	50.38	41.06	25.20	34.42	33.79	28.64	1.32
<i>Clupea harengus</i>	0.99	23.77	55.00	47.87	51.22	55.17	72.75
Ammodytidae	0.53	0.73	0.57	0.25	0.08	2.01	0.45
<i>Scomber scomber</i>	0.08	0.10	0.01	0.00		1.65	0.37
<i>Pandalus</i> sp.	0.11	0.01					
Unidentified Gadidae	4.77	6.05	3.46	1.45	0.45		
Unidentified Clupeidae		0.09	1.04	2.12	1.76	1.22	20.96
Non-commercial Gadidae	1.77	2.05	0.57	0.21	0.08	0.03	0.00
Weight % crustacean taxa							
Calanoida	0.63	0.05					
Mysida	0.02	0.02	0.00	0.00			
Flabellifera	0.15	0.19	0.02	0.00			
Gammaridea	0.00						
Hypertiidea	1.59	0.85	0.08	0.01	0.00	0.00	
Euphausiacea	7.80	5.87	2.09	2.06	1.49	0.69	
Caridea	0.66	0.41	1.12	1.95	1.87	1.38	0.04

TABLE 8-E-2: Summary of the stomach contents of **saithe** (percentage by weight) by predator age class, area and quarter, Total North Sea

Quarter 2	Age class						
	3	4	5	6	7	8	9+
General results							
Mean length, cm	41.77	46.65	54.63	67.10	76.23	82.43	95.32
Number of stomachs sampled	451	429	105	57	40	66	35
% empty stomachs	2.22	2.33	2.86	1.75	0.00	1.52	0.00
Total weight all prey	14.11	19.04	44.05	72.36	100.00	137.31	177.02
Total number of prey items	84.80	78.64	91.64	101.89	104.07	95.83	65.66
Average weight per prey	0.17	0.24	0.48	0.71	0.96	1.43	2.70
Weight % by major taxa							
Phaeophyta	0.00	0.00	0.01	0.00			
Cephalopoda					0.00	0.00	0.00
Crustacea	57.34	47.18	25.77	26.40	21.84	13.08	7.16
Echinodermata	0.01	0.01	0.01	0.00	0.00	0.00	0.00
Gnathostomata	42.65	52.80	74.20	73.59	78.16	86.92	92.84
Unknown	0.00	0.00	0.01	0.00			
Weight % commercial species of fish and crustacea							
<i>Melanogrammus aeglefinus</i>	0.01	0.06	0.13	0.03	3.65	8.64	9.06
<i>Merlangius merlangus</i>			0.01	0.05	2.81	6.55	15.59
<i>Trisopterus esmarki</i>	14.04	22.22	32.29	24.32	17.37	11.75	7.15
<i>Clupea harengus</i>	0.00	0.24	4.31	11.66	21.48	31.29	37.58
Ammodytidae	11.73	13.30	18.49	10.46	4.79	5.55	4.81
<i>Microstomus kitt</i>	0.00	0.00	0.00	0.00			
<i>Pandalus</i> sp.	0.01	0.01	0.01				
UnidentifiedPleuronectidae	0.03	0.01	0.00				
Unidentified Gadidae	2.46	3.21	3.28	1.67	0.70	0.43	2.37
Unidentified Clupeidae					0.19	0.44	0.71
Non-commercial Gadidae	0.48	0.66	3.22	11.09	14.93	15.28	10.74
Weight % crustacean taxa							
Flabellifera		0.00	0.00	0.00	0.00	0.00	0.00
Gammaridea	0.00	0.00	0.00	0.00	0.00		
Hyperiidea	5.63	2.90	0.98	0.26	0.13	0.18	0.13
Euphausiacea	49.13	42.66	24.32	25.94	21.59	12.83	6.97
Caridea	0.01	0.01	0.01	0.01	0.00		

TABLE 8-E-3: Summary of the stomach contents of **saithe** (percentage by weight) by predator age class, area and quarter, Total North Sea

Quarter 3	Age class						
	3	4	5	6	7	8	9+
General results							
Mean length, cm	42.31	51.60	60.64	67.19	77.33	81.26	93.48
Number of stomachs sampled	242	72	28	10	13	14	12
% empty stomachs	16.12	13.89	17.86	20.00	15.38	14.29	8.33
Total weight all prey	9.31	15.25	16.88	17.05	138.32	196.12	300.34
Total number of prey items	8.22	7.80	7.85	8.64	11.12	13.03	19.52
Average weight per prey	1.13	1.96	2.15	1.97	12.43	15.05	15.39
Weight % by major taxa							
Crustacea	9.35	4.78	4.94	5.34	2.69	2.66	2.87
Echinodermata	0.05	0.02	0.02	0.03	0.01	0.01	0.01
Gnathostomata	90.58	95.19	95.05	94.63	97.30	97.33	97.12
Unknown	0.02	0.01					
Weight % commercial species of fish and crustacea							
<i>Melanogrammus aeglefinus</i>	23.34	10.73	5.14	3.36	1.21	1.13	1.06
<i>Merlangius merlangus</i>	4.40	2.91	3.03	3.40	0.18	0.06	0.03
<i>Trisopterus esmarki</i>	39.15	59.69	64.61	59.89	13.18	10.61	6.76
<i>Clupea harengus</i>	0.08	2.14	8.19	20.59	75.31	78.00	81.40
<i>Sprattus sprattus</i>	0.05	0.01					
Ammodytidae	8.18	4.30	1.69		0.07	0.08	0.08
<i>Crangon crangon</i>			0.00	0.01	0.00	0.00	
Unidentified Gadidae	5.87	8.44	7.49	4.45	1.33	1.19	1.04
Unidentified Clupeidae					0.35	0.37	0.40
Non-commercial Pleuronectidae					1.04	1.10	1.20
Non-commercial Gadidae	0.52	2.39	2.33	1.04	0.38	0.37	0.40
Weight % crustacean taxa							
Gammaridea	0.19	1.79	1.43				
Hyperidea	0.07	0.03	0.01				
Euphausiacea	8.85	2.76	2.54	3.51	2.63	2.66	2.87
Caridea		0.14	0.95	1.84	0.06	0.00	

TABLE 8-E-4: Summary of the stomach contents of **saithe** (percentage by weight) by predator age class, area and quarter, Total North Sea

Quarter 4	Age class						
	3	4	5	6	7	8	9+
General results							
Mean length, cm	44.43	53.61	65.75	73.94	80.88	86.98	96.63
Number of stomachs sampled	628	165	27	8	5	3	13
% empty stomachs	10.99	9.70	7.41	12.50	20.00	33.33	7.69
Total weight all prey	13.57	19.45	40.02	56.22	88.33	133.44	154.43
Total number of prey items	3.28	3.83	4.13	3.43	3.85	5.64	6.61
Average weight per prey	4.14	5.08	9.68	16.40	22.95	23.64	23.38
Weight % by major taxa							
Annelida	0.01	0.02	0.00				
Gastropoda	0.01	0.00					
Cephalopoda	0.00	0.00	0.00	0.00			
Crustacea	0.55	0.66	0.45	0.42	0.25	0.09	0.07
Echinodermata	0.05	0.10	0.09	0.14	0.08	0.01	
Gnathostomata	99.28	98.94	99.39	99.44	99.67	99.90	99.93
Unknown	0.10	0.29	0.06				
Weight % commercial species of fish and crustacea							
<i>Melanogrammus aeglefinus</i>	8.01	5.69	3.09	4.85	3.53	1.30	1.53
<i>Merlangius merlangus</i>	1.30	1.16	0.46	0.95	0.72	0.20	0.42
<i>Trisopterus esmarki</i>	80.41	77.79	49.15	26.67	11.87	7.99	8.05
<i>Clupea harengus</i>	0.40	5.20	37.70	57.78	76.88	86.01	85.15
Ammodytidae	0.01	0.02	0.00				
<i>Limanda limanda</i>							1.94
<i>Scomber scomber</i>	0.05	1.67	3.69	1.51			
Unidentified Gadidae	6.23	3.10	0.95	0.48	0.15	0.01	
Unidentified Clupeidae	0.00	0.07	1.56	1.99	3.18	4.12	2.83
Non-commercial Pleuronectidae	0.03	0.01					
Non-commercial Gadidae	0.47	1.68	1.56	2.44	1.47	0.12	
Weight % crustacean taxa							
Flabellifera	0.00	0.00					
Hyperiidea	0.01	0.01	0.00				
Euphausiacea	0.39	0.53	0.34	0.38	0.25	0.09	0.05
Caridea	0.13	0.12	0.10	0.04			0.03

TABLE 8-F: Summary of the stomach contents of **grey gurnard** (percentage by weight) by predator size class and quarter, Total North Sea

	Size class												
	50	60	70	80	100	120	150	200	250	300	350	400	500
Quarter 1													
Number of stomachs sampled						19	605	587	358	248	85	14	
Total weight all prey						0.32	0.15	0.30	0.97	2.49	4.05	19.59	
Weight % by major taxa													
Annelida							5.91	3.18	0.63	0.01			
Gastropoda							0.71	0.21	0.08				
Bivalvia							4.40		0.15	0.02			
Scaphopoda									0.05				
Cephalopoda							0.23	4.40	10.66	3.21	0.56	7.57	
Crustacea						100.00	77.66	68.97	21.20	9.41	4.48	0.04	
Echiura								0.01					
Echinodermata							0.15		0.04				
Gnathostomata							10.86	23.15	67.19	87.35	94.96	92.39	
Unknown							0.09	0.09					
Weight % commercial species													
<i>Gadus morhua</i>									9.35				
<i>Melanogrammus aeglefinus</i>									2.43				
<i>Trisopterus esmarki</i>							0.14	9.96	7.75	56.91	29.32	21.43	
<i>Merlangius merlangus</i>									2.14	2.59	30.36	59.83	
Ammodytidae							4.44	5.05	25.46	11.38	11.98		
<i>Scomber scomber</i>											0.28		
<i>Limanda limanda</i>								0.18					

Continued

Table 8-F Continued

	Size class												
	50	60	70	80	100	120	150	200	250	300	350	400	500
Quarter 2													
Number of stomachs sampled					43	51	1682	1524	510	214	97	7	
Total weight all prey					0.21	0.18	43	0.85	1.82	4.20	7.45	20.81	
Weight % by major taxa													
Annelida						0.15	1.77	1.18	0.82	0.02	0.20		
Gastropoda							0.03	0.01		0.01			
Bivalvia					0.96		1.19	2.75	6.97	1.53			
Cephalopoda							62.95	45.13	19.85	10.60	27.42	27.32	
Crustacea					98.12	71.14			0.01	0.01	0.02		
Echinodermata									71.79	87.82	92.13	92.68	
Gnathostomata					0.91	28.71	34.06	50.92					
Weight % commercial species													
<i>Gadus morhua</i>								0.83	0.48	5.92	0.33		
<i>Melanogrammus aeglefinus</i>								0.24	0.24	0.52			
<i>Merlangius merlangus</i>							0.43	1.46	1.37	8.95	13.07	24.62	
<i>Trisopterus esmarki</i>							0.73	1.53	3.66	2.43	6.87	34.18	
<i>Clupea harengus</i>							0.01	0.01			3.96		
<i>Sprattus sprattus</i>									0.20	2.85			
Ammodytidae						9.34	11.36	21.30	36.60	25.37	24.91	1.37	
<i>Limanda limanda</i>							0.88	0.90	0.10	1.00			
<i>Pleuronectes platessa</i>									0.04				
Quarter 3													
Number of stomachs sampled					20	20	1222	1449	723	356	157	8	
Total weight all prey					0.08	0.24	0.45	0.94	2.02	3.56	5.72	4.22	
Weight % by major taxa													
Annelida							0.41	0.12	0.43	0.08			
Bivalvia						2.88	0.50	0.72	0.39	0.02	0.17		
Cephalopoda							0.80	0.02	0.11		0.23		
Crustacea					97.68	54.41	64.65	38.15	16.79	9.29	7.10	14.38	
Gnathostomata					2.32	42.71	33.64	60.98	82.29	90.61	92.50	85.62	

Continued

Table 8-F Continued

	Size class												
	50	60	70	80	100	120	150	200	250	300	350	400	500
Quarter 3 (cont)													
Weight % commercial species													
<i>Gadus morhua</i>							0.14	1.94	4.47	2.95	14.97		
<i>Melanogrammus aeglefinus</i>							0.56	0.12	0.63	1.12	3.81		
<i>Merlangius merlangus</i>							0.96	2.26	6.27	3.42	13.07		
<i>Trisopterus esmarki</i>								5.63	8.78	15.92	17.54		
<i>Sprattus sprattus</i>								2.41	4.57		0.32		
Ammodytidae						16.19	21.27	29.54	36.02	41.92	40.11	79.14	
<i>Scomber scomber</i>							0.63	0.15	0.09	1.92			
<i>Limanda limanda</i>										0.18			
Quarter 4													
Number of stomachs sampled				17	105	68	465	485	326	166	59	10	
Total weight all prey				0.16	0.25	0.42	0.20	0.59	0.80	1.87	2.30	1.78	
Weight % by major taxa													
Annelida					0.13	4.87	0.74	0.68	0.56	0.01			
Bivalvia					2.20		0.34	0.09	0.33				
Cephalopoda							2.85	3.52					
Crustacea			100.00		87.53	91.88	81.06	44.17	41.37	15.31	11.36	55.34	
Ectoprocta									0.03				
Gnathostomata					10.14	3.25	15.01	51.53	57.71	84.68	99.64	44.66	
Weight % commercial species													
<i>Gadus morhua</i>									7.90	5.02	3.75		
<i>Melanogrammus aeglefinus</i>								5.25		4.94			
<i>Merlangius merlangus</i>					0.03			3.85	3.29	24.68	13.19	43.28	
<i>Trisopterus esmarki</i>										7.47	2.25		
<i>Sprattus sprattus</i>						2.74	5.09	30.00	10.59	0.15			
Ammodytidae							0.23	0.46	0.09	18.06	32.74		
<i>Limanda limanda</i>													

TABLE 8-G: Summary of the stomach contents of starry ray (percentage by weight) (by predator size class and quarter, Total North Sea

	Size class												
	50	60	70	80	100	120	150	200	250	300	350	400	500
Quarter 1							39	60	115	98	99	207	19
Number of stomachs sampled							0.00	0.00	27.83	29.59	30.30	39.61	47.37
% empty stomachs							0.38	0.33	1.00	1.15	1.40	3.02	2.67
Total weight all prey							9.94	6.14	3.29	1.65	2.51	2.56	1.71
Total number of prey items							0.04	0.05	0.30	0.70	0.56	1.18	1.57
Average weight per prey													
Weight % by major taxa													
Annelida							9.62	30.00	8.01	3.37	4.01	3.17	0.29
Gastropoda												0.05	
Bivalvia								0.75		2.91			
Cephalopoda							65.58	55.62	25.14	35.33	34.01	12.30	0.28
Crustacea							2.79	12.01	66.59	57.94	57.94	83.89	4.86
Gnathostomata													94.84
Unknown							22.00	1.62	0.26	0.44	4.05	0.31	0.01
Weight % commercial species													
<i>Trisopterus esmarki</i>									3.25			4.44	
<i>Sprattus sprattus</i>							1.16	1.29		0.79	0.70		0.61
Ammodytidae											5.91		
<i>Crangon crangon</i>													
Quarter 2							25	66	60	82	107	270	41
Number of stomachs sampled							4.00	13.64	20.00	28.05	28.04	29.63	36.59
% empty stomachs							0.29	0.18	0.70	1.07	1.97	3.92	2.74
Total weight all prey							5.59	3.41	3.42	2.46	1.87	1.58	1.25
Total number of prey items							0.05	0.05	0.21	0.44	1.05	2.49	2.19
Average weight per prey													

Continued

Table 8-G Continued

	Size class												
	50	60	70	80	100	120	150	200	250	300	350	400	500
Quarter 2 (cont)													
Weight % by major taxa							32.36	26.61	14.17	9.02	2.45	1.67	0.91
Annelida										0.11			
Gastropoda													
Bivalvia									0.18				
Cephalopoda							40.66	44.83	51.77	0.86		0.84	
Crustacea							4.40			31.51	25.77	22.15	22.04
Echinodermata							12.77	17.95	31.95	57.74	70.84	74.09	75.26
Gnathostomata							9.82	10.61	1.93	0.75	0.94	1.25	1.78
Unknown													
Weight % commercial species													
<i>Melanogrammus aeglefinus</i>												13.42	
<i>Merlangius merlangus</i>										13.98	6.45	6.17	12.08
<i>Trisopterus esmarki</i>												3.30	
<i>Clupea harengus</i>													8.35
<i>Limanda limanda</i>													7.93
Quarter 3													
Number of stomachs sampled							78	207	219	268	300	346	53
% empty stomachs							0.00	4.35	10.96	11.57	12.33	19.65	39.62
Total weight all prey							0.17	0.36	0.89	1.49	2.45	2.34	2.99
Total number of prey items							3.64	2.69	2.10	1.84	2.17	1.72	0.88
Average weight per prey							0.05	0.13	0.43	0.81	1.13	1.36	3.39
Weight % by major taxa													
Phaeophyta												0.00	
Annelida					9.09		18.42	24.96	8.17	3.79	2.42	3.63	0.20
Bivalvia								0.69	0.11	0.17	0.08	0.04	0.10
Cephalopoda								0.03		0.18			
Crustacea					90.91	100.00	68.03	49.36	25.00	19.63	20.19	22.99	21.54
Priapulida									0.77				
Echinodermata								0.02		0.02	0.00		
Gnathostomata							11.33	24.84	65.95	75.70	77.09	72.68	78.05
Unknown							2.22	0.09		0.50	0.22	0.67	0.10

Continued

Table 8-G Continued

	Size class												
	50	60	70	80	100	120	150	200	250	300	350	400	500
Quarter 3 (cont)													
Weight % commercial species									0.53		1.11	0.33	31.04
<i>Gadus morhua</i>											0.91		4.32
<i>Merlangius merlangus</i>									3.06	5.81	10.76	16.42	4.07
<i>Trisopterus esmarki</i>									1.79	0.63	4.00		
<i>Clupea harengus</i>											0.29		
<i>Limanda limanda</i>													
Quarter 4													
Number of stomachs sampled						4	16	26	53	81	90	153	15
% empty stomachs						0.00	0.00	19.23	18.87	17.28	20.00	21.57	20.00
Total weight all prey						0.24	0.20	0.11	0.87	0.96	1.66	3.47	4.84
Total number of prey items						1.33	2.92	2.30	2.97	3.44	2.16	2.15	1.36
Average weight per prey						0.18	0.07	0.05	0.29	0.28	0.77	1.61	3.55
Weight % by major taxa													
Annelida							21.40	14.52	12.32	13.43	5.44	1.85	0.12
Gastropoda							1.88						
Bivalvia								0.68				0.00	
Cephalopoda									0.13	0.80	0.05		
Crustacea						100.00	74.57	76.59	63.79	37.04	28.80	16.29	36.75
Gnathostomata							2.15	8.21	23.19	46.12	71.39	81.43	62.12
Unknown									0.58	2.61	2.24	0.44	1.02
Weight % commercial species													
<i>Gadus morhua</i>								1.75				0.56	4.25
<i>Melanogrammus aeglefinus</i>												6.36	
<i>Merlangius merlangus</i>									1.16	1.87	20.23	29.55	44.88
<i>Trisopterus esmarki</i>													
<i>Clupea harengus</i>											2.08	0.12	
Ammodytidae													
<i>Solea solea</i>										16.62			
<i>Limanda limanda</i>													
<i>Crangon crangon</i>										0.12		0.56	

TABLE 9-A-1: Total prey size class distribution for cod in percentages by number and by predator size class, area and quarter, Total North Sea 1991

Quarter 1	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Fish prey																		
4-5 mm										0.73								
20-25 mm								0.19										
25-30 mm								5.33		0.03	0.22		0.01	0.45				
30-35 mm								2.51		0.70	0.04				0.15			
35-40 mm								4.15		0.26	0.25	0.24						
40-50 mm						3.05		0.59	1.38	0.41	1.40	0.52	1.83	0.67	0.53	0.07		
50-60 mm						0.76	1.98	3.77	1.34	0.12	1.05	1.06	0.63	0.49	0.68	0.66	0.77	
60-70 mm						1.53				0.23	1.87	0.65	1.12	0.18	1.45	0.59		
70-80 mm							0.37			1.05	4.54	0.93	0.38	1.27	1.45	0.85	1.62	
80-100 mm							0.32	1.74	5.73	1.54	4.83	4.31	4.93	4.17	5.30	6.90	5.65	7.32
100-120 mm								0.08	1.10	3.06	4.96	7.56	7.89	5.82	5.57	11.39	9.99	7.32
120-150 mm								0.30		1.47	5.04	11.09	10.86	11.90	11.57	14.86	25.82	12.20
150-200 mm							0.10			0.73	1.23	2.23	9.32	7.45	13.58	10.74	25.05	14.63
200-250 mm											0.25	0.36	3.91	8.49	5.92	10.34	5.83	12.20
250-300 mm													1.22	1.84	0.98	3.59	3.51	7.32
300-350 mm														1.55	0.37	2.24	1.31	
350-400 mm														0.11	0.74			
400-500 mm																0.14		
Unknown					15.38	0.61	6.16	7.80	10.06	5.65	10.58	11.40	10.15	12.12	11.29	12.38	5.66	9.76
Crustacean prey																		
Eggs							5.03											
3-4 mm							0.62											
4-5 mm						1.53	0.25											
5-6 mm							0.12											
6-7 mm							0.74											
8-10 mm					7.69	3.66	1.77	0.19		1.07	1.63	0.17	0.57		0.30	0.71		
10-12 mm								1.13										

Continued

Table 9-A-1 Continued

Quarter 1	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Crustacean prey	12-15 mm					3.66	5.51	5.13	1.10	0.60	0.82		0.82					
	15-20 mm					6.11	7.61	1.46		0.37	0.20	0.13	0.29		0.06			
	20-25 mm					3.05	2.68	0.08		1.67	1.90	1.64	0.01	1.05				
	25-30 mm					16.03	2.77	6.03	2.31	0.17	1.01	2.27	0.03	0.03	0.05			
	30-35 mm					5.04	3.51	8.23	5.67	2.04	6.59	3.82	1.17	1.34	0.60	1.02	0.51	
	35-40 mm					1.53	2.11	1.34	0.49	1.01	0.85	0.98	1.54	0.67	1.15	0.42		
	40-50 mm					0.31	3.78	2.97	4.03	2.04	1.96	1.36	2.88	2.99	2.34	1.34	0.26	
	50-60 mm					3.05	4.63	1.84	3.30	0.20	3.01	0.88	1.08	3.54	0.42	0.02		
	60-70 mm						2.01	1.26		0.29	0.42	0.07	1.09	3.16	3.50	0.06		
	70-80 mm							0.38		0.30	0.57	0.04	0.68	1.20	0.12			
	80-100 mm									0.29			0.32	0.30		0.28		
	100-120 mm												0.14	0.30	0.44			
	120-150 mm													0.14	0.44		0.51	
	150-200 mm													0.01				
Unknown					69.23	42.77	39.62	33.61	59.81	66.09	36.93	37.08	31.30	22.13	26.10	14.93	9.38	14.63
All prey	Eggs						5.03									0.01		
	3-4 mm						0.62											
	4-5 mm					1.53	0.25			0.73								
	5-6 mm						0.12											
	6-7 mm						0.74											
	8-10 mm							0.19										
	10-12 mm					7.69	3.66	1.77	1.13	1.07	1.63	0.17	0.57		0.30	0.71		
	12-15 mm						3.66	5.51	5.13	1.10	0.82		0.82					
	15-20 mm					7.69	6.11	7.61	1.46	0.37	0.20	0.13	0.29		0.06			
	20-25 mm						3.05	2.68	0.27	1.67	1.97	1.64	0.01	1.05				
	25-30 mm						16.03	2.77	6.03	2.31	1.23	2.27		0.48	0.05			

Continued

Table 9-A-1 Continued

Quarter 1	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
30-35 mm						5.04	3.51	13.56	5.67	2.74	6.62	3.82	1.19	1.34	0.75	1.02	0.51	
35-40 mm						1.53	2.11	3.85	0.49	1.28	1.10	1.22	1.54	0.67	1.15	0.42		
40-50 mm						3.36	3.78	7.12	5.41	2.45	3.36	1.88	4.71	3.66	2.87	1.41	0.26	
50-60 mm						3.82	6.60	2.43	4.64	0.31	4.07	1.94	1.71	4.02	1.09	0.68	0.77	
60-70 mm						1.53	2.01	5.03		0.52	2.28	0.73	2.21	3.34	4.95	0.65		
All prey																		
70-80 mm							0.37	0.38		1.35	5.11	0.97	1.06	2.47	1.57	0.85	1.62	
80-100 mm							0.32	1.74	5.73	1.83	4.83	4.81	5.25	4.17	5.30	7.19	5.65	7.32
100-120 mm								0.08	1.10	3.06	4.96	7.56	8.03	6.12	6.02	11.39	9.99	7.32
120-150 mm								0.30		1.47	5.04	11.09	10.86	11.90	12.46	14.86	26.33	12.20
150-200 mm							0.10			0.73	1.23	2.23	9.32	7.46	13.58	10.74	25.56	14.63
200-250 mm											0.25	0.36	3.91	8.49	5.92	10.34	5.83	12.20
250-300 mm													1.22	1.84	0.98	3.59	3.51	7.32
300-350 mm														1.55	0.37	2.24	1.31	
350-400 mm														0.11	0.74			
400-500 mm																0.14		
Unknown					84.62	50.70	54.11	51.30	73.55	79.61	55.31	59.18	47.31	41.34	41.84	33.77	18.67	39.02

TABLE 9-A-2: Prey size class distribution for **cod** in percentages by number and by predator size class, area and quarter, Total North Sea 1991

Quarter 2	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Fish prey																		
Eggs						17.39	0.07	0.01	0.18			0.13	0.15					
12-15 mm							0.05	0.02										
15-20 mm		1.06					0.06	0.10		0.20	0.06	0.03						
20-25 mm	2.07						0.73	0.07	0.25	0.80	0.02	0.02	0.03					
25-30 mm			2.31		100.00		0.53	0.01	0.02	0.04	0.05	0.05	0.12		0.08			
30-35 mm			0.93				0.03	0.02	0.16		0.00	0.11	0.03	0.07				
35-40 mm							0.04	0.15	0.24	0.16	0.41	0.57	4.58	0.15	0.95			
40-50 mm	0.69	0.53					0.04	0.28	0.92	1.32	1.35	3.95	8.36	3.19	0.70	0.54		
50-60 mm								0.04	0.43	0.76	0.86	1.25	0.63	2.06	0.53	6.99		
60-70 mm								0.06	0.37	0.30	0.46	0.76	0.72	0.68	0.13	4.66		
70-80 mm								0.04	0.62	0.40	0.47	1.69	1.54	2.13	1.31	1.17	0.96	
80-100 mm							0.05	0.04	0.15	0.46	0.29	1.07	2.17	2.94	3.30	2.22	4.02	
100-120 mm								0.04	0.20	0.79	0.51	2.39	9.61	11.53	13.85	8.82	18.66	
120-150 mm								0.01	0.07	0.21	0.22	1.02	5.69	10.19	17.33	11.63	16.51	
150-200 mm								0.00			0.12	0.13	1.30	5.92	10.77	5.80	7.92	
200-250 mm													0.24	0.99	0.83	2.10	4.85	
250-300 mm										0.01				0.04	0.42	0.13	0.96	
300-350 mm																0.17		
350-400 mm																		
400-500 mm																		
Unknown	2.07	4.40	1.85				1.51	0.62	1.45	1.30	2.08	3.26	6.94	6.43	10.78	7.02	11.30	
Crustacean prey																		
Eggs											0.00	0.00						
2-3 mm	31.11	39.58																
3-4 mm								24.80										
5-6 mm	25.20	39.58	92.59				10.47	13.66	22.78		49.60	13.90						
6-7 mm							7.41					0.17						

Continued

Table 9-A-2 Continued

Quarter 2	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Crustacean prey																		
7-8 mm	1.04	0.26					10.90	20.39	20.30	41.89	21.57	27.26	27.85					
8-10 mm							7.08	11.19	18.36	0.40	0.67	0.00	0.08					
10-12 mm		2.64				21.74	1.18	0.35	0.11	0.08	0.02		0.03	0.07				
12-15 mm						43.48	0.27	0.06	0.01	0.14	0.04		0.06					
15-20 mm							0.02	0.30	0.10	0.16	0.01	0.14	0.03	0.07				
20-25 mm							1.09	0.08	0.16		0.07	0.02	0.17	0.06				
25-30 mm							0.12	0.05	0.17	0.07	0.03	5.97	0.17	0.10	0.08			
30-35 mm							0.11	0.13	0.25	0.16	0.06	0.19	0.17	0.37				
35-40 mm							0.08	0.10	0.14	0.16	0.98	0.18	1.02	0.68	0.32	0.17		
40-50 mm							0.05	0.08	0.14	0.03	0.07	0.24	0.32	0.28		0.68		
50-60 mm								0.00	0.06			0.05	0.49	0.45		0.68		
60-70 mm								0.00			0.03	0.05	0.33	0.07				
70-80 mm															0.17			
80-100 mm													0.04					
120-150 mm	37.82	11.43	2.31			13.04	53.18	26.30	29.76	47.80	18.82	29.54	21.62	38.01	28.73	36.85	27.86	
Unknown																		
All prey																		
Eggs																		
2-3 mm	31.11	39.58									0.00	0.14	0.15					
3-4 mm								24.80										
5-6 mm	25.20	39.58	92.59				10.47	13.66	22.78		49.60	13.90						
6-7 mm							7.41					0.17						
7-8 mm		0.26																
8-10 mm	1.04						10.90	20.39	20.30	41.89	21.57	27.26	27.85					
10-12 mm							7.08	11.19	18.36	0.40	0.67	0.00	0.08					
12-15 mm		2.64				39.13	1.25	0.36	0.29	0.08	0.02		0.03	0.07				
15-20 mm		1.06				43.48	0.31	0.08	0.01	0.14	0.04		0.06					

Continued

Table 9-A-2 Continued

Quarter 2	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
20-25 mm	2.07						0.08	0.40	0.10	0.35	0.07	0.16	0.03	0.07				
25-30 mm							1.82	0.16	0.41	0.80	0.08	0.04	0.20	0.06				
30-35 mm			2.31		100.00		0.65	0.06	0.19	0.12	0.08	6.02	0.29	0.10	0.16			
35-40 mm			0.93				0.14	0.15	0.41	0.16	0.07	0.30	0.20	0.45				
40-50 mm	0.69	0.53					0.12	0.27	0.38	0.32	1.38	0.76	5.61	0.83	1.27	0.17		
All prey																		
50-60 mm							0.10	0.37	1.06	1.35	1.42	4.19	8.68	3.47	0.70	1.22		
60-70 mm								0.04	0.50	0.76	0.86	1.30	1.13	2.52	0.53	7.67		
70-80 mm								0.06	0.37	0.30	0.49	0.80	1.05	0.75	0.13	4.66		
80-100 mm							0.05	0.04	0.62	0.40	0.47	1.69	1.54	2.21	1.31	1.34	0.96	
100-120 mm								0.04	0.15	0.46	0.29	1.07	2.17	2.94	3.30	2.22	4.02	
120-150 mm							0.05	0.01	0.20	0.79	0.51	2.39	9.65	11.53	13.85	8.82	18.66	
150-200 mm								0.00	0.07	0.21	0.22	1.02	5.69	10.19	17.33	11.63	16.51	
200-250 mm											0.12	0.13	1.30	5.92	10.77	5.80	7.92	
250-300 mm													0.24	0.99	0.83	2.10	4.85	
300-350 mm										0.01				0.04	0.42	0.13	0.96	
350-400 mm																0.17		
400-500 mm															0.32	0.17		
Unknown	39.89	16.36	4.17			17.39	59.14	27.92	33.79	51.47	22.05	38.65	33.65	57.85	49.11	53.90	46.12	

TABLE 9-A-3: Prey size class distribution for **cod** in percentages by number and by predator size class, area and quarter, Total North Sea 1991

Quarter 3	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Fish prey																		
10-12 mm					0.05	0.27												
12-15 mm					0.24	0.81												
15-20 mm			0.04		0.07													
20-25 mm			0.91		0.05	1.63		0.24	0.08	0.19	0.14	0.09						
25-30 mm		0.22						0.82	0.28	0.70	0.31	1.03	0.48	0.28				
30-35 mm		0.06	0.33	0.28	0.37			1.04	0.42	0.42	0.14	1.48	0.37					
35-40 mm				0.05	0.15	0.98		1.55	1.99	0.57	1.23	2.00	0.04	0.45	0.40	0.75		
40-50 mm		0.06	0.08	0.22	0.10	1.55		0.93	1.35	1.74	0.94	4.01	1.01	1.05	0.24	0.37		
50-60 mm							20.00	2.24	5.34	1.78	0.42	0.42	1.22	0.34				
60-70 mm						0.10		3.04	10.19	7.69	5.18	3.67	4.79	1.91	2.63			
70-80 mm								4.36	3.67	7.60	11.90	14.13	12.47	8.40	9.90	2.25		
80-100 mm								5.06	2.97	2.49	7.78	14.57	12.86	15.16	12.33	6.36		
100-120 mm								0.12	1.07	1.19	2.40	4.72	3.83	5.78	9.29	3.65	5.59	
120-150 mm								0.43		0.44	2.36	4.70	5.79	6.26	10.04	7.86	12.59	25.00
150-200 mm									0.06	0.27	0.75	2.91	6.69	4.15	3.98	6.64	2.80	
200-250 mm									0.03	0.04		0.76	0.55	1.47	1.52	11.10	8.39	25.00
250-300 mm													0.63	0.98	2.32	8.98	25.00	
300-350 mm														0.23			1.40	25.00
350-400 mm																0.28	1.40	
400-500 mm																	2.10	
Unknown	2.76	0.06	0.17	1.75	0.34	2.08		7.88	15.56	20.97	14.99	9.26	10.57	23.11	2.81	2.46		
Crustacean prey																		
Eggs								0.12										
1-2 mm		10.34																
2-3 mm	16.57																	
3-4 mm		0.86		0.28	48.70													
4-5 mm		11.09																

Continued

Table 9-A-3 Continued

Quarter 3	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Crustacean prey																		
5-6 mm			1.91	0.52	2.34			0.09	5.27									
6-7 mm		0.32	0.83	5.57	1.23			0.09										
8-10 mm	2.76		0.58	1.27	2.47	1.09		1.25	0.10	1.12	1.47	0.25	0.26			8.61		
10-12 mm	15.19		3.05	6.55	0.99	1.49		2.62	0.66	0.30	0.51	0.02	0.79		0.20			
12-15 mm	11.05	5.51	0.42	0.14	1.71	1.81		3.70	0.92	1.21	1.41	0.04	1.23					
15-20 mm				0.04	3.25	1.49		5.16	1.77	1.68	2.68	1.05	0.67	0.28		0.75		
20-25 mm				1.31	0.28			6.23	5.49	0.40	0.21	1.23	0.44	0.74		0.37		
25-30 mm					0.19	0.54		1.59	1.59	1.47	0.93	0.14	0.03	0.14	0.40	0.75	1.40	
30-35 mm				0.03	0.08				0.47	0.64	1.34	0.28	0.24		5.05			
35-40 mm									0.36	0.36	0.29	0.50	0.11	0.99	2.63			
40-50 mm									0.12	0.20	0.32	0.65	0.10	0.35	0.40			
50-60 mm									0.03			0.04		0.85	0.81			
60-70 mm									0.03									
70-80 mm																		
80-100 mm								0.20	0.03	0.11	0.21		0.22			1.50		
100-120 mm																		
Unknown	51.66	69.07	85.68	79.13	35.47	85.00	80.00	36.16	33.99	39.36	37.11	28.47	26.78	22.34	32.17	29.91	43.36	
All prey																		
Eggs								0.12		0.73								
1-2 mm		10.34																
2-3 mm	16.57																	
3-4 mm		0.86		0.28	48.70													
4-5 mm		11.09																
5-6 mm			1.91	0.52	2.34			0.09	5.27									
6-7 mm		0.32	0.83	5.57	1.23			0.09										
8-10 mm	2.76		0.58	1.27	1.23	1.36		0.09		1.12	1.47	0.25	0.26			8.61		
10-12 mm	15.19		0.58	1.27	2.53	1.36		1.25	0.10	1.12	1.47	0.25	0.26					

Continued

Table 9-A-3 Continued

Quarter 3	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
12-15 mm	11.05	5.51	3.05	6.55	1.23	2.31		2.62	0.66	0.30	0.51	0.02	0.79		0.20			
15-20 mm			0.42	0.17	1.78	1.81		3.70	0.97	1.21	1.41	0.04	1.23					
20-25 mm			0.91	0.04	3.30	3.12		5.40	1.85	1.86	2.82	1.14	0.67	0.28		0.75		
25-30 mm		0.22		1.31	0.28			7.05	5.77	1.10	0.52	2.26	0.92	1.02		0.37		
30-35 mm		0.06	0.33	0.28	0.56	0.54		2.62	2.01	1.89	1.07	1.62	0.41	0.14	0.40	0.75	1.40	
All prey																		
35-40 mm				0.07	0.23	0.98		1.55	2.46	1.23	2.57	2.28	0.28	0.45	5.46	0.75		
40-50 mm		0.06	0.08	0.22	0.10	1.55		0.93	1.71	2.10	1.24	4.51	1.12	2.04	2.87	0.37		
50-60 mm							20.00	2.24	5.46	1.98	0.74	1.07	1.32	0.69	0.40			
60-70 mm						0.10		3.04	10.22	7.69	5.18	3.71	4.79	2.76	3.44			
70-80 mm								4.36	3.71	7.60	11.90	14.13	12.47	8.40	9.90	2.25		
80-100 mm								5.26	2.99	2.60	7.99	14.57	13.23	15.16	12.33	7.86		
100-120 mm								0.12	1.07	1.19	2.40	4.75	3.83	5.78	9.29	4.40		
120-150 mm								0.43		0.44	2.36	4.70	5.79	6.26	10.04	7.86	5.59	25.00
150-200 mm									0.06	0.27	0.75	2.91	6.69	4.15	3.98	6.64	12.59	25.00
200-250 mm									0.03	0.04		0.76	0.55	1.47	1.52	11.10	2.80	
250-300 mm													0.63	0.98	2.32	8.98	8.39	25.00
300-350 mm														0.23			1.40	25.00
350-400 mm																0.28	1.40	25.00
400-500 mm																	1.40	25.00
Unknown	54.42	71.52	91.89	83.72	37.72	88.23	80.00	59.13	54.07	66.65	57.08	41.28	45.01	50.19	37.85	39.02	66.43	

TABLE 9-A-4: Prey size class distribution for **cod** in percentages by number and by predator size class, area and quarter, Total North Sea 1991

Quarter 4	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Fish prey					0.13		0.21			0.06	0.23	0.44				0.10		
12-15 mm						0.47	1.32	0.51		0.56	0.23	1.63						
20-25 mm				0.32	0.22	0.21	0.76	0.26	0.29	0.48	1.14	0.63		0.36	0.33			
25-30 mm					0.18	0.17	1.27	4.20	1.80	2.05	0.56	0.88	0.34	0.24	0.17			
30-35 mm					0.68	0.79	2.62	9.44	3.02	5.09	4.85	1.89	1.88	2.17	1.10	0.58		
35-40 mm					0.10		0.47	0.58	1.70	2.10	1.70	0.82	2.77	1.99	0.91	1.84		
40-50 mm							0.21		1.58	1.02	1.96	1.42	1.34	1.24	0.83	2.42		3.33
50-60 mm								0.12	1.20	1.80	1.62	0.93	4.12	1.73	0.66	3.48	1.16	
60-70 mm									2.40	6.57	5.64	4.96	6.59	5.72	8.46	24.83	5.81	
70-80 mm									0.97	2.62	3.24	3.92	3.73	6.52	5.13	10.92	6.98	23.33
80-100 mm										0.93	1.84	2.30	3.18	6.37	7.36	2.71	15.12	23.33
100-120 mm										0.08	0.23	1.63	2.16	6.39	6.64	8.21	15.12	46.67
120-150 mm												0.42	0.62	0.74	2.59	3.29	37.21	3.33
150-200 mm													0.34	0.30	1.38	3.48	4.65	
200-250 mm																1.16		
250-300 mm																6.67	1.16	
350-400 mm																		
Unknown			3.53		1.57	1.28	3.56	4.22	6.98	5.23	6.23	4.93	4.13	2.85	5.51			
Crustacean prey																		
Eggs											0.03							
2-3 mm			35.29	2.91														
3-4 mm					0.08													
4-5 mm				3.10														
5-6 mm		25.00		13.50	0.40	4.93												
6-7 mm			2.35															
8-10 mm			35.29	4.07	18.74	0.98	3.53											
10-12 mm				8.76	0.87	4.86	2.75	0.26	1.46		0.02	0.17	0.07					

Continued

Table 9-A-4 Continued

Quarter 4	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Crustacean prey				1.78	6.81	1.93	3.37	0.58	0.36	0.64	0.04	2.15	0.67	0.48	0.33			
					1.41	4.73	3.84	0.20	1.09	0.16	1.30	0.67		0.18				
					0.51	4.50	4.05	0.87	2.06	2.26	1.34	0.39	0.42	0.36				
					0.26	2.57	5.68	8.71	3.88	2.56	3.24	0.76	1.15	1.42	1.05	1.84	1.16	
					1.21	7.65	3.56	10.22	4.37	5.23	2.83	5.17	1.15	1.13	2.21	0.77		
					1.13	0.52	3.27	2.86	0.55	2.34	5.06	13.52	5.83	2.50	0.83	0.48		
			0.97		1.35	0.22	2.13	7.02	5.62	2.31	5.00	6.31	7.97	9.41	7.64	3.96		
							0.57	1.03	1.70	1.10	4.87	4.34	2.99	2.33	2.65	0.97	1.16	
								0.07	0.24	0.42	2.07	2.11	2.35	1.01	0.85			
										0.04	0.12	0.37		0.20	0.17			
							0.83			0.21	0.88	0.43	0.07	0.03	1.32			
										0.33	0.08			0.20				
Unknown	66.67	23.53	60.28	57.13	58.07	51.16	39.98	53.75	47.80	37.84	32.86	38.45	25.61	33.96	16.62	9.30		
All prey					0.06						0.03							
			35.29	2.91														
					0.08													
				3.10														
	25.00		13.50		0.40	4.93												
			2.35															
				4.07	18.74	0.98	3.53											
			35.29	8.76	0.87	4.86	2.75	0.26	1.46		0.02	0.17	0.07					
				1.78	6.94	1.93	3.37	0.58	0.36	0.64	0.04	2.15	0.67	0.48	0.33			
					1.41	4.73	3.84	1.48	1.09	0.16	1.30	0.67		0.18				
					0.51	4.50	4.26	0.87	2.06	2.32	1.57	0.83	0.42	0.36				
					0.26	3.05	7.00	9.22	3.88	3.12	3.48	2.39	1.15	1.42	1.05	1.93	1.16	

Continued

Table 9-A-4 Continued

Quarter 4	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
30-35 mm				0.32	1.56	7.86	4.32	10.48	4.66	5.72	3.97	5.80	1.15	1.49	2.54	0.77		
35-40 mm					1.31	0.68	4.54	7.07	2.35	4.39	5.62	14.40	6.17	2.74	0.99	0.48		
40-50 mm				0.97	2.03	1.01	4.76	16.45	8.64	7.39	9.85	8.21	9.86	11.58	8.74	4.54		
50-60 mm					0.10		1.04	1.60	3.40	3.20	6.57	5.16	5.76	4.32	3.56	2.80	1.16	
60-70 mm							0.21	0.07	1.82	1.44	4.03	3.52	3.70	2.26	1.68	2.42		3.33
70-80 mm								0.12	1.20	1.84	1.73	1.30	4.12	1.73	0.83	3.48	1.16	
All prey																		
80-100 mm							0.83		2.40	6.78	6.52	5.39	6.79	5.79	9.79	24.83	5.81	
100-120 mm									0.97	2.94	3.31	3.92	3.76	6.52	5.13	11.50	6.98	23.33
120-150 mm										0.93	1.84	2.30	3.18	6.42	7.36	2.71	15.12	23.33
150-200 mm										0.08	0.23	1.63	2.16	6.39	6.64	8.21	15.12	46.67
200-250 mm												0.42	0.62	0.74	2.59	3.29	37.21	3.33
250-300 mm													0.34	0.30	1.38	3.48	4.65	
350-400 mm																1.16		
Unknown		75.00	27.06	64.58	65.06	65.46	59.57	51.79	65.70	59.05	49.90	41.74	50.08	46.93	47.41	28.41	11.63	

TABLE 9-B-1: Total prey size class distribution for **haddock** in percentages by number and by predator size class, area and quarter, Total North Sea 1991

Quarter 1	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Fish prey						0.01	0.08	0.02	0.02			0.03						
									0.02									
								0.04	0.02									
								0.07	0.06									
									0.06									
									0.15		0.15							
									0.05		0.12							
										0.29		0.09						
											0.12			0.16				
						0.02			0.03									
									0.17		0.35							
									0.09		0.67	0.09	0.17					
									0.04		0.48	0.10	0.10					
														0.10				
								0.21	0.95	0.55	2.00	1.41	0.17	1.08	4.35			
Unknown																		
Crustacean prey																		
Eggs						0.23				0.16								
1-2 mm					0.24	1.38	1.63	1.97	0.73	0.32	0.09	0.03						
2-3 mm					0.08	1.51	3.80	4.09	1.51	2.27	1.47	0.55						
3-4 mm						0.85	2.59	5.49	0.66	1.84	1.09	0.23						
4-5 mm					0.08	0.97	2.01	2.88	2.43	1.38	8.69	1.78	0.08					
5-6 mm						0.22	1.09	3.24	0.89	0.88	5.37	2.23	0.24					
6-7 mm					0.08	0.29	0.76	0.32	0.96	0.59	0.59	0.12	0.08					
7-8 mm					0.12	0.87	1.37	1.48	0.91	0.67	3.33	4.08	4.78					
8-10 mm						0.28	1.11	0.75	1.98	0.74	0.73	2.00	1.20					
10-12 mm						0.11	0.67	0.40	2.19	1.34	0.93	1.08	1.40					
12-15 mm						0.04	0.17	0.49	0.84	1.37	0.71	0.74	0.16					
15-20 mm																		
Crustacean prey																		
20-25 mm						0.04	0.24	0.71	0.33	0.98	0.89	0.80	1.76	65.22				
25-30 mm						0.03		0.26	0.05	0.30	0.04	0.07	1.60					

Continued

Table 9-B-1 Continued

Quarter 1	Size class												
	50	60	70	80	100	120	150	200	250	300	350	400	500
30-35 mm							0.09	0.53	0.28	0.08	0.06	0.37	
35-40 mm							0.09	0.37	0.04	0.23	0.33	0.13	0.08
40-50 mm							0.10		0.15	0.69	0.49	0.34	
50-60 mm									0.05			0.13	
Unknown					0.57	1.98	7.17	6.10	7.79	8.12	9.28	7.45	1.81
All prey													4.35
Eggs							0.13			0.26			
1-2 mm						0.87	0.63	3.92	0.31	0.57	0.08		
2-3 mm					97.61	2.72	4.61	4.89	3.98	2.71	1.15	0.56	
3-4 mm					0.08	74.12	39.85	7.29	6.32	7.08	5.40	0.69	1.40
4-5 mm						4.98	3.92	7.85	1.43	4.25	2.77	2.30	0.90
5-6 mm					0.08	2.43	3.17	7.40	5.52	4.69	12.17	8.86	2.36
6-7 mm						0.74	2.33	12.40	7.36	4.18	9.04	4.35	1.85
7-8 mm					0.08	0.56	2.55	1.87	2.49	2.53	2.92	10.26	8.88
8-10 mm					0.36	1.51	4.27	4.65	5.63	7.41	6.69	12.28	8.36
10-12 mm						0.61	2.32	2.18	3.43	1.21	2.16	3.80	1.48
12-15 mm						0.21	1.50	0.83	3.07	6.04	1.54	3.26	2.00
15-20 mm						0.21	1.28	5.92	4.49	7.15	5.24	5.83	3.12
20-25 mm						0.08	0.90	1.88	2.94	3.07	3.31	1.65	2.16
25-30 mm						0.13	0.17	0.43	1.31	0.94	1.35	1.29	3.60
30-35 mm						0.03	0.23	0.79	0.57	0.73	1.76	2.42	
35-40 mm						0.03	0.12	0.57	0.49	0.66	0.92	0.28	0.18
40-50 mm						0.03	0.33	0.13	0.93	1.32	1.74	1.12	0.92
50-60 mm								0.19	0.13	0.58	0.18	0.35	0.24
60-70 mm							0.09	0.09	0.25		0.28		2.08
70-80 mm						0.02	0.03	0.17	0.49	0.40		0.07	0.08
80-100 mm							0.03	0.23	0.05	0.80	0.15	0.86	
100-120 mm								0.15	0.36	0.48		0.23	0.10
120-150 mm								0.09				0.14	
150-200 mm												0.17	
200-250 mm													
Unknown					1.78	10.73	31.54	36.08	48.43	42.93	40.95	39.21	60.28
													21.74

TABLE 9-B-2: Total prey size class distribution for **haddock** in percentages by number and by predator size class, area and quarter, Total North Sea 1991

Quarter 2	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Fish prey																		
8-10 mm								0.00		0.00								
10-12 mm								0.00	0.00		0.00							
12-15 mm								0.00	0.01									
15-20 mm					6.06		0.02	0.02	0.00	0.00	0.01	0.00						
20-25 mm							0.08	0.03	0.02	0.00		0.02	0.05					
25-30 mm							0.00	0.01	0.00	0.00	0.01	0.02	0.22					
30-35 mm								0.01	0.00	0.01		0.02	0.20					
35-40 mm							0.01	0.01	0.01	0.04	0.02	0.06	0.11					
40-50 mm				0.18			0.01	0.22	0.06	0.13	0.31	0.31						
50-60 mm							0.06	0.12	0.32	0.13	0.34	0.25						
60-70 mm							0.01	0.03	0.02	0.08	0.07	0.38	0.01					
70-80 mm							0.02	0.03		0.03	0.01	0.14						
80-100 mm							0.00	0.00	0.02	0.00	0.01	0.02						
100-120 mm									0.00			0.00						
120-150 mm											0.00	0.01		0.23				
150-200 mm											0.00		0.05					
Unknown			18.18	0.54	3.03	0.65	0.39	0.39	0.68	0.36	0.94	0.82	0.43	1.35	4.76			
Crustacean prey																		
Eggs								1.92										
1-2 mm							4.79	0.05	0.00									
2-3 mm			36.36	18.08	57.58	26.76	8.88	1.05	1.52	53.31	1.04	0.02						
3-4 mm			27.27	15.91	15.15	5.83	32.12	28.95	28.14	4.48	15.87	16.36	0.01					
4-5 mm			9.09	1.08	12.12	8.32	12.52	9.79	0.80	4.46	1.04	5.72	0.15					
5-6 mm				27.58		1.43	5.00	1.75	5.27	3.34	0.19	17.74	29.29	0.11				

Continued

Table 9-B-2 Continued

Quarter 2	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Crustacean prey																		
6-7 mm				0.90		0.64	8.80	16.21	12.10	3.44	3.25	0.25	0.02	0.11				
7-8 mm				0.54		5.78	3.54	4.82	12.71	3.59	7.85	0.07	7.44					
8-10 mm						8.75	6.68	15.80	23.81	18.22	57.60	50.38	45.28	90.09	42.86			
10-12 mm				0.90		0.42	0.07	0.96	1.94	0.74	1.45	1.73	0.01					
12-15 mm						0.11	0.09	0.13	0.11	0.02	0.03	0.01	1.52	0.34				
15-20 mm							0.09	0.03	0.04	0.02	0.08	0.06	0.22	1.69				
20-25 mm							0.00	0.03	0.02	0.02	0.03	0.02	0.03	1.24				
25-30 mm							0.00	0.14	0.08	0.07	0.01	0.02	0.17					
30-35 mm								0.01	0.01	0.05	0.03	0.00						
35-40 mm							0.01		0.00	0.00	0.03	0.02		0.90				
40-50 mm							0.00	0.00	0.00	0.00	0.01							
50-60 mm								0.01	0.00		0.01							
80-100 mm												0.01						
Unknown			9.09	2.26		5.41	1.02	0.41	0.50	3.77	0.38	0.22	0.70	0.34				
All prey																		
Eggs							0.01	1.92										
1-2 mm							4.88	0.06	0.11	0.00	0.00							
2-3 mm			36.36	31.65	57.58	28.03	13.82	2.70	2.19	53.68	1.10	0.04						
3-4 mm			27.27	15.91	18.18	6.05	32.58	29.88	29.32	5.45	17.58	16.48	0.08					
4-5 mm			9.09	1.08	12.12	8.32	12.93	12.22	2.51	4.52	1.40	5.81	0.21					
5-6 mm				27.58		1.43	5.26	3.05	5.69	3.42	0.38	17.78	29.32	0.11				
6-7 mm				0.90		0.95	8.91	16.23	12.15	3.49	3.27	0.30	0.05	0.11				
7-8 mm				0.54		8.96	7.04	6.45	15.91	3.63	7.96	0.09	7.66	0.11				
8-10 mm				0.36		21.48	10.34	19.61	23.88	18.39	57.79	50.76	46.09	90.09	42.86			
10-12 mm				0.90		0.64	0.13	0.99	2.08	0.83	1.57	2.26	0.10		52.38			

