

**REPORT OF THE INTERNATIONAL FISHERIES
COMMISSION**

**APPOINTED UNDER THE TREATY BETWEEN THE UNITED STATES
AND CANADA FOR THE PRESERVATION OF THE
NORTHERN PACIFIC HALIBUT FISHERY**

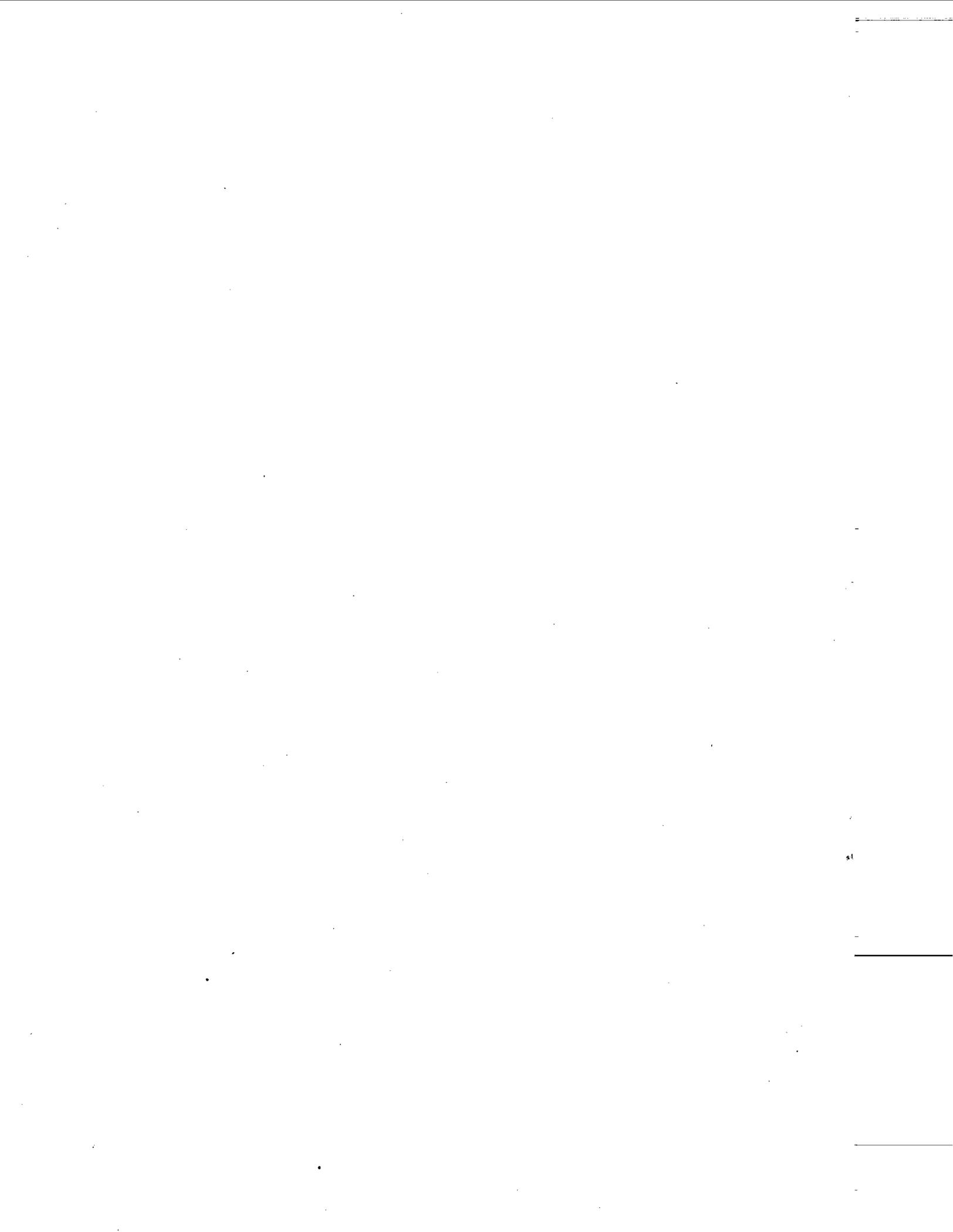
NUMBER 16

**REGULATION AND INVESTIGATION
OF THE PACIFIC HALIBUT
FISHERY IN 1950**

Commissioners:

