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## Internal RIVO report

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## Market Sampling of Landings of Commercial Fish Species in the Netherlands in 2002

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## Index for Tables and Figures

Detailed information on sampling in **2002** in this report as tables and figures. See overview below:

<b>2002</b>	<b>Market Sampling</b>		<b>Other Sampling</b>	
	Tables	Figures	Tables	Figures
Species				
<b>OVERVIEW SAMPLING</b>	1a		1b 1c	
Map of ICES Divisions		1		1
Herring	a/l: 2abcd	a/l: 2abcd	23a 24bc 25c	23a 24bc 25c
Horse mackerel	a/l: 3abcd	a/l: 3abcd	26bd	26bd
Mackerel	a/l: 4abcd	a/l: 4abcd	27a 28b 29bd	27a 28b 29bd
Blue whiting	a/l: 5abcd	a/l: 5abcd	30b	30b
Greater argentine	a/l: 6abc	a/l: 6abc	31b	31b
Sprat			32a 33bc	32a 33bc
Plaice	a/l: 7abcd	a/l: 7abcd	34abcd 35c 36c 37cd	34abcd 35c 36c 37cd
Sole	a/l: 8abcd	a/l: 8abcd	38ad 39c 40c 41cd	38ad 39c 40c 41cd
Turbot	a/l: 9abcd	a/l: 9abcd	42a 43c 44c 45d	42a 43c 44c 45d
Brill	a/l: 10abcd	a/l: 10abcd	46a 47c 48c 49cd	46a 47c 48c 49cd
Dab	a: 11abcd l: 12abcd	a: 11abcd l: 12abcd	50abcd 51c 52c 53cd	50abcd 51c 52c 53cd
Lemmon sole	a/l:13abcd	a/l:13abcd	54a 55c	54a 55c
Witch			56c	56c
Norwegian topknot			57c	57c
Thick back sole				
Flounder			58cd 59c 60cd	58cd 59c 60cd
Long rough dab			61c	61c
Scaldfish			62c	62c
Solenette			63c	63c
Cod	a: 14abcd l: 15abcd	a: 14abcd l: 15abcd	64a 65bd 66c	64a 65bd 66c
Whiting	a: 16abcd l: 17abcd	a: 16abcd l: 17abcd	67a 68bc 69c	67a 68bc 69c
Saithe				
Haddock			70a 71c	70a 71c
Norway pout			72a	72a
Ray blond	l: 18abcd	l: 18abcd		
Ray cuckoo	l: 19d	l: 19d		
Ray spotted	l: 20abcd	l: 20abcd		
Ray thornback	l: 21abcd	l: 21abcd		
Ray starry				
Norway lobster (Nephrops)	l: 22bcd	l: 22bcd		

a/l: age&length samples (representative samples) a: = age samples (stratified) l: = length samples  
abcd behind table/figure number refers to resp. 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> quarter

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## Summary

The biological market-sampling programme for marine fish species provides, together with the information from the assessment surveys by research vessels, the information, which is essential for relating changes in the fish stocks to changes in the fishery. The market sampling program in the Netherlands comprises the collection of fish samples from commercial catches, the analysis of these samples (estimation of length, weight, sex, sexual maturity and age), and the conversion of the national catches in tonnes to age compositions in numbers together with the additional information on mean weight at age, mean length at age, etc. In a later stage, this information by country is combined to figures representative for the whole fish stock. These combined international data, collected over many years, form the basis for the analysis of population dynamics and for providing biological advice on fishery management.

The age of a fish is determined from the otoliths (ear bones) taken out of the head. Because of seasonal changes in growth (food availability, temperature, spawning) ring structures are formed in the otolith similar to the ring structures that can be seen on transverse sections of a tree. Age determination is important because from the annual age compositions, the annual increase in length and weight can be traced. This allows a quantification of important processes such as growth, recruitment of new age groups, mortality etc.

