COOPERATIVE RESEARCH REPORT

No. 71

SIXTH REPORT OF THE BLUEFIN TUNA WORKING GROUP

Observations on the Size Composition of Bluefin Tuna Catches from 1973 to 1975

by

H Aloncle, J Hamre, J Rodriguez-Roda and K Tiews

https://doi.org/10.17895/ices.pub.7696

ISBN 978-87-7482-557-9

ISSN 2707-7144

International Council for the Exploration of the Sea
Charlottenlund Slot, DK-2920 Charlottenlund
Denmark

October 1977

CONTENTS

-o-o-o-

INTRODUCTION

Reference is made to the previous reports of the Bluefin Tuna Working Group (Statistical News Letters, Nos. 20, 26 and 38, and Cooperative Research Reports, Nos. 23 and 40). Following recommendations of the Pelagic Fish (Southern) Committee in 1973, 1974 and 1975, the members of the Bluefin Tuna Working Group continued the collection of data on the development of the bluefin tuna fisheries in the North Atlantic and adjacent seas. The work was carried out by correspondence between members and with other tuna scientists in the region, and it has again been concentrated on the collection of data on the size composition of tuna catches taken in 1973-75.

MATERIAL

The development of bluefin tuna catches in the Atlantic is shown in Table 1. It is based on revised statistics collected by the International Commission for the Conservation of Atlantic Tunas (ICCAT).

Reports on catches and on catch composition of bluefin tuna were submitted by the following countries: Canada (Tables 2-14), Denmark (Table 15), France (Tables 16-18), Norway (Tables 19-26), Spain (Tables 27-30), and USA (Tables 31-49).

The Federal Republic of Germany could still not resume its tuna fisheries because of unavailability of fish on the former fishing grounds in the central parts of the North Sea since 1963.

Dr S N Tibbo and Dr J S Becket stated that Canadian commercial landings of bluefin tuna in 1973 (= 800 t) were more than four times the amount taken in 1972, but less than 60% of the peak catch (1436 metric tons) in 1970 (Table 2). The catch included 160 metric tons of large tuna, chiefly from the trap fishery in St. Margarets Bay on the Atlantic coast of Nova Scotia, and 639 metric tons of small (under 60 kgs) fish from the purse-seine fishery off the New Jersey coast of the United States.

The sport fishery accounted for an additional 215 metric tons, about 18% less than the peak catch (261 metric tons) in 1972. Records supplied by Provincial Tourist Development Offices and the Fisheries Information Service show that sports fishermen caught 742 tuna during 1973. A total of 672 were taken in the southern Gulf of St. Lawrence (Prince Edward Island, northern New Brunswick and Quebec areas); 51 off the east coast of Newfoundland, and 19 off southwest Nova Scotia. All the fish were landed except for 16 taken off Quebec and 18 of the Newfoundland captures.

Size data for the three areas of the sports fishery, and for 113 tuna taken by traps are given in Table 3. Fish taken off Prince Edward Island were substantially larger (mean 344 kg) than those from Newfoundland (245 kg) with the few sports catches off Nova Scotia (326 kg) closer to the former, as in previous years. The average size of the commercial catches off Nova Scotia (243 kg) was, however, considerably smaller than that of the sports catches. The monthly variation in the size composition of catches in the Prince Edward Island area is given in Table 4. The average size (weight) increased as the season advanced, increasing from 325.6 kg in July to 390.8 kg in September-October.

Landings of small bluefin from the purse-seine fishery off the mid-Atlantic coast of United States were examined for size (length)

composition. Catches were all made during the month of August and samples were combined (Table 5). The data show four modes in the size distribution representing the different year classes.

Mrs C D Burnett and Dr J F Caddy reported that Canadian landings of bluefin tuna by all methods in the West Atlantic amounted to 768 metric tons in 1974, a substantial decrease when compared with the previous year (1005 metric tons). The catches by different gears varied considerably and the decline in total landings was due to major reductions in effort and catch in the purse-seine fishery off the eastern coast of the United States. This fishery only took 103 metric tons, in contrast to 635 metric tons the year before, and was well below a domestically imposed quota for 1974.

In contrast to the distant water purse-seine fishery for juveniles, the landings of large bluefin tuna from the immediate coastal waters off Canada increased substantially. The incidental catches by mackerel traps around St. Margaret's Bay, Nova Scotia, increased by nearly 120 tons to 256 metric tons, while the sports (rod and reel) fishery attained a new record of 365 metric tons, up 70% from the previous year.

Incidental captures by gillnets and mackerel seines accounted for the remainder (44 metric tons) of the total landings, while some additional catches, estimated at 18 metric tons, were tagged and released.

Weights were obtained for 1921 of the approximately 2056 large bluefin caught in Canadian waters during 1974 and these are presented in Tables 7 and 8. Size distributions are shown in Table 7 by area and method of capture, and that for the Prince Edward Island sports fishery is further sub-divided by month of landing in Table 8.

The landing of juvenile bluefin were sampled extensively for fork length, and the data (Table 9) show that the 1974 fishery was primarily based on age groups I, II and III.

Tagging was severely restricted in 1974, with 48 large bluefin and no juveniles marked and released. Recoveries during the year were also limited but included the recapture of a large tuna, off Prince Edward Island, which had been released five years earlier off Nova Scotia.

A preliminary attempt was made in 1974 to use acoustic telemetering devices to determine the survival of large bluefin when released after capture on rod and reel. Three fish were tagged, and despite their apparently exhausted condition, they moved off at speed on release, soon outdistancing the tracking boat, although one fish was followed for about three hours.

Mrs C D Burnett and Dr J F Caddy recorded that Canadian landings of bluefin in 1975 amounted to 629 metric tons, a decline of 139 metric tons from the previous year. The purse-seine fishery for juveniles off the eastern coast of the United States accounted for 291 metric tons, an increase of 188 metric tons over 1974, but within a domestically imposed quota.

The incidental captures of bluefin in mackerel traps in St. Margeret's Bay, Nova Scotia, declined by 115 metric tons to 144 metric tons in 1975, a decrease which may have been due to the reduced entry of mackerel into the Bay, since this species is the principal food of bluefin when in Nova Scotian waters.

The third category of Canadian bluefin landings, those from the sports fishery, also declined, from 265 metric tons to 206 metric tons (Table 2). This was due in part to restrictions on the fishing season and to a catch limit of two fish per vessel per day. Seasons of ten weeks' duration were established for various parts of the Gulf of St. Lawrence, with no transfer of vessels between areas permitted. In addition, the

number of licenses was frozen at the 1975 level, preventing an anticipated significant expansion of the fleet, and the maintenance of log records was made compulsory.

Weight distribution of bluefin taken in four areas along the Canadian Atlantic coast are summarised in Table 10. Of the 33 fish caught in Newfoundland, one was taken on the west coast (in Bonne Bay) for the first time in approximately 35 years.

Table 11 shows size data by months for Prince Edward Island; the weight increased as the season progressed.

Catches of small bluefin from the purse-seine fishery in July and August, off the mid-Atlantic coast of the United States, were sampled for size (length) composition. Samples are combined for presentation in Table 12.

In this year an experimental otolith sampling programme for age determination of giant bluefin tuna was started. Otoliths were sectioned at 0.2 mm through the sulcus, using a microtome with a carborundum blade, and examined in oil of cloves. Good agreement between age determinations using this method and those from vertebral ring counts was found for the smaller fish. For the larger fish examined, however, the vertebral rings were difficult to read peripherally, and appeared to underestimate the age, which, as judged by the otolith sections, seemed to be in the range of 18 to 24 years. Preliminary data indicate good agreement between the age composition of giant bluefin catches in the east and west Atlantic in 1974.

In 1975, 20 and 148 fish respectively were tagged and released in the Chaleur Bay and St. Margaret's Bay areas. A total of four recoveries were made in the Gulf of St. Lawrence during 1975 of fish tagged in 1971. In addition, a tuna tagged in the Bay of Chaleur in 1974 after capture on rod and reel, was recaptured off Grand Anse, N.B., and another that had been tagged in 1973 off Barnegat Light (New Jersey), after capture by purse seine, was recaptured in the same general area.

A tuna 'ranch' -two pound nets 94 metres in diameter and 30 metres deep - was set up by commercial interests early in the season in St. Margaret's Bay. Fifty-five large bluefin were towed in cages from the traps to the ranch. The fish were fed approximately 1½% of their body weight of mackerel and herring each day for a period of three to four months. At the end of that period the fish were in premium condition and were shipped to the Japanese market. Irrespective of economic aspects, this procedure does show that retention of large tuna in pounds is feasible with a minimal mortality (< 5%).

Dr O Bagge reported that 6 bluefin tuna were landed in Denmark between 30 August and 18 October 1973. The tuna were caught by Swedish and Danish midwater trawlers fishing in the southern Skagerrak respectively in the northern Kattegat (Table 13). In 1974 only 1 bluefin tuna (= 378 kg) was caught in September between Anholt and Læsø off the Swedish coast by Danish fishermen, and in 1975 7 fish were caught by Swedish midwater trawlers fishing for herring in the Kattegat.

The French data were submitted by Dr H Aloncle (Tables 14-17). According to Dr R Sara the total Italian madrague catches were about 1000 bluefin tuna in 1973. They were mostly large tuna. In one catch 111 tuna had an average weight of 470 kg. At the end of the fishing season some 100 small fish with an average weight of 40 kg were caught. Dr F Li Greci informed the Working Group that during the last two years some of the largest Sicilian fishing boats have fished bluefin and other tuna-like fishes by purse seine.

Mr S Myklevoll reported that the total Norwegian bluefin tuna catch in 1973 was 193 fish. Except for 1 fish that was caught on 31 July, the catches were made during two short periods: 12-16 August and 28-29

August, and landed on a short stretch (30 n.m.) off the coast west of Bergen. All the captured fish were of the big old stock, gutted weight ranging from 180 to 360 kgs (calculated total weight: 230-460 kgs) (Table 17). Complete weight data were received. No length measurements were recorded in 1973.

An average condition factor (K) of 2.12 has been calculated on the basis of length/weight measurements made in week 33 of 1971. This calculation is shown in Table 18. The calculated K-value has been used to convert the weight distribution in Table 17 to length (Table 19).

One American tuna tag was received in 1973. The release and recovery data are as follows:

Tagging:	Locality:	Cat Bay, Bahamas 25°30' 79°18'W
	Date:	9 May 1972
Recapture:	Locality:	Slotterøy Fyr 59°58'N 5°02'E
	Date:	27 August 1973

According to Mr S Myklevoll, the total Norwegian catch of bluefin tuna (Thunnus thynnus) in 1974 was 2286 fish. Weight frequency distribution (per mille) by week and total is given in Table 20. The catch consists of very large bluefin tuna only, with individual weights ranging from 165 to 370 kilos gutted weight and a mean weight of 264 kg, corresponding to 340 kg live weight. Catch distribution by weeks throughout the season is given in Table 27.

Fish were more abundant this year than for quite some time. Unfortunately, difficulties with sales and lack of cold storage capacity led to several fishing stops (2-3 days each time) throughout the season. Therefore the catch of 1974 is not representative of the availability of bluefin this year and cannot be compared with the previous years in this respect. The catch would no doubt have been somewhat bigger with no restrictions. The variation in weekly catches is also partly due to weather conditions.

The bulk of the catch was, like in the previous year, taken in a limited area close to the coast west of Bergen, with only a handful of fish taken at a little distance to the north and south. No fish are reported from northern Norway or the Skagerrak.

Some weight/length relation data: 71 fish out of a catch of 116 were collected in the last week of the season. A condition factor (K) of 2.15 was calculated. The mean weight ($\bar{w}'$) of the sample (274 kg) lies close to that week's mean (275 kg). The mean length ($\bar{l}'$) of the sample is 180 cm. If we consider this length as representative for the total catch, we can estimate the increasing K by weeks through the season over the weekly mean weights (Table 22). Weekly mean weights indicate an individual body weight gain of about 35 kg, which seems reasonable (Figure 1).

