

**REPORT OF THE INTERNATIONAL PACIFIC HALIBUT
COMMISSION**

APPOINTED UNDER THE CONVENTION BETWEEN CANADA AND
THE UNITED STATES OF AMERICA FOR THE PRESERVATION
OF THE NORTHERN PACIFIC HALIBUT FISHERY

NUMBER 21

**REGULATION AND INVESTIGATION
OF THE PACIFIC HALIBUT
FISHERY IN 1953**

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FOREWORD

The 1953 Convention between the United States and Canada for the Preservation of the Halibut Fishery of the Northern Pacific Ocean and Bering Sea provides that the International Pacific Halibut Commission, formerly designated the International Fisheries Commission, shall report upon its activities and investigations from time to time.

Twenty reports have been issued prior to the present one which is the seventh of a series of annual reports that were commenced in 1947 to provide a brief summary of the Commission's activities during the year.

Those desiring more extensive background material than included herein are referred to previous reports.



**REGULATION AND INVESTIGATION OF THE PACIFIC
HALIBUT FISHERY IN 1953**

By

INTERNATIONAL PACIFIC HALIBUT COMMISSION

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HISTORICAL BACKGROUND

The fourth effective convention between Canada and the United States concerned with the preservation of the Pacific halibut fishery was signed on March 2, 1953 and ratifications were exchanged on October 28, 1953. This represented one more step in the joint and mutually profitable effort to develop the Pacific halibut stocks to levels that will permit maximum sustained yields.

The background for the present understanding between the two countries extends back nearly forty years. Between 1914 and 1920, the halibut industry, particularly in the United States, had advocated the instituting of winter closed seasons and the prohibition of fishing upon certain nursery grounds. Marketing considerations were the primary reasons for the recommendation. On two occasions bills were introduced into the United States Congress for unilateral action on the proposals.

As a result of the findings of the United States-Canadian Joint Commission of 1918, a convention was negotiated between the two countries in 1919 but failed to secure ratification due to the inclusion of controversial provisions dealing with customs regulations and port-use privileges.

In consequence of further representation by the Canadian halibut industry to a Royal Commission in 1922 and the continued activity of the United States industry including the halibut vessel owners, a new convention was drawn up in 1922 omitting the controversial items of the 1919 draft and making conservation the primary consideration. This convention was signed on March 2, 1923 and, after further discussion, ratifications were exchanged October 21, 1924.

This first effective convention provided for a three-month winter closed season and for the appointment of the International Fisheries Commission with two members from each country, to investigate the fishery and to recommend measures for its preservation.

The winter closed season went into effect in November, 1924 but failed to halt the decline in the fishery. After extensive scientific investigations, broader regulatory measures to rebuild the fishery were recommended to the two governments in 1928. A new convention was signed May 9, 1930, and ratifications were exchanged May 9, 1931. This second convention provided that the Commission could change or suspend the closed season; divide the convention waters into areas and limit the catch of halibut to be taken from each; regulate the licensing and departure of vessels for purposes designated in the convention; collect statistics; fix the type of gear to be used; and, close grounds found to be populated by small immature halibut. Enforcement was made the responsibility of appropriate established agencies of the individual governments.

A third convention was signed January 29, 1937, and ratifications were exchanged July 28, 1937, extending the Commission's regulatory authority. The provisions of the 1930 Convention were continued but the new convention also provided for the control of the capture of halibut caught incidentally to fishing for other species in areas closed to halibut fishing and for prohibiting the departure of vessels for any area when those which had already departed would suffice to take the area's catch limit.

Since 1932, regulations to control the fishery have been adopted annually by the Commission and approved by the President of the United States and the Governor General of Canada.

Under regulation the stocks of halibut available to the fishery have increased greatly in magnitude and the annual catch during the past 4 years has averaged over 59 million pounds, some 15 million pounds greater annually than in 1931. A more than two-fold increase in the size of the fleet coupled with much larger catches per trip has sharply reduced the length of the fishing season.

The shortening of the fishing season has altered the distribution of fishing because the stocks of halibut on different grounds are not equally available nor uniformly fished at all times of year.

THE HALIBUT CONVENTION OF 1953

The 1953 convention was signed on March 2, 1953, the 30th anniversary of the signing of the 1923 convention. Ratifications were exchanged on October 28, 1953.

By 1940 it had become evident that the shortening of the season was interfering with the Commission's ability to provide more effectively for the preservation of the halibut fishery as required by the 1937 convention. After the end of World War II, in 1946, the Commission recommended to the governments treaty changes that would enable it to lengthen the fishing season. The halibut fleets supported the action and most of the wholesale halibut dealers appeared to favor it. In 1948 the Commission again drew the attention of the governments to the urgent conservation need for extended authority.

In 1949 the Commission examined the feasibility of dividing the fishing season into two or more periods and held coastwise public hearings on the question. It was the opinion of the Canadian Government that the terms of the 1937 convention would permit more than one period of fishing each year in an area. However, the United States Government advised the Commission that it lacked the authority under the 1937 convention to so divide the season. In view of these conflicting interpretations, it was necessary to abandon any further consideration of splitting the season.

The important change in the 1953 convention is that the Commission may establish one or more open or closed seasons each year in any area. This removes the doubt in the 1937 convention as to the Commission's authority in this matter. The new convention does not provide the Commission with authority to control the rate of landing of halibut by the application of between-trip tie-ups to the vessels individually or on any other basis as was proposed by the Commission in 1946.

Other changes in the 1953 convention, which is reproduced as an appendix to this report, were as follows:

(a) The International Fisheries Commission is continued under the new convention as the International Pacific Halibut Commission. This name more satisfactorily identifies the organization, which is no longer the only international fisheries agency as it was in 1923.