Continued

Table 9-B-2 Continued

Quarter 2	Size class												
	50	60	70	80	100	120	150	200	250	300	350	400	500
All prey													
12-15 mm						0.48	0.27	0.23	0.45	0.06	0.41	0.30	1.53
15-20 mm					6.06	0.32	0.37	0.60	0.82	0.42	2.55	0.74	0.57
20-25 mm							0.11	0.08	0.11	0.12	0.31	0.17	0.23
25-30 mm							0.01	0.20	0.13	0.11	0.15	0.19	0.39
30-35 mm						0.32	0.02	0.02	0.02	0.07	0.17	0.07	0.24
35-40 mm							0.02	0.01	0.02	0.06	0.07	0.12	0.11
40-50 mm				0.18			0.02	0.23	0.09	0.14	0.34	0.32	0.90
50-60 mm							0.06	0.14	0.33	0.13	0.38	0.28	3.55
60-70 mm							0.01	0.03	0.02	0.09	0.07	0.39	0.03
70-80 mm						0.32	0.02	0.04	0.00	0.03	0.01	0.15	0.05
80-100 mm							0.02	0.01	0.03	0.01	0.01	0.04	0.02
100-120 mm								0.00	0.00	0.00		0.00	
120-150 mm								0.00		0.00	0.00	0.01	
150-200 mm							0.00		0.00		0.00		0.05
200-250 mm													0.23
Unknown			27.27	20.89	6.06	22.70	3.17	5.32	4.09	5.37	4.47	3.69	9.72
													4.84
													4.76

TABLE 9-B-3: Total prey size class distribution for **haddock** in percentages by number and by predator size class, area and quarter, Total North Sea 1991

Quarter 3	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Fish prey	Eggs			3.00	15.45	9.24		18.79	0.00									
	7-8 mm			0.18			0.05											
	8-10 mm				0.03	0.01	0.02		0.02									
	10-12 mm									0.01								
	12-15 mm				0.03		0.01											
	15-20 mm				0.01	0.01	0.01	0.01	0.01	0.01								
	20-25 mm				0.01	0.01	0.02	0.01			0.01	0.02						
	25-30 mm				0.01	0.01	0.04		0.01	0.01								
	30-35 mm						0.03	0.00	0.00			0.04						
	35-40 mm						0.01	0.01	0.00		0.02	0.02						
	40-50 mm						0.03	0.08	0.20	0.15	0.75	0.96	0.64					
	50-60 mm						0.02	0.09	0.37	0.47	1.79	1.09	1.36	0.65				
	60-70 mm						0.18	0.06	0.25	0.50	1.01	0.62	5.24	9.74				
	70-80 mm							0.03	0.08	0.20	0.84	1.09	7.54	2.60				
	80-100 mm							0.03	0.02	0.02	0.06	0.01	0.08	0.16	7.79			
100-120 mm										0.01	0.01	0.08	0.16	7.79				
120-150 mm										0.01	0.01	0.08	0.16	7.79				
150-200 mm										0.01	0.01	0.08	0.16	7.79				
Unknown			1.39	0.25	0.18	0.73	1.13	0.67	1.23	2.13	5.22	4.81	15.23	19.48				
Crustacean prey	Eggs			2.24	3.10	3.43	0.11	0.02										
	1-2 mm			8.01	5.84	1.33	0.30	0.11										
	2-3 mm	1.15		10.97	7.82	14.89	3.36	0.66	0.28	0.08	0.13	0.03						
	3-4 mm	0.76		5.55	8.33	4.01	3.41	4.10	14.55	5.67	1.72	0.83	0.35					
	4-5 mm				6.42	9.61	1.64	13.65	12.51	13.63	3.01	0.95	11.56					
	5-6 mm	4.96		5.13	3.18	6.00	26.56	6.41	22.27	21.91	24.29	8.77	0.70	1.05				
	6-7 mm			1.07	0.39	0.80	6.79	0.71	0.88	22.41	23.81	27.30	1.58	0.48				
	7-8 mm				0.21	0.44	0.59	8.63	0.34	4.50	2.84	3.23	0.23	0.21				
	8-10 mm	1.15			0.96	0.49	0.39	0.26	5.28	0.51	12.22	0.62	0.72	0.29				

Continued

Table 9-B-3 Continued

Quarter 3	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Crustacean prey				1.88	0.41	1.15	11.46	0.14	0.13	0.36	0.57	1.10	0.48	5.84				
10-12 mm				0.31	0.80	0.18	0.29	0.06	0.15	0.23	1.03	1.16	0.19					
12-15 mm				0.19	0.31	0.57	0.56	0.13	0.25	0.40	0.40	1.80	0.78	2.60				
15-20 mm				0.06	0.17	0.14	0.08	0.07	0.25	0.29	0.23	0.61	0.23	2.60				
20-25 mm					0.01	0.03	0.26	0.01	0.07	0.01	0.05	0.48	0.48	1.95				
25-30 mm					0.01	0.01		0.01	0.03	0.02	0.01	0.03	0.64					
30-35 mm							0.02	0.01	0.02	0.07								
35-40 mm							0.01	0.00	0.02	0.01	0.01	0.05						
40-50 mm							0.02	0.00	0.01				0.03					
50-60 mm																		
70-80 mm										0.01								
80-100 mm								0.00	0.01	0.01								
Unknown	100.00	8.40	10.12	6.43	5.00	4.02	7.56	1.90	2.44	2.59	5.35	7.19	4.41	10.39				
All prey																		
Eggs			2.24	6.79	18.96	9.69	0.14	18.81	0.06	0.03	0.05							
1-2 mm			9.61	10.55	1.57	11.14	1.02	0.28	0.42	0.16		0.03	0.21					
2-3 mm		4.58	10.97	13.07	22.09	6.88	7.73	5.88	5.08	2.72	4.98	2.43						
3-4 mm		0.76	6.94	15.66	12.31	7.29	12.13	15.42	7.40	2.71	3.27	3.06	0.82	1.30				
4-5 mm				24.36	19.67	2.29	17.76	12.88	15.41	4.09	4.90	13.04	0.23	0.65				
5-6 mm		4.96	5.13	9.92	6.37	34.83	6.70	22.86	23.92	24.95	10.90	1.34	2.05	1.95				
6-7 mm			1.07	0.58	0.86	7.12	1.59	1.19	23.04	24.29	29.54	5.35	1.40	0.65				
7-8 mm			0.53	0.37	0.70	0.77	8.70	0.40	4.58	3.43	3.48	0.95	0.21					
8-10 mm		1.15	0.32	3.86	0.59	0.76	1.41	6.05	0.65	12.26	1.08	1.12	0.75					
10-12 mm				2.07	1.31	1.87	11.87	0.37	0.42	1.20	0.94	1.43	0.64	5.84				
12-15 mm				0.32	2.45	0.44	0.56	0.77	0.48	0.52	1.93	2.71	0.37					
15-20 mm				0.39	0.97	1.49	2.13	1.23	2.55	1.75	4.91	5.84	10.60	3.25				
20-25 mm				0.12	0.26	0.31	0.55	0.65	1.17	1.19	1.95	2.99	1.21	8.44				
25-30 mm					0.07	0.21	0.41	0.11	0.32	3.29	0.90	5.61	1.79	1.95				
30-35 mm				0.09	0.07	0.01	0.21	0.07	0.11	0.25	0.42	0.91	1.36	0.65				
35-40 mm					0.07	0.01	0.07	0.04	0.09	0.28	0.81	1.01	1.35					

Continued

Table 9-B-3 Continued

Quarter 3	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
All prey																		
40-50 mm					0.06		0.05	0.08	0.10	0.16	0.22	1.35	10.28					
50-60 mm						0.01	0.04	0.12	0.26	0.19	0.89	1.30	0.83					
60-70 mm				0.01	0.01	0.03	0.02	0.10	0.37	0.51	1.80	1.26	1.63	0.65				
70-80 mm							0.20	0.06	0.26	0.51	1.06	0.74	5.28	9.74				
80-100 mm								0.06	0.09	0.22	0.86	1.20	7.54	2.60				
100-120 mm							0.02	0.03	0.03	0.03	0.08	0.08	2.73	0.65				
120-150 mm										0.00	0.03	0.12	0.16	7.79				
150-200 mm									0.02	0.01	0.01	0.08						
200-250 mm								0.01										
250-300 mm										0.04	0.01							
300-350 mm									0.01									
350-400 mm																		
Unknown	100.00	88.55	63.19	11.85	11.68	14.86	26.69	12.53	13.17	15.21	24.98	46.06	48.56	53.90				

TABLE 9-B-4: Total prey size class distribution for **haddock** in percentages by number and by predator size class, area and quarter, Total North Sea 1991

Quarter 4	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Fish prey	5-6 mm								0.01									
	10-12 mm					0.04												
	12-15 mm						0.01											
	15-20 mm							0.03				0.05						
	20-25 mm								0.02	0.03			0.29					
	25-30 mm		0.06				0.03				0.15							
	30-35 mm						0.12	0.07		0.04								
	35-40 mm							0.03	0.06		0.03	0.23	0.43					
	40-50 mm						0.03	0.10	0.23	0.05	0.11	0.07	0.29					
	50-60 mm						0.02	0.03	0.02	0.15	0.03	0.20						
	60-70 mm						0.02	0.02	0.07									
	70-80 mm						0.02			0.08	0.21	0.26	0.44	0.06	0.77			
	80-100 mm									0.17	0.41	1.07	0.88	1.63	11.71			
100-120 mm									0.11	0.36	0.39	0.26	0.34	2.84				
120-150 mm										0.13	0.03		0.49					
Unknown				0.16	0.19	0.24	0.64	0.64	0.91	1.31	2.67	1.12	2.38	8.32				
Crustacean prey	Eggs																	
	1-2 mm				0.40	1.94	10.56	0.02	0.02	0.07								
	2-3 mm				2.63	1.48	0.31	3.39		0.07								
	3-4 mm				3.37	2.71	3.54	2.05	0.67	0.48	0.20	0.56						
	4-5 mm				1.35	2.79	4.58	4.51	4.42	2.42	1.50	0.65	0.40					
	5-6 mm				0.43	4.11	3.09	3.12	3.31	2.19	0.96	1.26	0.60	1.14				
	6-7 mm				0.32	0.81	1.46	2.32	0.74	1.83	3.99	0.98	0.80	2.40				
	7-8 mm				0.43	0.30	1.16	2.48	3.62	2.43	6.84	0.94	0.74	0.63				
	8-10 mm				0.67	0.80	0.97	1.46	0.99	0.36	1.63	0.41	1.22	0.92				
	10-12 mm				0.21	0.83	0.60	1.25	0.97	1.35	0.96	1.72	1.36	3.55	3.94			
	12-15 mm				0.13	0.94	0.87	1.59	0.50	0.77	2.83	1.72	0.85	1.31				
	15-20 mm				0.08	0.41	0.75	0.69	0.96	1.44	1.94	2.00	1.17	2.12	0.22			
					0.06	0.39	0.53	0.40	0.50	0.54	1.57	3.03	2.33	1.76	0.33			

Continued

Table 9-B-4 Continued

Quarter 4	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Crustacean prey				0.06	0.05	0.20	0.27	0.36	0.39	0.95	0.57	7.21	0.74	3.28				
20-25 mm																		
25-30 mm					0.11	0.10	0.14	0.18	0.09	0.24	0.96	3.25	2.29					
30-35 mm					0.03	0.04	0.20	0.05	0.09	0.12	0.18	0.43						
35-40 mm							0.02	0.16	0.12	0.08	0.23		0.86					
40-50 mm						0.01	0.07	0.07	0.05	0.06		0.16	0.06					
50-60 mm									0.11			0.06	0.29					
60-70 mm									0.02	0.06	0.24							
70-80 mm									0.02									
80-100 mm									0.03		0.03	0.08						
100-120 mm									0.01									
Unknown				1.72	9.53	8.10	8.58	9.47	8.41	6.76	18.36	15.99	39.63	7.77				
All prey																		
Eggs				4.30	3.99	12.34	0.89	0.05	0.12		0.03							
1-2 mm				4.33	3.10	2.63	6.27	1.82	0.49	0.82	0.21							
2-3 mm				5.90	6.60	9.24	6.57	23.13	15.34	6.77	4.61	3.35	0.29					
3-4 mm				59.41	29.71	17.72	7.64	11.33	8.00	9.10	5.28	2.14	1.43	0.55				
4-5 mm				1.36	4.95	14.25	7.78	5.12	7.75	3.72	3.19	2.74	4.01					
5-6 mm				1.35	2.22	2.76	3.54	1.78	3.17	5.18	3.36	3.19	5.55					
6-7 mm				0.59	1.13	1.85	12.48	4.42	3.84	10.08	1.63	1.24	0.63	1.64				
7-8 mm				0.67	0.88	1.50	1.90	1.86	1.18	2.19	1.35	2.23	1.49					
8-10 mm				0.21	1.70	2.02	2.28	1.91	1.89	2.65	2.07	2.08	3.84	4.92				
10-12 mm				0.37	1.76	1.20	2.32	0.96	1.16	1.31	3.02	2.61	1.59	6.89				
12-15 mm				0.46	0.90	1.39	3.26	1.26	2.39	2.63	3.42	1.48	2.66	3.83				
15-20 mm				0.06	1.07	1.32	1.25	2.80	9.05	4.96	7.87	8.84	9.32	9.41				
20-25 mm				0.13	0.27	1.49	1.05	1.20	1.72	3.81	2.31	10.48	1.95	3.28				
25-30 mm					0.17	0.51	0.33	0.76	0.83	0.97	1.88	4.81	2.35	1.09				
30-35 mm					0.03	0.10	0.52	0.62	0.34	0.41	0.33	0.81	2.29	1.64				
35-40 mm						0.04	0.14	0.40	0.58	0.93	0.47	0.64	1.63	0.11				
40-50 mm					0.06	0.07	0.16	0.34	0.40	0.78	1.31	1.12	1.49	1.20				

Continued

Table 9-B-4 Continued

Quarter 4	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Crustacean prey																		
50-60 mm						0.02	0.08	0.07	0.24	0.20	0.21	0.75	1.35	6.24				
60-70 mm						0.02	0.07	0.02	0.11	0.10	0.34	0.26	0.14	0.55				
70-80 mm						0.02	0.02	0.02	0.42	0.21	0.35	0.44	0.06	0.77				
80-100 mm					0.03	0.04	0.08	0.03	0.24	0.55	1.27	1.00	2.23	11.71				
100-120 mm						0.26		0.08	0.16	0.51	0.39	0.32	0.63	3.17				
120-150 mm					0.11	0.06		0.04	0.09	0.20	0.11	0.10	0.63	0.55				
150-200 mm					0.09	0.02	0.90		0.06		0.18		0.06					
250-300 mm										0.03								
1200-1500 mm				20.86	41.22	29.11	40.45	39.97	40.43	41.89	54.80	49.37	54.40	42.45				
Unknown																		

TABLE 9-C-1: Total prey size class distribution for whiting in percentages by number and by predator size class, area and quarter, Total North Sea, 1991

Quarter 1	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Fish prey	Eggs						0.16	45.17										
	20-25 mm						0.05	0.05			0.29							
	25-30 mm							0.04	0.04									
	30-35 mm					0.19	0.02	0.21	0.12	0.58								
	35-40 mm					0.03	0.03			0.18								
	40-50 mm					0.03	0.11	0.30	0.12	0.30								
	50-60 mm					0.32	0.11	0.52	3.38	2.05	0.44							
	60-70 mm					0.03	0.16	1.15	1.39	3.07	2.64	0.63						
	70-80 mm						0.02	0.32	2.13	2.97	4.40	4.16						
	80-100 mm						0.04	0.53	1.34	4.09	11.44	6.59	1.88					
	100-120 mm						0.01	0.16	1.43	6.72	6.21	6.09	30.04	100.00				
	120-150 mm							0.05	0.35	3.03	7.86	6.81	10.03					
	150-200 mm								0.05	1.04	2.58	3.70	6.79					
200-250 mm												3.13						
Unknown					0.60	0.79	1.51	6.93	16.74	13.34	12.82	14.84						
Crustacean prey	Eggs							0.40										
	2-3 mm				1.03	4.00	0.07	0.78										
	3-4 mm				19.15	7.57	0.22	0.42	1.02	0.50								
	4-5 mm				3.93	11.62	1.51	0.65		0.05								
	5-6 mm					1.84	1.88	0.38	0.46									
	6-7 mm					0.16	0.17	0.04	0.08	0.50								
	7-8 mm				5.40	4.95	0.53	0.66	0.51	0.25	0.14							
	8-10 mm				5.01	1.20	0.33	0.58	0.32	0.35	2.36							
	10-12 mm				10.24	3.93	2.75	0.77	2.53	1.54	0.59							
	12-15 mm					2.19	2.68	3.19	0.97	0.93	0.98							
	15-20 mm					0.99	0.65	1.02	1.30	6.91	3.40							
	20-25 mm					0.66	0.65	0.91	1.56	2.86	3.16							
	25-30 mm					0.50	0.17	0.25	0.27	6.42	0.88	0.74						

Continued

Table 9-C-1 Continued

Quarter 1	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Crustacean prey				0.42	0.30	1.06	0.18	0.48	3.02	2.85		9.40						
30-35 mm					0.05	0.05	0.14	0.41	1.53	1.07	1.94							
35-40 mm						0.13	0.28	0.71	3.16	2.57	4.45	3.13						
40-50 mm						0.03	0.22	0.31	0.28	0.71	0.13							
50-60 mm						0.02	0.03	0.14	0.49	0.64								
60-70 mm						0.01				0.12	0.44	0.78						
70-80 mm									0.08									
80-100 mm								0.07		0.20	0.44							
100-120 mm								26.28	11.36	17.87	34.85	19.33						
Unknown				52.26	33.29	19.93		9.70										
All prey																		
Eggs							0.16	45.57										
1-2 mm				1.77		23.62	51.16	8.36	5.62									
2-3 mm				1.03	0.07	7.02	0.72	0.78										
3-4 mm				19.15	2.73	8.95	0.22	0.46	1.02	0.50								
4-5 mm				3.93	10.31	11.62	1.51	0.65		0.05								
5-6 mm					3.30	1.84	1.88	0.42	0.46									
6-7 mm		100.00			0.16	0.17	0.06	0.04	0.08	0.50								
7-8 mm				5.40	8.01	4.95	0.53	0.66	0.51	0.25	0.14							
8-10 mm				5.01	0.87	1.20	0.33	0.58	0.41	0.35	2.36							
10-12 mm				10.24	30.41	3.93	2.75	0.77	2.53	1.54	0.59							
12-15 mm					3.05	2.19	2.91	3.19	0.97	0.93	0.98							
15-20 mm					3.90	1.01	0.67	1.54	1.30	6.91	3.40							
20-25 mm					0.66	0.65	0.97	1.60	6.93	3.04	3.45							
25-30 mm					0.50	0.20	0.25	0.30	6.65	0.88	0.74							
30-35 mm				0.42	0.30	1.25	0.22	0.77	3.38	3.52		9.40						
35-40 mm					0.05	0.16	0.17	0.41	1.53	1.26	1.94							
40-50 mm					0.03	0.16	0.48	1.04	3.27	4.11	4.45	3.13						
50-60 mm					0.32	0.14	0.57	0.83	4.19	2.86	0.57							
60-70 mm					0.03	0.17	0.28	1.29	1.96	4.05	2.64	0.63						

Continued

TABLE 9-C-2: Total prey size class distribution for **whiting** in percentages by number and by predator size class, area and quarter, Total North Sea, 1991

Quarter 2	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Fish prey																		
Eggs							0.00	0.02	0.20	0.42								
5-6 mm							0.00		0.04									
7-8 mm					0.11		0.00	0.01	0.00	0.10	0.00							
8-10 mm							0.00	0.00	0.05	0.01								
10-12 mm						0.05	0.00	0.02	0.03	0.00								
12-15 mm					0.08		0.03	0.04	0.09	0.13								
15-20 mm						0.05	0.04	0.08	0.14	0.07								
20-25 mm						0.06	0.02	0.11	0.07	0.06	0.15							
25-30 mm					0.11	0.02	0.12	0.28	0.30	0.64	0.23	0.10						
30-35 mm						0.00	0.00	0.00	0.06	0.00								
35-40 mm					0.24	0.19	0.25	0.38	0.38	1.40	2.78	2.48						
40-50 mm						0.03	0.21	0.27	0.35	1.48	3.11	1.50	34.36					
50-60 mm						0.00	0.04	0.09	0.13	1.10	1.89	1.33	30.26					
60-70 mm						0.00	0.02	0.03	0.08	0.32	1.78	0.08						
70-80 mm							0.01	0.04	0.07	0.20	0.51	0.32						
80-100 mm							0.00	0.01	0.04	0.17	0.68	0.65						
100-120 mm								0.01	0.04	0.12	0.77	0.34						
120-150 mm								0.00	0.01	0.08	0.15	0.57						
150-200 mm									0.01	0.08	0.15	0.57						
200-250 mm									0.00		0.02							
250-300 mm											0.02							
300-350 mm										0.00	0.02							
Unknown					0.32	0.17	0.29	0.49	0.54	1.63	3.33	4.18	35.38					
Crustacean prey																		
Eggs							0.20		0.24									
1-2 mm					0.16	25.56	3.63	0.13	0.04									
2-3 mm					37.07	19.84	8.71	4.79	6.28	0.05	0.04							
3-4 mm					1.11	0.37	5.28	3.77	3.80	0.01	0.19	0.10						
4-5 mm					3.56	5.60	7.83	7.62	2.32	3.89	16.12	0.07						

Continued

Table 9-C-2 Continued

Quarter 2	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Crustacean prey					1.80	1.81	3.83	1.99	1.18	0.91	0.36	0.11						
5-6 mm					0.07	0.59	4.22	2.22	3.85	10.21	0.03	0.05						
6-7 mm					5.03	1.86	3.13	6.35	8.01	7.51	24.74							
7-8 mm					8.30	2.72	4.88	6.35	5.81	11.71	12.01	68.14						
8-10 mm					0.42	0.08	0.81	0.90	0.81	4.97	0.62	0.10						
10-12 mm					0.01	0.02	0.09	0.10	0.04	0.04	0.08	0.29						
12-15 mm					0.99	0.02	0.10	0.08	0.08	0.15	0.13	0.41						
15-20 mm						0.02	0.01	0.03	0.09	0.46	0.21	0.10						
20-25 mm						0.00	0.00	0.08	0.38	1.95	4.08	11.42						
25-30 mm						0.01	0.01	0.16	0.03	0.32	7.48	1.84						
30-35 mm							0.00	0.00	0.01	0.01								
35-40 mm						0.00	0.01	0.01	0.01	0.02	0.15	0.10						
40-50 mm							0.01	0.01	0.00	0.01	0.01							
50-60 mm						0.00	0.00	0.00	0.00	0.00	0.01							
60-70 mm							0.00	0.00	0.00	0.00	0.01							
70-80 mm					0.20	3.31	2.98	2.25	1.48	2.08	17.98	5.55						
Unknown																		
All prey																		
Eggs							0.20	0.04	0.44	0.42								
1-2 mm					39.61	61.10	31.98	28.97	57.10	0.41								
2-3 mm					37.07	19.84	16.53	5.45	7.16	0.05	0.04							
3-4 mm					1.11	0.37	5.28	3.83	3.80	0.01	0.19	0.10						
4-5 mm					3.56	5.60	7.83	7.62	2.32	3.89	16.12	0.07						
5-6 mm					1.80	1.81	3.83	2.01	1.18	0.91	0.36	0.11						
6-7 mm					0.07	0.59	4.22	2.22	3.85	10.21	0.03	0.05						
7-8 mm					5.03	1.86	3.14	6.35	8.05	7.51	24.74							
8-10 mm					8.41	2.72	4.88	6.35	5.81	11.81	12.02	68.14						
10-12 mm					0.50	0.08	1.02	0.90	0.87	4.98	0.62	0.10						
12-15 mm					0.01	0.07	0.09	0.17	0.08	0.04	0.08	0.29						
15-20 mm					1.07	0.26	1.14	0.86	0.37	1.01	0.13	0.41						

Continued

Table 9-C-2 Continued

Quarter 2	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
All prey																		
20-25 mm						0.07	0.07	0.17	0.23	0.53	0.21	0.10						
25-30 mm						0.06	0.02	0.19	0.44	2.02	4.23	11.42						
30-35 mm					0.11	0.03	0.63	0.44	0.33	0.96	7.71	1.93						
35-40 mm						0.00	0.00	0.00	0.07	0.01								
40-50 mm					0.24	0.19	0.26	0.39	0.39	1.42	2.93	2.57						
50-60 mm						0.03	0.22	0.28	0.35	1.49	3.12	1.50	34.36					
60-70 mm						0.01	0.04	0.10	0.13	1.10	1.91	1.33	30.26					
70-80 mm						0.00	0.02	0.03	0.08	0.33	1.78	0.08						
80-100 mm							0.01	0.04	0.07	0.20	0.51	0.32						
100-120 mm							0.00	0.01	0.04	0.17	0.68	0.65						
120-150 mm								0.01	0.04	0.12	0.77	0.34						
150-200 mm								0.00	0.01	0.08	0.15	0.57						
200-250 mm									0.00		0.02							
250-300 mm										0.00	0.02							
300-350 mm										0.00								
Unknown					1.42	5.31	18.58	33.56	6.77	50.33	21.64	9.92	35.38					

TABLE 9-C-3: Total prey size class distribution for whiting in percentages by number and by predator size class, area and quarter, Total North Sea, 1991

Quarter 3	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Fish prey																		
Eggs								8.94	0.00									
5-6 mm				0.09	0.04			0.00										
7-8 mm				0.03				0.00										
8-10 mm																		
10-12 mm							0.01	0.01	0.10									
12-15 mm			0.04				0.05		0.01									
15-20 mm			0.04	0.08	0.03	0.19	0.07	0.01										
20-25 mm				0.08	0.02	0.06	0.06	0.02	0.11	0.02								
25-30 mm				0.02	0.00	0.02	0.02		0.03	0.02								
30-35 mm		0.25		0.04	0.24	0.27	0.24	0.12	0.04	0.26	1.23							
35-40 mm					0.02	0.02	0.02	0.00	0.03	0.07								
40-50 mm			0.07	0.06	0.08	0.36	0.24	0.29	0.61	0.54	0.92							
50-60 mm				0.01	0.23	0.49	0.32	0.97	1.24	1.26	2.37							
60-70 mm					0.02	0.35	0.11	0.55	1.15	1.46	10.65							
70-80 mm					0.03	0.15	0.13	0.49	1.29	1.87	20.99	27.11						
80-100 mm						0.03	0.08	0.16	0.78	1.62	9.73	27.86						
100-120 mm							0.01	0.07	0.31	0.66	7.96							
120-150 mm								0.00	0.10	0.35	3.33	10.62						
150-200 mm								0.01	0.03	0.49	3.01	1.66						
200-250 mm									0.01			2.26						
Unknown	7.50	0.73	0.55	0.38	0.76	1.65	1.05	1.10	2.72	2.94	16.93	23.72						
Crustacean prey																		
1-2 mm		0.72	6.94	6.77	3.01													
2-3 mm	55.00	40.80	59.88	37.56	5.80	1.56	27.24	9.54	3.27	0.00								
3-4 mm	12.50	1.27	4.05	0.14	3.86	5.44	4.44	0.04	0.06			2.26						
4-5 mm		14.55	9.62	13.20	14.00	17.62	14.60	12.00	15.70	1.73								
5-6 mm		40.41	8.70	19.43	26.03	25.23	8.76	26.23	36.12	73.10								
6-7 mm				1.20	6.63	1.01	15.55	7.68	6.78	0.01								
7-8 mm				0.40	0.01	4.28	1.08	9.33	9.43	2.26								

Continued

Table 9-C-3 Continued

Quarter 3	Size class																		
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
Crustacean prey	8-10 mm																		
	10-12 mm	25.00	0.40		0.07	0.12	0.02	2.16	0.58	0.15	0.32								
	12-15 mm		0.68	0.04	0.40	2.03	0.04	2.19	0.40	0.36	1.38	0.05							
	15-20 mm				2.25	0.04	0.06	0.24	0.19	0.50	0.31	0.47							
	20-25 mm			0.04	0.73	0.14	0.50	4.08	1.70	1.62	3.31	8.67							
	25-30 mm			0.28	0.19	0.14	0.13	0.26	1.00	0.62	3.20	0.31							
	30-35 mm				0.00	0.03	0.02	0.13	0.22	0.18	0.12	2.50							
	35-40 mm					0.01		0.03	0.04	0.02	0.07	0.66							
	40-50 mm				0.00			0.01	0.04	0.01	0.07	0.61							
	50-60 mm							0.01	0.02	0.02	0.09	0.05							
	60-70 mm								0.00		0.06		0.75						
	80-100 mm									0.01	0.02								
	Unknown		0.12	0.81	3.82	3.13	0.56	7.58	6.50	8.15	0.79	9.19	3.77						
All prey	Eggs					0.00			8.94	0.00									
	1-2 mm		0.72	6.94	10.26	13.69	3.90	5.79	2.05										
	2-3 mm	55.00	40.88	59.88	37.56	5.80	1.56	27.24	9.54	3.27	0.00								
	3-4 mm	12.50	1.27	4.05	0.14	3.86	5.44	4.44	0.04	0.06		2.26							
	4-5 mm		14.55	9.62	13.20	14.00	17.62	14.60	12.00	15.70	1.73								
	5-6 mm		40.41	8.70	19.43	26.03	25.23	8.76	26.23	36.12	73.10								
	6-7 mm				1.20	6.63	1.01	15.55	7.68	6.80	0.01								
	7-8 mm				0.49	0.04	4.28	1.08	9.33	9.43	2.26								
	8-10 mm		0.40		0.10	0.12	0.02	2.16	0.58	0.15	0.32								
	10-12 mm	25.00	0.68	0.04	0.56	2.03	0.04	2.20	0.41	0.46	1.38	0.05							
	12-15 mm			0.04	2.40	0.10	0.06	0.76	0.19	0.51	0.31	0.47							
	15-20 mm			0.94	2.04	2.78	3.53	5.65	4.96	1.96	4.00	8.67							
	20-25 mm			0.28	0.28	0.16	0.18	0.33	1.02	0.73	3.21	0.31							
25-30 mm				0.02	0.03	0.04	0.15	0.22	0.21	0.14	2.50								
30-35 mm		0.25		0.04	0.24	0.27	0.27	0.16	0.06	0.33	1.89								

Continued

Table 9-C-3 Continued

Quarter 3	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
All prey			0.07	0.00	0.02	0.02	0.03	0.04	0.04	0.14	0.61							
35-40 mm				0.06	0.08	0.36	0.25	0.31	0.63	0.63	0.97							
40-50 mm				0.01	0.23	0.49	0.32	0.97	1.25	1.32	2.37	0.75						
50-60 mm					0.02	0.35	0.11	0.55	1.16	1.48	10.65							
60-70 mm					0.03	0.15	0.13	0.49	1.29	1.87	20.99	27.11						
70-80 mm						0.03	0.08	0.16	0.78	1.62	9.73	27.86						
80-100 mm							0.01	0.07	0.31	0.67	7.96							
100-120 mm								0.00	0.10	0.35	3.33	10.62						
120-150 mm								0.01	0.03	0.49	3.01	1.66						
150-200 mm									0.01			2.26						
200-250 mm																		
Unknown	7.50	0.84	9.44	12.21	24.11	35.41	10.08	14.02	18.92	4.64	26.49	27.48						

TABLE 9-C-4: Total prey size class distribution for **whiting** in percentages by number and by predator size class, area and quarter, Total North Sea, 1991

Quarter 4	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Fish prey							0.01											
							0.03		0.01									
				0.18	0.06	0.09	0.01	0.03	0.01									
				0.09	0.04	0.14	0.06	0.10	0.12	0.13								
					0.10	0.04	0.04	0.17	0.10	0.55								
					0.05	0.03	0.19	0.46	0.29	0.28	0.51							
					0.02	0.11	0.07	0.10	0.24	0.12								
					0.01	2.03	0.25	0.78	0.35	1.49	0.43							
					0.01	0.06	0.29	0.26	1.11	1.23	0.81	3.76						
						0.06	0.34	0.57	0.87	2.31	1.10							
						0.03	0.30	0.44	1.34	5.68	1.97	0.48						
					0.01	0.01	0.60	2.36	3.88	12.03	11.34	20.95						
							0.09	0.30	1.07	4.51	4.36	17.80						
							0.01	0.05	0.24	2.14	0.80	4.84						
								0.01	0.22	0.57	0.51	4.33						
								0.06	0.01									
	0.79	1.01		0.12	0.77	0.39	1.16	2.29	4.98	9.61	6.48	9.21						
Crustacean prey																		
	92.06	53.54		0.50	0.61		0.31											
		4.29	3.33	16.79	2.75	0.42	0.67	0.11	0.22	0.01	28.32							
	6.35	12.12	10.00	1.50	2.16	14.21	37.16	7.35	10.54	0.38	0.17							
			11.33	42.10	46.31	13.76	12.42	6.69	1.96	1.23	2.96							
		0.25	5.33	2.69	5.98	1.24	7.26	20.33	5.37	0.20								
			6.67	0.03	2.21	0.49	0.15	0.07	0.00									
		25.76	9.11	5.46	13.63	7.52	1.31	17.70	29.94	18.57								
				5.31	1.97	0.95	2.15	0.71	1.30	0.46		2.17						
		2.53	15.56	7.11	15.90	6.89	5.65	11.64	21.72	1.00	0.55	4.33						
		0.51		0.58	1.24	1.16	2.62	1.10	0.51	1.01	0.08	1.08						

Continued

Table 9-C-4 Continued

Quarter 4	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Crustacean prey																		
15-20 mm				0.64	0.57	0.65	0.78	1.29	1.04	2.17	1.02							
20-25 mm				1.35	0.23	0.53	0.55	1.39	1.30	2.51	2.43	3.58						
25-30 mm				0.66	0.29	0.16	0.43	0.53	0.64	1.67	1.14	3.17						
30-35 mm					0.04	0.04	0.35	0.72	1.07	4.31	0.54	1.84						
35-40 mm					0.11	0.01	0.09	0.32	0.43	2.31	0.58							
40-50 mm					0.02		0.18	0.35	0.58	1.24	0.58	3.59						
50-60 mm							0.01	0.10	0.06	0.43	0.53							
60-70 mm							0.04	0.04	0.03	0.18								
70-80 mm									0.00	0.04	0.03							
80-100 mm									0.02									
100-120 mm										0.03	0.05							
300-350 mm									0.00									
Unknown	0.79		16.67	13.73	4.08	19.46	8.56	13.96	5.52	17.74	30.74	14.88						
All prey																		
Eggs	92.06	53.54			0.01													
1-2 mm				0.50	0.61		0.58											
2-3 mm		4.29	3.33	16.79	2.79	0.42	0.67	0.11	0.22	0.01	28.32							
3-4 mm	6.35	12.12	10.00	1.50	2.16	14.21	37.16	7.35	10.54	0.38	0.17							
4-5 mm			11.33	42.10	46.31	13.76	12.42	6.69	1.96	1.84	2.96							
5-6 mm		0.25	5.33	2.69	5.98	1.24	7.26	20.33	5.37		0.20							
6-7 mm			6.67	0.03	2.21	0.49	0.15	0.07	0.00									
7-8 mm		25.76	9.11	5.46	13.63	7.52	1.31	17.70	29.94	18.57								
8-10 mm				5.31	1.97	0.95	2.16	0.71	1.30	0.46								
10-12 mm		2.53	15.56	7.11	15.90	6.89	5.65	11.64	21.73	1.00	0.55	2.17						
12-15 mm		0.51		0.58	1.24	1.16	2.64	1.10	0.51	1.01	0.08	4.33						
15-20 mm				0.81	0.63	0.94	0.79	1.32	1.06	2.17	1.02	1.08						
20-25 mm				1.43	0.27	0.69	0.62	1.49	2.33	2.64	2.43	3.58						
25-30 mm				0.66	0.39	0.20	0.48	0.70	1.53	2.24	1.14	3.17						
30-35 mm					0.08	0.07	0.60	1.19	1.39	4.62	1.05	1.84						

Continued

Table 9-C-4 Continued

Quarter 4	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
All prey																		
35-40 mm					0.12	0.12	0.16	0.43	0.67	2.44	0.58							
40-50 mm					0.04	2.03	0.46	1.13	0.94	2.73	1.01	3.59						
50-60 mm					0.01	0.06	0.30	0.36	1.19	1.67	1.35	3.76						
60-70 mm						0.06	0.34	0.61	0.90	2.49	1.10							
70-80 mm						0.03	0.30	0.44	1.35	5.72	2.00	0.48						
80-100 mm					0.01	0.01	0.60	2.36	3.90	12.03	11.34	21.38						
100-120 mm							0.09	0.30	1.07	4.54	4.41	17.80						
120-150 mm							0.01	0.05	0.24	2.14	0.80	4.84						
150-200 mm								0.01	0.22	0.62	0.58	4.33						
200-250 mm									0.06		0.01							
300-350 mm									0.00									
Unknown	1.59	1.01	38.67	15.01	5.63	49.15	25.26	23.91	11.57	30.69	38.90	27.66						

TABLE 9-D-1: Total prey size class distribution for mackerel in percentages by number and by predator size class, area and quarter, Total North Sea, 1991

Quarter 1	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Fish prey							0.02	0.03										
60-70 mm								0.05										
80-100 mm										49.15								
Unknown								0.04		7.69								
Crustacean prey																		
1-2 mm							0.13											
2-3 mm							3.10	1.06										
3-4 mm							25.39	0.15										
4-5 mm							32.35	0.17										
5-6 mm							5.38	1.72										
6-7 mm							0.02	0.20										
7-8 mm							0.03	0.29										
8-10 mm							0.24	0.09										
10-12 mm							0.34	0.56										
12-15 mm								0.02										
15-20 mm							0.21	0.45	3.12									
20-25 mm							8.37	1.11	10.93									
25-30 mm							0.26	2.08	1.56									
30-35 mm							0.04											
35-40 mm								0.02										
Unknown							24.04	91.55	84.35									
All prey																		
1-2 mm							0.13											
2-3 mm							3.10	1.06										
3-4 mm							25.39	0.15		49.15								
4-5 mm							32.35	0.17										
5-6 mm							5.38	1.72										
6-7 mm							0.02	0.20										
7-8 mm							0.03	0.29										

Table 9-D-1 Continued

Quarter 1	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
All prey																		
8-10 mm							0.24	0.09			23.08							
10-12 mm							0.34	0.56			38.46							
12-15 mm								0.02			7.69							
15-20 mm							0.21	0.45	3.12									
20-25 mm							8.37	1.11	10.93									
25-30 mm							0.26	2.08	1.56									
30-35 mm							0.04				7.69							
35-40 mm								0.02										
40-50 mm											7.69							
60-70 mm							0.02	0.03		49.15								
80-100 mm								0.05										
Unknown							24.11	92.02	84.39	1.69	15.38							

TABLE 9-D-2: Total prey size class distribution for **mackerel** in percentages by number and by predator size class, area and quarter, Total North Sea, 1991

Quarter 2	Size class											
	50	60	70	80	100	120	150	200	250	300	350	400
Fish prey												
Eggs												
6-7 mm								0.01	0.05	0.19	0.01	0.15
12-15 mm									0.00			
15-20 mm								0.01	0.00	0.00		
20-25 mm												
25-30 mm									0.00	0.00	0.00	
30-35 mm									0.01	0.00	0.00	
35-40 mm								0.80	0.07	0.00	0.00	
40-50 mm								0.81	0.03	0.01	0.01	0.01
50-60 mm								0.12	0.05	0.02	0.02	0.09
60-70 mm								0.02	0.02	0.02	0.02	0.07
70-80 mm								0.01	0.01	0.02	0.03	0.01
80-100 mm								0.02	0.01	0.01	0.02	0.01
100-120 mm									0.00	0.00	0.00	0.01
120-150 mm										0.00	0.00	0.02
150-200 mm										0.00	0.00	0.03
200-250 mm										0.00	0.00	0.00
Unknown								1.99	0.17	0.08	0.04	0.21
Crustacean prey												
1-2 mm								42.33	55.88	38.49	86.75	81.14
2-3 mm						50.00		9.94	9.56	37.57	5.12	4.37
3-4 mm								5.77	10.51	17.03	1.46	4.87
4-5 mm								6.45	0.37	0.52	0.29	0.26
5-6 mm								7.04	2.38	2.80	0.17	2.20
6-7 mm								2.12	0.67	0.68	0.38	0.37
7-8 mm								0.73	0.88	1.18	0.68	0.30
8-10 mm								16.51	1.90	0.39	0.29	0.35
10-12 mm								0.08	0.17	0.14	0.05	0.30
12-15 mm									0.00	0.01	0.03	0.01

Continued

Table 9-D-2 Continued

Quarter 2	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Crustacean prey																		
15-20 mm									0.02	0.01	0.00	0.01						
20-25 mm									0.03	0.00	0.01							
25-30 mm								0.14	0.07	0.05	0.00							
30-35 mm									0.04	0.10	0.03	0.02						
35-40 mm								0.21	0.01	0.01	0.01	0.01						
40-50 mm									0.00									
100-120 mm									0.00									
Unknown								2.01	16.84	0.15	0.13	0.27						
All prey																		
Eggs									0.05	0.19	0.01	0.15						
1-2 mm								42.33	55.88	38.88	91.08	85.86						
2-3 mm						50.00		10.08	9.56	37.57	5.12	4.38						
3-4 mm								5.80	10.51	17.03	1.49	4.87						
4-5 mm								6.62	0.38	0.52	0.29	0.31						
5-6 mm								7.05	2.38	2.80	0.17	2.20						
6-7 mm								2.33	0.67	0.68	0.39	0.37						
7-8 mm								0.78	0.88	1.19	0.69	0.30						
8-10 mm								16.51	1.90	0.39	0.29	0.35						
10-12 mm								0.08	0.17	0.14	0.06	0.30						
12-15 mm								0.04	0.00	0.01	0.03	0.01						
15-20 mm									0.02	0.01	0.00	0.01						
20-25 mm								0.01	0.03	0.00	0.01							
25-30 mm								0.14	0.07	0.05	0.00							
30-35 mm									0.05	0.10	0.03	0.02						
35-40 mm								1.01	0.07	0.01	0.01	0.01						
40-50 mm								0.81	0.03	0.01	0.01	0.01						
50-60 mm								0.12	0.05	0.02	0.02	0.09						
60-70 mm								0.02	0.02	0.02	0.02	0.07						
70-80 mm								0.01	0.01	0.02	0.03	0.01						

Continued

Table 9-D-2 Continued

Quarter 2	Size class											
	50	60	70	80	100	120	150	200	250	300	350	400
All prey								0.02	0.01	0.01	0.02	0.01
80-100 mm									0.01	0.01	0.00	0.01
100-120 mm									0.00	0.00	0.01	0.02
120-150 mm										0.00	0.00	0.03
150-200 mm										0.00	0.00	0.00
200-250 mm							50.00	6.23	17.25	0.34	0.22	0.62
Unknown												

TABLE 9-D-3: Total prey size class distribution for **mackerel** in percentages by number and by predator size class, area and quarter, Total North Sea, 1991

Quarter 3	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Fish prey	Eggs								0.01	0.01	0.00							
	5-6 mm								0.00									
	6-7 mm								0.00	0.00								
	10-12 mm								0.01	0.01								
	12-15 mm						0.00		0.00									
	15-20 mm							0.00	0.01	0.05	0.00							
	20-25 mm						0.00		0.04									
	25-30 mm							0.00	0.00	0.00	0.00	0.00						
	30-35 mm							0.02	0.00	0.00	0.02							
	35-40 mm								0.00	0.00	0.00							
	40-50 mm								0.05	0.05	0.07	0.00						
	50-60 mm								0.17	0.07	0.08	0.00						
	60-70 mm						0.01		0.26	0.05	0.09	0.05						
	70-80 mm								0.14	0.02	0.06	0.05						
	80-100 mm								0.03	0.01	0.03	0.02						
100-120 mm									0.00	0.00	0.01	0.00						
120-150 mm											0.00	0.00	0.00					
150-200 mm											0.00	0.00	0.00					
Unknown							0.02	0.14	0.05	0.11	0.02							
Crustacean prey	Eggs										0.01							
	1-2 mm	50.00						92.62	20.39	28.47	45.69	90.31						
	2-3 mm					0.31	7.67	10.27	12.35	0.60								
	3-4 mm					6.42	25.48	9.30	5.66	1.89								
	4-5 mm					0.01	18.18	6.44	4.58	2.21								
	5-6 mm					0.00	9.21	2.47	1.61	0.64								
	6-7 mm					0.00	0.99	1.02	0.40	1.04								
	7-8 mm						0.46	0.22	0.10	0.21								
	8-10 mm						0.12	2.63	0.03	0.00								

Continued

Table 9-D-3 Continued

Quarter 3	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Crustacean prey																		
10-12 mm									1.21	0.01	0.37	0.04						
12-15 mm									2.84	0.70	0.38	0.00						
15-20 mm									2.25	0.43	0.37	0.04						
20-25 mm								0.12	0.68	0.43	0.09	0.26						
25-30 mm								0.21	0.18	0.28	0.52	0.85						
30-35 mm								0.07	0.03	0.03	0.00	0.00						
35-40 mm								0.02	0.00									
40-50 mm																		
Unknown								0.13	1.26	0.76	0.12	0.03						
All prey																		
Eggs									0.01	0.01	0.01							
1-2 mm								92.62	22.09	63.64	66.55	91.95						
2-3 mm	50.00							0.32	7.80	10.43	18.55	0.60						
3-4 mm								6.43	25.49	9.37	5.66	1.89						
4-5 mm								0.01	18.21	6.44	4.58	2.21						
5-6 mm								0.01	9.23	2.50	1.61	0.64						
6-7 mm								0.00	1.00	1.02	0.40	1.04						
7-8 mm									0.46	0.22	0.10	0.21						
8-10 mm									0.12	2.68	0.03	0.00						
10-12 mm									1.68	0.11	0.37	0.04						
12-15 mm								0.00	2.85	0.70	0.39	0.00						
15-20 mm									2.26	0.47	0.37	0.04						
20-25 mm								0.12	0.69	0.47	0.09	0.26						
25-30 mm								0.21	0.19	0.28	0.52	0.86						
30-35 mm								0.07	0.05	0.03	0.02	0.00						
35-40 mm								0.02	0.00	0.00	0.00							
40-50 mm									0.05	0.05	0.07	0.00						
50-60 mm									0.17	0.07	0.08	0.00						
60-70 mm								0.01	0.26	0.05	0.09	0.05						

Continued

Table 9-D-3 Continued

Quarter 3	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
All prey									0.14	0.02	0.06	0.05						
70-80 mm									0.03	0.01	0.03	0.02						
80-100 mm										0.00	0.01	0.00						
100-120 mm											0.00	0.00						
120-150 mm											0.00	0.00						
150-200 mm											0.00	0.00						
Unknown	50.00							0.19	7.25	1.43	0.38	0.11						

TABLE 9-D-4: Total prey size class distribution for **mackerel** in percentages by number and by predator size class, area and quarter, Total North Sea, 1991

Quarter 4	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Fish prey																		
20-25 mm							2.90											
30-35 mm							1.16	0.01		0.00	0.00							
35-40 mm									0.00									
40-50 mm							3.36	0.01	0.00		0.00							
50-60 mm							8.35	0.01		0.00								
60-70 mm							1.39			0.00								
70-80 mm								0.01	0.00	0.00	0.00	0.01						
80-100 mm									0.00	0.00	0.01	0.01						
100-120 mm										0.00	0.00	0.04						
120-150 mm											0.00	0.01						
200-250 mm												0.01						
Unknown							13.34	0.48	0.01	0.01	0.00	0.08						
Crustacean prey																		
1-2 mm									88.65	88.57	93.28	63.74						
2-3 mm								7.78	0.02	0.16	0.06	0.64						
3-4 mm							19.14		0.10	0.31	0.09	0.41						
4-5 mm									0.06	0.63	0.05	0.13						
5-6 mm							8.70	11.89	0.09	0.27	0.02	0.14						
6-7 mm							3.48	29.28	0.21	0.01	0.00	0.06						
7-8 mm								8.04	0.16	0.00	0.00	0.02						
8-10 mm							10.44	15.84	0.69	0.05	0.00	0.02						
10-12 mm							8.70	6.45	0.47		0.00							
12-15 mm							5.22	4.63	0.11	0.00	0.00							
15-20 mm								0.69		0.00								
20-25 mm										0.00								
Unknown							6.96	14.23	0.01	0.07	0.01	1.51						

Continued

Table 9-D-4 Continued

Quarter 4	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
All prey																		
1-2 mm									95.61	98.33	99.70	96.79						
2-3 mm								7.78	0.02	0.17	0.06	0.64						
3-4 mm							19.14		0.10	0.31	0.09	0.41						
4-5 mm									0.07	0.64	0.05	0.13						
5-6 mm							8.70	11.89	0.09	0.28	0.02	0.14						
6-7 mm							3.48	29.28	0.21	0.01	0.01	0.08						
7-8 mm								8.04	0.16	0.00	0.00	0.02						
8-10 mm							12.18	15.84	0.69	0.05	0.00	0.02						
10-12 mm							8.70	6.45	0.47	0.00	0.00							
12-15 mm							5.22	4.63	0.11	0.00	0.00							
15-20 mm								0.69		0.00								
20-25 mm							3.48	0.02		0.00	0.00							
30-35 mm							1.16	0.04		0.00	0.00							
35-40 mm									0.00									
40-50 mm							3.36	0.02	0.00		0.00							
50-60 mm							8.35	0.01		0.00	0.00							
60-70 mm							1.39			0.00								
70-80 mm								0.02	0.00	0.00	0.00	0.01						
80-100 mm									0.00	0.00	0.01	0.01						
100-120 mm										0.00	0.00	0.04						
120-150 mm											0.00	0.01						
200-250 mm											0.00	0.01						
Unknown							24.83	15.27	2.47	0.20	0.06	1.70						

TABLE 9-E-1: Total prey size class distribution for saithe in percentages by number and by predator size class, area and quarter, Total North Sea, 1991

Quarter 1	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Fish prey																		
15-20 mm												0.03						
20-25 mm											0.04	0.06						
25-30 mm											0.01	0.10						
30-35 mm												0.01						
35-40 mm											0.01	0.01						
40-50 mm												0.41	7.01		1.13			
50-60 mm											0.03	0.09						
60-70 mm											0.41	0.05	1.96					
70-80 mm										3.65		0.01	5.89					
80-100 mm											0.55	0.43				14.63		
100-120 mm										0.91	0.69	2.00	1.96	1.31	9.06	26.83		
120-150 mm											0.12	1.17	1.10	2.59	1.13	7.32		
150-200 mm										0.31	0.05	0.35	2.50	5.88	4.53	1.22		
200-250 mm												0.01	3.92	1.99	24.15		33.33	
250-300 mm												0.01		0.40	1.51	6.10	11.11	
Unknown										15.99	2.47	6.50	32.88	11.85	44.91	39.02	55.56	
Crustacean prey																		
5-6 mm													2.45					
7-8 mm											84.91	9.04		0.81				
10-12 mm										7.98	1.29	36.15	2.80					
12-15 mm										49.08	0.02	4.74	0.65					
15-20 mm										1.02		1.73	8.83					
20-25 mm										6.56	1.90	0.42	12.26					
25-30 mm										1.12		0.32	0.98	72.51				
30-35 mm											2.91	32.07		1.21	4.53	4.88		
35-40 mm											0.05	0.01	0.65					
40-50 mm																		
50-60 mm																		
60-70 mm																		
70-80 mm																		
Unknown										13.06	1.67	1.46	11.54	1.28	9.06			

Continued

Table 9-E-1 Continued

Quarter 1	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
All prey																		
5-6 mm										7.98	84.91	9.04	2.45					
7-8 mm										49.08	1.29	36.16	2.80	0.81				
10-12 mm										1.02	0.02	4.74	0.65					
12-15 mm										6.56		1.83	8.83					
15-20 mm										1.12	1.94	0.48	12.26					
20-25 mm											0.32	0.42	0.98	72.51				
25-30 mm											3.22	32.48		1.21	4.53	4.88		
30-35 mm											0.01	0.01	0.65					
35-40 mm											0.98	0.44	7.01		1.13			
40-50 mm											0.96	0.09						
50-60 mm											0.72	0.05	1.96					
60-70 mm												0.01	6.54					
70-80 mm										3.65		0.43				14.63		
80-100 mm											0.55	2.00	1.96	1.31	9.06	26.83		
100-120 mm										0.91	0.69	1.17	1.10	2.59	1.13	7.32		
120-150 mm											0.12	0.35	2.50	5.88	4.53	1.22		
150-200 mm										0.31	0.05	0.01	3.92	1.99	24.15		33.33	
200-250 mm												0.01		0.40	1.51	6.10	11.11	
250-300 mm										29.36	4.21	10.29	46.38	13.30	53.96	39.02	55.56	
Unknown																		

TABLE 9-E-2: Total prey size class distribution for saithe in percentages by number and by predator size class, area and quarter, Total North Sea, 1991