The length frequency distribution has been calculated from the weight data, and the length frequency distribution of the 71 fish measured in the last week of the season is plotted (Table 23; Figure 2).

Vertebrae from 9 fish have been collected. Age reading is difficult in old fish, and therefore no exact age can be given at this moment (if ever). Ages from about 12 to 20 years were found, but the samples will be studied more closely later.

One American-tagged bluefin tuna was recaptured this season. The release and recovery data are: Cat Bay, Bahamas, 8 June 1973; 59°52'N 5°00'E (WSW of Bergen), 12 September 1974.

According to Mrs Helga A Gill the total Norwegian bluefin catch in 1975 was 2881 fish with a total weight of 771 844 kg. All catches were landed

in the immediate vicinity of Bergen. No fish were reported from northern Norway or Skagerrak. Because of difficulties with sales and lack of cold storage capacity, three fish stops were imposed (2-3 days each time). Poor weather set a stop to further fishing 14 September.

Weight frequency distribution (per mille) of the weekly catch is given in Table 24. It will be noted that the total weight does not correspond to the total catch. This is due to some of the weight recordings being incomplete. No length measurements were taken and therefore condition factors are missing. No tag return has been reported in 1975.

Dr J Rodriguez-Roda reported that during 1973 only two madragues were in operation in the south of Spain; i.e. Barbate and La Línea. The captures from the Barbate madrague were 1952 bluefin tuna with a total weight of 399 453 kg. The madrague of La Línea captured 431 bluefin tuna with a total weight of 68 535 kg.

The total madrague fishery on the south coast of Spain yielded 2383 bluefin tuna with 467 988 kg in 1973. The total catch in 1973 thus amounted to more than four times in number and more than five times in weight than that of 1972, but it was still lower than the total captures in 1971 (Table 25).

In 1974 only one single madrague at La Línea ("La Atunara") was in operation, with a total bluefin tuna catch of 37 fish with a mean weight of 230 kg and a total weight of 8510 kg. Apart from these, 268 000 specimens of Auxis thazard (= 300 000 kg) were caught.

In 1975 only two madragues were fishing at the southern Spanish coast, i.e. at Barbate and at La Línea. The catches were:

Barbate	1848 tuna	=	445 241 kg
La Línea	14 tuna	=	2 400 kg
Total	1862 tuna	=	447 641 kg

Thus, the catches in Barbate were larger in 1975 than in 1973. The mean age of tuna for Barbate was 10.9 years at a mean length of 232 cm (Table 26).

Mr Frank Mather III reported that in 1974 only two traps were set in the Ibero-Moroccan Bay, i.e. at Cape Spartel and Garifa, both in Morocco, and that they did not catch a single bluefin.

Likewise, the catches of the Mediterranean traps were disastrous, with the exception of Favignana, which maintains a respectable average. On the other hand, Japanese longliners have caught a considerable tonnage of large bluefin tuna in the Mediterranean and its approaches. The time-area distribution of the Japanese catches fits very well with the theory of a migration into the Mediterranean for spawning, and then to the Atlantic after spawning. The Japanese longliners also fished in the Bay of Biscay for bluefin last summer, reportedly forcing the local fleet to greatly decrease its effort in the latter part of the season.

Dr J L Cort from Santander informed the Working Group that fishing for bluefin tuna in northern Spain is carried out by 35 vessels from Fuenterrabia. Their engine power ranges from 200 to 450 h.p. The activity of this fleet begins by mid-June and continues until October-November. Vessels from other ports may also occasionally catch some tuna, but these are only minor catches. Catches of the Fuenterrabia fleet can be estimated as 97% of the total northern bluefin tuna catch. The catch landed by the Fuenterrabia vessels was 891 148 kg.

The effort of the fleet has been 16 211 $\frac{\text{days at sea} \cdot \text{number of men}}{}$, 8.5% higher than that of 1974 (14 835 $\frac{\text{days at sea} \cdot \text{number of men}}{}$), and the fishing season lasted for about 30 days more than in the previous year. This unit has been adopted jointly by the Spanish and French

(CNEXO) scientists studying bluefin tuna in the Bay of Biscay.

Cpue has been lower this season: 54.9 kg in 1975 and 68 kg in 1974; however, the number of fish caught per unit effort was 4.4 in 1975 and 3.6 in 1974, due to a larger catch of small fish in 1975. The outstanding features of the 1975 season were the following:

1. The total lack of fish amounting to 100-200 kg, corresponding roughly to age groups VII-X; these fish have been steadily decreasing over the last two years, and the same was the case for fish of 50-100 kg (age groups V-VI) (Table 27).

   No data are available for 1973.

   The occurrence of large longliners in the Bay of Biscay during the last two years coincides with the decrease of these groups of fish in the catches of the local fleet. This makes us believe that the longliners fish especially on those groups of fish, and consequently local vessels must go for small fish of age groups II and III.

2. From October onwards, fish of age groups II and III have been leaving the area, and at the same time the fish of age group I (65-70 cm) began to enter the fishing grounds. Temperatures observed during that period ranged from 17 to 18°C, lower than those typical for other fish groups (19-21°C). This situation remained unchanged until 20 November, when the season was closed.

   2772 tuna were measured in the period July-October. The final distribution of age group frequencies also includes the catch taken in November (6500 age group I fish) (Table 28).

   43 fish were studied for sex ratio. They were distributed as follows: 32 of age group IV, 7 of age group VI, 2 of age group V and 2 of age group III. Of these, 53.5% were males and 46.5% females.

Information on the catch of bluefin tuna in 1973 by the Canadian-USA purse-seine fleet was compiled by the Southwest Fisheries Center of the National Marine Fisheries Service (Table 29). Mr G Sakagawa stated that an estimated total of 90 747 bluefin tuna (= 1490 metric tons) were caught by the Canadian-USA purse-seine fleet in 1973. More than 90% of the catch was made in July and August, and 2 year old fish dominated (Table 30). In 1972, 2136 metric tons of bluefin tuna were landed, 52% were 2 year old fish.

Some data on size of fish caught by USA handline, harpoon, rod and reel and trap fisheries were collected by Frank Mather III and John Mason of the Woods Hole Oceanographic Institution, and are shown in Table 31. It is noted that the length frequency sample from the rod and reel fishery is biased towards large fish (> 155 cm). Smaller bluefin tuna, primarily in the size range caught by the purse-seine fishery, were also landed but were not sampled. The length frequency samples in Table 31 indicate that large bluefin tuna (> 185 cm) continue to dominate the catch of the handline, harpoon and trap fisheries as they did in previous years.

The length frequency and tag return data for the US bluefin tuna fishery in the Northwest Atlantic in 1974 and 1975 were submitted by Dr Grant L Beardsley from the Atlantic Bluefin Tuna Program of the South-East Fisheries Center - Miami Laboratory.

The total of US bluefin tuna catch was 1338 metric tons in 1974. He reported that there may be a significant amount of giant bluefin being harvested by foreign trawlers in the Northwest Atlantic, which catch them on handline after they are chummed to the stern of the vessel during the haulback of the trawl.

It was stated that the total harvest of Atlantic bluefin tuna by US sport and commercial fishermen in 1975 was approximately 2845 metric tons (Table 41). The purse-seine fishery for small fish (ages 1-6) caught 1 761.8 metric tons. The fishery was characterised by good fishing for 2 year old bluefin tuna and more than 70% of the catch (by weight) consisted of this year class (Table 42). There was also a relatively abundant year class of 4 year olds and almost 17% of the catch was from this year class. The good catch of 2 year olds in the Northwestern Atlantic in 1975 confirms reports of a strong year class of 1 year olds in the Northwestern Atlantic in 1974. In addition, the seine fishery voluntarily restricted their harvest of this year class last year, although the good availability and abundance could have resulted in a substantial catch of this age group. The fishery was terminated on 15 August when US regulations based on ICCAT recommendations went into effect.

The catch of giant bluefin tuna by purse seine was 267.2 metric tons. This fishery operated only for a brief period in September, and all of the catch came from Cape Cod Bay. A great part of the catch early in the season consisted of 135 - 225 kg bluefin, but later in the season larger fish entered the catch.

The fishery for giant bluefin tuna by gears other than purse seine (primarily harpoons and handlines) landed approximately 2277 fish weighing 693.5 metric tons. Most of these fish were taken in the waters off Massachusetts (Table 43). The availability of giant bluefin was good during most of July, August and September. The fishery was closed on 21 September when it was anticipated that the quota of 2250 fish would be reached. The fishery also closed in July for approximately 14 days for economic reasons. The fishery was apparently dependent upon a large concentration of giant bluefin off Massachusetts which remained in the area for a considerable length of time. Fishing remained good right up to the closure date in September, and it is very likely that a substantially larger catch would have been taken had the season not closed.

The sport fishery for bluefin tuna, particularly for the small fish, is centered off the coasts of New Jersey and New York. Preliminary estimates indicate the 1975 catch to be about 121.7 metric tons. The bulk of the catch consisted of 1 year olds. The number of bluefin tuna landed by sport fishing in 1975 is estimated at about 17 000 fish. Estimates of last year's catch, based on surveys made this year, are about 45 000 fish. The good catch in 1974 also consisted mostly of 1 year olds and was the result of a strong incoming year class.

SUMMARY OF CONCLUSIONS

Bluefin Tuna Catches

The Spanish madrague fishery on bluefin tuna showed great fluctuations during the period under survey. In 1974 it came practically to an end, when the sole madrague in operation caught only 37 fish (= 8.5 tons). But the fishery recovered in 1975, then yielding a catch of 448 tons, which was the largest since 1971.

The Norwegian purse-seine fishery on bluefin tuna reached in 1973 its minimum but recovered steadily since then. Catches in 1975 were the largest since 1968, although due to difficulties with sales and lack of cold storage capacity, the fishery had to be interrupted several times. The French and Spanish fisheries in the Bay of Biscay showed normal fluctuations in their catches.

The US bluefin tuna fishery in the West Atlantic increased substantially in 1975 after 2 meagre catches in 1973 and 1974, while the Canadian

catches continued to decline in 1975 partly due to restrictions on the fishery.

Comparison of the Catch Composition Data Collected in Different Countries

Spanish catches compared with Norwegian catches

The size composition of the Norwegian bluefin tuna catches has again remained more or less unchanged over the last three years, so that there was no change over the last 11 years (Figures 3 and 4). Age readings by otoliths carried out by Caddy and Butler for giant bluefin tuna caught by Canadian fishermen suggest that these fish are in the range of 18 to 24 years, so that it might well be that the fishery is still recruiting from the famous 1952 year class which is re-assembling year by year at the Norwegian coast since 1958 (and which was observed first in 1957 at the Spanish coast).

On the Spanish coast, catches of 1973 and 1975 were, as already in 1972, of different age composition so no direct linkage of tuna occurrences can be concluded for these 2 areas for the period 1972-75.

Norwegian, Canadian and US catches of giant bluefin tuna

Although the US length frequency distribution given for handline, harpoon, rod and reel as well as trap catches cannot be considered a random sample, it is obvious that the predominant size groups in these catches were the same as in the Norwegian purse-seine fishery for 1973. The mode of the length distribution curve of the US giant tuna is at a length, which is about 10 cm larger than that of the Norwegian fish (Figure 3). In order to demonstrate this, the length composition of fish above 200 cm were separately compiled from the data given in Table 32 (Table 33).

The weight frequency distribution of Canadian sport and commercial catches of large bluefin tuna also tallied, to a large extent, with that of the Norwegian purse-seine catches for all years from 1972-75 (Figure 4).

US, Canadian and French catches of smaller fish

As in previous years, in 1973 the US and Canadian purse-seine catches consisted mainly of 2 year old fish. Fish of the relatively strong year class 1967 can be detected in the age composition (Table 30).

