Report of the 1962 Iceland Trawl Mesh Selection Working Group

AMENDMENTS

Table 4, and Table 7, line re "Goncharov", column under "Goncharov", 50% Ret. Length should read 37.2 and Selection Factor should read 3.2.

Table 7, column headed "Goncharov", Sub-column headed 'Meshed' refers to numbers meshed at each cm length in the whole trawl, not just in the cod end.

p.2, para. 5. Add sentence "The Soviet experiments also included tests with a chafer of the same dimensions as the top side of the cod-end and laced mesh for mesh without an opening near the codline."

p.4, para. 4. After sentence 2, add "The Soviet conclusions were that their two types of chafer exerted the same influence on selectivity provided that the length of the mesh-for-mesh chafer was only half that of the modified ICNAF type.

p.6, para. 1, lines 2-7. Delete "In the case .....the selection range."

A. R. Margetts
30th April, 1963.

International Council for the
Exploration of the Sea

Report of the 1962 Iceland Trawl Mesh Selection Working Group

Introduction

Following a request from the Permanent Commission, the North-Western Working Group was set up in May, 1960 to investigate the state of the fish stocks in the northern part of the Convention Area outside the north-east Arctic. This Group was to analyse the effects on the fish stocks of further increases of mesh sizes above 110 mm.

During its work the Group felt the need for more selectivity data for some of the more important species and it therefore passes the following recommendation for the consideration of the Liaison Committee:-

> "1. Selectivity data for cod, haddock, redfish and coalfish in Icelandic waters are needed. It is thought that these could most effectively be obtained by an international experiment along the lines of those carried out in the North Sea and the Arctic in 1959 and 1960. Accordingly, the Group recommends that the attention of the Chairman of the Comparative Fishing Committee be drawn to this proposition at an early date, with a view to planning an experiment of this kind at the 1961 meeting of the Council".

This recommendation was adopted by the Comparative Fishing Committee at its 1961 meeting and Mr. Jón Jónsson was asked to act as Organizer of the experiment.

During the detailed planning he was assisted by Mr. A. R. Margetts who also undertook to work out the first results for presentation at the 1962 ICES Meeting.

The experiments were carried out during the months April to September, 1962.

As an outcome of co-operation between ICES and ICNAF, Canada also took part in the experiment.

At the 1962 ICES Meeting, Mr. Margetts gave a summary of the results obtained so far, and at that meeting it was decided to have the results worked out in full detail by a Working Group. This Group was to be composed of representatives of the countries which took part in the experiment. Mr. Jón Jónsson was made Convenor of this Group with special assistance by Mr. Margetts.

The Group met at Charlottenlund, Copenhagen, 3-7th December, 1962.

Participants:-
- Jón Jónsson (Convenor, Iceland)
- A. R. Margetts (England)
- H. Bohl (German Federal Republic)
- E. Bratberg (Norway)
- J. Pope (Scotland)
- A. I. Treschev (U.S.S.R.)
- L. K. Boerema (Liaison Committee)
- E. Akyuz (by special agreement with FAO).

Unfortunately a representative for Canada was not able to attend the meeting but his data with a preliminary working-up were available to the Group.

The Experiments

During the summer months of 1962 seven countries with eight ships took part in co-ordinated trawl mesh selection experiments in Icelandic waters.

The chief aim of the experiments was to establish the selectivity on the principal commercial species of double-braided manila trawl cod-ends. This was to be done by use of the covered cod-end technique. Further aims were the comparison of selectivities measured by the alternate or paired haul techniques with those measured by the covered cod-end technique, measurement of the selectivity of cod-ends made from various other commonly used materials, and investigation of the effect on selectivity of forms of cod-end top-side chafers.

Table 1 shows the types of ships that took part in the experiments, their gear and their working time at Iceland.

Country	Name	Ship			Trawl		Working dates	Working areas	No. of hauls
		Tons	Length m o.a.	H.P.	Type	Headline length m			
Iceland	María Julía	138	27.8	470	Granton	17	28/3-1/4	SW Iceland	13
"	" "						20-28/7	N Iceland	43
							6-8/8	S & W Iceland	32
Norway	G. O. Sars	600	52	1,200	"	20	10-13/5	SW Iceland	16
"	Johan Hjort	697	52.3	1,300	"	20	13-16/9	SW Iceland	8
Scotland	Explorer	862	61	1,200	"	24	16-25/6	N Iceland	26
Fed. Rep. Germany	Anton Dohrn	999	62.3	850	"	32	9-26/7	N,NW & WIceland	62
U.S.S.R.	Goncharov	3,000	80	2,000	"	35	27/7-28/8	N & NW Iceland	26
England	ERNEST HOLT	604	59	900	"	25	20-28/7	N Iceland	51
Canada	A.T.Cameron						20-28/7	N Iceland	51

The ships were of three classes, the large stern-trawler GONCHAROV, the small cutter-type side trawler MARIA JULIA, and the others all side trawlers of similar size to each other.

In July ERNEST HOLT, A. T. CAMERON and MARIA JULIA fished simultaneously on the same grounds, otherwise ships worked individually.

G. O. SARS, JOHAN HJORT, EXPLORER, ANTON DOHRN, and GONCHAROV made only covered hauls. MARIA JULIA made mostly covered hauls with some alternate hauls, while ERNEST HOLT and A. T. CAMERON each made some covered hauls but took advantage of their fishing together to make paired alternate hauls, one ship fishing a small mesh simultaneously with the other fishing a large mesh, and each ship changing from large to small mesh and vice versa after two hauls. ERNEST HOLT, A.T.CAMERON, MARIA JULIA, G. O. SARS and JOHAN HJORT used only manila cod-ends. ANTON DOHRN used manila and Perlon, EXPLORER manila and nylon, and GONCHAROV manila and capron. GONCHAROV was the only ship to employ a top-side chafer and to make comparative hauls with and without the chafer.

All covered cod-end hauls were made with top-side covers of 35-70 mm mesh made of polythene, hemp or polyamide, and all except the nylon cod-end used by EXPLORER and the Norwegian cod-ends were with the bottom side of the cod-end blinded on the inside.

The Russian top-side chafer was a modification of the ICNAF type; its specifications were that it was of the same mesh size as the cod-end, of the same length, fixed at the forward end and two sides and open at the rear, and laced mesh for mesh at the forward end of the cod-end at 100 meshes width but maintaining its 100 meshes width where the cod-end tapered to and remained at 80 meshes.

The great majority of the hauls were of duration between one and two hours. Fish were measured to the nearest cm, the lengths being total except by Canada (fork length) and without the lobes of the tail fin smoothed down except by Scotland. Girth measurements were made of samples, either or both of the natural maximum body girth or maximum head girth (around rear edge of operculum) being recorded.

Weather conditions during the course of the experiments were mostly very fine indeed.

In the absence of the official ICES gauge, meshes were measured with other spring-loaded gauges which were subsequently calibrated against the ICES gauge.

The Data

The data collected were on selection of cod, haddock and redfish (type marinus) by cod-ends made of double manila, double capron, double nylon and double perlon. In nearly all cases the data collected were insufficient to derive selection curves for single hauls and, therefore, comparable hauls were grouped together. In most cases this meant combining hauls made in the same area within a short period of days. Exceptions to this were some data from ANTON DOHRN, MARIA JULIA and G. O. SARS, which were combined from different localities. Where data were so combined, this was justified by the similarity of the length composition of the catches in the separate localities.

The selection curves were drawn for covered, alternate and paired hauls. The percentages retained in the cod-end at each centimetre length were plotted, and the curves were fitted to these points by eye. The 50% lengths, as well as the selection ranges, were read off the so constructed curve. These figures are given in Tables 2-4 which also contain other items of information recommended as relevant in the report of the ICES Mesh Selection Working Group (ICES, 1963). In these tables, values followed by a question mark indicate the rather unreliable results which were obtained from meagre or variable data. The selection range values were rounded to the nearest centimetre and the number of fish in the selection range for cod-end and cover were rounded to the nearest ten fish. The 50% lengths for haddock caught by A. T. CAMERON, measured fork length, were adjusted to total length.

The quantities caught in the cod-end and cover were weighed aboard A. T. CAMERON, EXPLORER and GONCHAROV, basketed on ANTON DOHRN, ERNEST HOLT and G. O. SARS and counted on MARIA JULIA.

The grouped data from which selection factors were calculated are given in Tables 5, 6 and 7.

During the course of experiments, girth measurements were made on board A. T. CAMERON (cod, haddock and redfish, head and maximum body girth), EXPLORER (cod and haddock, head girth), ANTON DOHRN (redfish types marinus and mentella, maximum body girth), and MARIA JULIA (cod and haddock, maximum body girth). The average girths at lengths are given in Tables 8, 9 and 10.

Data were collected and recorded separately for redfish meshed in the cod-end. (Table 7). These data were, however, included with the cod-end catches in calculating the selectivity values.

In general, although there were exceptions, the experiments were not conspicuously successful and the quality of data and results was not always as good as might be desired. The most obvious reason for this was that in the covered cod-end experiments the selection range of the mesh in use frequently did not match well with the length distribution of the fish available, and in the alternate haul experiments there were very marked differences between the length distributions of the fish being caught on the same ground from haul to haul. Thus, with the numbers of hauls often being rather few, the selection curves and the 50% points were not always clearly defined. A notable exception to this was ANTON DOHRN redfish, and, amongst the other data, some such as GONCHAROV cod, MARIA JULIA and ERNEST HOLT cod with large mesh, EXPLORER and ERNEST HOLT N. Iceland haddock, and MARIA JULIA S.E. Iceland haddock yielded more definite results than the remainder. So, in considering all the results in tables 2-4, it is reasonable to attribute a substantial amount of the variation in selection factors to experimental variation.