(b) Membership of the Commission is increased from four to six Commissioners, three to be appointed by each country.

(c) All decisions of the Commission are to be made by a concurring vote of at least two of the Commissioners of each country. Previous conventions provided no rules of voting.

(d) The objective of the Commission is restated to be the development of the stocks of halibut in the convention waters to those levels which will permit the maximum sustained yield and the maintenance of the stocks at those levels.

(e) Any regulatory actions of the Commission are made contingent upon investigations having indicated such actions to be necessary to the objective of the convention.

(f) Authority for the application of size limits in addition to catch limits is specifically provided.

(g) Provision is made for regulating the retention of halibut caught incidentally while fishing for other species in areas or in portions of areas both open or closed to halibut fishing rather than only in closed areas.

(h) The Commission is permitted not only to conduct fishing operations for investigative purposes at any time but also to authorize such operations.

ACTIVITIES OF THE COMMISSION

In 1953 the Commission continued the regulation of the halibut fishery and the statistical and biological investigations that form the basis for current and future regulations.

With the 1953 convention changing membership on the Commission from two to three members from each country, the Government of Canada, early in November, 1953, appointed Mr. Richard Nelson of Vancouver, B.C., and Mr. Harold S. Helland of Prince Rupert as Commissioners to replace Mr. George W. Nickerson whose resignation took effect at that time. Mr. Nickerson had served as Secretary or Chairman from his appointment in 1943. Mr. George R. Clark, Ottawa, was reappointed under the new convention.

The United States continued the memberships of Mr. Seton H. Thompson and Mr. Edward W. Allen. The latter as Secretary became Acting Chairman under Commission procedure upon the resignation of Mr. G. W. Nickerson who had been Chairman. Mr. J. W. Mendenhall of Ketchikan, Alaska, was appointed the third United States member in January, 1954.

The Commission held its regular annual meeting at its office in Seattle, Washington, on January 21, 22 and 23, 1953. Meetings were held with representatives from the fishermen's and vessel owners' organizations in the major halibut ports, with representative Canadian and United States wholesale halibut dealers, with representatives of the otter trawl fishery in Washington State, and with a representative of a halibut liver-oil processor.

During the morning of January 21, the results of investigations conducted during 1952 and the statistics of the fishery and the effectiveness of regulation in 1952 were reviewed. In the afternoon, representatives of the Washington State otter trawlers and of a liver processor were heard on matters relative

to their interest in the fishery. Thereafter, the status of current appropriations and plans for investigations in 1953 were presented by the staff to the Commission and discussed.

On the second day, January 22, the Commission held a joint meeting with representatives of fleets and dealers and reviewed the previous season's fishing and the results of investigations. In the afternoon, one meeting was held with representatives of the Pacific coast halibut dealers and another with the fleet's representatives to receive and discuss recommendations for the regulation of the fishery in 1953.

On January 23, the Commission considered the industry's proposals, agreed upon the regulations to be recommended to the two governments for 1953 and made other administrative decisions.

THE 1953 REGULATIONS

The Pacific Halibut Fishery Regulations for 1953 were approved by the Governor General of Canada on April 17 and by the President of the United States on May 11, and became effective on the latter date.

The convention waters were divided into the same eight regulatory areas as in 1952. The eight areas, shown in Figure 1, were: Area 1A, the waters off the southern Oregon and northern California coasts south of Cape Blanco, Oregon; Area 1B, the waters off the Oregon and Washington coasts between Cape Blanco and Willapa Bay, Washington; Area 2A, the waters between Willapa Bay and Cape Spencer, Alaska, exclusive of Areas 2B and 2C; Area 2B, off the east coast of Moresby Island in lower Hecate Strait; Area 2C, off the west coast of Dall Island in the Forrester Island region of southeastern Alaska; Area 3A, extending from Cape Spencer to a line running south three-quarters east from Bold Cape through Caton Island of the Sanak Islands group; Area 3B, extending between the Bold Cape-Caton Island line and a line running true west from Cape Sarichef on Unimak Island; and Area 4, including those waters of the Bering Sea lying north of the Cape Sarichef line.

The fishing season in Areas 1A, 1B, 2A and 3A opened on May 17, three days later than in 1952 on account of the different tidal conditions in the two years. Areas 3B and 4 were opened on August 5 for a period of 25 days, eight days more than in 1952. The two small areas, Area 2B off British Columbia and Area 2C off southeastern Alaska, first established in 1951, were opened as separate areas for 10 days commencing July 31, five days later than in 1952.

Vessels fishing for crab in Area 4, in Bering Sea, with bottom nets of 12-inch or larger mesh were permitted to retain a limited proportion of halibut caught incidentally to such fishing between August 30 and November 14 inclusive.

Catch limits of 25,500,000 pounds and 28,000,000 pounds were continued for Areas 2A and 3A respectively. Areas 1A and 1B, where the total catch of halibut is comparatively small, were allowed to continue without catch limits. Areas 2B, 2C, 3B and 4 also had no catch limits assigned to them, fishing being restricted to a stated number of days in each area.