This report contains information on the biological sampling for the market sampling program: which species are sampled, how they were caught, when and where the samples are taken (date and position), how many fish have been measured, how many fish have been aged, etc. The report gives an overview of all the biological sampling activities in 2002 by RIVO on the landings of the commercial important species of herring, mackerel, horse mackerel, blue whiting, greater argentine, sole, plaice, turbot, brill, dab, lemon sole, cod, whiting, Norway lobster and four different species of rays from all ICES areas. This biological sampling took place on landings by both the Dutch fleet as well as foreign fleets landing in the Netherlands.

In addition this report contains information on the biological samples collected during research vessel surveys and discard trips both on commercial and non-commercial species.

## 1. Introduction

In the framework of the biological monitoring of the stocks of commercially important marine fish species, which are exploited by fishing fleets and are subject to EU management regulations, annual routine sampling programs of the landings in the Netherlands have been carried out since 1955 (pelagic species) and 1957 (demersal species). The information collected in these sampling programs concerns annual and quarterly age-length keys (ALK's), length distributions, weight at age and maturity at age. Combined with national statistics on nominal landings by size categories as used in the fish market, age distributions of the landings, at various levels of aggregation, can be constructed. These are used in assessments of the state of the stocks by the International Council for Exploration of the Sea (ICES). The biological market sampling program has been financially supported by the EU from 1995 to 1997 by contract no 94/016, from 1998 to 1999 by contract 97/0076 and from 2000 to 2001 by contract 99/0052. From 2002 onwards the Dutch market sampling is part of the data collection under EU Regulation 1639/2001. The research carried out in 2002 represents part of an international framework of national market sampling programs, which form the basis for fish stock assessment and management advice. The data obtained are essential to evaluate the probable effects of the various measures aiming at the conservation and management of fishery resources (TAC's and quota's) as laid down in the Common Fishery Policy.

The planning of the 2002 market sampling is given in The Netherlands National Programme for Collection of Fisheries Data in 2002 and carried out in "Programma Wettelijke en Dientsverlenende Taken Visserijonderzoek 2002-2005 (WERKPLAN 2002, van Beek 2002). This report presents the actual biological sampling of the landings in 2002 compared to the planned market sampling according the 2002 work plan, but it does not include an evaluation of the sampling, because this is included in the "Technical Report of Activity 2002 – The Netherlands" (Anon., 2003). Levels of sampling in previous years have been presented in RIVO reports, which are listed in section 5. Also a brief description of the sampling procedures presently applied in the Netherlands is given. The market sampling program in 2002 comprised the following species: sole, plaice, turbot, brill, dab, lemon sole, cod, whiting, herring, mackerel, horse mackerel, blue whiting, greater argentine, blond ray, spotted ray, cuckoo ray, thornback ray and Norway lobster.

In addition biological samples taken during research vessel surveys are presented, because part of these are also used for ALK's applied to commercial landings. During 2002 the following species have been sampled during research vessel surveys: herring, mackerel, blue whiting, greater argentine, sprat, plaice, sole, turbot, brill, dab, flounder, lemon sole, long rough dab, witch, Norwegian topknot, scaldfish, solenette, cod, whiting, haddock and Norway pout.

## 2. Sampling procedures

### 2.1 Plaice, Sole, Turbot, Brill, Lemon sole and Dab

Almost all of the plaice, sole, turbot, brill, lemon sole and dab landed in the Netherlands are caught by beam trawlers, which are fishing almost exclusively in the North Sea. Annex 1 shows the market size categories for these species together with the number of fish taken in 2002 by RIVO per size category for an age and length sample.

#### Representative sampling by size category, by harbour and by quarter

Representative sampling by size category, by harbour by quarter is carried out for plaice, sole, turbot and brill. Representative sampling implies that by size category the length distribution of the sample corresponds to that of the landings of that size category. Each fish sample consists of a certain number of fish per size category from one vessel, which is taken in a fish auction (see Appendix 1). There are three levels of stratification: by harbour, quarter and market size category. Sampling is restricted to 4 major landing ports (Den Helder, Stellendam, Urk and IJmuiden), which account for about 80% of the national landings. The number of samples are taken approximately in proportion to the expected landings in these ports and take account of differences in effort of various fleet components in different fishing areas. The sampling levels are based on both the Dutch as well as the foreign landings in the Netherlands.

