

# Extension of the STCF technical interaction model and data Collection of Fishery data for 1991 for the North Sea

Dutch participation

F.A. van Beek and E. Visser



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by F.A. van Beek and E. Visser  
Netherlands Institute for Fishery Research  
Postbox 68  
1970 AB IJmuiden

**1. Introduction**

This study is part of a general research activity undertaken by STCF, coordinated by DIFMAR and funded by the EC-Commission (AIR project).

This part of the study deals with the construction of a disaggregated database of biological and economical fishery data for 1991 from the Netherlands. The work was carried out in the framework of a subcontract between the Netherlands Institute for Fishery Research - Agriculture Research Department (RIVO-DLO) layed down in a contract between the coordinator, the Danish Institute for Fisheries and Marine Research (DIFMAR), and the EC-Commission.

The data presented for the Netherlands are age-compositions, mean weight-at-age, mean length-at-age, and effort by statistical rectangle of demersal species in the North Sea. Also mean price at age and gear-selection parameters are presented. Discard data are not available. Details concerning data definition and the data exchange formats are described in a working paper by Vinther<sup>1</sup>.

In this study the basic catch statistics from fishing logbooks and biological samples for 1991 were re-analyzed. The procedures and computer programmes used were the same as in a similar project dealing with 1989 data (Van Beek and Visser<sup>2</sup>).

This report contains a description of the overall work carried out, the procedures followed and a summary of the results obtained under the contract. Data according to the

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data-exchange format agreed by STCF are available in files and have been send to the database coordinator on two MSDOS floppy disks.

## 2. Sources of information

Basic data were obtained from the following sources:

computerized logbooks, available in an ORACLE based data base system (VIRIS) on the computer of the Ministry of Agriculture, Nature Management and Fisheries. This data base contains information on the distribution of effort and catches of species under quota regulation.

RIVO market sampling programme, available on RIVO computers. This data base contains age, length-at-age, and weight-at-age information of samples from commercial landings and research cruises.

RIVO interviews with the industry on the composition of the landings in market categories.

LEI statistics, containing information on price per market category.

ICES Working Group Reports, giving information on the estimated landings of the species considered in this study.

## 3. Fleet description

In the data base 4 fisheries were considered for the Netherlands, which take the majority of the catches of demersal species:

fleet	code	number of vessels
beam trawl > 300 HP	A	251
beam trawl ≤ 300 HP	B	220
demersal pair trawl	P	57
demersal otter trawl	O	117

The number of vessels by fishery is a distinct count of all registration numbers of vessels which have at least once participated in this fishery in 1991 according the log-

books. A number of vessels, especially the so called "Eurocutters" participate in more than one fishery.

No distinction in the logbook data base has been made in the gear code of beam trawl and shrimp trawl. Therefore vessels exclusively fishing for fish can not be distinguished from shrimpers with a bycatch of fish. The number of vessels of beam trawlers  $\leq 300$  hp is therefore overestimated.

#### 4. Species considered

In this study the major species considered for the fleets described above are: cod, haddock, whiting, saithe, plaice and sole. No biological sampling has been carried out on haddock and saithe. The information on these species is restricted to the spatial distribution of the nominal catch by fleet and estimates of the total catch.

The reporting of landings in the logbooks of species which are under TAC regulation is mandatory. This is not the case with landings of bycatch species. The reporting of landings of bycatch species which are not under TAC regulation is therefore incomplete. There are at present also no other estimates of these landings available. These species have not been included in the data base.

#### 5. Gear selectivity data

Selectivity data were available only for plaice and sole from Van Beek et al.<sup>3</sup>. The overall "traditional type" selection parameters given in this paper are converted in parameters as required by the STCF format. They are the same as those given in 1989.

The number of meshes around the cod-end and extension length may vary between ships. The standards in 1991 were:

fleet	mesh size	extension length	number meshes
beam trawl > 300 HP	80	0	150
beam trawl $\leq 300$ HP	75	0	100
demersal pair trawl	90	6.75	110
demersal otter trawl	90	6.75	110

The number of meshes around the cod-end given in the data base are conditional with the mesh size in use. It should be noted that after 1991 the mesh size has been increased in the beam trawl  $\leq$  300 HP from 75 to 80 mm and in the pair trawl and otter trawl from 90 to 100 mm. Also the number of meshes around the cod-end has decreased from 110 to 100 in the pair trawl and otter trawl.

