

III. Fleets and Activity of Nations in Cod Fisheries at Greenland

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Horsted (MS 1994) presented a review of catch statistics by nations, which participated in the cod fisheries in Greenland waters in this century. The first draft of the review paper was distributed in April 1993 to national representatives of the NAFO Scientific Council requesting comments and advice on the appropriate sections of the country-by-country catch statistics. Responses were received during 1993 and 1994 from most of the countries addressed (see Acknowledgements). Although not all responses resolved the questions raised for the country in question, most of them identified the need for substantial revision. The review paper (Horsted, MS 1994) incorporated these changes, especially in the text and in several cases the published catch statistics were amended.

It is not the author's intention here to repeat that review, but it would be of interest to briefly consider each participating nation's fleet and general activity. This is done here country by country in alphabetical order. Not all references from Horsted (MS 1994) are repeated here, and readers are referred to Tables 1–3 for amended catch statistics, which are presented in this review by country.

CANADA: Schooners from Newfoundland had an insignificant dory fishery in 1931, which resulted in 50 tons listed under miscellaneous vessels. Three trawlers from Newfoundland landed 679 tons in 1952 and a new stern trawler landed 8 tons in 1968. Two tons are recorded from East Greenland in 1976. Otherwise there was no Canadian cod fishery at Greenland.

DENMARK: Danish activity in cod fishing at Greenland has been very low. In 1925, and in 1929–30, a few long-liners produced less than 200 tons altogether. During 1936–38, a few schooners altogether fish more than 300 tons. There was no fishing activity in 1939–47. During 1948–51 Danish fishermen tried various gear from cutters, introducing with some success the pound net in inshore Greenland waters. Altogether about 20 000 tons were fished in those years. There has been no Danish cod fishing in Greenland waters since then.

FAROE ISLANDS: Experimental fishing carried out in 1906 and 1914 was without success as far as cod was concerned. Commercial cod fishing at Greenland started in 1925 and was up to 1977 an important component of the international fisheries at Greenland and of the Faroese economy. From 1926, Faroese vessels were offered harbour facilities, first at Ravns Storø, thereafter at Færingehavn south of Nuuk. From 1937, that harbour was also open to other foreign fishing vessels. Until 1940, the Faroese catches were taken by long-liners mainly, if not solely. There was no fishing activity at Greenland 1941–45. From 1948 or probably earlier trawlers also participated, but since 1969 the catch has again been mainly by long-liners. Bottom gillnets came into operation in 1969. Since 1935, the Faroese have been allowed to operate outside the skerries from a couple of stations at the West Greenland coast, using small boats and mainly hand lines. The introduction of the *snelle* in the 1950s was a great improvement for the hand line fishing (see Templeman, 1969). Except for the year 1983, landings after 1977 have been nil or negligible (e.g. 38 tons in 1979), apparently because the Faroese as a non-member of the EEC/EU have not got a quota.

An important component of the Faroese fishery at Greenland since 1935 has been the small land-based boats mentioned above. The most important basis for this fishing became Ravns Storø and Færingehavn. Apart from the period during World War II, this seasonal fishing took place from 1935 until 1972. The ICNAF List of Vessels (ICNAF, 1955), issued for the first time as a document for the 1955 Annual Meeting, shows that 57 small land-based boats participated in 1954 with a total of 224 fishermen involved. Lists of Faroese vessels of various types fishing in Greenland waters 1967–72, kindly supplied by Faroese fishing authorities in Tórshavn

(Fiskivinnustovan and Hagdeildin) show the following numbers of small land-based boats and men participating in the fishery at Greenland:

Year	Boats	Men
1954	57	224
1967	75	309
1968	85	368
1969	43	168
1970	21	84
1971	7	29
1972	4	18

The same sources of information give the following number and crew for larger vessels:

Year	Hand liners		Long liners		Bottom gillnets		Trawlers		Total	
	Boats	Men	Boats	Men	Boats	Men	Boats	Men	Boats	Men
1954	5	121	29	543	0	0	10	274	44	938
1967	44	981	36	868	0	0	10	398	90	2 244
1968	23	500	33	767	0	0	11	454	67	1 721
1969	11	256	29	535	18	439	12	256	70	1 756
1970	3	52	8	120	14	284	0	0	25	456
1971	2	32	6	75	4	80	9	392	21	579
1972	2	38	15	252	0	0	8	359	25	749

The larger vessels consisted of wooden liners and steel trawlers. Some of the oldest liners also functioned as mother vessels to dories. Of the 56 large liners used in 1968 (according to the *ICNAF List of Vessels*) five were built before or during World War II, the oldest being a dory vessel from 1898. The rest were built around 1960. Most of the vessels also fished around Newfoundland.

