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The IBTS database: a plea for quality control

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Abstract

The IBTS database as maintained at ICES Headquarters has been submitted to a quality check with reference to reported size distributions and species identifications. The check is based largely on a comparison of reported size distributions with available information on maximum length in the literature and on consistency in species compositions reported by individual countries (and sometimes years and areas). The results are alarming. For a large number of species the database contains unrealistic information. In many cases errors may be tracked to simple input errors, but clearly there have also been, and still are, severe species identification problems among all countries participating in the survey. Misidentifications involve errors in abundance of at least two species and, based on the limited analysis presented, a conservative guess is that at least 30% of all species reported may be affected. This not only means that trends in abundance of individual species may be biased, but, more importantly, it reduces the value of the IBTS database for diversity studies of the North Sea fish community to virtually zero. I present a strong plea for a comprehensive check of all data in the existing database, with an appropriate correction of uncertain identifications to higher taxa to reflect inherent uncertainties, and to embark on a serious quality control programme to ensure that future surveys yield only reliable information at the species level. The scientific credibility of ICES is at stake, because it is a waste to maintain a flawed database at ICES Headquarters.

Introduction

The International Bottom Trawl Surveys in the North Sea and Skagerrak/Kattegat represent a frontispiece of international cooperation within ICES. The origin traces back to 1960/1961 when several countries participated in an one-off joint project to delineate the distribution of juvenile herring and whiting (ICES, 1963; Gamble et al., 1962). Realizing the value of annual recruitment estimates of herring for management advice, the Netherlands and Germany took the initiative for a pilot study in February 1966 for monitoring surveys (Zijlstra, 1966). Gradually, other countries joined the project by reserving a considerable amount of ship time in their annual cruise programmes. By 1975, 9 countries were involved and the whole North Sea area between 52° to 61°30'N within the 250 m line was covered (Heessen *et al*., 1997). The Skagerrak/Kattegat was sampled from 1980 onwards.

The primary objective of the survey has changed from being directed towards juvenile herring to a general young fish survey that yielded recruitment estimates for seven commercial species. Much effort has been spent on standardisation of the gear and fishing methods and sampling, and the information collected is regularly used by several ICES stock assessment working groups. However, the surveys represent also an important source of information on a wide variety of other fish species, because the entire fish catch has routinely been sorted and measured. To underline the change in emphasis, the name of the survey has been changed over time from International Young Herring Survey, through International Young Fish Survey to International Bottom Trawl Survey. The ICES Secretariat is directly involved by maintaining the extensive database, which now includes all information collected from 1965 onwards. The data have, for instance, been used in preparing the Atlas of North Sea Fishes (Knijn *et al*., 1995) and comprehensive analyses of fish community metrics have been made by the Working Group on Ecosystem Effects of Fishing (ICES, 1996).

Recently, I have used, among other survey data, the IBTS data base for an analysis of a rarity index based on relative differences in abundance and distribution of fish (Daan, 2001). In contrast to recruitment estimates for commercial species, which are relatively insensitive to incidental mistakes in input data because of the large amount of reliable information, this type of application is highly sensitive to consistent and correct species identifications. If a rare species is not recognised in the catch, its relative rarity will be overestimated, while an incorrectly attributed species name will result in underestimated rarity.

Upon entry into the IBTS database, the data submitted by individual countries are subjected to extensive checks for appropriate coding, but there have been no checks on unlikely NODC species codes. Species identification is left completely to the responsibility of the

participants and data submitted are supposed to be correct. However, in analysing the data, it became increasingly obvious that the data can not always be used at face value and major corrections, based on expert judgement, were required to avoid nonsensical results. While it is often clear that that there must be a mistake, the appropriate correction is less obvious and depends on the nature of the error. Sometimes the mistake can be traced to an input error by checking against the original data sheet. In other cases, there appear to have been more or less systematic errors in species identification. In practice, the only option is often to delete such records entirely. This is unsatisfactory for three reasons: (1) two independent analyses of the same data base may give different results if expert judgements differ; (2) misidentifications affect estimates of abundance and distribution of two species; (3) deleting species records markedly affects community metrics such as number of species caught per haul.

Tracking species identification problems is not straightforward. My aim here is to provide examples of clearly aberrant data based on general knowledge of maximum size and rarity of individual species, and on inconsistencies between size compositions of related species recorded by different countries. The analysis does not pretend to provide a comprehensive account of all existing problems, but rather to indicate the kind of quality control that is required before the IBTS data base can be trusted as a basis for any analysis of the North Sea fish community.

Methods

The database including information from 1965 up to and including the 1st quarter of 1998 was transferred to SAS and linked with published information on maximum length (Lmax) according to Wheeler (1978). Invalid hauls and records with invalid species codes were deleted before analysis. Table 1 provides a summary of the number of hauls in which a particular taxon has been recorded, the total number of individuals, minimum and maximum size and Lmax. Altogether, 209 different NODC codes were encountered in 1623772 records. In bold I have indicated where problems have been encountered.

For some species pairs that are notorious for misidentification problems, more detailed analyses were made of the length compositions by country, year or area to investigate potential inconsistencies in reporting frequency distributions.

Where possible, the problematic species records encountered are indicated by ship, year and haul number. As far as Dutch data were involved, I went one step further and checked the records against the original data sheets to see whether it was possible to correct the records.

Results

1. Redundant codes

Some species have been reported at different levels of aggregation (species, genus and/or family). In many cases, there may be a good reason for doing this, if a genus is represented by more species, or a family by more genera, and if the responsible scientist felt unable to identify the species individually. However, it is common in scientific studies to 'identify to the lowest possible taxon'. Thus, if there is only one species per genus present in the North Sea (or one genus per family), the higher codes are redundant, because they imply effectively the same species or genus. There are 16 such codes (Table 2). Although the use of these may not be considered a real mistake, it means that any analysis requires additional pre-processing of the data to get rid of redundant codes and to narrow down the number of taxa reported.

2. Rare species

All species recorded belong to the North Sea fauna according to the available guides, and the possibility that these have actually been caught cannot be rejected *a priori*. Nevertheless, some caution seems required, because one would normally seek confirmation of apparently extremely rare species from taxonomists and there is plenty of room for mistakes. The nature of these surveys requires frequent exchange of scientific crews and not all scientists may be equally good in species identification. Moreover, electronic input from the original data sheets is usually done by people who have little or no idea of what they are entering. Table 3 provides a list of rare species records. Although the entire list should be scrutinised against the original data, I will discuss a few outstanding problems:

- **8713030105/*Torpedo marmorata***: The two marbled electric rays stemmed from two consecutive hauls of Tridens in 1975. The original data sheets revealed a misreading of an uncommon Dutch name for *Raja clavata*.

- **8713040158/*Raja undulata***: The sizes of the two undulate rays reported by Scotland and England suggest that these were newly hatched individuals, when characteristics normally reported in text books are not well developed.

- **8784010600/*Lepadogaster* spp.**: There are two species of this genus of clingfish, both of which are distributed outside the North Sea (Wheeler, 1978).

The one specimen recorded by France exceeds the maximum length by a factor 3!

• **8791932002/*Gaidropsurus mediterraneus***: Of the 20 shore rocklings reported by Germany (none by other countries), 6 exceeded the max length of 25 cm! The catches are centred in the 1983 and 1988 cruises, which suggests that the problem might be traced to a single scientist.

• **8794011502/*Trachyrhynchus murrayi***: The roughsnout rat-tails reported by Scotland (11-15 cm) are extremely small for this species. It seems more likely that these reflect an input error by confusion with *Triglops murrayi* (5-15 cm), which are more commonly reported from the same area.

• **8813010000/Lampridae**: The 44 specimens of (implied) *Lampris guttatus* reported by France in 3 years stand out exceptionally among none reported by any of the other countries. My hypothesis is that these opah represent input errors, where lampreys have possibly been misread for Lampridae.

• **8831090310/???**: The unknown code submitted by the Netherlands could be traced to an input error: should read 8831090831/*Liparis montagui*.

• **8842121801/*Leptoclinus maculatus***: Of the 23 spotted snake blennies (12-34 cm) reported by 4 countries, 12 were in excess of Lmax (20 cm). The length distribution fits more closely that of *Lumpenus lampretaeformis* (5-41 cm), which belongs to the same family.

• **8847016601/*Aphia minuta***: Of 44 specimens reported, 28 stem from a single haul made by Sweden, which were all larger than 38 cm! This is obviously an error. The other 16 were either 3 or 4 cm and there is little reason to distrust these data.

3. 'Undersized' species

The trawling gear used (GOV - 'Grande Ouverture Verticale') has a 2-cm (stretched mesh size) liner, through which fish larvae should generally escape. Thus, fish below 3 cm might reflect input errors (Table 4). In all 5 cases, where the record stemmed from a Dutch vessel, the record could be traced to an input error. Moreover, due to a programming error in translating input files into exchange format, a value for size class 1 had the additional effect that the rest of the length distribution of that species was skipped. The impact of this error was actually more serious than the small one we were looking for!

4. 'Oversized' species

The recorded length distributions of many species exceed the given Lmax, often by a considerable amount (Table 1). Although the reported Lmax may not be infallible, it would seem worthwhile in most of these cases to check the original data carefully, because many of these may reflect input errors (as found in some Dutch records). Moreover, regular excess of Lmax might indicate further identification problems. I provide a few extreme examples here:

• **8713040134/*Raja radiata***: Several countries have reported large starry rays of up to over 1 m, which would seem exceptional. However, among the different data sets, Scotland reported by far the most specimens over 60 cm (Table 5), which could be traced back to a single year (1989). Clearly, in that year the entire length distribution deviated from the usual pattern observed and it would seem likely that some error is involved.

• **8818010000/Gasterosteidae**: Two species of sticklebacks occur in the North Sea, *Gasterosteus aculeatus* and *Spinachia spinachia*.. The latter is considered extremely rare. Nevertheless, table 1 suggests that it is fairly common with 945 reported. Table 6 provides the length distributions of sticklebacks for selected countries. In the case of *G. aculeatus* there are a few outliers. The Dutch catch of 120 specimens of 10 cm long turned out to be a transcription error during electronic input. For *S. spinachia*, 8 specimens of a totally unrealistic size were reported by Denmark. The other 10 reported by Denmark correspond to a normal size range of the species. Remarkably, France has reported only 6 *G. aculeatus* and extremely large numbers of *S. spinachia* within the size range occupied by *G. aculeatus*. Norway and Scotland have reported Gasterosteidae and according to the length distribution, there seems to be little doubt that these have actually been *G. aculeatus*.