In 1974, the catches of juvenile fish were again composed of three successive year classes, but one year old fish were most abundant. This year class 1973 dominated also as 2 year old fish in 1975. A relatively abundant year class of 4 year olds was also present in the catches (Figure 3). Also in the Bay of Biscay was the strongest year class that of 2 year olds in 1975.

REFERENCES

ALONCLE, H, HAMRE, J, RODRUGUEZ-RODA, J and TIEWS, K, 1974. Fifth Report of the Bluefin Tuna Working Group. Observations on the size composition of Bluefin Tuna catches from 1970 to 1972". Cons.int.Explor.Mer, Coop.Res.Rep., No.40:1-52.

ALONCLE, H, HAMRE, J, RODRIGUEZ-RODA, J and TIEWS, K, 1974. Report of the Bluefin Tuna Working Group. Observations on the size composition of Bluefin Tuna catches from 1973. ICES, Doc. C.M.1974/J:7, pp.1-18.

ALONCLE, H, HAMRE, J, RODRIGUEZ-RODA, J and TIEWS, K, 1975 Report of the Bluefin Tuna Working Group. Observations on the size composition of the Bluefin Tuna catches from 1974. ICES,Doc.C.M.1975/J:5, pp.1-23.

CADDY, J F and BUTLER, M J A, 1975. Recent catch trends and age composition in Canadian coastal fisheries for giant Bluefin Tuna (Thunnus thynnus) and their relevance to assessment of the Northwest Atlantic large fish stocks. ICCAT SCRS 1975/38.

HAMRE, J, LOZANO, F, RODRIGUEZ-RODA, J and TIEWS, K, 1966. Second Report from the Bluefin Tuna Working Group. On the development of the Bluefin Tuna fisheries from 1950 to 1964 and further observations on size composition of Bluefin Tuna catches. Cons.int.Explor.Mer, Stat.News Letters, No.25:1-34.

HAMRE, J, LOZANO, F, RODRIGUEZ-RODA, J, and TIEWS, K, 1968. Third Report from the Bluefin Tuna Working Group. Observations on the size composition of Bluefin Tuna catches from 1965-66". Cons.int.Explor.Mer, Stat.News Letters, No.38:1-27.

HAMRE, J, MAURIN, C, RODRIGUEZ-RODA, J and TIEWS, K, 1971. Report of the Bluefin Tuna Working Group. Observations on the size composition of Bluefin Tuna catches from 1967-69. Cons.int. Explor.Mer, Coop.Res. Ser.A, No.23:1-49.

HAMRE, J, and TIEWS, K, 1964. Report from the Bluefin Tuna Working Group. On the size composition of Tuna catches from 1956-62. Cons.int.Explor.Mer, Stat.News Letters, No.20:1-43.

Table 1. Bluefin Tuna catch (in thousand metric tons) in the Atlantic and Mediterranean, 1964-75.

Country	Gear	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
TOTAL		38.5	35.0	25.3	32.3	22.0	20.2	15.9	21.5	13.3	13.6	24.7	25.6
Catch by Gear													
Longline	(LL)	12.8	9.7	3.0	0.9	0.5	0.3	0.2	4.8	0.8	1.6	5.5	5.7
Baitboats	(BB)	6.0	7.9	10.2	10.0	8.3	6.3	4.5	2.6	2.6	3.5	2.7	5.6
Purse seiners	(PS)	7.0	6.1	2.2	4.2	1.7	2.1	4.9	5.0	4.8	4.1	7.8	9.8
Traps	(TRA)	5.2	7.5	5.1	8.6	4.8	5.4	2.5	1.5	1.1	1.0	1.3	1.2
Surface	(SUR)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	1.1	0.5	1.5	0.0
Sport	(SPORT)	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.3	0.7	0.3
Trawling	(TROL)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Unclassified	(UNCL)	5.3	3.6	4.8	8.6	6.6	6.0	3.6	4.4	2.7	2.7	5.3	3.1
Catch by Country													
Algeria		0.0	0.0	0.1	0.2	0.1	0.2	0.0	0.1	0.0	0.0	0.1	0.1
Argentina		0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brazil		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Canada		1.0	0.7	0.3	0.4	0.4	0.6	1.6	1.2	0.5	1.0	0.8	0.6
China (Taiwan)		0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.0
Cuba		0.0	0.1	0.5	2.4	1.4	0.5	0.2	0.0	0.0	0.0	0.0	0.0
Denmark		0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dominican Republic		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
France		2.8	1.9	2.8	2.2	1.9	1.8	1.7	2.6	1.9	1.0	3.1	2.3
Germany, Fed.Rep. of		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Greece		0.6	0.7	0.5	0.6	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grenade		0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Italy		2.5	2.1	1.7	4.0	2.8	3.1	1.2	1.3	3.5	3.0	7.5	8.0
Japan		12.6	9.6	2.9	0.8	0.3	0.1	0.1	1.5	0.7	1.4	5.3	5.7
Korea		0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.1	0.1	0.0
Libya		0.4	0.6	0.7	0.8	1.0	2.0	0.5	0.6	0.3	0.4	0.5	0.0
Malta		0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Morocco		4.1	2.9	3.6	3.4	1.3	0.7	0.7	0.2	0.7	0.5	0.6	2.7
Norway		1.5	2.5	1.0	1.9	0.9	0.9	0.4	0.6	0.1	0.1	0.8	0.9
Poland		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Portugal		0.4	0.4	0.2	0.2	0.3	0.5	0.0	0.0	0.0	0.0	0.0	0.3
South Africa		0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spain		4.6	9.0	8.7	10.4	8.7	7.1	5.5	6.2	2.8	3.9	3.4	1.9
Sweden		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tunisia		0.5	0.3	0.6	0.7	0.9	0.6	0.3	0.5	0.4	0.3	0.3	0.0
Turkey		0.0	0.1	0.1	1.5	0.3	0.4	0.1	0.0	0.0	0.0	0.0	0.0
USA		4.9	3.2	1.2	2.3	0.8	1.2	3.3	3.2	2.1	1.3	1.9	2.9
Yugoslavia		0.3	0.1	0.2	0.3	0.2	0.3	0.1	0.3	0.2	0.2	0.3	0.2

Table 2. Canadian catches of Bluefin Tuna from the Atlantic Ocean, 1962-75.

Year	Landings (nominal catch in metric tons, live weight)			
	Traps and longlines	Purse seines	Total commercial	Sports[x)]
1962	137	-	137	40
1963	229	323	552	90
1964	318	579	897	99
1965	175	461	636	90
1966	211	-	211	102
1967	298	-	298	58
1968	253	-	253	180
1969	407	-	407	170
1970	275	1 161	1 436	151
1971	68	935	1 003	128
1972	36	202	238	261
1973	160	639	799	215
1974	300	103	403	365
1975	144	291	435	206

*) Prior to 1974, tagged and/or released fish are included in the sports totals, 1974 releases estimated at 18 tons, 1975 sports releases at 8 tons.

Table 3. Size composition (10 kg live weight classes per mille) of large Bluefin Tuna captured in three localities along the Canadian Atlantic coast in 1973.

Size class (kg)	Area				
	Prince Edward Island	Newfoundland	Nova Scotia		Total
	Sport	Sport	Commercial	Sport	Smoothed
140	2	-	-	-	1
150	-	-	-	-	1
160	-	-	9	-	1
170	-	-	26	-	3
180	2	-	9	-	4
190	-	48	26	-	8
200	4	48	89	-	14
210	3	-	97	-	18
220	4	238	133	-	22
230	6	285	79	-	25
240	14	95	71	-	29
250	18	95	124	-	33
260	26	95	71	-	38
270	40	-	89	125	43
280	35	-	53	125	45
290	46	48	89	63	48
300	54	-	26	125	51
310	60	-	9	125	57
320	88	-	-	-	62
330	60	-	-	188	62
340	86	-	-	-	63
350	71	-	-	125	62
360	71	-	-	-	55
370	52	-	-	62	47
380	51	-	-	-	40
390	43	-	-	62	36
400	38	-	-	-	33
410	43	-	-	-	31
420	29	-	-	-	26
430	23	-	-	-	18
440	14	-	-	-	11
450	6	-	-	-	6
460	2	-	-	-	2
470	2	-	-	-	1
480	2	-	-	-	1
490	2	-	-	-	1
500	3	-	-	-	1
510	-	-	-	-	1
	1 000	1 000	1 000	1 000	1 000
n =	650	21	113	16	800

Size class 140 kg = 140.0 to 149.9 kg.

Table 4. Size composition of large Bluefin caught by rod and reel off Prince Edward Island during four consecutive months of the 1973 season in 10 kg groups ‰ live weight.

Size Class	Sampling Period							
	Jul		Aug		Sep		Oct	
	n	‰	n	‰	n	‰	n	‰
140	-	-	-	-	1	6	-	-
150	-	-	-	-	-	-	-	-
160	-	-	-	-	-	-	-	-
170	-	-	-	-	-	-	-	-
180	1	6	-	-	-	-	-	-
190	-	-	-	-	-	-	-	-
200	1	6	2	11	-	-	-	-
210	1	6	1	5	-	-	-	-
220	2	11	-	-	1	6	-	-
230	3	17	1	5	-	-	-	-
240	2	11	6	33	1	6	-	-
250	4	22	8	44	-	-	-	-
260	10	56	6	33	1	6	-	-
270	14	78	10	54	2	12	-	-
280	6	33	14	76	2	12	1	9
290	14	78	13	71	3	17	-	-
300	11	61	17	93	7	40	-	-
310	16	89	10	54	11	63	2	18
320	10	56	27	147	13	75	7	61
330	11	61	12	65	13	75	3	26
340	20	112	18	98	13	75	5	44
350	7	39	9	49	17	98	13	114
360	12	67	9	49	18	104	7	61
370	8	45	3	16	18	104	5	44
380	4	22	7	38	13	75	9	79
390	5	28	3	16	12	69	8	70
400	5	28	2	11	7	40	11	96
410	5	28	2	11	5	29	16	140
420	1	6	3	16	5	29	10	88
430	3	17	1	5	5	29	6	52
440	2	11	-	-	2	12	5	44
450	1	6	-	-	1	6	2	18
460	-	-	-	-	1	6	-	-
470	-	-	-	-	-	-	1	9
480	-	-	-	-	-	-	1	9
490	-	-	-	-	-	-	1	9
500	-	-	-	-	1	6	1	9
		1 000		1 000		1 000		1 000
n =	179		184		173		114	

Size class 140 kg = 140.0 to 149.9 kg.

Table 5. Size composition of small Bluefin Tuna taken off the US east coast by Canadian vessels in 1973.

Size Class (cm)	No. of Fish	‰ Smoothed
45	-	1
50	12	8
55	50	12
60	13	12
65	26	40
70	283	169
75	895	259
80	200	150
85	11	27
90	13	20
95	137	71
100	341	104
105	100	62
110	6	13
115	3	3
120	17	12
125	66	20
130	23	13
135	2	3
140	-	1
...	...	...
170	1	1
n	2 199	1 000

Size category 50 = 50.0 to 54.9 (fork length caliper)

Table 6. Recoveries of small Bluefin Tuna double tagged with two types of spaghetti tag in 1971, with data on loss of one tag.

Year	Number Released	Number Recaptured	% "Survivors"*) Recaptured	% Recaptures One Tag Only
FTIA Tag (Nylon Barb)				
1971	140	17	12.1	6
1972		16	13.0	50
1973		2	1.9	0
Total		35	25.0	25.7
"H" Tag (Stainless Steel Anchor)				
1971	128	10	7.8	10
1972		20	16.9	55
1973		5	5.1	80
Total		35	27.3	45.7

*) Recovery rates for individual years have been calculated after allowing for known removals, i.e. the recaptures in previous years.

Table 7. Size composition (live weight per mille by 10 kg classes) of large Bluefin Tuna captured in three localities along the Canadian Atlantic coast in 1974.