Quarter 2	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Fish prey																		
15-20 mm										87.95	0.05	0.07	0.01					
20-25 mm											0.32	0.16	1.62	3.09				
25-30 mm											0.18	0.25						
30-35 mm											0.06	0.37	0.00					
35-40 mm											0.01	0.08	0.01	0.03		0.02		
40-50 mm										0.21	0.52	0.23	3.06	1.39	1.29	1.57		
50-60 mm										0.21	0.47	0.29	1.92	3.23	2.64	5.20		
60-70 mm										0.14	0.10	0.27	1.61	6.95	1.85	8.15		
70-80 mm									0.17		0.07	0.23	0.58	10.83	0.25	3.73		
80-100 mm											0.02	0.18	0.38	0.99	0.14	1.67	1.85	
100-120 mm											0.02	0.04	0.21	0.37	0.08	0.21	3.70	
120-150 mm											0.02	0.17	0.71	1.39	0.60	0.81	6.48	
150-200 mm											0.03	0.07	0.24	0.19	0.32	0.10	1.85	
200-250 mm												0.07		0.16	0.18	1.47	14.81	
250-300 mm														0.05	0.15	0.40	12.96	
300-350 mm																		
Unknown										0.55	1.59	4.32	1.74	1.14	0.39	3.05	18.52	
Crustacean prey																		
3-4 mm											2.08	0.36	0.15					
4-5 mm									2.95			0.16	0.63					
5-6 mm									27.72		8.22							
6-7 mm									13.12		1.67	2.22	0.05			0.02		
7-8 mm									13.12	1.23	40.23	15.76	18.53	0.62	8.22	2.96		
8-10 mm									29.19	3.39	9.57	13.76	1.94	0.20				
10-12 mm									11.82		13.22	7.30	2.40	0.82	0.78	0.06		
12-15 mm									0.70		0.77	1.57	0.46	0.44				
15-20 mm									0.61		0.35	0.14	0.03	0.01	0.91	0.03		
20-25 mm											1.78	5.82	1.95	7.73	8.89	2.31		
25-30 mm										0.10	5.67	19.99	17.82	26.34	31.90	14.96	3.70	
30-35 mm										0.48	8.44	13.11	10.84	21.14	21.98	22.78	22.22	
35-40 mm										0.27	2.02	3.35	4.31	6.86	18.80	8.19	7.41	

Continued

Table 9-E-2 Continued

Quarter 2	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Crustacean prey																		
40-50 mm										0.21	0.13	0.86	0.87	3.14		0.93	1.85	
50-60 mm														0.03	0.17			
80-100 mm															0.03			
100-120 mm															0.01			
120-150 mm									0.26	5.27	2.43	8.88	27.86	2.85	0.42	21.22	4.63	
Unknown																		
All prey																		
3-4 mm									2.95		2.08	0.36	0.15					
4-5 mm									27.72		8.22	0.16	0.63					
5-6 mm									13.12		1.67	2.22	0.05			0.02		
6-7 mm									13.12	1.23	40.23	15.76	18.53	0.62	8.22	2.96		
7-8 mm									29.19	3.39	9.57	13.76	1.94	0.20				
8-10 mm									11.82		13.22	7.30	2.40	0.82	0.78	0.06		
10-12 mm									0.70		0.77	1.57	0.46	0.44				
12-15 mm									0.61		0.40	0.21	0.05	0.01	0.91	0.03		
15-20 mm										87.95	2.11	5.99	3.58	10.82	8.89	2.31		
20-25 mm										0.10	5.85	20.24	17.82	26.34	31.90	14.96	3.70	
25-30 mm										0.48	8.50	13.48	10.85	21.14	21.98	22.78	22.22	
30-35 mm										0.27	2.03	3.43	4.32	6.89	18.80	8.20	7.41	
35-40 mm										0.41	0.64	1.08	3.93	4.53	1.29	2.50	1.85	
40-50 mm										0.21	0.47	0.29	1.92	3.27	2.64	5.20		
50-60 mm										0.14	0.10	0.27	1.61	6.95	1.85	8.15		
60-70 mm											0.07	0.23	0.58	10.83	0.25	3.73	1.85	
70-80 mm									0.17		0.02	0.18	0.38	0.99	0.31	1.67		
80-100 mm											0.02	0.04	0.21	0.37	0.10	0.21	3.70	
100-120 mm											0.03	0.17	0.71	1.39	0.61	0.81	6.48	
120-150 mm												0.07	0.24	0.19	0.32	0.10	1.85	
150-200 mm														0.16	0.18	1.47	14.81	
200-250 mm														0.05	0.15	0.40	12.96	
250-300 mm																0.09		
300-350 mm																		
Unknown								100.00	0.61	5.82	4.01	13.20	29.66	3.99	0.81	24.35	23.15	

TABLE 9-E-3: Total prey size class distribution for saithe in percentages by number and by predator size class, area and quarter, Total North Sea, 1991

Quarter 3	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Fish prey																		
40-50 mm														0.09				
50-60 mm											0.28	0.63	4.81	0.28				
60-70 mm											6.95	3.99	18.72	0.19		0.71		
70-80 mm											8.44	6.09	13.23	0.09	2.77	0.43		
80-100 mm												9.08	18.62	3.34	1.51	1.05		
100-120 mm											1.08	3.15	1.84	0.42	3.02	4.36		
120-150 mm											0.52	0.38	2.05	4.47	11.84	2.07		
150-200 mm											0.48	0.08	4.74	0.76	12.59	3.95		
200-250 mm													0.06		9.07	2.70		
250-300 mm															6.80	6.30		
300-350 mm																0.64		
Unknown								100.00			6.16	6.96	19.91	4.01	23.17	1.71		
Crustacean prey																		
3-4 mm							100.00					0.26						
5-6 mm												0.35						
7-8 mm												0.05						
8-10 mm											6.48		1.24					
10-12 mm											2.16	0.31	1.12					
15-20 mm											10.80	0.71			2.02	7.62		
20-25 mm										4.44	8.64	11.20	0.56	3.58	17.13	28.79		
25-30 mm										4.44	14.89	16.06	1.86	6.78	6.05	15.69		
30-35 mm										11.11	19.77	11.04	5.41	73.69	4.03	13.52		
35-40 mm										8.89	4.32	0.86	1.12	1.59		3.20		
40-50 mm														0.24				
Unknown										71.11	9.01	28.52	4.72	0.24		6.60		

Continued

Table 9-E-3 Continued

Quarter 3	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
All prey							100.00					0.26						
3-4 mm												0.35						
5-6 mm												0.05						
7-8 mm											6.48		1.24					
8-10 mm											2.16	0.31	1.12					
10-12 mm											10.80	0.71		0.24	2.02	7.62		
15-20 mm										4.44	8.64	11.25	0.56	3.58	17.13	28.79		
20-25 mm										4.44	14.89	16.06	1.86	6.78	6.05	15.69		
25-30 mm										11.11	19.77	11.04	5.41	73.69	4.03	13.52		
30-35 mm										8.89	4.32	0.86	1.12	1.59		3.20		
35-40 mm														0.33				
40-50 mm											0.28	0.63	4.81	0.28				
50-60 mm												3.99	18.72	0.19		0.71		
60-70 mm											6.95	6.09	13.23	0.09	2.77	0.43		
70-80 mm											8.44	9.08	18.62	3.34	1.51	1.05		
80-100 mm											1.08	3.15	1.84	0.42	3.02	4.36		
100-120 mm											0.52	0.38	2.05	4.47	11.84	2.07		
120-150 mm											0.48	0.08	4.74	0.76	12.59	3.95		
150-200 mm															9.07	2.70		
200-250 mm													0.06		6.80	6.30		
250-300 mm																0.64		
300-350 mm																	8.95	
Unknown								100.00		71.11	15.17	35.70	24.63	4.24	23.17			

TABLE 9-E-4: Total prey size class distribution for saithe in percentages by number and by predator size class, area and quarter, Total North Sea, 1991

Quarter 4	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
General results																		
Fish prey																		
25-30 mm											0.29	0.23	0.09	1.20				
40-50 mm												0.31						
50-60 mm											0.72	0.30	0.31					
60-70 mm											6.63	6.99	6.16					
70-80 mm										50.00	29.59	49.24	44.01	26.22	2.11			
80-100 mm											5.53	11.23	14.88	19.74	10.53	38.36	12.50	
100-120 mm												3.90	2.12	6.50	18.95	0.63	16.25	
120-150 mm												0.13	2.09	8.80	24.21	1.26	5.00	
150-200 mm															9.47		25.00	
200-250 mm														1.42	11.58	14.47	13.75	
250-300 mm														1.71	7.37	30.82	5.00	
Unknown							100.00			50.00	21.04	16.21	10.69	14.58	6.32	6.29	20.00	
Crustacean prey																		
5-6 mm												0.93						
8-10 mm											1.17	0.66						
10-12 mm											0.36							
12-15 mm												0.01						
15-20 mm											2.86	0.59	3.50	0.40		0.63	2.50	
20-25 mm											1.14	0.82	4.33	8.53				
25-30 mm											0.56	1.03	2.21	3.21				
30-35 mm											0.09	0.44	1.11	2.22				
35-40 mm												0.13	0.50	0.44		7.55		
40-50 mm												0.01						
50-60 mm												0.01						
Unknown											29.75	6.23	6.69	1.36	6.32			

Continued

Table 9-E-4 Continued

Quarter 4	Size class																	
	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
All prey																		
5-6 mm												0.93						
8-10 mm											1.17	0.66						
10-12 mm											0.36							
12-15 mm												0.01						
15-20 mm											2.86	0.59	3.55	1.09		0.63	2.50	
20-25 mm											1.14	0.94	4.45	9.09				
25-30 mm											0.84	1.03	2.21	3.21				
30-35 mm											0.09	0.44	1.11	2.22				
35-40 mm												0.13	0.50	0.44		7.55		
40-50 mm												0.24	0.09	1.20				
50-60 mm												0.32						
60-70 mm											0.72	0.30	0.31					
70-80 mm											6.63	6.99	6.16		2.11			
80-100 mm										50.00	29.59	49.24	44.01	26.22	10.53	38.36	12.50	
100-120 mm											5.53	11.23	14.88	19.74	18.95	0.63	16.25	
120-150 mm												3.90	2.12	6.50	24.21	1.26	5.00	
150-200 mm												0.13	2.09	8.80	9.47		25.00	
200-250 mm														1.42	11.58	14.47	13.75	
250-300 mm														1.71	7.37	30.82	5.00	
Unknown							100.00			50.00	51.08	22.92	18.54	18.35	15.79	6.29	20.00	

TABLE 10-A-1: Average stomach content weight (g) per 1000 fish by size class of commercially exploited prey species by predator size class, area and quarter, 1991, cod

Quarter 1		Cod size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 1																			
All species																			
All size classes						210	820	160	1044	2248	2020	3982	8341	29901	74997	58819	137587	99183	
<i>Gadus morhua</i>																			
150-200 mm														118					
250-300 mm															254				
Unknown size															5		4		
Total														118	259		4		
<i>Melanogrammus aeglefinus</i>																			
120-150 mm														2650	1530	187			
150-200 mm													575	81	205	4856	1197	32818	
250-300 mm																	5490		
400-500 mm														50	326	51			
Unknown size																			
Total													575	2781	2061	5094	6687	32818	
<i>Merlangius merlangus</i>																			
60-70 mm															11				
120-150 mm														357					
150-200 mm													340	686	315		250	5548	
200-250 mm														2669	3799	8088	4260	20468	
250-300 mm														1950	3335	45	8642		
300-350 mm															4494		6263		
Unknown size												18		279	148	521	393		
Total												18	340	5942	12102	8654	19809	26015	
<i>Trisopterus esmarki</i>																			
80-100 mm													136	97	86	64	67		
100-120 mm										577	95	102	446	1500	720	488	1981		
120-150 mm											253	162	686	1549	3460	9417	1612		

Continued

Table 10-A-1 Continued

Quarter 1		Cod size class																
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>T. esmarki</i> (cont)																		
150-200 mm										64	132	703	837	903		1758		
Unknown size													375	31		1		
Total									577	413	395	1972	4358	5200	9969	5420		
<i>Clupea harengus</i>																		
120-150 mm													18					
150-200 mm											212	426		926	1011	52	11835	
200-250 mm												303	3973	7823	1432	13774	26985	
250-300 mm												20	271	1240	1806	15742		
Unknown size													192	42		40		
Total											212	749	4453	10030	4249	29608	38820	
<i>Anmodytidae</i>																		
80-100 mm									76	28								
100-120 mm										32	58	11		23				
Unknown size																		
Total									76	60	58	11		23				
<i>Solea solea</i>																		
100-120 mm												264						
120-150 mm												290		48		123		
150-200 mm													157			338		
200-250 mm																		
Total												554	157	48		461		
<i>Limanda limanda</i>																		
35-40 mm										5								
70-80 mm														52		323		
100-120 mm																		
120-150 mm														49		578	1530	
150-200 mm												187				416		
Unknown size													7					
Total										12		187	7	101		1317	1530	

Continued

Table 10-A-1 Continued

Quarter 1		Cod size class																
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Scomber scombrus</i>																		
200-250 mm														2191		2114		
250-300 mm														36346	5193	39328		
300-350 mm															18053			
350-400 mm															31			
Unknown size																		
Total														38537	23277	41442		
<i>Nephrops norvegicus</i>																		
60-70 mm															106			
100-120 mm															973			
120-150 mm															2180			
Unknown size											413	504	503	849	707	5250		
Total											413	504	503	849	3966	5250		
<i>Crangon crangon</i>																		
35-40 mm											2							
Total											2							
<i>Pandalus</i>																		
10-12 mm											0							
12-15 mm											1							
20-25 mm										0			3	5				
25-30 mm											2	8						
30-35 mm										1								
40-50 mm								76	194		5							
50-60 mm										7	44							
60-70 mm																		
70-80 mm																		
80-100 mm																		
100-120 mm																		
Unknown size										21			10					
Total						185		76	194	31	51	21	248	125	80			

Continued

Table 10-A-1 Continued

Quarter 1		Cod size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 2																			
All species							200	80	1112		1148	4859	12688	14213	26631	105563	26661	46466	61807
All size classes																			
<i>Gadus morhua</i>																1123		9414	
150-200 mm																			
250-300 mm																			
Total																1123	9414		
<i>Melanogrammus aeglefinus</i>																			
150-200 mm																1084			
200-250 mm																319		2269	
Total																1403		2269	
<i>Merlangius merlangus</i>																			
100-120 mm																			
150-200 mm														695	8105	15173	751	1405	4356
200-250 mm															4100	12145	4150	7429	3429
250-300 mm															1798	15347		173	
300-350 mm																4166	962	6418	728
Unknown size													275	3814	2572		808		
Total													970	17818	49403	5862	16232	8513	
<i>Trisopterus esmarki</i>																			
80-100 mm																			
100-120 mm													955	684	277	337	613	367	
120-150 mm													4885		2872	7613	1609		
Unknown size										11					78	50			
Total										11			5839	684	3580	9326	1976		
<i>Clupea harengus</i>																			
120-150 mm																			
150-200 mm														2869		11304			
200-250 mm																9786	12567	6885	
Unknown size																	703		
Total														2869		21090	13270	6885	

Continued

Table 10-A-1 Continued

Quarter 1		Cod size class																	
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
Ammodytidae																			
50-60 mm									54	160									
70-80 mm									396	16	212	69							
80-100 mm										36	485	593							
100-120 mm											47	282							
120-150 mm														295					
300-350 mm										25	184	93							
Unknown size									450	237	928	1037		295					
Total																			
Solea solea																			
120-150 mm																	1106		
150-200 mm												113		360			757		
200-250 mm													519						
Total												113	519	360			1863		
Limanda limanda																			
120-150 mm																			
150-200 mm												645				3494	4748		
Total												645		1283		9151	11158		
Nephrops norvegicus																			
Unknown size																			
Total														1098					
Pandalus																			
10-12 mm										6									
15-20 mm										9	0								
20-25 mm											8								
25-30 mm										1									
30-35 mm											10								
40-50 mm						43				104	87	70							
50-60 mm						108			159		18								
60-70 mm						820					54								

Continued

Table 10-A-1 Continued

Quarter 1	Cod size class																	
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Pandalus</i> (cont)																		
70-80 mm										45								
Unknown size										10	19							
Total							971		159	176	196	70						
Area 3																		
All species																		
All size classes					155	334	679	1427	840	6340	3838	6671	15283	26246	15110	573560	274605	
<i>Melanogrammus aeglefinus</i>																		
100-120 mm																		
Unknown size												251	335					
Total												251	335					
<i>Merlangius merlangus</i>																		
80-100 mm																		
100-120 mm												1807	42					
120-150 mm										4365		332	573					
150-200 mm													1015	17346		274340	11234	
200-250 mm													3358			151760	63798	
250-300 mm													291					
Unknown size																		
Total										4365		2140	5280	17346		426100	75032	
<i>Trisopterus esmarki</i>																		
120-150 mm														919				
150-200 mm														721	2			
Unknown size																		
Total														1362	921			
<i>Clupea harengus</i>																		
150-200 mm																60040	7965	
200-250 mm																		
Unknown size																		
Total																60040	7965	

Continued

Table 10-A-1 Continued

Quarter 1	Cod size class																		
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
Ammodytidae																			
60-70 mm								94			120	142							
70-80 mm											347	144							
80-100 mm											71	266	23						
100-120 mm											203	134	36						
Unknown size							128	393			27	685	59						
Total							128	487			768								
Solea solea																			
150-200 mm													261						
Total													261						
Limanda limanda																			
150-200 mm													2658						
Total													2658						
Nephrops norvegicus																			
25-30 mm											40								
70-80 mm											1107								
Unknown size											269		672	3770		58470	70070		
Total											1416		672	3770		58470	70070		
Pandalus																			
20-25 mm								15			9								
25-30 mm							160				24			36					
40-50 mm							39		198		61	96	43	248					
50-60 mm											33		42						
60-70 mm								142		332									
70-80 mm																			
80-100 mm									28		105		15						
Unknown size							199	157	225	332	231	96	101	284					
Total							199	157	225	332	231	96	101	284					

Continued

Table 10-A-1 Continued

Quarter 1		Cod size class																	
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
Area 4																			
All species							439												
All size classes								300	7221	6922	14520	27326	44221	150145	291617	214410			
<i>Melanogrammus aeglefinus</i>																			
120-150 mm												374							
200-250 mm														10180					
Total												374		10180					
<i>Merlangius merlangus</i>																			
100-120 mm												78							
120-150 mm												1583	1449						
150-200 mm												1493	5101						
200-250 mm												1393	8609	12413	96435	43833			
300-350 mm														2325					
Unknown size																			
Total												4547	15160	14738	96435	43833			
<i>Trisopterus esmarki</i>																			
100-120 mm												846			8100				
120-150 mm											472								
Total											472	846			8100				
<i>Clupea harengus</i>																			
150-200 mm											1788					4263			
200-250 mm																4263			
Total											1788					4263			
<i>Ammodytidae</i>																			
80-100 mm																430			
120-150 mm													628						
Total													628			430			

Continued

Table 10-A-1 Continued

Quarter 1		Cod size class																	
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
<i>Limanda limanda</i>																			
70-80 mm											72			5128					
120-150 mm													2051						
150-200 mm																			
250-300 mm																	212470		
Total											72		2051	5128			212470		
<i>Nephrops norvegicus</i>																			
Unknown size											863		1162						
Total											863		1162						
<i>Pandalus</i>																			
25-30 mm										34	12								
30-35 mm											29								
40-50 mm											38	52	25						
50-60 mm													158			920			
80-100 mm															370				
Unknown size										34	79	52	183		370	920			
Total																			
Area 5																			
<i>All species</i>																			
All size classes								1080			20370	12590	18927	42721	70748	58663			
<i>Merlangius merlangus</i>																			
120-150 mm											18630			2119					
150-200 mm														8330					
200-250 mm																44440			
250-300 mm																			
300-350 mm																6395			
Unknown size														771	12977				
Total											18630			11220	12977	50835			

Continued

Table 10-A-1 Continued

Quarter 1	Cod size class																		
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
<i>Clupea harengus</i>																			
100-120 mm														2321					
120-150 mm														1813	27582				
150-200 mm																			
Total														4134	27582				
<i>Sprattus sprattus</i>																			
80-100 mm														1061					
Total														1061					
Anmodytidae																			
100-120 mm															264				
Total															264				
<i>Solea solea</i>																			
200-250 mm															9862				
Total															9862				
<i>Limanda limanda</i>																			
120-150 mm														3900	570				
Total														3900	570				
<i>Crangon crangon</i>																			
40-50 mm																260			
Total																260			
<i>Pandalus</i>																			
25-30 mm								10				70							
30-35 mm												115	69						
40-50 mm														303	84				
50-60 mm														1400	2568				
60-70 mm								627					318	2591	84				
70-80 mm								220				105	781	1894	188				
Unknown size														150					
Total								857				290	1168	6338	2923				

Continued

Table 10-A-1 Continued

Quarter 1		Cod size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 6																			
All species	All size classes						411	942	1824	3499	12904	9093	18214	29379	45295	77736	76702	91239	18784
<i>Gadus morhua</i>																			
120-150 mm																26			
200-250 mm																61			
Unknown size													38						
Total													38			87			
<i>Melanogrammus aeglefinus</i>																			
200-250 mm																31			
Total																31			
<i>Merlangius merlangus</i>																			
60-70 mm																			
80-100 mm													98	6			150	319	
100-120 mm												668	202	2850	32	300	899		
120-150 mm												375	5750		909	4364			
150-200 mm													707	3364	453	6103	2998	4776	
200-250 mm													102	5035	590	4195	5313	4248	17175
250-300 mm															876	2122	11029	2693	
300-350 mm																		9153	
Unknown size									2			273	516	257	110	75	249	1263	
Total									2			1315	7374	11512	2970	17158	20638	22453	17175
<i>Clupea harengus</i>																			
70-80 mm																	5		
80-100 mm												546		232	81	47	360		
100-120 mm													202	1253	388	28	245		
120-150 mm														117	352	144	2247	1279	
150-200 mm												27	148		5824	307	2672	8602	
200-250 mm													184			168	284	1361	

Continued

Table 10-A-1 Continued

Quarter 1		Cod size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>C. harengus</i> (cont)																			
250-300 mm												68			567		21	151	
Unknown size												640	533	1602	7464	695	5834	11393	
Total																			
<i>Sprattus sprattus</i>																			
50-60 mm								46											
70-80 mm								315	569							32		43	
80-100 mm													54	15	22	1684	207	1252	
100-120 mm													53			64			
120-150 mm													950			47			
Unknown size																6			
Total								361	569				1057	15	22	1833	207	1295	
<i>Ammodytidae</i>																			
60-70 mm											8	4							
70-80 mm												8							
80-100 mm																	401		
100-120 mm									8			24	18			10	265		
120-150 mm								29	82		94	912	188	67	5	29			
150-200 mm													276	115	83				
200-250 mm														240					
Unknown size								1	4				23	14	27	6	40		
Total								31	94		102	949	505	435	115	45	706		
<i>Pleuronectes platessa</i>																			
150-200 mm																	120		
200-250 mm																1805	230		
300-350 mm																		5986	
Total																1805	350	5986	
<i>Solea solea</i>																			
80-100 mm														70					
100-120 mm																	491		
120-150 mm															115	125	15	272	

Continued

Table 10-A-1 Continued

Quarter 1		Cod size class																	
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
<i>S. solea</i> (cont)																			
150-200 mm													184	702	488	571	695		
200-250 mm														368	130	728	4436		
Unknown size														34					
Total													254	1219	743	1805	5403		
<i>Limanda limanda</i>																			
40-50 mm									30										
50-60 mm												39	12	6	2	10			
60-70 mm													13	5	1	24			
70-80 mm													19	252	5	24			
80-100 mm											470	282	794	1554	665	421		2380	
100-120 mm												87		1222	4087	1320	1499	4960	
120-150 mm												2021	2780	4150	9202	3578	8320	33360	
150-200 mm												257	3213	12377	15579	7657	10390		
200-250 mm														193	461	5063			
250-300 mm															325	1004	1431	28475	
300-350 mm																242			
Unknown size													62	48	477	471	310	12455	
Total									30		470	2686	6893	19808	30804	19814	21951	81630	
<i>Nephrops norvegicus</i>																			
150-200 mm														15			959		
Unknown size												15							
Total												15		15			959		
<i>Crangon crangon</i>																			
15-20 mm								0				0							
20-25 mm								0											
25-30 mm								36	3					1	0				
30-35 mm												107			3		34		
35-40 mm								23				5	11		3		6		
40-50 mm								8	52			12	18	12	14				
50-60 mm								6	16	9		2	4	4	8	4			
60-70 mm							28						3	42	7				

Continued

Table 10-A-1 Continued

Quarter 1	Cod size class																	
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>C. crangon</i> (cont)																		
70-80 mm									15	26		19	77	0	5			
Unknown size															1			
Total							45	74	86	35		146	113	60	42	44		
<i>Pandalus</i>																		
30-35 mm												0						
35-40 mm														0				
40-50 mm														1	64			
50-60 mm								66				14						
Unknown size								1										
Total								66				129		2	64			
Area 7																		
All species																		
All size classes						397	534	1522	878	4138	9472	14185	38855	74359	46471	70132	298856	284540
<i>Gadus morhua</i>																		
150-200 mm																	4287	
350-400 mm														26393		380		
Unknown size																		
Total														26393		380	4287	
<i>Melanogrammus aeglefinus</i>																		
120-150 mm												2983	1780					
150-200 mm																		
Total												2983	1780					
<i>Merlangius merlangus</i>																		
80-100 mm													814				11277	
100-120 mm											2179	372					4441	46294
120-150 mm											738		3506	4445			2838	32859
150-200 mm													4918				1188	6274
200-250 mm														4249				

Continued

Table 10-A-1 Continued

Quarter 1		Cod size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>M. merlangus</i> (cont)	250-300 mm													2334		3049	550	11151	90630
	Unknown size															2417			
	Total											2917	372	11572	8694	5465	9017	107855	90630
<i>Trisopterus esmarki</i>	80-100 mm																715		
	100-120 mm										1747		1019	2658		703	1975		
	120-150 mm										84	2970	518	104		494			
	Unknown size									218	218	1007							
Total										218	1831	3978	1537	2761		1197	2690		
<i>Clupea harengus</i>	100-120 mm																	1083	
	120-150 mm																1185	4053	
	150-200 mm												934	534	23817	5532	12440	2177	26240
	200-250 mm													2944		10989	9575		
250-300 mm													9492			935			
Unknown size																			
Total													934	12970	23817	16521	24135	7313	26240
<i>Sprattus sprattus</i>	80-100 mm											276							
	120-150 mm														920	1530			
	Total											276			920	1530			
Ammodytidae	70-80 mm																56		
	80-100 mm							57						247			137	250	
	100-120 mm												59				335		
	120-150 mm												403				353		
150-200 mm																883			
Total								57					462	247		947	1765	250	
<i>Pleuronectes platessa</i>	300-350 mm																	10695	
	Unknown size																		
	Total																	10695	

Continued

Table 10-A-1 Continued

Quarter 1	Cod size class																	
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Solea solea</i>																		
120-150 mm															1443			
150-200 mm															1443		3652	23420
Total															1443		3652	23420
<i>Limanda limanda</i>																		
50-60 mm												61					1780	
70-80 mm																409	2614	1000
80-100 mm																635	1338	8270
100-120 mm														1258				
120-150 mm												1281				2926	12183	10700
150-200 mm																8199	53255	60240
200-250 mm																		
250-300 mm																	30910	31650
Unknown size																608	1100	
Total												1342	326	1258	808	12777	103182	111860
<i>Nephrops norvegicus</i>																		
120-150 mm																	3539	
Unknown size													664		96			
Total													664		96		3539	
<i>Crangon crangon</i>																		
30-35 mm															25			
Total															25			
<i>Pandalus</i>																		
20-25 mm						18			60									
30-35 mm						138		39				60			16			
50-60 mm										87								
60-70 mm																		
Total						155		39	60	87		60			16			

TABLE 10-A-2. Average stomach content weight (g) per 1000 fish by size class of commercially exploited prey species by predator size class, area and quarter, 1991, cod

Quarter 2		Cod size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 1																			
All species						390	287	167	1846	2313	5135	11226	20457	41500	81451	87451	200781	235752	
All size classes																			
Gadus morhua													94	237		1389	580		
150-200 mm																			
200-250 mm																			
400-500 mm																			
Total													94	237		1389	580		
Melanogrammus																			
aeglefinus																			
80-100 mm													21	31			497		
100-120 mm													88	32			1519		
120-150 mm												20	208	1360	3117	4165	33414		
150-200 mm														230	398				
200-250 mm															641				
250-300 mm																			
350-400 mm																			
Unknown size														14			11924		
Total												20	316	1668	4156	4165	47631		
Merlangius merlangus																			
120-150 mm																			
150-200 mm														53	52	376	241		
200-250 mm													2767		74	305	6054	26509	
250-300 mm														568	3916	297	6957		
300-350 mm															7298	1855	407		
Unknown size														409	118				
Total													2767	1030	11458	2833	13659	26509	

Continued

Table 10-A-2 Continued

Quarter 2		Cod size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Trisopterus esmarki</i>	25-30 mm													1					
	70-80 mm												4		28	61		1386	
	80-100 mm												8		1017	1460	3357	30277	
	100-120 mm										340	617	259	824	3989	7978	9335		
	120-150 mm									1737	1663	2989	11589						
	150-200 mm										2356	1737	2453			980			
	200-250 mm											1407	1338						
	Unknown size										32	133	159	707	149				
Total										2109	4770	6564	16912	5184	10479	12693	31663		
<i>Clupea harengus</i>	50-60 mm										25								
	60-70 mm										124								
	70-80 mm										72								
	150-200 mm												91	948	319	3189			
	200-250 mm													5864	16732	26906	35785	3261	
	250-300 mm													12288	1878	19831	25536		
	Unknown size										23		47	305	1506	13	4818	2830	
	Total										244		137	7116	30844	31985	60434	31627	
Ammodytidae	30-35 mm													3					
	35-40 mm												11						
	40-50 mm											8	67	92		21			
	50-60 mm								103		162	347	1556	1245	47	47	50		
	60-70 mm										86	256	106	46	11		1993		
	70-80 mm										8	329	52	104		1321			
	80-100 mm											186	19	122					
	100-120 mm															37			
	120-150 mm											103				168		345	
	150-200 mm								104		63	520	158	79	40	42	265		
	Unknown size								207		319	1751	2142	2231	99	1764	3629	345	
Total																			

Continued

Table 10-A-2 Continued

Quarter 2	Cod size class																	
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Solea solea</i>																		
100-120 mm													40	26	63	431	321	663
120-150 mm														231			541	
150-200 mm																	2553	
200-250 mm																	6053	
250-300 mm																	11674	
300-350 mm																	18764	
Total												40	26	294	431	321	40248	
<i>Limanda limanda</i>																		
20-25 mm										4								
30-35 mm											14	1						
35-40 mm												2						
50-60 mm												4						
60-70 mm												40	14	24				
80-100 mm																		
100-120 mm							22					18	128	1177	355	1181	3566	
120-150 mm												913	258	3486	1748	6511		
150-200 mm												87	44	118	404	882	1426	
Unknown size																		
Total							22			4	47	1065	444	4804	2507	10094	4992	
<i>Scomber scombrus</i>																		
300-350 mm																	12110	
Total																	12110	
<i>Nephrops norvegicus</i>																		
Unknown size								615			1207	1217	1303	6129	8286	22616	56161	
Total								615			1207	1217	1303	6129	8286	22616	56161	
<i>Pandalus</i>																		
25-30 mm												0	3					
40-50 mm												13		4				
50-60 mm																		
Unknown size								18										
Total								18										

Continued

Table 10-A-2 Continued

Quarter 2		Cod size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 2																			
All species		46	200					686	1673	2372	3933	9165	18307	47680	93447	230302	398204	243012	
All size classes																			
<i>Gadus morhua</i>																			
40-50 mm													2						
50-60 mm													1	27					
120-150 mm														340		1995			
150-200 mm																			
200-250 mm													59						
400-500 mm																	151214		
Total													61	366		1995	151214		
<i>Melanogrammus aeglefinus</i>																			
40-50 mm									37										
150-200 mm														164					
200-250 mm														173	178	12283	21484	100879	
Unknown size																			
Total									37					337	178	12283	21484	100879	
<i>Merlangius merlangus</i>																			
40-50 mm									12										
70-80 mm																			
120-150 mm												80		1103					
150-200 mm														236	1720	2601			
200-250 mm														508		13788	14040	14636	
300-350 mm															2721				
Unknown size													23	25	434				
Total									12			80	581	1872	4875	16389	14040	14636	
<i>Trisopterus esmarki</i>																			
35-40 mm													6						
60-70 mm														21					
80-100 mm															53				
100-120 mm											409	621	114	192	44				

Continued

Table 10-A-2 Continued

Quarter 2	Cod size class																		
	Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>T. esmarki</i> (cont)	120-150 mm										307	1625	2447	3628	8794	5663		2273	
	150-200 mm										71	294	341		1379				
	Unknown size										788	2679	3078	3841	10270	5663		2273	
	Total																		
<i>Clupea harengus</i>	120-150 mm													112		1378		9417	
	150-200 mm													432					
	200-250 mm													570	6749	20327	2481		
	250-300 mm													48	156				
	Unknown size													1161	6905	21705	2481	9417	
<i>Anmodytidae</i>	30-35 mm										7								
	40-50 mm																		
	50-60 mm																		
	60-70 mm																		
	70-80 mm																		
	80-100 mm																		
	100-120 mm																		
	120-150 mm																		
	150-200 mm																		
	200-250 mm																		
<i>Solea solea</i>	100-120 mm																		
	120-150 mm																		
	150-200 mm																		
	200-250 mm																		
	Unknown size																		
Total																			

Continued

Table 10-A-2 Continued

Quarter 2		Cod size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Limanda limanda</i>								16					23						
30-35 mm														1116	1352	153		3348	
70-80 mm												541	169	4098	11432	413	3167	18881	
80-100 mm													329	5417	19843	23674	12241	31168	
100-120 mm														389		15199	47869	14801	
120-150 mm																	19244		
150-200 mm																	12043		
200-250 mm																	4201	2489	
250-300 mm																			
Unknown size														104	1015	2047			
Total								16				541	521	11123	33642	52540	98765	70687	
<i>Pandalus</i>																			
10-12 mm									1			0							
12-15 mm								1											
15-20 mm									1		3	0							
20-25 mm																			
25-30 mm												10	0						
40-50 mm												14	14						
50-60 mm																			
Unknown size		2																	
Total		2						1	2		3	25	16						
Area 3																			
All species																			
All size classes							10	925	1332	2717	1581	11318	26654	50598	109538	72105	180775	482597	
<i>Gadus morhua</i>																			
100-120 mm																3155			
Total																3155			
<i>Melanogrammus aeglefinus</i>																			
150-200 mm																		26780	
200-250 mm																		38025	
Total													1025					64805	

Continued

Table 10-A-2 Continued

Quarter 2		Cod size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Merlangius merlangus</i>																			
200-250 mm														8882				41875	
250-300 mm														16427				87755	
Total														25309				129630	
<i>Trisopterus esmarki</i>																			
120-150 mm												948	1050	2714			5109	28790	
150-200 mm												4074	275	1463					
Unknown size												5022	1325	4177					
Total																	5109	28790	
<i>Clupea harengus</i>																			
200-250 mm														9542	68422	44735		66195	
250-300 mm															23453			80555	
Total														9542	91875	44735		146750	
<i>Sprattus sprattus</i>																			
70-80 mm															235		1847		
80-100 mm																	3487		
100-120 mm																	597		
Unknown size																			
Total															235		5930		
Ammodytidae																			
40-50 mm													29	429					
50-60 mm														192	603				
60-70 mm														88	787				
70-80 mm															192				
80-100 mm								223	40						293				
100-120 mm								342	78						1300				
120-150 mm									76	373					2988	2142			
150-200 mm									37	723	2	1683	719	575	472	235	450		
Unknown size																			
Total								566	231	1096	2	1683	748	5573	4488	235	450		

Continued

Table 10-A-2 Continued

Quarter 2		Cod size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Limanda limanda</i>														209			6440		
100-120 mm																			
120-150 mm													198	2247	5420				
150-200 mm													198	2456	5420		6440		
Total																			
<i>Nephrops norvegicus</i>																			
Unknown size											875		20146	83	2240	23980	137151	81882	
Total											875		20146	83	2240	23980	137151	81882	
<i>Pandalus</i>																			
15-20 mm									2			11		3					
35-40 mm													68						
40-50 mm													206	45	77				
50-60 mm										65		250	62	155	172		1183		
60-70 mm													69	473	353		1703		
70-80 mm									31			454	139	729	143				
80-100 mm															218				
Unknown size									8				68		242				
Total									42	65		716	610	1406	1204		2887		
Area 4																			
All species																			
All size classes								323	1316	2414	12612	24914	42253	28915			243500	138245	
<i>Melanogrammus aeglefinus</i>																			
200-250 mm																	166980		
Total																	166980		
<i>Merlangius merlangus</i>																			
120-150 mm																			
150-200 mm																			
Total																			

Continued

Table 10-A-2 Continued

Quarter 2		Cod size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Trisopterus esmarki</i>												1035							
100-120 mm											2532								
120-150 mm											981			12516					
150-200 mm																			
Total											3513	1035		12516					
<i>Clupea harengus</i>																			
150-200 mm														315		41650	46750		
200-250 mm												4326		300			21045		
Unknown size																			
Total												4326		615		41650	67795		
Anmodytidae																			
40-50 mm								4	13			307							
50-60 mm												458							
60-70 mm												154							
70-80 mm												166							
80-100 mm									119			507							
100-120 mm									347			530							
120-150 mm													15930						
150-200 mm												4353	9932						
200-250 mm												6653							
Unknown size										116		21							
Total							4	479	116	116		13149	25862						
<i>Solea solea</i>																			
120-150 mm														752					
Total														752					
<i>Limanda limanda</i>																			
150-200 mm														2218			15480		
Unknown size													565						
Total													565	2218			15480		

Continued

Table 10-A-2 Continued

Quarter 2		Cod size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Pandalus</i>																			
40-50 mm									10										
Unknown size									28										
Total									38										
Area 5																			
All species										900	2498		16143	19211	63308	51002	250443	309010	
All size classes																			
<i>Gadus morhua</i>														923					
120-150 mm																6566			
150-200 mm														923		6566			
Total																			
<i>Merlangius merlangus</i>																			
150-200 mm															619		88395		
250-300 mm															1425			8570	
Unknown size															2044		88395	8570	
Total															257				
<i>Trisopterus esmarki</i>																			
120-150 mm															257				
Total															257				
<i>Clupea harengus</i>																			
150-200 mm															3184		24892	95330	
200-250 mm																			
Total															3184		24892	95330	
<i>Sprattus sprattus</i>																			
80-100 mm																		6350	
100-120 mm													2880					20260	
Total													2880					26610	

Table 10-A-2 Continued

Quarter 2		Cod size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Ammodytidae																			
40-50 mm														113					
100-120 mm														510		596		13340	
120-150 mm																		136750	
150-200 mm														71					
Unknown size														694		596		150090	
Total																			
Solea solea																			
100-120 mm																	2438		
150-200 mm														674					
Total														674			2438		
Limanda limanda																			
100-120 mm																1324			
120-150 mm																	9815		
150-200 mm														2304	14044	2335			
200-250 mm															249		10745		
Unknown size														2304	14294	3659	20560		
Total																			
Crangon crangon																			
50-60 mm													308						
Total													308						
Pandalus																			
Unknown size													180						
Total													180						
Area 6																			
All species																			
All size classes	29	74	120					822	2395	4078	6217	13102	16855	34574	61359	84961	169897	376894	
Gadus morhua																			
60-70 mm											13								
100-120 mm											33								
Total											45								

Continued

Table 10-A-2 Continued

Quarter 2		Cod size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Melanogrammus aeglefinus</i>																			
150-200 mm																2531			
Total																2531			
<i>Merlangius merlangus</i>																			
40-50 mm									3										
100-120 mm												924		2754	45	201	2782		
120-150 mm														903		1465	1611	6478	
150-200 mm																1780	2360	31916	
200-250 mm															975	6831	6422	93349	
250-300 mm																1309	1831		
300-350 mm																	883		
Unknown size																			
Total									3			924		3657	1020	11586	15891	131743	
<i>Trisopterus esmarki</i>																			
150-200 mm															363				
Total															363				
<i>Clupea harengus</i>																			
100-120 mm															120				
120-150 mm														335		823	10346	9272	
150-200 mm													71	306			2249		
200-250 mm															1190				
250-300 mm															3333				
Unknown size																88			
Total													71	641	4643	911	12595	9272	
<i>Sprattus sprattus</i>																			
60-70 mm										14									
80-100 mm											56								
100-120 mm														1101	305	132			
120-150 mm															254	342	1634		
Total										14	56			1101	560	474	1634		

Continued

Table 10-A-2 Continued

Quarter 2		Cod size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Ammodytidae																			
50-60 mm									0		11								
60-70 mm										2	27								
80-100 mm									10						89				
100-120 mm										75	154		215	4046	887	206			
120-150 mm									85	231	499	141		361	5223	426	296		
150-200 mm												465		337		3578			
200-250 mm									10	11	195			529	1527	461			
Unknown size																			
Total									105	319	887	606	215	5272	7725	4670	296		
<i>Pleuronectes platessa</i>																			
150-200 mm																	1255		
300-350 mm																	5965		
Total																	7220		
<i>Solea solea</i>																			
80-100 mm										47				191					
100-120 mm										24			82	240	360		822	2563	
120-150 mm														26		7330	3722		
150-200 mm																	925	2129	
200-250 mm																			
Total										71			82	457	360	7330	5469	4692	
<i>Limanda limanda</i>																			
40-50 mm											5								
50-60 mm										16	7		13	5	22				
60-70 mm									2			155		14					
70-80 mm													25	39	34		189		
80-100 mm													23	400	52		1148		
100-120 mm													270	184	1953	1639	5687	2551	
120-150 mm											116		226	3349	1829	2263	21258	61806	
150-200 mm														3221	6445	8733	41436	70497	
200-250 mm														530	4671	6380	2769	12303	

Continued

Table 10-A-2 Continued

Quarter 2		Cod size class																	
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
<i>L. limanda</i> (cont)																			
250-300 mm										21		86	37	474	188	1608			
Unknown size										149	155	644	7779	15480	19204	74432	147157		
Total								2	16	232									
<i>Nephrops norvegicus</i>																			
Unknown size										232		316							
Total										232		316							
<i>Crangon crangon</i>																			
25-30 mm													1	3	10				
30-35 mm																			
35-40 mm								8											
40-50 mm								22	25	14				12					
50-60 mm								49	7	16									
60-70 mm								9		3			52	26					
Unknown size																			
Total								88	32	33			53	41	10				
Area 7																			
All species	48	27				90	477	1058	2641	2797	14964	28767	36217	96712	130641	254310		102850	
<i>Gadus morhua</i>																			
40-50 mm										52									
70-80 mm												11	239						
200-250 mm																			
Total										52		11	239						
<i>Melanogrammus aeglefinus</i>																			
120-150 mm													134						
150-200 mm													363						
200-250 mm													1829			5611	29493		
Unknown size													80						
Total													2406			5611	29493		

Continued

Table 10-A-2 Continued

Quarter 2		Cod size class																
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Merlangius merlangus</i>																		
40-50 mm											19	5	14					
50-60 mm												14	380					
60-70 mm												4695	1461		7834			
150-200 mm													345	11153	23408			
200-250 mm																		
Total											19	5094	1820	11153	31242			
<i>Trisopterus esmarki</i>																		
40-50 mm											23							
50-60 mm											18							
60-70 mm											48							
70-80 mm											17							
100-120 mm												201						
120-150 mm													1856		3771	1623		
150-200 mm																		
Unknown size											98							
Total											204	201	1856		3771	1623		
<i>Clupea harengus</i>																		
100-120 mm																		
120-150 mm														8647	1084	246	28970	
150-200 mm													1284		4454		13693	
200-250 mm													538					
Total													1822	8647	5538	246	42663	
<i>Sprattus sprattus</i>																		
120-150 mm													4153					
Total													4153					
<i>Ammodytidae</i>																		
40-50 mm	8							8			2							
50-60 mm									43									
60-70 mm									59									
70-80 mm								21	52									

Continued

Table 10-A-2 Continued

Quarter 2		Cod size class																
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Ammodytidae (cont)																		
80-100 mm									61	450		889	9			609		
100-120 mm									698		580	2042	29					
120-150 mm											4158	788	2093	3836	1334	4641		
150-200 mm												4117	1435	12045	41513	44538	6268	
200-250 mm													1169	10659	17016	26317		
250-300 mm		23						40	549		414	196	405	100	9849			
Unknown size								70	1462	450	5153	8033	5148	26640	69712	76105	6268	
Total	8	23																
Pleuronectes platessa																		
250-300 mm																25824		
Total																25824		
Solea solea																		
100-120 mm												56	121					
120-150 mm													121					
Total												56	121					
Limanda limanda																		
25-30 mm											1				179		812	
80-100 mm																		
100-120 mm												1014	87	2410		2753		
120-150 mm													1170			2676		
150-200 mm													396			6709		
200-250 mm																14083		
250-300 mm																		
Total											1	1014	1652	2410	179	26220	812	
Nephrops norvegicus																		
Unknown size												1484						
Total												1484						
Pandalus																		
25-30 mm										21	1			22				
Unknown size																		
Total										21	1			22				

TABLE 10-A-3. Average stomach content weight (g) per 1000 fish by size class of commercially exploited prey species by predator size class, area and quarter, 1991, cod

Quarter 3		Cod size class																		
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
Area 1																				
All species	28	27	70	90	203	128			2616	3748	5627	7931	15451	25877	48513	118068	85407	189	460	
<i>Gadus morhua</i>	All size classes																			
	20-25 mm		0																	
	30-35 mm		1		1															
	35-40 mm																			
	40-50 mm																			
	60-70 mm																			
	70-80 mm																			
	80-100 mm																			
	100-120 mm																			
	200-250 mm																			
400-500 mm																				
Unknown size																				
Total		2	2	1						364	289		17	188	767			8777		
<i>Melanogrammus aeglefinus</i>																				
	70-80 mm																			
	80-100 mm									208	8	289	426	371	18					
	100-120 mm										160	672	139	469	579		625			
	120-150 mm											712	186	769	779					
	200-250 mm														1586					
	250-300 mm																60233			
	Unknown size																			
Total									208	353	1672	782	1637	2962		625	60233			

Continued

Table 10-A-3 Continued

Quarter 3		Cod size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Merlangius merlangus</i>																			
40-50 mm										59									
70-80 mm	6	2								477	135	180	256	207					
100-120 mm												934			1316				
120-150 mm															1097				
200-250 mm															2095				
250-300 mm																			
300-350 mm																			
Unknown size															3				
Total		6	2							536	135	1114	256	424	4511				
<i>Trisopterus esmarki</i>																			
40-50 mm						12				11	25	12		16	48				
50-60 mm														50					
60-70 mm										267	13		120	94	141	240			
70-80 mm										541	77	833	137	101	179		818		
80-100 mm										50	257	416	244	242	94	240	254		
100-120 mm										60			427						
120-150 mm											120		1530	910	1907	9896	2515	18310	
150-200 mm												417	716	5905	848	17273	683		
Unknown size									143	106	57	111	64	52					
Total						12			143	1034	548	1789	3238	7369	3218	27649	4270	18310	
<i>Clupea harengus</i>																			
200-250 mm																8333	15034		
250-300 mm														269	17350	44718	10181	38223	
Unknown size													16				14670		
Total													16	269	17350	53051	39885	38223	
Anmodytidae																			
60-70 mm										738	760	282	47	57		43			
70-80 mm										36	721	742	1410	419	347	649			
80-100 mm									565		95	36	665	760	2379	1277	215		
100-120 mm													76		566	4451	46		
120-150 mm															168	1607			

Continued

Table 10-A-3 Continued

Quarter 3		Cod size class																	
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
Ammodytidae (cont)																			
150-200 mm															2317				
Unknown size								928	47	860	148	173	1006	945					
Total								1493	820	2435	1208	2372	2242	4406	10343	260			
Limanda limanda																			
70-80 mm												51							
80-100 mm												22							
120-150 mm													180	927		741			
150-200 mm													412						
Total												74	591	927		741			
Nephrops norvegicus																			
Unknown size									13	347	452	325	3357	1021	10809	12119			
Total									13	347	452	325	3357	1021	10809	12119			
Crangon crangon														2					
Unknown size														2					
Total														2					
Pandalus																			
10-12 mm											1	6							
20-25 mm									4					11					
25-30 mm								6						8					
30-35 mm										14	11								
35-40 mm												9		42					
50-60 mm																703			
80-100 mm																831			
100-120 mm																			
Unknown size								2	1	3	8								
Total								8	5	80	20	15		61		1534			

Table 10-A-3 Continued

Quarter 3		Cod size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 2																			
All species		20	16	54	69	187	375		2936	2987	4118	7807	22584	36903	49464	141694	182469	22	1420
All size classes																			
<i>Gadus morhua</i>							21				6								
40-50 mm											21								
50-60 mm											85	20	215						
60-70 mm											163	322							
70-80 mm											176	1102	1127	1742			482		
80-100 mm											302	60	401	1543		1376			
100-120 mm																			
120-150 mm																			
150-200 mm																			
Unknown size																			
Total							21		1039	789	788	1504	2845	3621		1376	482		
<i>Melanogrammus aeglefinus</i>																			
70-80 mm													35						
80-100 mm														355					
100-120 mm											589	146	339	131	1753		1894		
120-150 mm											88		314	811					
150-200 mm														570					
Unknown size										21	90	39		214					
Total										21	767	185	689	2081	1753		1894		
<i>Merlangius merlangus</i>																			
40-50 mm												11							
60-70 mm										22			14						
70-80 mm													30						
80-100 mm													82	969	3512		5705		24010
100-120 mm										77		221	1424	85	769				
120-150 mm												186							
150-200 mm																			

Continued

Table 10-A-3 Continued

Quarter 3		Cod size class																
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>M. merlangus</i> (cont)																		
200-250 mm									7			17		945		11590		
Unknown size									106		419	1566	1054	5226		17295		24010
Total																		
<i>Trisopterus esmarki</i>																		
40-50 mm									2									
50-60 mm								197	172									
60-70 mm				23				119	14	204	75	7						
70-80 mm									75		289							
80-100 mm									209	417	1085	1878	731	1943		6277		
100-120 mm								185	246	63	448	436	666					
120-150 mm											579	1636	2337			1665		
150-200 mm										241		4716	2446	4579		3234		
Unknown size									23	36	73	597	407					
Total						23		500	741	961	2548	9270	6588	6522		11176		
<i>Clupea harengus</i>																		
150-200 mm												94	498			3209		
200-250 mm													1720		124894	31148		
250-300 mm													2221			70930		
Unknown size												549						
Total												643	4440		124894	105287		
<i>Sprattus sprattus</i>																		
100-120 mm												627						
Total												627						
<i>Ammodytidae</i>																		
40-50 mm									1									
50-60 mm								9	51									
70-80 mm																		
80-100 mm								85			320	47	90					
100-120 mm									23	185	242	43	80					

Continued

Table 10-A-3 Continued

Quarter 3		Cod size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Ammodytidae (cont)																			
120-150 mm									261			316	37						
Unknown size										156	136	175	40	4					
Total									355	231	321	1052	167	173					
Solea solea																			
120-150 mm														166					
Total														166					
Limanda limanda																			
25-30 mm										0									
30-35 mm										1	1								
35-40 mm																			
100-120 mm																			
120-150 mm																			
150-200 mm																			
250-300 mm														92	1078		1516	12703	103750
300-350 mm														2439	1038	8805	9951	40523	407800
350-400 mm														2845	14659		11431		474200
Unknown size																	13740		
Total										2	1			14			1130		
Pandalus																			
15-20 mm							2		21										
20-25 mm									73										
25-30 mm					3				17								9		
30-35 mm											1								
35-40 mm											7								
40-50 mm																			
50-60 mm																			
60-70 mm																			
Unknown size																			
Total																			

Continued

Table 10-A-3 Continued

Quarter 3		Cod size class																	
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
Area 3																			
All species	22	20	38	54	170				1567	4500	4701	6629	17646	72121	45160	63840		146335	
All size classes										2		258							
Gadus morhua																			
60-70 mm																			
80-100 mm																			
Total										2		258							
Melanogrammus aeglefinus																			
40-50 mm																			
80-100 mm								19	11										
120-150 mm									96										
150-200 mm										145					4464				
Unknown size									17						8848				
Total								19	124	145					13312				
Merlangius merlangus																			
120-150 mm													298						
Unknown size									32				2722						
Total									32				3020						
Trisopterus esmarki																			
60-70 mm																			
70-80 mm									11			41	133			1985			
80-100 mm												239	173	693		5635			
120-150 mm									37			166	4949	2431	1112	10235			
150-200 mm														6679					
Unknown size									3	56				303					
Total									51	56	445	5255	11218		17855				
Clupea harengus																			
250-300 mm																			
Total														39226					
														39226					

Continued

Table 10-A-3 Continued

Quarter 3		Cod size class																	
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
Ammodytidae																			
40-50 mm									1	23									
50-60 mm								280	802	217		128							
60-70 mm								374	394	325	296	40	438						
70-80 mm								575	307	352	169	164	2062						
80-100 mm								125	163	75	67		1681						
100-120 mm									26	40			482						
120-150 mm									57				886						
150-200 mm								79	1474	2432	1196	40							
Unknown size																			
Total								1433	3223	3463	1729	371	5549						
Pleuronectes platessa																			
20-25 mm										3									
Total										3									
Limanda limanda																			
120-150 mm														41510					
Total														41510					
Nephrops norvegicus																			
Unknown size									322		480	5172	2402		18220		132940		
Total									322		480	5172	2402		18220		132940		
Pandalus																			
15-20 mm					30				0										
20-25 mm								2	1	2	26								
25-30 mm									1										
30-35 mm									26	3									
35-40 mm															1195				
40-50 mm										29	17								
50-60 mm											255								
60-70 mm															980				
Unknown size			1						5		109				3000				
Total			1		30			2	33	33	406				5175				