• **8831022207/*Myoxocephalus scorpius* – 8831024601/*Taurulus bubalis***: The sea scorpion *T. bubalis* is a small (Lmax=17 cm) and rare species that may be easily overlooked. Unexpectedly, England, France, Germany, Scotland and Sweden all report large fractions, which moreover exceed the Lmax by a considerable amount (Table 7). Only the Dutch length distribution corresponds to the known size range. Denmark and Norway have not reported this species, but their catches of bull-rout *M. scorpius* have been relatively small and based on the fraction reported by the Netherlands, Denmark would have been expected to have caught only one or two. France does not report *Myoxocephalus*, but only *Taurulus*! There is obviously something completely wrong with the identification of this species pair in most countries. Although the positive identification of *T. bubalis* by the Netherlands is confirmed by several photographs, there remains uncertainty whether all sea scorpions have been recognized, especially during earlier years.

• **8845010000/Ammodytidae:** Sandeel species are notoriously difficult to identify, although it is relatively easy to distinguish the genus *Hyperoplus* from *Ammodytes* (Table 8). In practice, relatively large proportions have been assigned to genus or family only by most countries. For those countries reporting individual *Ammodytes* species, it seems odd

that *A. tobianus* exceeds *A marinus* in length, although its published Lmax is smaller. The very large *Ammodytes* of over 40 cm are undoubtedly *Hyperoplus*. Hyperoplus provides another problem, because there are severe inconsistencies in the fraction of *H. lanceolatus* and H. immaculatus reported by individual countries:

	DEN	ENG	FRA	GFR	NED	NOR	SCO	SWE	
H.lance.	5384	120658	23244	104643	156997	1020	72331	15802	
H.imma.	0	0	187976	0	0	0	8223	0	

• **8846010100/Callionymus spp**.: The length distributions of the 3 species of dragonets present in the North Sea (Table 9a) indicate that all species exceed the Lmax reported in the literature. This suggests that at least the Lmax of *C. lyra* is underestimated, because confusion with other species seems unlikely. However, for both *C. maculatus* and *C. reticulatus* it seems highly unlikely that the tail ends of the distributions have been identified correctly, because they exceed Lmax by 100% and 50% respectively. Table 9b provides some details of the fractions of the three species reported by individual countries by area (southern and northern North Sea and for the Skagerrak/Kattegat). There are some striking inconsistencies. *C. reticulatus* is only reported frequently by the Netherlands, particularly in the southern North Sea, and rarely by England and Scotland. *C. maculatus* is extremely rare in the south according to the Netherlands, but less so according to Denmark, England and Germany. In the northern part, Germany reports more than 50% *C. maculatus*. There are also marked trends in the fractions of the 3 species reported by year and country, which likely reflect differences in identification criteria than in actual abundance. [NB.: *C. reticulatus* has been discovered only recently in the North Sea and Muus (1966) did not mention the reticulated dragonet; the Dutch revised version, Muus *et al*. (1999), has transposed the Dutch names going with the plates and texts, adding to the confusion! This may also apply to other translations).

• **8858010801/Buglossidium luteum**: Table 10 provides the length compositions of the catch reported by Scotland and by all other countries combined, indicating that a single country is responsible for the extensive tail to 100% above Lmax. Most likely, this species has been confused with other Soleid.ae

Apart from misidentifications, some unlikely sizes may occur as a consequence of input errors. Table 11 lists records (by country) with unlikely sizes (criterion: >10% over Lmax) that remain after excluding records with clear problems caused by the misidentifications dealt with above. As far as Dutch data are concerned, these could often be tracked down to input errors.

Other problems

• **8708020400/*Mustelus*** spp.: Table 12 lists the total numbers of unidentified, common and starry smoothounds reported by survey. Not only are the total catches highly variable, but species composition appears to shift markedly from survey to survey. Although this may not be entirely impossible, the results certainly do suggest that species identification reflects differences in 'preference' of the responsible scientists in this case.

• **8747010100/*Alosa* spp.**: Alewives *A. alosa* interbreed with *A. fallax* (Redeke, 1941), which is much more common in the North Sea. Although the number of gill rakers provides a reliable distinguishing feature, it is more common to find intermediate numbers of gill rakers than a number that fits entirely into the *A. alosa* range. The number of black spots is also often used for identification, but this characteristic is unreliable. The following table provides the number of the two species reported by individual countries:

	DEN	ENG	FRA	GFR	NED	NOR	SCO	SWE	
A. alosa	1	20	8	88	0	22	4	0	
A. fallax	4971	5	97	26	10744	0	11	17872	

This shows quite clearly that there is a major inconsistency in the fraction of the two species reported between England, Germany and Norway on the one hand and Denmark, the Netherlands and Sweden on the other.

Discussion

Although it is not always possible on the basis of the data presented to conclude which identifications can be trusted, the large and varying discrepancies between countries in their reports of a wide variety of species indicate that most of the participants in the IBTS have experienced and still experience severe problems with particular species identifications. This analysis suggests that at least 20 species pairs present problems, thus affecting the reliability of twice that number of species (i.e., some 30% of the total fish community!). My overall conclusion is therefore that the existing database cannot be used at present to obtain reliable information on changes in abundance and distribution for many species reported. Although the inconsistencies clearly indicate national problems, in practice there may be inconsistencies within countries, because scientific crews vary between cruises. However, a full account of all inconsistencies requires a much more comprehensive analysis.

Input errors can be relatively easily corrected. However, it seems unlikely that we will be able to correct all misidentifications of the past. Moreover, even if positive identifications of rare species can be trusted, this does not necessarily mean that these species have always been recognised. In those cases, the only proper solution would be to revise the NODC codes to reflect a higher taxonomic unit to meet the common scientific criterion of 'identification to the lowest possible level'. For further analysis, the data sets considered reliable may then be used to redistribute the higher taxa

over the constituent species, but from a scientific point of view it is frustrating that so much information will have to be thrown out, because this devalues the database considerably.

The ICES database is presently available upon request to individual scientists who want to perform particular analyses. In my opinion, ICES should be extremely restrictive in allowing further analyses of community metrics at this stage, because diversity estimates are directly and strongly affected by the present poor quality of the database.

In conclusion, there are two urgent matters to be resolved:

1. The historic data must be scrutinised by the responsible national laboratories, under the auspices of the IBTS WG, so that the database at ICES Headquarters contains only trustworthy information and can be used for comprehensive analyses;
2. The IBTS Working Group must ensure the collection of reliable information for all species during future surveys; this requires a re-investment in taxonomic knowledge by research directors of national laboratories and exchange of knowledgeable scientists among ships. Only inter-calibration among participants will remove the existing discrepancies.

References

Daan, N. 2001. A spatial and temporal diversity index taking into account species rarity, with an application to the North Sea fish community. ICES CM 2001/xx:yy.

Gamble, R., Garrod, D. J., Hannerz, L., Knudsen, H., Kuiter, K., Messtorff, J., and Sahrhage, D. 1962. Report on the International Whiting surveys of the North Sea in 1960 and 1961. ICES CM 1962/NNSC:5.

Heessen, H. J. L., Dalskov, J., and Cook, R. M. 1997. The International Bottom Trawl Survey in the North Sea, the Skagerrak and Kattegat. ICES CM 1997/Y:31.

ICES, 1963. International Young Herring Surveys, Report of Working Group Meeting in IJmuiden, 26-27 March , 1963. ICES CM 1963/HC:101.

ICES, 1996. Report of the Working Group on Ecosystem Effects of Fishing Activities, ICES Headquarters, 13-21 March 1996. ICES CM 1996/Assess/Env:1.

Knijn, R. J., Boon, T., Heessen, H. J. L., and Hislop, J. R. G. 1993. Atlas of North Sea fishes. ICES Cooperative Research Report, 194. 268 pp.

Muus, B. J. 1966. Zeevissengids. Elsevier, Amsterdam/Brussel.

Muus, B. J., Nielsen, J. G., Dahlstrøm, P., and Nystrøm, B. O. 1999. Zeevissen van Noord- en West-Europa. Schuyt en Co., Haarlem.

Redeke, H. C. 1941. De Visschen van Nederland. A. W. Sijthoff, Leiden.

Wheeler, A. 1978. Key to the Fishes of Northern Europe. Frederick Warne Ltd, London.

Zijlstra, J. J. 1966. Report on the pilot-study for future young herring research in the North Sea. ICES CM 1966/H:9.

Table 1. Listing of NODC codes, nr of positive hauls (n), total number (N), minimum (min) and maximum (max) of length distribution and reported maximum length (Lmax). NB.: Problematic items are bolded in all tables!.