It should also be noted that the selectivity parameters as obtained by scientific experiments are probably not representative for the present fisheries. The mesh size measurements applied by scientists (using ICES procedures) differ from those by control officers (using EC procedures, different gauge, different pressure). Also the selectivity parameters were obtained using "clean gears", with no attachments. The present EC legislation permits a number of gear attachments such as strengthening bags and chafers.

## **6. Effort data**

The logbook contains a column for recording fishing time by statistical rectangle. However, supplying fishing time data is optional. In most cases fishing hours were not reported. Therefore hours at sea were calculated for each trip from the date and time of depart and arrival and allocated in equal parts to those rectangles visited. The quarterly total hours absent from port from all trips, disaggregated by fleet and rectangle were divided by 24, giving days absent from port.

In a number of occasions the rectangles visited were not filled in. The effort calculated from these trips was accumulated and later on distributed to the rectangles proportional to the distribution of "allocated" effort.

The present effort index is biased as steaming time to the fishing grounds is included. Big vessels, fishing in distant waters, need longer steaming time compared to small vessels, fishing just outside the harbour. No correction for this phenomenon has been made.

The effort of pair trawlers includes the days absent from port of both vessels. So the effort of this fleet must be divided by a factor 2 when pairs of vessels are considered.

## **7. Total Catch Data and Total Value**

The total catch of each species was taken from ICES Working Group reports (ICES<sup>4</sup>). These catches are the estimates of the Working Groups and can therefore differ from official reported landings. The Working Group estimates are on a quarterly basis.

The total quarterly catch was allocated over the fleets in the same ratio as the reported landings in the logbooks (sum of statistical square landings, Table 7.1).

The total catch data (code: TOC) do not correspond with catch data (code: CAT) and age compositions (code: CAA) as the latter two reflect only to landings reported correctly in statistical rectangles.

No consistent information is available on total value in national currency by fleet. However STCF should be able to calculate total values from raised age compositions, weight at age, price at age and the whole fish / gutted fish weight ratio.

## **8. Catch Data**

The logbooks contain two data fields dealing with catch data. One data field contains an estimate from the skipper of the total catch landed in the harbour. The other data fields may contain catches together with detailed information of the fishery as fishing hours, number of hauls and statistical rectangle. In practice there always seems to be a discrepancy between both sets of information. In a number of occasions catch data by rectangle were not entered correctly.

Catch data by rectangle (code: CAT) for the STCF data base are extracted from the logbook data base as the sum of all landings reported in statistical rectangles. The total in all rectangles does not correspond with the estimate of the total catch (code: TOC). The relative distribution over the rectangles is representative for the distribution of the total catch.

## 9. Catch at age data

Catch at age data (code: CAA) were derived from catch data (code: CAT) and age-length-keys (ALKs). So the catch at age data correspond with the catch data but not with the total catch data (code: TOC), which may be subject to changes when estimates of national landings or the allocation to the different fleets will be revised.

### 9.1 Age-Length-Keys

ALKs were constructed on an area basis using information of the stratification of the catch in market categories (Table 9.1.1), length/age determinations from commercial and research samples (Table 9.1.2) and for cod and whiting length distributions of the landings (Table 9.1.2). The sample numbers given in Table 9.1.2 refer to a review of the Dutch market sampling schedule by Groeneveld<sup>5</sup>. The areas are defined as a group of rectangles in which the same ALK is valid. These areas differ by species and sometimes also by fleet (Figure 9.1.1). Because in an area the same ALK is used for all rectangles the relative age distribution is same in each rectangle and only the level differs, depending on the catch in the rectangle. Also the mean length at age and mean weight at age are the same within one area.

### 9.2 Plaice

ALKs were derived for 7 different areas using stratified otolith samples for beam trawlers > 300 hp. It was assumed that the small catches made by pair trawlers and otter trawlers would have the same age composition, so the same ALKs were used for these fleets.

Beam trawlers  $\leq$  300 hp are operating in coastal areas and catch a relative greater proportion of small (young) fish. For this fleet 3 different ALKs were constructed. When catches were reported outside coastal areas, ALKs corresponding with beam trawlers > 300 hp were used.