Sampling during spawning time (plaice: first quarter; sole, turbot and brill: second quarter) is intensified to obtain detailed biological parameters (maturity data and weight at age of the stock).

Plaice landings are marketed in 4 and sole in 5 size categories. Samples consist of 15 (plaice) or 10 (sole) fish in each size category bought from the vessel selected.

Turbot landings are marketed in 6 and brill in 3 size categories. Samples consist of 10 (turbot) or 15 (brill) fish in each size category bought from the vessel selected.

In addition, the total landings of the vessel, the amount landed in each size category, gear, fishing position, vessel name and vessel characteristics are recorded. No separate length samples are taken. The fish are measured and weighed. The ovaries are weighed during the

whole year in the laboratory. Sex and stage of maturity are recorded and both otoliths are removed for age determination. The age of the fish is determined by counting the number of rings on the slides of the sectioned otoliths.

The plan for 2002 of the number of plaice, sole, turbot and brill samples to be taken by quarter, in the different harbours, is given in the text tables of section 4.

#### Representative sampling by size category and by quarter

Representative sampling by size category and by quarter is carried out for lemon sole. There are two levels of stratification: by quarter and market size category. Sampling is carried out in Urk and IJmuiden. The plan for 2002 of the number of lemon sole samples to be taken by quarter is given in the text tables of section 4.

#### Non-representative sampling by quarter

Non-representative sampling by quarter is carried out for dab. This implies that each quarter both length and age samples are collected. Sampling is carried out in IJmuiden and Urk. The plan for 2002 of the number of dab samples for length and age to be taken by quarter is given in the text tables of section 4.

## 2.2. Cod and Whiting

Cod and whiting are caught by beam trawlers, pair trawlers and otter trawlers in the North Sea. The latter two fleets have almost disappeared over the last ten years. Roundfish is sampled in the auctions of IJmuiden and Den Oever and possibly in Urk and Stellendam. The distribution of the age and length sampling by quarter should reflect the landings by quarter. Annex 1 shows the market size categories for cod and whiting together with the number of fish taken in 2002 by RIVO per size category per age or length sample.

Cod is sorted in 6 market categories. Otolith samples and length measurements are taken in the auction. An age sample from an individual vessel consists of approximately 50 fish (1 otolith per fish) and each length sample consists of at least 50 fish. Age reading is carried out on sectioned otoliths mounted on slides.

Whiting are usually sold unsorted. Length measurements are collected in the auction. The age samples are bought and processed in the laboratory. Each sample consists of 50 fish and both otoliths are collected. Age reading is carried out on sectioned otoliths mounted on slides.

The target number of age and length samples to be collected in 2002 is given in text tables of section 4.

Prior to the assessment working group meetings, age-length-keys are prepared for each quarter. Usually also samples collected during surveys (IBTS) are included in the keys. Based on the samples, the quarterly length composition per market category is calculated. Information from a number of fish auctions on the landings per market size category is used to raise the quarterly landings by market category. The age-length keys are then used to derive the quarterly numbers and weights at age.

### 2.3. Herring, Mackerel, Horse Mackerel, Blue Whiting and Greater Argentine

The Dutch pelagic fleet consists of large freezer trawlers and pair trawlers, all using a pelagic trawl. In addition, a number of freezer trawlers and pair trawlers fishing under German, English and French flags land their fish mainly in the Netherlands (IJmuiden, Scheveningen or Vlissingen). The market sampling intensity has taken into account the landings of these 'foreign' vessels in the Netherlands. Biological samples of pelagic fish (horse mackerel, mackerel, herring, blue whiting and greater argentine) are taken from catches of the commercial fleet landing in the Netherlands. There are no size categories for the fish landed by the pelagic trawlers.

On board of a number of selected commercial vessels, crewmembers trained for their task by RIVO staff, are taking unsorted fish samples (frozen blocks of 20-23 kg) from the catches according to instructions obtained from RIVO. These vessels are also supplying information on all hauls (dates, positions, hours fishing, species compositions, etc.). The ships collect samples only from medium to large catches. The sampling scheme is that at least one or two samples per week per fish species per ICES Division or Subdivision are taken. This way of sampling has the advantage that the distribution of the collected samples represents roughly the distribution of the fishery by the pelagic fleet.

