INTERNATIONAL COMMISSION FOR THE NORTHWEST ATLANTIC FISHERIES

RESTRICTED

Serial No. 2849
(B.g.20)

ICNAF Res.Doc. 72/120

ANNUAL MEETING - JUNE 1972

Progress in the ICNAF Groundfish Survey Program, and Proposals for Coordinated Activities in 1972

by

M. D. Grosslein

Chairman, ad hoc Working Group on ICNAF

Coordinated Groundfish Surveys

Introduction

Progress in development of a coordinated ICNAF groundfish survey program was reviewed at the January 1972 mid-term meeting of the Assessment Subcommittee in Rome, and results of the discussions are summarized in the assessment report (Res. Doc. 72/1). It was apparent at the mid-term meeting that a more detailed inventory of surveys conducted in 1971, and proposed surveys for 1972, would serve to improve coordination of future survey activity as well as promote more complete analysis of survey data. Thus inventory forms were circulated to member countries and the results are summarized and reviewed in this paper. The possible need for centralized data processing of survey results at ICNAF headquarters was also discussed at the mid-term meeting, and the results of a canvas of appropriate scientists on this question are reported here also.

Finally some specific suggestions are made for: 1) improving the conduct and coordination of groundfish surveys in 1972 and future years, and 2) better utilization of survey data, both past and future.

Inventory of Groundfish Surveys for 1971 and 1972

Information on dates and locations of surveys, numbers of hauls by Subarea and Division, and trawl specifications and sampling methods, was requested from member countries, and the returns from each country are given in Table 3. These inventories are presented here in the hope that they will stimulate comparisons among various surveys particularly where overlap occurs. The extent of all known groundfish survey activity in 1971 and 1972 (some of which is not shown in Table 3) is summarized in Tables 1 and 2. Several countries, USA (Woods Hole), Canada (St. Andrews), and USSR (PINRO and AtlantNIRO), probably will continue standard surveys in Subareas 3-6 in 1973. Survey schedules for other countries (or research stations) are not yet firm for 1973.

In 1971, approximately 1800 bottom trawl hauls were made by research vessels in the ICNAF area (Table 1). About 80 percent of this effort was carried out in Subareas 3-5, with from 400-500 hauls in each of these Subareas. Approximately half as much

effort (245 hauls) was expended in Subarea 6, and less than 100 hauls were made in Subareas 1 and 2 combined. A similar amount of survey effort is scheduled for 1972 with about the same distribution by Subarea and season (Table 2).

Review and Evaluation of Surveys

Taken all together the current survey activity represents a considerable amount of sampling both geographically and seasonally. However, clearly there is a need for more consistency as well as intensity of sampling by season and area particularly in the three northern Subareas.

Evaluation of Canadian and USA-USSR surveys in Subareas 4-6 indicates that the sampling density on one of these surveys (about 1 haul per 300 square miles, rather uniformly distributed over the whole area) is adequate to detect major changes in stock size of most groundfish especially when a consistent time series is available (Res. Docs. 71/37, 71/59). Extrapolating this same intensity of sampling to Subareas 1-3 would imply that we should make at least 250 hauls in Subarea 3, 100 hauls in Subarea 2 and 75 hauls in Subarea 1, Divisions B-F.

As shown in Tables 1 and 2, the current level of sampling by all countries in Subarea 3 is well in excess of the suggested

mimimum in terms of total number of hauls; and if proposed sampling for 1972 is actually carried out, this level of effort will be exceeded in Subarea 2, and half met in Subarea 1. However, sampling is somewhat fragmented among the Divisions of Subarea 3, and the same Divisions often will not be surveyed at the same time of year in both years, 1971 and 1972. Obviously shortage of vessel time is a major contributing factor here. Nevertheless it must be recognized that in order to reap the full benefits of a survey, there must be consistency in sampling by season and area, so that all the points in a time series are directly comparable from the standpoint of seasonal and area availability factors. If it is not possible to survey all Divisions every year, one approach may be to survey only the most important Divisions annually, and the less important areas every third year or so.

The question of minimum or optimum sampling intensity is of course a complex one, involving among other things distribution, availability and structure of groundfish populations as well as relative size and economic value of the resource. Logistic and sampling problems associated with hydrographic conditions and ice relative to fish distribution, would appear to be particularly

troublesome in the north, and a uniform pattern of stations very likely would be inappropriate. Instead, hydrographic pre-surveys may be required to delineate areas of fish aggregations, and then trawling can be concentrated accordingly. Under such a scheme it is conceivable that acceptable accuracy for cod alone might be achieved with an overall sampling density of less than 1 station per 300 square mile. It is more likely, however, that variations in distribution and availability will require a higher overall sampling intensity and therefore it would be more realistic to consider the suggested sample sizes as minimal to start with. Actual results of the proposed 1972 surveys in Subarea 2 should provide considerable insight into this question.