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FOREWORD

The Conventions of 1923, 1930 and 1937 between the United States and Canada for the preservation of the halibut fishery of the Northern Pacific Ocean and Bering Sea provide that the International Fisheries Commission shall report upon its activities from time to time.

This is the sixteenth such report and the fourth of a series of annual reports commenced in 1947 to provide a brief summary of the Commission's activities during the year.

Those not familiar with the halibut fishery and past work of the Commission are referred to previous Annual Reports for further background material.



**REGULATION AND INVESTIGATION OF THE PACIFIC
HALIBUT FISHERY IN 1950**

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INTRODUCTION

Joint control of the halibut fishery of the northeastern Pacific by Canada and the United States, was proposed as early as 1915. It was initiated in 1924 by a treaty for the preservation and development of the fishery, signed by the two Governments in 1923 and ratified the following year.

The Treaty of 1923 established a three-month winter closed season and provided for the appointment of the International Fisheries Commission, composed of two members from each country. It required the Commission to investigate the fishery and to recommend regulations for its preservation and development.

Investigations by a scientific staff revealed that the decline in the fishery which was clearly taking place was caused by fishing. They showed that each increase in the amount of fishing brought about a reduction in the abundance of fish; that, after the initial exploitation of the stocks, increases in the amount of fishing were followed by decreases in the annual catch; and that the abundance and catch tended to become stable when the amount of fishing was constant for a few years but that such stability might be at a low level of production.

In 1928 the Commission recommended specific regulatory measures to reduce fishing and to halt the continuing decline in the fishery. Authority to apply these measures was provided by a new convention, signed in 1930 and ratified in 1931.

The Treaty of 1930 empowered the Commission to change or suspend the closed season; to divide the convention waters into areas and limit the catch of halibut to be taken from each; to regulate the licensing and departure of vessels; to collect the statistics of the fishery; to fix the type of gear to be used; and, to close grounds found to be populated by small immature halibut.

A subsequent treaty, signed and ratified in 1937, continued the provisions of the 1930 treaty and further provided for the control of the capture of halibut caught incidentally to fishing for other species in areas closed to regular halibut fishing. It also authorized the Commission to prohibit the departure of vessels for any area when those which had already departed would suffice to take the area's catch limit.

Control of halibut fishing was begun in 1932 and has been continued under regulations adopted annually by the Commission and recommended for approval to the President of the United States and the Governor-General of Canada. Enforcement of the regulations is carried out by specifically designated enforcement agencies of either Government.

The abundance of halibut on the coast as a whole, as indicated by the catch per skate in Areas 2 and 3 combined, has increased greatly under regulation. It is now approximately two and one-half times greater and the annual catch during the past five years has averaged over 56 million pounds, about 12 million pounds greater annually than in 1931. This additional poundage and the associated vitamin-bearing livers and viscera have

added more than \$3,000,000 to the fleets' earnings in each recent year. As a result of the increased abundance, the larger annual catches now permitted each year are taken with one-third less fishing than was required to secure the much smaller catches of 1931.

The increased abundance of halibut, together with over a hundred per cent increase in the size of the fleets, has greatly increased the rate of capture. In spite of the greater total catches allowed, the period of fishing which was eight and one-half months long in 1932 was only one month long in 1950 in one of the two important fishing areas and only two months long in the other.

The shortening of the fishing season has changed the distribution of fishing, has decreased fishing on some parts of the halibut stocks and has increased fishing on others. The effects of this change, which has clearly brought about the underfishing of some sections of the stocks and probably the overfishing of others, are being investigated to ascertain what regulatory changes may be required to secure the full justifiable utilization of all parts of the stocks.