The frozen samples are collected immediately after arrival of the vessels in a Dutch port. The samples are measured and sorted into cm-groups in the laboratory. A sub-sample of 25 fish, representative for the length distribution in the sample is taken for further biological measurements such as age, weight, sex and maturity in such a way that the length frequency distribution in the sub-sample is representative for the length distribution of the total catch.

The plan for 2002 of the number of samples for horse mackerel, mackerel, herring, blue whiting and greater argentine to be taken by quarter is given in the text tables of section 4.

### 2.4. Rays

From 2001 onwards RIVO included the length sampling of rays from commercial landings. These species include blond ray, cuckoo ray, spotted ray, starry ray and thornback ray.

Rays are caught by beam trawlers, pair trawlers and otter trawlers in the North Sea. The latter two fleets have almost disappeared over the last ten years. Rays are sampled in the auctions of IJmuiden, Urk and Stellendam. Annex 1 shows the market size categories for rays together with the number of fish taken in 2002 by RIVO per size category for a length sample. Rays are sorted in 4 market categories. Length measurements are taken in the auction by species. The weight by size category by species is estimated.

The target number of length samples to be collected in 2002 is given in text tables of section 4.

### 2.5. Norway lobster

From 2002 onwards RIVO included the length sampling of Norway lobster from commercial landings in its sampling programme. Norway lobster are caught by otter trawlers in the North Sea and are sampled in the auctions in Den Oever and IJmuiden. Annex 1 shows the market size categories together with the number of Norway lobster to be taken in 2002 by RIVO per size category for a length sample. Whole Norway lobster is sorted in 4 market categories, while there is an extra category for tails. Length measurements are collected in the auction or length samples are bought and processed at the laboratory. Of each size category the carapace length of 100 Norway lobsters should be measured. Of the tails the width of the 5<sup>th</sup> abdominal segment has to be measured. Both of whole Norway lobster, as well of the tails,





North Sea										
SOLE	Den Helder		Stellendam		Urk		Ijmuiden		Total	
	<i>plan-ning</i>	<i>rea-lised</i>	<i>plan-ning</i>	<i>rea-lised</i>	<i>plan-ning</i>	<i>rea-lised</i>	<i>plan-ning</i>	<i>rea-lised</i>	<i>plan-ning</i>	<i>rea-lised</i>
1 <sup>st</sup> Quarter	5	5	3	3	7	7	3	3	18	18
2 <sup>nd</sup> Quarter	8	8	5	5	11	11	5	5	29	29
3 <sup>rd</sup> Quarter	4	4	3	3	6	6	3	3	16	16
4 <sup>th</sup> Quarter	4	4	3	3	7	7	3	3	17	17
Total	21	21	14	14	31	31	14	14	80	80
										<b>0%</b>

North Sea										
TURBOT	Den Helder		Stellendam		Urk		Ijmuiden		Total	
	<i>plan-ning</i>	<i>rea-lised</i>	<i>plan-ning</i>	<i>rea-lised</i>	<i>plan-ning</i>	<i>rea-lised</i>	<i>plan-ning</i>	<i>rea-lised</i>	<i>plan-ning</i>	<i>rea-lised</i>
1 <sup>st</sup> Quarter	2	2	2	2	4	4	2	2	10	10
2 <sup>nd</sup> Quarter	4	4	4	4	8	8	4	4	20	20
3 <sup>rd</sup> Quarter	2	2	2	2	4	3	2	2	10	9
4 <sup>th</sup> Quarter	2	2	2	2	4	4	2	2	10	10
Total	10	10	10	10	20	19	10	10	50	49
										<b>-2%</b>

North Sea										
BRILL	Den Helder		Stellendam		Urk		Ijmuiden		Total	
	<i>plan-ning</i>	<i>rea-lised</i>	<i>plan-ning</i>	<i>rea-lised</i>	<i>plan-ning</i>	<i>rea-lised</i>	<i>plan-ning</i>	<i>rea-lised</i>	<i>plan-ning</i>	<i>rea-lised</i>
1 <sup>st</sup> Quarter	2	2	2	2	4	4	2	2	10	10
2 <sup>nd</sup> Quarter	4	4	4	4	8	8	4	4	20	20
3 <sup>rd</sup> Quarter	2	2	2	2	4	3	2	2	10	9
4 <sup>th</sup> Quarter	2	2	2	2	4	4	2	2	10	10
Total	10	10	10	10	20	19	10	10	50	49
										<b>-2%</b>