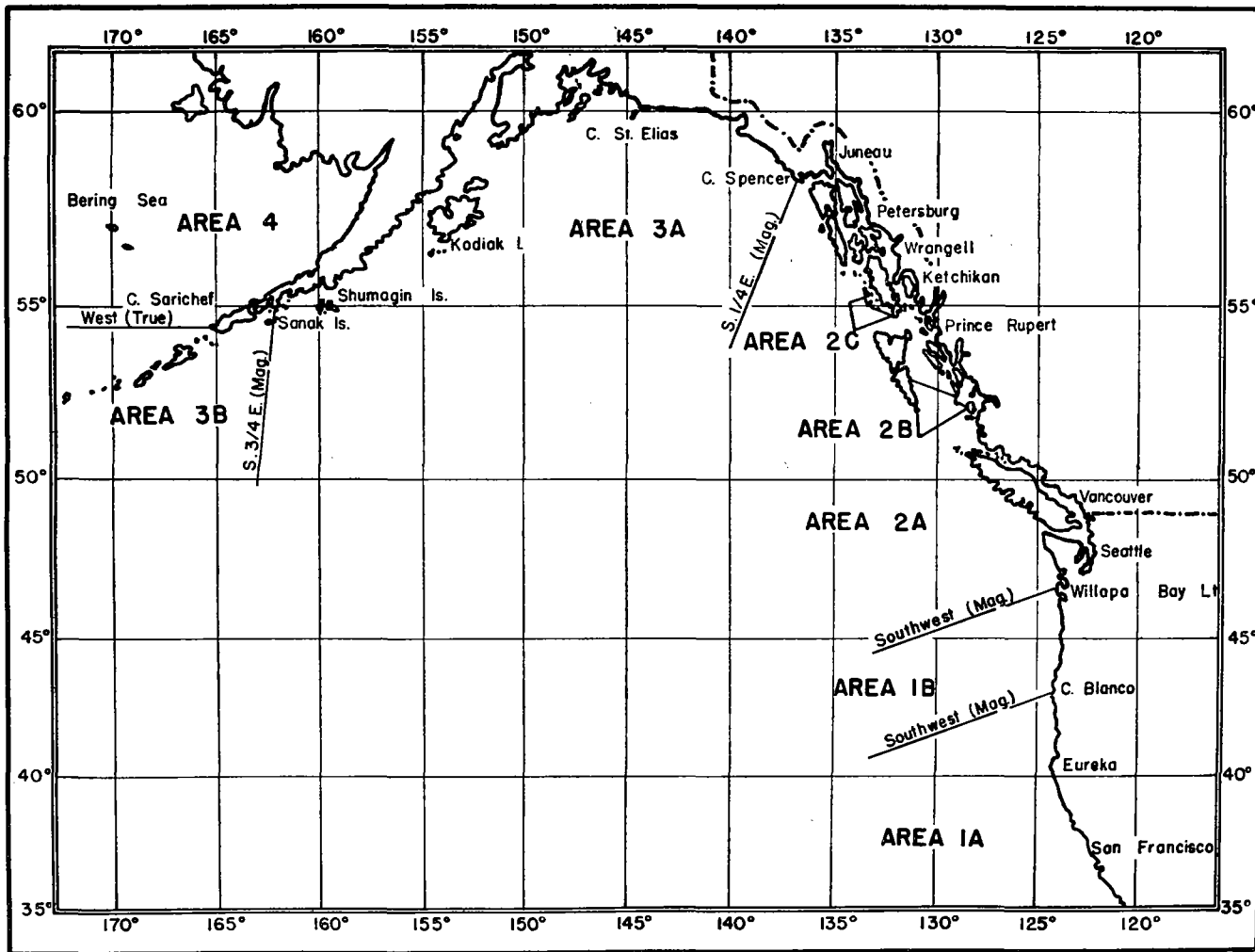


Figure 1. Pacific Coast of North America, showing regulatory areas defined by the International Fisheries Commission in 1953.

The closing dates of Areas 2A and 3A were again made contingent upon the attainment of their respective catch limits. The closing date of Area 2A was applied to Area 1B and that of Area 2A or Area 3A, whichever was later, was applied to Area 1A.

Other regulatory provisions were also continued as follows: a minimum size limit of 26 inches heads-on or five pounds heads-off for halibut; the closure of two nursery areas, one off Massett in northern British Columbia and one off Timbered Islet in southeastern Alaska; the prohibition of the use of dory gear and nets of any kind in fishing for halibut; the termination after November 16 of permits for the retention and possession of halibut caught incidentally during fishing for other species in Areas 1A, 1B, 2A, 2B, 2C, 3A and 3B; and, the beginning of the winter closed season after November 30 in any area that might still be open by reason of the non-attainment of the catch limit which otherwise determined its closure.

Areas 2A and 1B were closed to halibut fishing at midnight of June 9, and Areas 3A and 1A at midnight of July 7. Areas 2B and 2C were closed at midnight of August 9 and Areas 3B and 4 at midnight of August 29, as specified in the regulations.

The closing dates of Areas 2A and 3A were announced in advance on May 30 and June 18 respectively, on the basis of the estimated dates of attainment of their respective catch limits.

STATISTICS OF THE FISHERY

Landings from Regulatory Areas

Landings during 1953 from groups of regulatory areas that correspond to the original Areas 1, 2 and 3 are given and compared in the following table with landings for 1952 and with landings at five-year intervals back to 1931, the year immediately prior to the commencement of regulation by the Commission.

All poundages given in the tables are in thousands of pounds. They include amounts of halibut caught in contravention of the regulations, and are corrected for amounts declared from the wrong area. All 1953 figures in this report are preliminary and subject to minor changes.

UNITED STATES AND CANADIAN CATCHES BY REGULATORY AREAS

Year	Areas 1A, 1B	Area 2*			Area 3**			All Areas		
	U.S.	U.S.	Can.	Total	U.S.	Can.	Total	U.S.	Can.	Total
1931	923	14609	7018	21627	20907	765	21672	36439	7783	44222
1935	1489	13563	9255	22818	22088	953	23041	37140	10208	47348
1940	779	15362	12254	27616	25266	646	25912	41407	12900	54307
1945	401	12824	11554	24378	25584	3567	29151	38809	15121	53930
1950	392	12862	14184	27046	25396	4815	30211	38650	18999	57649
1952	521	13680	17213	30893	23843	7566	31409	38044	24779	62823
1953	529	14866	18218	33084	19373	7677	27050	34768	25895	60663

1952 and 1953:—*Includes 2A, 2B and 2C. **Includes Areas 3A, 3B and 4.