Conclusions

1. Cod. Nine sets of data gave selection factors for covered cod-ends of double manila, of which two are of doubtful validity. The ordinary unweighted average of these nine values is 3.2 which is unaltered if the two less reliable figures, 2.8 and 3.3, are omitted. The range of selection factors is 2.8 to 3.4 The summary tables do not point to any relationship between size of catch and selection factor, but the grouping of the data in the summary tables could mask any such effect. However, in the cases where it was possible to examine smaller groupings, there was no apparent effect of catch size on selectivity.

The average value of 3.2 for the selection factor is close to the average (3.3) of results previously available for the Icelandic region. (ICES, 1963.) The present figure is lower than those available for any other region.

Selection ranges varied from 8 to 18 cm with an average value of 13 cm. The selection ranges show a tendency to increase with the extreme range of mesh sizes in the cod-end. The relationship between selection range and average mesh size is somewhat more marked. No correlation was evident between mesh size and extreme mesh range.

Selection factors from paired and alternate hauls are less reliable due to the marked variation between hauls both in length composition and in quantity caught, to the small number of hauls, and also, in the case of A. T. CAMERON at Skalfandi, to accumulations of Laminaria in the cod-end. Such figures as were obtained, however, show that in this experiment the selection factors from paired hauls are somewhat lower than those from covered hauls while that from the alternate hauls is considerably higher.

Selection factors were also obtained for the polyamide materials capron and nylon, the former material being used in cod-ends fitted both with and without top-side chafers. There is no evidence that the type of chafer used by GONCHAROV influenced the selection of cod. The selection factors for the polyamide materials are higher than the average for double manila, and the differential calculated within ships is close to, but lower than 10%.

The selection ranges for the synthetic cod-ends also show an increase with both range of mesh size and average mesh size, although for these cod-ends mesh size and mesh range are positively related.

Girth measurements of cod at Iceland were taken on A. T. CAMERON, MARIA JULIA and EXPLORER. (Table 6.) It appears that N. Iceland cod is, in shape, intermediate between North Sea (Margetts, 1957) and Arctic cod (1959 International Arctic trawl mesh experiments; ICES, 1963). There appears to be no substantial cod shape differences between N. Iceland fishing grounds such as to affect selection. The regressions of girth on length are similar, so a comparison of girths can conveniently be made at an arbitarily chosen length, in this case 50 cm as being near the 50% lengths in Arctic and Iceland experiments. There were differences between the various ships' girth measurements both at Iceland and in the Arctic, but it is seen that the two independent measurements at Iceland both give a head girth measurement at length 50 cm (23.7 and 24.0 cm), appreciably greater than the biggest Arctic measurements (21.8, 21.2 and 23.1 cm) and about 2 cm greater than the mean of the Arctic measurements. The maximum body girth at length 50 cm measured at Iceland (24.0 and 26.2 cm) was similar to, or rather bigger than, the comparable Arctic measurements (22.6, 23.8 and 25.0 cm). The maximum body girth measurement is affected by such as feeding and "blown" condition, but it is the only one available for comparison of North Sea and Iceland cod, and, as such, shows North Sea cod measured on an English ship to have about the same girth as Iceland cod measured on A. T. CAMERON and MARIA JULIA.

The foregoing results are all from hauls made off the north coast of Iceland in the summer. Differences in shape and condition of cod between north and south Iceland are known to exist, the fish in the south generally being thicker, length for length, than those in the north. It would accordingly be expected that selectivity in the south would be lower than in the north. Seasonal differences within the northern area are unlikely to affect selectivity appreciably.

The mean of all the Arctic cod covered double manila trawl cod-end mesh selection factors from the ICES Mesh Selection Working Group report was 3.5. (Note: that report considers that, allowing for cover effects and catch size, the true factor might be 3.7). The comparable factors for North Sea and Iceland cod, both from limited experimental evidence, were both 3.4; the new evidence from 1962 indicates a selection factor for Iceland of 3.2 which is 8.5% below the Arctic factor while the head girth at Iceland was 9% greater than in the Arctic. Body girth measurements suggest that the North Sea cod selection factor should be about the same as the Iceland factor; such limited experimental

evidence as exists indicates it to be rather higher, but the difference could well be due to experimental variation.

2. Haddock. The data yielded sixteen estimates of the selection factor for covered cod-ends of double manila ranging from 3.0 to 3.6 with an unweighted average of 3.35. These results came from hauls taken both off the north and off the south coast of Iceland and no significant differences were found between these two areas. The data were not sufficient to analyse the relationship between catch size and selection factor. The average selection factor is higher than that of 3.2 calculated from previously available data for the Icelandic area and also higher than those for all other ICES areas for which data are available, although not very different from that for the Arctic. (ICES, 1963.) The reasons for this difference are not known, but the range of results suggests that at least not all of the difference is due to experimental variation in 1962.

The selection ranges from the covered double manila hauls vary from 4 to 13 cm with an average value of 9 cm, of which most of the lower values are considered doubtful. There is a clear relation between selection range and mesh size, the selection range increasing with the mesh size. On the other hand there is no relationship between selection range and the extreme range of mesh sizes in the cod-end.

Selection factors for double capron again do not show any real evidence of an effect on selection factor of the top-side chafer used by GONCHAROV.

EXPLORER data show the selectivity on haddock of double nylon to be about 10% higher than that of double manila, but GONCHAROV data indicate no selectivity difference between these two materials on haddock.

The polyamide materials show a relationship between selection range and mesh size similar to that for double manila. hese materials a relationship is also found between selection range and extreme range of mesh sizes, the latter being directly related to average mesh size for nylon and capron.

Girth measurements of haddock at Iceland were taken on thr of the ships; on two of these the maximum body girths were measured and these at total length 50 cm (25.6 and 27.7 cm) were of the same order as for North Sea haddock (27.2 cm, Margetts, 1954). Comparable Arctic haddock girth measurements are not available.

3. Redfish. The calculated selection factors for covered double manila hauls range from 2.2 to 3.2. In respect of this wide variation the present experiment is in agreement with previous experiments elsewhere.

The results obtained by ANTON DOHRN, when hauls are grouped according to total cod-end catch sizes above and below 500 kg, indicate lower selectivity with higher catches. The data tend to support the earlier observations (ICES, 1963) that there is an increase in selection factor with mesh size.

The selection ranges were difficult to derive in most cases, but reliable estimates indicate a selection range of about 16 cm.

Selection factors obtained for cod-ends of polyamide materials lie within the upper part of the range of selection factors for double manila. However, within-ship comparisons indicate no difference between polyamide and manila. It is noted that the selection factors greater than 3.0 were all obtained from the area SW Iceland while the values lower than this were obtained from W and N Iceland, but this could well be an experimental effect.

Redfish meshed in the cod-end were recorded separately on ANTON DOHRN and GONCHAROV. In ANTON DOHRN hauls, appreciable meshing (more than 5% meshed at any centimetre length) was confined to a length range extending over 12-15 cm. On plotting smoothed percentage meshed against length it was seen that, in the two manila cod-ends, at any centimetre length, the meshed proportion of the fish held by the cod-end rose to about 26% and 15% respectively, being above 10% over a length range of 6-11 cm. In the two perlon cod-ends, the proportion meshed

reached 20% and 30% respectively, and the length range of more than 10% meshed was 9 cm. In the case of GONCHAROV the meshing size range extended over 20 cm. Over 6 cm of this range about 50% of the fish held by the codend were meshed, and over much of the remainder of the range over 20% were meshed. In the case of ANTON DOHRN the length range where most fish were meshed was in the upper part of the trawl cod-end selection range while in GONCHAROV it extended over almost all of the selection range. ANTON DOHRN, per haul, caught larger numbers of fish in the selection range than did GONCHAROV. The pattern of meshing in the cod-end was similar to that of gill-net selection.

Comment

In these experiments a considerable amount of fishing time was devoted by A. T. CAMERON and ERNEST HOLT, and rather less by MARIA JULIA, to measuring selectivity by the alternate and paired haul technique. By considering hauls within ships the data from all three ships could be treated as for alternate hauls; by considering hauls of A. T. CAMERON and ERNEST HOLT together they could be treated as for paired hauls since it was arranged that while one ship was using big mesh the other was using small mesh. Yet the results achieved were some of the least satisfactory in a series of experiments which yielded quite a lot of rather uncertain results. The fundamental reason for this was that the length distribution and quantities of fish from place to place at quite short distances and even on one ground between different times varied very markedly. This meant that the alternate hauls were almost useless while the paired hauls were rather better yet to give clear results needed many more hauls than were possible. Plotting of selection curves and interpretation of even approximate 50% points was so unsure that it was thought best not to include suggested results from alternate hauls in the report table.

A feature of the selection curves plotted for the Iceland mesh experiments, and one also of the Barents Sea selection curves earlier (ICES, 1963), was that very frequently they did not smoothly approach the zero retained level, but rather there was a band of cm lengths where the percentage retained would have been expected to be near zero but where it was in fact around the 25% retained level. This may be a masking effect, but due not so much to the cover as to other fish in the catch. It would therefore be expected to be a real occurrence rather than an experimental artefact.

References

I.C.E.S., 1963. Mesh Selection Working Group. Coop. Res. Rep. No. 2.

Margetts, A. R. (1957) The length-girth relationships in whiting and cod and their application to mesh selection. I.C.E.S, Journ. du Conseil, 23 (1): 64-71.

Margetts, A. R. (1954) The length-girth relationships in haddock and whiting and their application to mesh selection. I.C.E.S., Journ. du Conseil, 20 (1): 56-61.