	LEMON SOLE		DAB			
	AGE samples		AGE samples		LENGTH samples	
	planning	realised	planning	realised	planning	realised
1 <sup>st</sup> Quarter	1	1	3	3	6	10
2 <sup>nd</sup> Quarter	1	1	3	3	6	8
3 <sup>rd</sup> Quarter	1	1	3	3	6	5
4 <sup>th</sup> Quarter	1	1	3	3	6	8
Total	4	4	12	12	24	31
		<b>0%</b>			<b>0%</b>	<b>+29%</b>

	C O D							
	AGE samples				LENGTH samples			
	Nr of AGE samples		Nr of AGE readings		Nr of LENGTH samples		Nr of LENGTH measurements	
	planning	realised	planning	realised	planning	realised	planning	realised
1 <sup>st</sup> Quarter	12	13	600	695	15	18	750	948
2 <sup>nd</sup> Quarter	8	9	400	443	15	16	750	817
3 <sup>rd</sup> Quarter	8	5	400	280	15	8	750	428
4 <sup>th</sup> Quarter	12	13	600	662	15	21	750	1074
Total	40	40	2000	2080	60	63	3000	3267
		<b>0%</b>	<b>+4%</b>		<b>+5%</b>		<b>+9%</b>	

<b>WHITING</b>								
	AGE samples				LENGTH samples			
	Nr of AGE samples		Nr of AGE readings		Nr of LENGTH samples		Nr of LENGTH measurements	
	planning	realised	planning	realised	planning	realised	planning	realised
1 <sup>st</sup> Quarter	7	6	350	300	10	17	500	1461
2 <sup>nd</sup> Quarter	5	6	250	300	10	18	500	1579
3 <sup>rd</sup> Quarter	5	6	250	300	10	8	500	1185
4 <sup>th</sup> Quarter	7	6	350	300	10	20	500	1480
Total	24	24	1200	1200	40	63	2000	5705
		<b>0%</b>		<b>0%</b>		<b>+58%</b>		<b>+188%</b>

<b>HERRING</b>								
	AGE samples				LENGTH samples			
	Nr of AGE samples		Nr of AGE readings		Nr of LENGTH samples		Nr of LENGTH measurements	
	planning	realised	planning	realised	planning	realised	planning	realised
1 <sup>st</sup> Quarter	38	3	950	75	38	3	1900	638
2 <sup>nd</sup> Quarter	36	37	900	925	36	37	1800	5579
3 <sup>rd</sup> Quarter	38	35	950	875	38	35	1900	4469
4 <sup>th</sup> Quarter	38	24	950	600	38	24	1900	3930
Total	150	99	3750	2475	150	99	7500	14616
		<b>-34%</b>		<b>-34%</b>		<b>-34%</b>		<b>+95%</b>

<b>MACKEREL</b>								
	AGE samples				LENGTH samples			
	Nr of AGE samples		Nr of AGE readings		Nr of LENGTH samples		Nr of LENGTH measurements	
	planning	realised	planning	realised	planning	realised	planning	realised
1 <sup>st</sup> Quarter	50	33	1250	825	50	33	2500	1896
2 <sup>nd</sup> Quarter	40	17	1000	425	40	17	2000	1446
3 <sup>rd</sup> Quarter	20	31	500	775	20	31	1000	2922
4 <sup>th</sup> Quarter	30	43	750	1075	30	43	1500	3993
Total	140	124	3500	3100	140	124	7000	10257
		<b>-11%</b>		<b>-11%</b>		<b>-11%</b>		<b>+47%</b>