Size class (kg)	Prince Edward Island		Newfoundland	Nova Scotia		Total Smoothed
	Incidental		Sport	Commercial	Sport	
	Gear	Sport				
70	-	2	-	-	-	-
80	-	-	-	-	-	-
90	-	-	-	-	-	-
100	-	-	-	-	-	-
110	-	-	-	1	-	-
120	-	-	-	-	-	-
130	-	-	-	-	-	-
140	-	-	-	1	-	-
150	-	-	-	-	-	-
160	-	-	-	-	-	-
170	-	-	-	1	-	-
180	-	-	-	1	-	-
190	-	-	-	4	-	1
200	-	-	-	5	-	2
210	-	2	-	4	-	5
220	-	3	-	24	-	12
230	8	12	33	34	-	21
240	8	10	67	55	-	29
250	8	16	33	61	-	36
260	-	24	67	72	-	45
270	33	31	133	83	40	55
280	8	44	133	90	40	65
290	49	55	133	99	40	71
300	49	71	33	81	40	71
310	33	63	67	62	80	72
320	49	89	200	97	80	83
330	140	101	100	56	80	85
340	49	93	-	69	-	74
350	57	74	-	33	200	58
360	107	59	-	27	200	47
370	49	53	-	18	-	39
380	107	50	-	10	40	35
390	66	55	-	5	40	30
400	66	31	-	4	40	22
410	16	22	-	1	-	14
420	41	16	-	-	40	10
430	25	13	-	1	-	8
440	16	4	-	1	-	4
450	8	1	-	-	-	2
460	-	3	-	-	-	2
470	8	1	-	-	40	2
Total	1 000	1 000	1 000	1 000	1 000	1 000
n	122	903	30	841	25	1 921
Average Weight (kg)	357	338	294	297	351	

Size class 70 kg = 70.0 to 79.9 kg.

Table 8. Size composition (live weight per mille by 10 kg classes) of large Bluefin Tuna caught by rod and reel off Prince Edward Island during four consecutive months of the 1974 season.

Size class (kg)	July		August		September		October	
	n	‰	n	‰	n	‰	n	‰
70	-	-	-	-	2	8	-	-
80	-	-	-	-	-	-	-	-
.	-	-	-	-	-	-	-	-
.	-	-	-	-	-	-	-	-
.	-	-	-	-	-	-	-	-
200	-	-	-	-	-	-	-	-
210	2	7	-	-	-	-	-	-
220	1	4	1	4	1	4	-	-
230	9	31	-	-	2	8	-	-
240	8	28	1	4	-	-	-	-
250	10	35	3	10	1	4	-	-
260	16	56	5	17	1	4	-	-
270	12	42	13	46	3	12	-	-
280	19	66	18	63	3	12	-	-
290	23	80	16	56	9	35	2	27
300	33	115	23	81	8	31	-	-
310	14	49	24	84	17	66	2	27
320	32	112	24	84	19	74	5	67
330	34	119	28	98	25	97	4	53
340	19	66	34	119	25	97	6	80
350	15	52	27	95	18	70	7	93
360	10	35	20	70	16	62	7	93
370	5	18	18	63	24	93	1	13
380	7	24	8	28	20	78	10	133
390	5	18	9	32	27	105	9	120
400	1	4	6	21	13	50	8	107
410	3	10	2	7	10	39	5	67
420	4	14	3	10	3	12	4	53
430	2	7	1	4	6	23	3	40
440	-	-	-	-	3	12	1	13
450	-	-	1	4	-	-	-	-
460	1	4	-	-	1	4	1	13
470	1	4	-	-	-	-	-	-
		1 000		1 000		1 000		1 000
Total No. of Fish	286		285		257		75	
Average Weight (kg)	315		331		358		372	

Size class 70 kg = 70.0 to 79.9 kg.

Table 9. Size composition of small Bluefin Tuna taken off the US coast by Canadian purse-seine vessels in 1974.

Size class (cm)	Number of fish	‰
45	11	6
50	638	345
55	102	55
60	2	1
65	3	2
70	199	107
75	299	162
80	40	22
85	144	78
90	277	150
95	53	29
100	4	2
105	-	-
110	-	-
115	-	-
120	1	1
125	-	-
130	1	1
135	6	3
140	11	6
145	16	8
150	7	4
155	3	2
160	4	2
165	4	2
170	9	5
175	6	3
180	4	2
185	2	1
190	2	1
Total	1 848	1 000

Size category 45 = 45.0 to 49.9 (fork length caliper).

Table 10. Size composition (live weight per mille by 10 kg classes) of large Bluefin Tuna captured in four localities along the Canadian Atlantic coast in 1975.

Size class (kg)	Prince Edward Island	Newfoundland	New Brunswick	Nova Scotia		Total Smoothed
	Sport	Sport	Sport	Commercial	Sport	
40	-	-	-	2	-	-
-	-	-	-	-	-	-
70	-	-	-	7	-	1
-	-	-	-	-	-	-
100	-	-	-	2	-	1
110	-	-	-	5	-	1
-	-	-	-	-	-	-
150	-	-	-	2	-	1
-	-	-	-	-	-	-
190	-	-	-	5	-	1
200	-	-	-	5	-	2
210	-	30	-	5	-	4
220	-	-	-	16	-	6
230	-	-	-	18	-	11
240	3	30	8	36	-	15
250	-	-	-	27	-	18
260	3	61	-	48	-	22
270	6	91	8	45	-	29
280	6	121	-	70	-	37
290	18	91	25	59	111	42
300	18	91	17	70	-	45
310	29	61	17	63	-	48
320	18	91	8	99	-	55
330	59	30	17	75	-	60
340	50	61	84	72	-	61
350	56	30	42	59	111	57
360	68	91	84	38	-	56
370	74	30	109	29	-	55
380	71	30	42	43	111	57
390	103	61	119	23	222	59
400	79	-	67	18	222	56
410	65	-	42	14	111	41
420	82	-	84	9	111	39
430	47	-	42	7	-	33
440	53	-	67	11	-	28
450	41	-	42	5	-	23
460	18	-	34	7	-	14
470	12	-	8	-	-	7
480	9	-	17	-	-	5
490	9	-	17	-	-	4
500	3	-	-	2	-	3
510	-	-	-	2	-	1
520	-	-	-	2	-	1
Number	339	33	119	442	9	942
Total	1 000	1 000	1 000	1 000	999	1 000
Mean weight kg.	388.4	314.1	392.0	319.1	379.9	

Size class 40 kg = 40.0 to 49.9 kg.

Table 11. Size composition (live weight per mille by 10 kg classes) of large Bluefin Tuna caught by rod and reel off Prince Edward Island during four consecutive months of the 1975 season.

Size class (kg)	July		August		September		October	
	No.	‰	No.	‰	No.	‰	No.	‰
240	-	-	-	-	1	4	-	-
250	-	-	-	-	-	-	-	-
260	1	250	-	-	-	-	-	-
270	-	-	1	13	1	4	-	-
280	-	-	1	13	1	4	-	-
290	-	-	4	51	2	8	-	-
300	-	-	3	38	3	12	-	-
310	-	-	6	77	4	16	-	-
320	-	-	2	26	4	16	-	-
330	1	250	5	64	14	57	-	-
340	-	-	6	77	10	40	1	100
350	-	-	5	64	14	57	-	-
360	-	-	8	103	15	61	-	-
370	-	-	9	115	16	65	-	-
380	1	250	5	64	18	73	-	-
390	1	250	9	115	23	93	2	200
400	-	-	6	77	21	85	-	-
410	-	-	2	26	20	81	-	-
420	-	-	3	38	23	93	2	200
430	-	-	2	26	13	53	1	100
440	-	-	-	-	18	73	-	-
450	-	-	1	13	13	53	-	-
460	-	-	-	-	5	20	1	100
470	-	-	-	-	4	16	-	-
480	-	-	-	-	2	8	1	100
490	-	-	-	-	2	8	1	100
500	-	-	-	-	-	-	1	100
Number	4		78		247		10	
Total	1 000		1 000		1 000		1 000	
Mean weight kg.	344.8		363.2		395.3		435.9	

Size class 240 kg = 240.0 to 249.9 kg

Table 12. Size composition of small Bluefin Tuna taken off the US coast by Canadian purse-seine vessels in 1975.

Size class (cm)	No. of fish	‰ (smoothed)
45	-	4
50	24	39
55	168	65
60	9	36
65	18	110
70	560	295
75	538	295
80	42	111
85	2	8
90	-	1
95	1	1
100	1	2
105	3	1
110	-	0
115	1	1
120	2	1
125	-	1
130	1	1
135	-	1
140	-	2
145	9	5
150	13	5
155	7	5
160	5	4
165	5	3
170	2	2
175	1	1
Total	1 412	1 000

Size category 50 = 50.0 to 54.9 cm (fork length caliper)

Table 13. Weight distribution in numbers of Bluefin Tuna landed in Denmark in 1973 and 1975. The weight group refers to gutted fish, with gills (kg).

Weight group (kg)	1973	1975
245-249	1	-
265-269	-	1
300-304	1	-
310-314	-	1
315-320	1	-
320-324	2	-
325-329	1	1
335-339	1	-
345-349	-	1
365-369	-	1
380-384	-	1
395-399	1	-
405-409	-	1
Total	8	7

All tuna are caught by Swedish midwater trawlers fishing for herring in Kattegat.

Table 14. French Bluefin Tuna catches in 1973 from St. Jean-de-Luz (in kg).

Date	Total weight	
	Fish below 30 kg	Fish above 30 kg
1973		
24 - 30.05	24 829	-
31.05 - 06.06	11 198	-
07 - 13.06	1 075	-
14 - 20.06	16 608	-
21 - 27.06	30 239	-
28.06 - 04.07	59 858	-
05 - 11.07	30 841	-
12 - 18.07	51 296	-
19 - 25.07	71 098	-
26.07 - 01.08	45 415	12 125
02 - 08.08	31 619	7 375
09 - 14.08	40 988	15 424
15 - 22.08	25 964	16 878
23 - 29.08	9 863	-
30.08 - 05.09	5 827	-
06 - 12.09	21 172	-
13 - 19.09	3 806	-
20 - 26.09	70	-
27.09 - 03.10	3 201	-
04 - 10.10	590	-
11 - 17.10	2 479	-
18 - 24.10	626	-
Total	488 662	51 802

Table 15. French Bluefin Tuna catches in 1974 from St. Jean-de-Luz (France) in kg.

Date	Total weight	
	Fish below 30 kg	Fish above 30 kg
1974		
06 - 12.06	1 437	-
13 - 19.06	18 556	-
20 - 26.06	70 786	-
27.06 - 03.07	65 253	-
04 - 10.07	52 450	-
11 - 17.07	28 674	-
18 - 24.07	79 513	-
25 - 31.07	36 599	18 206
01 - 07.08	22 274	6 840
08 - 14.08	9 903	-
15 - 21.08	35 099	-
22 - 28.08	54 808	-
29.08 - 04.09	872	-
05 - 11.09	15 989	-
12 - 18.09	19 923	-
19 - 25.09	7 169	-
26.09 - 02.10	2 063	-
Total	496 322	25 046

Table 16. French Bluefin Tuna catches in 1975 from Golfe de Gascogne (France) in kg.

Date	Total weight	
	Fish below 30 kg	Fish above 30 kg
1975		
05 - 11.06	51	-
12 - 19.06	1 143	-
19 - 25.06	97 714	-
29.06 - 02.07	90 915	-
03 - 09.07	54 996	-
10 - 16.07	39 025	-
17 - 23.07	66 619	11 520
24 - 30.07	29 278	12 575
31.07 - 05.08	64 512	8 108
06 - 12.08	22 641	1 300
13 - 19.08	73 036	-
21 - 27.08	14 647	-
28.08 - 03.09	22 641	-
04 - 10.09	36 674	-
11 - 17.09	15 607	-
18 - 24.09	3 191	-
25.09 - 01.10	9 981	-
02 - 08.10	5 175	-
09 - 15.10	7 863	-
16 - 22.10	3 063	-
Total	658 775	33 503

Table 17. Size composition (kg) of Norwegian Bluefin Tuna catches south of 62°N by smoothed weight frequency (‰) in 1973.