Continued

Table 10-A-3 Continued

Quarter 3		Cod size class																		
Prey size class		50	60	70	80	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 4																				
All species	140																			
All size classes																				
<i>Merlangius merlangus</i>																				
70-80 mm														186						
200-250 mm																	15990			
Unknown size																	4650			
Total														186			20640			
<i>Trisopterus esmarki</i>																				
Unknown size														113						
Total														113						
<i>Clupea harengus</i>																				
120-150 mm																	13380			
150-200 mm														8173	19195					
200-250 mm														18417			69065			
250-300 mm																	82445			
Total														26590	19195					
<i>Ammodytidae</i>																				
200-250 mm											202									
Total											202									
<i>Limanda limanda</i>																				
150-200 mm															27612					
Total															27612					
<i>Nephrops norvegicus</i>																				
Unknown size										604	985	1499	2491					30200		
Total										604	985	1499	2491					30200		
<i>Pandalus</i>																				
25-30 mm										8										
50-60 mm																				
60-70 mm											70			497						

Continued

Table 10-A-3 Continued

Quarter 3		Cod size class																
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Pandalus</i> (cont)																		
80-100 mm								76	224	112	500							
Unknown size									14									
Total								84	308	112	500	497						
Area 5																		
All species										1800	3218	7288	29860	129181	58478	127548		
All size classes																		
<i>Trisopterus esmarki</i>																		
120-150 mm													19540					
Total													19540					
<i>Clupea harengus</i>																		
200-250 mm																63614		
Total																63614		
<i>Sprattus sprattus</i>																		
120-150 mm														65790				
Total														65790				
Anmodytidae																		
150-200 mm											1217				1479			
Total											1217				1479			
<i>Limanda limanda</i>																		
80-100 mm														2925				
Total														2925				
<i>Scomber scombrus</i>																		
Unknown size																2143		
Total																2143		
Area 6																		
All species																		
All size classes																		
	45	41	107	227	270			1432	1974	8964	6248	9134	507	14590	72430	21700		

Continued

Table 10-A-3 Continued

Quarter 3		Cod size class																	
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
<i>Gadus morhua</i>												1632							
120-150 mm												1632							
Total												1632							
<i>Merlangius merlangus</i>																			
120-150 mm										84					31610	13270			
150-200 mm										1311	900								
Unknown size											691								
Total										1395	1592				31610	13270			
<i>Clupea harengus</i>																			
100-120 mm																8430			
120-150 mm										225									
Total										225						8430			
<i>Sprattus sprattus</i>																			
100-120 mm										521									
120-150 mm															15400				
Total										521					15400				
<i>Ammodytidae</i>																			
80-100 mm												23							
150-200 mm										190	68	158							
Unknown size																			
Total										190	68	181							
<i>Nephrops norvegicus</i>																			
Unknown size										253	161	1308	507						
Total										253	161	1308	507						
<i>Pandalus</i>																			
Unknown size					0														
Total					0														

Continued

Table 10-A-3 Continued

Quarter 3		Cod size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 7																			
All species																			
All size classes			50	27	54	115	218	9400	2517	4324	3888	6978	17807	24693	83297	99277	72495	35	3620
<i>Gadus morhua</i>																			
50-60 mm									85				172	37					
60-70 mm														200					
70-80 mm														91					
100-120 mm										46									
Unknown size									18										
Total									103	46			172	328					
<i>Melanogrammus aeglefinus</i>																			
70-80 mm															746				
80-100 mm															2125				
100-120 mm													980	350	2558				
120-150 mm															1816				
Total													980	350	7245				
<i>Merlangius merlangus</i>																			
80-100 mm										77			347	193	1424				
100-120 mm										77				765	964				
120-150 mm															1821	3420			
150-200 mm															15013	5287	10018		
200-250 mm																10562			
250-300 mm															1407		1575		
Unknown size																			
Total										154			347	957	20629	19270	11592		
<i>Trisopterus esmarki</i>																			
50-60 mm															50	270			
60-70 mm										149	122		698	248	2177	1578			
70-80 mm									448	201	558	465	545	4314	6233	13215			
80-100 mm									673	2148	177	2311	2356	3910	4477	14358			

Continued

Table 10-A-3 Continued

Quarter 3		Cod size class																	
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
<i>T. esmarki</i> (cont)																			
100-120 mm									67	419	592	271		929					
Unknown size									11	357		396							
Total								1121	2577	1633	3367	4266	8522	14087	29150				
<i>Clupea harengus</i>																			
120-150 mm															110				
150-200 mm												1402		841	21061		22250		
200-250 mm																			
250-300 mm														420					
Unknown size																			
Total												1402	841	21481	110		22250		
<i>Sprattus sprattus</i>										108									
70-80 mm										108									
Total																			
<i>Ammodytidae</i>																			
60-70 mm									23	38		60	93						
70-80 mm									74	43		122	327						
80-100 mm									43	101	154	1179							
100-120 mm										74		708							
150-200 mm														672					
200-250 mm												1325	1139	1766					
250-300 mm													432						
Unknown size												356	10	1994					
Total								219	303	490		3750	2003	4433					
<i>Solea solea</i>																	66600		
250-300 mm																	66600		
Total																			
<i>Limanda limanda</i>																			
20-25 mm								3											
30-35 mm									4										
35-40 mm								46											

Continued

Table 10-A-3 Continued

Quarter 3	Cod size class																		
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
<i>L. limanda</i> (cont)																			
40-50 mm				4				52					25						
80-100 mm													900						
100-120 mm												227	212	1603	6768				
120-150 mm													2910		7640				
150-200 mm													4047	1603	14407				
Total				4				102	4			227	4047	1603	14407				
<i>Nephrops norvegicus</i>																			
Unknown size									43										
Total									43										
<i>Pandalus</i>																			
8-10 mm				4	0														
20-25 mm				1				7			11								
25-30 mm										9									
30-35 mm										9									
35-40 mm									1										
Total				5	0			7	1	18	11								

TABLE 10-A-4: Average stomach content weight (g) per 1000 fish by size class of commercially exploited prey species by predator size class, area and quarter, 1991, cod

Quarter 4		Cod size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 1																			
All species																			
All size classes			70	13	59	176	470	1675	140	1669	4314	5462	12686	18735	41483	74612	185321	68	185
<i>Gadus morhua</i>																			
35-40 mm											1								
50-60 mm											14								
60-70 mm												24							
70-80 mm													1						
80-100 mm										27	1	26							
100-120 mm										38					340				
120-150 mm											27		5						
Unknown size											25			49					
Total										65	68	50	6	389					
<i>Melanogrammus aeglefinus</i>																			
70-80 mm															54				
80-100 mm										111	387	288	96	137	147	70		2635	
100-120 mm										409		406	528	545	1685	484	1370	5005	
120-150 mm											220	263	1990	1427	3227	4574	349		
150-200 mm													343	245	913	2540	2943		
200-250 mm																	12143		
250-300 mm																6392			
Unknown size										21	68	220	177	716	358	242	133		
Total										541	695	1177	3134	3069	6384	14303	16937	7640	
<i>Merlangius merlangus</i>																			
100-120 mm																			
120-150 mm																			
150-200 mm																			
200-250 mm																			

Continued

Table 10-A-4 Continued

Quarter 4		Cod size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>M. merlangus</i> (cont)																			
250-300 mm												3			2	623	40425		
Unknown size												3		268	556	1581	40425		
Total																			
<i>Trisopterus esmarki</i>																			
50-60 mm										1		1							
60-70 mm										66	44		45						
70-80 mm										176	723	998	2144	947	1552	5536	32085	3990	
80-100 mm											511	214	1894	2010	2878	4298	4595		
100-120 mm											9	9	331	206	1413	2593	2612		
120-150 mm													88	1208	2626	6732	8385		
150-200 mm										51	101	0	250	131	57	751			
Unknown size																			
Total										294	1388	1222	4752	4502	8527	19911	47677	3990	
<i>Clupea harengus</i>																			
150-200 mm														64					
200-250 mm													208	147	2730	3787	492		
Unknown size														3					
Total													208	214	2730	3787	492		
<i>Sprattus sprattus</i>																			
60-70 mm															10				
80-100 mm											8								
Total											8				10				
Anmodytidae																			
50-60 mm															4				
60-70 mm																			
70-80 mm																			
80-100 mm											3								
100-120 mm											90	1	49	760	19				
Total											93	1	149	760	23				

Continued

Table 10-A-4 Continued

Quarter 4		Cod size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Solea solea</i>														350		908			
150-200 mm														350		908			
Total.														350		908			
<i>Limanda limanda</i>							1					1			6 18				
25-30 mm											146			28		85			
35-40 mm														435		226	2148		
40-50 mm															1994	1767	1553		
60-70 mm																167			
70-80 mm																			
120-150 mm																			
150-200 mm																			
200-250 mm										5									
Unknown size																			
Total							1			5	146	1		462	2017	2244	3701		
<i>Scomber scombrus</i>																			
250-300 mm																14091	4399		
350-400 mm																2156	22566		
Unknown size																	47		
Total																16246	27012		
<i>Nephrops norvegicus</i>																			
Unknown size								950			27	497	194	510	4076	430	2199		
Total								950			27	497	194	510	4076	430	2199		
<i>Crangon crangon</i>																			
35-40 mm																	22		
Total																	22		
<i>Pandalus</i>																			
12-15 mm				1		1	2					2							
15-20 mm													3						
25-30 mm										18	1	1				31			
30-35 mm												5	13	19	7	4			
35-40 mm																			

Continued

Table 10-A-4 Continued

Quarter 4		Cod size class																
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Pandalus</i> (cont)																		
40-50 mm										14	4	85	70	86	327	27		
50-60 mm										3			53	242	87	45	325	
60-70 mm										7	6	38			272			
70-80 mm										28		56						
80-100 mm							710			44	276	176	114	66	897	686		
100-120 mm										82	27		29					
Unknown size										51	77		3	2				
Total				1	1	2	710		18	230	398	371	288	407	1614	758	325	
Area 2																		
All species																		
All size classes		40		105	67	133	538	1980	2586	8752	6911	9600	8622	45494	133388	150502	59696	
<i>Gadus morhua</i>																		
120-150 mm										414				395				
Total										414				395				
<i>Melanogrammus aeglefinus</i>																		
80-100 mm										255			270					
100-120 mm												233						
120-150 mm										4375	175						21052	
150-200 mm											1561							
Unknown size											47							
Total										4630	1782	233	270				21052	
<i>Merlangius merlangus</i>																		
150-200 mm																5795		
200-250 mm												4692		1108		23548		
Unknown size											29					5508		
Total											29	4692		1108		34852		

Continued

Table 10-A-4 Continued

Quarter 4		Cod size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Trisopterus esmarki</i>																			
70-80 mm										1048	707	48	551	2048	4965			12441	
80-100 mm											384	318	245	1504					
100-120 mm												1263							
120-150 mm												733							
150-200 mm													341		1108				
Unknown size										28		94			384		1253		
Total										1076	1091	2456	1137	3552	6457		1253	12441	
<i>Clupea harengus</i>																			
150-200 mm															1025				
200-250 mm																		555900	
Unknown size															113				
Total															1138			555900	
<i>Sprattus sprattus</i>																			
40-50 mm									765		273								
70-80 mm																2310	850		
80-100 mm															512				
Total									765		273				512	2310	850		
<i>Ammodytidae</i>																			
50-60 mm															7				
80-100 mm												65					282		
100-120 mm										582		227	325						
120-150 mm												485							
150-200 mm													918		488	952	872		
Unknown size												158							
Total										582		935	1243		495	952	1153		
<i>Solea solea</i>																			
150-200 mm																	2582		
Total																	2582		

Continued

Table 10-A-4 Continued

Quarter 4		Cod size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Limanda limanda</i>						2													
12-15 mm																			
80-100 mm																2692			
120-150 mm															528	31832			
150-200 mm															8014	41168	24328		
200-250 mm															1769		19405		
Unknown size																	7052		
Total						2									10311	75693	50785		
<i>Pandalus</i>																			
12-15 mm							8												
15-20 mm										7									
25-30 mm													75						
30-35 mm							28				9		6						
35-40 mm								229				26		27					
40-50 mm											36	79		177					
50-60 mm					87						46			153					
60-70 mm											68		107						
Unknown size							2				2								
Total					87		37	229		7	161	105	260	358					
Area 3																			
All species																			
All size classes					80		267		300	1050	3445	6188	37253	13665		217980	2510		
<i>Gadus morhua</i>																			
50-60 mm											143								
Total											143								
<i>Melanogrammus aeglefinus</i>																			
150-200 mm													11905						
Total													11905						

Continued

Table 10-A-4 Continued

Quarter 4		Cod size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Merlangius merlangus</i>																			
100-120 mm												1518	10680						
120-150 mm											501			495		207980			
150-200 mm																			
250-300 mm																			
Total											501	1518	10680	495		207980			
<i>Trisopterus esmarki</i>																			
80-100 mm											470					6690			
120-150 mm											70		3923						
Unknown size																			
Total											540		3923			6690			
<i>Nephrops norvegicus</i>																			
Unknown size											297	1220							
Total											297	1220							
<i>Pandalus</i>																			
15-20 mm												6							
20-25 mm												44							
50-60 mm												240	225						
60-70 mm												862							
Unknown size												166							
Total												1318	225						
Area 4																			
<i>All species</i>																			
All size classes					60	10	315	350	2460		660		18773	32020					
<i>Melanogrammus aeglefinus</i>																			
Unknown size														6690					
Total														6690					
<i>Merlangius merlangus</i>																			
150-200 mm													8590						
Total													8590						

Continued

Table 10-A-4 Continued

Quarter 4	Cod size class												
	50	60	70	80	100	120	150	200	250	300	350	400	500
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500
120-150 mm													6630
Total													6630
Area 5													
All species													
All size classes				50		100	677			16095	13224	13185	166880
<i>Gadus morhua</i>													
Unknown size													2700
Total													2700
<i>Melanogrammus aeglefinus</i>												925	
Unknown size												925	
Total												925	
<i>Merlangius merlangus</i>													
150-200 mm													13540
200-250 mm													90590
250-300 mm													61910
Total													166040
<i>Limanda limanda</i>													
150-200 mm													44565
Total													44565
<i>Crangon crangon</i>													
40-50 mm													1695
Total													1695
<i>Pandalus</i>													
25-30 mm							63						
30-35 mm										170			
Total							63			170			

Continued

Table 10-A-4 Continued

Quarter 4		Cod size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 6																			
All species					42	365	454	1521	1899	3785	6517	10554	15767	35800	49631	68211	54368		
All size classes																			
<i>Gadus morhua</i>											35								
100-120 mm											35								
Total											35								
<i>Merlangius merlangus</i>																			
150-200 mm													2256		2960	5287			
200-250 mm													54		2264	5816			
Unknown size																1463			
Total													2310		5224	12566			
<i>Trisopterus esmarki</i>																			
70-80 mm													40						
Total													40						
<i>Clupea harengus</i>																			
250-300 mm															2372	75			
Unknown size																75			
Total															2372	75			
<i>Sprattus sprattus</i>																			
70-80 mm									23		39		164			413			
80-100 mm											67	212			412	598			
100-120 mm												689							
120-150 mm												1397	37						
Unknown size													18						
Total									23		106	2298	219		412	1011			
<i>Ammodytidae</i>																			
120-150 mm												113				376			
150-200 mm													196		1094				
Unknown size									99				4	213					
Total									99			113	200	213	1470				

Continued

Table 10-A-4 Continued

Quarter 4		Cod size class																	
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
<i>Limanda limanda</i>					11	14					3								
35-40 mm										6	11			122					
40-50 mm											44		240						
50-60 mm										17	101	57							
60-70 mm											9	63							
70-80 mm										53									
80-100 mm															1150	3320			
100-120 mm													1044		3193	9685			
120-150 mm													3579		3241				
150-200 mm														11688	9944	2692			
200-250 mm															11930	9728			
Total					11	14				76	168	120	4864	11810	29458	25425			
<i>Crangon crangon</i>																			
20-25 mm					1		2	2				1	7						
25-30 mm							2	14		5	15	1							
30-35 mm					3		10	1		7	41	59		13					
35-40 mm					17		101	34		70	215	443	294	121					
40-50 mm					87		334	562	547	471	533	1115	1204	902	81	102			
50-60 mm							14	283	379	495	744	1339	1137	788	143	310			
60-70 mm								4	56	218	259	1003	1690	989	391				
70-80 mm											30	100							
Unknown size					24		186	422	320	719	529	1626	1667	521	21	150			
Total					133		651	1322	1302	1985	2365	5686	5999	3334	636	562			
Area 7																			
All species																			
All size classes			90	99	93	142	354	661	1394	4160	4549	20500	40880	187117	120215	469130	799	430	
<i>Gadus morhua</i>																			
60-70 mm												532				8960			
120-150 mm																			
Total												532				8960			

Continued

Table 10-A-4 Continued

Quarter 4		Cod size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Melanogrammus aeglefinus</i>																3582			
120-150 mm																6887			
150-200 mm																10468			
Total																			
<i>Merlangius merlangus</i>										555						2310		11050	
100-120 mm																		5807	
120-150 mm																29383			
150-200 mm																26390			
200-250 mm																			
250-300 mm										555						58083		16857	
Total																			
<i>Trisopterus esmarki</i>										316									
Unknown size										316									
Total																			
<i>Clupea harengus</i>																			10210
100-120 mm																		8963	48300
120-150 mm																		28543	128100
150-200 mm																		37507	186610
Total																			
<i>Sprattus sprattus</i>																		1067	
70-80 mm																		5117	
80-100 mm																		6183	
Total																			
<i>Anmodytidae</i>											29	64	3420						
50-60 mm																			
150-200 mm																			
Total											29	64	3420						

Continued

Table 10-A-4 Continued

Quarter 4		Cod size class																
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Pleuronectes platessa</i>																		
150-200 mm																	38603	51030
200-250 mm																	150900	104850
250-300 mm																		
Total																	189503	155880
<i>Limanda limanda</i>										42								
40-50 mm																		
50-60 mm																1635		
60-70 mm															770	1605		
70-80 mm																9110		
80-100 mm																5290		
100-120 mm															4840	10850	6107	45000
120-150 mm															23952		43413	74670
150-200 mm															20775	47765	58347	335450
200-250 mm															12643		55320	
Unknown size																2180		
Total										42					62980	78435	163187	455120
<i>Crangon crangon</i>																		
50-60 mm							3											
Total							3											
<i>Pandalus</i>																		
10-12 mm				4						61								
30-35 mm																		
Total				4						61								

TABLE 10-B-1: Average stomach content weight (g) per 1000 fish by size class of commercially exploited prey species by predator size class, area and quarter, 1991, haddock

Quarter 1		Haddock size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 1																			
All species						28	230	188	326	573	776	1478	2214	2964	28160				
All size classes																			
<i>Trisopterus esmarki</i>																			
80-100 mm											45		333	478					
100-120 mm												112	235						
120-150 mm											36	159							
Unknown size																			
Total											80	271	568	478					
Ammodytidae																			
80-100 mm											4								
100-120 mm									15		5								
Unknown size									4										
Total									19		8								
<i>Solea solea</i>																			
35-40 mm											8	7	1						
40-50 mm																			
Total											8	7	1						
<i>Nephrops norvegicus</i>																			
40-50 mm											21	8	16						
Unknown size							1						1						
Total							1				21	8	17						
<i>Crangon crangon</i>																			
7-8 mm							0												
8-10 mm							0												
12-15 mm							0				1								

Continued

Table 10-B-1 Continued

Quarter 1		Haddock size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>C. crangon</i> (cont)	20-25 mm								0										
	30-35 mm							0											
	Total						0	0	0		1								
<i>Pandalus</i>	40-50 mm									4									
	Unknown size							2					6						
	Total							2		4			6						
Area 2																			
All species																			
All size classes						20	101	159	414	379	920	893	1353	5382					
<i>Trisopterus esmarki</i>	Unknown size											2							
	Total											2							
Ammodytidae	60-70 mm							3											
	70-80 mm								32		82								
	80-100 mm										99	13							
	100-120 mm								28	38	33								
	Unknown size										62	4							
	Total								3	60	38	277	17						
<i>Pandalus</i>	40-50 mm										51								
	Unknown size												111						
	Total										51		111						
Area 3																			
All species																			
All size classes						54	126	218	555	294	418	600	3162	568					

Continued

Table 10-B-1 Continued

Quarter 1		Haddock size class																	
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
<i>Clupea harengus</i>												2272							
150-200 mm												386							
Unknown size																			
Total												2658							
<i>Ammodytidae</i>										6									
40-50 mm									2										
60-70 mm								45		21									
70-80 mm								1	2	38									
Unknown size																			
Total								45	4	65									
<i>Solea solea</i>																			
15-20 mm									0										
Total									0										
<i>Nephrops norvegicus</i>																			
25-30 mm										2									
40-50 mm											95								
Total										2	95								
<i>Pandalus</i>																			
12-15 mm								0											
Total								0											
Area 4																			
<i>All species</i>							209	405		83		3069							
All size classes																			
<i>Ammodytidae</i>																			
70-80 mm								114											
Total								114											

Continued

Table 10-B-1 Continued

Quarter 1		Haddock size class																
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Pandalus</i>																		
Unknown size							10											
Total							10											
Area 5 - No samples																		
Area 6																		
All species																		
All size classes								142										
Area 7																		
All species																		
All size classes						4	81	249	600	421	1038							
<i>Crangon crangon</i>																		
8-10 mm								2										
10-12 mm								5										
12-15 mm								3										
25-30 mm								37										
Unknown size								7										
Total								54										

TABLE 10-B-2: Average stomach content weight (g) per 1000 fish by size class of commercially exploited prey species by predator size class, area and quarter, 1991, haddock

Quarter 2		Haddock size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 1																			
All species																			
All size classes					8		102	535	951	1773	2707	3222	6035	10963	20379	1277			
<i>Clupea harengus</i>																			
Unknown size															1675				
Total															1675				
<i>Anmodytidae</i>																			
30-35 mm								0			0	6							
35-40 mm								2	0	8	7	68	6						
40-50 mm								28	34	116	60	332	36						
50-60 mm								3	5	4	21	82	48	13					
60-70 mm								2	4		35	2	195						
70-80 mm											8		117						
80-100 mm									1				191						
120-150 mm							3	40	95	340	205	406	666			390			
Unknown size																			
Total							3	76	140	468	363	897	1260	13		390			
<i>Nephrops norvegicus</i>																			
12-15 mm														72					
Total														72					
<i>Crangon crangon</i>																			
12-15 mm							0												
Total							0												
<i>Pandalus</i>																			
15-20 mm								0	0			1							
Unknown size									0										
Total								0	0			1							

Continued

Table 10-B-2 Continued

Quarter 2		Haddock size class																
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Pollachius virens</i>												1						
40-50 mm																		
Total												1						
Area 2																		
All species			4	27		116	553	1372	1645	2485	4119	8327	9179					
All size classes																		
<i>Trisopterus esmarki</i>																		
120-150 mm										1		110						
Unknown size																		
Total										1		110						
Ammodytidae																		
40-50 mm								2										
60-70 mm								0	76	2								
70-80 mm								5				351						
80-100 mm							6		106			75						
100-120 mm									40									
120-150 mm											140							
150-200 mm											333		3881					
Unknown size							78	64	368	254	972	747	839					
Total							84	71	590	256	1509	1173	4720					
<i>Solea solea</i>																		
25-30 mm							1											
Total							1											
<i>Crangon crangon</i>																		
8-10 mm							0											
Total							0											
<i>Pandalus</i>																		
15-20 mm									0									
Total									0									

Continued

Table 10-B-2 Continued

Quarter 2		Haddock size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 3																			
All species	All size classes			16	195	191	349	675	1338	2200	4266	5565	12780						
<i>Sprattus sprattus</i>	100-120 mm												171						
Total													171						
<i>Ammodytidae</i>																			
15-20 mm						160				2	3		2						
25-30 mm													16						
30-35 mm											3		86						
35-40 mm											52	2	1089						
40-50 mm								1	42	75	236	150							
50-60 mm					56			4	341	739	315	87	932						
60-70 mm									30		434	79	1826						
70-80 mm											86		343						
80-100 mm												69	143						
120-150 mm													377						
Unknown size					113			176	238	358	770	1856	1817						
Total					169	160		181	653	1194	1896	2243	6631						
<i>Crangon crangon</i>																			
12-15 mm								0		0									
Total								0		0									
<i>Pandalus</i>																			
8-10 mm										1									
10-12 mm							1			0									
12-15 mm								1		0									
15-20 mm								0		0									
Unknown size								0			0								
Total								1	1	1	0								

Continued

Table 10-B-2 Continued

Quarter 2		Haddock size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 4																			
All species								326	2263	917	596	5851	2491						
All size classes																			
Ammodytidae																			
40-50 mm								23	1774	4	140	53	3803	145					
Unknown size																			
Total								23	1778	140	53	3803	145						
Pleuronectes platessa																			
25-30 mm									12				3						
Unknown size																			
Total									12				3						
Area 5																			
All species																			
All size classes						31						27657							
Ammodytidae																			
Unknown size												27560							
Total												27560							
Area 6																			
All species																			
All size classes									726	868	1825								
Ammodytidae																			
Unknown size									362										
Total									362										
Area 7																			
All species																			
All size classes							82	535	732	1559	1113	3668	6482	6021	11927				

Continued

Table 10-B-2 Continued

Quarter 2	Haddock size class																		
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
<i>Gadus morhua</i> 35-40 mm Total									4 4										
<i>Trisopterus esmarki</i> 40-50 mm 50-60 mm Total									9 9			13 14 27							
Ammodytidae 50-60 mm Unknown size Total							38	2	14 22 36			39 1146 39							
<i>Pleuronectes platessa</i> 20-25 mm Total								8 8											

TABLE 10-B-3: Average stomach content weight (g) per 1000 fish by size class of commercially exploited prey species by predator size class, area and quarter, 1991, haddock

Quarter 3		Haddock size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 1																			
All species																			
All size classes	24	18	23	29	99	148	217	516	1128	2213	3312	4718	13225	49673					
<i>Gadus morhua</i>																			
50-60 mm														54					
Total														54					
<i>Melanogrammus aeglefinus</i>																			
70-80 mm																			
80-100 mm										82	33								
Unknown size									29										
Total									29	82	33								
<i>Trisopterus esmarki</i>																			
50-60 mm														135					
60-70 mm													31						
70-80 mm							3	4			25	5							
80-100 mm								24			6								
120-150 mm								23							39970				
Unknown size							2	0		6	49								
Total							2	3	51	6	85	31	135	39970					
<i>Anmodytidae</i>																			
50-60 mm																			
60-70 mm																			
70-80 mm							7												
80-100 mm																			
100-120 mm																			
Unknown size			5				8	28	54	232	418	1019	1183	5256	5222				
Total			5				8	35	111	513	869	1832	1762	9705	8174				

Continued

Table 10-B-3 Continued

Quarter 3		Haddock size class																
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Solea solea</i>																		
25-30 mm								0										
Total								0										
<i>Nephrops norvegicus</i>																		
15-20 mm							0											
70-80 mm										27								
80-100 mm									36	63								
Total							0		36	90								
<i>Crangon crangon</i>																		
8-10 mm					0													
12-15 mm					0						1							
15-20 mm								0	1									
20-25 mm											2							
25-30 mm											1							
Unknown size																		
Total					0		0	0	1		3							
<i>Pandalus</i>																		
25-30 mm							0	1	0									
30-35 mm									0				4					
Unknown size						0	0	0	1									
Total						0	1	1	2			4						
Area 2																		
All species																		
All size classes			40	77	80	200	216	924	786	1244	1881	2464						
<i>Melanogrammus aeglefinus</i>																		
80-100 mm											30							
Total											30							

Continued

Table 10-B-3 Continued

Quarter 3		Haddock size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Trisopterus esmarki</i>																			
60-70 mm												28							
70-80 mm												44							
80-100 mm												60							
100-120 mm											62								
Unknown size									68		10								
Total									68		72	132							
<i>Ammodytidae</i>																			
60-70 mm												4	13						
70-80 mm												16							
80-100 mm										12		68							
100-120 mm									144	19		91							
120-150 mm										37	41	19	273						
Unknown size									39	37		578	466						
Total									183	68	41	776	752						
<i>Crangon crangon</i>																			
15-20 mm								0											
Total								0											
<i>Pandalus</i>																			
15-20 mm							0												
Total							0												
Area 3																			
All species																			
All size classes					55	100	242	500	1438	3011	5444	6106	5525	772	2449				
<i>Melanogrammus aeglefinus</i>																			
150-200 mm													1140						
Total													1140						

Continued

Table 10-B-3 Continued

Quarter 3		Haddock size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Trisopterus esmarki</i>																			
80-100 mm											7								
Unknown size											4								
Total											11								
<i>Ammodytidae</i>																			
Eggs																			
50-60 mm				6	17		4	6	150	159	116	307	343						
60-70 mm							25	6	27	439	723	1307	538						
70-80 mm								81	39	225	781	680	226						
80-100 mm										31	105	281	96						
100-120 mm									19		26								
Unknown size						28	118	241	911	1779	2929	2690	2324						
Total					6	45	146	334	1196	2633	4679	5265	3527						
<i>Solea solea</i>																			
Unknown size									1										
Total									1										
<i>Nephrops norvegicus</i>																			
25-30 mm													23						
Total													23						
<i>Crangon crangon</i>																			
4-5 mm							0												
6-7 mm							0												
7-8 mm						0													
8-10 mm						0	0												
10-12 mm						0	0												
20-25 mm							0												
Total						0	1												
<i>Pandalus</i>																			
20-25 mm															92				
Unknown size												8			1341				
Total												8			1433				

Continued

Table 10-B-3 Continued

Quarter 3		Haddock size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 4																			
All species				108	52	104		791	598	746	1596	2331	5906	8990					
All size classes																			
Ammodytidae																			
150-200 mm									56	121	649								
Unknown size																			
Total									56	121	649								
Pleuronectes platessa										0									
10-12 mm																			
Total										0									
Crangon crangon																			
8-10 mm									0										
15-20 mm									1										
Total									1										
Pandalus										4									
25-30 mm																			
30-35 mm											4								
Total										4	4								
Area 5 - No samples																			
Area 6																			
All species																			
All size classes											4086								
Area 7																			
All species																			
All size classes					201	186	591	205	986	1390	1665	3173	5489	21985					
Melanogrammus aeglefinus																			
80-100 mm																			
Total																			

Continued

Table 10-B-3 Continued

Quarter 3		Haddock size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Trisopterus esmarki</i>																			
60-70 mm									58	48		40	266						
70-80 mm											23	167	221						
80-100 mm										42		14							
Unknown size																			
Total									58	91	23	337	486						
<i>Ammodytidae</i>																			
70-80 mm														503					
80-100 mm									44					4061					
100-120 mm														6057					
120-150 mm									42			3		543					
Unknown size														2454					
Total									86			3		13618					
<i>Crangon crangon</i>																			
6-7 mm						0													
12-15 mm						0	0	1	1		1								
20-25 mm																			
Total						0	0	1	1		1								
<i>Pandalus</i>																			
20-25 mm										0									
Total										0									

TABLE 10-B-4: Average stomach content weight (g) per 1000 fish by size class of commercially exploited prey species by predator size class, area and quarter, 1991, **haddock**

Quarter 4		Haddock size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 1																			
All species					53	99	170	282	551	928	1513	2625	3750	14642	36365				
All size classes																			
<i>Melanogrammus aeglefinus</i>																			
120-150 mm														892					
Total														892					
<i>Trisopterus esmarki</i>								6											
30-35 mm										9	4		18						
50-60 mm										4									
60-70 mm																			
70-80 mm												9	73	120	1179				
80-100 mm											307	305	381	1773	17044				
100-120 mm										114	79	436	299	1041	461				
120-150 mm										44									
Unknown size									56	24	33	219		1265	811				
Total								6	56	195	422	969	772	4199	19496				
<i>Clupea harengus</i>																			
Unknown size														586					
Total														586					
<i>Ammodytidae</i>																			
60-70 mm								0											
70-80 mm											7	5	17						
80-100 mm												59	31		533				
100-120 mm										44				110					
Unknown size									6	16	52	49	217	403	1551				
Total								0	6	60	58	112	265	514	2084				

Continued

Table 10-B-4 Continued

Quarter 4	Haddock size class																	
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Nephrops norvegicus</i>					0													
15-20 mm													3					
25-30 mm											50							
80-100 mm											1		1					
Unknown size																		
Total					0						50		4					
<i>Pandalus</i>					0													
8-10 mm																		
40-50 mm						25	2			0		2						
50-60 mm													566					
80-100 mm												25						
Unknown size										1	4							
Total					0	25	2			1	4	26	566					
Area 2																		
All species																		
All size classes					73	99	138	315	867	814	2159	2806	9003	37548				
<i>Trisopterus esmarki</i>																		
80-100 mm																		
100-120 mm									204		146	784	985					
120-150 mm									248		323	89	2838	22700				
Total									452		652	873	3823	22700				
<i>Ammodytidae</i>																		
80-100 mm											104							
100-120 mm										42								
120-150 mm										42								
Unknown size									7	170	292	148						
Total									7	255	396	148						

Continued

Table 10-B-4 Continued

Quarter 4		Haddock size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 3																			
All species	All size classes					107	136	277	645	1417	2485	2694	5493						
<i>Trisopterus esmarki</i>																			
70-80 mm								47											
100-120 mm										191	402	187							
Unknown size											24								
Total								47		191	427	187							
Ammodytidae																			
50-60 mm										15	54								
60-70 mm										27	133	16							
70-80 mm										22	243	81							
80-100 mm										13		61							
100-120 mm										87		83							
Unknown size																			
Total										164	431	240							
<i>Nephrops norvegicus</i>																			
40-50 mm									34										
60-70 mm											323	801							
70-80 mm										96									
Unknown size											156								
Total									34	96	479	801							
<i>Crangon crangon</i>																			
20-25 mm										2									
Total										2									
<i>Pandalus</i>																			
30-35 mm								0	3										
35-40 mm									21										

Continued

Table 10-B-4 Continued

Quarter 4		Haddock size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Pandalus</i>								18	14	23	9								
40-50 mm																			
50-60 mm																			
Unknown size																			
Total								19	38	23	9								
Area 4																			
All species																			
All size classes							335	412	486	326	1287	1807	1961						
<i>Clupea harengus</i>																			
30-35 mm											2								
Total											2								
Ammodytidae																			
120-150 mm												67							
Unknown size											1								
Total											1	67							
<i>Crangon crangon</i>																			
7-8 mm											0								
8-10 mm																			
12-15 mm																			
Total											0								
Area 5 - No samples																			
Area 6																			
All species																			
All size classes										1114	2516	185							
Area 7																			
All species																			
All size classes							222	177	170	693	1237	2114	2742		24185	23155			

TABLE 10-C-1: Average stomach content weight (g) per 1000 fish by size class of commercially exploited prey species by predator size class, area and quarter, 1991
whiting

Quarter 1		Whiting size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 1																			
All species						239	182	582	285	1000	1389	2701	7730	8420					
All size classes																			
<i>Melanogrammus aeglefinus</i>																			
80-100 mm											0								
100-120 mm											4								
120-150 mm													71						
150-200 mm										1									
Total										1	4		71						
<i>Merlangius merlangus</i>																			
40-50 mm										0									
50-60 mm										0									
120-150 mm										41									
Unknown size										0									
Total										41									
<i>Trisopterus esmarki</i>																			
50-60 mm										21	4								
60-70 mm																			
70-80 mm									12	35	15	152	16						
80-100 mm									27	108	43	68							
100-120 mm								11	0	361	242	252	3095	8420					
120-150 mm								4	68	128	136	1244	968						
150-200 mm										6	524	107	202						
Unknown size								3	9	21	83	156	57						
Total								17	117	680	1046	1978	4337	8420					

Continued

Table 10-C-1 Continued

Quarter 1		Whiting size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Clupea harengus</i>																			
120-150 mm											16		1705						
150-200 mm													586						
Total											16		2291						
<i>Anmodytidae</i>																			
30-35 mm											0								
50-60 mm							4	4	1	0									
60-70 mm								2											
70-80 mm								8	3	0									
80-100 mm								12	3										
100-120 mm									19										
150-200 mm												78							
Unknown size								12	11			3							
Total							4	38	37	0	0	80							
<i>Crangon crangon</i>																			
5-6 mm																			
8-10 mm								0	0										
10-12 mm							0	0	1										
12-15 mm								0	0	0									
15-20 mm								0	0										
20-25 mm									0	1									
25-30 mm						17		1			1								
30-35 mm																			
35-40 mm										0									
Total						17	0	1	1	2	1								
<i>Pandalus</i>																			
35-40 mm										8									
40-50 mm									1	5	9	12							
70-80 mm																			
80-100 mm										14									
100-120 mm									24		36	14							
Total									25	28	45	26							

Continued

Table 10-C-1 Continued

Quarter 1		Whiting size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 2																			
All species					30	65	289	747	684	1064	2363	2753							
All size classes																			
<i>Melanogrammus aeglefinus</i>												518							
80-100 mm												60							
150-200 mm																			
Total											60	518							
<i>Merlangius merlangus</i>																			
100-120 mm									18		97								
120-150 mm								12		22	83								
150-200 mm											327								
Total									30	22	507								
<i>Trisopterus esmarki</i>																			
50-60 mm										5									
60-70 mm								7											
70-80 mm								2	31	6									
80-100 mm								261	63	258	514								
100-120 mm								61	308	301	216	2110							
120-150 mm								41	51	76	151								
150-200 mm											63								
Unknown size								5	14	3		82							
Total								376	467	649	944	2192							
<i>Anmodytidae</i>																			
30-35 mm							4												
40-50 mm																			
50-60 mm							15	4	4	4	20								
60-70 mm							11	12	7		39								
70-80 mm							10	24	13	5	6								
80-100 mm							11	98	16	47	308								
100-120 mm							12	7	14	37									

Continued

Table 10-C-1 Continued

Quarter 1		Whiting size class																	
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
Ammodytidae (cont)																			
120-150 mm																			
Unknown size						7	11	5	45	193									
Total						70	156	60	138	565									
Crangon crangon																			
8-10 mm						0													
10-12 mm					0	1	0												
12-15 mm					1	0	0			0									
15-20 mm					1	0	0				4								
20-25 mm								0											
25-30 mm							2												
Unknown size					0		0												
Total					2	1	2	0		0	4								
Pandalus																			
60-70 mm								32											
Total								32											
Area 3																			
All species																			
All size classes				31	273	208	434	551	979	7599	4949	3110							
Melanogrammus aeglefinus																			
100-120 mm																			
120-150 mm									14										
150-200 mm											1740								
Total									14	55	1740								
Merlangius merlangus																			
70-80 mm								5											
100-120 mm									128	31	888								
120-150 mm								10	78	501	800								
Unknown size							1												
Total							1	15	205	532	1688								

Continued

Table 10-C-1 Continued

Quarter 1		Whiting size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Trisopterus esmarki</i>											12								
50-60 mm																			
70-80 mm									2										
80-100 mm									4	172	71								
100-120 mm											112								
120-150 mm									46	22	6431	1464							
Unknown size										4	19		1150						
Total									52	199	6645	1464	1150						
<i>Clupea harengus</i>																			
80-100 mm										50									
100-120 mm									40										
Total									40	50									
<i>Sprattus sprattus</i>																			
70-80 mm									6										
100-120 mm									20										
Total									25										
<i>Ammodytidae</i>																			
30-35 mm							1												
40-50 mm									5										
50-60 mm						219	6	1	1	1									
60-70 mm						6	12	11	1	1	11								
70-80 mm								12	19	5									
80-100 mm								34	27	21									
100-120 mm									29	8									
120-150 mm								13		5									
150-200 mm									8	114									
Unknown size												8							
Total						233	70	90	109	191	11	8							

Continued

Table 10-C-1 Continued

Quarter 1		Whiting size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Crangon crangon</i>						0													
5-6 mm										0									
8-10 mm										0									
10-12 mm										0									
12-15 mm								0	0	0									
35-40 mm								3											
40-50 mm										1									
Unknown size								2		1									
Total						0		6	0	2									
<i>Pandalus</i>																			
15-20 mm										0									
40-50 mm							1	1		1									
50-60 mm								29	22										
60-70 mm										1									
Unknown size										1									
Total							1	31	22	3									
Area 4																			
<i>All species</i>																			
<i>All size classes</i>							280	330	452	4727	1696	1950							
<i>Merlangius merlangus</i>																			
100-120 mm											1175								
Total											1175								
<i>Trisopterus esmarki</i>																			
100-120 mm										233									
120-150 mm										670									
Total										903									
<i>Sprattus sprattus</i>																			
70-80 mm										139									
80-100 mm											159								
100-120 mm										3338									
Total										3477	159								

Continued

Table 10-C-1 Continued

Quarter 1		Whiting size class																
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Ammodytidae																		
50-60 mm								11	89									
60-70 mm						130		85	48									
70-80 mm							105	94										
80-100 mm																		
100-120 mm							9		49									
Unknown size									22									
Total						130	113	190	209									
Crangon crangon																		
12-15 mm							1											
15-20 mm						5												
35-40 mm									15									
Total						5	1		15									
Pandalus																		
40-50 mm								175			1950							
50-60 mm										248								
Total								175		248	1950							
Area 5																		
All species																		
All size classes				27	159	253	1009	596	2208	2181	2536	630						
Sprattus sprattus																		
50-60 mm									41									
60-70 mm						30		76	85									
70-80 mm								52	258	193	313							
80-100 mm								156	89	366	902							
100-120 mm										266								
120-150 mm							70			245								
Unknown size																		
Total						30	70	283	474	1070	1215							

Table 10-C-1 Continued

Quarter 1		Whiting size class																	
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
Ammodytidae								3											
60-70 mm								3											
Total								3											
Crangon crangon																			
25-30 mm					64	2													
30-35 mm						9													
35-40 mm									18										
40-50 mm								5			131								
Unknown size																			
Total					64	11		5	18		131								
Pandalus																			
25-30 mm								1											
30-35 mm						2													
35-40 mm								7											
40-50 mm							48	8											
50-60 mm								17											
60-70 mm							24	9	12										
Unknown size							9												
Total						2	81	41	12										
Area 6																			
All species																			
All size classes		5		32	64	88	218	748	1257	2794	2977	8415							
Merlangius merlangus																			
80-100 mm										0									
100-120 mm									27			2627							
120-150 mm									16	113	331								
150-200 mm																			
Total									43	114	331	2627							

Continued

Table 10-C-1 Continued

Quarter 1		Whiting size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Clupea harengus</i>																			
80-100 mm								4		97	8								
100-120 mm									16	92	37	727							
120-150 mm											40	687							
Unknown size											27								
Total								4	16	189	112	1414							
<i>Sprattus sprattus</i>																			
50-60 mm								19	61	8									
60-70 mm								5	38	11	11	50							
70-80 mm								11	42	22	22	77							
80-100 mm								6	39	36	450	46							
100-120 mm									110	43	17								
120-150 mm											19								
Unknown size										41	30								
Total								40	290	161	548	173							
<i>Ammodytidae</i>																			
50-60 mm								2		4									
60-70 mm									0										
80-100 mm									6		45								
100-120 mm								1	9	18	164								
120-150 mm										69	8	254							
150-200 mm											39		375						
Unknown size								4	10	3	3								
Total								7	25	94	258	254	375						
<i>Crangon crangon</i>																			
8-10 mm											0								
10-12 mm							0				0								
12-15 mm								1	0	0									
15-20 mm						2		0		0	0								
20-25 mm								2	0										
25-30 mm																			
30-35 mm									6		1								
								1	3	0	21								

Continued

Table 10-C-1 Continued

Quarter 1	Whiting size class												
	Prey size class	50	60	70	80	100	120	150	200	250	300	350	400
<i>Crangon crangon</i> (cont)													
35-40 mm								2	6	14			
40-50 mm							2	3	3	2	73	14	
50-60 mm								1	11				
60-70 mm								1		2			
Unknown size						4	3	2	28	1	7	2	
Total						7	14	14	58	19	102	15	
<i>Pollachius virens</i>													
100-120 mm													3313
Unknown size													575
Total													3888
Area 7													
All species													
All size classes					32	79	73	591	955	1498	2720	1123	12310
<i>Melanogrammus aeglefinus</i>													
120-150 mm											65		
Total											65		
<i>Merlangius merlangus</i>													
80-100 mm											12		
100-120 mm										153			
120-150 mm											96		
150-200 mm												1047	
Total										153	108	1047	
<i>Trisopterus esmarki</i>													
80-100 mm										6			
100-120 mm										102	295		
120-150 mm										29	25		
Total										137	320		

Continued

Table 10-C-1 Continued

Quarter 1	Whiting size class																		
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
<i>Sprattus sprattus</i>																			
80-100 mm								118											
100-120 mm								29	297										
Total								147	297										
<i>Ammodytidae</i>																			
50-60 mm							22												
60-70 mm						1	14	45	63	15									
70-80 mm						4	83	346	19	11									
80-100 mm						9	154	50	13										
100-120 mm							1	5	158										
150-200 mm									161										
Unknown size						1	36	1	60										
Total						15	310	448	474	26									
<i>Crangon crangon</i>																			
10-12 mm							0												
12-15 mm						1													
Unknown size							0												
Total						1	0												
<i>Pandalus</i>																			
40-50 mm							1		6										
60-70 mm							21												
Unknown size						1	0	10	27	110									
Total						1	23	10	33	110									
<i>Other</i>																			
All size classes				32	79	56	229	309	272	658	77	135							

TABLE 10-C-2: Average stomach content weight (g) per 1000 fish by size class of commercially exploited prey species by predator size class, area and quarter, 1991, whiting

Quarter 2		Whiting size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 1																			
All species																			
All size classes						260	802	1085	1659	3293	6027	8716	12917	10430					
<i>Gadus morhua</i>																			
25-30 mm										0									
Total										0									
<i>Melanogrammus aeglefinus</i>																			
10-12 mm										0									
15-20 mm								6	2	0									
20-25 mm										8									
25-30 mm									0										
30-35 mm										2									
35-40 mm										0									
40-50 mm										1									
50-60 mm								1		1									
Unknown size										6									
Total								7	2	19									
<i>Merlangius merlangus</i>																			
10-12 mm									0										
12-15 mm									0										
15-20 mm										0	0								
20-25 mm										0									
25-30 mm										0									
100-120 mm													88						
Total									0	1	0		88						

Continued

Table 10-C-2 Continued

Quarter 2		Whiting size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Trisopterus esmarki</i>	15-20 mm								6	0									
	20-25 mm								1										
	25-30 mm								0										
	30-35 mm								0										
	40-50 mm								0										
	50-60 mm									3	3								
	60-70 mm									47		29							
	70-80 mm								1	7	5	35							
	80-100 mm									65	110		255						
	100-120 mm								4	137	374	779	1893						
120-150 mm									84	841	2393	477							
150-200 mm									12	41	278	1281							
Unknown size									5	1	66	11	229						
Total									16	356	1440	3526	4133						
<i>Clupea harengus</i>	120-150 mm																		
	Unknown size										42	298	953						
													2733						
	Total										42	298	3686						
<i>Sprattus sprattus</i>	70-80 mm									21		22							
	80-100 mm									25		25							
	100-120 mm										18								
	Total									46	18	47							
Anmodytidae	7-8 mm																		
	12-15 mm							0		0									
	15-20 mm								0	0									
	20-25 mm								0										
	25-30 mm									1	0								
	30-35 mm									117	77		9						
	35-40 mm									79	1								

Continued

Table 10-C-2 Continued

Quarter 2		Whiting size class																	
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
Ammodytidae (cont)																			
40-50 mm						512	229	360	209	264	223	370							
50-60 mm							363	329	760	850	757	290	2960						
60-70 mm							11	43	222	606	822	516	4992						
70-80 mm								63	50	148	158	43							
80-100 mm								28	11	24	64								
100-120 mm										15	9								
120-150 mm										71									
150-200 mm										28									
Unknown size							244	145	397	492	591	803	2478						
Total						512	912	1100	1845	2576	2624	2031	10430						
<i>Microstomus kitt</i>																			
20-25 mm									0										
Total									0										
<i>Crangon crangon</i>																			
12-15 mm								0											
15-20 mm									0										
30-35 mm									0										
50-60 mm								1		0									
Unknown size																			
Total								1	0	0									
<i>Pandalus</i>																			
12-15 mm								0		0									
15-20 mm								0		0									
20-25 mm								0											
Total								0		0									
Area 2																			
All species						355	261	942	1343	2483	3112	7535	25670						
All size classes																			

Continued

Table 10-C-2 Continued

Quarter 2		Whiting size class																	
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
<i>Gadus morhua</i>																			
40-50 mm							2	2											
50-60 mm							4												
Unknown size							6	2											
Total																			
<i>Melanogrammus aeglefinus</i>																			
15-20 mm							0												
25-30 mm							0												
40-50 mm							1		0										
Unknown size																			
Total							1		0										
<i>Merlangius merlangus</i>																			
30-35 mm									0										
50-60 mm											22								
Total									0		22								
<i>Trisopterus esmarki</i>																			
40-50 mm								1											
60-70 mm									3										
70-80 mm									7										
80-100 mm								1	15	8		3180							
100-120 mm								0	63	26	555	19840							
120-150 mm								16	87	65	300								
150-200 mm								1	7	19									
Unknown size									2										
Total								20	184	117	855	23020							
<i>Sprattus sprattus</i>																			
40-50 mm									4										
50-60 mm							13												
60-70 mm							33	9											

Continued

Table 10-C-2 Continued

Quarter 2		Whiting size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Sprattus sprattus</i> (cont)																			
70-80 mm									2	3	2								
80-100 mm																			
Total			46						11	7	2								
Ammodytidae																			
8-10 mm											2								
15-20 mm										1									
20-25 mm									0	3	1								
25-30 mm								3	12	1	3								
30-35 mm								26	5	36	2	13							
35-40 mm										8									
40-50 mm								29	51	21	12	24							
50-60 mm							13	11	82	175	74	253	1520						
60-70 mm								33	65	159	186	60							
70-80 mm								55	14	193	530	4439							
80-100 mm								40	98	271	257	1084	1130						
100-120 mm								6	59	44	130								
120-150 mm									38	155	128								
150-200 mm										293	132								
300-350 mm											1								
Unknown size								55	173	104	303								
Total			13	257					597	1464	1759	5873	2650						
<i>Microstomus kitt</i>																			
15-20 mm									2										
Total									2										
<i>Crangon crangon</i>																			
15-20 mm										0									
30-35 mm									0										
35-40 mm										4									
Unknown size										0									
Total									0	4									

Continued

Table 10-C-2 Continued

Quarter 2		Whiting size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Pandalus</i>																			
12-15 mm									0	0									
40-50 mm									2										
50-60 mm									5										
70-80 mm											9								
Total									8	0	9								
Area 3																			
All species																			
All size classes							304	789	1894	2392	9208	5505							
<i>Merlangius merlangus</i>																			
120-150 mm										18	10								
Total										18	10								
<i>Trisopterus esmarki</i>																			
100-120 mm									18										
150-200 mm										3									
Total									18	3									
Ammodytidae																			
5-6 mm									0	0									
10-12 mm																			
15-20 mm											7								
20-25 mm									0	3									
25-30 mm									41	110	14	12							
30-35 mm								6	104	230	211	101							
35-40 mm									8	40									
40-50 mm									204	345	177	396							
50-60 mm							32	221	182	149	2360	111							
60-70 mm							26	32	180	153	3856	600							
70-80 mm							21	26	106	72	79	1278							
80-100 mm								16	13	110	192								
100-120 mm								21	145	124	51								

Continued

Table 10-C-2 Continued

Quarter 2		Whiting size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Ammodytidae (cont)																			
120-150 mm									259	144	333								
150-200 mm									19	61									
Unknown size							75	163	319	475	820	726							
Total							153	559	1583	2015	8099	3224							
Crangon crangon																			
8-10 mm									0										
10-12 mm								6	0										
12-15 mm									0										
30-35 mm								0											
35-40 mm										2									
Unknown size								1											
Total								7	0	2									
Pandalus																			
12-15 mm										1									
30-35 mm																			
40-50 mm									2	1									
50-60 mm								3	7	11									
60-70 mm							61		7										
70-80 mm									7										
Unknown size																			
Total							61	5	26	13									
Area 4																			
All species							622	152	868	2284	3741	6419	5072						
All size classes																			
Merlangius merlangus																			
120-150 mm										80	14								
Total										80	14								