Obs	NODC	Name	n	N	min	max	Lmax
1	**8603010200**	Lampetra spp.	4	8	30	34	
2	8603010217	Lampetra fluviatilis	25	66	23	39	5
3	**8603010300**	Petromyzon spp.	3	6	30	35	
4	8603010301	Petromyzon marinus	17	36	16	62	60
5	8606010201	Myxine glutinosa	440	8224	9	**79**	**60**
6	8707040302	Lamna nasus	2	4	200	220	300
7	8708010000	Scyliorhinidae	1	2	73	73	
8	8708010203	Galeus melastomus	14	165	13	77	75
9	8708010300	Scyliorhinus spp.	3	4	50	66	
10	8708010306	Scyliorhinus canicula	754	4953	7	81	100
11	8708010307	Scyliorhinus stellaris	3	10	11	65	152
12	8708020102	Galeorhinus galeus	115	670	25	165	167
13	8708020400	Mustelus spp.	6	248	39	110	
14	8708020408	Mustelus asterias	72	382	24	101	180
15	8708020409	Mustelus mustelus	64	451	31	110	160
16	8710010000	Squalidae	22	142	27	112	
17	8710010102	Somniosus microcephalus	1	2	137	137	640
18	8710010201	Squalus acanthias	1914	25774	10	**148**	**122**
19	8710010510	Etmopterus spinax	19	68	20	48	60
20	**8713030105**	**Torpedo marmorata**	**2**	**4**	**85**	**85**	**60**
21	**8713040000**	Rajidae	25	126	11	65	
22	8713040100	Raja spec.	51	226	10	84	
23	8713040134	Raja radiata	4892	61121	**3.5**	**100**	**76**
24	8713040138	Raja brachyura	24	89	15	98	113
25	8713040141	Raja montagui	330	2263	11	**102**	**75**
26	8713040143	Raja batis	65	155	9	161	285
27	8713040146	Raja fullonica	23	47	30	93	120
28	8713040147	Raja circularis	17	51	47	102	120
29	8713040148	Raja naevus	853	4299	9	**106**	**70**
30	8713040153	Raja lintea	2	3	51	70	
31	**8713040158**	**Raja undulata**	**2**	**3**	**9**	**11**	**120**
32	8713040159	Raja clavata	731	12285	6	**105**	**85**
33	8713050111	Dasyatis pastinaca	4	12	14	67	106
34	8716020202	Chimaera monstrosa	61	643	9	87	150
35	**8741010000**	Anguillidae	2	4	14	14	
36	8741010102	Anguilla anguilla	107	363	6	100	100
37	8741120111	Conger conger	7	12	63	120	274
38	8747010100	Alosa spp.	4	7	10	22	
39	**8747010107**	**Alosa alosa**	**19**	**138**	**9**	**40**	**60**
40	8747010109	Alosa fallax	157	16981	7	49	55
41	8747010201	Clupea harengus	14053	56839553	**0.5**	44	43
42	8747011701	Sprattus sprattus	9071	52556018	**0.5**	**50**	**17**
43	8747012201	Sardina pilchardus	241	160749	6	**31**	**25**
44	8747020104	Engraulis encrasicolus	468	155532	**1**	21	20
45	8755010300	Salmo spp.	1	2	56	56	
46	8755010305	Salmo salar	4	6	50	85	150
47	8755010306	Salmo trutta	13	31	27	60	140
48	8755030301	Osmerus eperlanus	85	5005	4	27	30
49	**8756010000**	**Argentinidae**	225	23668	4	31	
50	8756010200	Argentina	73	5490	5	25	
51	8756010203	Argentina silus	490	13977	6	46	56
52	8756010209	Argentina sphyraena	1784	145197	4	28	27
53	8759010501	Maurolicus muelleri	706	132256	**2**	**12**	**7**
54	8762140000	Myctophidae	2	430	5	7	
55	**8784010600**	**Lepadogaster spp**	**1**	**2**	**20**	**20**	**7**
56	8784010701	Diplecogaster bimaculata	2	3	3	4	4
57	**8786010000**	Lophiidae	121	262	12	89	
58	8786010103	Lophius piscatorius	2343	7613	7	120	200
59	8786010104	Lophius budegassa	5	6	20	65	82
60	8791030402	Gadus morhua	14488	1001253	**1**	140	(150)
61	8791030901	Pollachius virens	2797	167395	10	118	130
62	8791030902	Pollachius pollachius	523	6928	6	100	130
63	8791031101	Brosme brosme	287	1074	8	90	110
64	8791031301	Melanogrammus aeglefinus	11194	14634290	3	**87**	**76**
65	8791031501	Rhinonemus cimbrius	1976	42693	3	45	41
66	8791031602	Phycis blennoides	25	64	15	70	75
67	8791031701	Trisopterus minutus	4924	305288	**1**	**35**	**26**
68	8791031702	Trisopterus luscus	1233	62722	**2**	45	41

69	8791031703	Trisopterus esmarki	7984	54780446	3	**32**	**25**
70	8791031801	Merlangius merlangus	15776	24095531	**1**	64	70
71	8791031901	Molva molva	1540	7733	4	155	200
72	8791031902	Molva dipterygia	13	21	28	139	150
73	8791032000	Gaidropsurus spp.	9	73	6	27	
74	8791032001	Gaidropsurus vulgaris	119	626	**2**	47	53
75	**8791032002**	**Gaidropsurus mediterraneus**	**7**	**20**	**17**	**29**	**35**
76	**8791032100**	Gadiculus	1	47	9	9	
77	8791032101	Gadiculus argenteus	600	94968	3	19	15
78	8791032201	Micromesistius poutassou	627	607111	**1**	**51**	**45**
79	8791032301	Raniceps raninus	21	42	5	16	30
80	8791032401	Ciliata mustela	133	880	5	**53**	**25**
81	8791032402	Ciliata septentrionalis	11	25	5	15	18
82	8791032501	Onogadus argenteus	1	6	24	24	45
83	**8791040000**	Merlucciidae	4	48	24	49	
84	8791040105	Merluccius merluccius	1983	19891	6	103	180
85	8792020202	Echiodon drummondi	18	50	10	31	32
86	8793010000	Zoarcidae	3	25	18	32	
87	8793010513	Lycenchelys sarsi	70	474	7	20	19
88	8793010700	Lycodes spp.	2	6	21	23	
89	8793010724	Lycodes vahli	532	52105	**2**	33	52
90	8793012001	Zoarces viviparus	123	2529	8	32	50
91	8794010117	Coryphaenoides rupestris	8	38	38	80	100
92	**8794011502**	**Trachyrhynchus murrayi**	**2**	**3**	**11**	**15**	51
93	8803020502	Belone belone	44	133	15	81	94
94	8803030201	Scomberesox saurus	1	2	37	37	50
95	8811030301	Zeus faber	60	146	6	43	60
96	8811060301	Capros aper	25	51	6	12	16
97	**8813010000**	**Lampridae**	**5**	**44**	**24**	**31**	150
98	8818010000	Gasterosteidae	8	36	5	7	
99	8818010101	Gasterosteus aculeatus	274	8286	3	**16**	**10**
100	8818010501	Spinachia spinachia	17	945	4	**43**	**20**
101	8820020000	Syngnathidae	79	424	6	42	
102	8820020100	Syngnathus	1	2	13	13	
103	8820020119	Syngnathus rostellatus	53	292	6	**26**	**17**
104	8820020120	Syngnathus acus	55	918	7	47	47
105	8820020123	Syngnathus typhle	5	12	12	16	30
106	8820022101	Entelurus aequoraeus	16	36	9	44	61
107	8820022202	Nerophis ophidion	1	2	13	13	30
108	8826010139	Sebastes marinus	26	392	12	43	100
109	8826010151	Sebastes mentella	1	2	50	50	
110	8826010175	Sebastes viviparus	480	8292	5	**41**	**30**
111	8826010301	Helicolenus dactylopterus	538	7842	3	23	46
112	8826010628	Scorpaena scropha	1	6	18	28	51
113	8826020000	Triglidae	68	5490	7	44	
114	8826020501	Trigla lucerna	463	4904	4	54	75
115	8826020601	Eutrigla gurnardus	8811	1366548	**2**	49	45
116	8826020701	Trigloporus lastoviza	1	8	18	18	36
117	8826020801	Aspitrigla cuculus	268	2851	7	43	40
118	8831020000	Cottidae	41	183	8	31	
119	8831020308	Artediellus atlanticus	1	2	6	6	13
120	8831022200	Myoxocephalus spp.	1	48	18	18	
121	8831022207	Myoxocephalus scorpius	888	16613	4	**37**	**30**
122	8831023807	Triglops murrayi	39	83	5	15	17
123	8831024601	Taurulus bubalis	143	2744	**2**	**31**	**18**
124	**8831024602**	**Micrenophrys lilljeborgi**	**4**	**8**	**5**	**10**	8
125	**8831080801**	**Agonus decagonus**	**2**	**16**	**8**	**12**	22
126	8831080803	Agonus cataphractus	1706	28806	3	**26**	**21**
127	8831090000	Cyclopteridae	2	6	7	9	
128	8831090310	????	1	6	7	8	
129	8831090800	Liparis spp.	13	304	5	14	
130	8831090828	Liparis liparis	235	2307	4	**35**	**18**
131	8831090831	Liparis montagui	9	43	4	9	10
132	8831091501	Cyclopterus lumpus	1480	5609	4	58	60
133	8835280103	Trachurus trachurus	3375	3856033	**1**	53	50
134	8835430000	Sparidae	3	6	9	36	
135	8835430804	Pagellus erythrinus	2	3	19	35	60
136	8835431201	Spondyliosoma cantharus	32	375	6	36	51
137	8835450202	Mullus surmuletus	368	12041	4	39	40
138	**8835720100**	Dicentrarchus spp.	2	10	30	38	
139	8835720101	Dicentrarchus labrax	40	162	9	56	100
140	8836010000	Mugilidae	4	18	12	60	
141	8836010704	Chelon labrosus	13	134	40	69	75
142	**8836010902**	**Liza aurata**	**3**	**8**	**38**	**56**	45
143	8839013301	Symphodus melops	2	12	6	12	25
144	8839013501	Ctenolabrus rupestris	1	2	3	3	18
145	8839013603	Labrus bergylta	5	9	10	35	60