Catches at East Greenland (i.e. after 1958) have been relatively small (altogether a little more than 7 000 tons). There was some fishing during the early 1970s with little fishing after 1977 (Table 3).

Altogether the Faroese output of the cod fishery at Greenland amounts to about 1.4 million tons, slightly less than the figure for Greenland itself, and placing the Faroese at number four on the list of nations which have exploited the resource (Table 4 and Fig. 2).

GREENLAND: Greenland as the coastal nation quite naturally has the longest history of cod catches, starting in 1911 and with no break thereafter. To this should be incorporated a non-registered catch for local consumption. The entire fishery was a small-boat fishery up to 1966 when four larger long-liners were introduced to fish offshore. They operated until 1970, when they were phased out. The first large stern trawler started fishing offshore in 1968, and several other stern trawlers owned and run by the government, since 1985 by the Greenland Home Rule companies, have since then been added to the fleet. Also a number of privately owned trawlers participated in the fishery, although now they mainly operate in the fisheries for shrimp.

The first record of commercial catch of cod by Greenland at East Greenland is from 1956, but there was some fishing for local consumption before then. Japanese trawlers were chartered to fish cod at East Greenland in 1986 and 1987 (Table 3).

Historically all inhabited places in Greenland have been right at the sea coast, and with no roads (except winter ice) between cities and settlements. Boats were essential for transport and communication, and for the

exploitation of the living resources of the sea. The Greenland fishing fleet before World War II consisted mainly of rowing boats and small motorboats (even kayaks were used). The Greenland statistics list number of boats for each settlement. Hansen and Hermann (1953, Fig. 38) graphically presents the total number of rowing boats during 1880–1952. The number increased rather steadily from about 150 by 1900 to about 1950 by 1950 with the highest rate of increase during 1925–30. Motorboats numbered less than 100 until the end of World War II, thereafter increased rapidly to about 400 by 1952. Although nearly all of them were in the cod fishing districts not all may have been fully active in cod fishing. But these were what the Greenlanders had at their disposal at that time.

The number of rowing boats used for regular fishing decreased after 1950 (2 092 boats that year) to about 1 300 in 1955 and about 1 200 by 1960. Thereafter it is not clear how many of the boats could be counted as part of the fishing fleet. Since an increasing proportion was being used for recreational purposes, there may have been less than 500 fishing commercially and regularly.

The number of motorboats fishing was reported as 364 by 1950, 272 of them were less than 22 feet long and 92 were larger. By 1955 the figures were 283 below 22 feet and 199 were larger. The development towards more motor vessels and especially towards larger vessels has continued since then. The Danish Ministry of Fisheries publishes an annual list of registered fishing vessels in the Danish Kingdom (includes the Faroe Islands and Greenland). From this the following numbers of vessels in the Greenland fishing fleet by tonnage class were obtained (grouping by size categories differs somewhat between years). The figures for 1970 are from the Royal Greenland Trade Department and include registered boats below 5 GRT not included in the annual lists mentioned.

Year	Vessel tonnage class (GRT)					
	Below 5	5–24	25–49	50–99	100–499	above 500
1970	3	251	23	6	7	0
1975	no info.	253	20	12	7	6
1980	–	267	22	12	21	6
1985	–	341	22	12	23	22

For 1990 the grouping was somewhat changed:

Year	Below 5	5–19	20–49	50–79	80–149	above 150
1990	no info.	342	36	19	11	60

Whereas most vessels below 5 GRT registered as fishing vessel may have participated in the cod fisheries or mixed fisheries (wolffish, redfish, halibut, salmon), a good many of those between 15 and 49 tons were side trawlers specializing in shrimp fishing inshore. Also the increase in number of vessels in size classes above the 50 GRT reflects interest in shrimp fishing both inshore and offshore, rather than cod fishing. Many of the small and medium sized vessels (below 80 GRT) were also used for salmon fishing in autumn in the late-1960s and 1970s.