SPECIES: COD

Ship	Gear	Date	Locality	Material	Runnage m/kg	Method	Mesh size (mm)			50% length
							mean	range	s.e. of mean	
A. T. Cameron		24-25/7 62	N. Iceland	D. Manila		Cover	120 +)			35.0
Anton Dohrn		9-14/7 62	N. + NW. Iceland	D. Manila	163	Cover	138	129-146		40.2
Explorer		16-20/6 62	N. Iceland	D. Manila		Cover	112	99-123		37.6
		22-25/6 62	N. Iceland	D. Manila		Cover	127	113-163		40.1
		21-22/6 62	N. Iceland	D. Manila		Cover	132	119-149		42.9 ?
Goncharov		28/7 62	N. Iceland	D. Manila		Cover	141 +)	122-155		49.0
Ernest Holt		24-25/7 62	N. Iceland	D. Manila		Cover	132	113-143		37.5 ?
María Julía		26-27/7 62	N. Iceland	D. Manila		Cover	117	104-134		39.0
		25/7 and 12-13/8 62	N. + NW. Iceland	D. Manila		Cover	138	117-153		47.0
A. T. Cameron		20-21/7 62	NW. Iceland	D. Manila		Paired	120			32 ?
Ernest Holt		26-27/7 62	N. Iceland	D. Manila		Paired	132	113-143		42 ?
María Julía		23-27/7 62	N. Iceland	D. Manila		Alternate	97	82-113		39.8 ?
Explorer		18-21/6 62	N. Iceland	D. Nylon		Cover	89	80-95		31.0 ?
Goncharov		27/7 62	N. Iceland	D. Capron		Cover	125 +)	111-141		44.7
		29-30/7 62	N. Iceland	D. Capron x)		Cover	108 +)	102-118		44.0
		28-29/7 62	N. Iceland	D. Capron x)		Cover	126 +)	113-150		41.5

x) with topside chafers (ICNAF type)

+) not corrected to ICES gauge.

Sel. factor	Sel. range (cm)	No. of hauls	Av. duration of tow (min.)	Towing speed (knots)	Average per haul Tot. weight of catch (kg)		Total of all hauls No. of fish in S.R.	
					C.E.	Cr.	C.E.	Cr.
2.9	11	9	6o	3.5	2447	268	28●o	186o
2.9	12	17	84	4.o	555	16o	5oo	3●o
3.4	8	7	6o	4	366	132	18o	17o
3.2	16	8	6o	4	674	177	●3o	37o
3.3 ?	18	3	6o	4	552	3o9	6o	9o
3.4	12	5	9o	3.5	1451	844	34o	37o
2.8 ?	16 ?	6	6o	3.5	264o	31o	324o	2ooo
3.3	12	6	6●	3.5	-	-	11o	11o
3.4	16	12	6o	3.5	-	-	66o	92o
2.7 ?	12 ?	8	6o	3.5	628		3●o	
3.2 ?	8 ?	4	6o	3.5	755		34o	
4.1 ?	8 ?	1o	54	3.5	-	-	95	
3.5 ?	8 ?	5	6o	4	475	56	2o	4o
3.6	13	5	8o	3.5	1144	119	44o	32o
4.1	7	3	8o	3.5	1364	489	33o	39o
3.3	13	5	85	3.5	152●	5o1	7oo	●4o

SPECIES: HADDOCK

Ship	Gear	Date	Locality	Material	Runnage m/kg	Method	Mesh size (mm)			50% length
							mean	range	s.e. of mean	
A. T. Cameron		24-25/7 62	N. Iceland	D. Manila		Cover	120 +)			35.5
Anton Dohrn		9-14/7 62	N. & NW. Iceland	D. Manila	163	Cover	138	129-146		42.2
Explorer		16-20/6 62	N. Iceland	D. Manila		Cover	112	99-123		35.6
		22-25/6 62	N. Iceland	D. Manila		Cover	127	113-143		41.6
Goncharov		28/7 62	N. Iceland	D. Manila		Cover	141 +)	122-155		50.0
Ernest Holt		24-25/7 62	N. Iceland	D. Manila		Cover	132	113-143		46.0
María Julía		24-27/7 62	N. Iceland	D. Manila		Cover	117	104-134		39.0
		28/3-1/4 62	SW. Iceland	D. Manila		Cover	126			42.4
		6-17/8 62	S. & SW. Iceland	D. Manila		Cover	138	119-153		48.0
		25/7 and 12-13/8 62	N. & NW. Iceland	D. Manila		Cover	138	117-153		49.6
G. O. Sars		10-11/5 62	SW. Iceland	D. Manila		Cover	98	87-112		31.0
		10+13/5 62	S. & SW. Iceland	D. Manila		Cover	99	92-109		35.4
		12/5 62	SW. Iceland	D. Manila		Cover	103	91-119		34.0
		10+13/5 62	S. & SW. Iceland	D. Manila		Cover	104	91-124		36.2
		10-11/5 62	SW. Iceland	D. Manila		Cover	120	102-134		38.8
		12-13/5 62	SW. Iceland	D. Manila		Cover	122	107-138		41.2
Explorer		18-21/6 62	N. Iceland	D. Nylon		Cover	89	80-95		32.1
Goncharov		27/7 62	N. Iceland	D. Capron		Cover	125 +)	111-145		45.3
		29-30/7 62	N. Iceland	D. Capron x)		Cover	108 +)	102-118		56.7 ?
		28-29/7 62	N. Iceland	D. Capron x)		Cover	126 +)	113-150		42.5

x) with topside chafers (ICNAF type).

+) not corrected to ICES gauge.

Sel.factor	Sel. range (cm)	No. of hauls	Av. duration of tow (min.)	Towing speed (knots)	Average per haul Tot. weight of catch (kg)		Total of all hauls No. of fish in S.R.	
					C.E.	Cr.	C.E.	Cr.
3.o	1o ?	9	6o	3.5	2447	268	39o	83o
3.1	12	16	83	4	52o	15o	38o	34o
3.2	9	7	6o	4	366	132	3oo	39o
3.3	11	8	6o	4	674	177	16o	18o
3.5	13	5	97	3.5	1451	844	336o	293o
3.5	1o	11	6o	3.5	264o	31o	33o	35o
3.3	9	6	6o	3.5	-	-	27o	17o
3.4	11	13	56	3.5	-	-	94o	88o
3.5	13	14	6o	3.5	-	-	84o	81o
3.6	12	12	6o	3.5	-	-	27o	32o
3.2	4 ?	4	48	4.o	2455	85	5o	5o
3.6	5 ?	2	45	3	11oo	11o	4o	6o
3.3	6 ?	3	25	4	825	192	3o	4o
3.5	5	2	45	4	1818	238	9o	5o
3.2	9	3	41	4	175o	493	44o	36o
3.4	9 ?	2	45	3.5	1575	363	18o	12o
3.6	5	5	6o	4	475	56	2oo	36o
3.5	11	5	8o	3.5	1144	119	1oo	8o
3.4 ?	9 ?	3	8o	3.5	1364	489	3oo	2oo
3.4	11 ?	5	85	3.5	1526	5o1	25o	24o

SPECIES: REDFISH[x]

Ship	Gear	Date	Locality	Material	Runnage m/kg	Method	Mesh size (mm) mean	Mesh size (mm) range	Mesh size (mm) s.e. of mean	50% length
Anton Dohrn		14-17/7 62	W. Iceland	D. Manila	163	Cover	139	129-146		39.6
		24-26/7 62	SW. Iceland	D. Manila	12o	Cover	149	14o-164		46.9
Explorer		16-2o/6 62	N. Iceland	D. Manila		Cover	112	99-123		24.8 ?
		22-25/6 62	N. Iceland	D. Manila		Cover	127	113-143		27.5
		21-22/6 62	N. Iceland	D. Manila		Cover	132	119-149		36.9
Johan Hjort		13/9 62	SW. Iceland	D. Manila		Cover	1o8	86-125		35.o ?
Anton Dohrn		17-2o/7 62	W. Iceland	D. Perlon	21o	Cover	132	124-139		38.5
		21-23/7 62	SW. Iceland	D. Perlon	2oo	Cover	143	135-15o		43.9
Explorer		18-21/6 62	N. Iceland	D. Nylon		Cover	89	8o-95		24.1 ?
Goncharov		5/8 62	W. Iceland	D. Capron		Cover	118	1o7-125		34.2

x of type marinus, except for "Goncharov" which included a small percentage of mentella.

Sel.factor	Sel.range (cm)	No. of hauls	Av.duration of tow (min.)	Towing speed (knots)	Average per haul Tot. weight of catch (kg)		Total of all hauls No. of fish in S. R.	
					C.E.	Cr.	C. E.	Cr.
2.9	16	11	1o8	4	435	292	268o	367o
3.1	15 ?	1o	174	4	661	665	2ooo	27oo
2.2 ?	7 ?	6	6o	4	366	132	5o	4o
2.2	16	8	6o	4	674	177	228o	2ooo
2.8	15 ?	3	6o	4	552	3o9	5oo	33o
3.2 ?	5 ?	2	75	3	595	185	2o	2o
2.9	16	17	1oo	4.o	659	493	8o8o	1249o
3.1	15 ?	7	137	4.o	558	481	122o	174o
2.7 ?	6 ?	3	6o	4	475	56	7o	6o
2.9	8	3	6o	3.5	258	24o	51o	43o