Continued

Table 10-C-2 Continued

Quarter 2		Whiting size class																	
	Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Trisopterus esmarki</i>																			
	100-120 mm										25	92							
	120-150 mm										188	1310							
	150-200 mm									17									
	Total									17	214	1402							
<i>Clupea harengus</i>																			
	120-150 mm										79								
	Total										79								
<i>Sprattus sprattus</i>																			
	60-70 mm									166	188								
	70-80 mm										254								
	80-100 mm								434	718	626								
	100-120 mm								278	481	420								
	120-150 mm								711	1365	1855								
	Total																		
Ammodytidae																			
	20-25 mm									0									
	30-35 mm							3	209	3									
	40-50 mm					500		47	104	95	584	87							
	50-60 mm							121	186	91	828	27							
	60-70 mm							36	300	178	630	342							
	70-80 mm							109	149	237	435	152							
	80-100 mm							37	53	184	268	87							
	100-120 mm							89	40	207	144	867							
	120-150 mm								96	230	376	1901							
	150-200 mm								49	308	180								
	Unknown size							210	111	281	265	15							
	Total					500		653	1299	1813	3710	3478							
<i>Crangon crangon</i>																			
	12-15 mm							0		0									
	15-20 mm									0									
	Total							0		0									

Continued

Table 10-C-2 Continued

Quarter 2		Whiting size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 5																			
All species	All size classes						358	558	1053	2375	2264	6680	548						
<i>Merlangius merlangus</i>	120-150 mm											1862							
Total												1862							
<i>Trisopterus esmarki</i>	100-120 mm											1							
Total												1							
<i>Clupea harengus</i>	80-100 mm									129									
Total										129									
<i>Sprattus sprattus</i>	60-70 mm								8	8									
	70-80 mm									233									
	80-100 mm								56	88	875								
	100-120 mm											1127							
	120-150 mm										43	576							
Unknown size																			
Total									64	329	918	1703							
Anmodytidae																			
	25-30 mm							8											
	30-35 mm							12											
	40-50 mm						15		93										
	50-60 mm						8		3	141									
	60-70 mm							26	35										
	70-80 mm								5	91									
	80-100 mm							133	147	132	429								
	100-120 mm								43	371	157								
	120-150 mm								37	254	197								
Unknown size							16	21	34	156	227	368							
Total							39	200	399	1145	1010	368							

Continued

Table 10-C-2 Continued

Quarter 2		Whiting size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Crangon crangon</i>									0										
8-10 mm																			
15-20 mm								1											
20-25 mm									0										
Total								1	0										
<i>Pandalus</i>																			
30-35 mm											7								
40-50 mm										7									
50-60 mm									3										
Unknown size											1								
Total									3	7	8								
Area 6																			
All species																			
All size classes						118	153	801	1316	2494	5608	7771	24244						
<i>Gadus morhua</i>																			
30-35 mm							3	1	0										
40-50 mm							2	5	2										
50-60 mm								3	4										
60-70 mm								2	6										
Unknown size										8									
Total							6	11	12	8									
<i>Melanogrammus aeglefinus</i>																			
30-35 mm								0											
35-40 mm								1											
Total								1											
<i>Merlangius merlangus</i>																			
12-15 mm									0										
15-20 mm								2											
20-25 mm									1										
25-30 mm									2										

Continued

Table 10-C-2 Continued

Quarter 2		Whiting size class																	
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
<i>M. merlangus</i> (cont)																			
30-35 mm						1		1		13									
35-40 mm							1			7									
40-50 mm										94									
50-60 mm										49	129								
100-120 mm										273	272								
120-150 mm									5	141									
150-200 mm																			
Total						1	2	4	5	577	401								
<i>Trisopterus esmarki</i>																			
12-15 mm									0										
15-20 mm								0											
20-25 mm								1											
50-60 mm										75									
80-100 mm										36									
150-200 mm										0									
Total								1	0	111									
<i>Clupea harengus</i>																			
80-100 mm									61										
100-120 mm												1920							
120-150 mm									59	883									
150-200 mm									26										
Unknown size						1													
Total						1			146	883		1920							
<i>Sprattus sprattus</i>																			
60-70 mm							21	11											
70-80 mm								77	83	297	199								
80-100 mm								81	171	210	487								
100-120 mm								18	49	425	546								
120-150 mm								99		139		2371							
150-200 mm										9									
Unknown size								4	15	20									
Total							21	289	318	1099	1232	2371							

Continued

Table 10-C-2 Continued

Quarter 2		Whiting size class																	
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
Anmodytidae																			
15-20 mm							0		0										
20-25 mm							0												
30-35 mm					7	2	3	5	1	0									
35-40 mm									0										
40-50 mm						1	8	13	14	44									
50-60 mm							12	23	32	19									
60-70 mm							6	41	17	5									
70-80 mm							7	75	38	29									
80-100 mm							7	18	20	113	504								
100-120 mm							4	31	111	149	936								
120-150 mm								5	486	169	229								
150-200 mm								11	125	994	1672	16303							
200-250 mm									17		368								
250-300 mm											1396								
Unknown size									79	47	195								
Total					2	2	14	31	252	940	1570	5301	16303						
					9	4	61												
Crangon crangon																			
5-6 mm							0												
8-10 mm							0												
10-12 mm							0												
12-15 mm									0										
15-20 mm							0	0											
20-25 mm							0												
25-30 mm							0	2		2									
30-35 mm							2	2											
35-40 mm							4												
40-50 mm							3	3											
50-60 mm								1											
60-70 mm																			
Unknown size							0	2		0									
Total							9	11		0	9								

Continued

Table 10-C-2 Continued

Quarter 2		Whiting size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 7																			
All species	All size classes					32	207	356	646	2020	5187	6817	13398						
Gadus morhua																			
	30-35 mm							2	7	2									
	35-40 mm									4									
	40-50 mm						3	3	8	53									
	50-60 mm								26	38									
	Total						3	5	41	96									
Melanogrammus																			
aeglefinus																			
	15-20 mm									7									
	25-30 mm									8									
	Total									15									
Trisopterus																			
esmarki																			
	15-20 mm									49									
	20-25 mm							0	0										
	25-30 mm							4	0										
	30-35 mm								1										
	50-60 mm								2										
	70-80 mm								17										
	80-100 mm									70	269								
	100-120 mm									230	196	3083	5750						
	120-150 mm									314			2505						
	Unknown size							0			105								
	Total							5	20	662	570	3083	8255						
Clupea																			
harengus																			
	70-80 mm							1											
	Total							1											

Continued

Table 10-C-2 Continued

Quarter 2		Whiting size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Sprattus sprattus</i>	60-70 mm								35										
	70-80 mm									5									
	Total								35	5									
<i>Ammodytidae</i>	20-25 mm						0												
	25-30 mm						0												
	30-35 mm							3	0	9									
	35-40 mm								0										
	40-50 mm						18	11	22	82	11								
	50-60 mm						1	19	72	259	60								
	60-70 mm						1	7	36	81	30								
	70-80 mm							6	8	57									
	80-100 mm							6	22	35									
	100-120 mm							9		54	1880								
	120-150 mm								32	178	610								
	150-200 mm								14		1049								
	Unknown size							15	31	111	328	870							
	Total						20	76	238	866	3969	870							
<i>Microstomus kitt</i>	12-15 mm						0												
	Total						0												
<i>Limanda limanda</i>	15-20 mm							3											
	20-25 mm							2											
	Total							5											
<i>Crangon crangon</i>	10-12 mm						0	0	0										
	12-15 mm																		
	15-20 mm						0		1	0									
	Total																		

Continued

Table 10-C-2 Continued

Quarter 2		Whiting size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Crangon crangon</i> (cont)										1									
30-35 mm									16										
40-50 mm							0		1	2									
Unknown size																			
Total							0	0	18	4									
<i>Pandalus</i>																			
50-60 mm									2										
Total									2										

TABLE 10-C-3. Average stomach content weight (g) per 1000 fish by size class of commercially exploited prey species by predator size class, area and quarter, 1991, whiting

Quarter 3		Whiting size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 1																			
All species	2	3	43	81	442	904	625	1828	2785	5170	6573	16070							
All size classes																			
<i>Melanogrammus aeglefinus</i>																			
30-35 mm				1	28				0										
40-50 mm								4	13	15									
50-60 mm									16	26	26								
60-70 mm								18	4	14	74								
70-80 mm								41	22	22	135								
80-100 mm									10	22	279								
100-120 mm									26	52	31								
Unknown size																			
Total				1	28			62	92	128	546								
<i>Merlangius merlangus</i>																			
40-50 mm										2									
50-60 mm					41			45	4	1									
60-70 mm					19				14	8									
70-80 mm										8									
80-100 mm											114								
100-120 mm									71	53									
120-150 mm										114	11								
Unknown size					5	10			25	8									
Total					65	10	45		114	194	125								
<i>Trisopterus esmarki</i>																			
Eggs									0	3									
30-35 mm					7	15	65		3										
35-40 mm										10									
40-50 mm				21	17	67	21	21	87	40									
50-60 mm				6	113	110		73	96	47	35								

Continued

Table 10-C-3 Continued

Quarter 3		Whiting size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Trisopterus esmarki</i>																			
60-70 mm						20	253		73	225	159	116							
70-80 mm						21	129		73	443	283	206							
80-100 mm									115	232	358	486							
100-120 mm										71	273	804							
120-150 mm										61	504	530	8861						
150-200 mm										30	1105	754	2426						
Unknown size					6	28	82	33	29	144	316	108							
Total					33	206	657	119	384	1394	3098	3039	11286						
<i>Sprattus sprattus</i>																			
60-70 mm											2								
70-80 mm											2								
80-100 mm												125							
Total											4	125							
<i>Ammodytidae</i>																			
30-35 mm						2	14		4		2								
40-50 mm						6	4			13	5								
50-60 mm						17	17		135	39	72								
60-70 mm						1			173	222	248	410							
70-80 mm							13		308	341	396	1091	2120						
80-100 mm									119	62	157	549	1258						
100-120 mm									19	13	70	148							
120-150 mm											21	71							
Unknown size						3			149	83	69	80	1315						
Total						28	48		906	773	1041	2348	4692						
<i>Crangon crangon</i>																			
35-40 mm									2										
Total									2										
<i>Pandalus</i>																			
60-70 mm										5	7								
80-100 mm											5								
Total										5	11								

Continued

Table 10-C-3 Continued

Quarter 3		Whiting size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 2																			
All species																			
All size classes	10	63	47	112	223	583	646	1196	2115	5267	10738	12715							
<i>Gadus morhua</i>																			
60-70 mm									77										
Total									77										
<i>Melanogrammus</i>																			
<i>aeglefinus</i>																			
50-60 mm									36	6									
60-70 mm									18										
70-80 mm								12	135	41									
80-100 mm									18	97	116	4367							
100-120 mm									145	245	758								
120-150 mm										67	322								
Total								12	352	457	1196	4367							
<i>Merlangius merlangus</i>																			
25-30 mm									4										
70-80 mm								1	15										
80-100 mm								10	38	186		6768							
100-120 mm								27	21										
Total								38	79	186		6768							
<i>Trisopterus esmarki</i>																			
30-35 mm						7		2											
40-50 mm						34		7	43	20									
50-60 mm						282	90	53	44	37	57								
60-70 mm								89	28	37	301								
70-80 mm								196	164	235	496	1580							
80-100 mm								30	354	244	1708								
100-120 mm									44	139	2162								
120-150 mm									14	176	4019								
150-200 mm										1526									
Unknown size								12		141	20								
Total						323	90	388	691	2555	8763	1580							

Continued

Table 10-C-3 Continued

Quarter 3	Whiting size class																		
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
<i>Clupea harengus</i>										331									
100-120 mm									167										
120-150 mm									167	331									
Total									167	331									
<i>Sprattus sprattus</i>																			
40-50 mm									0	2									
70-80 mm										101									
80-100 mm																			
Total									0	103									
<i>Anmodytidae</i>																			
30-35 mm						1		94	6	3									
40-50 mm				3			12	7											
50-60 mm						4	42	18	11	0									
60-70 mm								36	24										
70-80 mm								46	49										
80-100 mm						13	49	159	146	33									
100-120 mm									62	431	132								
120-150 mm								79	165	227									
Unknown size					1	2	5			141									
Total				3	1	20	201	350	456	835	132								
<i>Crangon crangon</i>																			
15-20 mm									0										
25-30 mm									1	0									
30-35 mm																			
40-50 mm									1										
Total									2	0									
<i>Pandalus</i>																			
15-20 mm										0									
30-35 mm									3										
Total									3	0									

Continued

Table 10-C-3 Continued

Quarter 3		Whiting size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 3																			
All species				12	210	550	949	1425	2267	2943	2126	5988	8640						
All size classes																			
<i>Gadus morhua</i>																			
70-80 mm											32								
80-100 mm											65								
Total											97								
<i>Melanogrammus aeglefinus</i>																			
40-50 mm							12			1	29								
60-70 mm										79									
70-80 mm								105	4	2	53								
80-100 mm																			
Total							12	105	4	82	82								
<i>Merlangius merlangus</i>																			
30-35 mm						9													
50-60 mm									15	83									
60-70 mm									4	4									
70-80 mm									6	77									
80-100 mm										22	588	993							
100-120 mm									3	157		1478							
Unknown size																			
Total						9			28	342	588	2472							
<i>Trisopterus esmarki</i>																			
30-35 mm								7											
35-40 mm											5								
40-50 mm						13	2	3	7	7									
50-60 mm						12	42	6	38	12	136								
60-70 mm						13	115		19	36									
70-80 mm								25	26	101	6								
80-100 mm									12	56	102	129	8640						

Continued

Table 10-C-3 Continued

Quarter 3	Whiting size class																		
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
<i>T. esmarki</i> (cont)																			
100-120 mm																			
Unknown size				21		38	23	5	266	90	840								
Total				21	38	196	64	106	513	338	969	8640							
<i>Clupea harengus</i>																			
80-100 mm									6	19									
100-120 mm								7	24										
Total								7	30	19									
<i>Sprattus sprattus</i>																			
60-70 mm								4											
70-80 mm							5		36										
Total							5	4	36										
<i>Anmodytidae</i>																			
30-35 mm					46		0	1											
40-50 mm				5	5	25	36	45	50	6									
50-60 mm					51	124	195	611	276	383	225								
60-70 mm						118	105	487	328	71	327								
70-80 mm					145	18	188	394	113	208	910								
80-100 mm						3	96	20	168	78									
100-120 mm							20	93	49	8									
120-150 mm									9	27									
150-200 mm									5										
Unknown size				10	112	389	365	146	197	73									
Total				15	359	677	1006	1797	1195	853	1462								
<i>Pandalus</i>																			
40-50 mm								22											
Unknown size							16		0										
Total							16	22	0										

Continued

Table 10-C-3 Continued

Quarter 3		Whiting size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 4																			
All species																			
All size classes		9	26	39	307			516	1309	3816	13506	26955	35280						
<i>Merlangius merlangus</i>									7										
30-35 mm									14										
40-50 mm									12										
50-60 mm											86								
60-70 mm											53								
80-100 mm										85									
Total									33	85	139								
<i>Trisopterus esmarki</i>																			
40-50 mm									1										
50-60 mm									3	29									
70-80 mm											12								
80-100 mm										54	112								
120-150 mm											847								
150-200 mm											280								
Unknown size											57								
Total									4	83	1308								
<i>Clupea harengus</i>																			
100-120 mm									33	329	68								
120-150 mm										644	3121		35280						
150-200 mm										111	6260	26955							
Unknown size											158								
Total									33	1084	9606	26955	35280						
<i>Sprattus sprattus</i>																			
50-60 mm									4	127									
60-70 mm									2										
70-80 mm										39									
80-100 mm									26	227									
100-120 mm										237	66								

Continued

Table 10-C-3 Continued

Quarter 3		Whiting size class																	
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
S. sprattus (cont)																			
120-150 mm									167	902									
Unknown size									47										
Total								32	844	968									
Ammodytidae																			
40-50 mm										17									
50-60 mm								1	7	35									
60-70 mm								5	35										
70-80 mm								155	27										
80-100 mm						11		6	4										
100-120 mm								339	236										
120-150 mm								107	542	339									
150-200 mm									116	378									
200-250 mm									200										
Unknown size						1		4	146										
Total						12		616	1311	769									
Crangon crangon																			
10-12 mm								0											
Total								0											
Pandalus																			
30-35 mm										6									
40-50 mm										73									
50-60 mm										165									
Unknown size								1		39									
Total								1		283									
Area 5																			
All species																			
All size classes			33	103		57	210	691	2108	7407	6256	330							
Merlangius merlangus																			
30-35 mm							37												
Total							37												

Continued

Table 10-C-3 Continued

Quarter 3		Whiting size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Clupea harengus</i>												81							
70-80 mm												198							
100-120 mm																			
Total												279							
<i>Sprattus sprattus</i>																			
50-60 mm										298									
70-80 mm										715	141								
100-120 mm											3295	5836							
120-150 mm										83									
Unknown size										64									
Total										1160	3436	5836							
<i>Ammodytidae</i>																			
80-100 mm									29										
150-200 mm									10		1183								
Unknown size									39		1183								
Total																			
<i>Limanda limanda</i>																			
40-50 mm									5										
Total									5										
<i>Nephrops norvegicus</i>																			
Unknown size									227	245									
Total									227	245									
<i>Crangon crangon</i>																			
20-25 mm									2										
Total									2										
<i>Pandalus</i>																			
30-35 mm											3	6							
40-50 mm												1							
Unknown size																			
Total											3	7							

Continued

Table 10-C-3 Continued

Quarter 3		Whiting size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 6																			
All species		2	10	35	83	117	219	353	849	3585	6434	9445	29729						
All size classes																			
<i>Merlangius merlangus</i>																			
30-35 mm									1										
60-70 mm									14										
150-200 mm											382								
200-250 mm													11993						
Unknown size										34									
Total									15	34	382		11993						
<i>Trisopterus esmarki</i>																			
80-100 mm																			
Unknown size										55			516						
Total										55			516						
<i>Clupea harengus</i>																			
80-100 mm										37	391								
100-120 mm										166	717								
120-150 mm												7310	15805						
150-200 mm											1413								
Total										203	2522	7310	15805						
<i>Sprattus sprattus</i>																			
60-70 mm									25	295									
70-80 mm									22										
80-100 mm									275	1021	83	441							
100-120 mm										737	69								
120-150 mm											1470								
Unknown size										7		408							
Total									322	2060	1622	850							

Continued

Table 10-C-3 Continued

Quarter 3		Whiting size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Anmodytidae																			
50-60 mm									0		15								
70-80 mm											107								
80-100 mm											410	244							
100-120 mm										53	36								
120-150 mm										57	454	767							
150-200 mm										86									
Unknown size										39									
Total									0	236	1022	1010							
Crangon crangon																			
7-8 mm										0									
8-10 mm									0										
10-12 mm									0										
12-15 mm									0										
15-20 mm						1	108		0										
20-25 mm				15			1		0										
25-30 mm							67		4										
30-35 mm						2			3										
40-50 mm									6										
Unknown size							0		0										
Total				15		4	177	14	5	7									
Area 7																			
All species																			
All size classes		66	77	235	214	232	537	1171	3400	3011	4309	8110							
Gadus morhua																			
40-50 mm										14									
50-60 mm									2	7									
60-70 mm																			
80-100 mm										92									
Total									2	112									

Continued

Table 10-C-3 Continued

Quarter 3		Whiting size class																
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Melanogrammus aeglefinus</i>											104							
40-50 mm									27									
50-60 mm								5	256									
60-70 mm									58									
70-80 mm									217									
80-100 mm							119		394	152								
Unknown size																		
Total							119	5	952	152	104							
<i>Merlangius merlangus</i>																		
20-25 mm						3												
30-35 mm						2												
50-60 mm								43		107								
60-70 mm								31	73	135								
70-80 mm										40								
80-100 mm										34								
Unknown size																		
Total						5		73	73	315								
<i>Trisopterus esmarki</i>																		
40-50 mm								22	14									
50-60 mm							22	71	15	123								
70-80 mm									337	117								
80-100 mm								48	125	258	109	8110						
Unknown size										63	162							
Total							22	141	491	561	271	8110						
<i>Clupea harengus</i>																		
80-100 mm							46											
100-120 mm									112									
120-150 mm										323								
Total							46		112	323								

Continued

Table 10-C-3 Continued

Quarter 3		Whiting size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Sprattus sprattus</i>																			
50-60 mm										29	211								
60-70 mm											94								
70-80 mm											195								
80-100 mm									98										
100-120 mm										473	59	1902							
120-150 mm												658							
Unknown size									103										
Total									202	502	559	2560							
<i>Ammodytidae</i>																			
30-35 mm									7										
40-50 mm									1										
50-60 mm									37										
60-70 mm								3	7	10	40								
70-80 mm									192	36	82								
80-100 mm									3	57	139								
100-120 mm										162	49								
150-200 mm												357							
Unknown size									21	200	2								
Total									268	465	311	357							
<i>Limanda limanda</i>																			
20-25 mm									2										
Total									2										
<i>Crangon crangon</i>																			
10-12 mm					0														
12-15 mm									0										
15-20 mm					9				0										
20-25 mm								1	6										
35-40 mm											3								
Total					10	1	6				3								

TABLE 10-C-4: Average stomach content weight (g) per 1000 fish by size class of commercially exploited prey species by predator size class, area and quarter, 1991, whiting

Quarter 4		Whiting size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 1																			
All species																			
All size classes	70				36	152	280	2052	2963	4233	5093	5695	11788						
<i>Melanogrammus aeglefinus</i>																			
50-60 mm												14							
80-100 mm								300	92	5	0	233							
100-120 mm									72	121	430	408	1411						
120-150 mm										195	7	287	561						
150-200 mm												12							
Unknown size										8	47	9							
Total								300	164	329	483	962	1972						
<i>Merlangius merlangus</i>																			
35-40 mm								23											
40-50 mm								27											
100-120 mm										3	14		304						
120-150 mm											144								
Total								50		3	158		304						
<i>Trisopterus esmarki</i>																			
35-40 mm										1		3							
40-50 mm								5	23	3	29								
50-60 mm								104		55	21	47							
60-70 mm								156	166	297	262	125							
70-80 mm								273	188	460	632	124							
80-100 mm						0		544	1712	1874	2145	2101	1511						
100-120 mm								84	277	716	544	664	1411						
120-150 mm									15	176	133	699	415						
150-200 mm											147	138	3604						
Unknown size						10		52	57	84	99	64							
Total						10		1217	2439	3665	4011	3965	6940						

Continued

Table 10-C-4 Continued

Quarter 4		Whiting size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Clupea harengus</i>																			
100-120 mm										48									
Total										48									
<i>Sprattus sprattus</i>																			
50-60 mm							49												
70-80 mm							31	16		1									
80-100 mm								78	98	4									
Unknown size								22											
Total							80	116	98	4									
<i>Anmodytidae</i>																			
60-70 mm								5			4								
70-80 mm								53		1	16	5							
80-100 mm								7	14	9	4								
100-120 mm								12			5								
Unknown size						5		11	37	7	49								
Total						5		88	52	16	77	5							
<i>Nephrops norvegicus</i>																			
100-120 mm												133							
Total												133							
<i>Crangon crangon</i>																			
35-40 mm											1								
40-50 mm								0											
Total								0			1								
<i>Pandalus</i>																			
35-40 mm											1								
40-50 mm								2	4										
50-60 mm										2	0	2							
60-70 mm										2	5								
70-80 mm										1	3	3							
Unknown size										1	2	13	94						
Total								2	4	6	13	18	94						

Continued

Table 10-C-4 Continued

Quarter 4		Whiting size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 2																			
All species					61	70	199	1740	2522	2222	3964	4863	6640						
All size classes																			
<i>Gadus morhua</i>																			
80-100 mm										34									
Total										34									
<i>Melanogrammus aeglefinus</i>																			
70-80 mm											14								
Total											14								
<i>Merlangius merlangus</i>																			
50-60 mm											5								
80-100 mm										9	376								
100-120 mm									45		328								
Total									45	9	710								
<i>Trisopterus esmarki</i>																			
35-40 mm										7									
50-60 mm										42	106								
60-70 mm								1	6	197	144								
70-80 mm								270	57	230	221								
80-100 mm								277	1660	549	736	757							
100-120 mm								71	72	571	425	949	6640						
120-150 mm										26	205								
150-200 mm											109								
Unknown size										4	34								
Total								632	1843	1625	1978	1706	6640						
<i>Sprattus sprattus</i>																			
60-70 mm								4			60								
70-80 mm										6	130								
80-100 mm																			
Total								4		6	189								

Continued

Table 10-C-4 Continued

Quarter 4		Whiting size class																	
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
Ammodytidae																			
50-60 mm						3		6	39	10									
60-70 mm								2	14	108									
70-80 mm								16	23	167									
80-100 mm								26	54	166	2391								
100-120 mm								289	39	89									
120-150 mm						62		19	36	23									
Unknown size																			
Total						66		358	205	563	2391								
<i>Crangon crangon</i>																			
15-20 mm				5			1												
40-50 mm									4										
Total				5			1		4										
Area 3																			
All species																			
All size classes				25	32	117	1285	1623	3563	7821	1253								
<i>Melanogrammus aeglefinus</i>																			
70-80 mm											677								
100-120 mm										13									
120-150 mm										2053									
Total										2066	677								
<i>Merlangius merlangus</i>																			
80-100 mm									53	66									
100-120 mm									175	208									
120-150 mm							4			1127									
Unknown size																			
Total							4		228	1401									

Continued

Table 10-C-4 Continued

Quarter 4	Whiting size class																		
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
<i>Trisopterus esmarki</i>										12									
50-60 mm							34	107	8										
60-70 mm								90	288	20									
70-80 mm							45	157	354	862	362								
80-100 mm								253	548	1348									
100-120 mm									18										
120-150 mm							19	13	8										
Unknown size							98	619	1223	2242	362								
Total																			
<i>Clupea harengus</i>										1098									
80-100 mm																			
120-150 mm									114										
Total									114	1098									
<i>Sprattus sprattus</i>																			
60-70 mm								240											
80-100 mm									119										
Total								240	119										
<i>Anmodytidae</i>																			
40-50 mm							6		13	30									
50-60 mm										21									
60-70 mm									11	93									
70-80 mm								76	22	129									
80-100 mm							30	312	112	30									
100-120 mm								90	47	62									
120-150 mm							255		38										
200-250 mm									1072										
Unknown size						11	92	39	22	5									
Total						11	384	516	1337	371									
<i>Nephrops norvegicus</i>																			
50-60 mm										202									
Total										202									

Continued

Table 10-C-4 Continued

Quarter 4		Whiting size class																	
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
<i>Pandalus</i>									0										
10-12 mm								8	9										
40-50 mm										6									
50-60 mm								2											
Unknown size						15													
Total						15		10	9	6									
Area 4																			
All species																			
All size classes		170	30	60	71	168	1234	706	953	12010									
<i>Merlangius merlangus</i>																			
Unknown size										143									
Total										143									
<i>Trisopterus esmarki</i>																			
60-70 mm								18											
100-120 mm										310									
150-200 mm										7505									
Unknown size								6											
Total								24		7815									
<i>Sprattus sprattus</i>																			
40-50 mm							39												
50-60 mm									25										
Unknown size									19										
Total							39		44										
<i>Ammodytidae</i>																			
70-80 mm										30									
100-120 mm								446		91									
120-150 mm										3897									
Total								446		4019									

Continued

Table 10-C-4 Continued

Quarter 4		Whiting size class																	
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
<i>Crangon crangon</i>																			
15-20 mm						4													
20-25 mm						2													
Total						6													
Area 5																			
All species																			
All size classes				43	226	294	450	942	2973	2721	8070								
<i>Merlangius merlangus</i>																			
100-120 mm								301		237									
Total								301		237									
<i>Sprattus sprattus</i>																			
40-50 mm						53													
60-70 mm									51	1165									
70-80 mm									86	11									
80-100 mm								19	443	173									
100-120 mm									459	276									
Unknown size									587										
Total						53		19	1626	1625									
Anmodytidae																			
60-70 mm							6												
Unknown size							8	88	175										
Total							14	88	175										
<i>Crangon crangon</i>																			
12-15 mm																			
20-25 mm						7	0												
25-30 mm																			
30-35 mm																			
40-50 mm																			
Unknown size				0						2									
Total				0		7	5	5	2										

Continued

Table 10-C-4 Continued

Quarter 4		Whiting size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Pandalus</i>										0									
15-20 mm										0									
40-50 mm									1										
Total									1	0									
Area 6																			
All species																			
All size classes			4	16	124	191	203	699	1444	3029	4697	5422	5822						
<i>Merlangius merlangus</i>																			
70-80 mm											6								
80-100 mm											3	129							
100-120 mm										35									
120-150 mm											110	29							
Total										35	119	159							
<i>Trisopterus esmarki</i>																			
40-50 mm									2										
Total									2										
<i>Clupea harengus</i>																			
60-70 mm											2								
80-100 mm												15							
100-120 mm									83	16	49	109							
120-150 mm												126							
150-200 mm										75									
Total									83	91	51	250							
<i>Sprattus sprattus</i>																			
35-40 mm								1	4										
40-50 mm									6		1								
50-60 mm									18	57	7		767						
60-70 mm									31	374	60	15							
70-80 mm								35	18	39	433	72	240						
80-100 mm									15	560	412	321							

Continued

Table 10-C-4 Continued

Quarter 4	Whiting size class																		
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
S. sprattus (cont)																			
100-120 mm								7	108	137	179								
120-150 mm									13	10									
Unknown size										25									
Total							36	100	1150	1084	587	1007							
Ammodytidae																			
50-60 mm								7	2										
60-70 mm									14	7									
70-80 mm								8	25	109									
80-100 mm								15	36	9	11	93							
100-120 mm								17	23	68									
120-150 mm									38	96									
150-200 mm								18	96	384	1357								
200-250 mm											32								
Unknown size							2	0	30	109									
Total							2	65	264	783	1400	93							
Solea solea																			
25-30 mm							2												
70-80 mm									10										
80-100 mm										18									
100-120 mm										146									
Unknown size										36									
Total							2		10	200									
Limanda limanda																			
40-50 mm							1												
Total							1												
Crangon crangon																			
10-12 mm						0			0		0								
12-15 mm						2													
15-20 mm								2	0	0									
20-25 mm					0	0	7	3	3	2	9								

Continued

Table 10-C-4 Continued

Quarter 4		Whiting size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>C. crangon</i> (cont)																			
25-30 mm						10		7	1	3	2	8							
30-35 mm						3		49	11	37	26		69						
35-40 mm						2		9	17	22	12	51							
40-50 mm						6		144	27	75	59	50	118						
50-60 mm								12	25	16	33	66							
60-70 mm									29	22									
Unknown size						1		6	29	4	38	45	31						
Total						22	2	233	145	161	195	229	218						
<i>Pandalus</i>																			
40-50 mm									0										
Total									0										
Area 7																			
<i>All species</i>																			
All size classes	32	23		54	113		220	825	1080	3526	2604	7356	4260						
<i>Gadus morhua</i>																			
100-120 mm									51										
Total									51										
<i>Merlangius merlangus</i>																			
50-60 mm										5		2							
100-120 mm								2											
Unknown size																			
Total								2		5		2							
<i>Trisopterus esmarki</i>																			
50-60 mm									4										
60-70 mm									17										
70-80 mm										143									
80-100 mm								181	142	303	948	1405	4260						
100-120 mm												4339							
Unknown size											169								
Total								181	163	446	1117	5744	4260						

Continued

Table 10-C-4 Continued

Quarter 4		Whiting size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Clupea harengus</i> 120-150 mm											664								
	Total										664								
<i>Sprattus sprattus</i> 80-100 mm										28									
	Total									28									
Anmodytidae	70-80 mm								13										
	80-100 mm								40	127									
	100-120 mm							170											
	120-150 mm									695									
	150-200 mm									1160									
Total							170	54	1982										
<i>Limanda limanda</i> 70-80 mm											78								
	Total										78								
<i>Crangon crangon</i> 20-25 mm 30-35 mm 35-40 mm						2				4									
									8										
								4											
	Total					2		4	8	4									

TABLE 10-D-1: Average stomach content weight (g) per 1000 fish by size class of commercially exploited prey species by predator size class, area and quarter, 1991, mackerel

Quarter 1		Mackerel size class																
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 1																		
All species																		
All size classes							771	258	235	235								
Ammodytidae																		
80-100 mm										230								
Area 2																		
All species																		
All size classes									445									
Area 3																		
All species																		
All size classes										3131								
Area 4 - No samples																		
Area 5 - No samples																		
Area 6 - No samples																		
Area 7 - No samples																		

TABLE 10-D-2: Average stomach content weight (g) per 1000 fish by size class of commercially exploited prey species by predator size class, area and quarter, 1991, mackerel

Quarter 2		Mackerel size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 1																			
All species																			
All size classes								70	839	2288	4335	6805	7691						
Gadus morhua												10							
50-60 mm												10							
Total												10							
Trisopterus esmarki																			
30-35 mm										7	3								
Unknown size																			
Total										7	3								
Ammodytidae																			
35-40 mm										0									
40-50 mm									358	110	10	110							
50-60 mm										20	78	565							
60-70 mm										117	253	764	379						
70-80 mm											154	550							
80-100 mm											282	573	5314						
Unknown size									261	215									
Total									619	462	776	2562	5693						
Area 2																			
All species																			
All size classes									870	2308	2637	5346	4781						
Gadus morhua																			
6-7 mm										4									
30-35 mm										4	7								
50-60 mm										30	14								
60-70 mm																			
Unknown size										31									
Total										69	21		426						

Continued

Table 10-D-2 Continued

Quarter 2		Mackerel size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Trisopterus esmarki</i>	35-40 mm										3								
	40-50 mm									8	11	47							
	50-60 mm									7	3								
	60-70 mm										13								
	Unknown size									16	5								
	Total									30	35	47							
<i>Ammodytidae</i>	15-20 mm										0								
	25-30 mm											2							
	35-40 mm									568	16		839						
	40-50 mm								83	3	48	233							
	50-60 mm								59	31	161	326	754						
	60-70 mm									24	156	768							
	70-80 mm									44	133	1181	67						
	80-100 mm									185	99	331	115						
	100-120 mm									40	15	527	174						
	120-150 mm										300	527	197						
	Unknown size								172	180									
	Total									315	1074	914	3381	2147					
<i>Scomber scombrus</i>	Eggs										1		3						
	Total										1		3						
Area 3																			
All species	All size classes									1002	2106	4901	4394						
<i>Ammodytidae</i>	25-30 mm										5								
	30-35 mm									8	8	15							
	35-40 mm										29								

Continued

Table 10-D-2 Continued

Quarter 2		Mackerel size class																
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Anmodytidae (cont)																		
40-50 mm									43	134	175							
50-60 mm										341	64							
60-70 mm										85	377							
70-80 mm											493							
80-100 mm												1225						
100-120 mm											208	1225						
120-150 mm									243	879	536	366						
Unknown size																		
Total									293	1480	3889	2816						
Area 4																		
All species																		
All size classes								1899	2258	3565	2844	2271						
Clupea harengus																		
120-150 mm											215							
Total											215							
Anmodytidae																		
35-40 mm								389										
40-50 mm								107		63	5							
50-60 mm									483		97							
60-70 mm										360	527							
70-80 mm									179		157							
80-100 mm										40	79							
100-120 mm										1053								
200-250 mm										701	295							
Unknown size								947	56									
Total								1443	719	2217	1160							
Area 5																		
All species																		
All size classes								663	2809	1981	5109	2592						

Continued

Table 10-D-2 Continued

Quarter 2	Mackerel size class																		
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
Ammodytidae																			
40-50 mm								39	3		63								
50-60 mm									30	54	45								
60-70 mm											92								
70-80 mm										29	24								
Unknown size									81	35	494								
Total								39	114	119	719								
Area 6																			
All species																			
All size classes								886	2134	3499	4493	8918							
<i>Trisopterus esmarki</i>																			
50-60 mm										2		44							
70-80 mm											22								
80-100 mm																			
Total										2	22	44							
<i>Clupea harengus</i>																			
80-100 mm										6	10								
100-120 mm										21	46								
120-150 mm											34								
Total										27	90								
<i>Sprattus sprattus</i>																			
80-100 mm										3	207								
100-120 mm										3	16	12							
120-150 mm											359								
200-250 mm												139							
Unknown size								32			10	109							
Total								32		6	592	260							
Ammodytidae																			
20-25 mm								0											
25-30 mm									0										

Continued

Table 10-D-2 Continued

Quarter 2		Mackerel size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Anmodytidae (cont)																			
30-35 mm										0									
40-50 mm										0									
50-60 mm											2								
60-70 mm									14	2	23	11							
70-80 mm											49	16							
80-100 mm									10		122	11							
100-120 mm											12	2							
120-150 mm												40	585						
150-200 mm											4	158	2298						
200-250 mm												26							
Unknown size									39	5	215	188	256						
Total									64	8	428	452	3138						
Area 7																			
All species																			
All size classes									1102	2148	3190	5975	6871						
Gadus morhua																			
40-50 mm										7									
50-60 mm										34									
Total										41									
Melanogrammus aeglefinus																			
50-60 mm										19									
Total										19									
Trisopterus esmarki																			
25-30 mm										2									
40-50 mm										52	11								
50-60 mm										101	7								
60-70 mm										22									
70-80 mm										12									
Unknown size										55	8								
Total										244	26								

Continued

Table 10-D-2 Continued

Quarter 2	Mackerel size class																		
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
<i>Sprattus sprattus</i>																			
70-80 mm								55	22	31	220								
80-100 mm								63		13	833								
Unknown size								116		5									
Total								233	22	49	1053								
<i>Ammodytidae</i>																			
40-50 mm									2			70							
50-60 mm									11	10									
60-70 mm									27	30									
70-80 mm									37	62	113								
80-100 mm									70	167	72								
100-120 mm										33									
Unknown size									47	290	176	1267							
Total									194	592	360	1337							
<i>Scomber scombrus</i>																			
Eggs										1									
Total										1									

TABLE 10-D-3: Average stomach content weight (g) per 1000 fish by size class of commercially exploited prey species by predator size class, area and quarter, 1991 mackerel

Quarter 3		Mackerel size class																
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 1																		
All species																		
All size classes								1874	3791	5069	7164	10314						
<i>Gadus morhua</i>																		
35-40 mm										0								
50-60 mm										2	1	28						
60-70 mm										2								
70-80 mm										1								
Total										6	1	28						
<i>Merlangius merlangus</i>																		
50-60 mm										0								
Unknown size										0								
Total										0								
<i>Trisopterus esmarki</i>																		
30-35 mm											4							
40-50 mm									1	5	141							
50-60 mm									183	92	325							
60-70 mm										97	55							
70-80 mm											128	1503						
80-100 mm										44	667	532						
100-120 mm											183							
120-150 mm											73							
Unknown size									1	63	170							
Total									185	301	1744	2036						

Continued

Table 10-D-3 Continued

Quarter 3		Mackerel size class																	
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
<i>Clupea harengus</i>	10-12 mm									1		72							
	120-150 mm									1		72							
	Total									1		72							
<i>Sprattus sprattus</i>	50-60 mm									1									
	Total									1									
Ammodytidae	40-50 mm										76								
	50-60 mm								9	51	132								
	60-70 mm								265	174	344	220							
	70-80 mm								9	223	385	265							
	80-100 mm								128	126	292	747							
	100-120 mm									23		145							
	Unknown size								86	178	543	604							
	Total								496	776	1772	1981							
<i>Scomber scombrus</i>	Eggs									0									
	Total									0									
Area 2																			
All species	All size classes							607	2480	2916	3656	4867							
<i>Trisopterus esmarki</i>	30-35 mm								8										
	Total								8										
<i>Clupea harengus</i>	25-30 mm											11							
	Total											11							

Continued

Table 10-D-3 Continued

Quarter 3		Mackerel size class																
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 3																		
Ammodytidae										0								
20-25 mm										0								
25-30 mm										0	1							
30-35 mm									2	0								
40-50 mm											1							
Total									2	1	2							
Area 3																		
All species																		
All size classes								1042	6120	3893	6585	20888						
Trisopterus esmarki																		
70-80 mm											601							
80-100 mm										13								
Total										13	601							
Ammodytidae																		
30-35 mm									11	0	131							
40-50 mm									497	464	327							
50-60 mm									1413	952	423							
60-70 mm									2037	768	1112	10456						
70-80 mm									1284	82	892	6203						
80-100 mm										58	63	814						
120-150 mm											612							
Unknown size									42	413	1391	2575						
Total									5283	2737	4952	20048						
Pleuronectes platessa																		
15-20 mm										15								
Total										15								
Area 4																		
All species																		
All size classes	41									1628	636							

Continued

Table 10-D-3 Continued

Quarter 3		Mackerel size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 5																			
All species All size classes											590								
Area 6																			
All species All size classes									262	795	1447	2014	3116						
<i>Clupea harengus</i> 100-120 mm												42							
Total												42							
<i>Sprattus sprattus</i> 80-100 mm												36							
Total												36							
<i>Ammodytidae</i> 15-20 mm										0									
25-30 mm										0									
80-100 mm										3									
150-200 mm												40							
Total										3		40							
<i>Crangon crangon</i> 6-7 mm										0									
7-8 mm												12							
Total										0		12							
Area 7																			
All species All size classes									311	1802	1854	2038	10520						
<i>Gadus morhua</i> 50-60 mm											6								
Total											6								

Continued

Table 10-D-3 Continued

Quarter 3	Mackerel size class																		
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
<i>Merlangius merlangus</i>											48								
60-70 mm											48								
Total											48								
<i>Trisopterus esmarki</i>																			
30-35 mm									2		5								
35-40 mm									11										
40-50 mm									15	9									
50-60 mm									1										
Unknown size																			
Total									30	9	5								
<i>Clupea harengus</i>																			
12-15 mm									1	0									
15-20 mm																			
20-25 mm								7											
35-40 mm										2	17								
40-50 mm										2									
70-80 mm										19									
80-100 mm										71									
Unknown size									0	39									
Total								7	1	135	17								
<i>Ammodytidae</i>																			
150-200 mm												5407							
Unknown size										6									
Total										6		5407							
<i>Scomber scombrus</i>																			
Eggs										0									
Total										0									

TABLE 10-D-4: Average stomach content weight (g) per 1000 fish by size class of commercially exploited prey species by predator size class, area and quarter, 1991, mackerel

Quarter 4		Mackerel size class																
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 1																		
All species																		
All size classes								82	2358	1197	2508	336						
<i>Trisopterus esmarki</i>																		
50-60 mm										61								
80-100 mm									936	127	2249							
100-120 mm										52	36							
Total									936	239	2286							
Area 2																		
All species																		
All size classes							914	4816										
Area 3																		
All species																		
All size classes									5		46							
Area 4 - No samples																		
Area 5																		
All species																		
All size classes							1611			3015								
<i>Sprattus sprattus</i>																		
40-50 mm							278											
50-60 mm							863			515								
60-70 mm							374			990								
70-80 mm										1290								
Total							1515			2795								

Continued

Table 10-D-4 Continued

Quarter 4		Mackerel size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 6																			
All species	All size classes							1076	437	825	2068	3613	8601						
<i>Clupea harengus</i>																			
	70-80 mm										314	11							
	80-100 mm												417						
	100-120 mm																		
	Total										314	11	417						
<i>Sprattus sprattus</i>																			
	70-80 mm								40										
	80-100 mm										152	39	189						
	100-120 mm										50	139	424						
	120-150 mm											80	381						
	Unknown size												148						
	Total								40		202	258	1142						
<i>Ammodytidae</i>																			
	20-25 mm							10											
	30-35 mm							13	2										
	40-50 mm							12	4										
	50-60 mm								5										
	80-100 mm											89							
	100-120 mm											770							
	200-250 mm												484						
	Unknown size							333	34	20			146						
	Total							368	45	20		858	630						
<i>Crangon crangon</i>																			
	5-6 mm									0									
	6-7 mm										0								
	Total									0	0								
Area 7 - No samples																			

TABLE 10-E-1: Average stomach content weight (g) per 1000 fish by size class of commercially exploited prey species by predator size class, area and quarter, 1991, saithe

Quarter 1		Saithe size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 1																			
All species											638	1986	3741	11181	12722	25373	16963	280871	
All size classes																			
<i>Trisopterus esmarki</i>																			
70-80 mm											84	292	143	206	434		556	917	
80-100 mm											78	465	670	58	1319	298	2422		
100-120 mm												251	1048	1438	5655	1939	2075		
120-150 mm											89	152	206		1151	5333			
150-200 mm																			
200-250 mm																			
250-300 mm																			
Unknown size											114	245	179	497	464				
Total											366	1406	2248	2199	9024	9673	5970		
<i>Clupea harengus</i>																			
120-150 mm													4		240				
150-200 mm															434				
200-250 mm														6143	461	11961	7514	171289	99034
250-300 mm																			
Unknown size											5			1395	52				
Total											5		4	7538	1187	11961	7514	270323	
<i>Ammodytidae</i>																			
60-70 mm															12				
70-80 mm															51				
120-150 mm													2						
Unknown size											40		25	20					
Total											90		27	83					
<i>Scomber scombrus</i>																			
200-250 mm													12						
250-300 mm																	2781		
Total													12				2781		

Continued

Table 10-E-1 Continued

Quarter 1		Saithe size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Pandalus</i>												9							
40-50 mm												9							
Total												9							
Area 2																			
All species												16658					18460		
All size classes																			
<i>Ammodytidae</i>																			
80-100 mm																	1391		
100-120 mm																	6128		
120-150 mm																	1410		
Unknown size																	4614		
Total																	13543		
Area 3 - No samples																			
Area 4 - No samples																			
Area 5 - No samples																			
Area 6 - No samples																			
Area 7																			
All species											1181	3053	3255	5079	79193	88621			
All size classes																			
<i>Trisopterus esmarki</i>												90	247						
80-100 mm												683	655	816					
100-120 mm																			
120-150 mm																			
150-200 mm																			
Total												773	902	816	6167	13305			
<i>Clupea harengus</i>																			
150-200 mm															2289				
200-250 mm															25000	50486			
250-300 mm															35922	19943			
Unknown size																			
Total															63211	70429			

TABLE 10-E-2: Average stomach content weight (g) per 1000 fish by size class of commercially exploited prey species by predator size class, area and quarter, 1991, saithe

Quarter 2		Saithe size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 1																			
All species	All size classes									1899	8983	11583	18398	39247	94159	97455	183386	175993	
Melanogrammus	aeglefinus													198			11982		
	150-200 mm																11487		
	200-250 mm																		
	250-300 mm													198			23468		
	Total																		
Merlangius	merlangus																		
	200-250 mm																269		
	250-300 mm															69	11610		
	300-350 mm																3305		
	Unknown size																86		
	Total															69	15269		
Trisopterus	esmarki																		
	15-20 mm										6600			1					
	20-25 mm												10	61					
	25-30 mm												36						
	30-35 mm											1	92	0					
	35-40 mm												23						
	40-50 mm												13						
	80-100 mm												171						
	100-120 mm											69	215	1802	55	67	138		
	120-150 mm											163	1007	7723	1866	749	438	3176	
	150-200 mm												255	5837	11193	8380	4663	5354	
	Unknown size											114	218	733	2177	7272	1837		
	Total										6600	347	2041	16157	15518	16566	9083	8531	

Continued

Table 10-E-2 Continued

Quarter 2		Saithe size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Clupea harengus</i>	150-200 mm														7061	2027	1919	55598	
	200-250 mm														4329	14061	32330	73430	
	250-300 mm																20056		
	300-350 mm																6246		
	Unknown size													39	210	462	4242	2515	
Total														39	11600	16550	64793	131543	
<i>Anmodytidae</i>	40-50 mm											9			140		83		
	50-60 mm													77	873		1320		
	60-70 mm										1	108		392	5217		6088		
	70-80 mm									22		66		310	14001		3792		
	80-100 mm												106	321	1810		2670		
	120-150 mm														1902				
	150-200 mm														639				
	Unknown size										250	601		3029	5903	35	415		
Total											282	1042		4129	30485	35	14368		
<i>Microstomus kitt</i>	15-20 mm													0					
	20-25 mm													0					
	Unknown size													0					
	Total													1					
<i>Pandalus</i>	Unknown size												2						
	Unknown size												2						
	Total												2						
Area 2																			
All species All size classes										1913	2770	12041	9122		23384	13545	39821	356011	

Continued

Table 10-E-2 Continued

Quarter 2		Saithe size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Melanogrammus aeglefinus</i>																		38085	
150-200 mm																		101514	
200-250 mm																		139598	
Total																			
<i>Merlangius merlangus</i>																		216413	
250-300 mm																		216413	
Total																			
<i>Trisopterus esmarki</i>																	37714		
120-150 mm															12330	13470			
150-200 mm																			
Unknown size															12330	13470	37714		
Total																			
<i>Ammodytidae</i>																			
80-100 mm												700	2615		1180				
100-120 mm												1933	688		6013				
120-150 mm												2096			1574				
Unknown size												1227	1775						
Total												5957	5078		8768				
Area 3																			
<i>All species</i>																			
All size classes														30218	48107		181484	218822	
<i>Merlangius merlangus</i>																			
200-250 mm																		156374	
250-300 mm																		62447	
Total																		218822	
<i>Trisopterus esmarki</i>																			
120-150 mm															25127				
Total															25127				

Continued

Table 10-E-2 Continued

Quarter 2		Saithe size class																	
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
<i>Clupea harengus</i>																			
200-250 mm																85108			
Unknown size																60512			
Total																145620			
<i>Ammodytidae</i>																			
40-50 mm													5430	180		1877			
50-60 mm													2163	200		788			
60-70 mm													1922						
70-80 mm													432			1472			
Unknown size													9292	1387		5392			
Total													19237	1766		9529			
Area 4 - No samples																			
Area 5 - No samples																			
Area 6																			
All species																			
All size classes								2748	3649		7189								
<i>Ammodytidae</i>																			
40-50 mm											1110								
50-60 mm											867								
70-80 mm									473										
Unknown size											3849								
Total									473		5826								
Area 7																			
All species										13	1296	6797	29204	92427	23143	165627			
All size classes																			
<i>Merlangius merlangus</i>																			
200-250 mm																12256			
250-300 mm																31555			
Total																43810			

Continued

Table 10-E-2 Continued

Quarter 2	Saithe size class																		
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
<i>Trisopterus esmarki</i>																			
80-100 mm																1066			
100-120 mm																26950			
120-150 mm												1711	6458	86210	13835	45399			
150-200 mm												2026	8517		9248				
Unknown size												1269	1489						
Total												5006	16464	86210	23083	73415			
<i>Clupea harengus</i>																			
250-300 mm																32579			
Unknown size																615			
Total																33193			

TABLE 10-E-3. Average stomach content weight (g) per 1000 fish by size class of commercially exploited prey species by predator size class, area and quarter, 1991, saithe

Quarter 3		Saithe size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 1																			
All species								512			1080	4689	10419	16677	13533	39788	311901		
All size classes																			
<i>Melanogrammus aeglefinus</i>																			
60-70 mm												122	17				111		
70-80 mm													12	32		141	120		
80-100 mm												103	548	965	513	620	3169		
100-120 mm													2877		441				
120-150 mm													1115				231		
Total												225	4568	997	953	760	3630		
<i>Merlangius merlangus</i>																			
40-50 mm													15		9				
50-60 mm															58				
60-70 mm															29				
70-80 mm														18					
80-100 mm													309	216	582	190	96		
100-120 mm												374	228	452					
120-150 mm																			
Unknown size													105						
Total												374	656	686	678	190	96		
<i>Trisopterus esmarki</i>																			
50-60 mm												25	42	242			360		
60-70 mm													394	1965	21	296	173		
70-80 mm												108	286	1719	31	96	885		
80-100 mm												613	1544	1324	739		3131		
100-120 mm												226	34	295			8756		
120-150 mm												503	139	2141	5382	6814	9233		
150-200 mm												665	248	3539	2874	14966			
Unknown size												64	704	753	312	539			
Total												2205	3391	11978	9360	22710	22537		

Continued

Table 10-E-3 Continued

Quarter 3		Saithe size class																
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Clupea harengus</i>																		
150-200 mm																436		
200-250 mm													524		4560	23308		
250-300 mm															11095	200991		
300-350 mm													284	737	94	38367		
Unknown size													808	737	15749	118		
Total																263221		
<i>Sprattus sprattus</i>																		
70-80 mm												11						
Total												11						
<i>Ammodytidae</i>																		
60-70 mm												25						
70-80 mm												105						
80-100 mm												250	426					
Unknown size												125						
Total												506	426					
<i>Crangon crangon</i>																		
20-25 mm															10			
Total															10			
<i>Pandalus</i>																		
35-40 mm														318				
Total														318				
Area 2																		
<i>All species</i>																		
All size classes												15465	38777			219391		
<i>Melanogrammus aeglefinus</i>																		
80-100 mm													7752					
100-120 mm													2464					
Total													10217					

Continued

Table 10-E-3 Continued

Quarter 3		Saithe size class																
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Merlangius merlangus</i>													847					
80-100 mm													847					
Total													847					
<i>Trisopterus esmarki</i>												809						
60-70 mm												3217	3825					
70-80 mm												3353	10907					
80-100 mm												3417	2370			3426		
100-120 mm																6284		
120-150 mm																		
150-200 mm																		
Unknown size												664	8866			706		
1745																		
Total												11460	27714			10416		
<i>Clupea harengus</i>																		
250-300 mm																122784		
Total																122784		
<i>Ammodytidae</i>																		
80-100 mm																658		
100-120 mm																1142		
Unknown size																217		
Total																2018		
Area 3 - No samples																		
Area 4																		
All species																		
All size classes																362		
Area 5 - No samples																		
Area 6																		
All species																		
All size classes																1000		
Area 7 - No samples																		

TABLE 10-E-4: Average stomach content weight (g) per 1000 fish by size class of commercially exploited prey species by predator size class, area and quarter, 1991, saithe