Sum of products discrepancies remain within 4%

### 9.3 Sole

Also for sole ALKs were derived for 7 different areas using stratified otolith samples for beam trawlers > 300 hp. These

areas are not the same as for plaice. It was assumed that the small catches made by pair trawlers and otter trawlers would have the same age composition, so the same ALKs were used for these fleets.

Beam trawlers  $\leq 300$  hp are operating in coastal areas and catch a relative greater proportion of small (young) fish. For this fleet 3 different ALKs were constructed. When catches were reported outside coastal areas, ALKs corresponding with beam trawlers  $> 300$  hp were used.

Sum of products discrepancies remain within 1%

#### 9.4 Cod

ALKs were constructed for 4 different areas from unstratified otolith samples (market and research) and stratified length compositions. Different length composition have been used for beam trawlers  $> 300$  hp, otter trawl and pair trawl. For beam trawlers  $\leq 300$  hp the same length composition has been used as in the otter trawl.

Sum of products discrepancies in general remain within 5%. However in a number of rectangles they can be as high as  $\pm 20\%$ .

#### 9.5 Whiting

ALKs were constructed for 3 different areas from unstratified otolith samples (market and research) and unstratified length compositions. As no separate length compositions were available for the different fleets the same ALKs have been applied to all fleets.

Sum of products discrepancies are all too low. In general they are around -5%. However in a number of rectangles they can be as high as -15%.

### **10. Price at Age**

Information on prices per market category were made available by LEI on a quarterly basis (Table 10.1). Price at age was calculated using the routine market sampling computer programmes. Prices differ by age and quarter but not by areas and fleets.



## 11. Landings distribution

No information on the landings in foreign countries is available. If such information will become available it is probably not possible to allocate these to separate fleets.

## 12. Computer programs used for data manipulation

MSPLIT	Pascal
MLEN	Pascal
MALK	Pascal
MRAISE	Pascal
MALKSTCF	Pascal
MRAISESTCF	Pascal
EFFORT	SQL
CATCHDATA	SQL
CATEGORIE	SQL
CATCHATAGE	Pascal

## 13. Data files on floppy disks

### disk1 (Volume STCF-NED-1)

files:	contents:
NED91FLE.FED	A: fleet data
NED91GES.FED	B: gear selections data
NED91EFF.FED	C: effort data
NED91TOC.FED	D: total catch data
NED91CAT.FED	E: catch data
NED91PRI.FED	G: price at age data
NED91WFG.FED	J: whole fish /gutted fish weight ratio

### disk2 (Volume STCF-NED-2)

files:	contents:
NED91CAA.FED	F: catch at age data

## References

- 1) Vinther, M. Contents and exchange format for the North Sea STCF Data Base (Version 1.0). STCF Working Document
- 2) Beek, F.A. van, 1990. Discard sampling programme for the North Sea, Dutch participation. RIVO Intern Rapport Demvis 90-303
- 3) Beek, F.A. van, A.D. Rijnsdorp and P.I. van Leeuwen 1983. Results of the mesh selection experiments on sole and plaice with a commercial beam trawl vessels in the North Sea in 1981. ICES C.M. 1983/B:16 Fish Capture Committee. ref: Dem. fish Committee
- 4) ICES 1993. Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak. ICES C.M. 1992/Assess:4
- 5) Groeneveld, K. 1993. Overzicht van de RIVO platvis otolietenbemonstering in 1991 en 1992. referentie







Table 7.1a Total landings by species, quarter and fleet in kg, reported in statistical squares

		COD	HAD	PLE	POK	SOL	WHG
BT > 300 HP	1	560078	341	19618974	114	5600709	405016
	2	400277	11627	11546968	268	3357199	226799
	3	251866	6510	10662862	244	4174568	171906
	4	534662	6647	19174830	42	3407026	222342
BT ≤ 300 HP	1	219786	0	1152919	0	402900	86052
	2	84869	77	2242453	49	778656	21367
	3	39943	0	1421781	12	522826	8322
	4	172150	117	925069	104	237932	138943
OTTER TRL	1	540350	33237	133313	246305	51899	274796
	2	114390	5200	122402	0	10664	53164
	3	77832	3404	104399	0	6835	148498
	4	368874	1169	50563	0	13762	457765
PAIR TRL	1	1017893	23	2178	116	0	451762
	2	409200	1416	57142	12	764	246326
	3	573417	21752	19196	4	42	283406
	4	713987	1405	33844	0	257	628330
TOTAL		6079574	92925	67268893	247270	18566039	3824794