Since 1968, Greenland has had a steadily growing fleet of large trawlers enabling Greenland to compete with other nations in the offshore fishing throughout the year not only in Greenland waters but also in more distant waters, e.g. on Flemish Cap and in the Barents Sea. The large Greenland trawlers owned first by the State, later by the Greenland Home Rule, have, however, not had their own choice of fishing. They have been changing between cod and shrimp fishing, based on effort by management trying to take into account not only vessels' economy, but also that of the individual fish plants and social problems of the various Greenland

communities. One could say that the large Greenland trawlers came too late to benefit from the good part of the cod epoch. However, as seen from Tables 2 and 3 their contribution to the total Greenland catch of cod has been rather substantial. In 1989, for instance, 57 000 tons out of a total catch of 96 000 tons (including East Greenland) were taken by the trawlers – the highest annual Greenland catch of cod ever.

Greenland had a total output of the cod of about 1.5 million tons plus a non-registered catch directly for local consumption. This registered total catch is exceeded only by those of Germany and Portugal (Table 4, Fig. 2).

FRANCE: France has a long tradition of cod fishing in the Northwest Atlantic. Statistics dating back to 1874 were submitted to ICNAF (Second Annual Report, 1952). Only vessels from the mainland have fished in Greenland waters.

Fishing at West Greenland started in 1926 with two dory schooners. There was no French fishing there during 1939–45. Dories were phased out during 1947–51. Fishing thereafter has been by trawlers, and until 1962 by side trawlers only. In 1962, 30 such French side trawlers operated at Greenland, 28 of them were of the 901–1 800 GRT class, 2 larger than 1800 GRT. Nearly all were built in the first ten years after World War II. They also operated in ICNAF Subareas 2–4.

In 1965, a new stern trawler (1798 GRT) joined the fleet, now a total of 28 vessels, and in 1968 four vessels out of the 30 fishing at Greenland were large stern trawlers. Otherwise the French trawler fleet did not change much during the 1960s. In 1971, only seven out of a fleet of 29 trawlers operating in the Northwest Atlantic fished at West Greenland with a catch of 4 100 tons, and these were all side trawlers built around 1950.

Apart from negligible catches in 1973 and 1979, the year 1972 could be considered the last year of French cod fishing at West Greenland, with a catch that year of 5 515 tons.

There is no record of French fishing at East Greenland in the ICNAF or ICES statistics except that a note in *ICNAF Stat. Bull.*, Vol. 2, page 16 states that "part of the French catch registered as taken in the Northwest Atlantic before 1958 was taken just east of Cape Farewell".

The total French catch of cod from West Greenland waters amounted to about 400 000 tons before World War II and double thereafter. This total is slightly less than that registered by Greenland and the Faroe Islands but well below that of Germany and Portugal, making France number five on the list of nations exploiting the resource (Table 4, Fig. 2).

THE FEDERAL REPUBLIC OF GERMANY (FRG): FRG had virtually no fishing at Greenland before World War II, but rapidly built up a fleet of modern high seas trawlers in the 1950s. For 1956, the first year in which *ICNAF List of Vessels* contains a list for Germany, 66 trawlers of 501–900 GRT class built in the years 1949–56 are listed. All recorded one or more (up to four) trips to Div. 1D and five of them also to Div. 1F.

In 1959, 78 FRG trawlers of the 501–900 GRT class fished at West Greenland. In 1962 as many as 84 were engaged there, of which 26 were of the 901–1800 GRT class. In 1965, 79 trawlers participated in the fishery, six of them built in 1964 and 1965 at a size of above 1800 GRT (up to 2 555 GRT). Most of the fleet was equipped with Diesel motors with Brake Horse Power (BHP) from about 1 000 to 3 200 in the large new ones. After 1965 the number of FRG fishing vessels at Greenland gradually declined to 73 in 1968 and to 42 in 1971 (9 side trawlers and 33 stern trawlers).