The landings from Areas 1A and 1B are combined and correspond to those from original Area 1. These areas are at the southern extremity of the commercial range of the species and, as their halibut stocks are relatively small, no catch limits have been placed upon them. The combined annual catch from Areas 1A and 1B has been about one-half million pounds or less in recent years.

The combined catch of 33,084,000 pounds in 1953 from Areas 2A, 2B and 2C, which correspond to the original Area 2, was higher than in 1952 due to some increase in the total catch from Areas 2B and 2C, a larger post-season permit catch, and the landing of abnormally large fares caught after the advance announcement of the closure of Area 2A, particularly from the Goose Island and middle Hecate Strait region. Landings by Canadian vessels from Areas 2A, 2B and 2C amounted to 18,218,000 pounds and were 55 per cent of the combined total compared to 56 per cent in 1952.

Included in the landings from Area 2A are 603,000 pounds caught incidentally to fishing under permit in the area for other species after Area 2A had been closed to halibut fishing. This total is almost one-third higher than in 1952. Permit landings of 13,000 pounds from Area 3A are similarly included in the Area 3 total.

The 1953 catch from Areas 3A and 3B, which were previously included in Area 3, was 26,970,000 pounds compared to 31,277,000 pounds in 1952 in which the catch was greatly in excess of the catch limit. The balance of the difference in landings in 1953 was chiefly due to a large number of United States vessels leaving the fishery in the three weeks which elapsed between announcement of the closing date and actual closure of Area 3A. Also a number of United States Area 2A vessels that had expressed their intention of fishing in Area 3A after closure of the former area failed to do so.

United States and Canadian landings from all areas in 1953 amounted to 60.7 million pounds and were 16.5 million pounds above the 1931 level.

Landings by Ports

The distribution of landings from all regulatory areas according to ports is shown for various years in the following table.

LANDINGS BY PORTS FROM ALL AREAS BY U.S. AND CANADIAN VESSELS COMBINED

Year	Calif. and Oregon	Washington		Alaska		British Columbia			Total	
		Seattle	Other Ports	S.E. Alaska	Western Alaska	Van-couver	Prince Rupert	Other Ports	Canadian Ports	U.S. Ports
1931	892	15032	202	8240	1482	1066	16792	516	18374	25848
1935	1281	22275	114	6536	13	2242	12964	1923	17129	30219
1940	1014	19203	258	9544	182	1907	18765	3434	24106	30201
1945	756	12140	553	18796	2181	1943	15346	2215	19504	34426
1950	723	7473	1465	21008	4367	1096	17020	4497	22613	35036
1952	693	11425	2001	19309	2703	2400	19686	4601	26687	36136
1953	764	13196	1685	14619	3625	4572	18036	4166	26774	33889

A greater proportion of the total catch was landed in Seattle and Vancouver than in 1952. With lower prices in 1953, vessels tended to land more of their fares in ports offering higher prices. Furthermore, a labor dispute in Alaska at the outset of the season diverted vessels to Seattle. Landings in Western Alaska were higher as a result of the extension of the fishing season from 17 to 25 days in Areas 3B and 4.

THE FISHERY IN THE SPECIAL AREAS

Area 2B in lower Hecate Strait and Area 2C in the Forrester Island region of southeastern Alaska were opened for a 10-day period in late July and early August, as in 1951 and 1952.

The number of vessels fishing in each area and their catches in 1000's of pounds during each of the three seasons are shown in the following table.

THE AREA 2B AND AREA 2C FISHERIES

Year	Area 2B (Lower Hecate Strait)							Area 2C (Forrester Island)						
	No. of vessels			Catch				No. of vessels			Catch			
	1951	1952	1953	1951	1952	1953	3-Yr. Total	1951	1952	1953	1951	1952	1953	3-Yr. Total
Can.	56	56	54	1451	1430	1880	4761	8	13	2	265	275	138	678
U.S.	46	32	35	918	634	1070	2622	35	78	35	950	1071	627	2648
Total	102	88	89	2369	2064	2950	7383	43	91	37	1215	1346	765	3326

The 1953 catch of nearly three million pounds from Area 2B was about fifty per cent greater than the catch in 1952, with about the same size of fleet operating. A better distribution of fishing over the whole area contributed to the improved yield. Also, more vessels in 1953 realized that the southern tip of the Horseshoe grounds was included in Area 2B and took advantage of fishing on those productive grounds. This reduced the congestion of vessels on the other portions of the area and was conducive to better fishing throughout Area 2B.

The catch of 765,000 pounds from Area 2C in 1953 was only 57 per cent of the 1952 total. The number of boats fishing in the area was only 41 per cent as great.

The total catch from Areas 2B and 2C combined for the three years was 10,709,000 pounds, in contrast to the 3,750,000 pounds that might have been expected from the same grounds had they been opened during the regular fishing seasons. Thus, a net gain in yield of about 7,000,000 pounds resulted from the three years of the experiment.

Areas 3B and 4 were opened for a period of 25 days in August, eight days longer than in 1952. The number of vessels that operated in each area and the catch landed from each, in 1000's of pounds are shown for 1952 and 1953 in the following table.