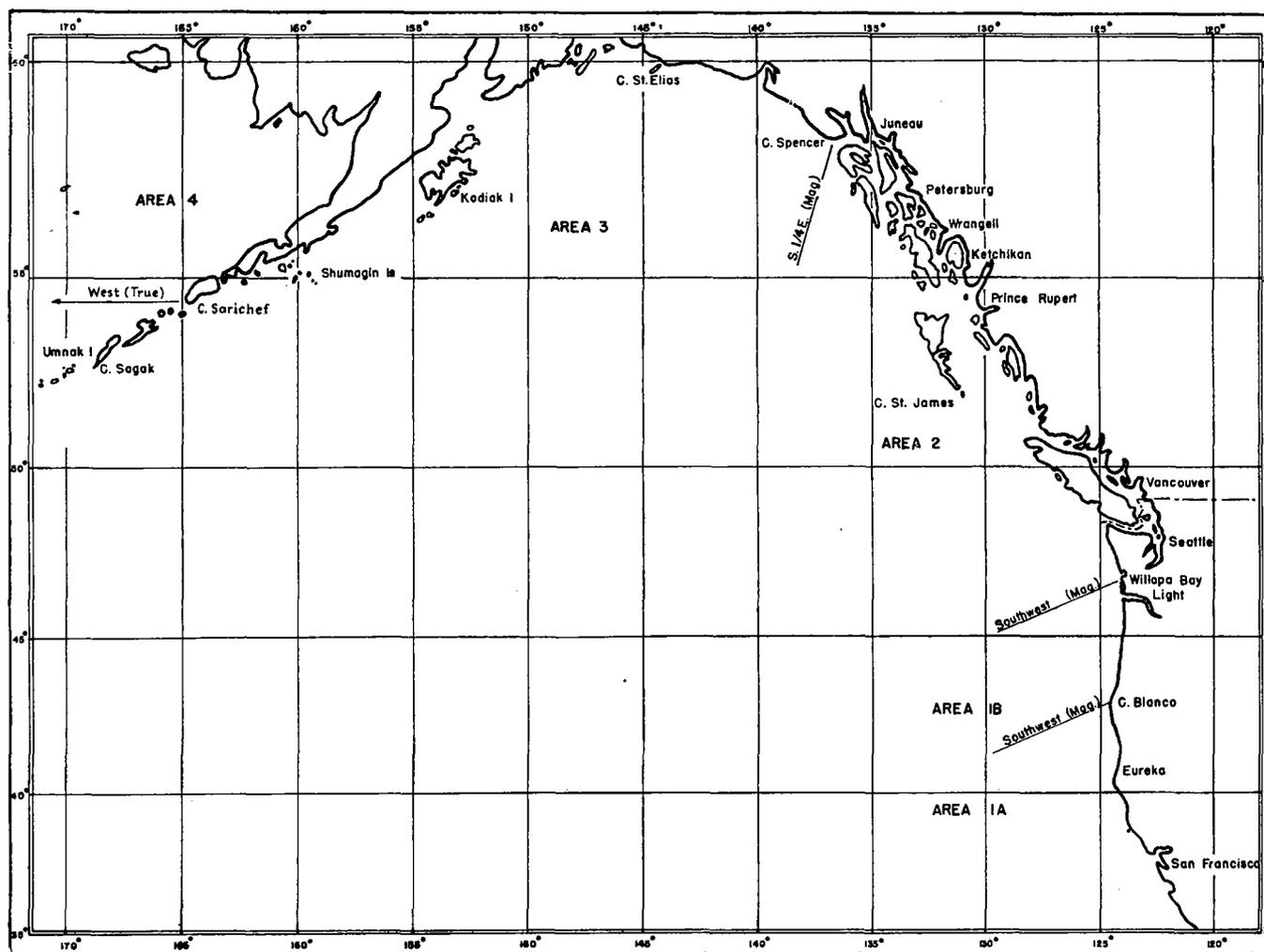
ACTIVITIES OF THE COMMISSION

The regulation of the fishery and the statistical and biological observations upon which regulation depends were continued during 1950. Contact was maintained with all branches of the halibut industry, by means of conferences with the fleets and wholesale dealers.