In 1974, in spite of 32 vessels fishing in the Northwest Atlantic, only five reported fishing at West Greenland, while 30 reported fishing farther westward at Labrador (Subarea 2). Of the five at West Greenland one was as large as 3 577 GRT with 5000 BHP Diesel engine, built in 1973.

In 1977, all 37 trawlers fishing in the Northwest Atlantic visited Greenland waters. Only three of them were built before 1960. In 1980, 31 trawlers fished in the Northwest Atlantic, all with activity in Greenland waters, only one dating before 1960 while 14 were younger than ten years.

In 1983 the number was 21 vessels visiting Greenland waters, 13 of them larger than 1 800 GRT (up to 3 577 GRT), 6 just above 900 GRT and 2 in the 501–900 GRT class, all built in the period 1960–70s.

In 1986 and 1989 only two FRG trawlers fished in the Northwest Atlantic, including Greenland waters. The catch in 1989 was relatively good, but the small catches thereafter could indicate less activity.

At East Greenland the Federal Republic of Germany had been by far the most active nation of those exploiting the cod stock. They fished there throughout the period 1955–95 with catches recorded separately for East Greenland since 1958 in the *ICES Bull. Stat.* Catches reported for ICES Subarea XII (further to the Southeast) for the years 1978–84 were considered by the ICES Working Group on Cod Stocks off East Greenland (Anon., 1987) to have been taken in ICES Subarea XIV and are, therefore, included in Table 3.

Until the mid-1970s cod catches at West Greenland by FRG greatly exceeded those from East Greenland. Thereafter the two areas yielded catches of cod of about the same magnitude with East Greenland clearly dominating in the years 1989–95.

The vessels used at East Greenland were the same as those used at West Greenland. In 1989, the Greenland licensing office noted a participation of 12 different trawlers fishing at East Greenland. At East Greenland redfish has been a significant by-catch or even prime target species in the mixed FRG fishery.

The total catch of cod taken by the FRG in Greenland waters between 1952 and 1995 (inclusive) amounted to about 1.7 million tons (400 tons were recorded before 1939). The Federal Republic of Germany thereby ranks as second on the list of national catches of the cod at Greenland (Table 4 and Fig. 2) after Portugal. However, looking only at the post-war period, FRG would be the leader closely followed by Portugal (Tables 2 and 4, and Fig. 2). The same would be the case if total catches included species other than cod (primarily redfish).

THE GERMAN DEMOCRATIC REPUBLIC (GDR): GDR had a short history of cod fishing at Greenland only during 1958–72. For some of the years catches in the Northwest Atlantic were not reported separately by statistical areas, but the fraction taken at Greenland may be judged from observations in other years. Not being a member of the European Union (until being integrated with the Federal Republic of Germany in 1991) the GDR stopped fishing at West Greenland in 1972, when fishing zones were expanded.

Not being a member of ICNAF until 1974, the GDR was not included in the *ICNAF List of Vessels* until that year. *ICNAF Stat. Bull.* had no catch recorded by the GDR at West Greenland for 1973. However, the List of Vessels indicates that of the 64 trawlers from the GDR fishing in the Northwest Atlantic, 14 had activity at West Greenland. Most of these trawlers were of the 601–900 and 901–1800 GRT classes, but also larger vessels listed as factory trawlers or auxiliary vessels were recorded. All were built between 1950 and 1971 and all were Diesel powered. The listed home-port was Rostock.

The author could not resolve the question why the GDR showed no catch figures for cod for Subarea 1 for 1974, and that 3 409 tons of other groundfish, other than cod, redfish and flatfishes were recorded, while the list of vessels indicated significant activity there. The author has chosen to let the *ICNAF Stat. Bull.* be considered as correct, although one could well suspect that "other groundfish" may have been cod or at least included some.

ICELAND: Although a neighbour to Greenland, Iceland did not participate in the cod fisheries at West Greenland until 1936 by a long-liner with poor result. No further fishing experiments were carried out there until 1948 when a trawler operated. A trawler operated again in 1949 together with some long-liners. From

1951 to 1967, except for a total catch of 64 000 tons in 1952, the annual catch never exceeded 20 000 tons. The latest catch at West Greenland was about 100 tons for 1968 and 1969 by bottom gillnets.