Table 7.1b Total landings by species, quarter and fleet in kg, raised in statistical squares

		COD	HAD	PLE	POK	SOL	WHG
BT > 300 HP	1	600775	345	23045560	87	7232679	412791
	2	486490	13963	13997086	1629	4381789	244335
	3	304464	7401	12887243	938	5398939	180856
	4	585248	7830	22565043	288	4396851	238874
BT ≤ 300 HP	1	235756	0	1354284	0	520300	87704
	2	103148	92	2718273	298	1016295	23019
	3	48284	0	1718379	46	676167	8755
	4	188438	138	1088626	712	307057	149274
OTTER TRL	1	579613	33632	156597	187825	67022	280071
	2	139028	6245	148374	0	13919	57275
	3	94086	3870	126178	0	8840	156229
	4	403774	1377	59503	0	17760	491802
PAIR TRL	1	1091856	23	2558	88	0	460434
	2	497334	1700	69267	73	997	265372
	3	693166	24729	23200	15	54	298160
	4	781540	1655	39828	0	332	675050
INPUT Q1		2508000	34000	24559000	188000	7820000	1241000
INPUT Q2		1226000	22000	16933000	2000	5413000	590000
INPUT Q3		1140000	36000	14755000	1000	6084000	644000
INPUT Q4		1959000	11000	23753000	1000	4722000	1555000
TOTAL		6833000	103000	80000000	192000	24039000	4030000

Table 9.1.1 Distribution of market categories relative to 1000 kg landings by fleet and quarter. (STCF 1991 data base)

Spec	Quarter	Fleet Code	Area	Cat I	Cat II	Cat III	Cat IV	Cat V	Tot	Source Code
Sole	1	APO	1	33	362	284	204	117	1000	Vert
Sole		APO	2	53	163	378	275	131	1000	Vert
Sole		APO	3	54	196	306	303	142	1000	Vert
Sole		APO	4	42	141	343	254	221	1000	Vert
Sole		APO	5	55	287	389	202	67	1000	Vert
Sole		APO	6	46	170	302	302	181	1000	Vert
Sole		APO	7	70	235	354	230	111	1000	Vert
Sole	2	APO	1	38	206	309	311	135	1000	Vert
Sole		APO	2	40	215	369	245	131	1000	Vert
Sole		APO	3	44	199	328	309	120	1000	Vert
Sole		APO	4	41	200	343	269	147	1000	Vert
Sole		APO	5	63	229	342	273	93	1000	Vert
Sole		APO	6	47	170	331	336	116	1000	Vert
Sole		APO	7	52	191	350	308	98	1000	Vert
Sole	3	APO	1	30	214	265	302	190	1000	Vert
Sole		APO	2	14	161	316	281	229	1000	Vert
Sole		APO	3	24	176	282	314	204	1000	Vert
Sole		APO	4	36	232	338	236	158	1000	Vert
Sole		APO	5	40	180	313	347	120	1000	APO2-4/5
Sole		APO	6	23	135	293	372	177	1000	Vert
Sole		APO	7	23	186	328	298	164	1000	Vert
Sole	4	APO	1	49	181	272	340	157	1000	Vert
Sole		APO	2	64	220	303	215	199	1000	Vert+SNIJ
Sole		APO	3	30	186	277	359	148	1000	Vert
Sole		APO	4	21	164	221	333	261	1000	Vert
Sole		APO	5	15	130	285	422	148	1000	Vert
Sole		APO	6	40	221	304	361	74	1000	Vert
Sole		APO	7	51	316	280	263	91	1000	Vert
Sole	1	B	1/3	90	221	348	133	208	1000	Vert
Sole	2	B	1/3	37	234	315	236	178	1000	Vert
Sole	3	B	1/3	37	242	200	205	316	1000	Vert
Sole	4	B	1/3	75	203	229	289	204	1000	Vert

Table 9.1.1 continued, Distribution of market categories relative to 1000 kg landings by fleet and quarter. (STCF 1991 data base)