146	8839013605	Labrus mixtus	1	1	35	35	35
147	8840060101	Echiichthys vipera	955	142429	5	**20**	14
148	8840060102	Trachinus draco	251	18069	6	40	41
149	8842010100	**Blennius spp.**	1	4	20	20	
150	8842020000	Anarhichaidae	14	61	8	101	
151	8842020100	Anarhichas spp.	2	4	9	48	
152	8842020102	Anarhichas denticulatus	1	6	77	93	130
153	8842020103	Anarhichas lupus	1264	3452	5	120	125
154	8842020104	Anarhichas minor	7	15	11	63	135
155	8842120000	Lumpenidae	4	16	18	32	
156	8842120905	Lumpenus lampretaeformis	648	16446	5	41	49
157	**8842121801**	**Leptoclinus maculatus**	**8**	**23**	**12**	**34**	20
158	8842130209	Pholis gunnellus	44	1823	**1**	24	25
159	8845010000	Ammodytidae	700	558904	3.5	41	
160	8845010100	Ammodytes spp.	268	671657	4	**45**	
161	8845010105	Ammodytes tobianus	82	18046	7	**32**	**20**
162	8845010106	Ammodytes marinus	344	563273	**2**	**29**	**24**
163	8845010201	Gymnammodytes semisquamatus	3	26	8	**28**	**24**
164	8845010300	Hyperoplus spp.	1	8563	14	28	
165	8845010301	Hyperoplus lanceolatus	1011	257494	**0.5**	**55**	**32**
166	**8845010302**	**Hyperoplus immaculatus**	**51**	**57960**	**6**	**31**	30
167	**8846010000**	**Callionymidae**	**163**	**2147**	**5**	**27**	
168	8846010100	Callionymus	36	353	9	23	
169	8846010106	Callionymus lyra	3764	53849	3	**38**	**30**
170	8846010107	Callionymus maculatus	1256	39513	3	**30**	**14**
171	8846010120	Callionymus reticulatus	64	450	4	**18**	**10**
172	8847010000	Gobiidae	343	10681	2	22	
173	8847011300	Gobius spp.	23	22566	2	7	
174	8847011316	Gobius niger	6	16	4	13	17
175	8847014901	Crystallogobius linearis	5	10	5	6	5
176	8847015100	Pomatoschistus spp.	217	33064	3	8	
177	8847015101	Pomatoschistus minutus	148	19405	2	**19**	**10**
178	8847015103	Pomatoschistus microps	1	34	4	7	7
179	8847016601	Aphia minuta	4	44	3	**58**	**5**
180	**8847016700**	Lesueurigobius spp.	5	12	8	9	
181	8847016702	Lesueurigobius friesii	7	48	6	11	11
182	8850030302	Scomber scombrus	3992	975311	**2**	58	60
183	8857030000	Scophthalmidae	13	61	5	11	
184	8857030402	Psetta maxima	954	2401	12	79	100
185	8857030403	Scophthalmus rhombus	536	1613	6	68	75
186	8857031700	Arnoglossus spp.	5	17	6	13	
187	8857031702	Arnoglossus laterna	536	4593	3	19	19
188	8857031703	Arnoglossus imperialis	1	2	14	14	25
189	8857031706	Arnoglossus thori	1	1	13	13	18
190	8857032101	Zeugopterus punctatus	27	71	6	**29**	**25**
191	8857032200	Phrynorhombus spp.	1	4	6	7	
192	8857032201	Phrynorhombus norvegicus	103	319	3	**22**	**12**
193	8857032202	Phrynorhombus regius	6	15	5	12	20
194	8857032302	Lepidorhombus whiffiagonis	1002	9264	4	65	61
195	8857040502	Glyptocephalus cynoglossus	2471	26011	4	54	55
196	8857040603	Hippoglossoides platessoides	9974	1981470	3	**71**	**48**
197	8857040904	Limanda limanda	12450	8775692	**1**	**100**	**42**
198	8857041202	Microstomus kitt	7532	154526	**1**	51	66
199	8857041402	Platichthys flesus	2506	82694	**2**	55	51
200	8857041502	Pleuronectes platessa	9881	519576	**1**	65	91
201	8857041902	Hippoglossus hippoglossus	201	389	26	180	254
202	8858010000	Soleidae	24	615	5	39	
203	8858010600	Solea spp.	1	1	32	32	
204	8858010601	Solea vulgaris	1594	15339	3	51	60
205	8858010610	Solea lascaris	2	5	12	23	35
206	**8858010800**	Buglossidium	13	78	5	11	
207	8858010801	Buglossidium luteum	1091	21792	**2**	**28**	**13**
208	**8858010900**	Microchirus spp.	2	10	13	21	
209	8858010903	Microchirus variegatus	41	210	9	19	33

Table 2. Redundant NODC codes because the taxon is represented by a single species (ss) genus or a single genus (sg) family.

Reported NODC code	Reason	Appropriate NODC code	Records
8603010200/*Lampetra* spp.	- ss:	8603010217/*L. fluviatilis*	ISI1992/4 hl 2, 1993/2 hl 2; TRI 1992/4 hl 12, 1993/4 hl21.
8603010300/*Petromyzon* spp.	- ss:	8603010301/*P. marinus*	ISI 1991/4 hl 33; CIR 1995/4 hl 3, 1996/4 hl 3.
8713040000/Rajidae	- sg:	8713040100/*Raja* spp.	GOS, JOH,DAN2, MIC
8741010000/Anguillidae	- ss:	8741010102/*A. anguilla*	MIC 182/1 hl 57,60.
8756010000/Argentinidae	- sg:	8756010200/*Argentina* spp.	CIR, THA, ARG
8786010000/Lophiidae	- sg:	8786010100/*Lophius* spp.	SCO2, EXP, CLU
8791032100/*Gadiculus* spp.	- ss:	8791032101/*G. argenteus*	ARG 1985/1 hl 24.
8791040000/Merluccidae	- ss:	8791040105/*M. merluccius*	THA 1984/1 all hauls.
8793010724/*Lycodes* spp.	- ss:	8793010724/*L. vahli*	AND 1968/1 hl 44,49,50,51,52
8831022200/*Myoxocephalus* spp.	- ss:	8831022200/*M. scorpius*	AND 1968/1 hl 68, 76.
8835720100/*Dicentrarchus* spp.	- ss:	8835720101/*D. labrax*	ISI 1991/4 hl 4; CIR1993/3 hl 3.
8842020000/Anarhichaidae	- sg:	8842020100/*Anarhichas* spp.	JOH & MIC 1975-1981.
8846010000/Callionymidae	- sg:	8846010100/*Callionymus* spp.	SCO2 , EXP, ARG, GOS, JOH, MIC, ELD, JHJ
8847016700/*Lesueurigobius* spp.	- ss:	8847016702/*L. friesii*	THA 1990/1996
8858010800/*Buglossidium* spp.	- ss:	8858010801/*B. luteum*	THA 1990/1 1991/1 1992/1; THA2 1998/1
8858010900/*Microchirus* spp.	- ss:	8858010900/*M. variegatus*	EXP 1976/1 hl 11.

Table 3. List of rare species.

NODC	Name	Year	Quar	Ship	Haul	Rectangle
8707040302	*Lamna nasus*	77	1	PO	60	42F0
8707040302	*Lamna nasus*	96	4	GOS	27	46F1
8710010102	*Somniosus microcephalus*	98	1	ARG	117	44G1
8713030105	***Torpedo marmorata***	**75**	**1**	**TRI**	**12**	**50F0**
8713030105	***Torpedo marmorata***	**75**	**1**	**TRI**	**13**	**49F0**
8713040153	*Raja lintea*	92	2	SCO2	53	48E9
8713040153	*Raja lintea*	96	1	MIC	5	50F0
8713040158	***Raja undulata***	**83**	**1**	**EXP**	**48**	**46E6**
8713040158	***Raja undulata***	**90**	**1**	**CIR**	**3**	**34F1**
8755010305	*Salmo salar*	76	1	ARG	20	41G2
8755010305	*Salmo salar*	89	1	TRI	30	37F7
8755010305	*Salmo salar*	92	3	TRI2	5	37F3
8755010305	*Salmo salar*	95	3	SCO2	5	42E7
8784010600	***Lepadogaster* spp.**	**92**	**1**	**THA**	**29**	**37F6**
8784010701	*Diplecogaster bimaculata*	87	1	SCO2	62	48E8
8784010701	*Diplecogaster bimaculata*	91	1	SCO2	52	47E7
8786010104	*Lophius budegassa*	91	3	SCO2	52	48E7
8786010104	*Lophius budegassa*	93	1	SCO2	1	49E9
8786010104	*Lophius budegassa*	93	1	SCO2	9	51E8
8786010104	*Lophius budegassa*	93	3	SCO2	63	50E8
8786010104	*Lophius budegassa*	95	1	WAH3	10	42F6
8791032002	***Gaidropsurus mediterraneus***	**83**	**1**	**AND2**	**43**	**47E8**
8791032002	***Gaidropsurus mediterraneus***	**83**	**1**	**AND2**	**75**	**45F0**
8791032002	***Gaidropsurus mediterraneus***	**83**	**1**	**AND2**	**85**	**44F0**
8791032002	***Gaidropsurus mediterraneus***	**88**	**1**	**WAH2**	**7**	**39F4**
8791032002	***Gaidropsurus mediterraneus***	**88**	**1**	**WAH2**	**12**	**39E8**
8791032002	***Gaidropsurus mediterraneus***	**88**	**1**	**WAH2**	**47**	**37F3**
8791032002	***Gaidropsurus mediterraneus***	**91**	**1**	**WAH2**	**25**	**44E9**
8791032501	*Onogadus argenteus*	95	4	GOS	6	52F1
8794010117	*Coryphaenoides rupestris*	75	1	ARG	39	45F9
8794010117	*Coryphaenoides rupestris*	76	1	ARG	42	45F9
8794010117	*Coryphaenoides rupestris*	87	1	ARG	46	44F8
8794010117	*Coryphaenoides rupestris*	91	2	ARG	109	45F9
8794010117	*Coryphaenoides rupestris*	92	4	DAN2	14	44F8
8794010117	*Coryphaenoides rupestris*	95	2	ARG	147	45G0
8794010117	*Coryphaenoides rupestris*	96	1	ARG	33	45G0
8794010117	*Coryphaenoides rupestris*	98	1	ARG	137	45F9
8794011502	***Trachyrhynchus murrayi***	**91**	**3**	**SCO2**	**8**	**41E8**
8794011502	***Trachyrhynchus murrayi***	**94**	**1**	**SCO2**	**1**	**43E8**
8813010000	**Lampridae**	**94**	**3**	**THA**	**20**	**37F8**
8813010000	**Lampridae**	**94**	**3**	**THA**	**21**	**37F7**
8813010000	**Lampridae**	**95**	**1**	**THA**	**37**	**39E8**
8813010000	**Lampridae**	**96**	**3**	**THA2**	**6**	**34F1**
8813010000	**Lampridae**	**96**	**3**	**THA2**	**57**	**31F1**
8820020123	*Syngnathus typhle*	96	1	ARG	36	44G0
8820020123	*Syngnathus typhle*	98	1	ARG	57	41G0
8820020123	*Syngnathus typhle*	98	1	ARG	67	41G2
8820020123	*Syngnathus typhle*	98	1	ARG	80	43G0
8820020123	*Syngnathus typhle*	98	1	ARG	150	45G0
8820022202	*Nerophis ophidion*	68	1	AND2	60	41F5
8820022202	*Nerophis ophidion*	92	1	SOL	5	39F5
8826010151	*Sebastes mentella*	96	4	GOS	33	52F0
8826010628	*Scorpaena scropha*	91	1	SCO2	66	42E7
8826020701	*Trigloporus lastoviza*	95	4	THA	8	36F0
8831020308	*Artediellus atlanticus*	97	1	MIC	40	43F6
8831024602	*Micrenophrys lilljeborgi*	68	1	AND2	44	43F7
8831024602	*Micrenophrys lilljeborgi*	97	3	WAH3	39	44E8
8831024602	*Micrenophrys lilljeborgi*	97	3	WAH3	40	44E9
8831024602	*Micrenophrys lilljeborgi*	98	1	DAN2	14	39E9
8831024602	*Micrenophrys lilljeborgi*	98	1	WAH3	166	44F0
8831080801	*Agonus decagonus*	96	2	MIC	36	37F0
8831080801	*Agonus decagonus*	98	1	MIC	36	43F5
8831090310	**????**	**94**	**1**	**TRI2**	**5**	**35F0**
8831090831	*Liparis montagui*	67	1	AND2	54	38F5
8831090831	*Liparis montagui*	68	1	AND2	3	37F6
8831090831	*Liparis montagui*	68	1	AND2	46	43F7
8831090831	*Liparis montagui*	72	1	SKA	24	43F8
8831090831	*Liparis montagui*	77	1	CIR	23	42F7
8831090831	*Liparis montagui*	77	1	CIR	28	41F7
8831090831	*Liparis montagui*	88	1	CIR	7	35F0
8831090831	*Liparis montagui*	91	1	ARG	11	42F5
8831090831	*Liparis montagui*	94	1	TRI2	6	36F3
8831090831	*Liparis montagui*	95	1	ARG	41	45G0
8831090831	*Liparis montagui*	95	1	TRI2	5	35F0
8831090831	*Liparis montagui*	96	2	SCO2	29	42F7
8831090831	*Liparis montagui*	97	3	CIR	1	32F1
8831090831	*Liparis montagui*	98	1	DAN2	23	40F6
8835430804	*Pagellus erythrinus*	71	1	EXP	7	44E7
8835430804	*Pagellus erythrinus*	73	1	TRI	14	41F1
8835430804	*Pagellus erythrinus*	91	1	ISI	8	34F3
8835430804	*Pagellus erythrinus*	96	1	SCO2	31	45E9
8836010902	*Liza aurata*	93	3	CIR	2	32F2