Quarter 4		Saithe size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
Area 1																			
All species								281			2167	7235	13507	21160	34762	68251	115411	144231	
All size classes																			
<i>Melanogrammus aeglefinus</i>																			
80-100 mm													89				534	3851	
100-120 mm													280	208	222				
120-150 mm													730	1157	339	4297	2543	4126	
150-200 mm															331				
Unknown size													28						
Total													1127	1365	892	4297	3078	7977	
<i>Merlangius merlangus</i>																			
70-80 mm																152			
80-100 mm													3				432		
100-120 mm													166	226					
120-150 mm													98			1677			
Total													266	226		1829	432		
<i>Trisopterus esmarki</i>																			
40-50 mm														4	50				
50-60 mm													14						
60-70 mm												24	19						
70-80 mm												523	635	503					
80-100 mm											2118	4885	6724	8064	3722	849	6763	6428	
100-120 mm												1310	2495	4485	6559	3593	637	9845	
120-150 mm													457	835	2373	4748		4628	
150-200 mm													217	2392	11102	8729			
Unknown size								281				329	801	914	1536				
Total								281			2118	7071	11361	17196	25341	17918	7400	20901	

Continued

Table 10-E-4 Continued

Quarter 4		Saithe size class																	
Prey size class		50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200
<i>Clupea harengus</i>															8				
150-200 mm															690	10185	27271	53759	
200-250 mm															1860	23763	76090	59607	
250-300 mm													25	616	24		1084	1749	
Unknown size													25	616		33948	104445	115115	
Total													25	616	2584				
<i>Anmodytidae</i>													1						
60-70 mm													1						
70-80 mm													1						
80-100 mm													2	8					
Unknown size																			
Total													4	8					
<i>Scomber scombrus</i>																			
150-200 mm													1		2289				
Unknown size													1		2460				
Total													1		4749				
<i>Pandalus</i>																			
15-20 mm														10				238	
20-25 mm													0		7				
30-35 mm															44				
35-40 mm													25						
50-60 mm													6						
Unknown size													2						
Total													33	10	50			238	
Area 2																			
<i>All species</i>																			
All size classes											2603		39672					485213	
<i>Merlangius merlangus</i>																			
100-120 mm																		7487	
Total																		7487	

Continued

Table 10-E-4 Continued

Quarter 4		Saithe size class																	
Prey size class	50	60	70	80	100	120	150	200	250	300	350	400	500	600	700	800	1000	1200	
<i>Trisopterus esmarki</i>	70-80 mm											708							
	80-100 mm									2603		23409							
	100-120 mm											8543							
	Unknown size											7012							
	Total									2603		39673							
<i>Clupea harengus</i>	150-200 mm																312990		
	200-250 mm																79290		
	Unknown size																41396		
	Total																433676		
	<i>Limanda limanda</i>																	44050	
150-200 mm																	44050		
Total																	44050		
Area 3 - No samples																			
Area 4 - No samples																			
Area 5 - No samples																			
Area 6 - No full stomachs																			
Area 7																			
All species											6190	2636		28343	2571				
All size classes																			
<i>Trisopterus esmarki</i>	70-80 mm											142							
	80-100 mm										1950	189		7204					
	100-120 mm										4167								
	120-150 mm											1046		21139					
	Unknown size											548							
Total											6117	1926		28343					

TABLE 11-A-1: Average stomach content weight (g) per 1000 fish by age class of commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **cod**

Quarter 1	Cod age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes		1113	7601	27760	69124	93458	113538
<i>Gadus morhua</i>							
1				41	106	160	627
2				133	1923	801	1071
3				8	121	34	11
Total			2	182	2151	995	1710
<i>Melanogrammus aeglefinus</i>							
1			89	1193	1478	1274	634
2				1	1	1	500
3					23	309	219
4					37	506	309
5					65	892	544
6					21	288	175
Total			92	1194	1625	3271	2381
<i>Merlangius merlangus</i>							
1		4	1146	2277	4231	3903	10142
2			141	1969	6681	6323	9759
3			12	1294	4360	5579	7314
4			2	219	1308	1208	1730
5			0	122	626	686	840
6			0	40	245	238	239
Total		5	1301	5920	17450	17938	30023
<i>Trisopterus esmarki</i>							
1			871	1701	2295	2390	1317
2			85	734	1171	1527	606
3			0	70	67	154	85
Total		1	956	2506	3533	4070	2008
<i>Clupea harengus</i>							
1			219	1088	3481	1985	3301
2			63	1235	3985	4763	4767
3			28	931	1680	4246	2786
4			6	309	783	3131	1958
5			0	167	561	2277	1473
Total			316	3742	10490	16403	14285
<i>Sprattus sprattus</i>							
1		285	28	44	122	56	234
2		0	31	14	71	98	33
3			24	8	17	20	7
4			2	1	0	0	0
5			1	0	2	3	1
Total		285	87	67	213	178	274

Continued

Table 11-A-1 Continued

Quarter 1	Cod age class						
Prey age class	0	1	2	3	4	5	6+
Ammodytidae							
1		38	201	155	129	176	191
2		5	11	9	15	46	37
3		2	6	5	9	25	19
4		1	2	2	2	4	3
5		0	1	1	2	5	4
6		0	2	2	2	2	2
Total		46	223	175	176	265	258
Other							
All size classes		776	4624	13974	33485	50340	62599

TABLE 11-A-2: Average stomach content weight (g) per 1000 fish by age class commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, cod

Quarter 2	Cod age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes	44	2604	18804	51400	111741	190870	251585
<i>Gadus morhua</i>							
0		1	1	0	0		
1		2	43	240	278	296	155
2				26	227	8624	8695
3				12	107	4568	4614
4				0	2	285	291
Total		3	45	279	614	13774	13755
<i>Melanogrammus aeglefinus</i>							
0		2	3	2	0		
1			131	1296	9022	16032	26583
2			1	67	356	2086	1755
3			0	9	175	1615	1233
4				1	32	298	228
5				2	35	332	254
6				0	7	66	50
Total		2	135	1378	9628	20429	30103
<i>Merlangius merlangus</i>							
0		1	15	12	1	0	
1		10	655	1389	2868	2549	5283
2			363	1642	4000	3158	9609
3			78	1136	2517	3337	9713
4			8	184	1087	796	1783
5			5	99	465	561	915
6			1	40	62	135	222
Total		11	1125	4502	11002	10537	27712
<i>Trisopterus esmarki</i>							
0			6	4	0		
1		40	1940	5636	5596	4127	9538
2		2	601	899	960	2742	2202
3		0	278	510	219	257	186
4		0	23	39	21	45	33
Total		42	2849	7087	6796	7172	11960
<i>Clupea harengus</i>							
0		2	21	8	32	47	22
1		0	131	773	2712	2369	4870
2		1	112	5775	12603	18135	20364
3		0	77	1858	4443	8314	9979
4		0	29	462	953	1898	2832
5		0	49	672	1349	3030	4715
Total		4	419	9548	22092	33792	42782

Continued

Table 11-A-2 Continued

Quarter 2	Cod age class						
Prey age class	0	1	2	3	4	5	6+
<i>Sprattus sprattus</i>							
1		7	81	38	180	355	495
2		0	14	159	211	204	193
3		0	2	20	34	10	28
4				0	3		0
5				0	3		0
Total		8	96	217	431	569	717
Ammodytidae							
0	3	38	728	767	384	1087	822
1		96	859	891	964	2172	2151
2		79	685	723	1276	2917	3860
3		55	381	510	1251	2963	3715
4		13	94	110	207	415	631
5		7	86	155	565	1467	1366
6		11	90	134	313	696	794
Total	3	299	2923	3289	4958	11753	13348
Other							
All size classes	42	2235	11212	25100	56220	92844	111209

TABLE 11-A-3: Average stomach content weight (g) per 1000 fish by age class commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **cod**

Quarter 3	Cod age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes	75	4439	22205	48994	97297	120542	141504
<i>Gadus morhua</i>							
0	0	161	869	626	377	269	62
1				11	44		88
2							1332
3							234
4							17
Total	0	161	880	670	377	269	1734
<i>Melanogrammus aeglefinus</i>							
0		138	928	1661	566	1208	511
1			34	356	105	159	11105
2							368
Total		138	962	2017	671	1366	11984
<i>Merlangius merlangus</i>							
0	0	87	786	1087	639	793	254
1		152	76	1317	5007	5524	1739
2			8	371	872	818	216
3			10	374	161	200	8
4			1	45	36	20	
5			1	21	12	10	
6			0	8	2	4	
Total	0	239	882	3223	6729	7369	2217
<i>Trisopterus esmarki</i>							
0	0	498	2372	2214	2799	3095	1266
1		52	2753	4752	5443	3673	5393
2		4	180	772	812	153	88
3		0	6	35	37	5	3
Total	0	554	5313	7774	9094	6927	6750
<i>Clupea harengus</i>							
0		12	1	61	792		
1		3	968	2384	4605	12538	6097
2			401	2593	14049	25382	11507
3			283	1960	6761	10007	5787
4			170	2881	6343	7224	6674
5			161	3403	7737	8644	7808
Total		14	1984	13281	40286	63792	37873
<i>Sprattus sprattus</i>							
0		3					
1		28	546	528			
2		0	373	434			
3			81	105			
Total		32	1000	1067			

Continued

Table 11-A-3 Continued

Quarter 3	Cod age class						
Prey age class	0	1	2	3	4	5	6+
Ammodytidae							
0	0	1081	1135	2195	1609	553	110
1	0	17	173	400	404	16	2
2	0	4	5	58	83	1	
3	0	11	13	59	94	0	
4	0	8	32	34	32	0	
5		5	39	34	17		
6		11	107	76	17		
Total	0	1137	1503	2857	2257	571	112
Other							
All size classes	74	2163	9681	18104	37883	40247	80834

TABLE 11-A-4: Average stomach content weight (g) per 1000 fish by age class commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, cod

Quarter 4	Cod age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes	1068	7529	23937	53880	78422	190421	277656
<i>Gadus morhua</i>							
0		67	116	153			267
Total		67	155	153			267
<i>Melanogrammus aeglefinus</i>							
0		957	1912	4284	6390	7985	7574
1		1	3	919	4282	6264	5698
2				5	29	14	4
Total		960	2087	5472	10700	14262	13276
<i>Merlangius merlangus</i>							
0		417	1441	751	508	303	1504
1		324	2272	2549	6710	8098	9653
2		72	490	1058	2911	5687	6418
3		37	225	291	2703	3022	3433
4		22	133	11	223		
5		9	55		46		
6		7	42		46		
Total		888	4658	4659	13147	17110	21008
<i>Trisopterus esmarki</i>							
0		811	2541	5032	10456	20089	20483
1		12	457	2488	5944	5795	4814
2		0	19	90	214	215	180
3		0	1	5	11	11	9
Total		838	3018	7615	16644	26110	25487
<i>Clupea harengus</i>							
0			41	21		3602	
1		3	81	758	1494	73509	99433
2		3	99	698	1391	4704	5763
3			26			208	279
4			5				
5			14				
Total		7	266	1480	2885	78422	109077
<i>Sprattus sprattus</i>							
0	1	59	53	182	24	24	772
1		120	2	2	0	116	
2		27					
3		13					
4		0					
Total	1	219	55	184	25	24	888

Continued

Table 11-A-4 Continued

Quarter 4	Cod age class						
Prey age class	0	1	2	3	4	5	6+
Ammodytidae							
0		66	353	305	23	32	16
1		28	103	90			
2		7	21	8			
3		12	77	73			
4		4	16	1			
5		3	10	0			
6		3	11	0			
Total	4	122	590	478	23	32	16
Other							
All size classes	1063	4427	13108	33839	34999	54461	107637

TABLE 11-B-1: Average stomach content weight (g) per 1000 fish by age class of commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **haddock**

Quarter 1	Haddock age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes		223	481	881	1439	1590	3006
<i>Trisopterus esmarki</i>							
1		0	8	64	237	229	303
2			0	14	12	12	7
Total		0	8	78	250	241	309
<i>Clupea harengus</i>							
1				1		14	11
2				8		87	73
3				0		0	0
Total				9		101	85
<i>Ammodytidae</i>							
1		10	31	56	31	19	8
2		0	0	0	0	0	0
Total		10	31	56	31	19	8
Other							
All size classes		214	441	739	1159	1230	2603

TABLE 11-B-2: Average stomach content weight (g) per 1000 fish by age class of commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **haddock**

Quarter 2	Haddock age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes	37	1171	2166	3296	4543	5316	4773
<i>Trisopterus esmarki</i>							
1				2	6	4	1
2				0	1	0	0
Total		0	0	2	7	4	1
<i>Clupea harengus</i>							
Total						4	41
<i>Sprattus sprattus</i>							
1				1	1	2	2
2				0	0	2	2
Total				1	1	4	4
Ammodytidae							
0	27	395	533	587	496	928	921
1		15	74	161	282	261	164
2		0	8	65	69	99	59
3		0	4	30	27	46	27
4			1	5	4	7	4
5			1	5	4	8	5
6			0	3	2	4	2
Total	27	410	621	978	1048	1685	1337
Other							
All size classes	10	762	1544	2315	3488	3618	3389

TABLE 11-B-3: Average stomach content weight (g) per 1000 fish by age class of commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **haddock**

Quarter 3	Haddock age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes	102	1201	2483	5687	4636	5007	7633
<i>Gadus morhua</i>							
0					6	2	9
Total					6	2	9
<i>Melanogrammus aeglefinus</i>							
0		6	14	52	94	39	212
1			0	11	20	8	49
Total		6	14	63	114	47	261
<i>Trisopterus esmarki</i>							
0	0	19	238	220	51	34	33
1							1839
Total	0	19	238	220	51	34	1872
Ammodytidae							
0	5	557	1039	3220	2714	2992	3733
1		6	8	143	33	85	24
2		0	1	4	3	3	1
3		1	3	8	7	4	0
4		1	2	6	6	3	0
5		1	2	4	4	2	
6		1	2	5	5	2	
Total	7	642	1069	3391	2771	3092	3759
Other							
All size classes	95	534	1162	2014	1693	1832	1732

TABLE 11-B-4: Average stomach content weight (g) per 1000 fish by age class of commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **haddock**

Quarter 4	Haddock age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes	181	1033	2076	3242	4479	6149	14191
<i>Melanogrammus aeglefinus</i>							
0				54	140	347	765
Total				54	140	347	765
<i>Trisopterus esmarki</i>							
0	5	146	395	553	853	878	4161
1		0	0	18	43	103	232
Total	5	146	395	572	896	982	4393
<i>Clupea harengus</i>							
0		0	0				
Total		0	0	35	90	222	490
Ammodytidae							
0	0	112	285	363	406	304	623
1		12	39	30	26	26	4
2		1	2	1	1	1	
3		0	2	1	3	2	
4		0	0	0	0	0	
Total	0	125	329	395	436	334	664
Other							
All size classes	175	762	1351	2187	2917	4264	7878

TABLE 11-C-1: Average stomach content weight (g) per 1000 fish by age class of commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **whiting**

Quarter 1	Whiting age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes		432	1038	1688	2351	2172	2978
<i>Melanogrammus aeglefinus</i>							
1			1	4	28	25	32
2				0	0	0	
Total			1	4	28	25	32
<i>Merlangius merlangus</i>							
0			0	0	0	0	0
1		0	40	67	179	177	332
2			0	0	1	2	3
Total		0	40	67	180	179	335
<i>Trisopterus esmarki</i>							
1		5	219	513	835	820	1907
2		0	1	2	13	14	42
3		0	0	0	1	2	4
Total		5	219	515	848	836	1953
<i>Clupea harengus</i>							
1		0	16	9	14	11	12
2				0	0	0	0
Total		0	16	9	14	11	12
<i>Sprattus sprattus</i>							
1		35	187	430	296	246	46
2		1	51	150	93	74	4
3		0	1	1	3	1	1
4		0	0	0	0	0	0
5		0	0	0	0	0	0
Total		37	238	580	392	321	51
<i>Ammodytidae</i>							
1		107	135	143	126	146	197
2		0	11	13	20	14	7
3		0	6	7	11	6	1
4		0	1	1	2	1	0
5		0	1	1	2	1	0
6		0	1	1	1	1	0
Total		107	154	165	162	169	204
Other							
All size classes		283	369	347	728	630	391

TABLE 11-C-2: Average stomach content weight (g) per 1000 fish by age class of commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **whiting**

Quarter 2	Whiting age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes		948	2219	3017	3598	3782	4226
<i>Gadus morhua</i>							
0		6	3	2	2	3	0
Total		6	3	2	2	3	1
<i>Melanogrammus aeglefinus</i>							
0		0	2	3	1	0	1
Total		0	2	3	1	0	1
<i>Merlangius merlangus</i>							
0		1	1	1	4	5	8
1		1	11	26	50	43	55
Total		2	12	28	54	48	62
<i>Trisopterus esmarki</i>							
0		1	6	10	7	7	10
1		2	47	120	139	211	306
2		0	2	7	11	19	22
3		0	0	0	1	1	2
4		0	0	0	0	0	0
Total		3	55	137	158	239	340
<i>Clupea harengus</i>							
0		1	6	7	16	28	8
1		1	9	19	64	111	118
2		0	0	0	0	1	0
Total		1	15	26	81	140	126
<i>Sprattus sprattus</i>							
0		1	0	0	0	0	0
1		69	300	395	642	517	648
2		9	33	40	76	61	94
3		3	6	5	12	12	21
4		0	1	0	1	1	1
5		0	1	0	1	1	1
6		0	0	0	0	0	0
Total		82	341	441	731	592	767
Ammodytidae							
0		218	741	1060	865	854	1136
1		97	296	387	522	494	571
2		20	107	156	258	277	273
3		4	34	57	95	92	106
4		1	7	13	22	22	24
5		1	4	7	12	12	14
6		1	6	10	23	23	22
Total		341	1197	1691	1797	1775	2145
Other							
All size classes		513	594	689	774	985	785

TABLE 11-C-3: Average stomach content weight (g) per 1000 fish by age class of commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **whiting**

Quarter 3	Whiting age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes	269	1015	2845	4037	4515	4585	6421
<i>Gadus morhua</i>							
0		3	36	26	23	23	13
Total		3	36	26	23	23	13
<i>Melanogrammus aeglefinus</i>							
0	1	49	294	224	268	238	396
Total	1	49	294	224	268	238	396
<i>Merlangius merlangus</i>							
0	1	35	101	126	164	170	348
1		0	2	1	3	14	6
2				0	0		0
3				0	0		0
4				0	0		0
Total	1	35	103	127	167	184	355
<i>Trisopterus esmarki</i>							
0	36	73	320	384	445	425	1070
1		0	29	248	252	307	1537
2		0	1	13	10	16	50
3		0	0	0	0	0	0
Total	36	73	352	646	706	753	2656
<i>Clupea harengus</i>							
0		21	221	507	365	496	575
1		0	49	422	298	802	741
Total		21	270	929	662	1298	1316
<i>Sprattus sprattus</i>							
0	0	9	93	77	86	110	4
1		116	393	514	883	517	127
2		1	30	91	146	68	46
3		0	4	13	8	17	12
4		0	0	1	1	1	1
5		0	0	1	1	1	1
Total	0	127	521	698	1123	714	192
<i>Ammodytidae</i>							
0	106	233	492	491	424	458	632
1	0	7	38	74	44	45	98
2		0	2	7	10	6	6
3		4	32	68	70	43	25
4		0	10	25	46	24	12
5		0	7	17	31	16	8
6		1	34	65	57	28	10
Total	106	245	615	747	682	620	793
Other							
All size classes	124	462	654	640	883	754	700

TABLE 11-C-4: Average stomach content weight (g) per 1000 fish by age class of commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **whiting**

Quarter 4		Whiting age class						
Prey age class		0	1	2	3	4	5	6+
All species								
All size classes		624	1687	2675	4192	3217	3324	3288
<i>Gadus morhua</i>								
0		0	1	3	3	3	6	1
Total		0	1	3	3	3	6	1
<i>Melanogrammus aeglefinus</i>								
0		12	19	110	323	108	145	176
1				0	0	0	0	0
Total		12	19	110	323	108	145	176
<i>Merlangius merlangus</i>								
0		2	33	85	232	122	162	221
Total		2	33	86	233	124	162	221
<i>Trisopterus esmarki</i>								
0		142	487	1120	2067	902	856	689
1		0	5	76	119	145	55	123
2			0	20	19	38	2	5
3			0	0	0	0	0	0
Total		142	492	1216	2205	1085	913	818
<i>Clupea harengus</i>								
0		3	29	44	124	38	55	63
1			3	5	2	5	7	2
Total		3	32	49	126	42	61	65
<i>Sprattus sprattus</i>								
0		19	127	151	125	354	434	455
1		1	20	40	75	190	186	242
2		0	1	1	2	4	4	5
3			0	0	1	2	2	2
4			0	0	0	0	0	0
Total		20	148	193	202	550	626	705
Ammodytidae								
0		34	223	181	168	150	122	116
1		11	62	96	184	101	43	71
2		1	3	6	6	4	2	3
3		1	8	23	25	33	10	9
4		0	12	18	37	24	12	15
5		0	13	19	45	25	12	18
6		0	19	28	66	35	17	26
Total		46	339	377	543	401	242	291
Other								
All size classes		398	622	641	558	904	1168	1011

TABLE 11-D-1: Average stomach content weight (g) per 1000 fish by age class of commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **mackerel**

Quarter 1	Mackerel age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes		416	389	235	222	34	864
Ammodytidae							
1			0	230	217	33	
Total			0	230	217	33	
Other							
All size classes		416	389	5	5	1	864

TABLE 11-D-2: Average stomach content weight (g) per 1000 fish by age class of commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **mackerel**

Quarter 2	Mackerel age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes		1135	2443	3141	3661	3805	4975
<i>Gadus morhua</i>							
0		1	2	2	2	1	12
Total		1	2	2	2	1	12
<i>Melanogrammus aeglefinus</i>							
0		0	0	0			
Total		0	0	0			
<i>Trisopterus esmarki</i>							
0		1	5	6	6	6	10
1			0	1	3	6	10
Total		1	5	6	9	11	20
<i>Clupea harengus</i>							
0			4	11	24	24	28
1			0	12	5	36	43
Total			4	23	29	59	72
<i>Sprattus sprattus</i>							
1		21	2	16	47	82	146
2			0	6	22	44	82
3			0	3	13	26	48
4			0	1	2	4	8
5			0	1	2	4	7
6							27
Total		38	3	26	86	159	318
<i>Ammodytidae</i>							
0		69	120	213	220	317	243
1		17	85	258	308	372	311
2		0	2	13	27	47	301
3		0	26	112	43	92	242
4			16	65	19	44	59
5			5	22	7	16	30
6			15	65	18	42	48
Total		87	270	748	642	929	1233
Other							
All size classes		1009	2159	2335	2894	2644	3320

TABLE 11-D-3: Average stomach content weight (g) per 1000 fish by age class of commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **mackerel**

Quarter 3	Mackerel age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes		847	2857	3351	2734	2202	2409
<i>Gadus morhua</i>							
0			2	3	1	0	0
Total			2	3	1	0	0
<i>Merlangius merlangus</i>							
0			0	1	1	1	0
Total			0	1	1	1	0
<i>Trisopterus esmarki</i>							
0		1	121	150	224	59	46
1				0	9	2	1
Total		1	121	151	232	61	47
<i>Clupea harengus</i>							
0			3	15	13	25	26
Total		0	3	15	13	25	26
<i>Sprattus sprattus</i>							
0			0	0	0	0	0
1			0	3	7	20	21
Total			1	4	7	20	21
<i>Ammodytidae</i>							
0		5	339	450	427	194	91
1			1	1	7	2	18
2			0	0	1	1	7
3			0	1	2	7	13
4			0	1	2	6	7
5			0	1	1	4	5
6			0	1	2	5	5
Total		5	341	456	441	219	146
Other							
All size classes		840	2389	2722	2039	1875	2168

TABLE 11-D-4: Average stomach content weight (g) per 1000 fish by age class of commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **mackerel**

Quarter 4	Mackerel age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes	1374	44	157	397	885	2666	3040
<i>Trisopterus esmarki</i>							
0		7	43	152	147	880	369
Total		7	43	152	147	880	369
<i>Clupea harengus</i>							
0		1	3	10	33	51	66
Total		1	3	10	33	51	66
<i>Sprattus sprattus</i>							
0	63	1	2	5	19	35	49
1		0	1	5	29	75	144
2		0	0	0	3	9	20
3			0	0	1	3	8
4			0	0	0	0	0
Total	63	1	3	11	53	123	221
Ammodytidae							
0	147	0	3	13	99	284	400
1			0	1	9	25	35
6							31
Total	147	0	3	14	108	309	466
Other							
All size classes	1164	34	105	210	544	1303	1918

TABLE 11-E-1: Average stomach content weight (g) per 1000 fish by age class of commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **saithe**

Quarter 1	Saithe age class						
Prey age class	3	4	5	6	7	8	9+
All species							
All size classes	2621	4590	10602	14983	22367	24905	133178
<i>Trisopterus esmarki</i>							
1	1128	1304	720	851	1228	1661	512
2	447	797	1952	3159	3283	2311	823
3	42	102	788	1852	2991	3003	1072
4			41	224	688	915	374
Total	1617	2203	3501	6085	8191	7890	2781
<i>Clupea harengus</i>							
1	2	9	143	383	494	385	47
2	11	430	2354	2873	5526	7468	36960
3	11	420	2161	2133	3027	3344	45194
4	2	91	515	661	1053	1315	25738
5	0	4	120	425	846	960	15659
Total	27	954	5293	6475	10947	13472	123606
Ammodytidae							
1	21	31	53	30	11	236	588
2	0	1	0	0		5	12
3	0	0	0	0		0	1
4	0	0	0	0		0	0
Total	21	32	54	30	11	242	602
Other							
All size classes	957	1402	1754	2393	3218	3301	6190

TABLE 11-E-2: Average stomach content weight (g) per 1000 fish by age class of commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **saithe**

Quarter 2	Saithe age class						
Prey age class	3	4	5	6	7	8	9+
All species							
All size classes	16385	21251	43237	64741	116279	125194	151095
<i>Melanogrammus aeglefinus</i>							
1	2	26	84	37	3107	5578	11815
2					1525	2738	2803
3					61	110	109
Total	2	26	84	37	4694	8426	14727
<i>Merlangius merlangus</i>							
1					369	667	5548
2			1	9	2129	3808	13612
3			1	11	1885	3360	8858
4			0	1	300	536	1655
5			0	0	121	217	560
6			0	0	44	78	312
Total			2	22	4848	8667	30547
<i>Trisopterus esmarki</i>							
0	243	168	57	12			
1	1283	2818	9451	13542	15979	14444	15911
2	226	851	2851	3835	4737	3075	1343
3	19	77	254	337	413	242	58
4	3	14	44	53	71	43	10
Total	1775	3928	12657	17780	21200	17804	17323
<i>Clupea harengus</i>							
1		1	45	72	555	970	1132
2		32	1165	2493	9782	22883	32746
3		16	701	2464	7168	8095	9636
4		4	211	879	2812	3316	4198
5		7	336	1446	5061	6001	6498
Total	0	61	2457	7354	25376	41266	54210
Ammodytidae							
0	305	733	4952	4458	4018	4524	4879
1	294	528	2726	2709	1808	1333	1407
2	170	204	198	179	79		
3	80	95	73	63	28		
4	13	15	12	10	5		
5	14	16	9	8	3		
6	7	8	5	4	2		
Total	881	1599	7976	7432	5943	5857	6286
Other							
All size classes	13727	15638	20061	32117	54218	43175	28001

TABLE 11-E-3: Average stomach content weight (g) per 1000 fish by age class of commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **saithe**

Quarter 3	Saithe age class						
Prey age class	3	4	5	6	7	8	9+
All species							
All size classes	9233	14674	17219	18784	124840	176415	281064
<i>Melanogrammus aeglefinus</i>							
0	3423	2383	1518	915	1298	1337	2420
Total	3423	2383	1518	915	1298	1337	2420
<i>Merlangius merlangus</i>							
0	576	663	626	581	167	64	64
Total	576	663	626	581	167	64	64
<i>Trisopterus esmarki</i>							
0	2617	4901	4096	734	1936	2703	4264
1	630	3585	6829	9870	10955	10252	12624
2	113	609	931	1361	1730	1401	1536
3	5	28	43	64	81	66	72
Total	3366	9123	11899	12030	14703	14422	18497
<i>Clupea harengus</i>							
1			142	449	3261	3830	6885
2	1	55	265	725	17530	29568	41762
3	1	73	222	554	13824	20583	32972
4	3	162	400	933	22855	29763	54446
5	4	196	468	1078	33394	43460	80348
Total	9	487	1497	3740	90862	127200	216409
<i>Sprattus sprattus</i>							
0	8	4					
Total	8	4					
Ammodytidae							
0	376	414	186		254	571	635
1					15	34	38
Total	376	414	186		269	605	673
Other							
All size classes	1474	1602	1492	1519	17542	32787	43002

TABLE 11-E-4: Average stomach content weight (g) per 1000 fish by age class of commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **saithe**

Quarter 4	Saithe age class						
Prey age class	3	4	5	6	7	8	9+
All species							
All size classes	13827	21154	42296	68361	97602	112464	128896
<i>Melanogrammus aeglefinus</i>							
0	1059	1283	1491	2944	3841	3154	4640
1	0	0	2	1			
Total	1059	1283	1493	2945	3841	3154	4640
<i>Merlangius merlangus</i>							
0	245	248	240	928	1152	519	377
Total	245	248	240	928	1152	519	377
<i>Trisopterus esmarki</i>							
0	11126	12511	11768	9156	7399	7354	10909
1	584	3443	8820	9728	5437	680	820
2	14	127	340	354	184	23	
3	1	7	18	19	10	1	
Total	11725	16088	20946	19257	13029	8058	11729
<i>Clupea harengus</i>							
0	0	1	3	2			3504
1	8	216	2101	5529	10489	13710	20706
2	12	330	3353	8687	16710	22196	26343
3	7	191	2057	5207	10215	13875	13179
4	14	370	3998	10122	19857	26969	25611
5	13	320	3452	8739	17143	23284	22111
Total	54	1427	14964	38287	74418	100038	111459
Ammodytidae							
0	4	5	2				
Total	4	5	2				
Other							
All size classes	740	2102	4651	6943	5161	694	691

TABLE 12-A-1: Average number prey organisms per 1000 stomachs by age class commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **cod**

Quarter 1	Cod age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes		2144.78	3156.98	3182.72	3949.88	4236.20	5240.33
<i>Gadus morhua</i>							
1				4.15	3.61	3.48	15.07
2				1.24	10.76	20.06	10.27
3				0.03	0.44	0.18	0.04
Total			0.36	5.42	14.81	23.72	33.59
<i>Melanogrammus aeglefinus</i>							
1			4.67	49.73	72.41	60.81	22.91
2				0.02	0.06	0.03	4.02
3					0.09	1.16	0.89
4					0.15	1.90	1.07
5					0.27	3.35	1.88
6					0.09	1.08	0.61
Total			5.86	49.75	73.07	68.32	31.37
<i>Merlangius merlangus</i>							
1		0.33	101.10	149.66	233.77	271.62	678.29
2			3.80	41.11	114.13	127.77	196.38
3			0.31	22.00	58.20	76.94	85.64
4			0.06	2.41	13.17	13.27	16.84
5			0.00	1.21	5.83	6.67	7.72
6			0.00	0.31	2.17	2.30	2.08
Total		0.98	105.27	216.70	427.26	498.57	986.95
<i>Trisopterus esmarki</i>							
1			132.11	233.68	222.06	227.80	133.40
2			9.09	65.75	69.54	80.08	32.16
3			0.03	4.64	3.23	5.89	3.30
Total		2.16	141.24	304.08	294.83	313.78	168.86
<i>Clupea harengus</i>							
1			16.96	43.14	140.44	152.98	222.31
2			3.19	38.32	120.92	139.03	141.76
3			2.01	30.40	55.57	103.52	70.85
4			0.42	8.49	19.62	49.55	31.56
5			0.02	2.77	10.47	29.73	20.29
Total			22.59	124.61	347.04	474.81	486.77
<i>Sprattus sprattus</i>							
1		97.90	5.93	10.37	27.89	12.29	46.87
2		0.05	2.22	1.31	6.55	10.39	3.53
3			1.65	0.54	1.51	2.11	0.71
4			0.16	0.04	0.03	0.00	0.00
5			0.07	0.03	0.22	0.35	0.12
Total		97.95	10.03	12.30	36.19	25.14	51.23

Continued

Table 12-A-1 Continued

Quarter 1	Cod age class						
Prey age class	0	1	2	3	4	5	6+
Ammodytidae							
1		17.40	132.59	69.67	72.21	97.57	115.83
2		0.96	2.14	2.25	2.77	8.71	7.47
3		0.32	0.53	0.45	1.35	4.46	3.59
4		0.09	0.17	0.14	0.24	0.70	0.56
5		0.05	0.07	0.05	0.25	0.86	0.68
6		0.02	0.07	0.06	0.15	0.42	0.33
Total		18.85	135.57	72.90	78.45	114.01	128.62
Other							
All size classes		2024.84	2736.05	2396.96	2678.23	2717.85	3352.95

TABLE 12-A-2: Average number prey organisms per 1000 stomachs by age class commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **cod**

Quarter 2	Cod age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes	1886.37	15246.64	21748.45	10497.33	9061.83	11299.16	11426.78
<i>Gadus morhua</i>							
0		1.31	1.44	0.33	0.08		
1		1.11	2.34	10.56	45.26	13.07	2.25
2				0.99	8.60	13.43	8.90
3				0.47	4.04	6.80	4.68
4				0.01	0.06	0.31	0.28
Total		2.42	3.79	12.36	58.05	33.61	16.12
<i>Melanogrammus aeglefinus</i>							
0		2.82	0.87	0.61	0.06		
1			6.38	32.69	126.25	187.06	349.59
2			0.01	0.71	2.89	12.03	11.39
3			0.00	0.06	0.91	8.43	6.45
4				0.01	0.16	1.56	1.19
5				0.01	0.18	1.73	1.33
6				0.00	0.04	0.34	0.26
Total		2.82	7.26	34.09	130.49	211.14	370.21
<i>Merlangius merlangus</i>							
0		3.86	12.59	10.46	1.00	0.59	
1		0.52	31.75	61.65	76.41	42.66	72.01
2			7.40	44.02	64.16	45.94	109.29
3			1.44	20.90	29.82	33.09	102.71
4			0.14	2.45	8.00	6.04	15.98
5			0.10	0.97	3.35	3.49	6.35
6			0.01	0.43	0.56	0.90	1.91
Total		4.38	53.44	140.87	183.31	132.71	329.95
<i>Trisopterus esmarki</i>							
0			7.70	4.28	1.23		
1		4.13	177.30	383.82	327.95	198.24	490.59
2		0.16	43.89	49.24	40.61	91.89	79.12
3		0.01	8.26	14.88	6.70	8.46	6.10
4		0.00	0.91	1.28	0.72	1.49	1.08
Total		4.30	238.06	453.51	377.20	300.09	576.91
<i>Clupea harengus</i>							
0		1.10	9.27	0.65	2.11	3.15	1.47
1		0.00	4.92	47.55	131.05	77.58	147.30
2		0.01	2.56	122.96	242.83	264.52	270.78
3		0.01	0.82	29.34	62.57	128.86	129.84
4		0.00	0.22	5.31	11.32	32.18	35.96
5		0.00	0.35	6.52	15.20	52.21	58.11
Total		1.12	18.14	212.33	465.08	558.48	643.45

Continued

Table 12-A-2 Continued

Quarter 2	Cod age class						
Prey age class	0	1	2	3	4	5	6+
<i>Sprattus sprattus</i>							
1		1.80	10.09	5.60	31.04	64.25	62.61
2		0.03	0.86	8.70	15.82	20.00	22.18
3		0.01	0.09	1.06	2.14	0.54	2.69
4				0.01	0.21		0.03
5				0.01	0.21		0.03
Total		1.83	11.04	15.38	49.41	84.79	87.54
<i>Ammodytidae</i>							
0	65.31	88.41	2091.32	2175.40	970.21	1351.06	999.15
1		40.82	240.09	220.28	150.01	456.64	448.25
2		17.08	81.02	69.23	75.64	149.95	268.18
3		8.89	28.56	35.36	69.80	132.01	206.60
4		2.01	6.79	7.87	12.22	18.98	36.30
5		1.12	5.61	8.64	29.91	59.50	58.97
6		1.51	6.07	7.90	17.08	28.55	37.19
Total	65.31	159.84	2459.46	2524.69	1324.87	2255.90	2070.93
Other							
All size classes	1821.06	15069.93	18957.27	7104.10	6473.40	7722.44	7331.69

TABLE 12-A-3: Average number prey organisms per 1000 stomachs by age class commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **cod**

Quarter 3	Cod age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes	5240.45	4971.71	5119.06	6941.14	7982.93	6791.36	7023.63
<i>Gadus morhua</i>							
0	2.26	69.10	220.55	115.87	63.11	53.00	12.82
1			0.94	4.39			3.36
2							50.59
3							8.90
4							0.65
Total	2.26	69.10	221.49	120.25	63.11	53.00	76.31
<i>Melanogrammus aeglefinus</i>							
0		26.63	97.93	214.43	58.74	118.26	55.68
1			0.70	5.15	1.40	2.08	122.91
2							4.08
Total		26.63	98.64	219.58	60.14	120.34	182.66
<i>Merlangius merlangus</i>							
0	1.17	19.89	89.21	134.85	74.78	13.89	4.45
1		6.21	1.69	40.14	184.83	164.53	51.91
2			0.12	7.05	21.49	25.69	7.45
3			0.14	7.30	3.19	3.81	0.29
4			0.02	0.89	0.67	0.34	
5			0.01	0.45	0.21	0.18	
6			0.00	0.17	0.04	0.07	
Total	1.17	26.10	91.20	190.84	285.21	208.53	64.10
<i>Trisopterus esmarki</i>							
0	0.22	167.97	660.15	741.32	749.63	611.50	278.26
1		4.03	137.43	202.03	211.61	162.43	147.30
2		0.26	7.00	25.73	26.54	8.73	5.81
3		0.01	0.22	1.14	1.21	0.34	0.25
Total	0.22	172.28	807.56	972.86	994.44	783.01	431.62
<i>Clupea harengus</i>							
0		0.72	0.05	9.26	43.14		
1		0.07	26.00	47.17	149.86	411.17	185.16
2			4.91	29.41	215.46	553.97	258.12
3			2.54	17.85	78.66	192.42	120.01
4			2.02	24.57	68.93	183.89	153.28
5			2.21	28.72	82.55	216.58	177.52
Total		0.82	37.73	156.96	638.59	1558.00	894.08
<i>Sprattus sprattus</i>							
0		1.04					
1		3.64	28.42	28.78			
2		0.00	19.80	23.45			
3			4.32	5.79			
Total		4.68	52.55	58.03			

Continued

Table 12-A-3 Continued

Quarter 3	Cod age class						
Prey age class	0	1	2	3	4	5	6+
Ammodytidae							
0	0.02	1833.65	1122.42	1874.15	954.00	357.67	57.50
1	0.00	4.36	15.38	114.40	96.91	6.13	1.43
2	0.00	0.81	0.54	12.46	6.82	0.10	
3	0.00	1.94	0.80	12.07	6.23	0.04	
4	0.00	1.36	1.62	6.67	2.17	0.01	
5		0.91	1.98	6.60	1.11		
6		2.04	4.41	11.85	1.15		
Total	0.02	1845.08	1147.15	2038.21	1068.39	363.95	58.93
Other							
All size classes	5236.78	2827.02	2662.75	3184.42	4873.04	3704.55	5315.92

TABLE 12-A-4: Average number prey organisms per 1000 stomachs by age class commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **cod**

Quarter 4	Cod age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes	3057.74	4210.55	5411.98	7972.90	9156.69	10003.64	11027.37
<i>Gadus morhua</i>							
0		35.10	23.72	17.95			14.90
Total		35.10	38.09	17.95			14.90
<i>Melanogrammus aeglefinus</i>							
0		102.83	199.56	393.03	462.23	446.55	374.46
1		0.02	0.09	8.08	32.59	63.88	62.96
2				0.03	0.19	0.09	0.03
Total		104.03	227.90	440.69	495.01	510.52	437.45
<i>Merlangius merlangus</i>							
0		27.40	60.92	42.07	21.19	11.95	48.51
1		10.18	43.13	36.56	75.44	68.82	113.09
2		1.88	8.49	9.15	26.72	40.20	45.94
3		0.59	3.63	2.04	24.68	20.06	22.68
4		0.35	2.15	0.07	2.14		
5		0.15	0.89		0.45		
6		0.11	0.67		0.45		
Total		41.21	119.89	89.88	151.05	141.03	230.21
<i>Trisopterus esmarki</i>							
0		191.13	446.62	791.95	1777.26	3433.14	3477.63
1		1.07	23.86	113.91	231.75	207.70	172.69
2		0.00	0.86	3.09	6.22	6.61	5.83
3		0.00	0.03	0.16	0.33	0.35	0.30
Total		210.43	471.38	909.11	2017.93	3647.79	3656.45
<i>Clupea harengus</i>							
0			2.48	1.28			148.88
1		0.13	3.38	18.66	53.86	822.29	1113.67
2		0.12	3.13	16.78	50.15	77.66	79.89
3			0.68			2.25	3.01
4			0.14				
5			0.37				
Total		0.24	10.18	38.19	104.33	902.20	1345.46
<i>Sprattus sprattus</i>							
0	0.29	16.71	15.29	56.09	6.41	4.63	168.51
1		8.97	0.39	0.41	0.09		22.64
2		1.70					
3		0.76					
4		0.02					
Total	0.29	28.15	15.69	56.50	6.50	4.63	191.15

Continued

Table 12-A-4 Continued

Quarter 4	Cod age class						
Prey age class	0	1	2	3	4	5	6+
Ammodytidae							
0		44.48	224.00	172.98	18.54	18.52	9.52
1		4.28	12.53	13.97			
2		0.60	1.83	1.38			
3		1.18	10.29	11.21			
4		0.39	1.93	0.23			
5		0.23	1.23	0.08			
6		0.25	1.38	0.03			
Total	3.23	51.40	253.19	199.88	18.54	18.52	9.52
Other							
All size classes	3054.21	3739.98	4275.67	6220.71	6363.33	4778.94	5142.22

TABLE 12-B-1: Average number of prey organisms per 1000 stomachs by age class of commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **haddock**

Quarter 1	Haddock age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes		6698.64	6915.90	7338.79	9548.06	9158.57	12053.59
<i>Trisopterus esmarki</i>							
1		0.00	1.56	11.50	43.89	40.64	47.54
2			0.02	1.19	0.91	0.89	0.48
Total		0.00	1.59	14.46	48.46	42.89	49.54
<i>Clupea harengus</i>							
1				0.03		0.34	0.29
2				0.19		2.18	1.83
3				0.00		0.01	0.01
Total				0.23		2.53	2.13
Ammodytidae							
1		9.81	31.04	54.67	34.06	21.53	9.69
2		0.00	0.00	0.01	0.00	0.00	0.00
Total		9.82	31.05	54.68	34.06	21.53	9.69
Other							
All size classes		6688.82	6883.26	7269.42	9465.53	9091.62	11992.22

TABLE 12-B-2: Average number of prey organisms per 1000 stomachs by age class of commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **haddock**

Quarter 2	Haddock age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes	8043.76	109505.11	261529.54	215854.37	195322.41	175307.91	140078.65
<i>Trisopterus esmarki</i>							
1				0.79	0.64	0.35	0.08
2				0.07	0.06	0.03	0.01
Total		0.00	0.58	0.86	0.70	0.38	0.09
<i>Clupea harengus</i>							
Total						0.28	2.72
<i>Sprattus sprattus</i>							
1				0.08	0.07	0.34	0.33
2				0.05	0.05	0.22	0.21
Total				0.14	0.12	0.55	0.54
Ammodytidae							
0	266.63	1256.06	1795.12	1829.37	1368.32	2427.14	2785.23
1		14.47	54.22	89.38	162.54	148.85	117.33
2		0.02	0.75	5.81	6.14	9.88	8.09
3		0.00	0.32	2.44	1.93	4.12	3.58
4		0.05	0.39	0.32	0.66	0.57	
5		0.05	0.37	0.18	0.62	0.57	
6		0.03	0.19	0.09	0.32	0.30	
Total	266.63	1270.72	1850.53	2245.62	1969.07	3481.77	3326.25
Other							
All size classes	7777.13	108234.39	259678.43	213607.75	193352.52	171824.94	136749.06

TABLE 12-B-3: Average number of prey organisms per 1000 stomachs by age class of commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **haddock**

Quarter 3	Haddock age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes	18243.92	45598.54	33801.12	21987.71	20621.23	20112.17	18945.42
<i>Gadus morhua</i>							
0					6.40	2.05	9.00
Total					6.40	2.05	9.00
<i>Melanogrammus aeglefinus</i>							
0		1.36	3.16	4.61	7.06	2.92	13.63
1			0.00	0.67	1.26	0.53	3.09
Total		1.36	3.16	5.27	8.32	3.45	16.72
<i>Trisopterus esmarki</i>							
0	0.56	7.08	83.21	77.81	28.04	15.14	22.92
1							92.93
Total	0.56	7.08	83.21	77.81	28.04	15.14	115.85
Ammodytidae							
0	6.25	408.58	945.09	2852.99	3062.26	3147.11	4264.03
1		2.77	2.29	51.71	12.44	31.51	10.80
2		0.16	0.10	1.12	0.68	0.87	0.47
3		1.04	0.28	0.99	0.79	0.63	0.20
4		0.94	0.23	0.58	0.53	0.31	0.04
5		0.64	0.15	0.34	0.33	0.17	
6		0.75	0.18	0.40	0.39	0.20	
Total	522.69	6429.60	2373.10	2908.12	3077.41	3180.80	4275.53
Other							
All size classes	17720.67	39160.50	31341.65	18996.50	17501.05	16910.73	14528.32

TABLE 12-B-4: Average number of prey organisms per 1000 stomachs by age class of commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **haddock**

Quarter 4	Haddock age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes	15013.45	11391.68	10964.91	11500.88	11393.87	12517.30	16774.92
<i>Melanogrammus aeglefinus</i>							
0				2.46	6.38	15.76	34.76
Total				2.46	6.38	15.76	34.76
<i>Trisopterus esmarki</i>							
0	4.66	26.13	58.30	86.37	120.48	169.28	861.36
1		0.00	0.04	1.04	2.47	6.03	13.56
Total	4.66	26.13	58.33	87.41	122.94	175.30	874.92
<i>Clupea harengus</i>							
0		0.25	1.04				
Total		0.25	1.04	0.85	2.19	5.42	11.95
Ammodytidae							
0	0.66	93.70	226.08	369.42	451.52	282.25	448.18
1		3.86	13.94	13.24	12.38	11.55	1.67
2		0.14	0.63	0.47	0.21	0.36	
3		0.06	0.65	0.20	0.61	0.45	
4		0.01	0.05	0.04	0.02	0.03	
Total	0.66	98.03	241.35	383.36	464.73	294.64	474.85
Other							
All size classes	15008.14	11267.26	10664.19	11026.80	10797.63	12026.18	15378.44

TABLE 12-C-1: Average number of prey organisms per 1000 stomachs by age class of commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **whiting**

Quarter 1	Whiting age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes		20367.33	6862.37	2026.10	1415.26	1356.21	794.09
<i>Melanogrammus aeglefinus</i>							
1			0.26	1.18	6.89	6.57	4.07
2				0.00	0.00	0.00	
Total			0.26	1.18	6.90	6.57	4.07
<i>Merlangius merlangus</i>							
0			0.00	0.00	0.00	0.00	0.00
1		0.32	10.29	12.01	29.98	28.60	36.01
2			0.00	0.01	0.07	0.12	0.15
Total		0.32	10.29	12.02	30.06	28.72	36.16
<i>Trisopterus esmarki</i>							
1		1.61	50.45	102.06	117.51	127.04	198.98
2		0.00	0.53	0.88	2.30	1.90	2.92
3		0.00	0.00	0.03	0.07	0.18	0.40
Total		1.61	50.98	102.98	119.87	129.12	202.30
<i>Clupea harengus</i>							
1		0.03	2.45	1.27	1.93	1.72	2.06
2				0.00	0.00	0.00	0.00
Total		0.03	2.45	1.27	1.93	1.72	2.06
<i>Sprattus sprattus</i>							
1		14.07	34.26	50.87	46.62	37.93	13.30
2		0.27	5.17	13.68	8.86	6.87	0.49
3		0.00	0.11	0.08	0.27	0.09	0.08
4		0.00	0.00	0.00	0.01	0.01	0.01
5		0.00	0.00	0.00	0.00	0.00	0.00
Total		14.34	39.54	64.64	55.76	44.90	13.88
<i>Ammodytidae</i>							
1		95.65	114.55	112.91	103.59	113.25	130.74
2		0.03	1.31	1.96	3.25	2.47	1.73
3		0.00	0.69	0.97	1.60	0.96	0.16
4		0.00	0.11	0.15	0.25	0.16	0.05
5		0.00	0.13	0.19	0.31	0.17	0.00
6		0.00	0.07	0.09	0.15	0.08	0.00
Total		95.69	116.86	116.26	109.15	117.10	132.69
Other							
All size classes		20255.34	6641.98	1727.75	1091.59	1028.09	402.92

TABLE 12-C-2: Average number of prey organisms per 1000 stomachs by age class of commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **whiting**

Quarter 2	Whiting age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes		158501.22	194603.02	202894.01	256653.33	189970.56	231039.03
<i>Gadus morhua</i>							
0		6.91	3.55	1.65	1.39	1.70	0.11
Total		6.91	3.55	1.65	1.39	1.70	0.32
<i>Melanogrammus aeglefinus</i>							
0		4.11	12.23	20.45	6.69	1.93	4.66
Total		4.11	12.23	20.51	6.74	1.96	4.73
<i>Merlangius merlangus</i>							
0		6.54	5.98	5.21	5.16	5.45	7.69
1		0.10	1.40	3.53	6.28	5.14	5.81
Total		6.65	7.38	8.74	11.44	10.58	13.50
<i>Trisopterus esmarki</i>							
0		2.92	15.23	10.79	6.74	4.25	3.47
1		0.33	6.63	15.92	17.16	25.96	36.20
2		0.02	0.36	0.87	1.02	1.47	1.76
3		0.00	0.02	0.05	0.07	0.10	0.12
4		0.00	0.00	0.00	0.01	0.01	0.02
Total		3.26	22.25	27.64	24.99	31.79	41.57
<i>Clupea harengus</i>							
0		0.22	1.33	1.53	3.41	5.84	1.09
1		0.08	0.62	1.69	5.15	8.58	9.64
2		0.00	0.01	0.01	0.03	0.06	0.01
Total		0.30	1.99	3.24	8.59	14.47	10.74
<i>Sprattus sprattus</i>							
0		1.43	0.43	0.42	0.36	0.29	0.50
1		23.25	87.31	99.12	153.07	126.07	168.04
2		1.05	4.41	6.03	10.99	8.17	11.33
3		0.31	0.66	0.59	1.20	1.06	1.80
4		0.04	0.07	0.04	0.08	0.09	0.14
5		0.04	0.07	0.04	0.08	0.10	0.15
6		0.00	0.00	0.00	0.00	0.00	0.00
Total		26.13	92.96	106.24	165.79	135.78	181.97
<i>Ammodytidae</i>							
0		734.04	3006.42	4032.10	2355.57	1946.58	2980.47
1		40.16	107.99	154.01	209.80	185.08	238.86
2		3.58	15.23	20.90	36.98	41.81	38.14
3		0.44	3.21	5.18	8.90	8.98	9.76
4		0.09	0.69	1.13	2.06	2.12	2.20
5		0.05	0.37	0.63	1.09	1.10	1.21
6		0.06	0.50	0.88	1.87	1.95	1.85
Total		779.19	3137.27	4218.38	2620.88	2201.04	3290.71
Other							
All size classes		157674.66	191325.39	198507.62	253813.51	187573.23	227495.49

TABLE 12-C-3: Average number of prey organisms per 1000 stomachs by age class of commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **whiting**

Quarter 3	Whiting age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes	45188.47	32931.35	19585.08	19839.50	10160.44	9917.14	16248.73
<i>Gadus morhua</i>							
0		1.37	13.88	12.52	8.94	9.29	3.60
Total		1.37	13.88	12.52	8.94	9.29	3.60
<i>Melanogrammus aeglefinus</i>							
0	1.49	11.74	87.94	58.59	69.65	60.82	47.45
Total	1.49	11.74	87.94	58.59	69.65	60.82	47.45
<i>Merlangius merlangus</i>							
0	2.51	26.66	44.99	44.26	57.57	56.06	59.82
1		0.00	0.10	0.04	0.11	1.89	0.30
2				0.00	0.00		0.02
3				0.00	0.00		0.00
4				0.00	0.00		0.00
Total	2.51	26.66	45.10	44.30	57.68	57.95	60.14
<i>Trisopterus esmarki</i>							
0	22.63	33.74	116.74	149.70	156.98	148.99	294.79
1		0.00	1.55	12.30	13.51	15.72	87.24
2		0.00	0.05	0.48	0.37	0.60	2.09
3		0.00	0.00	0.00	0.00	0.00	0.01
Total	22.63	33.82	118.95	162.48	170.85	166.91	384.12
<i>Clupea harengus</i>							
0		7.60	17.45	39.50	30.00	35.57	52.26
1		0.03	1.80	11.07	7.79	21.11	16.93
Total		7.62	19.25	50.56	37.79	56.68	69.19
<i>Sprattus sprattus</i>							
0	0.01	4.72	42.46	35.28	37.08	45.02	1.07
1		33.37	70.49	76.03	114.40	78.44	15.80
2		0.22	3.29	9.64	15.01	6.51	4.60
3		0.01	0.40	1.17	0.69	1.43	1.18
4		0.00	0.03	0.11	0.06	0.09	0.12
5		0.00	0.03	0.12	0.07	0.10	0.13
Total	0.01	38.32	116.69	122.35	167.30	131.59	22.91
<i>Ammodytidae</i>							
0	234.58	234.15	427.11	318.21	338.21	387.96	402.99
1	0.00	1.35	8.37	15.35	9.41	9.35	19.44
2		0.01	0.23	1.38	1.12	0.90	0.91
3		0.61	4.51	9.34	7.19	5.28	2.95
4		0.04	1.06	2.43	3.71	2.21	1.11
5		0.03	0.72	1.61	2.51	1.49	0.72
6		0.07	2.55	4.99	4.30	2.35	0.84
Total	234.58	236.25	444.55	353.31	366.44	409.53	428.96
Other							
All size classes	44927.26	32575.56	18738.73	19035.40	9281.79	9024.36	15232.35