For 1954, the *ICNAF List of Vessels* contains 23 vessels of 600 – about 700 GRT, probably all trawlers (10 of them were registered as trawler in the list for 1956, and 16 trawlers of the same size and age (built 1947–51) were listed as having fished in Subarea 1). In 1959, 24 out of 41 vessels fishing in the Northwest Atlantic were active at West Greenland (no noteworthy change from 1956). In 1962, two out of 12 vessels, and in 1965, 8 out of 13 vessels (now including 2 above 900 GRT, built in 1960) fished at Greenland. In 1968 only one vessel out of three operating in the Northwest Atlantic operated at West Greenland, using bottom gillnets.

The series of Icelandic catches are longer for East Greenland than for West Greenland, *viz.* 1954–76 with catches of up to 10 000 tons and with sporadic catches below 100 tons in some of the years thereafter. The vessels were most likely all trawlers since redfish was the major target species.

ITALY: Italy has shown little interest in fishing for cod in the Northwest Atlantic. Catch figures for cod were reported for 1938–40 but none of them are thought to be from Greenland waters. However, for the years 1950 to 1960 and for 1965 catches of cod were reported. Except for the years 1958, 1960 and 1965 when catches in Subarea 1 were specified, catches are given for the ICNAF Convention Area as a whole or for two or more Subareas combined. Thus catches listed as taken at West Greenland in other years (Table 2) are qualified estimates rather than directly reported figures.

There are no records of Italian fishing at East Greenland.

Vessels used were 1–3 of the large *Genepesca* trawlers (1 200 – about 1 600 GRT), built in 1947–50 and 3 built in 1953. 1953 was the best year for catches with 4 000–5 000 tons recorded. Probably not more than one vessel operated at Greenland in the other years.

JAPAN: Japan has had only negligible catches of cod in Greenland waters, apparently as by-catch in fisheries for redfish and Greenland halibut with trawlers chartered by Greenland or with the research and scouting vessel *Shinkai Maru* (3 395 GRT) in search for deep water resources at West as well as at East Greenland (Jørgensen, 1998). The catches at East Greenland (1986–91) were only marginally higher than those at West Greenland.

NORWAY: Norway has had a long tradition for fishing at Greenland, starting at West Greenland in 1924 although with Atlantic halibut as the target species (Hjort and Ruud, 1929). Halibut has remained of interest to Norway, especially for the long-liners. Only since 1950 were catches in the Northwest Atlantic reported separately for trawlers and long-liners. Catches prior to 1950 are here regarded as taken solely by long-liners. There is a nearly unbroken series of catch data from 1924 to 1978 (no fishing at Greenland 1940–45). The small catches (below 10 tons) listed since 1984 are by-catches in the fishery for shrimp.

Catches by long-liners were considerably higher than those by trawlers until 1967 inclusive. Thereafter the two fishing methods have varied much in relative importance. In several cases all or part of the catch by long-liners was not broken down by ICNAF Subareas. In such cases the author has allocated part of the catch to Subarea 1.

In 1953, 59 Norwegian vessels were fishing in the Northwest Atlantic. Most, if not all, were likely to have had their main activity at West Greenland. Three of them seem from their size (567–617 GRT) to have been trawlers, the remainder liners, mostly long-liners, 6 of the 51–150 GRT class and 50 of the 151–500 GRT class.

In 1956, 71 long-liners and 2 trawlers were fishing at Greenland. The long-liners were generally old vessels, the oldest dating back to 1885, with only 19 of them built after World War II.

In 1959, 52 liners and 2 trawlers were fishing at Greenland. In 1962, 46 liners (151–500 GRT class); in 1965, 18 liners and 2 trawlers; and in 1968, 35 long-liners and 7 trawlers were fishing at Greenland.

The Norwegian activity at Greenland thus fluctuated quite a bit in the 1950s and 1960s as also indicated by the annual catches (Table 2). Thereafter the Norwegian cod fishing activity at Greenland decreased rapidly. There seems to have been no trawlers fishing cod in 1970, and in 1971 only one trawler and four long-liners were fishing, with the long-liners also using drift gillnets, likely for salmon rather than for cod. For 1974 the ICNAF List of Vessels records 21 trawlers and 9 long-liners. However, since ICNAF Stat. Bull. indicated that only 411 tons of cod were caught by trawlers a good part of the 21 trawlers were likely fishing shrimp rather than cod. Since then there were no trawl caught cod reported by Norway, and cod catches by long-liners were negligible after 1977, when only 6 long-liners were fishing.