8836010902	*Liza aurata*	94	3	TRI2	1	33F4
8836010902	*Liza aurata*	96	3	CIR	3	32F2
8839013301	*Symphodus melops*	92	4	DAN2	3	41G2
8839013301	*Symphodus melops*	97	3	ARG	586	43G2
8839013501	*Ctenolabrus rupestris*	97	3	ARG	590	43G1
8839013603	*Labrus bergylta*	93	1	ARG	14	44G1
8839013603	*Labrus bergylta*	94	1	SCO2	53	45E7
8839013603	*Labrus bergylta*	95	1	ARG	2	43G1
8839013603	*Labrus bergylta*	96	3	ARG	148	43G2
8839013603	*Labrus bergylta*	97	3	ARG	576	41G2
8839013605	*Labrus mixtus*	97	3	SCO2	87	44E6
8842010100	*Blennius* spp.	94	3	THA	27	39F8
8842020102	*Anarhichas denticulatus*	96	2	MIC	68	50F2
8842020104	*Anarhichas minor*	72	1	JOH	13	45E8
8842020104	*Anarhichas minor*	77	1	JOH	35	43F7
8842020104	*Anarhichas minor*	83	1	ELD	14	45F4
8842020104	*Anarhichas minor*	92	4	DAN2	30	37E9
8842020104	*Anarhichas minor*	93	4	GOS	49	45F1
8842020104	*Anarhichas minor*	94	4	GOS	19	49F0
8842020104	*Anarhichas minor*	94	4	GOS	24	48F1
8842121801	***Leptoclinus maculatus***	**72**	**1**	**THE**	**11**	**46G1**
8842121801	***Leptoclinus maculatus***	**89**	**1**	**DAN2**	**35**	**39F6**
8842121801	***Leptoclinus maculatus***	**91**	**3**	**SCO2**	**33**	**47F3**
8842121801	***Leptoclinus maculatus***	**91**	**4**	**DAN2**	**7**	**42G2**
8842121801	***Leptoclinus maculatus***	**94**	**4**	**DAN2**	**33**	**46F3**
8842121801	***Leptoclinus maculatus***	**97**	**3**	**CIR**	**33**	**45F4**
8842121801	***Leptoclinus maculatus***	**97**	**3**	**CIR**	**34**	**45F3**
8842121801	***Leptoclinus maculatus***	**97**	**3**	**CIR**	**40**	**42F0**
8845010201	*Gymnammodytes semisquamatus*	91	1	ARG	1	43F7
8845010201	*Gymnammodytes semisquamatus*	97	1	SCO2	15	42F3
8845010201	*Gymnammodytes semisquamatus*	97	1	SCO2	17	44F4
8847011316	*Gobius niger*	89	1	CIR	4	32F1
8847011316	*Gobius niger*	93	2	ARG	129	44G1
8847011316	*Gobius niger*	94	1	ARG	16	46G1
8847011316	*Gobius niger*	96	3	THA2	8	35F2
8847011316	*Gobius niger*	97	1	TRI2	23	32F1
8847011316	*Gobius niger*	97	3	ARG	586	43G2
8847014901	*Crystallogobius linearis*	84	1	EXP	7	38F6
8847014901	*Crystallogobius linearis*	84	1	EXP	10	39F6
8847014901	*Crystallogobius linearis*	84	1	EXP	11	39F7
8847014901	*Crystallogobius linearis*	84	1	EXP	12	39F7
8847014901	*Crystallogobius linearis*	98	1	TRI2	15	37F2
8847015103	*Pomatoschistus microps*	91	1	WAH2	11	38F2
8847016601	*Aphia minuta*	72	1	AND2	3	37F6
8847016601	*Aphia minuta*	72	1	AND2	4	37F5
8847016601	***Aphia minuta***	**72**	**1**	**SKA**	**41**	**42G2**
8847016601	*Aphia minuta*	73	1	AND2	2	35F3
8847016601	*Aphia minuta*	73	1	AND2	7	37F5
8847016601	*Aphia minuta*	73	1	AND2	28	43E9
8847016601	*Aphia minuta*	78	1	PO	17	38E9
8847016601	*Aphia minuta*	78	1	TRI	57	34F3
8847016601	*Aphia minuta*	93	4	DAN2	40	44G1
8847016601	*Aphia minuta*	95	3	TRI2	10	39F6
8847016700	*Lesueurigobius* spp.	95	1	ARG	1	44G1
8847016700	*Lesueurigobius* spp.	95	1	ARG	34	46G1
8847016700	*Lesueurigobius* spp.	95	2	ARG	141	43G2
8847016700	*Lesueurigobius* spp.	95	2	ARG	143	44G1
8847016700	*Lesueurigobius* spp.	95	2	ARG	151	43G1
8847016702	*Lesueurigobius friesii*	97	1	ARG	49	43G1
8847016702	*Lesueurigobius friesii*	97	1	THA2	1	31F2
8847016702	*Lesueurigobius friesii*	97	3	ARG	585	43G2
8847016702	*Lesueurigobius friesii*	97	3	ARG	589	44G1
8847016702	*Lesueurigobius friesii*	97	3	ARG	601	46G1
8847016702	*Lesueurigobius friesii*	98	1	ARG	78	43G2
8847016702	*Lesueurigobius friesii*	98	1	ARG	116	44G1
8857031703	*Arnoglossus imperialis*	94	1	WAH3	8	42F7
8857031706	*Arnoglossus thori*	92	2	SCO2	30	36F2
8857032202	*Phrynorhombus regius*	73	1	EXP	46	43E8
8857032202	*Phrynorhombus regius*	83	1	EXP	48	46E6
8857032202	*Phrynorhombus regius*	84	1	EXP	48	46E6
8857032202	*Phrynorhombus regius*	84	1	EXP	49	44E6
8857032202	*Phrynorhombus regius*	93	1	SCO2	46	42E9
8857032202	*Phrynorhombus regius*	94	2	SCO2	34	40F6
8858010610	*Solea lascaris*	92	2	SCO2	31	36F1
8858010610	*Solea lascaris*	94	3	CIR	77	36F0

Table 4. Records with unlikely small fish (<2cm).