TABLE 5

Species	Cod			Cod			Cod		
Ship	"Anton Dohrn"			"A. T. Cameron"			"A. T. Cameron"		
Area	N + NW Iceland			Skjalafandi			N. Iceland		
Date	9-14/7/1962			24-25/7/1962			July 1962		
Codend	D Manila			Manila coveral			D Manila		
Mean mesh size (mm)	138			120			120		
Method	Cover			Cover			Paired haul		
No. of hauls	17						8		
Haul duration (mins)	84						60		
Average total catch (kg)	555	160							
Length (cm)	C.E.	Cov.	%	C.E.	Cov.	%	A.T.C. 120 mm	E.H. 75 mm	120 mm 75 m %
20					2				
21					2			1	
22					6				
23		1	0.0		13		1	1	100
24	1	4	20.0	4	24	14		1	
25	3	13	18.8	3	47	6	1	10	10
26	5	10	33.3	13	91	12	4	9	44
27	6	18	25.0	23	138	14	12	26	46
28	15	34	30.6	30	138	18	13	27	48
29	8	36	18.2	29	154	16	19	52	37
30	5	33	13.2	48	127	27	38	77	49
31	4	19	17.4	64	134	32	25	85	29
32	11	12	47.8	59	109	35	31	62	50
33	3	14	17.6	74	103	42	28	62	45
34	6	18	25.0	88	122	42	36	61	59
35	8	22	26.7	137	130	51	52	55	95
36	13	30	30.2	194	166	54	55	73	75
37	17	29	37.0	326	206	61	68	92	74
38	28	42	40.0	464	219	68	93	103	90
39	34	39	46.6	622	264	70	132	130	102
40	40	47	46.0	803	278	74	175	163	107
41	48	39	55.2	891	315	74	197	173	114
42	55	47	53.9	949	250	79	185	194	95
43	76	30	71.7	917	226	80	197	204	97
44	75	30	71.4	854	165	84	187	188	99
45	62	29	68.1	700	101	87	161	167	96
46	45	11	80.4	666	66	91	149	144	103
47	57	13	81.4	644	45	93	118	122	97
48	57	10	85.1	466	43	92	91	107	85
49	65	11	85.5	457	18	96	85	80	106
50	66	12	84.6	321	6	98	65	71	92
51	79	5	94.0	297	15	95	63	57	111
52	79	7	91.9	294	14	95	57	50	114
53	70	7	90.9	250	4	98	56	43	130
54	108	8	93.1	233	3	99	69	40	172
55	90	13	87.4	212	4	98	41	42	98
56	120	7	94.5	205	2	99	37	43	86
57	100	6	94.3	199	2	99	44	33	133
58	117	7	94.4	190	3	98	39	35	111
59	115	4	96.6	149	1	99	34	40	85
60	84	3	96.6	132		100	40	38	
61	76	4	95.0	125		100	31	31	
62	66	-	100.0	171	2	99	29	22	
63	55	2	96.5	133		100	30	21	
64	48	2	96.0	109		100	19	15	
65	38		100.0	85		100	22	14	
66	36		100.0	93		100	18	9	
67	39		100.0	76		100	12	9	
68	32		100.0	28		100	14	8	
69	32		100.0	52		100	11	9	
≥ 70	573		100.0	339		100	137	91	
TOTAL	2770	728		13218	3758		3021		
50% Length cm	40.2				35				
Selection Range cm	12								
Selection Factor	2.9				2.9				

-TABLE 5 (Cont'd)

Species	Cod	Cod	Cod
Ship	"Ernest Holt"	"Ernest Holt"	"Explorer"
Area	Skjalafandi	N. Iceland	Iceland
Date	24-25/7/1962	July 1962	
Codend	Manila coveral	D. Manila	D. Manila
Mean mesh size (mm)	132	132	112.2
Method	Cover	Paired haul	Cover
No. of hauls		4	7
Haul duration (mins)		60	
Av. total catch (kg)			

Length (cm)	C.E.	Cov.	%	E.H. 132 mm	A.T.C. 50 mm	132x2% / 50 mm	C.E.	Cov.	%
≤ 20									
21								3	
22								4	
23								16	0
24		1	0				3	41	7
25	2		100				3	34	8
26	2	1	67				6	66	8
27	4	5	44				7	52	12
28	16	11	59				5	43	10
29	2	28	7				6	33	15
30	12	33	27		≤ 30	61	3	35	8
31	18	45	29			16	8	21	28
32	20	45	31			14	3	21	12
33	34	52	40			13	4	14	22
34	42	47	47			14	16	18	47
35	32	54	37	1		24 8	12	15	44
36	38	61	38	3		32 19	14	25	36
37	94	92	51	7		47 30	21	27	44
38	180	139	56	17		74 46	28	31	47
39	216	179	55	12		99 24	27	16	63
40	316	172	65	21		143 29	34	15	69
41	384	224	63	32		177 36	27	10	73
42	458	268	63	41		185 44	28	6	82
43	474	223	68	66		183 72	31	3	91
44	520	180	74	70		206 68	19	-	100
45	468	170	73	84		173 97	14	2	88
46	448	145	76	82		179 92	7	-	100
47	432	110	80	72		167 86	7	1	88
48	386	82	82	45		136 66	9		100
49	302	77	80	62		127 98	12		
50	292	52	85	49		140 70	10		
51	262	47	85	47		112 84	6		
52	302	23	93	65		99 131	8		
53	292	35	89	54		113 96	7		
54	322	14	96	46		90 102	1		
55	330	10	97	44		95 93	5		
56	296	10	97	53		94 113	4		
57	266	7	97	31		87 71	5		
58	242	10	96	42		106 79	6		
59	268	4	98	44		94 94	≥ 3		
60	198	5	98	45		76 118	60 cm 63		
61	298	3	99	24		95 51			
62	272	1	100	20		74 54			
63	246	2	99	32		65 98			
64	180	2	99	29		47 123			
65	142	3	98	8		49 33			
66	104		100	9		49 37			
67	126	1	99	12		33 73			
68	60		100	7		21 67			
69	66		100	10		24 83			
≥ 70	482		100	79		131 121			
TOTAL	9946	2673		1365		3764	472	552	
50% Length cm	38.5							37.6	
Sel. range cm								8	
Sel. factor	3.0							3.4	

TABLE 5 (Cont.d.)

SPECIES	Cod			Cod			Cod		
Ship	"Explorer"			"Explorer"			"Explorer"		
Area	Iceland			Iceland			Iceland		
Date									
Codend	D. Manila			D. Manila			D. Nylon		
Mean mesh size (mm)	126.8			131.6			89.1		
Method									
No. of hauls	8			3			5		
Haul duration (mins)									
Av. total catch (kg)									
Length (cm)	C.E.	Cov.	%	C.E.	Cov.	%	C.E.	Cov.	%
≤ 20		1							
21		1	0		1			1	
22	2	11	15		1			3	
23	4	7	36		7			1	
24	2	16	11		4	0		6	0
25	12	22	35	2	3	40	2	4	33
26	10	25	29	3	10	23	3	6	33
27	6	26	19	2	4	33	1	11	8
28	7	31	18	2	5	29	4	4	50
29	7	21	25	1	7	12	5	8	38
30	7	27	21	4	6	40	3	2	60
31	6	20	23	2	5	29	3	6	33
32	3	6	33	-	4	0	4	4	50
33	9	7	56	1	3	25	3	-	100
34	8	18	31	2	5	29	-	2	0
35	13	28	32	3	4	43	3	3	50
36	15	25	38	2	4	33	14	1	93
37	14	37	27	-	7	0	8	4	67
38	27	35	44	7	7	50	10	1	91
39	21	31	40	-	4	0	7	1	88
40	42	41	51	5	11	31	7	1	88
41	32	34	48	2	9	18	13	-	100
42	33	21	61	5	9	36	6		
43	30	16	65	2	4	33	1		
44	36	9	80	6	3	67	4		
45	30	12	71	4	4	50	1		
46	14	12	54	5	2	71	4		
47	17	4	81	4	2	67	1		
48	27	3	90	6	3	67	4		
49	28	2	93	6	2	75	1		
50	32	9	78	9	2	82	2		
51	36	2	95	13	1	93	3		
52	37	1	97	15	2	88	7		
53	32	-	100	5	1	83	1		
54	38	3	93	10	1	91	3		
55	33	1	97	17	2	89	3		
56	31	-	100	15	-	100	6		
57	31	-	100	17			5		
58	31	1	97	8			7		
59	20	-	100	12			5		
60	≥ 60 cm 371			≥ 60 cm 204			≥ 60 cm 150		
61									
62									
63									
64									
65									
66									
67									
68									
69									
≥ 70									
TOTAL	1154	566		401	150		304	69	
50% Length cm	40.1			42.9?			31.0?		
Sel. range cm	16			18			8?		
Sel. factor	3.2			3.3?			3.5?		

TABLE 5 (Cont'd)

Species	Cod	Cod	Cod
Ship	"Goncharov"	"Gonchavov"	"Goncharov"
Area	N. Iceland (8)	N. Iceland (8)	N. Iceland (8)
Date	28.7.1962	27.7.1962	29-30/7/1962
Codend	D. Manila	D. Capron	D. Capron with chafer
Mean mesh size (mm)	141	125	108
Method	Cover	Cover	Cover
No. of hauls	5	5	3
Haul duration (mins)	97	80	80
Average total catch (kg)	1451	1144	1364

Length (Cm)	C.E.	Cov.	%	C.E.	Cov.	%	C.E.	Cov.	%
≤ 20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30	≤ 30 cm 27	604	4	≤ 30 cm 2	51	4	≤ 30 cm 23	509	4
31	2	54	4		1		2	39	5
32	5	55	8	1	3	25	3	41	7
33	2	29	6		6		2	29	4
34	3	46	6	1	4	20	1	21	5
35	18	52	26		4		15	31	33
36	1	49	2		4		10	27	27
37		41		2	8	20	5	32	14
38	6	46	12	4	10	29	7	25	22
39	10	65	13	6	11	35	26	50	34
40	38	80	32	14	29	33	53	107	33
41	11	57	16	9	22	29	23	53	30
42	23	58	28	20	28	42	36	55	40
43	12	40	23	26	30	46	46	48	49
44	27	47	36	27	26	51	29	37	44
45	39	55	41	40	35	53	78	31	72
46	26	50	34	38	36	51	38	12	76
47	58	14	81	48	22	69	54	5	92
48	13	21	38	33	22	61	27	6	82
49	13	14	48	32	18	64	45	1	98
50	35	21	62	64	22	74	91	4	96
51	26	9	74	33	13	72	28	3	90
52	22	21	52	47	7	87	30		100
53	22	7	76	41	7	86	18		100
54	31	14	69	43	12	78	23		100
55	61	15	80	83	10	89	69	1	99
56	58	10	85	62	10	86	55		100
57	71	8	90	81	8	91	48	1	98
58	56	6	90	60	10	86	51		100
59	52	2	96	46	3	94	22		100
60	140	4	96	157	10	94	81		100
61	87	6	94	87	4	96	51		100
62	68	2	97	115	7	94	57		100
63	53		100	80	3	96	34		100
64	61	3	95	88	2	98	35		100
65	95	3	97	139	3	98	74		100
66	43		100	83		100	32		100
67	79	1	99	85	2	98	27		100
68	59	2	97	73	1	99	34		100
69	39		100	60	2	97	12		100
≥ 70	536	2	100	589	3	99	201		100
TOTAL	1988	1613		2419	509		1613	1068	
50% Length cm	49			44.7			44.0		
Sel. range cm	12			13			7		
Selection factor	3.4			3.6			4.1		

TABLE 5 (Cont'd.)