Norway's total output of cod fishing at Greenland was close to 900 000 tons (Table 4, Fig. 2).

POLAND: Poland had the only records of catches of cod at Greenland from 1960 and 1962–69 when small amounts (below 900 tons annually) were taken. The best year, 1968, when 861 tons were taken by large trawlers (about 2 800 GRT), the *ICNAF List of Vessels* indicated that 22 vessels participated in the fishery at Greenland. The *ICNAF Stat. Bull.*, however, indicates only 62 days on ground with 45 fishing days. Thus, there seems to have been just short trips to the area, probably on the way to (or from) Subareas 2 and 3 where Poland had much higher activity and catches. The Polish fleet fishing in the Northwest Atlantic that year amounted to 84 trawlers.

PORTUGAL: Like France, Portugal has a long tradition for fishing cod in the Northwest Atlantic, specifically off Newfoundland but also during the good part of the cod epoch at Greenland. The traditional fishing was by long-lines and/or handlines from dories. Trawlers were introduced in 1936 (*ICNAF Stat. Bull.*, Vol. 2, page 18).

Hansen and Hermann (1953) state that Portuguese fishing at Greenland started in 1913. *ICES Bull. Stat.*, which started to include fisheries at Greenland and Newfoundland in 1925, however, does not list any Portuguese catches there until 1932, and figures published up to 1951 are for Greenland and Newfoundland combined. It has, therefore been complicated to arrive at a reasonably qualified estimate of the proportion of the catch taken at Greenland (see Horsted, MS 1994).

Portugal does not seem to have been fishing at East Greenland.

By 1953 the Portuguese dory fleet fishing in the Northwest Atlantic consisted of 45 mother vessels 44 of which seem to have been stationed at West Greenland during part of the season. The trawler fleet consisted of 22 side trawlers of 200–1 700 GRT and 900–1 200 BHP. They were probably not all visiting Greenland that year since the trawlers catches were only 8 000 tons as compared to 14 000 in 1952 and 42 000 in 1954.

The dory fleet fishing at Greenland increased slightly through the 1950s. In 1956, there were 49 and in 1959, 48 mother vessels. Also the total tonnage and number of dories carried increased. The average number of dories per mother vessel was 51 by 1935, 55 by 1956 and 61 by 1959. In 1959, one of the vessels carried 10 motor-dories manned with more men than the traditional one-man dory. The number of trawlers remained constant throughout at 22.

By 1962, the number of dories had fallen relating to a decrease in mother vessels to 35 although the mean capacity was 64 dories. The number of trawlers had risen to 30 by 1962. The number of dory mother vessels remained at 30 in 1965 and 1968, while number of trawlers fluctuated much: 14 in 1965, 33 in 1968. Thereafter both fleets decreased rapidly. By 1971 only 8 trawlers participated, thereafter virtually none. The number of mother vessels fell to 8 by 1971 plus 3 with motor-dories fishing with bottom gillnets. In 1974 two and in 1977 four vessels with motor-dories fished by bottom gillnets, but thereafter Portuguese fishing activity at Greenland stopped.

Portugal has had a total output of about 2.1 million tons from its cod fishery at Greenland, the largest on the list (Table 4 and Fig. 2).

SPAIN: Like Portugal and France, Spain also had a long tradition for fishing cod in the Northwest Atlantic. Catch statistics have been reported since 1927 (*ICNAF Stat. Bull.*, Vol. 3, page 15). At Greenland, only trawlers, mainly single otter trawlers were used until 1968 when one otter trawler and 87 pair trawlers were reported fishing there. Since then only pair trawlers have been reported (in the *ICNAF List of Vessels*) fishing at Greenland.

A few Spanish trawlers fished at Greenland in the 1930s (Hansen and Hermann, 1953). Only since 1952 have Spanish catches in the Northwest Atlantic been specified by Subareas in the *ICNAF Statistical Bulletin*. However, fishing at Greenland probably occurred right after World War II although with less activity than in other parts of the Northwest Atlantic. Estimates of 1 000 tons landed were set for the years 1946–50, 2 000 tons for 1951 (Table 2). There has been no Spanish cod fishing at Greenland after 1976.