Year	Quar	Ship	Haul	Nodc	Name	Class	N	Input error
65	**1WIL**	**1**	**8747010201**		***Clupea harengus***	**1.5**	**1**	*****
67	**1WIL**	**17**	**8857041502**		***Pleuronectes platessa***	**1.0**	**1**	*****
69	**1WIL**	**5**	**8857040904**		***Limanda limanda***	**1.0**	**34**	*****
76	1 JOH	46	8857040904		*Limanda limanda*	1.0	4	
82	1 MIC	41	8791031701		*Trisopterus minutus*	1.5	2	
82	1 MIC	41	8791031801		*Merlangius merlangus*	1.0	8	
82	1 MIC	41	8791031801		*Merlangius merlangus*	1.5	4	
83	1AND2	92	8747011701		*Sprattus sprattus*	1.0	7	
83	1AND2	98	8747011701		*Sprattus sprattus*	1.0	2	
86	1DAN2	2	8857040904		*Limanda limanda*	1.5	2	
91	4DAN2	11	8842130209		*Pholis gunnellus*	1.0	2	
92	3WAH	25	8791031701		*Trisopterus minutus*	1.0	2	
93	1THA	12	8857041502		*Pleuronectes platessa*	1.0	54	
93	2SCO2	30	8845010301		*Hyperoplus lanceolatus*	0.5	1	
94	4GOS	3	8791032201		*Micromesistius poutassou*	1.0	14	
95	1 MIC	15	8747011701		*Sprattus sprattus*	1.0	4	
95	1 MIC	23	8791032201		*Micromesistius poutassou*	1.5	2	
95	1 MIC	31	8791032201		*Micromesistius poutassou*	1.5	2	
95	2 MIC	23	8857040904		*Limanda limanda*	1.5	14	
95	4DAN2	2	8835280103		*Trachurus trachurus*	1.0	34	
95	4DAN2	3	8747011701		*Sprattus sprattus*	1.0	45	
95	4DAN2	58	8747020104		*Engraulis ancrasicolus*	1.0	6	
96	2 MIC	5	8791032201		*Micromesistius poutassou*	1.5	2	
97	**3TRI2**	**11**	**8857041202**		***Microstomus kitt***	**1.0**	**2**	*****
98	1DAN2	21	8747011701		*Sprattus sprattus*	0.5	13	
98	1THA2	4	8791030402		*Gadus morhua*	1.0	50	
98	**1TRI2**	**32**	**8747010201**		***Clupea harengus***	**0.5**	**8**	*****

Table 5. Length distributions (by 10 cm size classes) of *Raja radiata* by country (for SCO in 1989 and other years combined, separately).

Size	DEN	ENG	FRA	GFR	NED	NOR	SCO Other	SCO 1989/1	SWE	Total	
0	17	106	0	140	16	101	87	**82**	17	566	
10	244	479	36	850	176	504	813	**88**	245	3435	
20	709	1735	146	1386	523	1161	2288	**96**	490	8534	
30	1424	3638	266	2923	1558	3931	3746	**181**	1086	18753	
40	2341	4274	266	3694	2035	5509	4674	**252**	1652	24697	
50	398	407	78	461	189	620	437	**262**	1866	4718	
60	2	0	4	24	6	18	0	**240**	87	381	
70	0	0	2	0	2	28	2	6	6	46	
80	0	0	**7**	0	0	**2**	**1**	0	0	**10**	
100	0	0	0	**2**	0	0	0	0	0	**2**	
Total		5135	10639	805	9480	4505	11874	12048	**1207**	5449	59935

Table 6. Length distributions (a) and unlikely records (b) of sticklebacks reported by selected countries.

a. Length distributions

	88180100008818010101				8818010501			
	Gasterosteidae	*Gasterosteus aculeatus*			*Spinachia spinachia*			
	NOR+SCO	Total	FRA	Others	Total	DEN	FRA	Others
3	-	7	-	7	-	-	-	-
4	-	67	-	67	6	-	**6**	-
5	1	1314	-	1314	90	-	**90**	-
6	33	5941	6	5935	651	-	**651**	-
7	2	825	-	825	180	2	**178**	-
8	-	4	-	4	2	2		-
9	-	-	-		2	2		-
10	-	**120**	-	**120**	3	3	-	-
11	-	**2**	-	**2**	-	-	-	-
12	-	-	-	-	-	-		
13	-	-	-	-	3	3	-	-
…								
16	-	**3**	-	**3**	-	-	-	-
…								
33	-	-	-	-	**4**	**4**	-	-
43	-	-	-	-	**4**	**4**	-	-

b. Records with ‘oversized’ sticklebacks

1970/1	**TRI**	**hl 30**	***Gasterosteus aculeatus***	**10 cm**	**120**	***Input error**
1979/1	**PO**	**hl 29**	***Gasterosteus aculeatus***	**11 cm**	**2**	
1987/1	**SCO2**	**hl 32**	***Gasterosteus aculeatus***	**16 cm**	**3**	
1992/4	**DAN2**	**hl 8**	***Spinachia spinachia***	**33 cm**	**4**	
1992/4	**DAN2**	**hl 8**	***Spinachia spinachia***	**43 cm**	**4**	

Table 7. Length distributions of *Myoxocephalus scorpius* (a) and *Taurulus bubalis* (b) reported by individual countries (%: percentage catch of the two species combined).

a. 8831022207 - *Myoxocephalus scorpius*

	DEN	ENG	FRA	GFR	NED	NOR	SCO	SWE	Total
4	-	12	-	-	4	-	-	-	16
5	22	12	-	-	-	-	-	-	34
6	25	38	-	-	32	-	-	-	95
7	45	40	-	-	68	-	1	-	154
8	98	40	-	18	144	-	3	-	303
9	105	38	-	42	206	-	2	4	397
10	51	38	-	40	250	-	7	4	390
11	55	14	-	52	330	6	4	-	461
12	26	6	-	62	168	8	-	6	276
13	35	28	-	77	224	2	5	8	379
14	39	51	-	73	352	-	7	40	562
15	61	76	-	88	496	-	9	52	782
16	59	122	-	95	1264	-	17	54	1611
17	89	157	-	113	783	-	20	64	1226
18	123	128	-	122	991	-	23	88	1485
19	194	113	-	79	1023	-	31	83	1433
20	128	120	-	72	770	2	39	96	1227
21	104	108	-	130	472	-	35	87	936
22	77	135	-	85	610	2	23	102	1034
23	111	108	-	52	935	8	26	93	1333
24	74	120	-	77	472	10	35	43	831
25	34	79	-	57	281	-	25	49	525
26	20	57	-	72	276	2	8	24	459
27	26	26	-	55	140	-	16	32	295
28	21	15	-	24	86	6	11	21	184
29	11	13	-	10	26	-	10	6	76
30	-	6	-	10	4	2	11	4	37
31	-	2	-	8	4	-	5	4	23
32	11	6	-	-	2	-	7	-	26
33	-	-	-	-	-	-	4	-	4
34	-	4	-	4	-	-	2	-	10
35	-	-	-	-	6	-	1	-	7
37	-	-	-	-	2	-	-	-	2
Total	1554	1723	-	1517	10421	48	387	964	16613

b. 8831024601 - *Taurulus bubalis*

	DEN	ENG	FRA	GFR	NED	NOR	SCO	SWE	Total
2	-	-	**2**	-	-	-	-	-	2
3	-	-	**2**	-	-	-	-	-	2
4	-	16	**4**	-	4	-	-	-	24
5	-	44	**2**	-	6	-	-	-	52
6	-	30	**23**	-	4	-	-	-	57
7	-	30	**50**	-	2	-	-	-	82
8	-	16	**70**	-	10	-	-	-	96
9	-	16	**64**	-	-	-	-	-	80
10	-	8	**60**	6	-	-	-	-	74
11	-	6	**87**	-	-	-	-	-	93
12	-	8	**115**	-	4	-	-	2	129
13	-	-	**167**	-	4	-	-	-	171
14	-	6	**246**	-	-	-	-	-	252
15	-	-	**247**	-	-	-	-	2	249
16	-	2	**216**	-	-	-	-	-	220
17	-	8	**213**	-	-	-	2	2	225
18	-	2	**185**	-	-	-	4	-	191
19	-	6	**139**	-	-	-	1	2	148
20	-	**16**	**100**	**6**	-	-	-	**2**	**124**
21	-	**14**	**70**	**2**	-	-	**3**	-	**89**
22	-	**20**	**81**	**2**	-	-	**3**	**2**	**108**
23	-	**16**	**60**	**2**	-	-	**2**	**4**	**84**
24	-	**6**	**36**	-	-	-	**3**	**4**	**49**
25	-	**9**	**54**	-	-	-	**2**	**5**	**70**
26	-	**4**	**30**	-	-	-	-	-	**34**
27	-	**5**	**2**	**16**	-	-	**1**	**2**	**26**
28	-	**2**	**4**	-	-	-	-	-	**6**
29	-	**2**	-	-	-	-	**1**	-	**3**
30	-	-	**2**	-	-	-	-	-	**2**
31	-	**3**	-	-	-	-	**1**	-	**4**
Total	-	**295**	**2331**	**34**	34	-	**24**	**27**	**2744**
%	0	15	100	2	+	0	6	3	14

Table 8. Length distributions of reported sandeels.

	88450100008845010100884501010588450101068845010201					8845010300	8845010301	8845010302	Total	
	Ammodytidae	*Ammodytes*	*A.tobianus*	*A.marinus*	*G.semisq.*	*Hyperoplus*	*H.lanceol.*	*H.immac.*		
0	0	0	0	0	0	0	1	0	1	
2	0	0	0	1	0	0	0	0	1	
3	1	0	0	0	0	0	3	0	4	
4	0	17	0	0	0	0	11	0	28	
5	8	97	0	7	0	0	25	0	137	
6	239	307	0	58	0	0	110	6	720	
7	605	3638	28	151	0	0	259	16	4697	
8	4933	13348	234	626	8	0	401	24	19574	
9	8081	15747	612	1236	6	0	370	6	26058	
10	9103	11931	581	1681	5	0	341	2	23644	
11	13000	10472	280	1941	1	0	293	6	25993	
12	21494	9457	303	13304	0	0	306	4	44868	
13	34003	40264	766	38385	0	0	415	27	113860	
14	34162	99493	1042	90428	1	160	1357	556	227199	
15	48803	143590	2388	96805	1	800	7000	5771	305158	
16	75441	133375	2769	90448	0	1521	17850	12773	334177	
17	132172	109605	3065	64655	0	1841	43572	16119	371029	
18	132158	52671	3366	55213	1	2241	61683	12870	320203	
19	18489	14727	1643	41415	1	800	25760	5830	108665	
20	9779	4268	432	33390	0	80	18125	3436	69510	
21	8982	5607	**308**	22288	0	0	18290	122	55597	
22	3826	765	**105**	7151	1	80	17533	253	29714	
23	2631	680	**63**	1884	0	160	15392	42	20852	
24	213	685	**23**	1003	0	0	9131	36	11091	
25	446	**531**	**14**	**562**	0	80	6592	16	8241	
26	149	**192**	**6**	**627**	0	400	3980	8	5362	
27	53	**101**	**4**	**6**	0	160	3333	12	3669	
28	20	**56**	0	**4**	**1**	240	1962	11	2294	
29	26	**11**	**2**	**4**	0	0	1504	8	1555	
30	23	**14**	**2**	0	0	0	696	2	737	
31	6	**2**	**5**	0	0	0	378	4	395	
32	11	0	**5**	0	0	0	**251**	0	267	
33	**12**	0	0	0	0	0	**213**	0	225	
34	**17**	0	0	0	0	0	**61**	0	78	
35	**3**	0	0	0	0	0	**44**	0	47	
36	**4**	0	0	0	0	0	**29**	0	33	
37	**2**	0	0	0	0	0	**201**	0	203	
38	**5**	0	0	0	0	0	**10**	0	15	
39	**2**	0	0	0	0	0	**6**	0	8	
40	**1**	2	0	0	0	0	**4**	0	7	
41	**1**	0	0	0	0	0	0	0	1	
42	0	2	0	0	0	0	0	0	2	
45	0	2	0	0	0	0	0	0	2	
55	0	0	0	0	0	0	**2**	0	2	
Total	558904	671657	18046	563273	26	8563	257494	57960		2135923