THE AREA 3B AND AREA 4 FISHERIES

Year	Area 3B (West of Sanak Islands)				Area 4 (Bering Sea)*			
	No. of vessels		Catch		No. of vessels		Catch	
	1952	1953	1952	1953	1952	1953	1952	1953
Can.	1	3	69	208	---	---	---	---
U.S.	38	13	808	721	6	5	133	80
Total	39	16	877	929	6	5	133	80

*About 120,000 and 152,000 pounds of the Area 3B catches in 1952 and 1953 respectively were taken in that portion of the area lying north of the Aleutian Islands. These amounts combined with the Area 4 catches result in total Bering Sea catches of 253,000 pounds and 232,000 pounds in 1952 and 1953 respectively.

Fewer vessels participated in the Area 3B and Area 4 fishery in 1953, but their greater effectiveness and the longer fishing period maintained the catch from Areas 3B and 4 at about one million pounds. The combined catch from the two areas in 1952 and 1953 totalled 2,019,000 pounds, a net gain in yield of about 1,750,000 pounds above what might have been expected from these areas had they been opened only during the regular fishing seasons. Of the 1952 and 1953 gain about one-half million pounds were taken from the Bering Sea.

CATCH PER UNIT OF FISHING EFFORT

The relative size of the halibut stocks available to the commercial fishery from year to year are indicated by analysis of the daily fishing records kept by the captains of halibut vessels. All halibut vessels of five net tons or over are required to keep such records showing the date, fishing location, amount of gear fished and estimated catch of halibut in pounds for each fishing operation.

In Area 2A, the sharp increase in pounds of halibut caught per unit effort, which occurred in 1952, was continued during 1953. In the British Columbia section of the area, the increase was most pronounced on the Goose Island and Cape Scott grounds. In the southeastern Alaska section, the improvement was most noticeable in the inside waters.

In Area 3A, which includes the grounds from Cape Spencer to Sanak Islands, the 1953 catch per unit effort was slightly higher than in 1952 and was greater than it had been in the previous 30 years with the exception of 1944. The portion of the area lying west of Trinity Islands showed a substantially increased catch per unit effort in 1953.

In Area 2B, which was opened for 10 days fishing, the catch per unit effort was higher than in 1952. Some of the increase can be attributed to a wider dispersal of the fleet over the area which was conducive to more effective fishing.

In Area 2C, the catch per unit effort during the 10-day fishing season was slightly lower in 1953 than in 1952.

On the grounds west of the Sanak Islands, in Area 3B, the vessels profited from their previous year's experience and had more successful fishing.

In Bering Sea, Area 4, some prospecting was conducted in the Pribilof Islands region but the amount of halibut encountered was not profitable. The Makushin Bay region produced most of the one-quarter million pound Bering Sea catch. Fishing in the area was not sufficient to provide reliable average returns per unit of effort.

COMPOSITION OF CATCHES

Sampling of the commercial catches to secure data and materials for the study of changes in the length composition and age composition of the stocks was again conducted at the ports of Seattle, Vancouver and Prince Rupert during the fishing seasons. More than 40,000 length measurements and 10,000 otoliths were collected from 71 trips from Areas 2A, 2B, 2C, 3A and 3B. An additional 6,000 length measurements and 5,500 otoliths were secured incidentally during tagging operations.

The samples from the Goose Island grounds, north of Vancouver Island in Area 2A, showed a decided increase from 1952 to 1953 in halibut of all commercial ages. This contributed to the higher catch per skate. The increase was greater in the 7-year-old and younger fish than for the other age classes, a hopeful sign in view of the relative scarcity of young fish during the preceding few years. The 9-year-old fish in 1953 ranked first in numbers as in the preceding four years, but the 10-year-olds, for the first time in 20 years of sampling, made a larger contribution by weight to the catch. This marked a further step in the accumulation of older fish, more valuable both biologically and commercially.

The catches from Area 2B, whose grounds have always produced a higher proportion of older fish than other grounds in Hecate Strait, particularly in the summer months, showed an increasingly high proportion of older fish. The proportion of halibut over 15 years of age was twice as high as in 1951 and 1952 at the same season. In the single sample from the Cape St. James region of Area 2B, fish over 15 years of age constituted more than 65 per cent of the catch by numbers.

Samples of the catches from the Portlock-Albatross portion of Area 3A showed some change from recent years. In 1935 the production was dependent on the 10 to 14-year-olds for the bulk of the catch. More recently, the fishery has been largely dependent on the weight of the 11 to 16-year-olds. In 1953 there was a strong showing in the numbers of 9 and 10-year-olds and a corresponding increase in their contribution to the catch. Also, fish over 20 years of age appeared to be present in greater numbers. The observed increase of older fish in the samples agrees with the increase in the average proportion of "large" (over 60 pounds) in the commercial catches from 22 per cent in 1936 to 32 per cent at present.

Since 1949 large numbers of otoliths from the banks west of Cape Spencer have been made available for analysis through the expanded sampling program. A progressive prominence of certain year classes indicates differences in the strength of these classes but no major fluctuations are apparent. The many age classes contributing to the fishery in this area give a stability to

these stocks not possible in some species or even in halibut stocks in some other areas. The consistency from year to year is indicated in Figure 2, showing the age composition of the Portlock-Albatross samples for 1950 to 1953.