There are no records of Spanish fishing at East Greenland.

In 1953, Spain had 25 otter trawlers operating in the Northwest Atlantic, 23 of them in the 901–1 800 GRT class, 2 in the 151–500 GRT class, but not all of them are likely to have been fishing at Greenland. The list for 1956 has 18 otter trawlers and 2 pair trawlers fishing at Greenland. In 1959 and 1962, 25 and 24 otter trawlers, respectively, fished there. Most were built in the 1940s and 1950s. Thereafter there was a low activity period 1963–67 with only 6 trawlers operating in 1965 (catch 650 tons). For 1968 only one otter trawler was reported fishing at Greenland but 87 pair trawlers were there (pair trawlers counted as individual vessels). In 1971 and 1974 44 and 34 pair trawlers, respectively, were operating at Greenland, but there has been no activity since 1976.

UNION OF SOVIET SOCIALISTIC REPUBLICS (USSR): USSR until 1959 had no ICNAF or ICES records of fishing at Greenland, and none since 1977. Generally speaking, the activity in cod fishing has been very low at West Greenland as well as at East Greenland. In the latter area catches of cod are recorded for some of the years during 1963–77 and in 1992.

It is difficult to assess the USSR fishing from information in the *ICNAF List of Vessels* where no vessels fishing at Greenland were recorded until 1965 (one trawler, but no catch of cod was registered in ICNAF Stat. Bull.). In 1968, 11 trawlers were recorded, but since only 670 tons of cod were recorded this number of vessels may include some fishing for shrimp or fish other than cod. In 1971, 1974 and 1977, 7, 27 and 12 USSR trawlers, respectively, were recorded fishing at Greenland, but it is difficult to judge how many of them, if any, were fishing directly for cod. Thereafter no USSR cod fishing activity was recorded at Greenland.

The USSR vessels have also exploited redfish at Greenland. The cod/redfish ratio fluctuates much between years but in some years the quantities of redfish landed exceeded that of cod considerably. For instance in 1975 and 1976, close to 4 000 tons and 6 000 tons of redfish with only 214 and 137 tons of cod, were reported respectively. At East Greenland the USSR had also fished redfish, but the fishery was stopped by regulations (closed areas) when the fish size was found too small.

THE UNITED KINGDOM (UK): UK fisheries statistics for cod at Greenland are available from different sources, and annual figures differ between these (see Horsted, MS 1994). In general, the UK was amongst the first nations participating in the fisheries at Greenland, although in the beginning (from 1924) it was a fishery by long-lines for Atlantic halibut with a by-catch of cod rather than a directed cod fishery.

The first UK trawlers were at Greenland in 1935. Long-line fishing was phased out after World War II (there was no fishing during 1939–45), and trawlers have dominated since 1948. The target species for the trawlers was cod with redfish as the major by-catch.

Catches of cod were above 10 000 tons in most years during 1948–68, with a period of low catches during 1955–58 and a record high of 55 000 tons in 1962. Fishing activity and catches fell after 1968 to a level below 4 000 tons annually, and has been sporadic since 1976 with few thousand tons.

The UK has had a tradition of fishing in the Cape Farewell area, and already in the 1920s part of the catches was likely taken in waters east of the Cape. However, only since 1958 does the ICES statistics give figures for East Greenland separately. Catches at East Greenland before then were incorporated in figures for West Greenland. Annual catches recorded for East Greenland have seldom approached 2 000 tons during 1958–78. There are no records of cod fishing there during 1979–88, while for 1989–92 between 1 300 and 5 500 tons was reported with a few hundred tons annually thereafter.

Until the mid-1930s the UK fleet fishing at Greenland consisted of long-liners only. Some of them were again fishing right after the World War II until 1952, but only trawlers have operated thereafter. In 1953, 95 steam trawlers of the 501–900 GRT class participated. In 1956, only 8 were listed, fishing in Div. 1F. In 1959, 31 trawlers were listed, 33 in 1962 and 50 in 1965. In 1968, 25 trawlers were listed of which 14 were stern trawlers. In 1971 and 1974, only 14 trawlers were listed, all diesel powered and the oldest was built in 1957.