Ideally surveys should be made during more than one season each year, because seasonal availability of some species varies from year to year particularly in the northern areas, and this can cause bias in abundance indices. Achieving adequate seasonal coverage may require dividing up the areas and/or seasons into mutually exclusive parts to be surveyed by different countries. For example, it might be desirable to mount two surveys a year over the whole of Subarea 3, by treating the USSR spring survey as one, and pooling all the remaining Canadian effort into a

second survey at some other season. With only a little more effort in terms of total hauls, it would thus be possible to substantially increase the capability of monitoring annual stock changes over the whole of Subarea 3. Obviously the same approach could yield significant gains in efficiency and/or precision in other Subareas as well.

However, this approach may require a great deal more flexibility in vessel scheduling than is possible at present. It also requires a firm basis in inter-calibration experiments of relative fishing power, well defined and carefully controlled survey methods, complete and rapid exchange of data, and a high degree of mutual confidence. Frankly these conditions are not easy to meet. Nevertheless, the importance and cost of research vessel surveys make it desirable to continue seeking ways of pooling our resources more effectively.

Turning now to methods of sampling catches, it should be noted that minimum data recorded on survey catches include weight and length frequency of all species for US, Canadian and USSR surveys in Subareas 4-6 and USSR surveys in Subarea 3; weight of all species but only length frequencies of priority species (cod, haddock, redfish, and principal flounders) are

recorded for surveys by Canada in Subareas 2 and 3, and Federal Republic of Germany in Subareas 1 and 2. Also I think that length frequencies of priority species only are recorded by other countries which have conducted some groundfish surveys in the ICNAF area (France, Poland, Denmark), but I have not yet received inventory forms from these countries. In the long run it may be a false economy to overlook length frequencies of non-priority species especially where their biomass is significant. The additional cost of obtaining this information is quite small relative to total cost of survey activities, but it does take additional manpower aboard ship.

The method of selecting stations is a critical element in the design of a survey and the chief advantages of the stratified-random scheme have been reviewed (Res. Doc. 71/32). This is the principal method now being used for surveys in Subareas 4-6 by Canada, USA and USSR, with a standard set of sampling strata. In Subarea 3, Canada is using a combination of stratified-random and standard transects, and USSR is using a grid pattern. Whatever method is used, there are important advantages in establishing fixed sampling areas with common boundaries. Thus we should attempt to establish such areas for the Laurentian

Channel northward. The preliminary stratification scheme for Subarea 3 which was prepared and tested by Mr. Pinhorn of the St. John/s Biological Station, should be evaluated. Also Dr. Messtorff has prepared a stratification scheme for Subarea 2 for review at this annual meeting (Res. Doc. 72/).

Survey Data Processing by ICNAF

The possible need for the ICNAF data processing unit to handle research vessel data was discussed at the mid-term meeting in Rome. In my circular letter to scientists in charge of surveys I asked whether:

1) it was possible for current survey data to be summarized in the format shown in Res. Doc. 71/128 (catch per haul at length) in time for the mid-term meeting of the Assessment Subcommittee in January,
2) there was interest in utilizing ICNAF data processing facilities, and if so, whether they would be willing to submit individual haul data (for a few priority species) on a standard ICNAF survey log format.

Only Canada and USA responded, and both countries indicated they could provide the summaries (for a few species) for the mid-term meetings, and that they had adequate ADP capability

and preferred to process their own data. Without pre-judging the significance of the lack of response from other countries, I think it is clear that the problem of processing research vessel data still remains a major one, and it should be given serious attention by all member countries, by the ad hoc Working Group on surveys, and by ICNAF itself.

Proposals for 1972

In order to increase the amount of useful information from groundfish surveys in the ICNAF area I propose that:

1) a tentative set of standard sampling areas be adopted for Subareas 1-3, along the lines proposed by Mr. Pinhorn and Dr. Messtorff, and that where possible these standard sampling areas be used for surveys during the remainder of 1972; and that a common set of these sampling areas be chosen within each Subarea (giving preference to sets where overlap occurs and where the best time series exist) and catch per haul data summarized for a common set of species (at least cod, haddock, redfish and priority flounders),

2) common sets of sampling areas and species be designated in Subareas 4-6 also, and similar procedures followed,

3) all countries endeavor to submit to the mid-term meeting of the Assessment Subcommittee in January 1973, survey catch per haul at length data using the format given in Res. Doc. 71/128, and the common sets of areas and species referred to in 1) and 2) above.