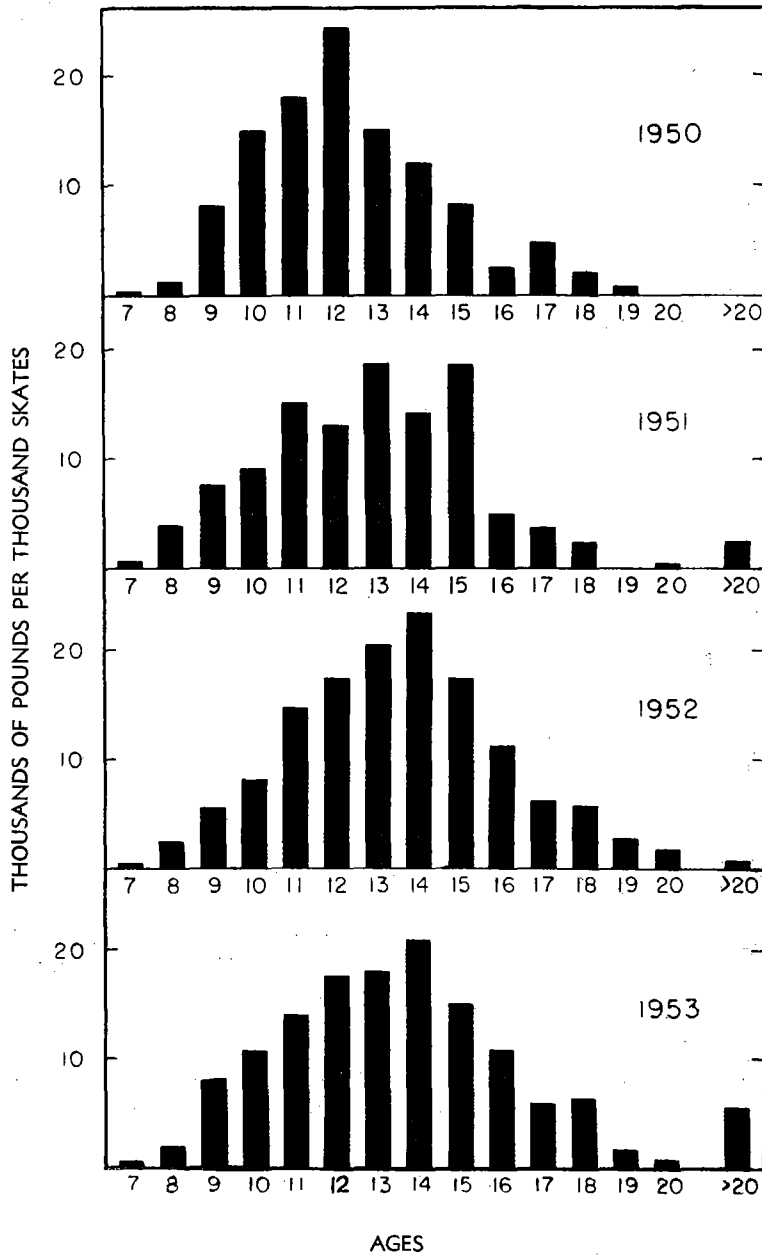


Figure 2. Age composition of halibut stocks on Portlock and Albatross banks as shown by samples of the commercial catch from 1950 to 1953 inclusive.

Series of age readings that will provide valuable information upon the growth of halibut under the conditions that have prevailed on the grounds during the past 25 years are being gradually accumulated.

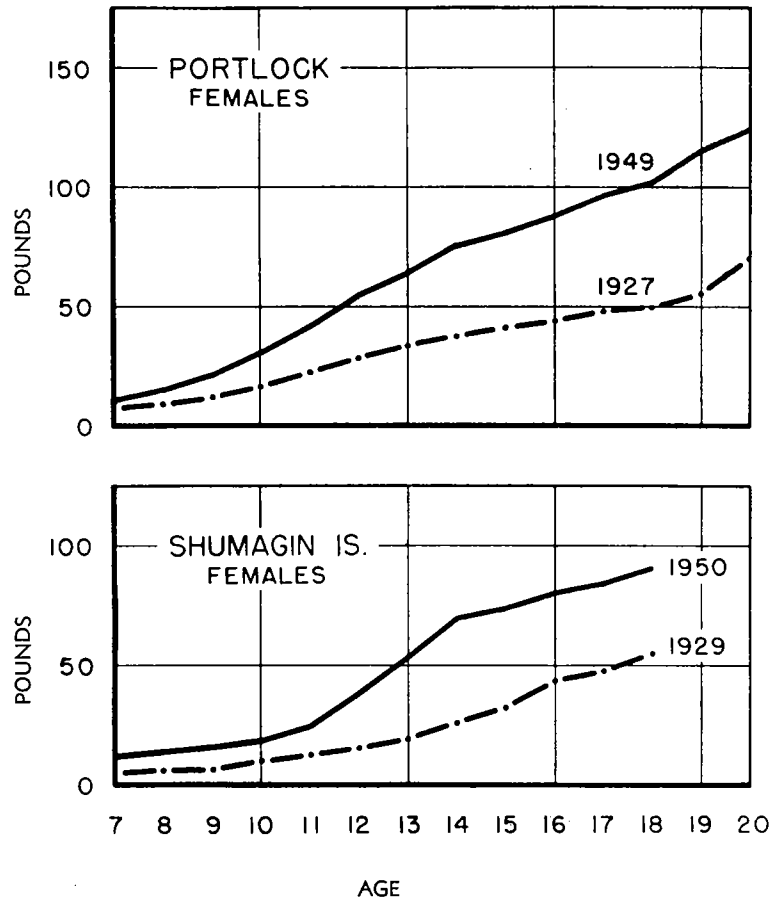


Figure 3. Age-weight relationship of female halibut in samples of catches taken from Portlock bank in 1927 and 1949 and from the Shumagin Islands grounds in 1929 and 1950.

That profound changes in the growth rate have occurred is indicated by Figure 3, showing the age-weight relationship of females at different ages in samples taken from Portlock Bank and the Shumagin Islands grounds in early and recent years. Observed differences are in keeping with the differences in the density of the stocks as measured by the catch per unit effort.

On Portlock Bank in 1927 and on the Shumagin grounds in 1929, the age groups represented in the catches had lived under the crowded conditions that exist in little-fished stocks. On the other hand, the fish in the 1949 and 1950 catches had lived under the relatively low stock densities of the 1930's.