The UK like FGR have made use of redfish in the catches and their fishery may at least sometimes be characterized as a mixed fishery. Landings of redfish have, however, generally been modest (below 1 000 tons annually) at West Greenland.

The overall total UK catch of cod at Greenland is about 418 000 tons (Table 4).

THE UNITED STATES OF AMERICA (USA): USA had records of cod fishing only at West Greenland, and that was in 1969 and 1970 when altogether 478 tons were caught.

IN GENERAL: Table 5 illustrates the activity as judged by the number of vessels (over 50 GRT) participating in the cod fishery at West Greenland since 1953. It shows that the number of vessels was rather stable between 300 and 400 different vessels from the early-1950s to the mid-1960s. It seems to have peaked around 1968 when no less than 424 vessels were registered as fishing at West Greenland, several of them making more than one trip. After that time the number of foreign vessels declined drastically, especially so far as the long-liners and Portuguese dory vessels were concerned. Horsted (MS 1965) showed that vessel capacity and fishing power generally increased from 1953–54 to 1962. Developments seem to have continued especially for trawlers, where a gradual shift from side- to stern-trawlers seems to have been a major improvement allowing for fishing in more rough weather and hence to permit fishing to take place throughout the year. However, with stock abundance and catch-rate generally decreasing after 1968, the interest and hence the activity level have decreased much since then, but not necessarily accompanied by decreasing fishing mortality.

The ICES North Western Working Group recently, and for the first time, succeeded in performing an analytical assessment of the combined West-East offshore stock components covering the years 1955 to 1992 (Anon., 1996, 1997). This assessment indicates that average fishing mortality rate (F) for age groups 5–8 increased from a level of 0.1 by 1955 to about 0.4 by 1962, remained at that level until 1973 and then increased further to 0.9 by 1978. Large fluctuations thereafter (0.1 by 1987 and 1.3 by 1990) seem possibly due partly to regulations and partly to abrupt changes in recruitment (e.g. entrance of the 1984 year-class).

No doubt, however, there is a potential international fleet of vessels ready to go into a new rush for cod fishing should the stock situation improve. However, now there are also new political considerations: the extended Exclusive Economic Zone and new management regimes through nationally allocated quotas.

Table 5

TABLE 5. Estimated number of vessels (Nos.) above 50 GRT engaged in fishing for groundfish, primarily cod, at West Greenland and their average size (BHP for trawlers), crew (for liners) and number of dories (for dory vessels (except in 1977)). Number of Days (DoG) on Ground from information in *ICNAF List of Vessels*.

Year	Otter trawlers				Liners				Dory mother vessels				Total Nos.
	Nos.	GRT	BHP	DoG	Nos.	GRT	Crew	DoG	Nos.	GRT	Dories	DoG	
1953	205	875	1061	30	89	185	19.8	96	40	693	51	73	334
1956	170	926	1112	28	113	178	19.4	85	49	765	55	54	332
1959	219	940	1224	40	108	190	20.2	154	47	872	61	72	374
1962	226	1037	1321	60	94	236	22.4	156	35	70	64	102	355
1965	213	1170	1704		67	300	21.9		30	908	67		310
1968	306 ¹	1268	1714		88	248	20.3		30	911	69		424
1971	136 ¹	1182	1900		12 ²	302	21.1		11	967	51 ³		159
1974	107 ¹	1521	2160		36 ⁴	219	18.8 ⁵		2	1068	6 ⁶		145
1977	56	1947	3013		6	405	18.7		4	957	67	crew	66
1980	37	2051	3315		0				0				37
1983	39	1615	3004		1	242	20		0				40
1986	13	1750	3349		5	185			0				18
1989	18	1379	2290		0				0				18

¹ Number of trawlers include 87 Spanish pair trawlers (counted as single vessels) for 1968, 44 for 1971 and 34 for 1974.

² 15 Greenlandic or Norwegian vessels fishing part- or full-time for species other than cod (salmon, shrimp) not included.

³ 18 motorboats from 3 mother vessels not included in mean number of dories.

⁴ Includes some vessels fishing shrimp part of the time or fully.

⁵ Calculated for 22 non-Greenlandic vessels only.

⁶ Motor boats fishing by gillnets.