The regular annual meetings of the Commission were held at Seattle, Washington on January 18, 19 and 20, 1950. On the second day, a conference was held with the Conference Board composed of representatives from the fishermen's and vessel owners' organizations in the major halibut ports—Seattle, Vancouver, Prince Rupert, Ketchikan, Petersburg and Juneau. Results of the previous season's fishery and of the Commission's investigations were reviewed and proposals of the Conference Board delegates regarding the regulation of fishery in 1950 were discussed. Thereafter, regulations and a program of investigations for the 1950 season were adopted.

During the Commission's meeting with the Halibut Conference Board, methods of distributing fishing in time and space, so as to obtain more fishing in some underfished sections and less fishing in some apparently overfished parts of Area 2 were discussed. Particular consideration was given to a proposal that certain of the underfished sections of Area 2 be closed to fishing during the regular season and be opened in late summer at the season during which they had provided the best fishing in earlier years. This method and a rotation of opening dates for the areas as a whole were the only permissible methods of spreading fishing over a greater part of the year, under the terms of the Treaty of 1937.

Because the later opening of small sections of the grounds would involve many administrative and regulatory problems and cause many operational difficulties from the fleets' point of view, it was decided to defer decision until the following year.



Pacific Coast of North America, showing the regulatory areas defined by the International Fisheries Commission in 1950.

THE 1950 REGULATIONS

The Pacific Halibut Fishery Regulations for 1950 were approved by the President of the United States on April 10 and by the Governor-General in Council of Canada on April 20 and became effective as of the latter date.

The 1950 regulations were substantially the same as those for 1949. The convention waters were divided into the same five regulatory areas: Area 1A, the waters off the southern Oregon and northern California coasts south of Cape Blanco, Oregon; Area 1B, lying off the Oregon and Washington coasts between Cape Blanco and Willapa Bay; Area 2, between Willapa Bay and Cape Spencer, Alaska; Area 3, between Cape Spencer and a line running true west from Cape Sarichef on Unimak Island; Area 4, the Bering Sea north of the above Cape Sarichef line.

Catch limits of 25,500,000 pounds, 28,000,000 pounds and 500,000 pounds were continued for Areas 2, 3 and 4, respectively. Area 1A and 1B, where the catch of halibut is relatively unimportant, were allowed to continue without catch limits.

The opening of the fishing season in all areas was set for May 1. The closure dates of Areas 2, 3 and 4 were again made contingent upon the attainment of their respective catch limits, or in the case of Area 4 upon the earlier closure of Area 3 to eliminate opportunities for illegal post-season fishing in Area 3. The closure date of Area 2 was applied to Area 1B and that of Areas 2 or 3, whichever was later, was applied to Area 1A.

The following regulatory provisions were also continued: a minimum size limit of 26 inches heads-on or five pounds heads-off for halibut; the closure of two nursery areas, one off Masset 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 for the capture of halibut; the termination of permits for the retention of halibut caught incidentally during fishing for other species in closed areas after November 15; and, the beginning of the winter closed season after November 30, if it had not previously begun through the earlier attainment of the catch limits.

Areas 2 and 1B were closed to halibut fishing at midnight of June 1, two days earlier than in 1949. Areas 3, 4 and 1A were closed at midnight July 5, seven days earlier than in 1949. The closure dates of Areas 2 and 3 were announced in advance on May 20 and June 14, respectively, on the basis of the estimated dates of attainment of their catch limits.