Table 1. Inventory of groundfish surveys conducted in the ICNAF area in calendar 1971. Number of hauls, Division (and country) within each Subarea.

Month	SUBAREA 1	2	3	4	5	6	Totals
Jan			4/Pn(CAN)	20/R(CAN)			24
Feb							
Mar			36/O,N(CAN)		155/Z(USA)	81/(USA)	272
Apr		19/J(CAN)	15/L,K(CAN)	71/X(USA)	43/Y(USA)		148
May			239/(USSR)1/				239 1/
June			85/L,N(CAN)	23/X(USSR)	63/Z(USSR)	16/A(USSR)	187
July				125/V,W,X(CAN) ?/V(France)			125 ?
Aug				112/V,W,X(USSR)			112
Sept			?/(Poland)	65/T(CAN)			65
Oct		24/J(CAN)	41/L,N(CAN)		129/Z(USA) 116/Z(USSR)	81/(USA) 45/(USSR)	436
Nov		20/(Fed.Rep. Germ.)	3/K(CAN) 6/K (Fed.Rep. Germ.) ?/P(France)	70/X(USA)	40/Y(USA)		139
Dec	17/(Fed.Rep. Germ.)						17
Total hauls	17	63	429	486	546	223	1764

1/ All divisions, May-July

Table 2. Inventory of scheduled groundfish surveys for calendar 1972 in the ICNAF area. Number of hauls, Division (and country) within each Subarea.

Month	SUBAREA 1	2	3	4	5	6	Totals
Jan			4/Pn(CAN)	16/R,S(CAN)			20
Feb							
Mar			45/Ps(CAN)		122/Z(USA)	83/(USA)	250
Apr			240/(USSR)[1]	70/X(USA)	47/Y(USA)		357
May			80/L,N(CAN)				80
June				26/X (USSR)	63/Z(USSR)	16/(USSR)	105
July				125/V,W,X(CAN)			125
Aug				120/V,W,X(USSR)			120
Sept				65/T(CAN)			65
Oct				20/W(USSR)	125/Z(USA) 120/Z(USSR)	80/(USA) 47/(USSR)	392
Nov		40/(Fed.Rep.Germ)[2] 100/(UK)[3]	7/Pn(CAN)	25/R(CAN) 70/X(USA)	45/Y(USA)		287
Dec	40/(Fed.Rep. Germ.)						40
Total hauls	40	140	376	537	522	226	1841

1/ All divisions, April-June.

2/ All divisions

3/ Plan to coordinate UK survey with Fed. Rep. Ger., tentatively plan to conduct 17 day survey in Subarea 1 or 2 and to make on the order of 100 + hauls.

1971

Table 3. ICNAF GROUNDFISH SURVEY INVENTORY

Country		USA
Institute or Laboratory		National Marine Fisheries Service Northeast Fisheries Center Woods Hole, Massachusetts
Name of Research Vessel(s) or Vessel Class		R/V Albatross IV Otter trawler (stern)
Dates of Survey(s)		SPRING: Mar. 9, 1971 – May 1, 1971 AUTUMN: Sept. 30, 1971 – Nov. 19, 1971
Number hauls in each ICNAF Subarea		SPRING: 4X - 71; 5Y - 43; 5Z - 155; 6 - 81 AUTUMN: 4X - 70; 5Y - 40; 5Z - 129; 6 - 81
Survey Trawl	Type trawl Vertical Opening Horizontal opening Mesh size in Cod end	#36 Yankee Trawl 2.6 m 11.5 m 95 mm Cod end 13 mm Liner
Standard Haul	Speed Duration Ave. Area per haul	3.5 knots 30 minutes .01 sq. naut. mi.
Method of selecting stations		Stratified Random
Weigh and Measure all species ?		All species weighed and measured
If only few priority species processed, list them by ICNAF Subdivisions		