Species	Cod			Cod			Cod			Cod		
Ship	"Goncharov"			"Maria Julia"			"Maria Julia"			"Maria Julia"		
Area	N. Iceland (8)			N. Iceland			N & NW Iceland			N. Iceland		
Date	28-29/7/1962			24-27/7/62			25/7&12-13/8/62			July 1962		
Codend	D Capron w. chafer			D. Manila			D. Manila			D. Manila		
Mean mesh size (mm)	126			117			138			97		
Method	Cover			Cover			Cover			Alternate haul		
No. of hauls	5			6			12			10		
Haul duration (mins)	85			60			60			54		
Av. total catch (kg)	1526											
Length (cm)	C.E.	Cov.	%	C.E.	Cov.	%	C.E.	Cov.	%	97 mm C.E.	61 mm C.E.	97 % mm x 1.4
≤ 20				1	1	50					7	
21												
22					1							
23					1			1	0		1	
24					2			1	0	1		
25					1		1	1	50		5	
26								3	0	1	3	24
27				1	5	17		6	0		10	
28				3	7	30	2	9	18	1	12	6
29				1	11	8	2	2	50	2	6	24
30	≤ 30cm 141	672	17	5	10	33	2	15	12	1	7	10
31	4	40	9	2	10	17	3	19	14	2	7	20
32	2	43	4	2	5	29	6	17	26		8	
33	7	20	26	2	7	22	2	29	6		3	
34	9	30	23	2	13	13	4	23	15	1	6	12
35	13	50	21	4	9	31	10	18	36	3	7	31
36	19	35	35	4	3	57	2	36	5	5	9	40
37	17	45	27	5	7	42	14	33	30	5	9	40
38	18	42	30	9	8	53	18	61	23	7	11	45
39	31	24	56	8	11	42	36	69	34	8	13	44
40	87	90	49	17	20	46	48	108	31	12	11	78
41	46	66	41	15	11	58	48	109	31	26	25	74
42	63	48	57	22	5	81	54	136	28	30	23	93
43	56	41	58	11	8	58	54	104	34	27	16	121
44	66	42	61	11	7	61	54	79	41	31	15	148
45	100	65	61	13	5	72	45	62	42	28	22	91
46	86	39	69	15	6	71	43	45	49	17	15	81
47	46	31	60	17	2	89	45	44	51	25	17	105
48	50	20	71	9	5	64	48	36	57	25	15	119
49	77	17	82	10	1	91	42	34	55	6	10	43
50	76	21	78	6	1	86	34	29	54	18	17	76
51	68	9	88	10			27	12	69	11	17	46
52	47	10	82	7	1	88	36	17	68	17	14	87
53	71	4	95	7			20	13	61	17	14	87
54	80	4	95	7			21	14	60	10	11	65
55	66	12	85	9			27	8	77	20	7	204
56	66	4	94	4			24	3	89	14	12	83
57	69	3	96	4			32	6	84	10	14	51
58	63	5	93	3			27	10	73	16	8	143
59	70	1	99	7			27	6	82	22	10	157
60	134	3	98	7			33	4	89	13	7	133
61	90		100	1			32	3	91	17	4	304
62	86	1	99	4			26	3	90	9	12	54
63	93		100	1			27		100	5	9	40
64	93		100	6			26	1	96	13	7	133
65	86		100	6			24	1	96	20	10	143
66	79	1	99	2			24			13	8	116
67	62		100	1			25			7	2	250
68	61		100				15			8	4	143
69	70		100	2			13			4	3	95
≥ 70	528		100				161			45	20	161
TOTAL	2997	1538		287	184		1264	1230		573	503	
50% Length cm	41.5			39.0			47.0					
Sel. range cm	13			12			16					
Selection factor	3.3			3.3			3.4					

Table 6

Species	Haddock			Haddock			Haddock			Haddock		
Ship	ANTON DOHRN			A. T. CAMERON			E. HOLT			EXPLORER		
Area	N & NW Iceland			Skjalafandi			Skjalafandi			Iceland		
Date	9-14/7 1962			24-25/7/62			24-25/7/62					
Cod-end	D. Manila			Manila coveral			Manila coveral			D. Manila		
Mean mesh size(mm)	138			120			132			..112.2		
Method	Cover			Cover			Cover			Cover		
No. of Hauls	16									7		
Haul duration (min)	83											
Average total catch kg	520	150										
≤ Length cm	CE	Cov	%	CE	Cov	%	CE	Cov	%	CE	Cov	%
20				2	99	2				2	8	20
21				1	8	11				-	20	0
22				1	3	25				2	68	3
23		3	0.0							11	183	6
24		5	0.0	3	7	30				29	328	8
25	1	37	3	12	35	26				34	409	8
26	6	52	10	31	89	26				59	488	11
27	11	109	9	37	157	19		5	0	71	500	12
28	23	138	14	69	212	25	1	4	20	85	455	16
29	19	154	11	90	226	28	1	14	7	92	312	23
30	20	145	12	76	154	33	1	22	4	69	231	23
31	8	103	7	53	101	34	3	19	14	72	150	32
32	13	87	13	32	62	34	1	14	7	38	98	28
33	12	58	17	20	28	42		7	0	36	48	43
34	6	40	13	8	21	28		9	0	8	10	44
35	3	25	11	4	10	29		4	0	16	14	53
36	6	10	38	9	9	50		1	0	11	13	46
37	6	14	30	25	7	78	1	3	25	20	14	59
38	7	11	39	42	17	71	1	11	8	32	22	59
39	14	21	40	65	18	78	3	16	16	59	19	76
40	18	43	30	112	20	85	9	36	20	56	15	79
41	30	39	44	137	24	85	13	26	33	41	6	87
42	53	53	50	122	22	85	29	41	41	42	3	93
43	67	39	63	157	19	89	32	68	32	47	-	100
44	57	49	54	125	18	87	39	52	43	29	2	94
45	52	36	59	96	10	91	38	58	40	19	-	100
46	22	16	58	86	3	97	34	31	52	19	-	
47	36	9	80	75	1	99	28	20	58	26		
48	27	8	77	82	4	95	26	24	52	21		
49	32	12	73	94	4	96	30	12	71	31		
50	51	8	86	127		100	29	13	69	32		
51	54	8	87	154	2	99	37	10	79	29		
52	62	9	87	176	1	99	45	11	80	27		
53	71	11	87	190		100	47	10	82	29		
54	93	9	91	219	2	99	72	9	89	43		
55	93	8	92	212	1	100	126	4	97	37		
56	96	2	98	181	1	99	111	7	94	59		
57	129	4	97	142		100	127	4	97	46		
58	90	4	96	124		"	110	5	96	61		
59	90	-	100	94		"	93	2	98	≥ 41		
60	60	1	98	69		"	68	2	97	60 cm	266	
61	51	1	98	42		"	62	1	98			
62	53		100	31		"	48	1	98			
63	32		100	30		"	28		100			
64	24		100	16		"	26		"			
65	14		100	16		"	15		"			
66	21		100	8		"	12	1	92			
67	11		100	10		"	11		100			
68	4		100	8		"	14					
69	11		100	6		"	7					
70	15		100	17		"	25					
Total	1674	1381		3538	1395		1403	577		1747	3416	
50% Ret. length(cm)	42.2			35?- 36?			46			35.6		
Selection range(cm)	12									9		
Selection factor	3.1			3.0?			3.6			3.2		

Table 6 (contd)

Species	Haddock	Haddock	Haddock	Haddock	Haddock
Ship	EXPLORER	EXPLORER	G. O. SARS	G. O. SARS	G. O. SARS
Area	Iceland	Iceland	S&SW Iceland	SW Iceland	SW Iceland
Date			10 & 13/5/62	10-11/5/62	10-11/5/62
Cod-end	D. Manila	D. Nylon	D. Manila	D. Manila	D. Manila
Mean mesh size(mm)	126.8	89.1	104	120	98
Method	Cover	Cover	Cover	Cover	Cover
No. of Hauls	8	5	2	3	4
Haul duration (min)			45	41	45
Average total catch kg			1818	1750	2455