Spec	Quarter	Fleet Code	Area	Cat I	Cat II	Cat III	Cat IV	Cat V	Tot	Source Code
Plaice	1	APO	1	73	164	378	385		1000	Vert
Plaice		APO	2	84	174	346	396		1000	Vert
Plaice		APO	3	82	238	372	308		1000	Vert
Plaice		APO	4	88	236	368	308		1000	Vert
Plaice		APO	5	94	275	413	218		1000	SNIJ
Plaice		APO	6	71	146	403	380		1000	Vert
Plaice		APO	7	80	288	307	325		1000	Vert+SNIJ
Plaice	2	APO	1	37	119	299	545		1000	Vert
Plaice		APO	2	41	150	330	479		1000	Vert
Plaice		APO	3	80	221	306	393		1000	Vert
Plaice		APO	4	46	195	318	441		1000	Vert
Plaice		APO	5	46	195	318	441		1000	APO2/4
Plaice		APO	6	42	169	246	543		1000	Vert
Plaice		APO	7	32	209	302	452		1000	Vert
Plaice	3	APO	1	45	61	191	703		1000	Vert
Plaice		APO	2	23	106	265	606		1000	Vert
Plaice		APO	3	155	355	235	244		1000	Vert
Plaice		APO	4	18	114	252	616		1000	Vert
Plaice		APO	5	184	305	175	336		1000	Vert
Plaice		APO	6	15	124	395	466		1000	Vert
Plaice		APO	7	33	105	342	521		1000	Vert
Plaice	4	APO	1	120	230	464	186		1000	Vert
Plaice		APO	2	88	171	310	431		1000	Vert
Plaice		APO	3	55	132	422	390		1000	Vert
Plaice		APO	4	24	114	257	606		1000	Vert
Plaice		APO	5	38	144	396	421		1000	Vert
Plaice		APO	6	110	175	420	295		1000	Vert
Plaice		APO	7	110	175	420	295		1000	APO4/6
Plaice	1	B	1/3	46	192	316	446		1000	Vert
Plaice	2	B	1/3	46	199	274	481		1000	Vert
Plaice	3	B	1/3	37	107	174	681		1000	Vert
Plaice	4	B	1/3	55	139	310	496		1000	Vert





Table 9.1.1 continued, Distribution of market categories relative to 1000 kg landings by fleet and quarter. (STCF 1991 data base)

Spec	Quarter	Fleet Code	Area	Cat I	Cat II	Cat III	Cat IV	Cat V	Tot	Source Code
COD	1	A	1	225	90	101	124	460	1000	Vert
COD		A	2	193	118	110	222	358	1000	Vert
COD		A	3	301	189	224	108	178	1000	Vert
COD		A	4	413	33	45	126	383	1000	Vert
COD	2	A	1	28	0	49	410	514	1000	Vert
COD		A	2	57	69	221	300	352	1000	Vert
COD		A	3	197	176	235	259	132	1000	Vert
COD		A	4	107	100	89	138	566	1000	Vert
COD	3	A	1	100	90	206	249	356	1000	HH
COD		A	2	165	72	219	278	265	1000	Vert
COD		A	3	29	46	128	260	537	1000	Vert
COD		A	4	28	64	197	235	476	1000	Vert
COD	4	A	1	375	0	26	111	489	1000	Vert
COD		A	2	136	101	163	202	398	1000	Vert
COD		A	3	53	178	114	214	441	1000	Vert
COD		A	4	106	0	126	73	695	1000	Vert
COD	1	P	1/4	114	236	312	177	162	1000	HH
COD	2	P	1/4	17	92	215	247	428	1000	HH
COD	3	P	1/4	11	75	198	291	425	1000	HH
COD	4	P	1/4	8	90	227	150	525	1000	HH
COD	1	B0	1/4	212	310	268	139	70	1000	HH
COD	2	B0	1/4	132	154	144	267	303	1000	HH
COD	3	B0	1/4	13	110	280	281	316	1000	HH
COD	4	B0	1/4	9	71	209	111	600	1000	HH

Table 9.1.2 Otolith sample codes used for area based age-length-  
keys, from Groeneveld 1993. (STCF 1991 data base)