1972

Table 3 (cont'd). ICNAF GROUNDFISH SURVEY INVENTORY

Country			USA
Institute or Laboratory			National Marine Fisheries Service Northeast Fisheries Center Woods Hole, Massachusetts
Name of Research Vessel(s) or Vessel Class			R/V Albatross IV Otter trawler (stern)
Dates of Survey(s)			SPRING March 8, 1972 April 24, 1972 AUTUMN Sept. 30, 1972 Nov. 17, 1972
Number hauls in each ICNAF Subarea			4X - 70 5Y - 46 5Z - 122 6 - 84 4X - 70 5Y - 45 5Z - 125 6 - 80
Survey Trawl	Type trawl Vertical Opening Horizontal opening Mesh size in Cod end		#36 Yankee Trawl 2.6 m 11.5 m 95 mm Cod end 13 mm Liner
Standard Haul		Speed Duration Ave. Area per haul	3.5 knots 30 minutes .01 sq. naut. mi.
Method of selecting stations			Stratified Random
Weigh and Measure all species ?			All species weighed and measured
If only few priority species processed, list them by ICNAF Subdivisions			

1973

Table 3 (cont'd). ICNAF GROUNDFISH SURVEY INVENTORY

Country		USA
Institute or Laboratory		National Marine Fisheries Service Northeast Fisheries Center Woods Hole, Massachusetts
Name of Research Vessel(s) or Vessel Class		R/V Albatross IV (stern trawler)
Dates of Survey(s)		Similar to 1971-72
Number hauls in each ICNAF Subarea		" " "
Survey Trawl	Type trawl Vertical Opening Horizontal opening Mesh size in Cod end	Same
Standard Haul	Speed Duration Ave. Area per haul	"
Method of selecting stations		"
Weigh and Measure all species ?		"
If only few priority species processed, list them by ICNAF Subdivisions		

1971

ICNAF GROUNDFISH SURVEY INVENTORY

Country		Canada (Maritimes)
Institute or Laboratory		Fisheries Research Board of Canada Biological Station St. Andrews, New Brunswick
Name of Research Vessel(s) or Vessel Class		*A.T. CAMERON* *E.E. PRINCE*
Dates of Survey(s)		5 - 30 July Div. 4X-W-V 7 - 23 September Div. 4T
Number hauls in each ICNAF Subarea		Subarea 4 : 190 hauls
Survey Trawl	**Type trawl** **Vertical Opening** **Horizontal opening** **Mesh size in Cod end**	#36 Yankee otter trawl 9 feet 33 feet (wingtip to wingtip) 4½" nylon codend, ½" knotless nylon liner throughout
Standard Haul	**Speed** **Duration** **Avg. Area per haul**	3.5 knots 30 minutes 0.0095 sq. nautical miles (calculating from wingtip to wingtip)
Method of selecting stations		Random selection within strata
Weigh and Measure all species ?		Yes
If only few priority species processed, list them by ICNAF Subdivisions		NA.

See Halliday, R.G. and Kohler, A.C., ICNAF Doc. 71/35 (Serial No. 2520) for further details.

1972

ICNAF GROUNDFISH SURVEY INVENTORY

Country		Canada (Maritimes)
Institute or Laboratory		Fisheries Research Board of Canada Biological Station St. Andrews, New Brunswick
Name of Research Vessel(s) or Vessel Class		↑
Dates of Survey(s)		↑
Number hauls in each ICNAF Subarea		↑
Survey Trawl	Type trawl Vertical Opening Horizontal opening Mesh size in Cod end	AS FOR 1971 SUBMISSION ↓
Standard Haul	Speed Duration Avg. Area per haul	↓
Method of selecting stations		↓
Weigh and Measure all species ?		↓
If only few priority species processed, list them by ICNAF Subdivisions		↓

1973

ICNAF GROUNDFISH SURVEY INVENTORY

Country		Canada (Maritimes)
Institute or Laboratory		Fisheries Research Board of Canada Biological Station St. Andrews, New Brunswick
Name of Research Vessel(s) or Vessel Class		↑
Dates of Survey(s)		↑
Number hauls in each ICNAF Subarea		↑
Survey Trawl	Type trawl Vertical Opening Horizontal opening Mesh size in Cod end	↑ AS FOR 1971 SUBMISSION ↓
Standard Haul	Speed Duration Avg. Area per haul	↓
Method of selecting stations		↓
Weigh and Measure all species ?		↓
If only few priority species processed, list them by ICNAF Subdivisions		↓