TABLE 12-C-4: Average number of prey organisms per 1000 stomachs by age class of commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **whiting**

Quarter 4	Whiting age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes	20194.11	15167.57	14693.42	5849.54	10271.88	9173.62	11127.07
<i>Gadus morhua</i>							
0	0.01	0.37	1.18	0.98	1.21	2.18	0.37
Total	0.01	0.37	1.18	0.98	1.21	2.18	0.37
<i>Melanogrammus aeglefinus</i>							
0	2.00	2.06	10.31	29.08	14.40	14.09	17.16
1			0.00	0.00	0.00	0.00	0.00
Total	2.00	2.06	10.31	29.08	14.40	14.09	17.17
<i>Merlangius merlangus</i>							
0	3.18	6.65	12.55	31.02	16.84	18.07	25.40
Total	3.82	6.65	12.71	31.17	17.15	18.07	25.40
<i>Trisopterus esmarki</i>							
0	60.97	145.69	308.49	560.58	245.15	224.80	172.60
1	0.00	0.42	4.78	8.74	7.72	5.29	10.52
2		0.01	0.85	0.77	1.23	0.33	0.67
3		0.00	0.00	0.01	0.01	0.01	0.01
Total	60.97	146.12	314.13	570.10	254.11	230.42	183.81
<i>Clupea harengus</i>							
0	0.51	3.65	6.07	18.43	4.63	8.93	10.04
1		0.18	0.28	0.12	0.28	0.40	0.12
Total	0.51	3.83	6.34	18.55	4.92	9.34	10.16
<i>Sprattus sprattus</i>							
0	11.85	57.65	55.21	38.90	123.79	147.92	164.74
1	0.28	3.14	6.29	12.03	31.49	31.82	41.83
2	0.00	0.06	0.11	0.13	0.38	0.39	0.44
3		0.01	0.03	0.05	0.13	0.14	0.19
4		0.00	0.00	0.00	0.00	0.00	0.00
Total	12.13	60.87	61.64	51.10	155.79	180.28	207.21
<i>Ammodytidae</i>							
0	27.98	88.81	84.89	125.43	80.06	71.48	64.71
1	3.43	6.41	8.72	11.54	8.73	4.86	5.48
2	0.24	0.22	0.48	0.43	0.36	0.26	0.23
3	0.13	0.68	2.49	2.21	3.94	1.19	0.69
4	0.04	0.71	1.12	1.78	1.50	0.92	0.83
5	0.02	0.70	1.07	2.06	1.41	0.78	0.88
6	0.02	0.98	1.47	3.03	1.93	1.04	1.26
Total	31.86	98.52	102.74	151.64	111.05	91.71	90.55
Other							
All size classes	20082.80	14849.15	14184.38	4996.93	9713.25	8627.52	10592.42

TABLE 12-D-1: Average number of prey organisms per 1000 stomachs by age class of commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **mackerel**

Quarter 1	Mackerel age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes		30357.71	2635.60	339.08	320.24	48.44	3586.21
Ammodytidae							
1			0.07	166.67	157.41	23.81	
Total			0.07	166.67	157.41	23.81	
Other							
All size classes		30357.71	2635.53	172.41	162.84	24.63	3586.21

TABLE 12-D-2: Average number of prey organisms per 1000 stomachs by age class of commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **mackerel**

Quarter 2	Mackerel age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes		49045.76	202803.08	398507.85	580867.63	879028.50	1283669.21
<i>Gadus morhua</i>							
0		0.49	1.71	1.31	1.11	0.69	5.92
Total		0.54	1.83	1.31	1.13	0.69	5.92
<i>Melanogrammus aeglefinus</i>							
0		0.06	0.10	0.02			
Total		0.06	0.10	0.02			
<i>Trisopterus esmarki</i>							
0		0.97	4.39	6.96	8.02	8.37	5.66
1			0.01	0.10	0.38	0.76	1.33
Total		0.97	4.40	7.05	8.40	9.12	6.99
<i>Clupea harengus</i>							
0			0.42	1.29	2.82	2.97	3.76
1			0.02	0.75	0.38	2.29	2.83
Total			0.44	2.04	3.20	5.26	6.59
<i>Sprattus sprattus</i>							
1		14.11	0.61	3.83	7.69	12.09	22.82
2			0.05	0.48	1.83	3.51	7.58
3			0.02	0.26	1.04	2.05	4.19
4			0.00	0.04	0.16	0.32	0.66
5			0.00	0.04	0.16	0.32	0.65
6							1.81
Total		27.77	0.68	4.65	10.89	18.29	37.71
Ammodytidae							
0		124.75	175.27	227.83	226.14	319.76	249.55
1		8.87	45.44	158.74	166.62	204.73	129.36
2		0.00	0.72	3.46	3.82	6.63	42.45
3		0.00	1.42	6.54	2.62	5.23	30.32
4			0.83	3.79	1.16	2.36	7.23
5			0.28	1.28	0.43	0.87	3.67
6			0.83	3.78	1.11	2.27	5.89
Total		133.62	224.81	405.42	401.90	541.85	468.47
Other							
All size classes		48882.79	202570.82	398087.36	580442.12	878453.28	1283143.53

TABLE 12-D-3: Average number of prey organisms per 1000 stomachs by age class of commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **mackerel**

Quarter 3	Mackerel age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes		58441.08	204786.40	263500.78	280108.36	356720.81	390605.89
<i>Gadus morhua</i>							
0			1.24	2.13	0.72	0.24	0.14
Total			1.24	2.13	0.72	0.24	0.14
<i>Merlangius merlangus</i>							
0			0.26	0.56	0.71	0.71	0.18
Total			0.26	0.56	0.71	0.71	0.18
<i>Trisopterus esmarki</i>							
0		1.65	120.85	139.15	146.58	41.22	25.72
1				0.04	0.76	0.18	0.13
Total		1.65	120.85	139.20	147.35	41.40	25.84
<i>Clupea harengus</i>							
0			1.23	5.02	3.63	4.05	3.37
Total		0.80	4.54	6.47	4.15	4.14	3.45
<i>Sprattus sprattus</i>							
0			0.61	0.87	0.18	0.09	0.01
1			0.03	0.44	0.87	2.67	2.81
Total			0.64	1.31	1.05	2.77	2.82
Ammodytidae							
0		8.56	374.95	500.53	479.49	265.25	92.61
1			0.35	0.43	1.15	0.38	1.33
2			0.00	0.01	0.10	0.10	0.46
3			0.01	0.08	0.20	0.51	0.89
4			0.01	0.07	0.15	0.45	0.54
5			0.00	0.05	0.10	0.31	0.34
6			0.00	0.06	0.12	0.36	0.39
Total		8.56	375.58	502.30	481.76	267.44	96.55
Other							
All size classes		58430.07	204283.28	262848.81	279472.61	356404.10	390476.92

TABLE 12-D-4: Average number of prey organisms per 1000 stomachs by age class of commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **mackerel**

Quarter 4	Mackerel eage class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes	42314.21	29077.73	45394.79	143638.71	633314.08	1444277.17	1749302.39
<i>Trisopterus esmarki</i>							
0		1.55	10.90	35.05	32.69	191.54	80.10
Total		1.55	10.90	35.05	32.69	191.54	80.10
<i>Clupea harengus</i>							
0		0.13	0.66	2.39	7.72	11.93	11.79
Total		0.13	0.66	2.39	7.72	11.93	11.79
<i>Sprattus sprattus</i>							
0	74.38	0.18	0.46	1.21	4.33	7.65	9.59
1		0.01	0.14	0.55	3.18	8.01	15.77
2		0.00	0.01	0.05	0.32	0.87	1.86
3			0.00	0.01	0.10	0.30	0.66
4			0.00	0.00	0.00	0.01	0.01
Total	74.38	0.20	0.61	1.82	7.93	16.85	27.89
Ammodytidae							
0	283.32	0.62	1.17	5.02	39.77	113.88	159.49
1			0.09	0.39	3.07	8.80	12.33
6							2.34
Total	283.32	0.62	1.26	5.41	42.85	122.68	174.16
Other							
All size classes	41956.52	29075.23	45381.36	143594.05	633222.90	1443934.16	1749008.45

TABLE 12-E-1: Average number of prey organisms per 1000 stomachs by age class of commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **saithe**

Quarter 1	Saithe age class						
Prey age class	3	4	5	6	7	8	9+
All species							
All size classes	15855.16	7372.14	3532.18	3561.01	3545.05	2639.57	3366.67
<i>Trisopterus esmarki</i>							
1	286.95	300.28	176.68	139.19	168.93	224.71	57.58
2	74.73	82.68	139.90	190.46	175.85	103.90	31.29
3	9.20	9.71	41.51	75.03	88.46	64.36	17.48
4			1.74	9.73	28.82	34.66	12.70
Total	370.89	392.66	359.84	414.42	462.06	427.63	119.05
<i>Clupea harengus</i>							
1	1.14	6.40	84.64	165.27	154.13	74.87	1.08
2	0.29	13.38	81.96	126.72	255.96	376.98	838.65
3	0.28	12.54	64.77	74.06	88.76	81.40	942.79
4	0.06	2.70	14.46	18.19	23.82	26.62	419.97
5	0.00	0.12	1.68	5.45	11.68	16.06	215.32
Total	1.77	35.14	247.52	389.70	534.35	575.91	2417.99
Ammodytidae							
1	24.32	50.13	114.60	65.29	25.00	122.70	305.47
2	0.11	0.18	0.02	0.00		2.06	5.13
3	0.01	0.02	0.00	0.00		0.16	0.39
4	0.00	0.00	0.00	0.00		0.05	0.12
Total	24.44	50.34	114.62	65.29	25.00	124.96	311.11
Other							
All size classes	15458.06	6894.00	2810.19	2691.60	2523.64	1511.07	518.52

TABLE 12-E-2: Average number of prey organisms per 1000 stomachs by age class of commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **saithe**

Quarter 2	Saithe age class						
Prey age class	3	4	5	6	7	8	9+
All species							
All size classes	99951.44	103654.95	103383.34	99083.65	121929.12	101973.51	81703.66
<i>Melanogrammus aeglefinus</i>							
1	0.09	1.34	4.41	1.94	32.84	58.95	193.53
2					9.64	17.30	18.68
3					0.38	0.68	0.68
Total	0.09	1.34	4.41	1.94	42.86	76.93	212.89
<i>Merlangius merlangus</i>							
1					7.34	13.25	68.23
2			0.09	0.89	29.48	50.89	170.92
3			0.11	1.01	33.10	56.99	121.43
4			0.01	0.11	6.86	12.06	26.48
5			0.00	0.02	4.04	7.22	11.84
6			0.00	0.01	1.28	2.27	5.35
Total			0.21	2.03	82.11	142.70	404.28
<i>Trisopterus esmarki</i>							
0	2587.11	683.51	725.01	273.43			
1	1004.79	1463.73	1000.32	1057.29	1199.00	1167.26	1278.11
2	22.64	74.16	187.19	225.67	233.30	163.58	81.44
3	0.64	4.90	15.86	19.27	19.00	11.18	2.53
4	0.11	0.88	2.75	2.70	3.24	1.96	0.45
Total	3615.29	2227.20	1931.16	1578.38	1454.57	1343.99	1362.54
<i>Clupea harengus</i>							
1		0.07	1.11	1.70	10.94	22.48	27.22
2		1.55	26.12	44.96	194.84	1007.09	1554.91
3		0.61	11.47	28.02	93.51	149.59	196.65
4		0.14	2.85	8.58	40.06	70.81	105.62
5		0.20	4.32	13.69	46.97	65.49	82.87
Total	0.10	2.57	45.88	96.94	386.32	1315.54	1967.40
Ammodytidae							
0	403.32	658.63	5457.99	4903.56	5490.11	9014.67	10532.80
1	180.40	256.63	1524.92	1581.36	1311.04	1199.88	1305.25
2	17.18	12.84	16.54	16.93	8.35		
3	6.66	4.95	5.55	5.51	2.80		
4	1.07	0.80	0.91	0.90	0.46		
5	0.91	0.67	0.60	0.58	0.30		
6	0.47	0.35	0.31	0.30	0.15		
Total	610.01	934.88	7006.82	6509.14	6813.21	10214.54	11838.05
Other							
All size classes	95725.95	100488.97	94394.86	90895.22	113150.05	88879.79	65918.50

TABLE 12-E-3: Average number of prey organisms per 1000 stomachs by age class of commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **saithe**

Quarter 3	Saithe age class						
Prey age class	3	4	5	6	7	8	9+
All species							
All size classes	8041.18	7778.03	7561.64	8408.85	15488.76	27509.85	33288.36
<i>Melanogrammus aeglefinus</i>							
0	377.89	266.21	209.53	118.83	133.09	129.10	224.87
Total	377.89	266.21	209.53	118.83	133.09	129.10	224.87
<i>Merlangius merlangus</i>							
0	147.07	163.13	172.11	179.36	40.31	9.90	11.46
Total	147.07	163.13	172.11	179.36	40.31	9.90	11.46
<i>Trisopterus esmarki</i>							
0	996.06	2803.70	2151.50	219.33	383.38	483.84	753.60
1	37.66	361.20	688.29	765.11	594.37	563.36	664.09
2	5.98	61.83	72.99	56.80	63.52	51.20	60.06
3	0.28	2.89	3.38	2.66	2.98	2.40	2.82
Total	1039.98	3229.64	2916.19	1043.93	1044.28	1100.82	1480.60
<i>Clupea harengus</i>							
1			10.94	37.02	112.27	114.39	177.43
2	0.02	0.82	13.06	42.59	190.77	248.59	354.54
3	0.02	1.08	7.41	22.99	126.05	158.38	244.40
4	0.05	2.40	9.23	26.56	182.19	214.61	365.29
5	0.05	2.90	9.93	27.97	233.81	279.59	482.70
Total	0.14	7.20	50.57	157.12	845.09	1015.54	1624.34
<i>Sprattus sprattus</i>							
0	2.24	1.03					
Total	2.24	1.03					
Ammodytidae							
0	387.49	401.20	172.71		118.29	266.15	295.72
1					5.52	12.42	13.80
Total	387.49	401.20	172.71		123.81	278.57	309.52
Other							
All size classes	6086.38	3709.61	4040.54	6909.61	13302.18	24975.93	29637.57

TABLE 12-E-4: Average number of prey organisms per 1000 stomachs by age class of commercially exploited prey species by predator age class, area and quarter, Total North Sea, 1991, **saithe**

Quarter 4	Saithe age class						
Prey age class	3	4	5	6	7	8	9+
All species							
All size classes	3564.98	3828.57	4061.07	3786.19	3870.37	4344.91	5289.07
<i>Melanogrammus aeglefinus</i>							
0	94.18	90.94	105.26	223.64	288.89	229.17	343.03
1	0.00	0.02	0.09	0.06			
Total	94.18	90.95	105.35	223.70	288.89	229.17	343.03
<i>Merlangius merlangus</i>							
0	22.63	24.59	25.18	83.33	114.81	78.70	60.98
Total	22.63	24.59	25.18	83.33	114.81	78.70	60.98
<i>Trisopterus esmarki</i>							
0	2537.47	2680.27	2299.41	1547.17	1198.16	1404.63	1793.48
1	38.11	140.30	359.36	355.35	165.43	20.68	70.84
2	0.73	4.60	12.58	11.49	4.68	0.58	
3	0.04	0.24	0.66	0.60	0.24	0.03	
Total	2576.36	2825.40	2672.00	1914.61	1368.52	1425.93	1864.32
<i>Clupea harengus</i>							
0	0.19	1.77	3.88	2.34			126.04
1	1.00	20.79	101.45	230.24	420.73	549.49	725.05
2	1.18	23.44	120.68	267.66	500.06	670.27	777.44
3	0.57	7.97	42.88	80.99	159.37	233.42	225.40
4	1.11	15.50	83.36	157.44	309.79	453.71	438.02
5	0.96	13.38	71.97	135.92	267.45	391.71	378.16
Total	5.01	82.85	424.23	874.59	1657.41	2298.61	2670.10
Ammodytidae							
0	6.20	4.45	1.00				
Total	6.20	4.45	1.00				
Other							
All size classes	860.60	800.33	833.31	689.95	440.74	312.50	350.64

TABLE 13-A-1: Average prey weight (g) at time ingestion by age class prey by predator age class, area and quarter, Total North Sea, 1991, cod

Quarter 1	Cod age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes		0.83	3.85	13.96	28.00	35.30	34.67
<i>Gadus morhua</i>							
1				15.90	47.10	73.33	66.55
2				171.88	286.09	63.87	166.86
3				442.85	438.93	308.80	403.47
Total			10.06	53.71	232.37	67.09	81.48
<i>Melanogrammus aeglefinus</i>							
1			30.49	38.38	32.67	33.53	44.28
2				44.61	35.67	47.01	199.22
3					385.01	426.63	392.91
4					385.01	426.63	462.78
5					385.01	426.63	462.78
6					385.01	426.63	462.78
Total			25.03	38.38	35.59	76.59	121.43
<i>Merlangius merlangus</i>							
1		20.95	18.14	24.34	28.96	22.99	23.92
2			59.34	76.61	93.66	79.18	79.51
3			59.33	94.11	119.87	116.02	136.63
4			63.53	145.39	158.88	145.71	164.35
5			164.72	161.52	171.79	164.54	174.08
6			164.72	205.98	180.56	166.03	183.46
Total		7.74	19.77	43.71	65.35	57.57	48.67
<i>Trisopterus esmarki</i>							
1			10.54	11.65	16.54	16.79	15.79
2			14.98	17.86	26.94	30.50	30.14
3			12.15	24.18	33.26	41.79	41.45
Total		0.82	10.83	13.18	19.18	20.76	19.03
<i>Clupea harengus</i>							
1			20.64	40.37	39.65	20.76	23.76
2			31.83	51.56	52.73	54.81	53.80
3			22.45	49.02	48.38	65.63	62.92
4			21.36	58.30	63.81	101.12	99.27
5			25.09	96.02	85.68	122.55	116.10
Total			22.40	48.05	48.36	55.27	46.95
<i>Sprattus sprattus</i>							
1		4.65	7.43	6.76	7.03	7.36	7.98
2		7.19	22.59	17.63	17.30	15.07	14.93
3			23.49	22.29	18.17	15.12	15.15
4			23.52	23.47	23.39	23.14	23.14
5			23.52	20.56	17.41	15.09	15.08
Total		4.65	13.80	8.70	9.43	11.31	8.57

Continued

Table 13-A-1 Continued

Quarter 1	Cod age class						
Prey age class	0	1	2	3	4	5	6+
Ammodytidae							
1		3.51	2.43	3.55	2.85	2.88	2.64
2		8.90	8.23	6.53	8.54	8.50	7.99
3		8.97	17.35	16.03	11.00	8.86	8.62
4		8.97	22.56	22.34	15.71	8.81	8.50
5		8.97	21.31	21.40	11.07	8.93	8.75
6		8.97	40.98	40.15	19.77	8.93	8.75
Total		3.93	2.63	3.85	3.60	3.71	3.21
Other							
All size classes		0.61	2.70	9.33	20.00	29.63	29.87

TABLE 13-A-2: Average prey weight (g) at time ingestion by age class prey by predator age class, area and quarter, Total North Sea, 1991, cod

Quarter 2	Cod age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes	0.04	0.27	1.38	7.83	19.73	27.03	35.23
<i>Gadus morhua</i>							
0		1.30	1.51	2.32	1.46		
1		3.46	29.48	36.30	9.84	36.27	110.35
2				42.24	42.24	1027.45	1562.46
3				42.24	42.24	1075.18	1576.42
4				42.24	42.24	1479.20	1662.75
Total		2.29	18.81	36.09	16.93	655.78	1365.41
<i>Melanogrammus aeglefinus</i>							
0		1.27	6.16	5.82	5.99		
1			32.86	63.45	114.34	137.13	121.66
2			121.75	150.08	197.12	277.57	246.58
3			162.79	248.22	308.15	306.65	305.81
4				303.94	312.88	306.72	305.81
5				303.94	312.88	306.72	305.81
6				303.94	312.88	306.72	305.81
Total		1.27	29.75	64.67	118.05	154.81	130.10
<i>Merlangius merlangus</i>							
0		0.52	1.94	1.90	1.29	0.83	
1		29.57	33.02	36.05	60.06	95.61	117.39
2			78.40	59.69	99.75	109.98	140.68
3			86.29	86.95	135.08	161.37	151.30
4			90.90	119.70	217.48	210.78	178.51
5			86.01	164.27	222.18	257.34	230.60
6			113.61	151.11	176.61	239.06	186.38
Total		3.97	33.69	51.14	96.03	127.03	134.38
<i>Trisopterus esmarki</i>							
0			1.35	1.32	0.52		
1		15.42	17.51	23.49	27.30	33.31	31.11
2		23.52	21.92	29.22	37.82	47.74	44.53
3		31.97	53.87	54.89	52.30	48.64	48.80
4		37.66	40.42	48.07	46.95	48.37	48.72
Total		15.74	19.15	25.00	28.83	38.24	33.17
<i>Clupea harengus</i>							
0		3.00	3.54	18.81	24.29	23.81	24.29
1		124.59	42.65	26.01	33.11	48.87	52.90
2		124.59	70.20	75.14	83.04	109.69	120.33
3		124.59	149.03	101.34	113.62	103.23	122.97
4		124.59	216.18	139.35	134.72	94.37	126.03
5		124.59	225.42	164.86	141.93	92.85	129.82
Total		5.33	36.92	71.95	76.00	96.81	106.38

Continued

Table 13-A-2 Continued

Quarter 2	Cod age class						
Prey age class	0	1	2	3	4	5	6+
<i>Sprattus sprattus</i>							
1		6.42	12.85	10.93	9.26	8.84	12.64
2		18.43	25.63	29.29	21.36	16.33	13.91
3		18.43	27.17	29.56	25.75	29.90	16.71
4				23.24	23.24		23.24
5				23.24	23.24		23.24
Total		6.64	13.97	22.61	13.97	10.74	13.10
Ammodytidae							
0	0.07	0.69	0.56	0.56	0.63	1.29	1.32
1		3.76	5.73	6.47	10.28	7.61	7.68
2		7.42	13.52	16.70	26.99	31.12	23.03
3		9.86	21.34	23.07	28.67	35.91	28.77
4		10.72	22.06	22.32	27.08	35.01	27.81
5		9.83	24.44	28.60	30.20	39.44	37.06
6		11.44	23.72	27.23	29.30	39.01	34.16
Total	0.07	2.99	1.90	2.08	5.99	8.34	10.31
Other							
All size classes	0.04	0.24	0.95	5.65	13.90	19.24	24.27

TABLE 13-A-3: Average prey weight (g) at time ingestion by age class prey by predator age class, area and quarter, Total North Sea, 1991, **cod**

Quarter 3	Cod age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes	0.02	1.43	6.94	11.29	19.50	28.40	32.23
<i>Gadus morhua</i>							
0	0.31	3.73	6.31	8.64	9.56	8.14	7.71
1			17.97	16.08			42.13
2							42.13
3							42.13
4							42.13
Total	0.31	3.73	6.35	8.91	9.56	8.14	36.35
<i>Melanogrammus aeglefinus</i>							
0		8.29	15.17	12.39	15.43	16.34	14.68
1			76.29	110.50	119.21	122.07	144.56
2							144.56
Total		8.29	15.60	14.69	17.85	18.17	104.97
<i>Merlangius merlangus</i>							
0	0.45	7.00	14.09	12.90	13.67	91.28	91.28
1		39.11	72.24	52.50	43.35	53.72	53.60
2			107.20	84.21	64.90	50.97	46.36
3			108.58	82.03	80.65	83.93	46.36
4			105.79	81.35	84.72	93.29	
5			100.37	76.75	96.15	88.52	
6			100.37	75.64	90.22	88.52	
Total	0.45	14.64	15.48	27.02	37.75	56.54	55.34
<i>Trisopterus esmarki</i>							
0	1.99	4.74	5.75	4.78	5.97	8.10	7.28
1		20.74	32.05	37.63	41.15	36.18	58.58
2		25.19	41.16	47.98	48.95	28.11	24.24
3		23.78	42.14	48.23	48.83	23.38	21.84
Total	1.99	5.15	10.53	12.79	14.63	14.16	25.02
<i>Clupea harengus</i>							
0		26.42	48.68	10.63	29.36		
1		54.69	59.59	80.88	49.17	48.79	52.69
2			130.67	141.07	104.33	73.31	71.33
3			178.55	175.71	137.51	83.21	77.15
4			134.69	187.58	147.24	62.86	69.67
5			116.27	189.57	149.96	63.86	70.38
Total		28.35	84.16	135.38	100.94	65.51	67.77
<i>Sprattus sprattus</i>							
0		5.20					
1		12.44	30.74	29.34			
2		33.12	30.10	29.62			
3			30.08	29.06			
Total		10.83	30.44	29.42			

Continued

Table 13-A-3 Continued

Quarter 3	Cod age class						
Prey age class	0	1	2	3	4	5	6+
Ammodytidae							
0	3.32	0.94	1.62	1.87	2.70	2.48	3.06
1	9.20	6.20	18.02	5.60	6.68	4.28	1.95
2	9.20	8.43	16.10	7.49	19.42	8.86	
3	9.20	8.83	25.40	7.88	24.12	8.86	
4	9.20	9.10	31.21	8.14	23.79	8.86	
5		9.29	31.70	8.26	25.07		
6		8.54	38.63	10.20	24.28		
Total	4.17	0.99	2.10	2.24	3.38	2.51	3.03
Other							
All size classes	0.02	1.22	5.82	9.10	12.44	17.38	24.33

TABLE 13-A-4: Average prey weight (g) at time ingestion by age class prey by predator age class, area and quarter, Total North Sea, 1991, **cod**

Quarter 4		Cod age class						
Prey age class		0	1	2	3	4	5	6+
All species								
All size classes		0.56	2.86	7.08	10.81	13.70	30.46	40.29
<i>Gadus morhua</i>								
0			3.08	7.84	13.67			28.67
Total			3.08	6.51	13.67			28.67
<i>Melanogrammus aeglefinus</i>								
0			14.90	15.33	17.44	22.12	28.61	32.36
1			73.51	56.10	181.95	210.22	156.90	144.80
2					239.40	245.86	252.57	254.86
Total			14.77	14.65	19.87	34.59	44.70	48.56
<i>Merlangius merlangus</i>								
0			24.38	37.84	28.55	38.34	40.60	49.60
1			50.99	84.28	111.55	142.32	188.26	136.58
2			61.15	92.32	184.96	174.30	226.38	223.55
3			99.06	99.06	228.20	175.26	241.05	242.16
4			99.06	99.06	253.34	166.38		
5			99.06	99.06		166.38		
6			99.06	99.06		166.38		
Total			34.48	62.16	82.93	139.26	194.12	146.01
<i>Trisopterus esmarki</i>								
0			6.79	9.10	10.17	9.41	9.36	9.42
1			17.37	30.65	34.95	41.04	44.64	44.61
2			43.51	36.20	46.43	55.04	51.98	49.39
3			43.51	39.19	47.02	55.04	51.98	49.39
Total			6.37	10.24	13.40	13.20	11.45	11.15
<i>Clupea harengus</i>								
0				26.61	26.12			38.71
1			42.69	38.38	65.03	44.37	143.03	142.85
2			42.69	50.72	66.51	44.37	96.91	115.41
3				60.39			148.24	148.24
4				60.39				
5				60.39				
Total			42.69	41.87	62.00	44.24	139.08	129.71
<i>Sprattus sprattus</i>								
0		4.93	5.63	5.59	5.20	6.09	8.16	7.33
1			21.38	6.10	6.70	6.70		8.19
2			25.85					
3			27.11					
4			27.11					
Total		4.93	12.46	5.61	5.21	6.10	8.16	7.43

Continued

Table 13-A-4 Continued

Quarter 4	Cod age class						
Prey age class	0	1	2	3	4	5	6+
Ammodytidae							
0		2.38	2.52	2.82	2.00	2.77	2.77
1		10.59	13.18	10.27			
2		18.21	18.03	9.47			
3		15.72	11.95	10.47			
4		17.81	13.09	9.47			
5		17.69	12.62	9.47			
6		17.42	12.34	9.47			
Total	1.89	3.81	3.73	3.83	2.00	2.77	2.77
Other							
All size classes	0.56	1.89	4.91	8.70	8.80	18.23	33.49

TABLE 13-B-1: Average prey weight (g) at time of ingestion by age class of prey by predator age class, area and quarter, Total North Sea, 1991, **haddock**

Quarter 1	Haddock age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes		0.05	0.11	0.19	0.24	0.28	0.40
<i>Trisopterus esmarki</i>							
1		8.31	8.36	8.85	8.63	9.00	10.18
2			19.58	19.31	21.90	21.66	21.72
Total		8.31	8.43	8.65	8.24	8.98	9.99
<i>Clupea harengus</i>							
1				63.79		63.79	63.79
2				63.79		63.79	63.79
3				63.79		63.79	63.79
Total				63.79		63.79	63.79
Ammodytidae							
1		1.58	1.60	1.63	1.44	1.39	1.33
2		3.54	4.40	4.13	3.75	3.85	3.44
Total		1.58	1.60	1.63	1.44	1.39	1.33
Other							
All size classes		0.05	0.10	0.16	0.20	0.22	0.35

TABLE 13-B-2: Average prey weight (g) at time of ingestion by age class of prey by predator age class, area and quarter, Total North Sea, 1991, **haddock**

Quarter 2	Haddock age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes	0.01	0.02	0.01	0.02	0.04	0.05	0.05
<i>Trisopterus esmarki</i>							
1				3.32	15.39	17.27	22.91
2				3.32	15.39	17.27	22.91
Total		0.22	0.22	3.32	15.39	17.27	22.91
<i>Clupea harengus</i>							
Total						24.12	24.12
<i>Sprattus sprattus</i>							
1				11.64	11.64	11.64	11.64
2				11.64	11.64	11.64	11.64
Total				11.64	11.64	11.64	11.64
Ammodytidae							
0	0.16	0.50	0.48	0.51	0.58	0.61	0.53
1		1.65	2.19	2.88	2.78	2.81	2.24
2		4.14	17.88	17.95	17.99	16.10	11.73
3		4.14	20.40	19.84	22.59	17.67	12.26
4			20.58	19.65	21.93	17.50	12.21
5			21.77	22.02	34.66	19.56	12.81
6			21.77	22.02	34.66	19.56	12.81
Total	0.16	0.52	0.54	0.70	0.85	0.77	0.64
Other							
All size classes	0.00	0.01	0.01	0.02	0.03	0.03	0.04

TABLE 13-B-3: Average prey weight (g) at time of ingestion by age class of prey by predator age class, area and quarter, Total North Sea, 1991, **haddock**

Quarter 3	Haddock age class						
Prey age class	0	1	2	3	4	5	6+
<i>All species</i>							
All size classes	0.01	0.04	0.12	0.41	0.36	0.40	0.64
<i>Gadus morhua</i>							
0					1.55	1.55	1.55
Total					1.55	1.55	1.55
<i>Melanogrammus aeglefinus</i>							
0		6.71	6.84	18.09	21.30	21.19	24.88
1			25.53	25.53	25.53	25.53	25.53
Total		6.71	6.87	19.03	21.94	21.86	25.00
<i>Trisopterus esmarki</i>							
0	0.69	4.40	4.58	4.53	2.94	3.62	2.32
1							31.66
Total	0.69	4.40	4.58	4.53	2.94	3.62	25.85
<i>Ammodytidae</i>							
0	1.23	2.18	1.76	1.81	1.42	1.52	1.40
1		3.21	5.67	4.42	4.24	4.30	3.62
2		1.51	10.85	6.33	6.32	5.37	3.65
3		1.51	16.24	13.13	14.66	11.15	3.65
4		1.51	17.04	17.45	18.14	16.38	3.65
5		1.51	17.27	19.48	19.48	19.48	
6		1.51	17.27	19.48	19.48	19.48	
Total	0.02	0.16	0.72	1.87	1.44	1.56	1.41
<i>Other</i>							
All size classes	0.01	0.02	0.06	0.17	0.15	0.17	0.19

TABLE 13-B-4: Average prey weight (g) at time of ingestion by age class of prey by predator age class, area and quarter, Total North Sea, 1991, **haddock**

Quarter 4	Haddock age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes	0.02	0.15	0.30	0.45	0.63	0.79	1.35
<i>Melanogrammus aeglefinus</i>							
0				35.22	35.22	35.22	35.22
Total				35.22	35.22	35.22	35.22
<i>Trisopterus esmarki</i>							
0	1.70	8.93	10.84	10.25	11.33	8.30	7.73
1		21.05	21.05	28.13	27.90	27.47	27.39
Total	1.70	8.93	10.85	10.46	11.66	8.96	8.03
<i>Clupea harengus</i>							
0		0.64	0.64				
Total		0.64	0.64	65.60	65.60	65.60	65.60
Ammodytidae							
0	0.97	1.92	2.02	1.57	1.44	1.73	2.22
1		5.01	4.53	3.60	3.37	3.64	4.03
2		6.83	5.48	4.68	5.41	4.70	
3		6.83	3.99	4.68	8.21	7.31	
4		6.83	5.48	4.68	5.41	4.70	
Total	0.97	2.05	2.18	1.65	1.50	1.81	2.24
Other							
All size classes	0.02	0.11	0.20	0.32	0.43	0.57	0.82

TABLE 13-C-1: Average prey weight (g) at time of ingestion by age class of prey by predator age class, area and quarter, Total North Sea, 1991, **whiting**

Quarter 1		Whiting age class						
Prey age class		0	1	2	3	4	5	6+
All species								
All size classes			0.03	0.24	1.33	2.66	2.56	6.00
<i>Melanogrammus aeglefinus</i>								
1				8.69	5.51	6.40	6.11	12.61
2					27.84	27.84	27.84	
Total				8.69	5.51	6.41	6.11	12.61
<i>Merlangius merlangus</i>								
0				0.01	0.01	0.01	0.01	0.01
1			0.54	6.19	8.94	9.54	9.93	14.75
2				33.49	29.79	20.92	25.08	33.47
Total			0.54	6.19	8.97	9.57	9.99	14.83
<i>Trisopterus esmarki</i>								
1			4.65	6.94	8.04	11.36	10.33	15.34
2			6.73	1.72	3.30	9.15	11.42	22.87
3			5.66	6.69	13.17	15.10	15.37	15.54
Total			4.65	6.89	8.00	11.32	10.36	15.45
<i>Clupea harengus</i>								
1			8.17	10.47	10.77	11.29	10.49	8.93
2					46.50	46.50	46.50	46.50
Total			8.17	10.47	10.77	11.29	10.49	8.94
<i>Sprattus sprattus</i>								
1			4.02	8.71	13.51	10.15	10.39	5.48
2			8.42	15.81	17.53	16.79	17.25	14.13
3			8.46	12.03	15.97	19.41	18.61	19.71
4			17.53	22.72	23.06	23.10	22.13	21.28
5			17.53	22.07	22.69	22.77	21.07	19.96
Total			4.11	9.65	14.37	11.25	11.46	5.88
Ammodytidae								
1			1.79	1.88	2.02	1.94	2.07	2.41
2			5.26	13.15	10.55	10.06	8.92	6.21
3			8.48	13.56	11.22	10.65	10.24	6.59
4			8.07	13.52	11.12	10.54	9.95	6.57
5			10.18	13.58	11.33	10.76	10.59	9.90
6			10.18	13.58	11.33	10.76	10.59	9.91
Total			1.79	2.10	2.28	2.37	2.31	2.46
Other								
All size classes			0.02	0.09	0.32	1.07	0.98	1.55

TABLE 13-C-2: Average prey weight (g) at time of ingestion by age class of prey by predator age class, area and quarter, Total North Sea, 1991, **whiting**

Quarter 2		Whiting age class						
Prey age class		0	1	2	3	4	5	6+
All species								
All size classes			0.01	0.02	0.02	0.02	0.03	0.03
<i>Gadus morhua</i>								
0			1.48	1.55	1.67	2.40	3.22	0.83
Total			1.48	1.55	1.67	2.40	3.22	2.81
<i>Melanogrammus aeglefinus</i>								
0			0.19	0.20	0.21	0.21	0.21	0.21
Total			0.19	0.20	0.21	0.21	0.20	0.21
<i>Merlangius merlangus</i>								
0			0.33	0.28	0.45	1.27	1.53	1.62
1			10.95	12.45	11.91	12.73	13.39	15.05
Total			0.50	2.60	5.08	7.56	7.29	7.40
<i>Trisopterus esmarki</i>								
0			0.28	0.66	1.54	1.68	2.56	4.64
1			9.47	11.24	12.07	12.97	13.00	13.53
2			8.95	10.55	11.99	16.75	20.86	19.95
3			6.15	8.91	11.63	17.33	23.22	22.27
4			9.49	15.41	18.18	24.81	29.07	29.34
Total			1.26	3.98	7.96	10.09	12.00	13.09
<i>Clupea harengus</i>								
0			4.17	7.33	7.37	7.50	7.72	11.11
1			12.20	23.34	17.68	19.96	20.68	19.59
2			10.62	21.44	21.44	21.44	21.44	21.44
Total			6.27	12.32	12.82	15.02	15.46	18.73
<i>Sprattus sprattus</i>								
0			0.71	1.20	1.28	1.28	1.28	1.28
1			4.77	5.50	6.38	6.71	6.56	6.17
2			13.27	12.15	10.65	11.02	11.96	13.30
3			14.67	14.26	13.26	16.07	17.54	18.98
4			14.80	14.79	14.52	15.56	15.29	16.57
5			14.79	14.54	13.47	13.19	13.00	13.87
6			8.54	8.51	8.49	8.48	8.46	8.53
Total			5.04	5.87	6.64	7.06	6.97	6.74
<i>Ammodytidae</i>								
0			0.47	0.39	0.42	0.59	0.70	0.61
1			3.85	4.39	4.02	3.98	4.27	3.82
2			8.80	11.28	11.94	11.16	10.62	11.44
3			15.73	17.15	17.72	17.07	16.36	17.40
4			16.10	17.38	17.85	17.25	16.73	17.41
5			17.85	18.91	18.74	17.57	16.90	17.90
6			17.52	19.17	19.11	19.68	19.31	18.85
Total			0.70	0.61	0.64	1.10	1.29	1.04
Other								
All size classes			0.01	0.00	0.01	0.00	0.01	0.01

TABLE 13-C-3: Average prey weight (g) at time of ingestion by age class of prey by predator age class, area and quarter, Total North Sea, 1991, **whiting**

Quarter 3		Whiting age class						
Prey age class		0	1	2	3	4	5	6+
All species								
All size classes		0.01	0.05	0.23	0.33	0.71	0.74	0.63
<i>Gadus morhua</i>								
0			3.18	4.14	3.27	4.20	3.91	5.96
Total			3.18	4.14	3.27	4.20	3.91	5.96
<i>Melanogrammus aeglefinus</i>								
0		1.50	6.67	5.35	6.11	6.15	6.27	13.34
Total		1.50	6.67	5.35	6.11	6.15	6.27	13.34
<i>Merlangius merlangus</i>								
0		0.71	2.13	3.58	4.57	4.55	4.85	9.30
1			66.26	38.26	23.97	38.74	11.84	34.56
2					29.95	46.53		35.15
3					29.95	46.53		35.15
4					29.95	46.53		35.15
Total		0.71	2.13	3.66	4.58	4.62	5.08	9.44
<i>Trisopterus esmarki</i>								
0		2.57	3.44	4.39	4.11	4.53	4.57	5.81
1			12.75	29.47	32.32	29.83	31.31	28.18
2			14.60	43.34	43.66	41.76	42.34	38.05
3			14.60	33.44	36.53	36.99	37.06	36.53
Total		2.57	3.45	4.74	6.36	6.61	7.22	11.06
<i>Clupea harengus</i>								
0			4.41	20.28	20.53	19.45	22.33	17.60
1			24.00	43.57	61.08	61.13	60.77	70.07
Total			4.48	22.46	29.41	28.04	36.65	30.44
<i>Sprattus sprattus</i>								
0		4.18	2.96	3.49	3.50	3.71	3.89	6.29
1			5.58	8.92	10.82	12.34	10.55	12.87
2			10.09	14.52	15.17	15.51	16.79	16.16
3			19.82	17.84	17.81	17.91	18.69	16.28
4			16.25	16.01	16.42	16.29	16.12	16.20
5			16.25	16.01	16.42	16.29	16.12	16.20
Total		4.18	5.29	7.14	9.13	10.74	8.68	13.43
Ammodytidae								
0		0.73	1.59	1.84	2.47	2.00	1.89	2.51
1		4.71	8.50	7.20	7.76	7.53	7.62	8.10
2			13.55	14.55	8.65	13.97	11.01	11.29
3			9.47	11.51	11.62	15.56	12.91	13.70
4			13.51	15.89	16.26	19.85	17.24	17.89
5			13.51	15.92	16.67	20.01	17.47	18.35
6			19.94	21.01	20.96	21.14	19.41	18.35
Total		0.73	1.66	2.21	3.39	2.98	2.42	2.96
Other								
All size classes		0.00	0.02	0.06	0.05	0.15	0.13	0.07

TABLE 13-C-4: Average prey weight (g) at time of ingestion by age class of prey by predator age class, area and quarter, Total North Sea, 1991, **whiting**

Quarter 4		Whiting age class						
Prey age class		0	1	2	3	4	5	6+
All species								
All size classes		0.05	0.18	0.29	1.15	0.50	0.58	0.47
<i>Gadus morhua</i>								
0		11.73	6.32	4.43	4.28	4.28	4.28	4.28
Total		11.73	6.32	4.43	4.28	4.28	4.28	4.28
<i>Melanogrammus aeglefinus</i>								
0		9.75	14.92	17.13	17.76	12.02	16.52	16.37
1				5.73	5.82	6.74	7.03	7.80
Total		9.75	14.92	17.13	17.76	12.02	16.52	16.37
<i>Merlangius merlangus</i>								
0		1.03	7.96	10.79	11.97	11.61	14.34	13.91
Total		0.98	7.96	10.81	11.97	11.62	14.34	13.91
<i>Trisopterus esmarki</i>								
0		3.74	5.35	5.81	5.90	5.89	6.09	6.39
1		8.12	20.76	25.36	21.73	29.95	16.71	18.78
2			11.04	36.70	40.53	49.70	10.42	13.13
3			11.04	11.42	12.61	18.45	21.50	25.63
Total		3.74	5.39	6.19	6.19	6.83	6.34	7.12
<i>Clupea harengus</i>								
0		10.85	12.92	11.67	10.75	13.03	9.81	10.08
1			26.17	26.17	26.17	26.17	26.17	26.17
Total		10.85	13.55	12.31	10.85	13.79	10.52	10.27
<i>Sprattus sprattus</i>								
0		2.55	3.52	4.38	5.15	4.57	4.70	4.42
1		5.09	10.23	10.17	9.98	9.65	9.33	9.26
2		10.78	16.78	17.47	19.53	18.32	17.63	18.04
3			22.67	21.41	21.02	19.55	18.47	18.32
4			24.46	24.20	24.18	23.89	24.41	24.01
Total		2.61	3.88	5.00	6.34	5.65	5.55	5.44
Ammodytidae								
0		1.92	4.01	3.42	2.15	3.01	2.73	2.86
1		5.00	15.55	17.68	25.47	18.50	14.15	20.72
2		5.05	18.50	19.89	24.03	19.23	13.99	17.83
3		6.76	17.88	14.52	18.14	13.62	13.98	19.87
4		9.81	26.47	25.93	33.27	25.24	21.31	29.80
5		13.47	29.71	29.16	34.69	28.28	24.66	32.47
6		13.47	30.81	30.33	35.07	29.45	26.11	33.26
Total		2.32	5.50	5.87	5.73	5.77	4.23	5.15
Other								
All size classes		0.03	0.07	0.07	0.18	0.15	0.22	0.15

TABLE 13-D-1: Average prey weight (g) at time of ingestion by age class of prey by predator age class, area and quarter, Total North Sea, 1991, **mackerel**

Quarter 1	Mackerel age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes		0.02	0.24	1.11	1.11	1.11	0.39
Ammodytidae							
1			2.21	2.21	2.21	2.21	
Total			2.21	2.21	2.21	2.21	
Other							
All size classes		0.02	0.24	0.05	0.05	0.05	0.39

TABLE 13-D-2: Average prey weight (g) at time of ingestion by age class of prey by predator age class, area and quarter, Total North Sea, 1991, **mackerel**

Quarter 2	Mackerel age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes		0.04	0.02	0.01	0.01	0.01	0.01
<i>Gadus morhua</i>							
0		2.08	2.20	2.36	2.31	2.25	3.38
Total		2.03	2.13	2.36	2.29	2.25	3.38
<i>Melanogrammus aeglefinus</i>							
0		2.22	2.22	2.22			
Total		2.22	2.22	2.22			
<i>Trisopterus esmarki</i>							
0		2.32	1.68	1.29	1.20	1.10	2.94
1			11.84	11.84	11.84	11.84	11.84
Total		2.32	1.69	1.43	1.68	1.99	4.63
<i>Clupea harengus</i>							
0			14.43	14.01	13.55	12.68	11.96
1			18.77	25.67	21.22	25.05	24.55
Total			14.59	18.28	14.46	18.08	17.36
<i>Sprattus sprattus</i>							
1		2.34	5.62	6.82	9.71	10.88	10.27
2			16.64	19.14	19.60	19.87	17.22
3			20.10	20.04	20.02	20.01	18.29
4			20.10	20.04	20.02	20.01	18.29
5			20.10	20.04	20.02	20.01	18.29
6							23.68
Total		2.18	6.90	9.06	12.66	13.94	13.48
<i>Ammodytidae</i>							
0		0.89	1.09	1.50	1.55	1.58	1.56
1		3.11	2.99	2.60	2.96	2.91	3.84
2		5.32	5.50	6.03	11.16	11.26	11.35
3		5.32	29.58	27.41	26.14	28.12	12.76
4			29.74	27.51	26.48	29.64	13.02
5			29.70	27.50	26.42	29.13	12.90
6			29.76	27.53	26.57	29.94	13.14
Total		1.04	1.92	2.95	2.56	2.74	4.21
Other							
All size classes		0.03	0.02	0.01	0.01	0.00	0.00

TABLE 13-D-3: Average prey weight (g) at time of ingestion by age class of prey by predator age class, area and quarter, Total North Sea, 1991, **mackerel**

Quarter 3	Mackerel age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes		0.02	0.02	0.02	0.02	0.01	0.01
<i>Gadus morhua</i>							
0			2.38	2.23	2.16	2.25	2.79
Total			2.38	2.23	2.16	2.25	2.79
<i>Merlangius merlangus</i>							
0			1.19	1.69	2.60	2.69	2.73
Total			1.19	1.69	2.60	2.69	2.73
<i>Trisopterus esmarki</i>							
0		1.14	1.61	1.73	2.44	2.29	2.84
1				17.87	18.00	17.87	18.06
Total		1.14	1.61	1.73	2.52	2.35	2.92
<i>Clupea harengus</i>							
0			4.16	4.84	5.70	9.82	12.26
Total		0.05	1.16	3.77	4.99	9.60	12.01
<i>Sprattus sprattus</i>							
0			0.73	0.73	0.73	0.73	0.73
1			12.13	12.13	12.13	12.13	12.13
Total			1.33	4.56	10.15	11.75	12.08
Ammodytidae							
0		0.98	1.45	1.44	1.42	1.17	1.57
1			4.90	4.48	9.18	9.16	22.16
2			11.89	21.17	12.53	18.51	23.97
3			19.02	21.17	19.29	20.95	22.69
4			20.65	21.17	20.73	21.12	21.61
5			21.17	21.17	21.17	21.17	21.40
6			21.17	21.17	21.17	21.17	21.26
Total		0.98	1.45	1.45	1.47	1.31	2.41
Other							
All size classes		0.02	0.02	0.02	0.01	0.01	0.01

TABLE 13-D-4: Average prey weight (g) at time of ingestion by age class of prey by predator age class, area and quarter, Total North Sea, 1991, **mackerel**

Quarter 4	Mackerel age class						
Prey age class	0	1	2	3	4	5	6+
All species							
All size classes	0.05	0.00	0.01	0.00	0.00	0.00	0.00
<i>Trisopterus esmarki</i>							
0		7.70	6.24	6.96	7.21	7.35	7.36
Total		7.70	6.24	6.96	7.21	7.35	7.36
<i>Clupea harengus</i>							
0		7.04	7.01	7.00	6.94	6.85	8.93
Total		7.04	7.01	7.00	6.94	6.85	8.93
<i>Sprattus sprattus</i>							
0	1.35	4.97	5.83	6.99	7.18	7.40	8.10
1		11.99	13.68	13.87	14.58	14.92	14.66
2		14.50	16.68	16.78	17.07	17.17	17.47
3			18.43	18.43	18.43	18.43	19.18
4			18.43	18.43	18.43	18.43	19.18
Total	1.35	5.50	7.83	9.40	10.69	11.68	12.70
Ammodytidae							
0	0.83	1.22	3.88	3.99	3.99	3.99	4.02
1			4.39	4.52	4.52	4.52	4.55
6							21.04
Total	0.83	1.22	3.92	4.03	4.03	4.03	4.28
Other							
All size classes	0.04	0.00	0.00	0.00	0.00	0.00	0.00

TABLE 13-E-1: Average prey weight (g) at time of ingestion by age class of prey by predator age class, area and quarter, Total North Sea, 1991, **saithe**

Quarter 1	Saithe age class						
Prey age class	3	4	5	6	7	8	9+
All species							
All size classes	0.26	1.00	4.80	6.73	10.09	15.10	63.29
<i>Trisopterus esmarki</i>							
1	6.29	6.95	6.52	9.78	11.63	11.82	14.23
2	9.57	15.43	22.33	26.53	29.87	35.59	42.10
3	7.35	16.78	30.36	39.48	54.11	74.66	98.11
4			37.58	36.80	38.20	42.23	47.11
Total	6.98	8.98	15.57	23.49	28.36	29.52	37.38
<i>Clupea harengus</i>							
1	2.81	2.21	2.71	3.71	5.13	8.23	69.44
2	62.90	51.48	45.96	36.28	34.54	31.70	70.51
3	62.90	53.53	53.38	46.08	54.58	65.72	76.70
4	62.90	53.65	56.96	58.09	70.70	79.04	98.06
5	62.90	58.80	114.26	124.77	115.88	95.63	116.35
Total	24.18	43.43	34.22	26.59	32.78	37.43	81.79
Ammodytidae							
1	1.35	1.00	0.75	0.72	0.72	3.08	3.08
2	4.24	5.45	4.62	4.50		3.85	3.85
3	4.24	5.45	4.62	4.50		3.91	3.91
4	4.24	5.45	4.62	4.50		3.91	3.91
Total	1.36	1.02	0.75	0.72	0.72	3.10	3.10
Other							
All size classes	0.10	0.33	1.00	1.42	2.04	3.50	19.10

TABLE 13-E-2: Average prey weight (g) at time of ingestion by age class of prey by predator age class, area and quarter, Total North Sea, 1991, **saithe**

Quarter 2	Saithe age class						
Prey age class	3	4	5	6	7	8	9+
All species							
All size classes	0.26	0.33	0.67	1.05	1.53	1.96	2.96
<i>Melanogrammus aeglefinus</i>							
1	30.56	30.56	30.56	30.56	151.39	151.39	97.68
2					253.21	253.21	240.04
3					257.30	257.30	257.30
Total	30.56	30.56	30.56	30.56	175.23	175.23	110.68
<i>Merlangius merlangus</i>							
1					80.49	80.50	130.09
2			17.09	17.09	115.54	119.73	127.42
3			17.09	17.09	91.12	94.34	116.72
4			17.09	17.09	69.99	71.12	100.03
5			17.09	17.09	47.82	48.00	75.69
6			17.09	17.09	54.40	54.93	93.26
Total			17.09	17.09	94.47	97.17	120.89
<i>Trisopterus esmarki</i>							
0	0.15	0.39	0.13	0.07			
1	2.04	3.08	15.12	20.49	21.32	19.80	19.92
2	15.94	18.36	24.37	27.19	32.48	30.07	26.39
3	47.76	25.21	25.62	28.02	34.80	34.67	36.90
4	47.82	25.17	25.42	31.26	35.07	34.79	36.90
Total	0.79	2.82	10.49	18.02	23.32	21.19	20.34
<i>Clupea harengus</i>							
1		31.55	64.55	67.31	81.15	69.07	66.57
2		33.43	71.37	88.72	80.33	36.35	33.70
3		41.83	97.73	140.72	122.65	86.59	78.40
4		50.00	118.40	164.04	112.29	74.92	63.60
5		52.60	124.16	169.06	172.39	146.61	125.45
Total	5.20	37.75	85.70	121.38	105.10	50.19	44.09
Ammodytidae							
0	1.21	1.78	1.45	1.45	1.17	0.80	0.74
1	2.61	3.29	2.86	2.74	2.21	1.78	1.72
2	15.79	25.38	19.14	16.93	15.18		
3	19.16	30.73	21.09	18.43	16.18		
4	18.74	30.07	20.89	18.38	16.04		
5	23.98	38.48	24.77	21.00	18.33		
6	23.98	38.48	24.77	21.00	18.33		
Total	2.31	2.74	1.82	1.83	1.40	0.92	0.85
Other							
All size classes	0.23	0.25	0.34	0.57	0.77	0.78	0.68