<b>HORSE MACKEREL</b>								
	AGE samples				LENGTH samples			
	Nr of AGE samples		Nr of AGE readings		Nr of LENGTH samples		Nr of LENGTH measurements	
	planning	realised	planning	realised	planning	realised	planning	realised
1 <sup>st</sup> Quarter	60	29	1500	725	60	29	3000	1896
2 <sup>nd</sup> Quarter	60	19	1500	475	60	19	3000	1446
3 <sup>rd</sup> Quarter	30	18	750	400	30	18	1500	2922
4 <sup>th</sup> Quarter	80	59	2000	1475	80	59	4000	3993
Total	230	125	5750	3075	230	125	11500	10257
		<b>-46%</b>		<b>-46%</b>		<b>-46%</b>		<b>-11%</b>

<b>BLUE WHITING</b>								
	AGE samples				LENGTH samples			
	Nr of AGE samples		Nr of AGE readings		Nr of LENGTH samples		Nr of LENGTH measurements	
	planning	realised	planning	realised	planning	realised	planning	realised
1 <sup>st</sup> Quarter	24	6	600	150	24	6	1200	1647
2 <sup>nd</sup> Quarter	24	17	600	425	24	17	1200	2995
3 <sup>rd</sup> Quarter	6	7	150	175	6	7	300	2388
4 <sup>th</sup> Quarter	6	1	150	25	6	1	300	301
Total	60	31	1500	775	60	31	3000	7331
		<b>-48%</b>		<b>-48%</b>		<b>-48%</b>		<b>+144%</b>

<b>GREATER ARGENTINE</b>								
	AGE samples				LENGTH samples			
	Nr of AGE samples		Nr of AGE readings		Nr of LENGTH samples		Nr of LENGTH measurements	
	planning	realised	planning	realised	planning	realised	planning	realised
1 <sup>st</sup> Quarter	2	1	50	25	2	1	100	144
2 <sup>nd</sup> Quarter	14	10	350	250	14	10	700	924
3 <sup>rd</sup> Quarter	0	6	0	150	0	6	0	576
4 <sup>th</sup> Quarter	0	0	0	0	0	0	0	0
Total	16	17	400	425	16	17	800	1644
		<b>+6%</b>		<b>+6%</b>		<b>+6%</b>		<b>+106%</b>

	NORWAY LOBSTER				RAYS ssp.			
	Nr of LENGTH samples		Nr of LENGTH measurements		Nr of LENGTH samples		Nr of LENGTH measurements	
	planning	realised	planning	realised	planning	realised	planning	realised
1 <sup>st</sup> Quarter	2	0	400	0	24	16	600	545
2 <sup>nd</sup> Quarter	4	6	800	1987	24	11	600	285
3 <sup>rd</sup> Quarter	12	11	2400	4480	24	5	600	212
4 <sup>th</sup> Quarter	2	3	400	1321	24	18	600	549
Total	20	20	4000	7788	96	50	2400	1591
		<b>0%</b>		<b>+95%</b>		<b>-48%</b>		<b>-34%</b>

Details of the biological sampling for the **2002** market-sampling program as well as the survey sampling are presented in tables and figures. The Index of Tables and Figures by species is given after the Table of Contents in the beginning of this report. The table and figure numbers are kept identical for fast table and figure searching. The a, b, c and d after the table or figure numbers refer to respectively the 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> quarter.

The age and length samples will be used to construct age-length-keys (ALK's) by which a representative catch in tonnes can be converted into numbers by age group. Such ALK's can be constructed on a monthly, quarterly or yearly basis by (sub)area or areas combined and by market size category. The required level of stratification will be specified by the relevant ICES assessment Working Groups and differ by stock and also require desegregated information on the landing statistics by market size category of the sampling year. This information is not available at the time of production of this report and is therefore not included.

This report presents the actual biological sampling of the landings in 2002 compared to the planned market sampling according the 2002 work plan, but it does not include an evaluation of the sampling, because this is included in the "Technical Report of Activity 2002 – The Netherlands" (Anon., 2003).

#### 4.2. Age samples from Dutch research vessel surveys in 2002

During Dutch Research Vessel Surveys biological samples are taken from catches of various species to collect information on age, length and maturity. During these surveys (International Bottom Trawl Surveys (IBTS-1 and IBTS-3), Herring Echo Survey (Echo), North Sea Mackerel Egg Survey (Egg), Demersal Fish Survey (DFS), Beam Trawl Survey (BTS) and Sole Net Survey (SNS)) length distributions are collected. Age length-keys are used to convert these length distributions to numbers-at-age. In most cases these samples are stratified by rectangle or sampling area. In general a fixed number of otoliths are collected for each cm-group in each stratum.