1971

ICNAF GROUNDFISH SURVEY INVENTORY

Country		Canada	Canada
Institute or Laboratory		Biological Station St. John's, NFLD.	Biological Station St. John's, NFLD.
Name of Research Vessel(s) or Vessel Class		*A.T. Cameron* Otter trawler (side)	*A.T. Cameron* Otter trawler (side)
Dates of Survey(s)		Jan. 22, 1971 Feb. 6, 1971	Feb. 26, 1971 Mar. 9, 1971
Number hauls in each ICNAF Subarea		Subarea 4 - 20 Subarea 3 - 4	Subarea 3 - 36
Survey Trawl	**Type trawl** **Vertical Opening** **Horizontal opening** **Mesh size in Cod end**	41.5 10 ft 45 ft 90 mm in codend 29-12.6 mm liner	41.5 10 ft 45 ft 90 mm in codend 29-12.6 mm liner
Standard Haul	**Speed** **Duration** **Avg. Area per haul**	3.5 knots 30 minutes .013 sq. naut. mi.	3.5 knots 30 minutes .013 sq. naut. mi.
Method of selecting stations		Standard lines	Standard lines
Weigh and Measure all species ?		All species weighed Priority species measured	All species weighed Priority species measured
If only few priority species processed, list them by ICNAF Subdivisions		4R - Cod, Redfish 3Pn - Cod	3O - Cod, Redfish, Haddock, Am. Plaice, Halibut. 3N - Cod, Redfish, Plaice, Yellowtail.

1 9 7 1

ICNAF GROUNDFISH SURVEY INVENTORY

Country		Canada	Canada
Institute or Laboratory		Biological Station St. John's, NFLD.	Biological Station St. John's, NFLD.
Name of Research Vessel(s) or Vessel Class		*A.T. Cameron* Otter trawler (side)	*A.T. Cameron* Otter trawler (side)
Dates of Survey(s)		April 13, 1971 May 3, 1971	June 2, 1971 June 18, 1971
Number hauls in each ICNAF Subarea		Subarea 3 - 15 Subarea 2 - 19	Subarea 3 - 85
Survey Trawl	**Type trawl** **Vertical Opening** **Horizontal opening** **Mesh size in Cod end**	41.5 10 ft 45 ft 90 mm in codend 29-12.6 mm liner	41.5 10 ft 45 ft 90 mm in codend 29-12.6 mm liner
Standard Haul	**Speed** **Duration** **Avg. Area per haul**	3.5 knots 30 minutes .013 sq. naut. mi.	3.5 knots 30 minutes .013 sq. naut. mi.
Method of selecting stations		Standard lines	Stratified - Random
Weigh and Measure all species ?		All species weighed Priority species measured	All species weighed Priority species measured
If only few priority species processed, list them by ICNAF Subdivisions		3L - Cod, Am. Plaice Witch, Turbot 3K - Cod, Turbot 2J - Cod	3L - Cod, Am. Plaice, Yellowtail 3N - Cod, Am. Plaice, Yellowtail

1 9 7 1

ICNAF GROUNDFISH SURVEY INVENTORY

Country		Canada	Canada
Institute or Laboratory		Biological Station St. John's, NFLD.	Biological Station St. John's, NFLD.
Name of Research Vessel(s) or Vessel Class		*A.T. Cameron* Otter trawler (side)	*A.T. Cameron* Otter trawler (side)
Dates of Survey(s)		Oct. 4, 1971 Oct. 15, 1971	Oct. 25, 1971 Nov. 9, 1971
Number hauls in each ICNAF Subarea		Subarea 3 - 41	Subarea 2 - 24 Subarea 3 - 6
Survey Trawl	**Type trawl** **Vertical Opening** **Horizontal opening** **Mesh size in Cod end**	41.5 10 ft 45 ft 90 mm in codend 29-12.6 mm liner	41.5 10 ft 45 ft 90 mm in codend 29-12.6 mm liner
Standard Haul	**Speed** **Duration** **Avg. Area per haul**	3.5 knots 30 minutes .013 sq. naut. mi.	3.5 knots 30 minutes .013 sq. naut. mi.
Method of selecting stations		Stratified - Random	Standard lines
Weigh and Measure all species ?		All species weighed Priority species measured	All species weighed Priority species measured
If only few priority species processed, list them by ICNAF Subdivisions		3L - Cod, Am. Plaice Yellowtail 3N - Cod, Am. Plaice Yellowtail	2J - Cod, Redfish, Turbot 3K - Cod, Am. Plaice