Table 9. Length distributions (a) and reported fractions (b) of *Callionymus* spp. by country by region.

a. Length distributions

884601000088460101008846010106		8846010107	8846010120	Total	
Callionymidae	*Callionymus* spp.	*C. lyra*	*C. maculatus*	*C. reticulatus*	
30	0	11	38	0	49
40	0	147	272	5	424
51	0	471	513	67	1052
65	0	759	797	107	1668
781	0	1369	2153	113	3716
871	0	1593	5254	32	6950
9219	2	1717	6822	34	8794
10	289	0	1862	7359	40	9550
11	231	2	1533	5809	20	7595
12	253	18	2336	4455	**10**	7072
13	219	40	3012	2734	**2**	6007
14	171	54	4226	1747	**10**	6208
15	73	54	5368	756	**2**	6253
16	68	42	5774	295	**2**	6181
17	109	34	5361	**147**	**2**	5653
18	90	34	5112	**207**	**4**	5447
19	86	24	4689	**36**	0	4835
20	75	6	3597	**29**	0	3707
21	56	27	2067	**25**	0	2175
22	25	4	1454	**10**	0	1493
23	11	12	666	**23**	0	712
24	5	0	326	**14**	0	345
25	3	0	194	**8**	0	205
26	5	0	95	**5**	0	105
27	1	0	58	**2**	0	61
28	0	0	15	0	0	15
29	0	0	5	**2**	0	7
30	0	0	15	**1**	0	16
31	0	0	**6**	0	0	6
32	0	0	**2**	0	0	2
35	0	0	**2**	0	0	2
36	0	0	**4**	0	0	4
38	0	0	**3**	0	0	3
Total	2147	353	53849	39513	450	96312

b. Reported fractions

Callionymidae + *Callionymus* spp.	*C. lyra*		*C. maculatus*		*C. reticulatus*			
(N)	N		%	N	%	N	%	
South of 55°30’								
DEN			5821	97	**195**	3		
ENG		5323	98	**116**	2			
FRA	4694		100	**9**	+			
GFR	1862		91	**188**	9			
NED			11836	97	**6**	+	355	3
NOR	(216)		461	98	**8**	1		
SCO(113)	2276		98	**43**	2	2	+	
North of 55°30’								
DEN			2456	93	178	7		
ENG			1747	79	433	19	**38**	2
FRA	1811		100					
GFR	1126		60	740	40			
NED			1438	94	54	3	**54**	3
NOR	(1177)		120	100				
SCO(436)	2392		70	1033	30	1	+	
SWE			2201	73	825	27		
Skagerrak/Kattegat								
DEN			4494	58	3281	42		
NOR	(504)							
SWE	(54)		4572	12	32408	88		

Table 10. Length distributions of *Buglossidium* spp. by France and of *Buglossidium luteum* reported by Scotland and by other countries combined.

	8858010800		8858010801	
	Buglossidium spp.		*Buglossidium luteum*	
Size class	FRA	Total	Others	SCO
2	3	3	0	
3	74	74	0	
4	294	291	**3**	
5	2	172	171	**1**
6	2	1279	1274	**5**
7	10	3378	3348	**30**
8	16	5810	5748	**62**
9	22	5312	5258	**54**
10	12	3276	3238	**38**
11	6	1454	1436	**18**
12		443	406	**37**
13		86	50	**36**
14		48	15	**33**
15		**36**	**11**	**25**
16		**45**	**4**	**41**
17		**43**	**6**	**37**
18		**17**	0	**17**
19		**10**	0	**10**
20		**4**	0	**4**
21		**6**	0	**6**
22		**1**	0	**1**
…				
28		**1**	0	**1**
Total	78	21792	21333	459

Table 11. Records with unlikely length classes by country.

NODC	Name	Year	Quar	Ship	Haul	Rect	Size	N	Input error
Denmrk									
8713040159	Raja clavata	92	1	DAN2	36	36F0	100	5	
8791031701	Trisopterus minutus	92	1	DAN2	35	37F1	30	2	
8791031701	Trisopterus minutus	92	4	DAN2	29	37F0	30	4	
8791031701	Trisopterus minutus	93	1	DAN2	15	40E9	30	10	
8791032101	Gadiculus argenteus	92	4	DAN2	63	46F3	17	2	
8791032101	Gadiculus argenteus	94	4	DAN2	44	45F0	17	33	
8826010175	Sebastes viviparus	85	1	DAN2	12	46F3	41	2	
8826010175	Sebastes viviparus	93	4	DAN2	45	46F3	41	2	
8831024602	Micrenophrys lilljeborgi	98	1	DAN2	14	39E9	10	2	
England									
8713040148	Raja naevus	95	3	CIR	56	51F1	93	2	
8747012201	Sardina pilchardus	92	3	CIR	2	32F2	30	2	
8826010175	Sebastes viviparus	94	4	CIR	46	51F2	36	2	
8826010175	Sebastes viviparus	95	4	CIR	64	51F2	37	2	
8836010902	Liza aurata	93	3	CIR	2	32F2	52	2	
France									
8710010201	Squalus acanthias	93	3	THA	35	34F3	148	2	
8713040148	Raja naevus	92	3	THA	15	35F1	98	2	
8713040159	Raja clavata	96	3	THA2	17	36F0	102	2	
8858010801	Buglossidium luteum	97	1	THA2	49	33F2	17	2	
Germany									
8606010201	Myxine glutinosa	94	1	WAH3	55	45F0	79	2	
8713040134	Raja radiata	77	1	PO	16	38F0	100	2	
8713040141	Raja montagui	95	1	WAH3	65	51E8	85	2	
8713040141	Raja montagui	95	1	WAH3	65	51E8	90	4	
8713040141	Raja montagui	95	1	WAH3	65	51E8	92	2	
8713040141	Raja montagui	95	1	WAH3	65	51E8	102	2	
8747011701	Sprattus sprattus	74	1	AND2	45	42F4	19	1	
8747011701	Sprattus sprattus	77	1	PO	21	40F1	19	2	
8747011701	**Sprattus sprattus**	**91**	**2**	**WAH2**	**28**	**39E9**	**19**	**5**	
8747011701	**Sprattus sprattus**	**91**	**2**	**WAH2**	**28**	**39E9**	**19**	**10**	
8791031701	Trisopterus minutus	82	1	AND2	19	37E9	33	2	
8791031703	**Trisopterus esmarki**	**77**	**1**	**PO**	**20**	**40F1**	**28**	**7**	
8791031703	**Trisopterus esmarki**	**77**	**1**	**PO**	**20**	**40F1**	**29**	**4**	
8791031703	**Trisopterus esmarki**	**77**	**1**	**PO**	**65**	**45F0**	**28**	**24**	
8791031703	**Trisopterus esmarki**	**77**	**1**	**PO**	**65**	**45F0**	**30**	**6**	
8791031703	**Trisopterus esmarki**	**79**	**1**	**PO**	**9**	**38F0**	**29**	**4**	
8791031703	**Trisopterus esmarki**	**79**	**1**	**PO**	**9**	**38F0**	**32**	**2**	
8791031703	**Trisopterus esmarki**	**92**	**1**	**WAH2**	**23**	**45E9**	**28**	**10**	
8791031703	**Trisopterus esmarki**	**92**	**1**	**WAH2**	**23**	**45E9**	**29**	**10**	
8791031703	**Trisopterus esmarki**	**92**	**1**	**WAH2**	**23**	**45E9**	**30**	**2**	
8791032101	**Gadiculus argenteus**	**77**	**1**	**PO**	**72**	**47F3**	**17**	**2**	
8791032101	**Gadiculus argenteus**	**84**	**1**	**AND2**	**77**	**44F0**	**18**	**2**	
8820020119	**Syngnathus rostellatus**	**93**	**1**	**WAH2**	**59**	**45E6**	**26**	**2**	
8826010175	Sebastes viviparus	83	1	AND2	55	50F1	35	18	
8826010175	Sebastes viviparus	83	1	AND2	64	46F3	37	2	
8826010175	Sebastes viviparus	86	1	AND2	105	44F5	39	2	
8840060101	**Echiichthys vipera**	**95**	**2**	**WAH3**	**7**	**38F2**	**17**	**10**	
8840060101	**Echiichthys vipera**	**95**	**2**	**WAH3**	**7**	**38F2**	**18**	**6**	
8840060101	**Echiichthys vipera**	**95**	**2**	**WAH3**	**7**	**38F2**	**19**	**6**	
8840060101	**Echiichthys vipera**	**95**	**2**	**WAH3**	**7**	**38F2**	**20**	**18**	
8858010801	Buglossidium luteum	88	1	WAH2	74	47E8	17	2	
8858010801	Buglossidium luteum	98	1	WAH3	162	44E6	17	2	
Netherlands									
8713040159	Raja clavata	76	1	TRI	21	39E9	105	2	
8713040159	Raja clavata	91	1	TRI2	29	35F0	100	2	
8747011701	**Sprattus sprattus**	**93**	**2**	**TRI2**	**8**	**39E9**	**19**	**100**	*** (9 cm)**
8747012201	Sardina pilchardus	91	2	ISI	19	34F4	31	2	
8747012201	Sardina pilchardus	92	2	ISI	19	34F3	31	2	
8791031701	Trisopterus minutus	66	1	WIL	12	40F5	29	1	
8791031701	**Trisopterus minutus**	**95**	**4**	**ISI**	**3**	**35F4**	**30**	**16**	*** (T. luscus)**
8791032401	**Ciliata mustela**	**76**	**1**	**TRI**	**54**	**33F4**	**53**	**2**	*** (23 cm)**
8831080803	**Agonus cataphractus**	**84**	**1**	**ISI**	**18**	**36F8**	**24**	**4**	*** (M. scorpius)**
8831080803	**Agonus cataphractus**	**84**	**1**	**ISI**	**18**	**36F8**	**25**	**16**	*** (M. scorpius)**
8831080803	**Agonus cataphractus**	**84**	**1**	**ISI**	**18**	**36F8**	**26**	**12**	*** (M. scorpius)**
8831090828	**Liparis liparis**	**94**	**2**	**TRI2**	**13**	**41F5**	**35**	**2**	*** ?**
8831090828	**Liparis liparis**	**97**	**1**	**TRI2**	**30**	**36F7**	**32**	**2**	*** ?**
8836010902	Liza aurata	94	3	TRI2	1	33F4	56	2	
8840060101	Echiichthys vipera	77	1	TRI	7	35F4	17	2	
8840060101	Echiichthys vipera	77	1	TRI	7	35F4	18	2	
8840060101	Echiichthys vipera	98	1	TRI2	37	36F1	18	2	
8857032201	Phrynorhombus norvegicus	92	1	TRI2	41	33F2	14	2	
8857040904	**Limanda limanda**	**70**	**1**	**TRI**	**13**	**43F7**	**100**	**4**	*** (10 cm)**
8857040904	**Limanda limanda**	**70**	**1**	**WIL**	**11**	**38F2**	**47**	**8**	*** (7 cm)**
8857040904	**Limanda limanda**	**70**	**1**	**WIL**	**11**	**38F2**	**48**	**8**	*** (8 cm)**
8857040904	**Limanda limanda**	**70**	**1**	**WIL**	**11**	**38F2**	**49**	**16**	*** (9 cm)**