Length cm	CE	Cov	%	CE	Cov	%	CE	Cov	%	CE	Cov	%	CE	Cov	%
≤ 20	4	85	4		2	0		7	0	1	15	6	2	14	12
21	-	1	0	1	2	33		3	0		2	0		1	0
22	2		22	1	9	10		5	0					1	0
23	3	17	15	4	24	14		4	0					1	0
24	12	53	18	7	39	15									
25	24	108	18	9	96	9									
26	42	169	20	28	150	16							1	6	14
27	59	264	18	29	175	14					5	0		6	0
28	56	261	18	43	156	22		3	0		17	0	3	14	18
29	48	246	16	52	163	24	1	6	14		13	0	3	12	20
30	52	161	24	36	103	26	1	7	12	2	18	10	11	19	37
31	31	108	22	38	48	44	2	10	17	6	14	30	19	12	61
32	13	65	17	39	24	62		13	0	2	9	18	9	7	56
33	6	19	24	18	13	58	1	10	9	1	10	9	8	3	73
34	2	13	13	12	6	67	2	9	18	3	2	60	12	2	86
35	5	15	25	9	-	100	4	7	36	4	8	33	18	2	90
36	5	11	31	12	-	100	7	4	64	9	23	28	35	3	92
37	8	9	47	21	2	91	13	8	62	27	33	45	54	3	95
38	11	35	24	19	-	100	24	14	63	37	31	54	75	2	97
39	15	25	38	25			40	15	73	49	50	49	124		100
40	23	26	47	19			67	15	82	80	71	53	193	2	99
41	17	17	50	24			95	10	90	81	64	56	251		100
42	20	19	51	15			116	15	89	119	57	68	277		"
43	22	7	76	12			134	8	94	129	57	69	261		"
44	12	8	60	8			103	5	95	108	26	81	233		"
45	7	7	50	3			103	3	97	88	23	79	163		"
46	13	4	76	7			90	3	97	63	17	79	135		"
47	10	3	77	1			58		100	51	2	96	109		"
48	13	2	87	2			43		"	36	2	95	85		"
49	8	-	100	2			28		"	23	2	92	50		"
50	14	-	100	3			32		"	23	1	96	58		"
51	27	1	96	4			19		"	14		100	33		"
52	35	-	100	2			17		"	20		"	36		"
53	35	-	100	3			14		"	8		"	23		"
54	51	1	98	4			16		"	6		"	25		"
55	63	-	100	3			12		"	5		"	16		"
56	81			1			8		"	5		"	18		"
57	86			3			8		"	1		"	9		"
58	95			3			4		"	1		"	10		"
59	≥ 86			≥ 7			4		"	1		"	10		"
60	60 376			60 8			6		"	2		"	7		"
61	cm			cm			2		"	1		"	4		"
62							5		"	1		"	4		"
63							2		"	2		"	1		"
64							1		"				1		"
65													2		"
66													1		"
67													1		"
68							1		"						
69															
70													2		"
Total	1492	1767		537	1012		1083	184		1009	572		2392	110	
50% Ret.length(cm)	41.6			32.1			36.2			38.8			31		
Selection range(cm)	11			5			5			9			4?		
Selection factor	3.3			3.6			3.5			3.2			3.2		

Table 6 (contd)

Species	Haddock			Haddock			Haddock			Haddock		
Ship	G. O. SARS			G. O. SARS			G. O. SARS			GONCHAROV		
Area	SW Iceland			SW ICeland			S & SW Iceland			N. Iceland (8)		
Date	12-13/5/62			12/5/62			12-13/5/62			28/7/62		
Cod-end	D. Manila			D. Manila			D. Manila			D. Manila		
Mean mesh size (mm)	122			103			99			141		
Method	Cover			Cover			Cover			Cover		
No. of Hauls	2			3			2			5		
Haul duration(min)	45			25			45			97		
Average total catch kg	1575			825			1100			1451		
Length cm	CE	Cov	%	CE	Cov	%	CE	Cov	%	CE	Cov	%
20	15	345	4	1	104	1	1	367	0.3			
21	3	11	21		21	0		49	0			
22		6	0		5	0		17	0			
23		11	0		2	0		8	0			
24		4	0					7	0			
25								1	0			
26				1	1	50						
27		2	0					2	0			
28		5	0		3	0		3	0			
29		9	0	2	7	22	1	10	9			
30	2	7	22	1	17	6	3	12	20	≤ 30 cm	42 1260	4
31	3	19	14	8	21	28	10	24	29	1	69	1
32	4	12	25	12	27	31	8	27	23	7	68	9
33	1	15	6	9	21	30	10	28	26	1	21	5
34	1	8	11	8	13	38	10	15	40	4	51	7
35	3	5	38	4	1	80	5	3	62	2	62	3
36		2	0	5	1	83	5		100		68	
37	2	8	20	3	1	75	1	1	50	20	79	20
38	1	4	20	2		100	13		100	16	112	12
39	3	11	21	4	1	80	18	1	95	31	160	16
40	12	10	55	14	4	78	27		100	73	356	17
41	10	8	56	14	2	88	30		"	47	210	18
42	20	23	47	12	2	86	46		"	87	215	29
43	25	16	61	19	2	90	64		"	44	169	21
44	30	12	71	19		100	47		"	69	147	32
45	36	16	69	32		"	50		"	80	167	23
46	43	12	78	38	1	97	38		"	103	173	37
47	35	14	71	37	1	97	32		"	96	180	35
48	43	3	93	34		100	28		"	141	176	44
49	46	3	94	40		"	21		"	146	161	48
50	55	3	95	49		"	20		"	312	316	50
51	54	3	95	33		"	14		"	288	179	62
52	62	2	97	41		"	15		"	369	212	54
53	60	2	97	40		"	19		"	438	168	72
54	53	1	98	34		"	13		"	427	20	68
55	46	1	98	33		"	14		"	852	276	76
56	40		100	29		"	15		"	562	137	80
57	27		100	23		"	11		"	510	91	85
58	42	1	98	13		"	10		"	328	60	85
59	17		100	11		"	7		"	195	42	82
60	19			20		"	10		"	255	36	88
61	13			13		"	5		"	118	7	94
62	12			5		"	7		"	81	6	93
63	10			9		"	7		"	58	5	92
64	8			10		"	5		"	32	4	89
65	9			4		"	3		"	34	6	85
66	8			2		"	1		"	14		100
67	2			3		"	2		"	15		"
68	4			5		"	1		"	12		"
69	4			2		"	2		"	19		"
70	3			4		"	1		"	28		"
Total	885	616		702	258		650	575		5967	5751	
50% Ret. length(cm)	41.2			34			35.4			50		
Selection range(cm)	9?			6?			5?			13		
Selection factor	3.4			3.3?			3.6?			3.5		

Table 6 (contd)

Species	Haddock			Haddock			Haddock		
Ship	GONCHAROV			GONCHAROV			GONCHAROV		
Area	N. Iceland (8)			N. Iceland (8)			N. Iceland		
Date	27/7/62			28-30/7/62			28-29/7/62		
Cod-end	D. Capron			D. Capron with chafer			D. Capron with chafer		
Mean mesh size (mm)	125			108			126		
Method	Cover			Cover			Cover		
No. of Hauls	5			3			5		
Haul duration (min)	80			80			85		
Average total catch kg	1144			1364			1526		
Length cm	CE	Cov	%	CE	Cov	%	CE	Cov	%
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30	≤ 30 cm 3	69	4	≤ 30 10	665	1	≤ 30 148	548	21
31	1	22	4	2	26	7		18	0
32		4		1	11	8	1	16	6
33	1	12	8	6	6	50	1	6	14
34		13		3	4	43		5	0
35		4		12	12	50	3	7	30
36	1	1	50	5	15	25	3	5	38
37	1	4	20	21	19	52	3	20	13
38	4	8	33	32	30	52	6	16	27
39	6	3	67	53	19	74	10	19	34
40	5	10	33	72	57	56	14	29	33
41	4	6	40	51	26	66	26	30	46
42	5	6	46	52	28	65	37	32	54
43	7	5	58	46	11	81	15	23	39
44	4	3	57	100	9	92	24	16	60
45	16	10	62	129	11	92	37	21	64
46	11	10	52	81	11	88	41	14	75
47	20	5	80	105	8	93	34	17	67
48	14	4	78	78	5	94	56	13	81
49	8	5	62	124		100	39	6	87
50	52	5	91	207	3	99	119	10	92
51	23		100	108		100	101	4	96
52	56	3	95	133		100	129	6	96
53	48	1	98	173	1	99	169	1	99
54	72		100	198	1	99	196	6	97
55	132	4	97	281	1	100	260	2	99
56	57		100	152	1	99	242	1	100
57	85		100	139	2	99	222		100
58	42	1	98	96		100	140	1	99
59	24	1	96	59		100	130		99
60	51	1	98	34		100	65		99
61	17		100	18		100	28		99
62	10		100	23		100	34		99
63	4		100	14		100	19		99
64	7	1	88	7		100	15		99
65	14		100	8		100	20		99
66	5		100	4		100	10		99
67	2		100	9		100	5		99
68	5		100	2		100	3		99
69	3		100	2		100	1		99
70	3		100	6		100	9		99
Total	823	221		1676	982		2425	892	
50% Ret. Length(cm)	43.3			36.7			42.5		
Selection Range(cm)	11			9			11		
Selection Factor	3.5			3.4			3.4		

Table 6 (contd)