TAGGING OPERATIONS IN 1953

In 1953 the halibut vessel "Regina" was chartered for a period of 105 days to carry forward the program commenced in 1949 to ascertain the relationship between stocks on different sections of the regulatory areas and between stocks on the same grounds at different seasons of the year and to determine the availability of each stock to fishing. Six trips were made in 1953 and 6,190 halibut were tagged, bringing the total tagged since 1949 to 28,460.

These operations completed the spring and early summer phases of the tagging program between Vancouver Island and Cape Ommaney, Alaska.

Recoveries in 1953 from all experiments numbered 1,290, the largest number received in any one year. Practically all were derived from 1951 to 1953 releases. Recoveries in 1952 and 1951 were 1,163 and 347 respectively. The small total received in 1951 can be attributed to the fact that it was derived from 1949 and 1950 releases which were chiefly in Area 3A where the rate of recovery is low.

The following table summarizes the tagging operations from 1951 to 1953 inclusive, and the recoveries from these experiments.

The tag recoveries in 1953 corroborated previous evidence of low recovery rates from experiments on Portlock Bank and west, high recovery rates in the northern Hecate Strait-Dixon Entrance regions, and the relative independence of the stocks of fish that were marked on different grounds at the same season. Recoveries from spring experiments did not yet cover a sufficient number of years to permit comparison with the previously conducted summer experiments.

The problem of unequal availability of stocks of fish from one year to the next and even within a fishing season, as shown by sudden changes in the catch per unit effort, has been mentioned at various times in the Commission's reports. This phenomenon has been observed several times in recent years in tag recoveries and is very well demonstrated by results from the large 1951 Goose Island experiment. Approximately 20,000 skates fished in the region of tagging in 1952 caught 1.8 per cent of the tagged fish, whereas in 1953, 15,000 skates caught 7.5 per cent. Thus, in the 1953 season, four times more tagged fish were caught with less fishing effort than in the 1952 season. In contrast, the catch of unmarked fish was only twice as great. The difference in the tag recoveries becomes even more significant when it is remembered that the number of tagged fish remaining in any experiment declines with each successive year.

The present tagging program was designed to provide, as far as possible, samples of sufficient size to permit quantitative estimates of the rates of fishing and natural mortality. Though tentative estimates of these may be made from the first few years' recoveries, at least four years' returns are needed before dependable values can be derived. When there is evidence of unequal availability, even more years' recoveries are needed before any conclusions regarding these statistics can be made.

**SUMMARY OF 1951-1953 TAGGING EXPERIMENTS SHOWING THE NUMBER
TAGGED BY TAGGING LOCATIONS AND DATE AND THE NUMBER
RECOVERED BY EXPERIMENT AND YEAR OF RECOVERY**

1951 Locations	Month of Tagging	No. Tagged	No. of Recoveries		
			0 Yr.	Yr. I	Yr. II
South of Cape Spencer					
Icy Strait	Feb.-Mar.	1688	90	82	42
Lower Hecate Strait	Sept.	233	....	12	11
Two Peaks	Aug.-Sept.	1820	....	341	246
Prince of Wales I.	Aug.	2000	....	219	71
Goose I.	Sept.-Oct.	2709	....	68	253
West of Cape Spencer					
Yakutat	Aug.	1502	....	128	86
Albatross Bank-Trinity Is.	July	1188	....	36	13
Total Tagged		11140			

1952 Locations	Month of Tagging	No. Tagged	No. of Recoveries		
			0 Yr.	Yr. I	Yr. II
South of Cape Spencer					
Cape Scott	Mar.-April	772	8	30	....
Hecate Strait	June-July	658	24	51	....
Two Peaks	April	378	40	69	....
Two Peaks	June-July	707	11	115	....
Frederick I.	April	70	2	5	....
Dixon Entrance	April	30	3	3	....
Prince of Wales I.	Apr.-June-July	250	13	10	....
West of Cape Spencer					
Seward Gully	May	822	8	25	....
Chiniak Gully	May	493	1	9	....
Albatross Gully	May	75	0	2	....
Total Tagged		4255			

1953 Locations	Month of Tagging	No. Tagged	No. of Recoveries		
			0 Yr.	Yr. I	Yr. II
South of Cape Spencer					
W. Coast Graham I.	April	171	3	....	....
Whaleback	April	359	11	....	....
Dixon Entrance	April	120	22	....	....
Two Peaks	May	692	70	....	....
Two Peaks	July	173	1	....	....
Bonilla I.	May	944	29	....	....
Horseshoe Ground	July	1701	13	....	....
Ramsay I.	June-July	641	18	....	....
Prince of Wales I.	June	98	1	....	....
Cape Ulitka	June	726	7	....	....
Goose I.	June	191	....	....	....
Coronation I.	June	235	....	....	....
Cape Scott	July	139	....	....	....
Total Tagged		6190			

APPENDIX**Convention Between Canada and the United States of America for the Preservation of the Halibut Fishery of the Northern Pacific Ocean and Bering Sea, signed March 2, 1953.**

The Government of Canada and the Government of the United States of America, desiring to provide more effectively for the preservation of the halibut fishery of the Northern Pacific Ocean and Bering Sea, have resolved to conclude a Convention replacing the Convention signed at Ottawa, January 29, 1937 and have named as their plenipotentiaries:

The Government of Canada:

The Honourable James Sinclair,
Minister of Fisheries.

The Honourable Hugues Lapointe,
Minister of Veterans Affairs.

The Government of the United States of America:

The Honourable Don C. Bliss,
Charge d'Affaires ad interim.