1 9 7 2

ICNAF GROUNDFISH SURVEY INVENTORY

Country		Canada	Canada
Institute or Laboratory		Biological Station St. John's, NFLD.	Biological Station St. John's, NFLD.
Name of Research Vessel(s) or Vessel Class		*A.T. Cameron* Otter trawler (side)	*A.T. Cameron* Otter trawler (side)
Dates of Survey(s)		Jan. 17, 1972 Feb. 4, 1972	Mar. 20, 1972 Mar. 30, 1972
Number hauls in each ICNAF Subarea		Subarea 3 - 4 Subarea 4 - 16	Subarea 3 - 45
Survey Trawl	**Type trawl** **Vertical Opening** **Horizontal opening** **Mesh size in Cod end**	41.5 10 ft 45 ft 90 mm in codend 29-12.6 mm liner	41.5 10 ft 45 ft 90 mm in codend 29-12.6 mm liner
Standard Haul	**Speed** **Duration** **Avg. Area per haul**	3.5 knots 30 minutes .013 sq. naut. mi.	3.5 knots 30 minutes .013 sq. naut. mi.
Method of selecting stations		Standard lines	Stratified - Random
Weigh and Measure all species ?		All species weighed Priority species measured	All species weighed Priority species measured
If only few priority species processed, list them by ICNAF Subdivisions		4R - Cod 4S - Cod 3Pn - Cod, Haddock	3Ps - Cod, Haddock, Am. Plaice, Witch, Redfish, Halibut

1 9 7 2

ICNAF GROUNDFISH SURVEY INVENTORY

Country		Canada	Canada
Institute or Laboratory		Biological Station St. John's, NFLD.	Biological Station St. John's, NFLD.
Name of Research Vessel(s) or Vessel Class		*A.T. Cameron* Otter trawler (side)	*A.T. Cameron* Otter trawler (side)
Dates of Survey(s)		May 3, 1972 May 20, 1972	Oct. 31, 1972 Nov. 20, 1972
Number hauls in each ICNAF Subarea		Subarea 3 - 80-90	Subarea 3 - 7 Subarea 4 - 25
Survey Trawl	Type trawl Vertical Opening Horizontal opening Mesh size in Cod end	41.5 10 ft 45 ft 90 mm in codend 29-12.6 mm liner	41.5 10 ft 45 ft 90 mm in codend 29-12.6 mm liner
Standard Haul	Speed Duration Avg. Area per haul	3.5 knots 30 minutes .013 sq. naut. mi.	3.5 knots 30 minutes .013 sq. naut. mi.
Method of selecting stations		Stratified - Random	Standard lines
Weigh and Measure all species ?		All species weighed Priority species measured	All species weighed Priority species measured
If only few priority species processed, list them by ICNAF Subdivisions		3L - Cod, Am. Plaice Yellowtail 3N - Cod, Am. Plaice Yellowtail	4R - Cod, Redfish 3Pn - Cod

1 9 7 1

ICNAF GROUNDFISH SURVEY INVENTORY

Country		Fed. Rep. Germany
Institute or Laboratory		Bundesforschungsanstalt für Fischerei, Institut für Seefischerei, Bremerhaven
Name of Research Vessel(s) or Vessel Class		" WALTHER HERWIG"
Dates of Survey(s)		23 Nov. - 1 Dec. : Subarea 2 (incl. Div. 3 K) 3 Dec. - 11 Dec. : " 1 (Div. 1 C-F)
Number hauls in each ICNAF Subarea		Subarea 2: 20 (2J-8,2H-6, 2G-6) + Div. 3K: 6 " 1: 17 (1C-6, 1D-5, 1E-4, 1F-2)
Survey Trawl	**Type trawl** **Vertical Opening** **Horizontal opening** **Mesh size in Cod end**	standard groundfish trawl, HR/GR 102/140 feet (rollers) 2-3 m abt. 20 m 32 mm (codend liner)
Standard Haul	**Speed** **Duration** **Avg. Area per haul**	4.5 knots 60 min. 0.48 square miles
Method of selecting stations		Different depth zones across the shelf area (no replicate hauls)
Weigh and Measure all species ?		Total weight of catch; priority species weighed separately and either all or random sample measured; All by-catch species with at least numbers of specimen recorded.
If only few priority species processed, list them by ICNAF Subdivisions		Subarea 2 : abt. 40 species of fish recorded, measurements of 14 spec. Subarea 1 : 21 species recorded, measurements of 6 spec.