Group means		Week number				Total
w'[1]	w[2]	31	32	33	35	
182	234	-	-	3	-	1
187	241	-	-	6	-	3
192	247	-	-	3	3	3
197	253	-	-	-	6	3
202	260	-	-	-	3	1
207	266	-	25	6	-	4
212	273	-	50	19	-	12
217	279	250	25	33	6	20
220	286	500	-	41	17	29
227	292	250	-	41	27	35
232	298	-	25	50	22	41
237	305	-	75	75	30	53
242	311	-	150	81	36	62
247	318	-	175	64	46	61
252	324	-	75	64	51	59
257	331	-	-	70	57	60
262	337	-	25	58	62	59
267	343	-	50	47	73	60
272	350	-	25	45	84	62
277	356	-	-	42	87	61
282	363	-	25	39	74	55
287	369	-	75	42	47	46
292	376	-	75	42	33	39
297	382	-	50	39	36	37
302	388	-	50	33	35	35
307	395	-	25	25	30	27
312	401	-	-	17	33	24
317	408	-	-	8	35	21
322	414	-	-	6	25	15
327	420	-	-	3	11	7
332	427	-	-	-	3	1
337	433	-	-	-	3	1
342	440	-	-	-	6	3
347	446	-	-	-	3	1
352	453	-	-	-	3	1
357	459	-	-	-	6	3
362	465	-	-	-	3	1
n =		1	10	90	92	193

1) w' = weight of gutted fish without head

2) w = weight of ungutted fish (w = w' x 1.285)

Table 18. Calculated length and condition factors for Norwegian Bluefin Tuna catches 1973, based on 1971 data.

Week no.	1973				1971			
	n	$\bar{w}'$	$\bar{l}'$	K	n	$\bar{w}'$	$\bar{l}'$	K
31	1	227.0	178.8	1.82	145	232.5	176.5	1.92
32	10	257.3	178.8	2.06	136	241.7	176.5	2.00
33	90	258.2	178.8	2.06	215	248.2	176.5	2.06
34	0	-	-	-	492	254.9	176.5	2.11
35	92	237.7	178.8	2.19	107	264.3	176.5	2.19
36	0	-	-	-	0	-	-	-
37	0	-	-	-	542	280.0	176.5	2.32
Total	193	265.4	178.8	2.12	1637	259.9	176.5	2.15

Table 19. Length frequency distribution (‰) for Norwegian Bluefin Tuna catches in 1973, calculated from weight distribution data (Table 17) by condition factor, K = 2.12.

Length group	(total)	‰ (smoothed)
215-219		1
220-224		4
225-229		8
230-234		29
235-239		77
240-244		130
245-249		167
250-254		183
255-259		169
260-264		129
265-269		73
270-274		25
275-279		6
280-284		3
n =	193	1 000

Table 20. Size composition (kg) of Norwegian Bluefin Tuna catches south of 62°N by smoothed weight frequency (‰) in 1974.

Group means		Week number							
w'[1]	w[2]	30	31	32	33	34	35	37	Total
167	215	125	-	1	1	-	-	-	-
172	221	250	-	3	1	-	-	-	1
177	228	125	-	4	1	-	-	-	x
182	234	-	-	6	1	-	-	1	1
187	241	-	-	8	3	5	1	2	2
192	247	-	-	5	8	9	1	1	3
197	253	-	5	12	14	13	2	1	6
202	260	-	10	25	16	18	4	1	9
207	266	-	5	27	21	9	7	3	11
212	273	-	5	29	28	-	13	7	16
217	279	-	19	36	31	13	19	9	20
222	286	-	33	35	33	27	24	12	23
227	292	-	43	41	45	27	31	17	30
232	298	-	53	57	57	27	38	24	40
237	305	-	58	64	58	35	47	29	45
242	311	-	48	68	63	75	59	36	53
247	318	-	72	72	77	92	66	45	63
252	324	-	115	66	79	57	67	50	65
257	331	-	82	62	70	35	66	58	63
262	337	-	39	53	65	35	70	68	65
267	343	-	39	47	62	31	73	70	65
272	350	-	43	49	55	40	69	69	62
277	356	-	58	42	44	75	60	68	57
282	363	125	53	36	36	105	52	66	53
287	369	250	29	34	30	101	47	59	47
292	376	125	29	31	25	66	41	54	41
297	382	-	48	23	23	35	34	53	37
302	388	-	44	16	17	27	29	46	30
307	395	-	15	15	10	22	24	36	23
312	401	-	-	13	8	13	17	27	17
317	408	-	10	9	8	9	13	24	15
322	414	-	24	8	7	5	9	23	13
327	420	-	19	6	4	-	7	16	9
332	427	-	5	2	3	-	7	10	7
337	433	-	-	-	3	-	5	7	4
342	440	-	-	-	2	-	2	5	3
347	446	-	-	-	1	-	2	4	2
352	453	-	-	-	-	-	1	2	1
357	459	-	-	-	-	-	-	2	x
362	465	-	-	-	-	-	-	2	1
367	472	-	-	-	-	-	-	1	x
n =		2	52	240	533	57	647	755	2 286
w'		457	13597	60325	134919	15049	171083	207514	602 944
$\bar{w}$'		228.5	261.5	251.4	253.1	264.0	264.4	274.9	263.8

1) w' = weight of gutted fish without head

2) w = weight of ungutted fish (w = w' x 1.285)

Table 21. Norwegian catch distribution by weeks, variation in catch size and mean catch in 1974.

Week no.	No. of catches	Total	No. of fish. Variation	Mean catch
30	1	2	2	22
31	3	52	1-36	17.3
32	10	240	1-42	24
33	11	533	9-97	48.5
34	3	57	11-33	19
35	21	647	4-85	30.8
36	0	0	-	-
37	10	755	29-159	75.5
Total	59	2 286	1-159	38.7

Table 22. Calculated condition factor (K) for Norwegian Bluefin Tuna catches in 1974.

Week no.	$\bar{w}'$	$\bar{l}'$	K
30	228.5	180	1.80
31	261.5	180	2.06
32	251.4	180	1.97
33	253.1	180	1.98
34	264.0	180	2.07
35	264.4	180	2.07
37	274.9	180	2.15
Mean	263.8	180	2.07

Table 23. Calculated length frequency distribution (‰) for Norwegian Bluefin Tuna catches from weight data and length frequency distribution of 71 fish measured in 1974.

Length group (cm)	Smoothed weight frequency (‰)	
	Calculated by K = 2.07	71 fish measured
217	1	
222	3	
227	9	
232	22	7
237	51	42
242	103	99
247	160	183
252	189	226
257	178	166
262	140	116
267	87	91
272	41	53
277	14	18
282	3	
287	1	

Table 24. Size composition (kg) of Norwegian Bluefin Tuna catches south of 62°N by smoothed weight frequency (‰) in 1975.

Group means		Week number							
w'	w	30	31	32	33	34	35	37	Total
152	192	13	-	-	-	-	-	-	x
157	202	13	4	-	-	-	-	-	1
162	208	13	6	-	-	1	-	-	1
167	215	13	6	1	-	1	-	-	1
172	221	27	8	2	-	1	-	-	1
177	227	13	14	3	1	1	-	-	2
182	234	27	10	3	1	x	-	-	2
187	240	27	10	6	2	x	1	-	3
192	247	27	20	8	3	1	2	-	5
197	253	13	24	10	5	3	2	-	6
202	260	27	24	13	7	7	2	2	8
207	266	27	28	19	11	10	3	3	12
212	272	27	38	25	15	12	5	3	15
217	279	27	32	32	19	15	7	5	19
222	285	40	48	38	25	21	7	5	24
227	292	27	58	43	27	19	11	4	26
232	298	27	64	53	33	24	16	2	33
237	305	27	66	55	41	33	19	6	37
242	311	27	78	59	46	35	23	6	41
247	317	27	72	62	48	42	30	9	45
252	324	53	64	65	52	51	36	14	49
257	330	53	62	63	57	52	39	24	52
262	337	67	52	67	56	53	46	25	54
267	343	80	46	63	54	60	50	30	54
272	350	67	32	58	55	57	54	34	54
277	356	67	26	55	55	55	56	45	54
282	362	53	20	45	47	59	58	46	50
287	369	40	22	36	42	58	57	56	46
292	375	27	16	30	41	53	56	61	43
297	382	27	14	25	36	48	50	71	39
302	388	-	12	18	29	42	48	63	33
307	395	-	12	13	25	31	44	68	29
312	401	-	6	9	19	26	38	64	25
317	408	-	2	6	14	22	33	62	20
322	414	-	2	4	10	16	32	57	17
327	420	-	2	2	11	15	27	56	15
332	427	-	-	1	10	13	21	44	12
337	433	-	-	1	11	10	17	36	11
342	440	-	-	-	12	9	15	32	10
347	446	-	-	-	13	9	13	20	9
352	453	-	-	-	10	8	12	16	7
357	459	-	-	-	8	7	12	11	6
362	465	-	-	-	8	5	10	9	6
367	472	-	-	-	6	2	8	5	4
372	478	-	-	-	6	3	5	5	3

continued..

Table 24 (ctd)

Group means		Week number							Total
w'	w	30	31	32	33	34	35	37	
377	485	-	-	-	5	2	5	1	3
382	491	-	-	-	6	3	3	1	3
387	498	-	-	-	4	3	3	1	2
392	504	-	-	-	3	3	3	-	2
397	510	-	-	-	2	1	3	-	2
402	517	-	-	-	2	1	3	-	2
407	523	-	-	-	1	-	3	-	1
412	529	-	-	-	1	-	3	-	1
417	536	-	-	-	1	-	3	-	1
422	542	-	-	-	1	-	3	-	1
427	549	-	-	-	1	-	1	-	x
432	555	-	-	-	1	-	1	-	x
n		15	100	818	693	293	700	178	2797
w'		3608	24092	204643	190009	80952	201132	53613	758049
$\bar{w}'$		240.5	240.9	250.2	274.2	276.3	287.3	301.2	271.0

w' = weight of gutted fish without head

w = weight of ungutted fish (w = w' x 1.285)

Table 25. Size composition in ‰ (smoothed) of Spanish madrague catches of Bluefin Tuna in 1973.

Length group (cm)	‰ (smoothed)
140-144.9	2
145-149.9	5
150-154.9	5
155-159.9	2
160-164.9	2
165-169.9	5
170-174.9	8
175-179.9	15
180-184.9	26
185-189.9	31
190-194.9	36
195-199.9	43
200-204.9	57
205-209.9	84
210-214.9	99
215-219.9	96
220-224.9	90
225-229.9	84
230-234.9	79
235-239.9	70
240-244.9	50
245-249.9	31
250-254.9	23
255-259.9	22
260-264.9	17
265-269.9	6
270-274.9	2
275-279.9	5
280-284.9	5
285-289.9	2
n = 161	1 000

Table 26. Size composition in ‰ (smoothed) of Spanish madrague catches of Bluefin Tuna at Barbate in 1975.

Length group (cm)	‰ (smoothed)
50- 54.9	1.7
55- 59.9	3.5
60- 64.9	5.2
65- 69.9	7.8
70- 74.9	8.7
75- 79.9	7.8
125-129.9	0.9
130-134.9	1.8
135-139.9	0.9
175-179.9	0.9
180-184.9	3.5
185-189.9	6.9
190-194.9	10.4
195-199.9	14.7
200-204.9	19.9
205-209.9	32.0
210-214.9	53.6
215-219.9	63.2
220-224.9	59.7
225-229.9	73.5
230-234.9	97.8
235-239.9	109.0
240-244.9	113.3
245-249.9	101.2
250-254.9	70.1
255-259.9	50.2
260-264.9	37.2
265-269.9	19.0
270-274.9	9.5
275-279.9	7.8
280-284.9	4.4
285-289.9	0.9
n = 289	1 000

Table 27. Spanish Bluefin Tuna catches from the Bay of Biscay according to commercial size categories landed at the fish market at Fuenterrabia in % from 1972-1975.