**Plaice beam trawl > 300 HP**

area  
code/quarter

1/1	6	7	8	9	10	11	17	22	
1/2	30	34	35						
1/3	44	53	54	56					
1/4	70	71	77						
2/1	2	5	18	19	21	23			
2/2	28	37	39	40					
2/3	45	46	47	50	52	53	56	59	
2/4	63	69	70	76					
3/1	1	3	4	12	24	25	13	16	20
3/2	27	29	38						
3/3	45	47	52	55	58	59	60		
3/4	62	68	72	78					
4/1	4	14	15	24	25				
4/2	31	32	33	36	41	42	43		
4/3	48	51	57	60	61				
4/4	64	65	66	73	74	75			
5/1	14	15	24						
5/2	36	42							
5/3	51	57	60	61					
5/4	65	67	74	75					
6/1	2	12	18	20					
6/2	21	49							
6/3	49	55	62						
6/4	62	78	79	76					
7/1	1	13	16						
7/2	26	27	38						
7/3	58	60	61						
7/4	67	68	72						

Table 9.1.2 continued. Otolith sample codes used for area based age-length-keys, from Groeneveld 1993. (STCF 1991 data base)

Sole beam trawl > 300 HP

area  
code/quarter

1/1	2	9	14	15					
1/2	18	23	32	43					
1/3	53	59	61	62					
1/4	63	65	72	73	74				
2/1	8	14	15						
2/2	24	25	26	27	31	35	36	38	45
2/3	50	53	55	59					
2/4	63	65	67	73	74				
3/1	3	4	5	10	11	17			
3/2	22	28	33	39	40	41	42		
3/3	46	48	49	51	57	58			
3/4	64	70	71						
4/1	3	8	11	16					
4/2	19	30	31	34	35	37	42	43	44
4/3	47	52	54	60					
4/4	64	66	67	72					
5/1	5	6	10						
5/2	28	29							
5/3	46	51							
5/4	70	71							
6/1	1	6	12						
6/2	20	21	39						
6/3	51	56	58						
6/4	69	75							
7/1	3	7	12	13					
7/2	18	20	21	23	32				
7/3	48	56	62						
7/4	68	76							

Table 9.1.2 continued. Otolith sample codes used for area based age-length-keys, from Groeneveld 1993. (STCF 1991 data base)

Coastal plaice beam trawl  $\leq$  300 HP

area  
code/quarter

3/1	4	14	15	24	25
3/2	31	32	33	36	42
3/3	51	57	61		
3/4	65	67	73	74	75
2/1	19	23			
2/2	37	40	41	43	
2/3	50	53			
2/4	63	64	66	70	
1/1	6	7	8	9	
1/2	30	34	35		
1/3	44	53	54		
1/4	70	71	77		

Table 9.1.2 continued. Otolith sample codes used for area based age-length-keys, from Groeneveld 1993. (STCF 1991 data base)

Coastal sole beam trawl  $\leq$  300 HP

area  
code/quarter

3/1	8	14	15			
3/2	24	25	26	27	36	38
3/3	50	53	59			
3/4	65	73	74			
2/1	8	11	16			
2/2	19	37	41	42		
2/3	49	52	55			
2/4	64	66	67	70	71	
1/1	5	10	17			
1/2	28	29	33	41		
1/3	46	49				
1/4	70	71				

Table 9.1.2 continued. Otolith and length measurement sample codes used for area based age-length-keys (STCF 1991 data base)

Whiting otolith samples, all gears

area  
code/quarter

1/1	2	3	500	501	502	503	504	605					
1/2	7	8	10	400	401	505	506	507	508	611	618		
1/3	11	14	402	403	509	624							
1/4	18	404	405	510									
2/1	4	100	101	102	103	104	105	300	301	302	303	304	
	305												
2/2	200	201	202	306	307	308	309	607	700	701	702	703	
2/3	14	17	106	107	108	109	110	203	204	205	206	207	
	310	311	312	313	314	621	622	704	705	706	707	708	
2/4	208	209	210	633	709								
3/1	1	2	3	5	600	601	602	603	604				
3/2	6	7	8	9	10	606	608	609	610	612	613	614	
	615	616	617	619									
3/3	11	12	13	14	15	16	620	623					
3/4	18	19	20	21	22	23	24	625	626	627	628	629	
	630	631	632	634	635	636	637	638					

length measurements

1/1	3	4	7	8	10	15	24	27	32				
1/2	37	38	45	47	48	49							
1/3	53	55	56	57	59	71	74	79					
1/4	82	86	87	89	113								
2/1	7	8	16										
2/2	38	39											
2/3	51	52	59	66	78	81							
2/4	82	83	85										
3/1	1	2	3	4	5	6	7	8	9	10	11	12	
	13	14	15	17	18	19	20	21	22	23	24	25	
	26	27	28	29	30	31	32						
3/2	33	34	35	36	38	39	40	41	42	43	44	46	
	48	50											
3/3	54	58	60	61	62	63	64	65	67	68	70	72	
	73	75	76	77	80								
3/4	83	84	85	86	87	88	89	90	91	92	93	94	
	95	96	97	98	99	100	101	102	103	104	105	106	
	107	108	109	110	111	112	113	114	115				