1 9 7 2

ICNAF GROUNDFISH SURVEY INVENTORY

Country		Fed. Rep. Germany
Institute or Laboratory		Bundesforschungsanstalt für Fischerei, Institut für Seefischerei, Bremerhaven
Name of Research Vessel(s) or Vessel Class		"WALTHER HERWIG"
Dates of Survey(s)		17 - 30 November : Subarea 2 1 - 12 December : " 1
Number hauls in each ICNAF Subarea		max. 40 per Subarea, depending on weather conditions
Survey Trawl	**Type trawl**	standard groundfish trawl, HR/GR 102/140 feet (Rollers)
	Vertical Opening	2-3 m
	Horizontal opening	abt. 20 m
	Mesh size in Cod end	32 mm (codend liner)
Standard Haul	**Speed**	4.5 knots
	Duration	30 min.
	Avg. Area per haul	0.24 square miles
Method of selecting stations		according to sampling strata and hydrographic conditions
Weigh and Measure all species ?		weight and number of specimen of all species; measurements and ageing material of priority species (cod, redfish, Greenland halibut and other if possible)
If only few priority species processed, list them by ICNAF Subdivisions		see above

1971 - 1972
ICNAF Ground Fish Survey Inventory

Country		USSR
Institute or Laboratory		PINRO, Laboratory of bottom fishes of Northwest Atlantic
Name of Research Vessel (s) or Vessel Class		Perseus III
Dates of Survey(s)		May - July 1971 April - June 1972
Number of hauls in each ICNAF Subarea		1971 - 239 1972 - about the same
Survey Trawl	Type trawl	Bottom otter-trawl
	Vertical Opening	2m
	Horizontal Opening	18m
	Mesh size in Cod end	130mm (in manila), with capron liner, knot-to-knot distance 10mm
Standard Haul	Speed	3.5 knots
	Duration	1 hour
	Avg. Area per haul	about 17000 m^2
Method of selecting stations		Standard grid
Weigh and Measure all species ?		All species
If only few priority species processed, list them by ICNAF Subdivisions		———

1973

ICNAF Ground Fish Survey Inventory

Country		USSR
Institute or Laboratory		PINRO, Laboratory of bottom fishes of Northwest Atlantic
Name of Research Vessel(s) or Vessel Class		Perseus III
Dates of Survey(s)		April-June (approximately)
Number hauls in each ICNAF Subarea		250
Survey trawl	Type trawl Vertical Opening Horizontal Opening Mesh size in Cod end	Bottom otter trawl 2m 18m 130mm (in manila), with capron liner, knot-to-knot distance 10mm
Standard haul	Speed Duration Avg. Area per haul	3,5 knots 1 hour about 17000 m^2
Method of selecting stations		Standard grid
Weigh and Measure all species?		All species
If only few priority species processed, list them by ICNAF Subdivisions		

Country		USSR
Institute or Laboratory		ATLANTNIRO
Name of Research Vessel(s) or Vessel Class		SRTM "BLESK"
Dates of Survey(s)		AUGUST - OCTOBER
Number hauls in each ICNAF Subarea		4V 4W 4X 5ZE 5ZW 6 Total 16 58 38 62 54 45 273
Survey Trawl	Type trawl	27.1m bottom trawl
	Vertical Opening	3.5m
	Horizontal opening	19m
	Mesh size in Cod end	10mm
Standard Haul	Speed	3.5 knots
	Duration	30min
	Avg. Area per haul	0.014sq.miles
Method of selecting stations		Random stations method
Weigh and Measure all species ?		All species
If only few priority species processed, list them by ICNAF Subdivisions		

19 / 1

ICNAF GROUNDFISH SURVEY INVENTORY

Country		USSR
Institute or Laboratory		ATLANTNIRO
Name of Research Vessel(s) or Vessel Class		BMRT "ARGUS"
Dates of Survey(s)		5 - 29 June
Number hauls in each ICNAF Subarea		4X 5ZE 5ZW 6 Total 25 48 14 16 103
Survey Trawl	Type trawl Vertical Opening Horisontal opening Mesh size in Cod end	hake bottom trawl - 815 4.7m 13.5m 12mm
Standard Haul	Speed Duration Avg. Area per haul	3.5knots 30min 0.013sq.miles
Method of selecting stations		Random stations method
Weigh and Measure all species ?		All species
If only few priority species processed, list them by ICNAF Subdivisions		