Weight (kg)	1972	1973	1974	1975
< 10	21.9	-	25.6	53.9
10-25	42.8	-	62.1	37.7
25-50	7.4	-	9.0	7.4
50-100	23.9	-	3.1	1.1
100-200	3.9	-	0.3	-
	100.0		100.0	100.0
Total number of fish/year	34 485		53 991	70 937

Table 28. Age composition of Spanish Bluefin Tuna catches from the Bay of Biscay in 1975.

Age group	Number of fish	in ‰
I	12 796	180
II	44 465	625
III	7 107	102
IV	5 145	73
V	945	13
VI	479	7
Total	70 937	1 000

Table 29. Length frequency distribution of Atlantic Bluefin Tuna caught by the Canadian-USA purse-seine fleet in 1973 (smoothed ‰).

Length group (cm)	‰ (smoothed)
46- 50	3
51- 55	15
56- 60	22
61- 65	17
66- 70	65
71- 75	193
76- 80	224
81- 85	102
86- 90	15
91- 95	19
96-100	61
101-105	94
106-110	51
111-115	8
116-120	7
121-125	21
126-130	27
131-135	13
136-140	3
141-145	4
146-150	8
151-155	12
156-160	10
161-165	3
166-170	0
171-175	0
176-180	1
181-185	1
186-190	1
	1 000
n = 90 746 specimens	

Table 30. Estimated numbers and ages of Bluefin Tuna caught by the Canadian-USA purse-seine fleet in the northwest Atlantic in 1973.

Age (years)	Approximate length (cm)	Catch	
		Number	%
1	50- 59	5 494	6.1
2	70- 90	53 770	59.3
3	91-110	21 526	23.7
4	111-131	6 150	6.8
5	132-150	1 308	1.4
6	151-162	2 395	2.6
7	163-174	446	<0.1
8	175-186	38	<0.1
9	187-201	19	<0.1
	n =	90 746	100.0
Average length (cm) = 87.6			

Table 31. Length frequency distribution of Atlantic Bluefin Tuna caught by USA fishermen in 1973 (% smoothed). The months when samples were collected are shown in parantheses.

Fork length (cm)	Catch by gear				
	(Jul-Oct) Handline[1]	(Jun-Oct) Harpoon[1]	(Jun-Oct) Rod & Reel[1]	(Jul-Nov) Trap[2]	Total
121-125	-	-	-	5	1
126-130	-	-	-	21	2
131-135	-	-	-	26	2
136-140	-	-	-	21	2
141-145	-	-	-	26	2
146-150	-	-	-	21	2
151-155	-	-	1	5	1
156-160	-	-	3	-	2
161-165	-	-	4	5	3
166-170	-	-	4	11	3
171-175	-	3	4	5	3
176-180	-	5	3	-	2
181-185	-	3	7	5	5
186-190	-	3	18	11	12
191-195	-	8	28	11	19
196-200	-	8	31	11	21
201-205	-	5	21	11	15
206-210	4	6	12	16	10
211-215	16	11	13	21	13
216-220	24	11	16	31	17
221-225	44	17	23	42	26
226-230	89	31	46	26	47
231-235	121	45	71	11	67
236-240	129	57	86	21	79
241-245	125	94	113	52	104
246-250	117	142	134	93	128
251-255	97	162	131	113	137
256-260	77	153	101	113	108
261-265	69	116	60	98	76
266-270	48	77	38	73	50
271-275	24	37	20	53	26
276-280	12	7	8	26	10
281-285	4	-	4	11	4
286-290	-	-	-	5	1
	1 000	1 000	1 000	1 000	1 000
n =	62	88	271	48	469

1) Sample of catch. Samples from rod and reel are from only the catch of large fish (> 155 cm). Both small (< 156 cm) and large fish are caught with rod and reel.

2) Virtually the entire USA trap catch of Bluefin Tuna was sampled.

Table 32. Monthly size composition of US Bluefin Tuna catches in ‰ (smoothed) (fork length by caliper) for 1974.

Fork length	July	August	September	October	Total
41- 45	8	-	-	-	3
46- 50	104	23	1	-	47
51- 55	197	66	124	-	137
56- 60	110	64	320	-	168
61- 65	11	21	273	-	102
66- 70	15	1	77	-	32
71- 75	79	20	2	-	42
76- 80	126	66	13	-	77
81- 85	81	84	26	-	67
86- 90	67	79	22	-	53
91- 95	96	95	17	10	64
96-100	67	104	34	-	65
101-105	19	70	39	-	39
106-110	2	15	17	10	13
111-115	-	11	2	-	4
116-120	-	26	-	-	7
121-125	-	50	1	-	13
126-130	-	53	2	-	14
131-135	-	33	1	10	9
136-140	-	22	-	-	6
141-145	-	47	-	-	6
146-150	-	21	-	10	5
151-155	-	12	-	10	3
156-160	-	4	-	-	1
161-165	-	2	-	-	1
166-170	-	1	-	-	-
171-175	-	1	-	-	-
176-180	-	-	-	-	-
181-185	-	-	-	10	-
186-190	-	-	-	10	-
191-195	-	-	-	-	-
196-200	-	-	-	-	-
201-205	-	-	-	-	-
206-210	-	-	-	10	-
211-215	-	-	-	10	-
216-220	-	-	-	10	-
221-225	-	-	-	10	-
226-230	1	-	1	10	1
231-235	1	-	1	-	1
236-240	2	1	1	10	1
241-245	3	2	1	10	2
246-250	3	1	1	40	2
251-255	3	1	4	80	3
256-260	3	1	5	130	4
261-265	2	1	5	150	3
266-270	1	1	4	165	2
271-275	1	1	3	145	2
276-280	-	-	2	83	1
281-285	-	-	1	40	-
286-290	-	-	-	20	-
291-295	-	-	-	10	-
296-300	-	-	-	-	-
301-305	-	-	-	-	-
n =	26 027	16 836	22 233	114	65 210

Table 33. Monthly size composition of US Bluefin Tuna catches above 200 cm (comp. Table 32) in ‰ (smoothed) (fork length by caliper) for 1974.

Fork length	Jun	Jul	Aug	Sep	Oct	Nov	Total
195-199	-	-	4	1	-	-	1
200-204	16	-	8	4	-	-	3
205-209	31	-	8	7	2	-	5
210-214	32	2	9	10	7	15	7
215-219	47	5	9	11	12	44	10
220-224	47	12	9	9	14	44	12
225-229	47	29	16	10	9	15	18
230-234	94	57	34	15	2	-	31
235-239	125	98	80	20	-	15	54
240-244	109	144	126	29	9	30	81
245-249	125	159	123	59	35	59	99
250-254	156	148	119	103	70	103	117
255-259	93	137	145	141	117	118	137
260-264	31	110	137	171	172	118	143
265-269	31	64	96	167	198	103	123
270-274	16	25	50	120	159	73	80
275-279	-	7	18	72	91	73	44
280-284	-	2	7	36	49	102	23
285-289	-	1	2	11	29	73	8
290-294	-	-	-	2	12	15	2
295-299	-	-	-	1	6	-	1
300-304	-	-	-	1	5	-	1
305-309	-	-	-	-	2	-	-
n =	16	465	234	639	107	17	1 478

Table 34. 1974 recaptures of Giant (120 kg) Bluefin Tuna. Released by cooperators of the Woods Hole Oceanographic Institution's Game Fish Tagging Program (WHOI) and the National Marine Fisheries Service's Marine Research Tagging Program (NMFS).

RELEASE			RECAPTURE		
Date	Area	Gear	Date	Area	Gear
8.6.1973	Bahamas	Rod & Reel	3.7.1974	New England	Handline (WHOI)
22.7.1974	New England	Free tagged	26.7.1974	New England	Rod & Reel (WHOI)
18.8.1970	Newfld.	Rod & Reel	22.7.1974	Nova Scotia	Harpooned (WHOI)
14.8.1970	Newfld.	Rod & Reel	15.7.1974	New England	Handline (WHOI)
22.7.1974	New England	Rod & Reel	30.7.1974 x)	New England	Rod & Reel (WHOI)
27.7.1973	New England	Rod & Reel	4.8.1974	New England	Rod & Reel (NMFS)
8.6.1973	Bahamas	Rod & Reel	12.9.1974	Norway	Seine (WHOI)
22.7.1974	New England	Free tagged	8.9.1974	New England	Rod & Reel (WHOI)

x) Tag shed, but fish identified by taggers on basis of deformed fin and an open wound on lateral line where they had noted the tag had been placed. This recapture may be considered as highly probable, if not certain.

Table 35. Woods Hole Oceanographic Institution - Cooperative Game Fish Tagging Program. Releases and returns for Giant (over 120 kg) Bluefin Tuna tagged in Newfoundland waters, by year of release, months at large, and area*) of recapture.

Year	Releases	Returns/Months at large						Total
		0-5.9	6.0-17.9	18.0-29.9	30.0-41.9	42.0-53.9	?	
1962	6	0	0	0	0	0		0
1963	3	0	0	0	0	0		0
1964	41	0	0	0	0	0		0
1965	47	0	0	0	0	0		0
1966	49	0	0	0	0	0		0
1967	6	0	0	0	0	0		0
1968	193	1 L	0	0	1 L	0		2 L
1969	166	0	0	0	0	0		0
1970	79	1 L	0	0	0	1 M, 1N		3 LMN
1971	32	0	0	1 M	0	-		1 M
1972	38	0	1 G	0	-	-		1 G
1973	0	0	0	-	-	-		0
1974	0	0	-	-	-	-		0
Unknown	1						1L	1 L

*) Areas: L = Local; M = Massachusetts; N = Nova Scotia; G = Grand Banks.

Table 36. Woods Hole Oceanographic Institution - Cooperative Game Fish Tagging Program. Releases and returns for Giant Bluefin Tuna (over 120 kg) tagged off the Bahamas by year of release, months at large, and area**) of recapture.

Year	Releases	Returns/Months at large					Total
		0-5.9	6.0-17.9	18.0-29.9	30.0-41.9	42.0-53.9	
1954	21	0	0	0	0	0	0
1955	14	0	0	0	0	0	0
1956	41	0	0	0	0	0	0
1957	0	0	0	0	0	0	0
1958	0	0	0	0	0	0	0
1959	25	0	0	0	0	0	0
1960	13	0	0	2 N	0	0	2 N
1961	34	2 N	0	0	0	0	2 N
1962	45	1 N	0	0	0	0	1 N
1963	147	0	0	1 B	0	0	1 B
1964	41	0	0	0	0	0	0
1965	55	0	0	0	0	0	0
1966	105	0	0	0	0	1 A	1 A
1967	82	1 N	0	0	0	0	1 N
1968	57	0	0	0	0	0	0
1969	47	0	0	0	0	1 B	1 B
1970	182	1 A	0	0	0	0	1 A
1971	49	0	0	1 A	0	-	1 A
1972	32	0	1 N	0	-	-	1 N
1973	47	0	1 A, 1 N	-	-	-	2 AN
1974	31	0	-	-	-	-	-

**) Areas: A = Northeastern North America; B = Brazil and Argentina; N = Norway.

Table 37. Releases and returns for Giant (over 122 kg) Bluefin Tuna tagged in New England coastal waters, by years of release and recapture. Returns expressed in numbers (numerators) and percentage of releases (denominators), were all from New England waters.