The Honourable William C. Herrington,
Special Assistant for Fisheries and Wildlife to the Under-Secretary of State.

who, after having communicated to each other their respective full powers, found in good and due form, have agreed upon the following articles:

Article I.

1. The nationals and inhabitants and fishing vessels and boats of Canada and of the United States of America, respectively, are hereby prohibited from fishing for halibut (*Hippoglossus*) in Convention waters as herein defined, except as provided by the International Pacific Halibut Commission in regulations designed to develop the stocks of halibut in the Convention waters to those levels which will permit the maximum sustained yield and to maintain the stocks at those levels pursuant to Article III of this Convention.

2. "Convention waters" means the territorial waters and the high seas off the western coasts of Canada and of the United States of America, including the southern as well as the western coasts of Alaska.

3. It is understood that nothing contained in this Convention shall prohibit the nationals or inhabitants or the fishing vessels or boats of Canada or of the United States of America from fishing in the Convention waters for other species of fish during any season when fishing for halibut in the Convention waters is prohibited by this Convention or any regulations adopted pursuant to this Convention. It is further understood that nothing contained in this Convention shall prohibit the International Pacific Halibut Commission from conducting or authorizing fishing operations for investigation purposes at any time.

Article II.

1. Every national or inhabitant, vessel or boat of Canada or of the United States of America engaged in fishing on the high seas in violation of this Convention or of any regulation adopted pursuant thereto may be seized by duly authorized officers of either Contracting Party and detained by the officers making such seizure and delivered as soon as practicable to an authorized official of the country to which such person, vessel or boat belongs, at the nearest point to the place of seizure or elsewhere as may be agreed upon. The authorities of the country to which such person, vessel or boat belongs alone shall have jurisdiction to conduct prosecutions for the violation of the provisions of this Convention or any regulations which may be adopted in pursuance thereof and to impose penalties for such violation, and the witnesses and proof necessary for such prosecutions, so far as any witnesses or proofs are under the control of the other Contracting Party, shall be furnished with all reasonable promptitude to the authorities having jurisdiction to conduct the prosecutions.

2. Each Contracting Party shall be responsible for the proper observance of this Convention and of any regulations adopted under the provisions thereof in the portion of its waters covered thereby.

Article III.

1. The Contracting Parties agree to continue under this Convention the Commission known as the International Fisheries Commission established by the Convention for the

preservation of the halibut fishery, signed at Washington, March 2, 1923, continued by the Convention signed at Ottawa, May 9, 1930 and further continued by the Convention, signed at Ottawa, January 29, 1937, except that after the date of entry into force of this Convention it shall consist of six members, three appointed by each Contracting Party, and shall be known as the International Pacific Halibut Commission. This Commission shall make such investigations as are necessary into the life history of the halibut in the Convention waters and shall publish a report of its activities and investigations from time to time. Each Contracting Party shall have power to fill, and shall fill from time to time, vacancies which may occur in its representation on the Commission. Each Contracting Party shall pay the salaries and expenses of its own members. Joint expenses incurred by the Commission shall be paid by the two Contracting Parties in equal moieties. All decisions of the Commission shall be made by a concurring vote of at least two of the Commissioners of each Contracting Party.

(2) The Contracting Parties agree that for the purpose of developing the stocks of halibut of the Northern Pacific Ocean and Bering Sea to levels which will permit the maximum sustained yield from that fishery and for maintaining the stocks at those levels, the International Pacific Halibut Commission, with the approval of the Governor General in Council of Canada and of the President of the United States of America, may, after investigation has indicated such action to be necessary, in respect of the nationals and inhabitants and fishing vessels and boats of Canada and of the United States of America, and in respect of halibut:

- (a) divide the Convention waters into areas;
- (b) establish one or more open or closed seasons, as to each area;
- (c) limit the size of the fish and the quantity of the catch to be taken from each area within any season during which fishing is allowed;
- (d) during both open and closed seasons, permit, limit, regulate or prohibit, the incidental catch of halibut that may be taken, retained, possessed, or landed from each area or portion of an area, by vessels fishing for other species of fish;
- (e) prohibit departure of vessels from any port or place, or from any receiving vessel or station, to any area for halibut fishing, after any date when in the judgment of the International Pacific Halibut Commission the vessels which have departed for that area prior to that date or which are known to be fishing in that area shall suffice to catch the limit which shall have been set for that area under section (c) of this paragraph;
- (f) fix the size and character of halibut fishing appliances to be used in any area;
- (g) make such regulations for the licensing and departure of vessels and for the collection of statistics of the catch of halibut as it shall find necessary to determine the condition and trend of the halibut fishery and to carry out the other provisions of this Convention;
- (h) close to all taking of halibut such portion or portions of an area or areas as the International Pacific Halibut Commission finds to be populated by small, immature halibut and designates as nursery grounds.

Article IV.

The Contracting Parties agree to enact and enforce such legislation as may be necessary to make effective the provisions of this Convention and any regulation adopted thereunder, with appropriate penalties for violations thereof.

Article V.

1. This Convention shall be ratified and the instruments of ratification exchanged at Washington as soon as possible.

2. This Convention shall enter into force on the date of exchange of ratifications and shall remain in force for a period of five years and thereafter until two years from the date on which either Contracting Party shall have given notice to the other of its desire to terminate it.

3. This Convention shall, from the date of the exchange of ratifications, replace and terminate the Convention for the preservation of the halibut fishery signed at Ottawa, January 29, 1937.

In Witness Whereof the respective plenipotentiaries have signed and sealed this Convention.

Done at Ottawa in duplicate, in the English language, this second day of March 1953.

For The Government of Canada:

James Sinclair
Hugues Lapointe

For The Government of The United States of America:

Don C. Bliss
William C. Herrington