1972

ICNAF GROUNDFISH SURVEY INVENTORY

Country		USSR
Institute or Laboratory		ATLANTNIRO
Name of Research Vessel(s) or Vessel Class		SRTM "BLESK"
Dates of Survey(s)		AUGUST - OCTOBER
Number hauls in each ICNAF Subarea		4V 4W 4X 5ZE 5ZW 6 Total 18 60 40 64 56 47 285
Survey Trawl	Type trawl Vertical Opening Horizontal opening Mesh size in Cod end	27.1m herring trawl 3.5m 15m 8-10mm
Standard Haul	Speed Duration Avg. Area per haul	3.5knots 30min 0.014sq.miles
Method of selecting stations		Random stations method
Weigh and Measure all species ?		All species
If only few priority species processed, list them by ICNAF Subdivisions		

Table 2

Country	USSR
Institute or Laboratory	ATLANTNIRO
Name of Research Vessel(s) or Vessel Types	RHRT "ARGUS"
Dates of Survey(s)	June, October
Number hauls in each ICNAF Subarea	June: 4X 26, 5XE 48, 5ZW 15, 6 16, Total 105; October: 4X 20
Survey Trawl: Type trawl	hake bottom trawl - 815
Survey Trawl: Vertical Opening	4.7m
Survey Trawl: Horizontal Opening	13.5m
Survey Trawl: Mesh size in Cod end	12mm
Standard Haul: Speed	3.5 knots
Standard Haul: Duration	30min
Standard Haul: Avg. Area per haul	0.013sq.miles
Method of selecting stations	Random stations method
Weigh and Measure all species ?	All species
If only few priority species processed, list them by ICNAF Subdivisions	

1973

ICNAF GROUNDFISH SURVEY INVENTORY

Country		USSR
Institute or Laboratory		ATLANTNIRO
Name of Research Vessel(s) or Vessel Class		RTM "BELOGORSK"
Dates of Survey(s)		August - September
Number hauls in each ICNAF Subarea		4V: 16; 4W: 50; 4X: 38; 5ZE: 62; 5ZW: 54; 6: 45; Total: 273
Survey Trawl	Type trawl	27.1m herring trawl
	Vertical Opening	3.5m
	Horizontal opening	11.5m
	Mesh size in Cod end	10mm
Standard Haul	Speed	3.5knots
	Duration	30min
	Average area per haul	0.14sq miles
Method of selecting stations		Random stations method
Weigh and Measure all species ?		All species
If only few priority species processed, list them by ICNAF Subdivisions		

INTERNATIONAL COMMISSION FOR THE NORTHWEST ATLANTIC FISHERIES

Serial No. 2849
(B.g.20)

ICNAF Res.Doc. 72/120
Addendum

ANNUAL MEETING - JUNE 1972

Progress in the ICNAF Groundfish Survey Program, and proposals for coordinated activities in 1972

by

M.D. Grosslein[1]
Chairman, *ad hoc* Working Group on ICNAF Coordinated Groundfish Surveys

Table 1. Inventory of groundfish surveys conducted in the ICNAF Area in calendar 1971. Number of hauls Division (and country) within each Subarea.

Month	Subarea 1	2	3	4	5	6	Totals
Jan	3/(Denmark)	-	4/Pn(Canada)	20/R(Canada)	-	-	27
Feb	-	-	-	-	-	-	-
Mar	-	-	36/O,N(Canada)	-	155/Z(USA)	81/(USA)	272
Apr	-	19/J(Canada)	15/L,K(Canada)	71/X(USA)	43/Y(USA)	-	148
May	4/(Denmark)	-	239/(USSR)[a]	-	-	-	243[a]
June	-	-	85/L,N(Canada)	23/X(USSR)	63/Z(USSR)	16/A(USSR)	187
July	-	-	-	125/V,W,X(Canada)	-	-	125
	-	-	-	61/V(France)	-	-	61
Aug	-	-	-	112/V,W,X(USSR)	-	-	112
Sept	-	-	?/(Poland)	65/T(Canada)	-	-	65
Oct	-	24/J(Canada)	41/L,N(Canada)	-	129/Z(USA)	81/(USA)	
	-	-	-	-	116/Z(USSR)	45/(USSR)	436
Nov	-	20/(Fed.Rep. Germany)	3/K(Canada)	70/X(USA)	40/Y(USA)	-	
	-	-	6/K(Fed.Rep. Germany)	-	-	-	139
	-	-	78/P(France)	-	-	-	78
Dec	17/(Fed.Rep. Germany)	-	-	-	-	-	17
Total Hauls	24	63	507	547	546	223	1,910

[a] All Divisions, May-July

[1] National Marine Fisheries Service, Northeast Fisheries Center, Woods Hole, Massachusetts, USA

120