Releases		Returns, by year of recapture									Total
Year	Number	1966	1967	1968	1969	1970	1971	1972	1973	1974[a]	
1966	2	0	0	0	0	0	0	0	0	-	0
1967	0	-	0	0	0	0	0	0	0	-	0
1968	6	-	-	0	0	1/16.7	0	0	0	-	1/16.7
1969	1	-	-	-	0	0	0	0	0	-	0
1970	4	-	-	-	-	0	0	0	0	-	0
1971	10	-	-	-	-	-	0	0	1/10.0	-	1/10.0
1972	17	-	-	-	-	-	-	1/5.9	1/5.9	-	2/11.8
1973[b]	15	-	-	-	-	-	-	-	5/33.3	1/6.7	6/40.0
1974[c]	10	-	-	-	-	-	-	-	-	2/20.0[d]	2/20.0
Total						1		1	7	3	12

Footnotes:

a) Incomplete.

b) Includes 6 releases of, and 4 1973 returns from, fish tagged while swimming free.

c) Includes 4 releases of, and 2 returns from, fish tagged while swimming free.

d) Another fish, tagged in 1974 after capture by rod and reel, has very probably also been recaptured after shedding the tag. It was identified by the crew which had probably tagged it on the basis of a deformed pectoral fin, and a wound on the lateral line where the tagging data card indicated that the tag had been placed. This probable recapture occurred 8 days after the release.

Table 38. Releases and returns for Giant (over 122 kg) Bluefin Tuna, Thunnus thynnus, tagged in New England coastal waters, by cooperators with the Woods Hole Oceanographic Institution and National Marine Fisheries Service fish tagging programs.

Year released	Releases*)	Returns by months at large			Total	%
		0-5.9	6-17.9	18-29.9		
1966	2	-	-	-	-	
1967	0	-	-	-	-	
1968	6	-	-	1	1	16.7
1969	1	-	-	-	-	
1970	4	-	-	-	-	
1971	10	-	-	1	1	10.0
1972	17	1	1	-	2	11.8
1973	15[a])	5	-	-	6[a])	40.0
1974	10[b])	2	-	-	2[b])	20.0

*) Fish were caught for tagging by rod and reel except as noted.

a) Includes 6 releases of, and 4 1973 returns from, fish tagged while swimming free.

b) Includes 4 releases of, and 2 1974 returns from, fish tagged while swimming free.

Table 39. Woods Hole Oceanographic Institution - Cooperative Game Fish Tagging Program. Releases of young Bluefin Tuna in coastal waters between Cape Hatteras and Cape Cod, by year and method of capture for tagging, and return rates from these, based on all data received up to 1 February 1974.

Year	Purse seine		Rod and reel	
	Releases	Return rate, %	Releases	Return rate, %
1954	0	0	169	1.8
1955	0	0	215	0
...				
1957	0	0	34	2.9
1958	0	0	38	0
1959	0	0	25	0
1960	0	0	15	6.7
1961	21	0	129	5.4
1962	25	0	52	7.7
1963	0	0	29	31.0
1964	455	28.2	10	30.0
1965	1 629	15.0	43	39.5
1966	3 772*)	29.0	187	44.9
1967	614	29.5	14	21.4
1968	219	47.5	41	26.8
1969	92	17.4	244	38.1
1970	32	25.0	426	41.5
1971	311*)	20.6	31	48.5
1972	127*)	30.7	66	39.4
1973	264	18.5	86	11.6
1974	1 424*)	4.4	277	2.9

*) Includes jig releases.

Table 40. Woods Hole Oceanographic Institution - Cooperative Game Fish Tagging Program. Numbers of local returns from small Bluefin Tuna released in coastal waters between Cape Hatteras, North Carolina, and Cape Cod, Massachusetts, and percentage of returns by method of recapture.

Year	N	Method of recapture	
		Commercial	Sport
1954	1	100.0	0
1955	0	0	0
1956	0	0	0
1957	1	0	100.0
1958	0	0	0
1959	0	0	0
1960	1	100.0	0
1961	7	100.0	0
1962	4	100.0	0
1963	9	100.0	0
1964	131	96.2	3.8
1965	243	88.5	11.5
1966	1 163	84.9	15.1
1967	184	91.3	8.7
1968	115	87.0	13.0
1969	109	95.4	4.6
1970	185	99.5	0.5
1971	79	93.7	6.3
1972	65	90.8	9.2
1973	59	96.6	3.4
1974	71	69.0	31.0

Table 41. 1975 catch of Atlantic Bluefin Tuna by US fishermen.

Fishery	Metric tons
Purse seine (ages 1-6)	1 761.8
Purse seine (> age 6)	267.2
Harpoon, handline, rod and reel	693.5
Sports	121.7
Total	2 844.2

Table 42. Estimated 1975 catch of Bluefin Tuna (in metric tons) of US purse seine fleet in the western North Atlantic Ocean. Figures do not include an estimated 267.2 metric tons of Giant Bluefin Tuna taken by purse seine in September.

Age	June	July	August	Total
1	3.4	51.2	6.5	61.1
2	80.6	1 224.3	24.4	1 329.3
3	3.7	55.5	6.4	65.6
4	16.0	243.6	28.9	288.5
5	0.9	13.5	2.2	16.1
6	-	-	0.7	2.2
Total	104.6	1 588.1	69.1	1 761.8

Table 43. Landings of Giant Bluefin Tuna (> 135 kg) by States from harpoon, handline, and rod and reel fishery for 1975.

Louisiana	2
Florida	1
Maryland	1
New Jersey	9
New York	27
Rhode Island	6
Massachusetts	1 906
New Hampshire	25
Maine	300
Total	2 277

Table 44. Monthly size composition of small Bluefin Tuna caught by US purse seine fleet in 1975 in ‰ (smoothed) (fork length by caliper). (Total catch = 1 761.8 metric tons, total sample = 4 587 fish.)

Fork length (cm)	July	August	Total
46 - 50	4	3	3
51 - 55	26	57	38
56 - 60	42	117	69
61 - 65	25	68	40
66 - 70	121	52	96
71 - 75	310	174	261
76 - 80	287	222	264
81 - 85	101	100	101
86 - 90	10	8	10
91 - 95	3	4	4
96 - 100	6	9	7
101 - 105	8	15	10
106 - 110	10	20	14
111 - 115	15	31	20
116 - 120	17	44	27
121 - 125	12	41	22
126 - 130	4	21	10
131 - 135	2	7	3
136 - 140	1	3	1
141 - 145		1	
146 - 150		1	
151 - 155		1	
156 - 160		1	
	1 000	1 000	1 000
n =	2 921	1 666	4 587

Table 45. Sample weight frequency distribution of Giant Atlantic Bluefin Tuna caught by the US purse seine fleet in September 1975 (total catch = 1 017 fish, total sampled = 964 fish), in ‰ (smoothed).

Round weight (kg) *)	‰ (smoothed)
108.86 - 112.94	1
113.40 - 117.48	2
117.93 - 122.02	2
122.47 - 126.55	2
127.01 - 131.09	2
131.54 - 135.62	4
136.08 - 140.16	6
140.61 - 144.70	9
145.15 - 149.23	15
149.69 - 153.77	16
154.22 - 158.30	15
158.76 - 162.84	20
163.29 - 167.38	25
167.83 - 171.91	23
172.37 - 176.45	17
176.80 - 180.98	10
181.44 - 185.52	9
185.97 - 190.06	10
190.51 - 194.59	11
195.04 - 199.13	15
199.58 - 203.66	17
204.12 - 208.20	14
208.65 - 212.73	12
231.19 - 217.27	9
217.72 - 221.81	6
222.26 - 226.34	8
226.80 - 230.88	9
231.22 - 235.41	14
235.87 - 239.95	15
240.40 - 244.49	13
244.92 - 249.02	12
249.48 - 253.56	16
254.01 - 258.09	16
258.55 - 262.63	15
263.08 - 267.17	19
267.62 - 271.70	23
272.16 - 276.24	21
276.69 - 280.77	19
281.23 - 285.31	23
285.76 - 289.85	25
290.30 - 294.38	27
294.84 - 298.92	29
299.37 - 303.45	27
303.91 - 307.99	29
308.44 - 312.53	32
312.99 - 317.06	33
317.51 - 321.60	30
322.05 - 326.14	26
326.59 - 330.67	23
331.12 - 335.20	24
335.66 - 339.74	26
340.19 - 344.25	18
344.73 - 348.81	19
349.27 - 353.35	17
353.80 - 357.88	19
358.34 - 362.42	16
362.87 - 366.96	12
367.41 - 371.49	9
371.95 - 376.03	8
376.48 - 380.56	8
381.02 - 385.10	9
385.55 - 389.64	10
390.09 - 394.17	8
394.63 - 398.71	5
399.16 - 403.24	4
403.70 - 407.78	2
408.23 - 412.32	2
412.77 - 416.85	1
417.31 - 421.39	1
421.84 - 425.92	1
426.38 - 430.46	1
430.91 - 435.00	1
435.45 - 439.53	2
439.98 - 444.07	1
444.52 - 448.60	0
449.06 - 453.11	1
	1 000
n =	957

*) One fish weighed 72.575 kg
and one weighed 86.183 kg

Table 46. Estimated numbers and ages of Atlantic Bluefin Tuna caught by the US purse seine fleet in 1975.

Age	June	July	August
1	850	12 798	1 625
2	8 059	122 409	2 440
3	206	3 083	356
4	516	7 856	932
5	20	300	4 850
6	-	-	11

Table 47. Sample length frequency distribution of New England handgear for Atlantic Bluefin Tuna caught in 1975 by US fishermen (total catch = 2 331 fish greater than 300 lbs (= 136 kg) round weight, total sampled = 657 fish) in ‰ smoothed.

Fork length (cm)	Harpoon	Rod & reel	Handline	Gear unknown	Total in ‰ (smoothed)
166 - 170	2				0
171 - 175	4				1
176 - 180	2				0
181 - 185	0				0
186 - 190	0	1	0	0	1
191 - 195	0	2	2	3	2
196 - 200	2	2	4	6	3
201 - 205	5	1	2	8	4
206 - 210	7	1	2	14	4
211 - 215	11	3	4	14	6
216 - 220	20	4	4	22	10
221 - 225	25	9	8	45	15
226 - 230	22	20	18	48	25
231 - 235	35	58	43	59	48
236 - 240	69	79	88	88	78
241 - 245	98	109	156	121	117
246 - 250	141	149	191	149	157
251 - 255	170	160	165	138	161
256 - 260	139	140	126	98	131
261 - 265	96	116	94	79	102
266 - 270	63	81	51	65	69
271 - 275	41	39	16	28	34
276 - 280	29	14	2	5	14
281 - 285	15	7	4	5	8
286 - 290	4	4	10	5	6
291 - 295	0	1	8	3	3
296 - 300		0	2	0	1
	1 000	1 000	1 000	1 000	1 000
n =	138	302	128	89	657

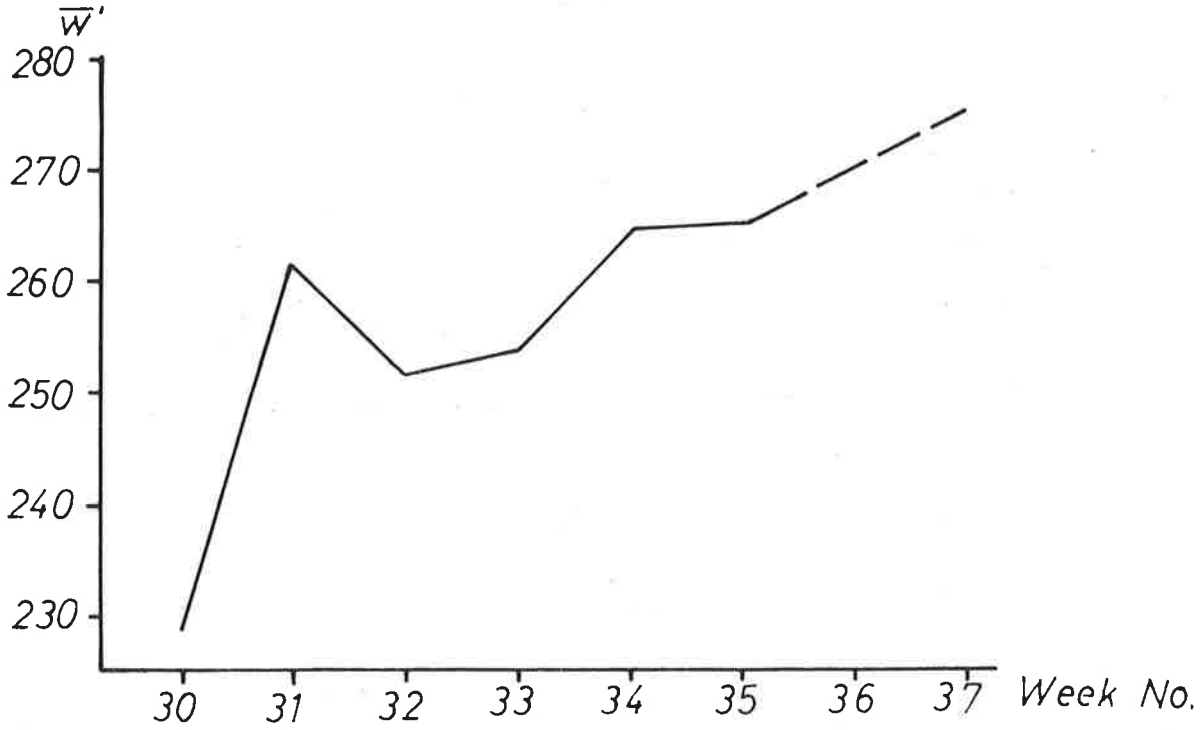

Figure 1. Body weight increase of Bluefin Tuna caught on the Norwegian coast by weeks in 1974.