Species	Haddock			Haddock			Haddock			Haddock		
Ship	MARIA JULIA			MARIA JULIA			MARIA JULIA			MARIA JULIA		
Area	SW Iceland			N Iceland			N & NW Iceland			S & SW Iceland		
Date	28/3-1/4/62			24-27/7/62			25/7 & 12-13/8/62			6-17/8/62		
Cod-end	D. Manila			D. Manila			D. Manila			D. Manila		
Mean mesh size (mm)	126			117			138			138		
Method	Cover			Cover			Cover			Cover		
No. of Hauls	43			6			12			14		
Haul duration (min)	56			60			60			60		
Average total catch kg												
Length cm	CE	Cov	%	CE	Cov	%	CE	Cov	%	CE	Cov	%
20				1	2	33					1	
21										2		
22								2	0	3	13	19
23					1			1	0	6	37	14
24				1						16	88	15
25				2	7	22		7	0	9	77	10
26				3	21	13	1	12	8	15	73	17
27				5	49	9	2	40	5	3	52	5
28		1		9	81	10	2	60	3	2	28	7
29	1			8	102	7	10	66	13	5	10	33
30	1	6	14	9	120	7	10	108	8		18	0
31		7	0	17	82	17	4	87	4	3	40	7
32		10	0	11	72	13	3	69	4	6	83	7
33		12	0	6	54	10	3	32	9	9	94	9
34	1	7	13	10	26	28	1	25	4	17	143	11
35	2	7	22	2	16	11	1	20	5	22	150	13
36	4	9	31	5	8	38		18	0	25	131	16
37	7	17	29	6	6	50	2	7	22	21	122	15
38	18	43	30	5	11	31	2	11	15	22	79	22
39	31	76	29	10	16	38	1	10	9	14	45	24
40	56	127	31	29	21	58	8	34	19	10	37	21
41	87	125	41	43	29	60	11	38	22	16	33	33
42	134	116	54	54	32	63	15	46	25	19	43	31
43	120	125	49	79	26	75	21	49	30	31	59	34
44	139	90	61	77	22	78	18	47	28	42	85	33
45	123	66	65	70	19	79	24	44	35	59	87	40
46	125	69	64	70	19	79	20	38	34	77	89	46
47	90	24	79	78	4	92	16	24	40	72	95	43
48	101	31	77	44	4	92	13	22	37	79	71	53
49	74	24	76	16	2	89	16	11	59	80	69	54
50	98	20	83	25	3	89	11	15	42	106	86	55
51	97	12	89	33	1	97	22	11	67	108	60	64
52	112	12	90	35			32	11	74	114	46	71
53	82	6	93	54	3	95	33	22	60	106	44	71
54	109	5	96	55	4	93	57	10	85	109	32	77
55	103	3	97	71	1	99	51	19	73	103	22	82
56	76	3	96	61	1	98	62	17	78	108	19	85
57	81	2	98	81			46	15	75	89	20	82
58	45	3	94	65			75	4	95	91	13	88
59	2	2	96	45			61	6	91	85	10	89
60	60		100	36			62	6	91	66	4	94
61	32			18			29	1	97	63	1	98
62	42			18			30	2	94	54		100
63	16			12			22	1	96	53	2	96
64	24			13			18			26	1	96
65	12			4			10			33		
66	13	2	87	5			10			20		
67	12			6			6			12		
68	9			5			5	1	83	7		
69	7			1			1			7		
≥ 70	20			7			14			28		
Total	2216	1062		1290	865		861	1069		2073	2312	
50% Ret. Length(cm)		42.4			39.0			49.6			48.0	
Selection Range(cm)		11			9			12			13	
Selection Factor		3.4			3.3			3.6			3.5	

TABLE 7

Species	Redfish				Redfish			
Ship	"Anton Dohrn"				"Anton Dohrn"			
Area	W. Iceland				S.W. Iceland			
Date	14-17/7/62				24-26/7/62			
Cod end	D. Manila				D. Manila			
Mean mesh size (mm)	139				149			
Method	Cover				Cover			
No. of hauls	11				10			
Haul duration (mins)	108				174			
Av. total catch (kg)	435	292			661	665		
Length (cm)	C.E.	Cov.	%	Meshed	C.E.	Cov.	%	Meshed
≤ 20	11	44	20					
21	1	4	20					
22	1	7	12					
23	5	9	36					
24	2	24	8					
25	10	42	19					
26	28	61	32					
27	45	95	32					
28	69	147	32					
29	65	179	27					
30	79	212	27	1	2	1	67	
31	115	269	30		2	1	67	
32	134	333	29	1	2	3	40	
33	195	379	34	2	6	6	50	
34	216	361	37	2	8	16	33	
35	201	349	36	5	21	43	33	
36	183	295	38	4	27	64	30	2
37	200	273	42	6	51	123	29	4
38	206	258	44	10	69	212	25	5
39	190	190	50	11	98	216	31	5
40	186	198	48	10	149	290	34	5
41	187	148	56	11	139	286	33	5
42	171	116	60	15	158	278	36	9
43	162	93	64	8	142	262	35	14
44	131	71	65	12	125	199	39	13
45	134	49	73	10	88	138	39	9
46	135	32	81	24	89	117	43	10
47	123	30	80	19	148	131	53	23
48	146	29	83	19	179	137	57	38
49	150	13	92	12	190	138	58	49
50	138	6	96	18	199	106	65	54
51	93	1	99	9	226	88	72	52
52	84	3	97	5	172	46	79	45
53	42		100	-	133	25	84	23
54	24		100	1	77	6	93	14
55	7		100	-	54	3	95	7
56	8		100	1	13	1	93	1
57	5		100		11	1	92	-
58	1		100		4		100	1
59	1		100		3		100	
60	17		100		107		100	
61								
62								
63								
64								
65								
66								
67								
68								
69								
≥ 70								
Total	3901	4320		216	2692	2936		388
50% ret. length (cm)	39.6				46.9			
Selection range (cm)	16				15?			
Selection factor	2.9				3.1			

TABLE 7

Species	Redfish				Redfish			
Ship	"Anton Dohrn"				"Anton Dohrn"			
Area	W. Iceland				S.W. Iceland			
Date	17-20/7/62				21-23/7/62			
Cod end	D. Perlon				D. Perlon			
Mean mesh size (mm)	132				142			
Method	Cover				Cover			
No. of hauls	17				7			
Haul duration (mins)	100				137			
Av. total catch (kg)	659	493			558	481		
Length (cm)	C.E.	Cov.	%	Meshed	C.E.	Cov.	%	Meshed
20	37	60	38					
21	1	11	8					
22	4	14	22					
23	10	21	32					
24	12	49	20					
25	32	71	31					
26	48	147	25					
27	86	267	24					
28	151	408	27					
29	196	599	25					
30	338	904	27	2	4	1	80	
31	455	1049	30	2	2	6	25	
32	592	1288	32	9	2	4	33	
33	704	1406	33	15	4	14	22	
34	734	1288	36	17	11	21	34	1
35	724	1319	35	23	26	39	40	2
36	645	1034	38	22	32	58	36	2
37	728	929	44	43	58	110	34	2
38	653	714	48	57	97	200	33	3
39	541	492	52	42	98	214	31	7
40	477	416	53	55	132	252	34	11
41	465	246	65	69	142	215	40	10
42	434	201	68	67	182	211	46	12
43	391	135	74	72	124	170	42	15
44	354	83	81	69	105	92	53	16
45	296	38	89	51	74	73	50	16
46	297	23	93	58	75	46	62	12
47	301	17	95	47	85	34	71	22
48	314	9	97	47	88	20	82	38
49	266	4	98	19	104	9	92	23
50	236	4	98	13	106	7	94	21
51	197	6	97	1	95	2	98	11
52	157	2	99	3	78		100	7
53	81		100		42		100	-
54	46		100		24		100	
55	15		100		22		100	1
56	10		100		11		100	
57	2		100		7		100	
58					4		100	
59	3		100		1		100	
60	29		100		77		100	
61								
62								
63								
64								
65								
66								
67								
68								
69								
70								
Total	11062	13254		803	1912	1798		232
50% ret. length (cm)	38.5				43.9			
Selection range (cm)	16				15?			
Selection factor	2.9				3.1			

TABLE 7

Species	Redfish	Redfish	Redfish
Ship	"Explorer"	"Explorer"	"Explorer"
Area	Iceland	Iceland	Iceland
Date	D. Manila	D. Manila	D. Manila
Cod end	112.2	126.8	131.6
Mean mesh size (mm)	Cover	Cover	Cover
Method	6	8	3
No. of hauls			
Haul duration (mins)			
Av. total catch (kg)			

Length (cm)	C.E.	Cov.	%	C.E.	Cov.	%	C.E.	Cov.	%
20	2	10	17	31	114	21		10	
21	2	3	40	17	33	34		6	0
22	2	3	40	40	79	34	3	7	30
23	4	4	50	55	103	35	-	4	0
24	8	4	67	81	144	36	9	22	29
25	6	7	46	121	178	40	7	17	29
26	8	6	67	176	180	49	15	27	36
27	8	3	73	254	228	53	21	56	27
28	10	6	62	243	204	54	26	59	31
29	7	5	58	239	215	53	39	90	30
30	4	3	57	267	169	61	33	109	23
31	7	1	88	238	172	58	36	108	25
32	3	-	100	196	104	65	60	93	39
33	4	-	100	152	70	68	56	95	37
34	-	-	-	122	45	73	51	75	40
35	1	1	50	67	30	69	40	42	49
36	5	-	100	65	18	78	39	34	53
37	-			43	14	75	28	27	51
38	-			28	7	80	24	23	51
39	-			18	3	86	21	8	72
40	-			13	1	93	14	6	70
41	-			7	-	100	12	4	75
42	-			6	1	86	8	4	67
43	-			-	-	-	4	1	80
44	-			3	1	75	12	-	100
45	-			-	-	-	6	-	100
46	-			1	-	100	3	1	75
47	-			-			1	-	100
48	-			1			4		
49	-						1		
50	-						2		
51	-								
52	-								
53	-								
54	-								
55	-								
56	-								
57	-								
58	-								
59	-								
60	≥ 60 cm 1								
61									
62									
63									
64									
65									
66									
67									
68									
69									
70									
Total	82	56		2484	2113		575	928	
50% ret. length (cm)	24.8?			27.5			36.9		
Selection range (cm)	7?			16			15?		
Selection factor	2.2?			2.2			2.8		