NODC	Name	Year	Quar	Ship	Haul	Rect	Size	N
Norway								
8747011701	**Sprattus sprattus**	**92**	**2**	**JOH**	**33**	**43F8**	**47**	**2**
8747011701	**Sprattus sprattus**	**92**	**2**	**JOH**	**33**	**43F8**	**50**	**2**
8747011701	**Sprattus sprattus**	**94**	**2**	**MIC**	**49**	**42G1**	**19**	**93**
8791031703	Trisopterus esmarki	84	1	ELD	45	44F5	29	2
8791032101	**Gadiculus argenteus**	**76**	**1**	**JOH**	**53**	**49F3**	**17**	**29**
8826010175	Sebastes viviparus	83	1	ELD	14	45F4	34	2
8826010175	**Sebastes viviparus**	**92**	**4**	**GOS**	**5**	**49F0**	**39**	**22**
Scotland								
8713040141	Raja montagui	89	1	SCO2	44	47E8	84	1
8713040141	Raja montagui	89	1	SCO2	44	47E8	86	2
8713040141	Raja montagui	89	1	SCO2	44	47E8	91	1
8713040148	**Raja naevus**	**89**	**1**	**SCO2**	**2**	**44E8**	**82**	**1**
8713040148	**Raja naevus**	**89**	**1**	**SCO2**	**2**	**44E8**	**97**	**1**
8713040148	**Raja naevus**	**89**	**1**	**SCO2**	**2**	**44E8**	**98**	**1**
8713040148	**Raja naevus**	**89**	**1**	**SCO2**	**6**	**41E8**	**80**	**3**
8713040148	**Raja naevus**	**89**	**1**	**SCO2**	**6**	**41E8**	**97**	**6**
8713040148	**Raja naevus**	**89**	**1**	**SCO2**	**6**	**41E8**	**100**	**3**
8713040148	**Raja naevus**	**89**	**1**	**SCO2**	**6**	**41E8**	**106**	**3**
8713040148	**Raja naevus**	**89**	**1**	**SCO2**	**7**	**42E8**	**92**	**2**
8713040148	**Raja naevus**	**89**	**1**	**SCO2**	**7**	**42E8**	**93**	**2**
8713040148	**Raja naevus**	**89**	**1**	**SCO2**	**7**	**42E8**	**98**	**2**
8713040148	**Raja naevus**	**89**	**1**	**SCO2**	**8**	**41E9**	**93**	**2**
8713040148	**Raja naevus**	**89**	**1**	**SCO2**	**37**	**44E7**	**92**	**1**
8713040148	**Raja naevus**	**89**	**1**	**SCO2**	**39**	**45E6**	**100**	**1**
8713040148	**Raja naevus**	**89**	**1**	**SCO2**	**40**	**45E7**	**98**	**1**
8713040148	**Raja naevus**	**89**	**1**	**SCO2**	**40**	**45E7**	**105**	**1**
8713040148	**Raja naevus**	**89**	**1**	**SCO2**	**44**	**47E8**	**80**	**1**
8713040148	**Raja naevus**	**89**	**1**	**SCO2**	**44**	**47E8**	**92**	**2**
8713040148	**Raja naevus**	**89**	**1**	**SCO2**	**44**	**47E8**	**98**	**1**
8713040148	**Raja naevus**	**89**	**1**	**SCO2**	**44**	**47E8**	**100**	**2**
8713040148	**Raja naevus**	**89**	**1**	**SCO2**	**44**	**47E8**	**103**	**1**
8713040148	**Raja naevus**	**89**	**1**	**SCO2**	**44**	**47E8**	**105**	**2**
8713040148	**Raja naevus**	**89**	**1**	**SCO2**	**55**	**43E9**	**93**	**1**
8713040148	**Raja naevus**	**89**	**1**	**SCO2**	**55**	**43E9**	**100**	**1**
8713040148	**Raja naevus**	**89**	**1**	**SCO2**	**55**	**43E9**	**103**	**1**
8713040148	**Raja naevus**	**89**	**1**	**SCO2**	**56**	**44E9**	**95**	**2**
8713040148	**Raja naevus**	**89**	**1**	**SCO2**	**56**	**44E9**	**101**	**2**
8759010501	**Maurolicus muelleri**	**85**	**1**	**SCO2**	**11**	**45F0**	**12**	**1**
8759010501	Maurolicus muelleri	91	1	SCO2	37	45F0	8	1
8759010501	Maurolicus muelleri	93	1	SCO2	39	44E6	8	3
8826010175	Sebastes viviparus	92	3	SCO2	69	47F0	39	1
8826010175	Sebastes viviparus	93	3	SCO2	46	47F3	34	1
8826010175	Sebastes viviparus	95	3	SCO2	39	47F3	37	1
8840060101	Echiichthys vipera	81	1	EXP	14	38F2	17	1
8847014901	Crystallogobius linearis	84	1	EXP	10	39F6	6	1
8847014901	Crystallogobius linearis	84	1	EXP	12	39F7	6	4
8857032201	Phrynorhombus norvegicus	91	1	SCO2	53	46E7	22	1
8857040603	**Hippoglossoides platessoides**	**97**	**2**	**SCO2**	**35**	**42F6**	**53**	**3**
8857040603	**Hippoglossoides platessoides**	**97**	**2**	**SCO2**	**35**	**42F6**	**54**	**5**
8857040603	**Hippoglossoides platessoides**	**97**	**2**	**SCO2**	**35**	**42F6**	**55**	**5**
8857040603	**Hippoglossoides platessoides**	**97**	**2**	**SCO2**	**35**	**42F6**	**56**	**2**
8857040603	**Hippoglossoides platessoides**	**97**	**2**	**SCO2**	**35**	**42F6**	**57**	**1**
8857040603	**Hippoglossoides platessoides**	**97**	**2**	**SCO2**	**35**	**42F6**	**59**	**1**
Sweden								
8747011701	Sprattus sprattus	76	1	ARG	25	43G1	19	2
8759010501	Maurolicus muelleri	72	1	SKA	31	44G1	9	1
8791031701	Trisopterus minutus	80	1	ARG	3	44F8	31	2
8791031701	Trisopterus minutus	80	1	ARG	32	43G1	35	2
8791032101	Gadiculus argenteus	94	3	ARG	183	44F8	17	2
8791032101	**Gadiculus argenteus**	**95**	**3**	**ARG**	**195**	**45G0**	**19**	**12**
8791032101	Gadiculus argenteus	97	3	ARG	557	44F8	17	4
8791032201	Micromesistius poutassou	91	3	ARG	193	44F8	51	2
8857032101	**Zeugopterus punctatus**	**81**	**1**	**ARG**	**13**	**43G0**	**29**	**2**

Table 12. Reported catches of *Mustelus* spp., *Mustelus asterias* and *Mustelus asterias* by year and quarter.

	8708020400 *Mustelus* spp.	5708020408 *M.mustelus*	8708020409 *M.asterias*	Total
1965-1				
1966-1				
1967-1				
1968-1				
1969-1				
1970-1				
1971-1			1	1
1972-1				
1973-1				
1974-1				
1975-1				
1976-1		1		1
1977-1				
1978-1		2		2
1979-1				
1980-1				
1981-1				
1982-1				
1983-1				
1984-1		6		6
1985-1				
1986-1				
1987-1				
1988-1		12		12
1989-1				
1990-1		8		8
1991-1		5		5
1991-2			6	6
1991-3			5	5
1991-4			2	2
1992-1			2	2
1992-2		10	2	12
1992-3		20	10	30
1992-4			28	28
1993-1		17	10	27
1993-2		6		6
1993-3	30	32	6	68
1993-4		2	8	10
1994-1	268	98		366
1994-2			5	5
1994-3		12	104	116
1994-4		2	17	19
1995-1		141		141
1995-2		2		2
1995-3				
1995-4			18	18
1996-1		5	31	36
1996-2			1	1
1996-3		76	62	138
1996-4			1	1
1997-1		10	14	24
1997-2		12	6	18
1997-3		6	24	30
1997-4				
1998-1		7	48	55