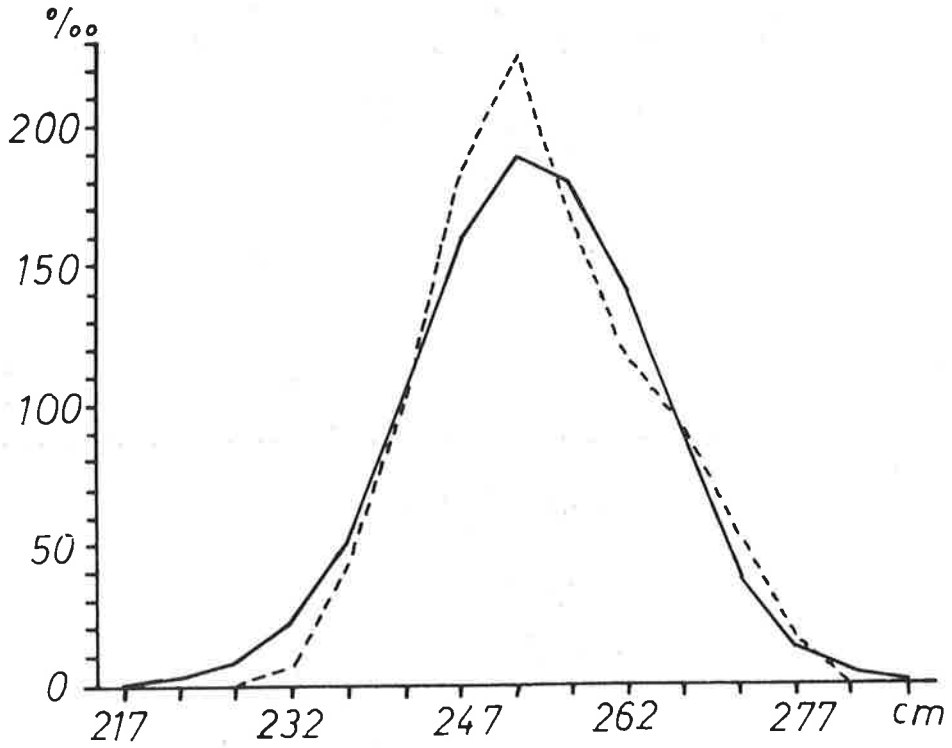

Figure 2. Calculated length frequency distribution from weight data, and length frequency distribution of 71 fish measured (broken line) on the Norwegian coast in 1974.

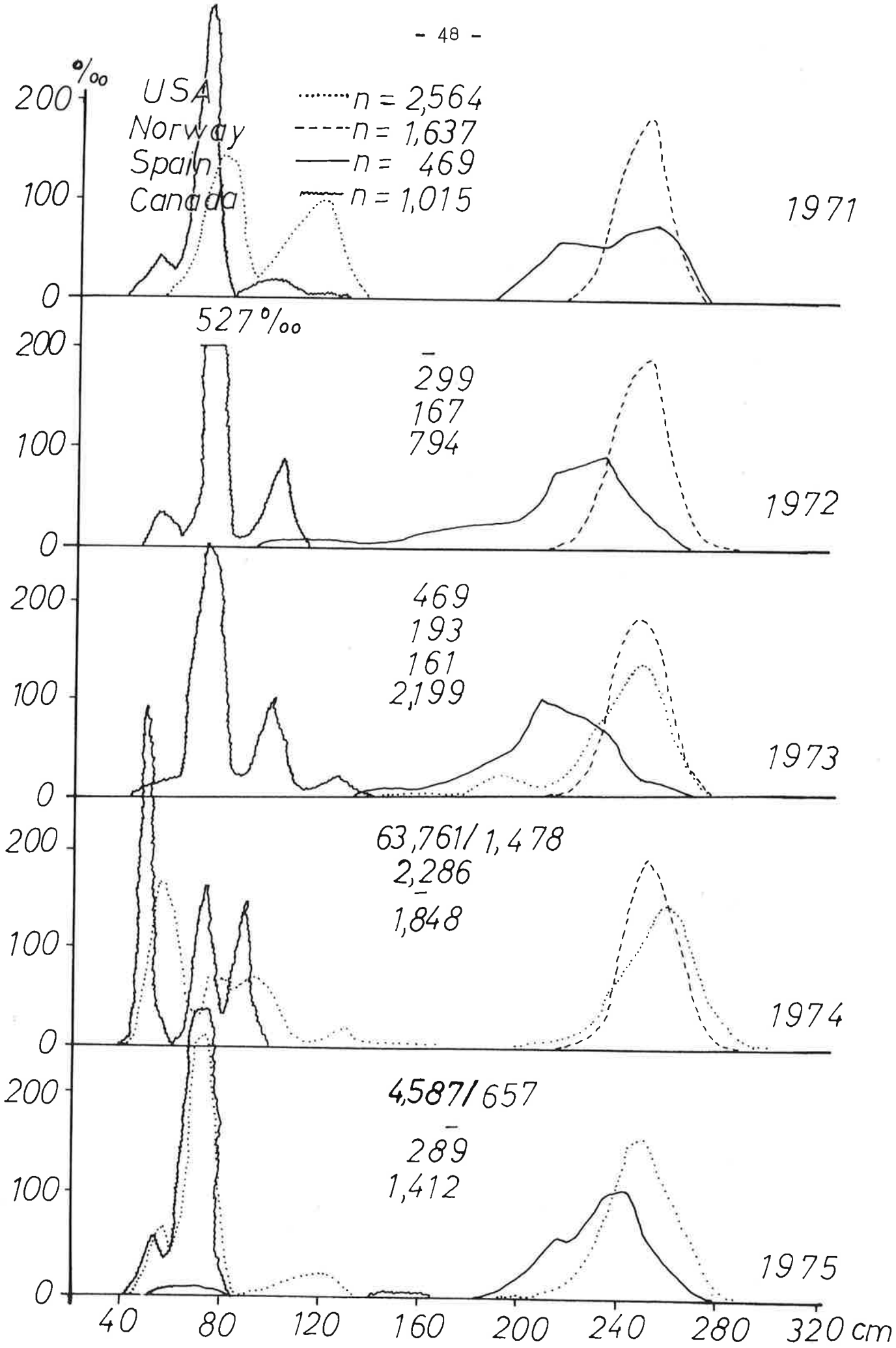

Figure 3. Size composition of Bluefin Tuna catches made in USA, Norway, Spain and Canada.

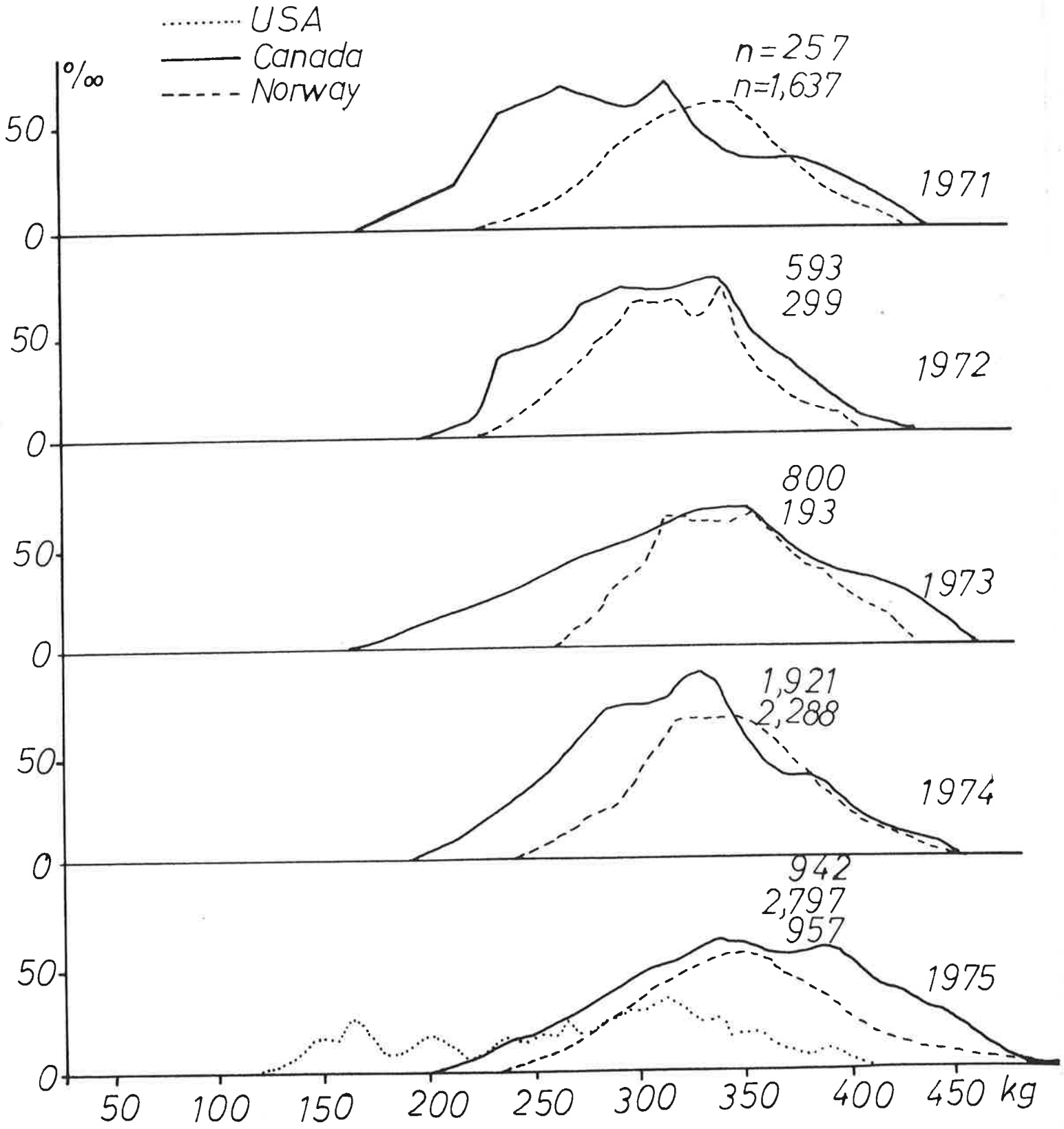

Figure 4. Weight composition of Bluefin Tuna catches made in USA, Canada and Norway.

Indication of spine colours

Liaison Committee Reports	Red
Reports of Advisory Committee on Marine Pollution	Yellow
Fish Assessment Reports	Grey
Pollution Studies	Green
Others	Black

-o-o-o-o-