Details of the biological sampling during research vessel surveys are given for 2002 in this report. The distribution of the samples is given both in tables and figures (see index of tables and figures after the Table of Contents).

Age samples collected from research vessel surveys are not used for the calculation of the catch in numbers at age based on the Dutch landings with the exception of cod and whiting.

The survey sampling in 2002 is summarised by survey in table 1b and by species in table 1c. Both tables present by quarter and by sample type the number of samples, length measurements and age readings.

#### 4.3. Discard samples taken on commercial vessels in 2002

In 2002 discard sampling was carried on board of beam trawlers and freezer trawlers in all quarters. The discard sampling in 2002 is summarised in table 1b, which presents by species, by quarter and by sample type the number of samples, length measurements and age readings.

Details of the biological sampling during discard trips are given for 2002 in this report. The distribution of the samples is given both in tables and figures (see index of tables and figures after the Table of Contents).

## 5. Literature

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## Annex 1

### MARKET SIZE CATEGORIES applied in Dutch auctions and the number of fish taken in 2002 by RIVO per size category for an age and length sample

Species	Market size category	From	To (not inclusive)	Nr of fish in one AGE sample	Nr of fish in one LENGTH sample
Sole	1	38 cm	and larger	10	-
Sole	2	33 cm	38 cm	10	-
Sole	3	30 cm	33 cm	10	-
Sole	4	27 cm	30 cm	10	-
Sole	5	24 cm	27 cm	10	-
Plaice	1	41 cm	and larger	15	-
Plaice	2	35 cm	41 cm	15	-
Plaice	3	31 cm	35 cm	15	-
Plaice	4	27 cm	31 cm	15	-
Turbot	1+	6 kg	and more	□	-
Turbot	1	4 kg	6 kg	10	-
Turbot	2	3 kg	4 kg	10	-
Turbot	3	2 kg	3 kg	10	-
Turbot	4	1 kg	2 kg	10	-
Turbot	5	0,5 kg	1 kg	10	-
Turbot	6	25 cm	0.5 kg	□	-
Brill	1+	2 kg	and more	□	-
Brill	1	40 cm (1 kg)	and larger (2 kg)	15	-
Brill	2	30 cm (0,4 kg)	40cm (1 kg)	15	-
Brill	3	25 cm	30 cm (0,4 kg)	15	-
Lemon sole	1	37 cm	and larger	□	-
Lemon sole	2	31 cm	37 cm	25	-
Lemon sole	3	25 cm	31 cm	□	-
Dab	1	30 cm	and larger	25	25
Dab	2	23 cm	30 cm	□	25
Whiting	1	40 cm	and larger	□	□
Whiting	2	36 cm	40 cm	□	□
Whiting	3	32 cm	36 cm	50 #	50 #
Whiting	4	27 cm	32 cm	□	□
Cod	1	88 cm	and larger	10	10
Cod	2	72 cm	88 cm	10	10
Cod	3	55 cm	72 cm	10	10
Cod	4	46 cm	55 cm	10	10
Cod	5 @	35 cm	46 cm	10	10
Norway lobster	1+	10 / kg	and less	-	□
Norway lobster	1	11 / kg	20 / kg	-	100
Norway lobster	2	21 / kg	30 / kg	-	100
Norway lobster	3	31 / kg	40 / kg	-	100
Norway lobster	4	41 / kg	and more	-	100
Norway lobster	5	only tails		-	100
Ray (Raja spp)	1	5 kg	and more	-	30
Ray (Raja spp)	2	3 kg	5 kg	-	30
Ray (Raja spp)	3	1 kg	3 kg	-	30
Ray (Raja spp)	4	0,3 kg	1 kg	-	30

□ Combined with the lower size category

□ Combined with the higher size category

@ Size category 5 can be split in two categories 5 and 6

# Whiting are usually sold unsorted