Table 9.1.2 continued. Otolith and length measurement sample codes used for area based age-length-keys (STCF 1991 data base)

Cod otolith samples, all gears

area  
code/quarter

1/1	7	500	501	502	503	504	617	618				
1/2	12	505	506	507	627	646						
1/3	16	20	649									
1/4	29	403	404	508								
2/1	100	101	102	103	104	105	106	107	108	301	302	300
	303											
2/2	200	201	202	203	204	205	206	207	208	209	304	305
	306	307	400	401	402	621	622	623	624	634	632	633
	634	701	702	703	704	705	706					
2/3	109	110	111	112	113	210	211	212	213	214	215	308
	15	17	21	309	310	311	312	647	648	707	708	709
	710	711										
2/4	216	217	218	219	661	712						
3/1	600	610	611	612	613	614	615	616				
3/2	14	625	626	628	629	630	631	635	636	637	638	639
3/3	15	21	18	19								
3/4	23	24	652	653	654	656	659	660	662	663		
4/1	1	2	3	4	5	6	7	8	9	10	601	602
	603	604	605	606	607	608	609					
4/2	11	12	13	14	620	640	642	643	645			
4/3	16	18	19	20								
4/4	22	23	25	26	27	28	29	651	655	657	665	666

length measurements

1/1	6	8	10	23	26							
1/2	36	37	38	42	43	44						
1/3	47	49	50	41	60	61	63	66				
1/4	67	71	92									
2/1	6	8										
2/2	37	38	40									
2/3	45	46	53	57	65							
2/4	67	68	70									
3/1	6	8	15	21	22							
3/2	32	33	34	35	40							
3/3	48	52	54	55	56	58	59	62				
3/4	68	70	75	93								
4/1	1	2	3	4	5	9	10	11	12	13	14	16
	17	18	19	20	23	24	25	26	27	28	29	30
	31											
4/2	32	33	34	35	37	38	39	41	43	44		
4/3	47	49	52	58	61	62	64					
4/4	69	71	72	73	74	76	77	78	79	80	81	82
	83	84	85	86	87	88	89	90	91	92	94	95

Table 10.1 Average price/kg in Dutch florins per market category in Dutch fish markets in 1991 (source: LEI)

<u>species</u>	<u>cat</u>	<u>quarter 1</u>	<u>quarter 2</u>	<u>quarter 3</u>	<u>quarter 4</u>
saithe	1	2.36	3.27	3.98	4.36
	2	2.49	3.37	4.38	4.56
	3	2.75	3.39	4.32	5.46
	4	2.60	2.99	2.75	2.87
haddock	1	4.91	4.92	4.20	4.12
	2	4.72	4.76	4.30	4.18
	3	4.70	4.83	4.46	4.54
	4	4.11	4.52	4.52	4.58
sole	1	15.87	17.78	28.00	22.83
	2	12.92	14.67	18.02	19.05
	3	12.34	14.41	16.82	19.01
	4	12.41	14.15	15.79	14.88
	5	10.90	13.46	13.84	11.25
plaice	1	2.75	4.81	5.29	4.59
	2	3.10	4.91	5.13	4.18
	3	3.67	5.10	4.84	3.79
	4	3.78	4.90	4.33	3.44
whiting	1	3.08	4.47	3.60	2.54
	2	2.89	3.04	3.42	1.76
	3	1.60	4.71	3.77	2.46
	4	2.16	3.92	3.09	1.78
cod	1	4.96	6.37	6.93	6.02
	2	4.99	6.61	6.79	6.89
	3	5.27	6.27	6.54	6.47
	4	4.12	5.50	5.92	5.90
	5	4.63	4.85	5.03	4.34