TABLE 13-E-3: Average prey weight (g) at time of ingestion by age class of prey by predator age class, area and quarter, Total North Sea, 1991, **saithe**

Quarter 3	Saithe age class						
Prey age class	3	4	5	6	7	8	9+
All species							
All size classes	1.84	3.02	3.64	3.57	12.90	10.26	13.51
<i>Melanogrammus aeglefinus</i>							
0	14.49	14.32	11.60	12.32	15.60	16.57	17.22
Total	14.49	14.32	11.60	12.32	15.60	16.57	17.22
<i>Merlangius merlangus</i>							
0	6.26	6.50	5.82	5.18	6.62	10.30	8.97
Total	6.26	6.50	5.82	5.18	6.62	10.30	8.97
<i>Trisopterus esmarki</i>							
0	4.20	2.80	3.05	5.36	8.08	8.94	9.05
1	26.77	15.88	15.88	20.64	29.49	29.12	30.42
2	30.30	15.76	20.41	38.34	43.57	43.79	40.91
3	30.29	15.64	20.15	38.34	43.57	43.79	40.91
Total	5.18	4.52	6.53	18.44	22.53	20.96	19.99
<i>Clupea harengus</i>							
1			20.74	19.41	46.47	53.57	62.08
2	110.52	108.08	32.49	27.26	147.02	190.31	188.47
3	110.52	108.08	47.95	38.53	175.47	207.94	215.86
4	110.52	108.08	69.38	56.23	200.71	221.89	238.47
5	110.52	108.08	75.37	61.67	228.51	248.71	266.33
Total	110.52	108.08	47.37	38.08	172.03	200.41	213.17
<i>Sprattus sprattus</i>							
0	5.76	5.76					
Total	5.76	5.76					
<i>Ammodytidae</i>							
0	1.55	1.65	1.73		3.43	3.43	3.43
1					4.41	4.41	4.41
Total	1.55	1.65	1.73		3.48	3.48	3.48
Other							
All size classes	0.39	0.69	0.59	0.35	2.11	2.10	2.32

TABLE 13-E-4: Average prey weight (g) at time of ingestion by age class of prey by predator age class, area and quarter, Total North Sea, 1991, **saithe**

Quarter 4	Saithe age class						
Prey age class	3	4	5	6	7	8	9+
All species							
All size classes	6.21	8.84	16.66	28.89	40.35	41.41	38.99
<i>Melanogrammus aeglefinus</i>							
0	17.99	22.57	22.67	21.06	21.27	22.02	21.64
1	35.80	36.03	36.32	36.32			
Total	18.00	22.57	22.68	21.07	21.27	22.02	21.64
<i>Merlangius merlangus</i>							
0	17.35	16.16	15.25	17.83	16.06	10.56	9.90
Total	17.35	16.16	15.25	17.83	16.06	10.56	9.90
<i>Trisopterus esmarki</i>							
0	7.02	7.47	8.19	9.47	9.88	8.38	9.73
1	24.51	39.27	39.27	43.80	52.58	52.58	18.51
2	31.61	44.25	43.30	49.36	62.85	62.85	
3	31.61	44.25	43.30	49.36	62.85	62.85	
Total	7.28	9.11	12.54	16.09	15.23	9.04	10.07
<i>Clupea harengus</i>							
0	0.84	0.68	1.13	1.21			44.49
1	12.24	16.62	33.14	38.43	39.89	39.92	45.69
2	16.48	22.53	44.45	51.93	53.47	52.98	54.22
3	20.90	38.24	76.74	102.87	102.56	95.11	93.55
4	20.90	38.24	76.74	102.87	102.56	95.11	93.55
5	20.90	38.24	76.74	102.87	102.56	95.11	93.55
Total	17.37	27.57	56.44	70.04	71.84	69.63	66.79
<i>Ammodytidae</i>							
0	0.91	1.82	3.02				
Total	0.91	1.82	3.02				
Other							
All size classes	1.38	4.20	8.93	16.10	18.74	3.55	3.15

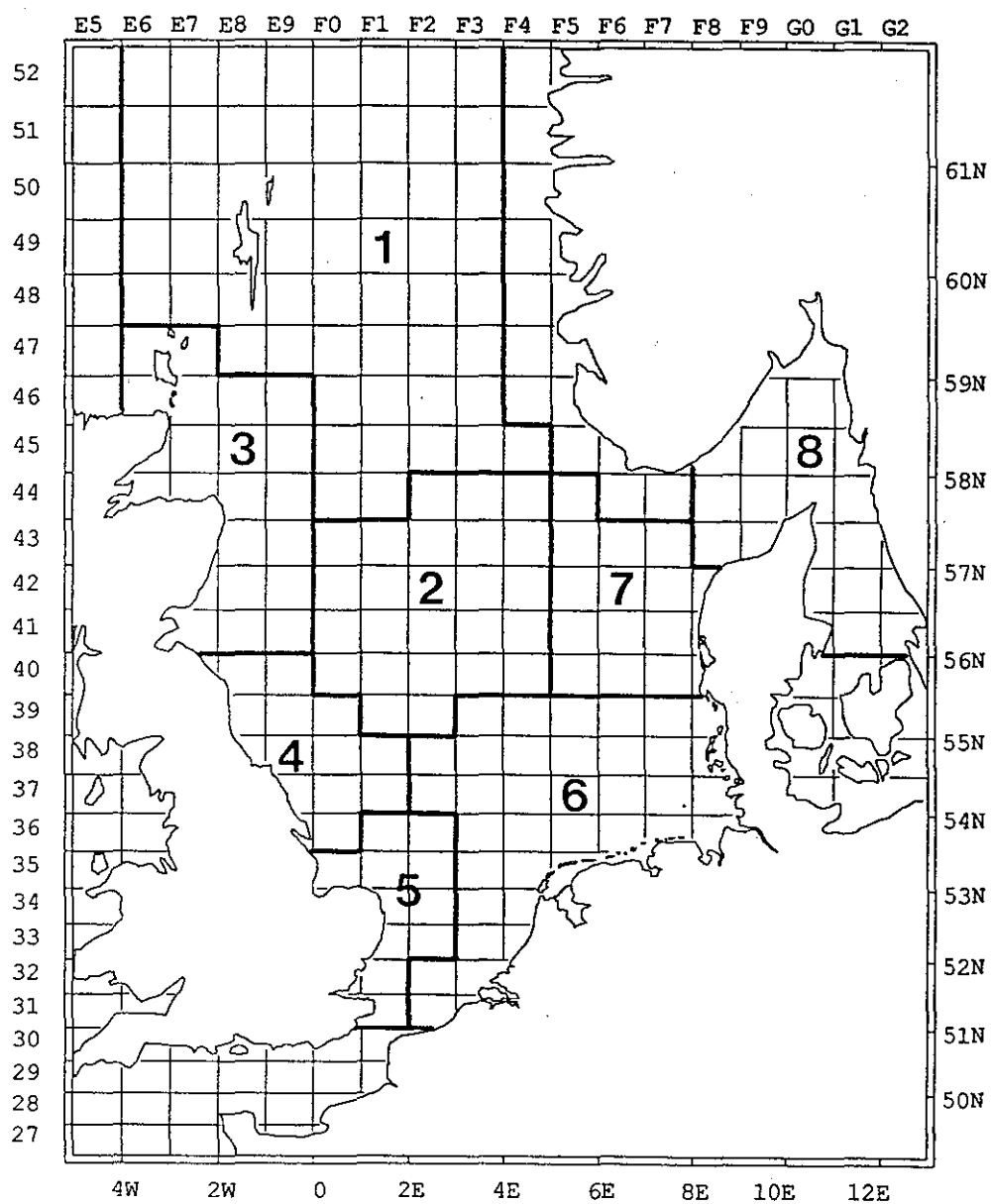
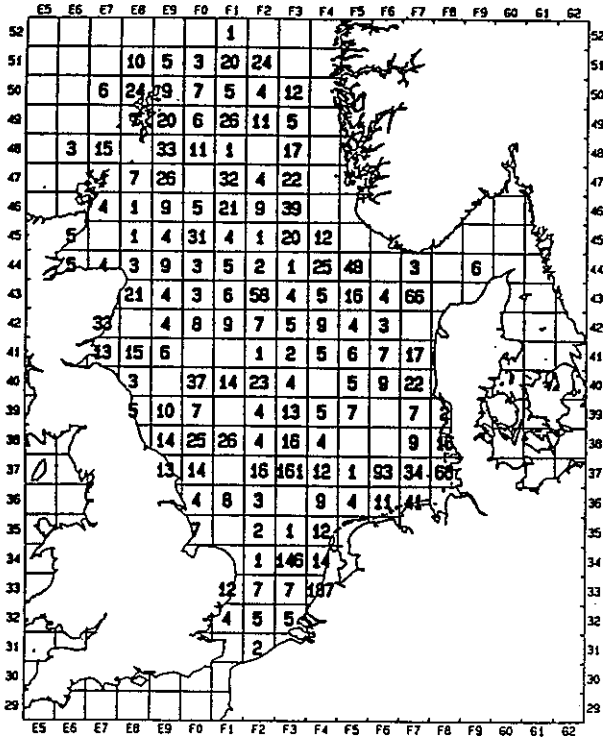
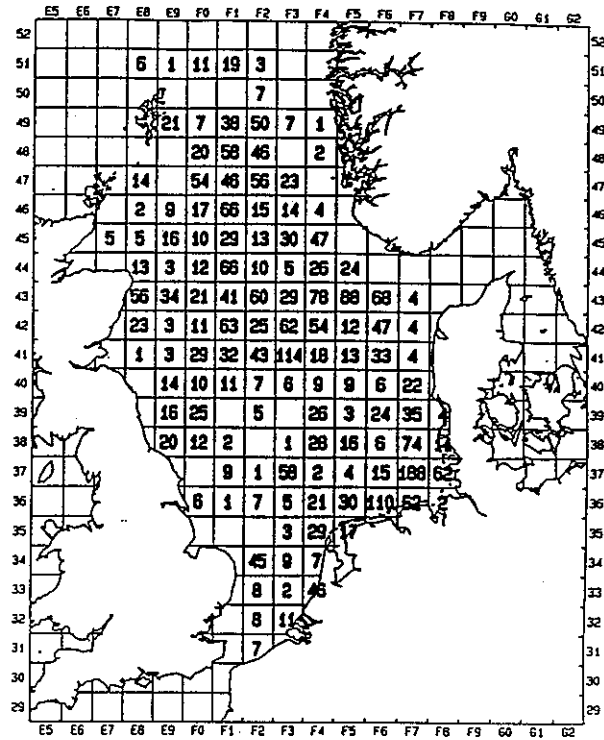


FIGURE 1 Boundaries of ICES roundfish sampling areas.

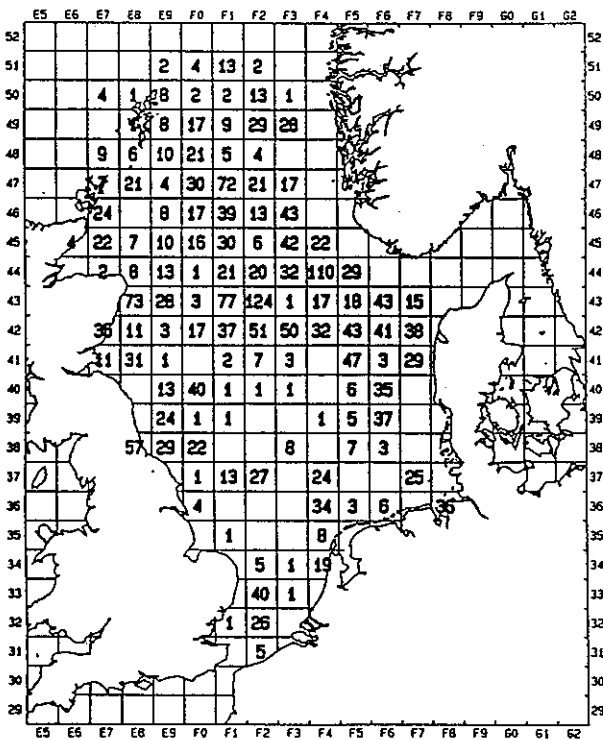
Q1



Q2



Q3



Q4

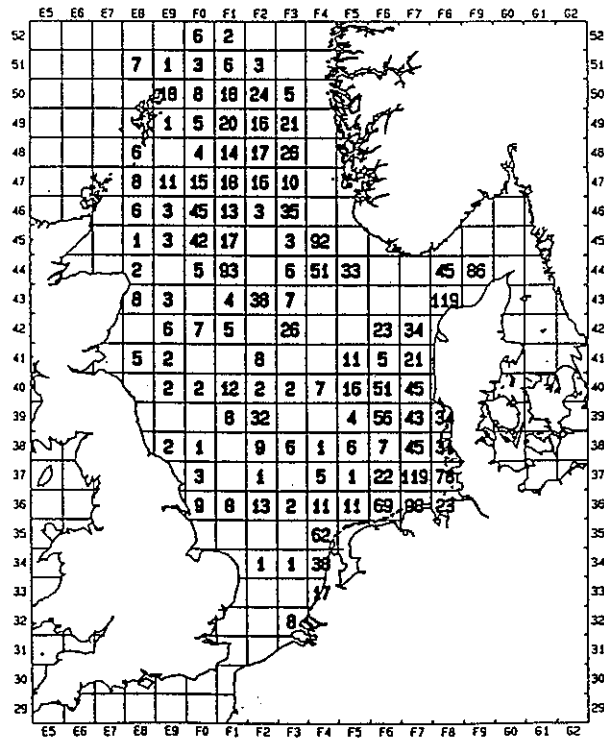


FIGURE 2 Number of cod stomachs sampled in each statistical rectangle in each quarter in 1991.

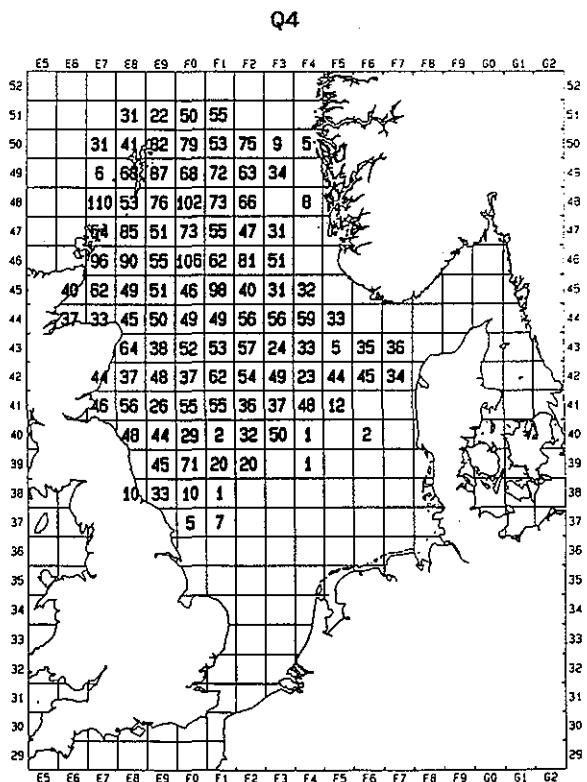
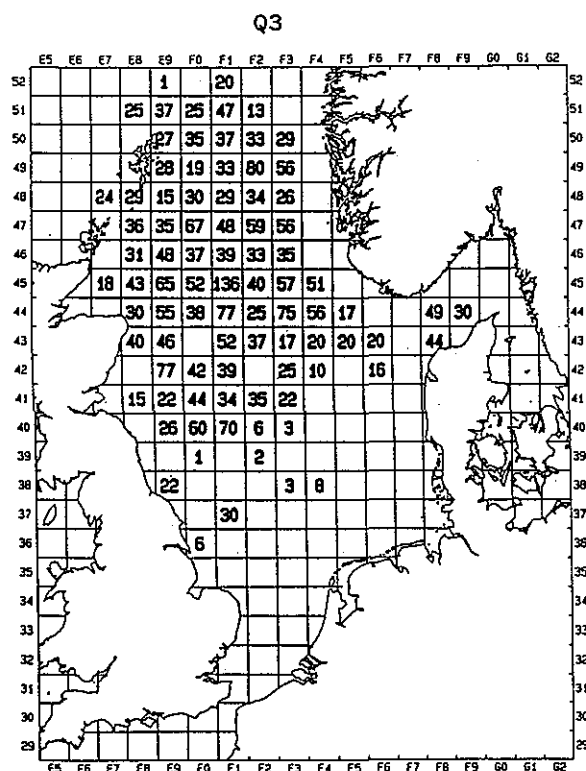
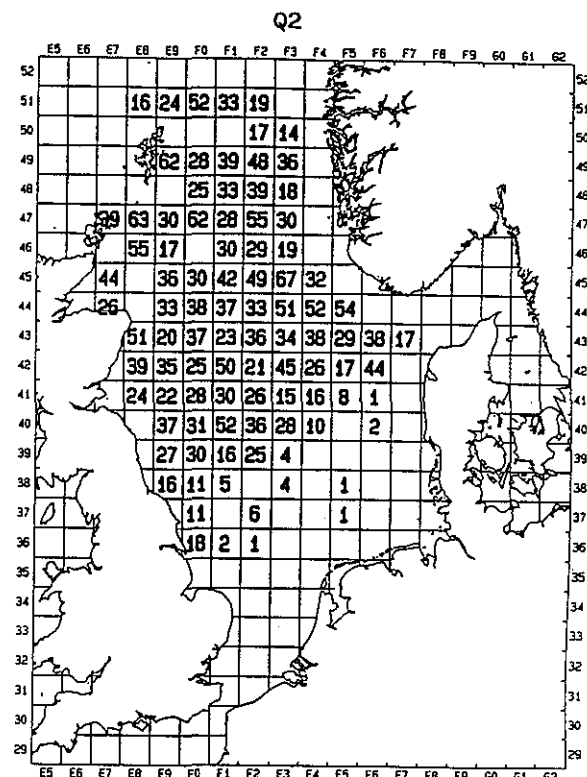
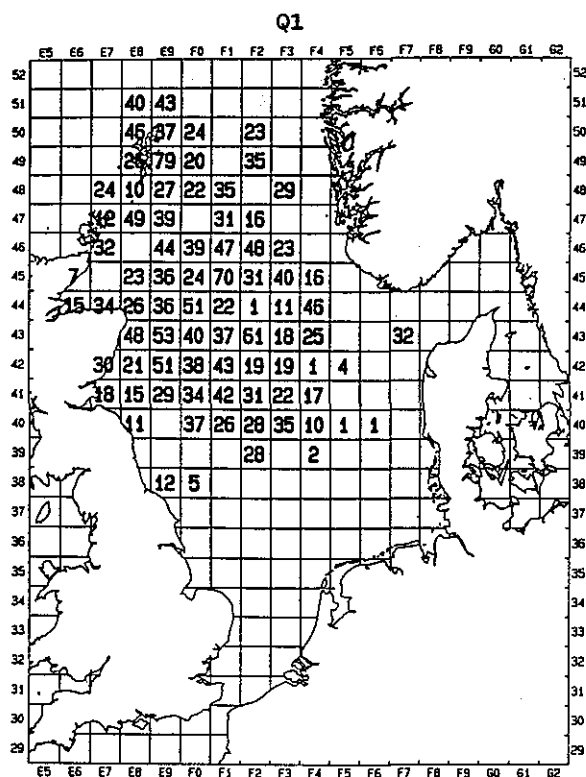


FIGURE 3 Number of haddock stomachs sampled in each statistical rectangle in each quarter in 1991.

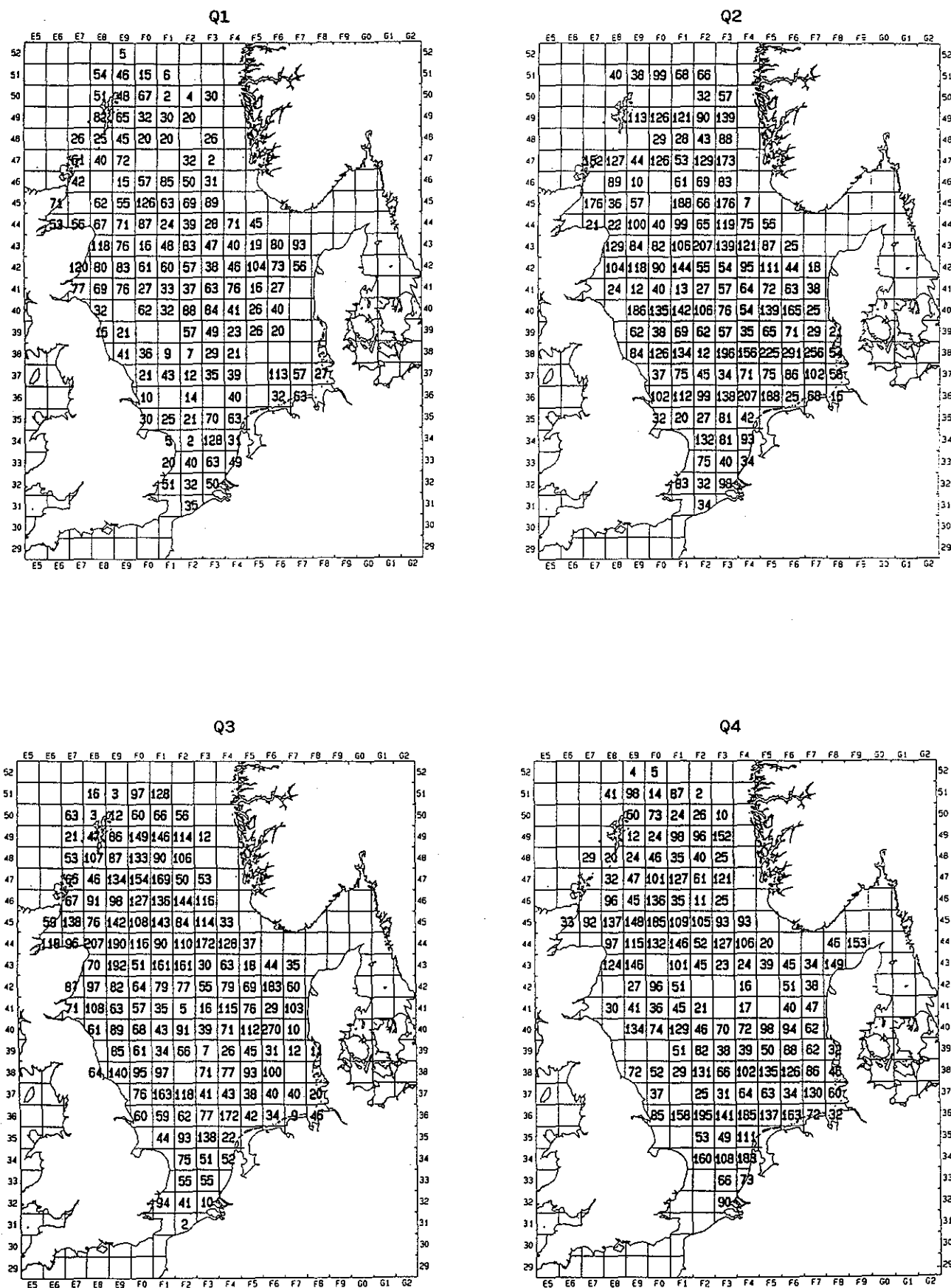


FIGURE 4 Number of whiting stomachs sampled in each statistical rectangle in each quarter in 1991.

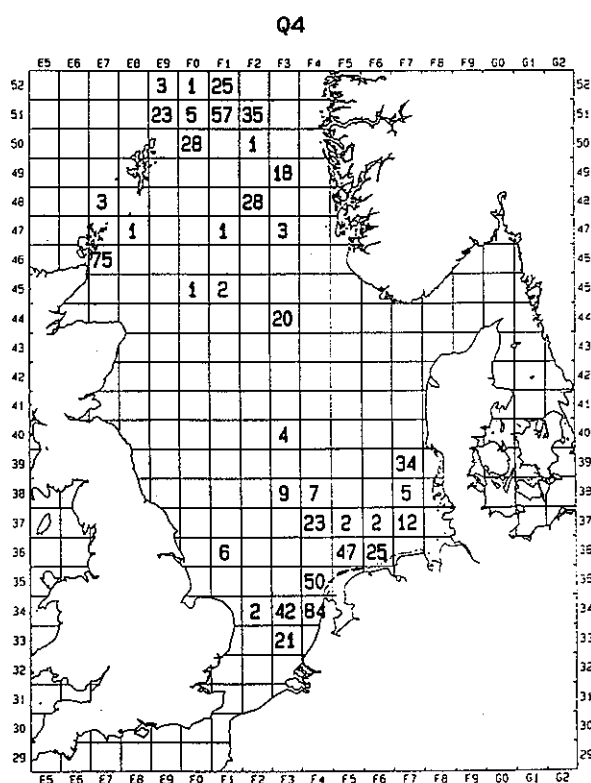
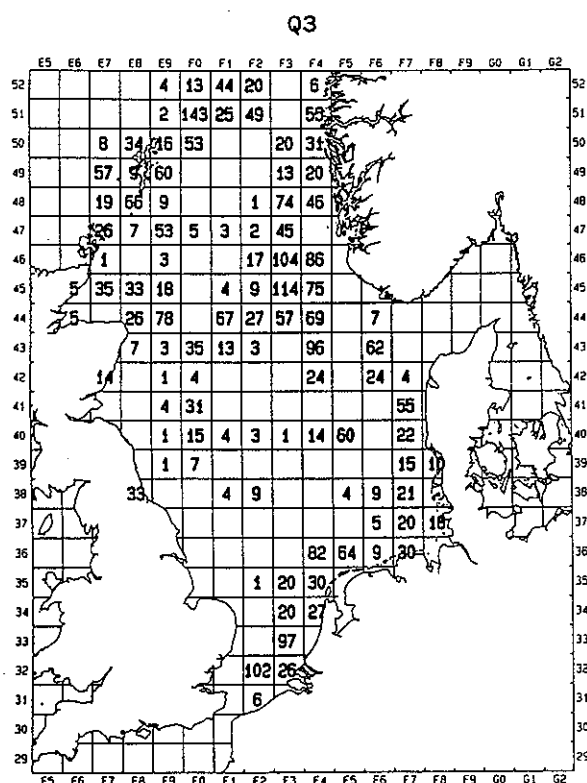
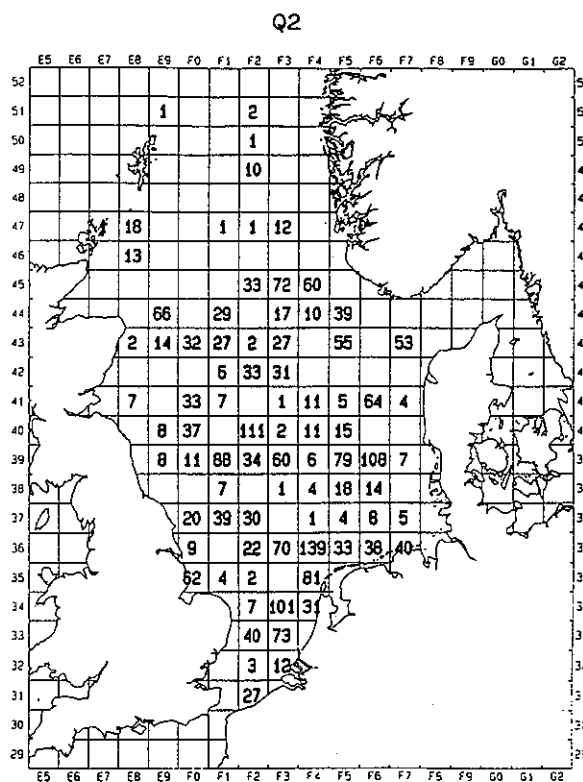
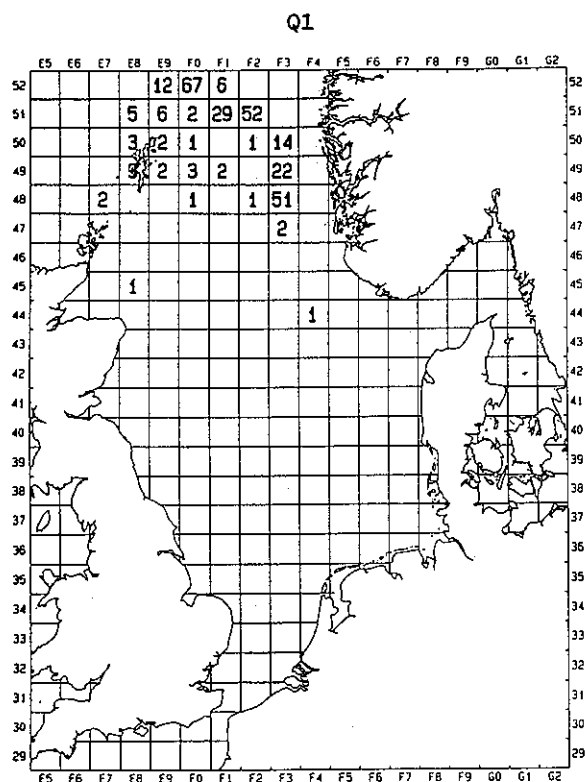


FIGURE 5 Number of mackerel stomachs sampled in each statistical rectangle in each quarter in 1991.

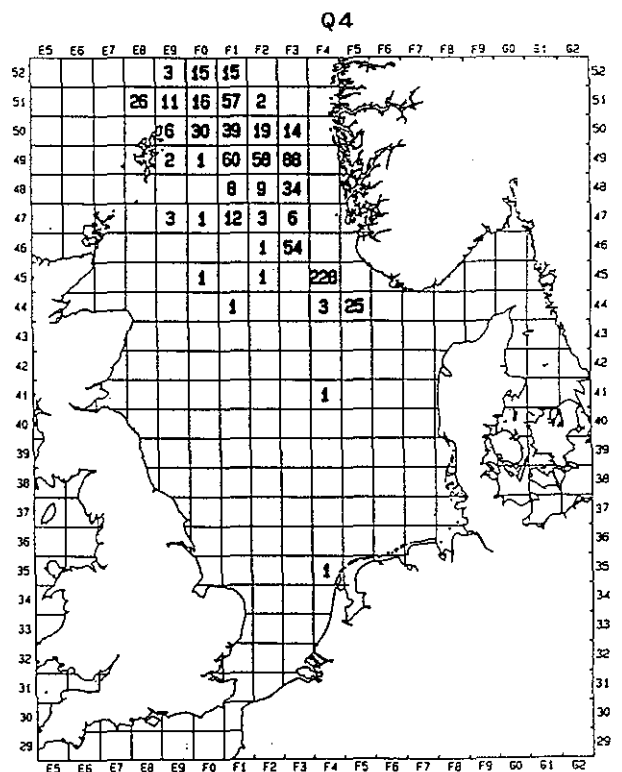
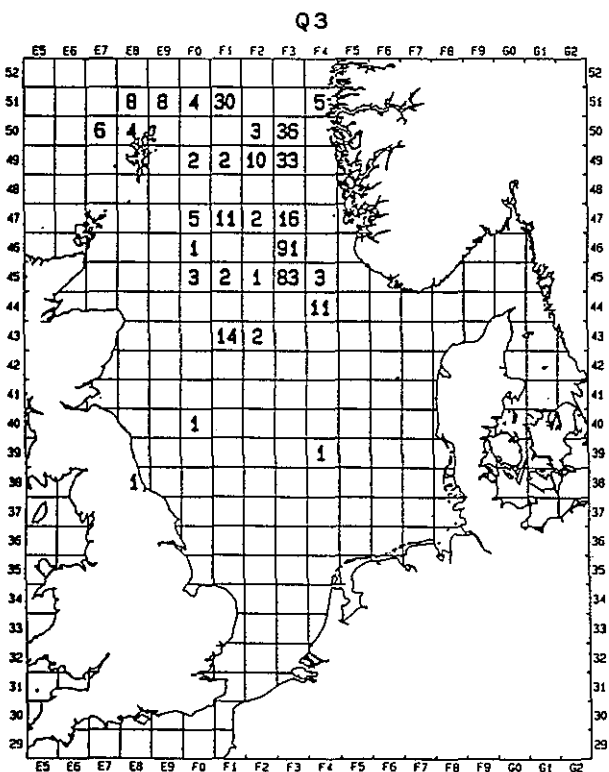
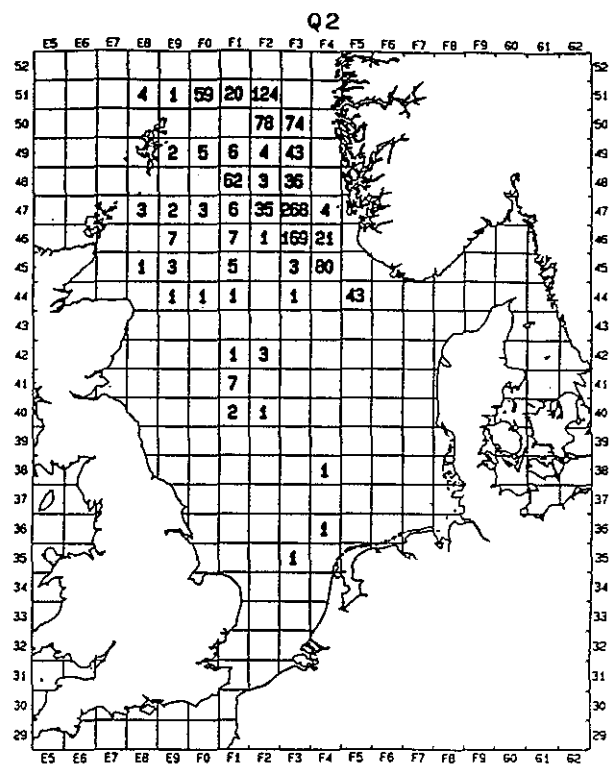
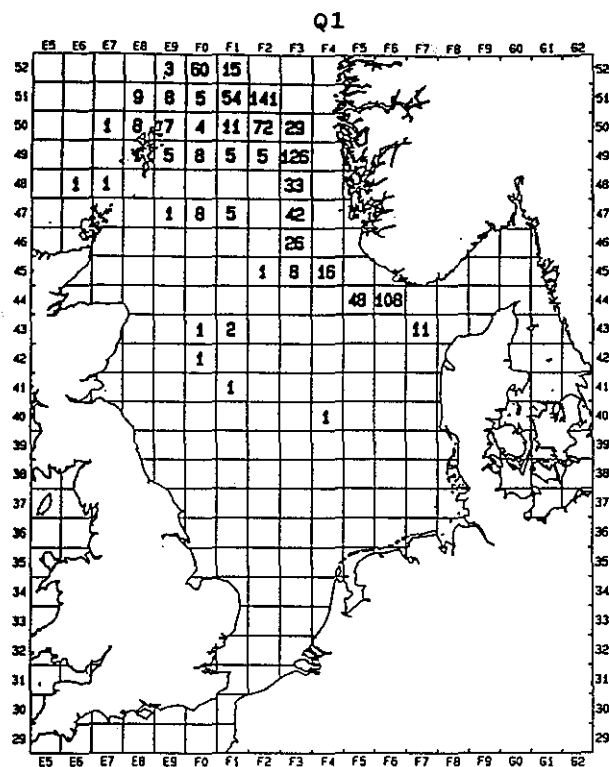


FIGURE 6 Number of saithe stomachs sampled in each statistical rectangle in each quarter in 1991.

PREY OF 0-GROUP GADIDS IN THE NORTHERN NORTH SEA IN JUNE 1991

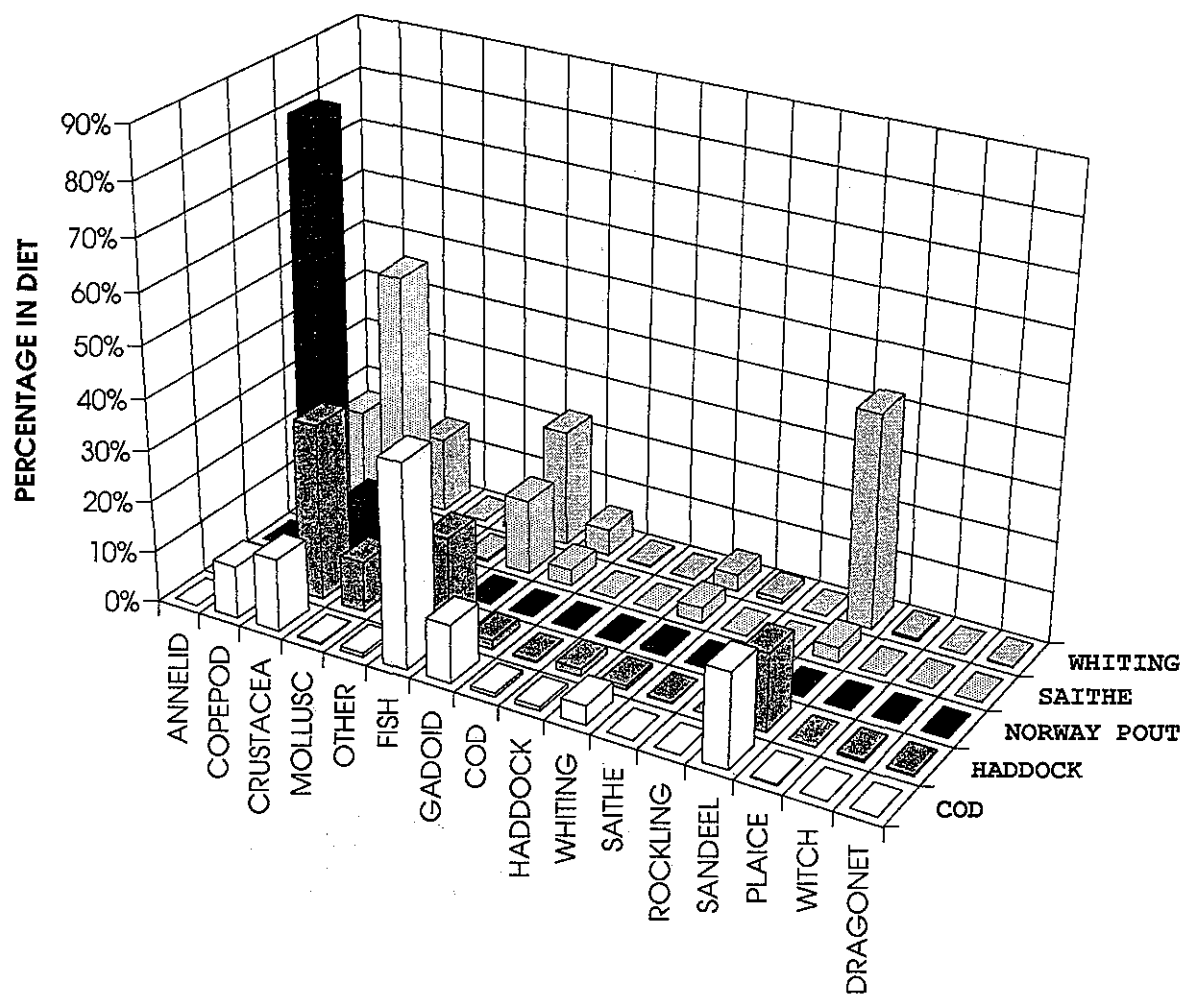


FIGURE 7 Stomach contents (percentage by weight) of 0-group gadoids in the northern North Sea in June 1991.

PERCENTAGE OF FISH PREY IN THE DIET OF 0-GROUP GADOIDS IN THE NORTHERN NORTH SEA IN JUNE 1991

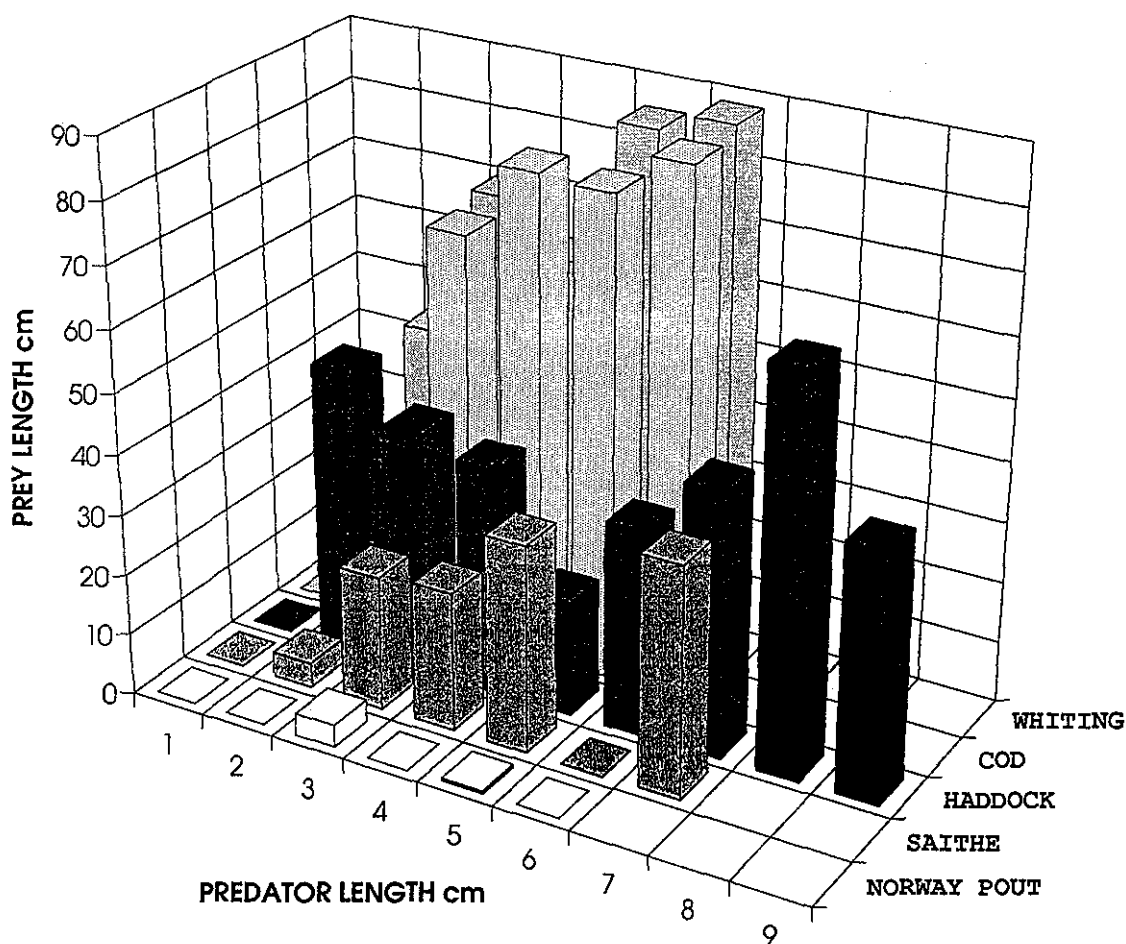


FIGURE 8 Percentage by weight of fish prey in the diet of 0-group gadoids in the northern North Sea in June 1991.

LENGTH OF FISH PREY IN RELATION TO LENGTH OF PREDATOR

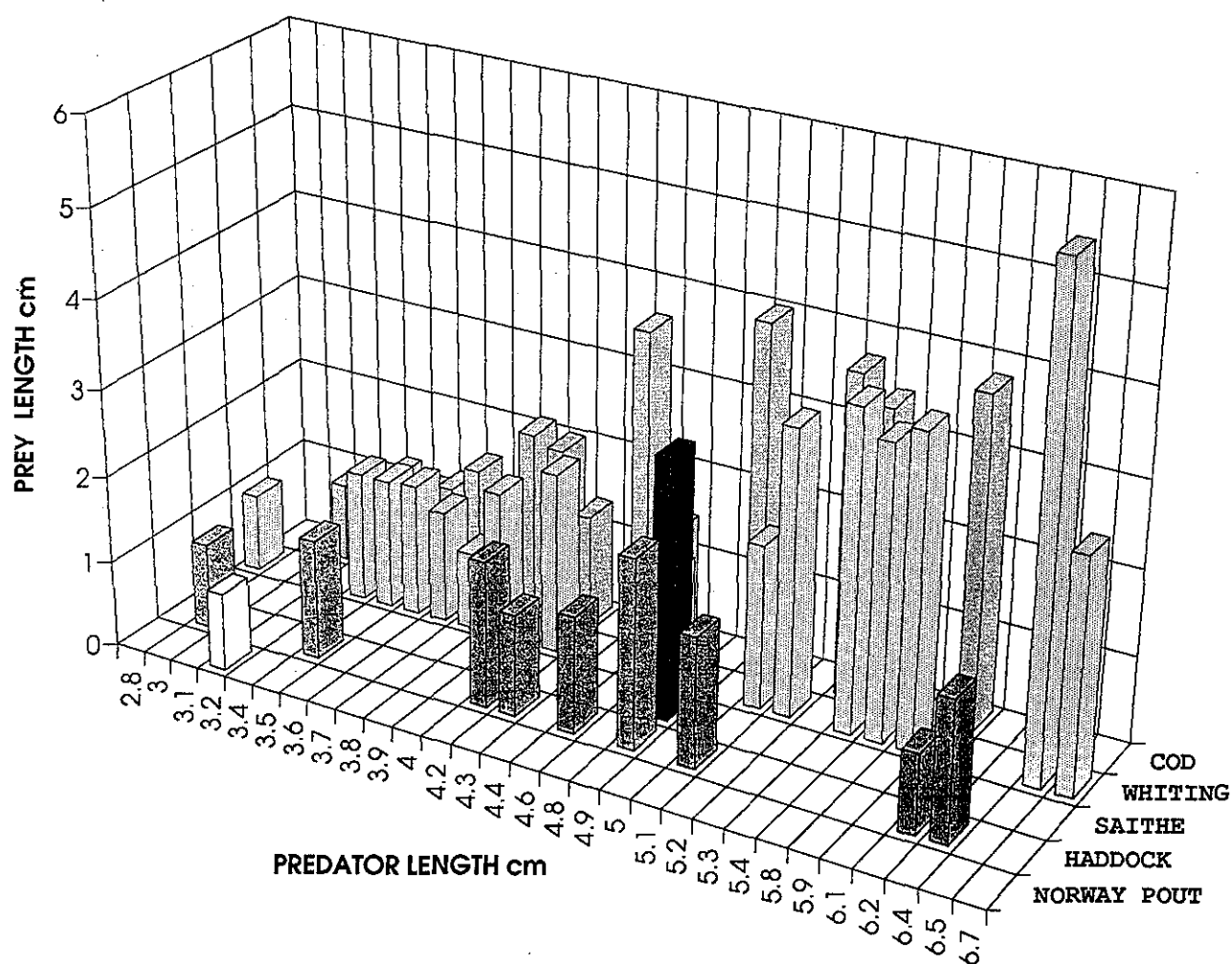


FIGURE 9 Length of fish prey in the stomachs of 0-group gadoids of each size sampled in the northern North Sea in June 1991.

Appendix A

Numbers of non-regurgitated stomachs that were to be collected per size class per haul in each quarter of 1991

Size class (cm)	Species									
	Primary predators					Secondary predators				
	Cod	Whiting	Saithe	Mackerel	Haddock	Scad	Gurnards*	Rays*	LR dab	Other*
5-5.9	5	5	5	5	5					
6-6.9	5	5	5	5	5					
7-7.9	5	5	5	5	5					
8-9.9	5	5	5	5	5					
10-11.9	5	5	5	5	5					
12-14.9	5	5	5	5	5					
15-19.9	10	10	25	25	5	10	10	10		
20-24.9	10	10	25	25	5	10	10	10	10	
25-29.9	10	10	25	25	5	10	10	10	10	
30-34.9	10	10	25	25	5	10	10	10	10	
35-39.9	10	10	25	25	5	10	10	10		
40-49.9	10	10	25	25	5	10	10	10		
50-59.9	10	10	25		5			10		
60-69.9	25	10	25		5			10		
70-79.9	25		25		5			10		
80-99.9	25		25					10		
100-119.9	25		25					10		
>120	25		25					10		

*Each species of gurnard and ray was sampled separately

*The following demersal species normally occur infrequently but were sampled whenever possible (up to five stomachs per size class):

Tope	<i>Galeorhinus galeus</i>
Spurdog	<i>Squalus acanthias</i>
Spotted dogfish	<i>Scyliorhinus caniculus</i>
Conger	<i>Conger conger</i>
Pollack	<i>Pollachius pollachius</i>
Ling	<i>Molva molva</i>
Torsk	<i>Brosme brosme</i>
Hake	<i>Merluccius merluccius</i>
Angler fish	<i>Lophius piscatorius</i>
Turbot	<i>Scophthalmus maximus</i>
Brill	<i>S. rhombus</i>
Megrim	<i>Lepidorhombus whiffiagonis</i>
Halibut	<i>Hippoglossus hippoglossus</i>

In the case of pelagic 0-group gadoids and greater sandeel (*Hyperoplus*) a random sample of 50-100 individuals per haul was required.

Appendix B

Format for North Sea stomach data exchange tape.

Position	Name	Type ^a	Range of values	Comment
1-2	Ecosystem name	2N	1-8	Footnote ^b for coding scheme
3-4	Year	2N	01-99	Year - 1900
5	Quarter	1N	1-4	
6-9	Square	4AN		ICES rectangle
10-19	Predator code	10N		NODC 10-digit, see footnote ^c
20-24	Sample number	5N	1-99999	Unique fish ID
25-27	Country	3A		ICES alpha codes No data: XXX
28-31	Ship	4A		ICES alpha, if available No data: XXXX
32-34	Sampling method	3A		Footnote ^d for coding scheme No data: XXX
35-40	Station/haul	6AN		Use national system No data: XXXXXX
41-42	Month	2N	01-12	Not known: 99
43-44	Day	2N	01-31	Not known: 99
45-48	Time of day	4N	0-2399, 9999	Local time, hh/mm, start of tow Not known: 9999
49	Quadrant	1N	1-4, 9	See footnote ^e Not known: 9
50-53	Latitude	4N	0-9000, 9999	dd/mm Not known: 9999
54-58	Longitude	5N	0-18000, 99999	ddd/mm Not known: 99999
59-61	Depth (meters)	3N	1-999	Mean depth of tow Not know: 999
62-64	Temperature (bottom)	3N	-9.9 to 99.8	XX.X one implied decimal Not known: 999
65-68	Predator (mean) length	4N	1-9999	mm XXXX
69-73	Predator (mean) weight	5N	1-99999	grams XXXXX Not known: 99999
74-75	Predator (mean) age	2N	0-99	Not known: 99
76-79	Predator lower length bound	4N	1-9999	mm XXXX
80-83	Predator upper length bound	4N	1-9999	mm XXXX
84-90	CPUE	7N	1-9999999	Weighting coefficient for sample Not known: 1

Position	Name	Type ^a	Range of values	Comment
91-93	Number with food	3N	0-999	0, 1 for individual samples
94-96	Number regurgitated	3N	0-999	0, 1 for individual samples
97-99	Number with skeletal remains	3N	0-999	0, 1 for individual samples
100-102	Number empty	3N	0-999	0, 1 for individual samples
103-112	Prey species code	10N		NODC 10-digit
113-116	Prey lower length bound	4N	1-9999	mm XXXX Not known: 9999
117-120	Prey upper length bound	4N	1-9999	mm XXXX Not known: 9999
121-128	Prey weight	8N	1-99999999	Total weight mg XXXXXXXXX
129-134	Prey number	6N	1-999999	Total number Not known: 999999
135	Digestion stage	1N	0-2, 9	See footnote ^f

^aAll numeric fields (N) right justified, zero filled; all alpha (A) and mixed alpha/numeric fields (AN) left justified, space filled

^bNorth Sea=1, Baltic Sea=2, Barents Sea=3, Iceland=4, Northeastern Newfoundland=5, Northeastern USA=6, Southern Shelf=7, Faroes=8

^cNODC codes for predators:

Cod	<i>Gadus morhua</i>	8791030402
Whiting	<i>Merlangius merlangus</i>	8791031801
Haddock	<i>Melanogrammus aeglefinus</i>	8791031301
Saithe	<i>Pollachius virens</i>	8791030901
Mackerel	<i>Scomber scombrus</i>	8850030302

^dDEM=demersally caught by trawling or seining gears

PEL=pelagically caught by trawling or seining gears

DHL=demersal hook and line

PHL=pelagic hook and line

DGN=demersal gill net

PGN=pelagic gill net

^eQuadrants for position identification are: 1=NE, 2=NW, 3=SW, 4=SE

(The axes of the quadrants are the equator and the Greenwich meridian)

^fDigestion stages are: 0=Pristine, 1=Affected by digestion, 2=Skeletal remains, 9=Unknown