TABLE 7

Species	Redfish	Redfish	Redfish
Ship	"Explorer"	"Goncharov"	"Johan Hjort"
Area	Iceland	N. Iceland	S.W. Iceland
Date		5/8/62	13/9/62
Cod end	D. Nylon	D. Capron	D. Manila
Mean mesh size (mm)	89.1	118	108
Method	Cover	Cover	Cover
No. of hauls	3	3	2
Haul duration (mins)		60	75
Av. total catch (kg)		258	595

Length (cm)	C.E.	Cov.	%	C.E.	Cov.	%	Meshed	C.E.	Cov.	%	Meshed
20	2	3	40					4	830	0.5	
21	3	1	75					1	80	1	
22	3	5	38						38	0	
23	-	8	0					1	34	3	
24	9	12	43						29	0	
25	25	13	66					1	40	2	
26	33	21	61					2	34	6	
27	51	20	72						17	0	
28	164	17	91					1	10	9	
29	72	11	87					2	11	15	
30	135	3	98	24	314	7	6	1	9	10	
31	140	4	97	14	39	26	4	1	5	17	
32	119	1	99	21	66	24	16	2	2	50	
33	115	-	100	24	42	36	13	5	10	33	
34	142			43	75	36	17	1	1	50	
35	78			40	87	32	46	5	6	45	
36	61			37	47	44	38	3	1	75	
37	27			47	53	47	72	3	3	50	
38	16			46	22	68	30		2	0	
39	31			41	25	62	42	3	1	75	
40	30			40	16	71	41	8		100	
41	27			33	2	94	14	5		100	
42	21			35	6	85	16	12		100	
43	-			27		100	6	5		100	
44	-			16	8	67	6	3		100	
45	10			24	4	86	8	2		100	
46	21			21		100	1				
47	-			18	4	82	5				
48	10			22	2	92	1				
49				3	1	75	1				
50				13	4	77	5	1		100	
51				11	1	92	1				
52				10	2	83					
53				6		100	1				
54				5		100					
55				7	2	78	2				
56											
57				1		100					
58				2		100					
59	≥60 cm 1			1		100					
60				1		100					
61				1		100					
62				1		100					
63											
64				2		100					
65				2		100					
66											
67											
68											
69											
70				2		100					
Total	1346	119		641	822		392	72	1163		
50% ret. length (cm)	24.1?			34.2				35?			
Selection range (cm)	6?			8				5?			
Selection factor	2.7?			2.9				3.2?			

Table 8. Cod. Mean girth at length

Ship Locality Date	MARIE JULIA N. & NW. Iceland July		A. T. CAMERON N. Iceland July			EXPLORER N. Iceland June	
Length cm	Max. Body Girth cm	No. of Obs.	Head Girth cm	Max. Body Girth cm	No. of Obs.	Head Girth cm	No. of Obs.
15	10.0	1					
20	-						
21	-						
22	-						
23	14.0	1				10.4	1
24	-					10.4	3
25	-					11.2	5
26	14.0	2				11.6	6
27	15.0	1				11.8	5
28	14.2	4				12.5	6
29	16.0	1				12.8	2
30	14.3	3	14.0	13.8	1	12.9	4
31	15.5	2	14.1	14.0	3	13.6	2
32	16.0	4	15.4	15.7	3	14.2	2
33	25.0	1	15.5	15.6	7	15.2	3
34	17.5	4	15.8	16.2	5	-	
35	19.0	2	16.0	16.0	6	15.3	1
36	18.4	5	16.4	16.6	12	17.0	1
37	19.0	3	17.7	17.8	12	16.0	1
38	18.0	4	17.8	18.0	10	17.8	3
39	20.2	5	18.2	18.2	18	19.2	2
40	20.5	6	19.1	19.3	12	19.2	2
41	20.2	22	19.2	19.4	12	-	
42	21.5	16	20.3	20.4	19	-	
43	22.2	12	20.4	20.5	15	19.9	2
44	23.1	17	20.9	21.1	25	-	
45	23.7	18	21.6	21.8	15	22.2	1
46	23.8	9	22.0	22.2	16	22.0	1
47	24.2	10	23.0	23.2	15	-	
48	25.4	13	23.1	23.3	15	-	
49	25.8	6	23.6	24.0	19	-	
50	25.2	15	23.1	23.3	13	23.8	2
51	27.9	8	24.0	24.2	14		
52	27.4	10	24.8	25.0	19		
53	27.2	12	25.8	26.0	10		
54	27.7	3	25.0	25.3	13		
55	28.7	9	26.1	26.4	9		
56	30.9	13	26.3	26.4	13		
57	29.0	8	26.9	27.2	18		
58	30.9	12	27.7	28.0	12		
59	31.1	12	27.7	28.1	11		
60	33.2	14	28.7	28.9	10		
Regression Girth (G) on Length (L)						HG* = 0.529L - 2.4 cm	

Regression from curve fitted by eye, except* which is a calculated fit

Table 9. Haddock. Mean girth at length

Ship Locality Date	EXPLORER N. Iceland June		A. T. CAMERON N. Iceland July				MARIE JULIA N. & NW. Iceland July	
Length cm	Head Girth cm	No. of Obs.	Mean Head Girth (cm)	No. of Obs.	Mean Body Girth (cm)	No. of Obs.	Max. body Girth cm	No. of Obs.
22	10.0	1						
23	11.1	3					13.0	1
24	-						-	
25	11.9	3	13.4	2	13.6	1		
26	12.0	2	13.2	2	13.5	1	-	
27	12.8	1	-	-	-	-	-	
28	13.4	3	14.4	8	14.8	3	-	
29	13.6	2	14.8	8	15.1	7	15.3	3
30	14.1	2	15.5	8	15.8	8	16.0	2
31	14.6	3	16.1	11	16.6	10	17.0	2
32	-		16.7	10	16.9	10	18.0	5
33	15.6	2	16.5	10	16.9	8	18.5	2
34	16.0	2	17.5	5	18.0	4	-	
35	16.4	2	17.6	3	18.0	3	21.0	3
36	17.0	2	18.8	2	19.0	2	19.0	1
37	17.3	1	19.4	7	19.7	5	21.0	1
38	-		19.7	5	20.2	5	-	
39	18.7	3	21.1	7	21.5	7	21.5	8
40	19.4	3	20.8	12	21.3	12	22.9	7
41	19.6	5	21.5	12	22.0	12	23.3	12
42	19.3	2	22.1	12	22.7	12	23.2	19
43	20.7	1	22.5	9	23.1	9	24.3	33
44	21.2	1	22.6	6	23.5	6	24.7	34
45	21.3	2	23.1	6	23.7	6	25.2	34
46	21.6	2	24.2	3	25.0	3	26.1	16
47	-		24.7	8	25.2	8	26.5	12
48	22.6	1	25.5	5	26.5	5	26.5	11
49	22.6	1	26.1	4	26.9	4	27.7	9
50			26.8	8	27.3	7	31.3	3
51			27.6	4	28.5	4	29.6	5
52			28.1	3	29.4	3	28.8	8
53			26.9	6	27.7	3	29.1	12
54			28.4	9	29.5	7	30.1	17
55			29.2	6	30.5	5	30.4	10
56			28.8	7	29.9	7	30.7	24
57			29.7	3	30.3	2	30.9	15
58			30.1	3	31.5	3	35.6	20
59			30.8	3	31.8	3	31.7	14
60			30.7	4	32.0	4	32.3	18
61			32.7	1	-		33.7	10
62			31.3	3	32.3	3	33.8	6
63			31.8	1	32.5	1	34.0	6
64			31.5	1	33.3	1	32.0	2
65			-	-	-		37.5	2
66			-	-	-		36.0	3
67			29.9	1	31.0	1	36.5	2
70			35.2	1	37.8	1	-	
74							39.0	1
Regression Girth (G) on Length (L)	G*= 0.475L+ 0.01 cm		G* = 0.523L + 0.4 cm G* = 0.495L + 1.0 cm				G = 0.552L	

Regression from curve fitted by eye, except * which are calculated fits

Table 10. Redfish. Mean girth at length

Ship	A. T. CAMERON			ANTON DOHRN			
Locality	N. Iceland			W. Iceland		S. W. Iceland	
Date	July			July		July	
Sebastes type	Not separated, probably marinus			marinus		mentella	
Length cm	Head Girth cm	Body Girth cm	No. of Obs.	Body Girth cm	No. of Obs.	Body Girth cm	No. of Obs.
19	13.6	13.5	1				
23	15.6	15.3	1				
24	17.3	17.4	2				
25	17.9	18.1	6				
26	18.4	18.6	9				
27	19.1	19.3	19	18.1	33		
28	20.1	20.2	16	18.9	42		
29	20.8	21.0	17	19.9	40		
30	21.8	22.0	22	20.9	50		
31	22.3	22.6	18	21.3	64		
32	22.8	23.0	13	22.0	78		
33	23.7	24.0	12	23.1	68		
34	24.2	24.7	14	23.6	79		
35	25.2	25.4	8	24.3	93		
36	26.3	26.8	10	24.8	73		
37	26.4	27.1	5	25.6	98		
38	26.9	27.1	4	26.6	109		
39	27.3	27.3	1	27.3	114		
40	29.6	30.5	1	28.1	114		
41	29.0	29.0	1	28.9	108	29.5	37
42	31.5	32.9	1	29.6	99	30.4	70
43	29.8	30.2	2	30.2	75	31.2	60
44				31.0	74	31.7	83
45				32.1	64	32.8	63
46				32.5	52	32.9	36
47				33.2	63		
48				34.0	54		
49				34.5	47		
50				35.5	44		
51				35.9	20		
52				36.6	32		
53				37.8	27		
Regression Girth (G) on Length (L)	HG* = 0.73L - 0.5 cm	BG = 0.75L - 0.8cm		BG* = 0.742L - 1.7cm		BG*= 0.711L+0.5cm	

Regression from curve fitted by eye, except* which are calculated fits