STATISTICS OF LANDINGS

Landings reported from Areas 1A and 1B combined, from Area 2 and from Area 3 during 1949 and 1950 are shown in the following table in comparison with those at five-year intervals back to 1931, the year immediately preceding the commencement of the Commission's regulation of the fishery. No landings were reported from Area 4.

All figures are in thousands of pounds. They include halibut caught incidentally while fishing under permit for other species in areas closed to halibut fishing. They have not been modified for variable amounts of halibut not reported or for poundage reported from the wrong area.

Year	Area 1		Area 2		Area 3			Areas 1, 2, 3		
	U.S.	U.S.	Can.	Total	U.S.	Can.	Total	U.S.	Can.	Total
1931	923	14629	7018	21647	20887	765	21652	36439	7783	44222
1935	1489	13113	8955	22068	22533	1251	23784	37135	10206	47341
1940	779	14396	11102	25498	25396	1582	26978	40571	12684	53255
1945	529	13230	11750	24980	25605	3551	29156	39364	15301	54665
1949	426	12461	13578	26039	23433	5168	28601	36320	18746	55066
1950	392	12594	14115	26709	25413	4769	30182	38399	18884	57283

Landings shown for Area 1 in 1949 and 1950 include those for present Areas 1A and 1B, into which the Area 1 of earlier years was subdivided in 1946. The halibut stocks in these areas are relatively inconsequential and no catch limits have been placed upon them. In recent years the combined annual catch from Areas 1A and 1B has been about 0.5 million pounds or less.

Area 2 landings have increased markedly over those in earlier years, the annual production from 1946 to 1950 averaging about 5.6 million pounds more than in 1931.

Area 3 landing in 1950 were about 8.5 million pounds above the 1931 total. The catch exceeded the catch limit of 28.0 million pounds by about 2.0 million pounds and the 1949 catch by 1.6 million pounds. The excess over the catch limit was due to the occurrence of much better than average weather during the 20-day period between announcement of closure and the closing date.

Combined United States and Canadian landings from all areas in 1950 were about 13.0 million pounds above the 1931 level.

The distribution of landings in 1950 from the two major regulatory areas, Areas 2 and 3, is shown in the following table:

Year	Canadian Ports				United States Ports				
	Vancouver, New West- minster	Prince Rupert	Minor Ports	Total	Puget Sound	S.E. Alaska	Central Alaska	Minor Ports	Total
1931	1066	16792	516	18374	15201	8240	1484	—	24925
1935	2242	12964	1921	17127	22067	6532	12	114	28725
1940	1996	18580	3314	23890	18773	9305	182	326	28586
1945	1910	15272	2498	19680	11951	19060	2181	1264	34456
1949	1473	16809	3986	22268	9161	17425	4689	1096	32371
1950	1086	16995	4418	22499	7358	20963	4372	1701	34394

Canadian landings in Alaskan ports declined from 629,000 pounds in 1949 to 70,000 pounds in 1950. The reciprocal port privileges treaty, signed by the United States and Canada on March 24 and replacing annual legisla-

tion regarding the use of United States' ports by Canadian halibut vessels, was not ratified until after the close of the halibut fishing season. Only a few distress landings were made by Canadian vessels in Alaskan ports.

Landings under permit to retain a percentage of halibut caught incidentally during fishing for other species in areas closed to halibut fishing decreased sharply in Area 2, from 870,000 pounds in 1949 to 307,000 pounds in 1950. The decrease was attributable mainly to reduction in demand and in prices paid for halibut. This made the blackcod fishery, which accounts for most of the landings of incidentally caught halibut, relatively unattractive.

ABUNDANCE OF HALIBUT IN AREAS 2 AND 3

The relative abundance of the halibut available to the commercial fishery and the changes therein from year to year are determined by analysis of the 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 for each fishing operation.

Fishing records for 1950 indicated that the weight of halibut available to the fishery was about five per cent greater in both Areas 2 and 3 than during 1949.

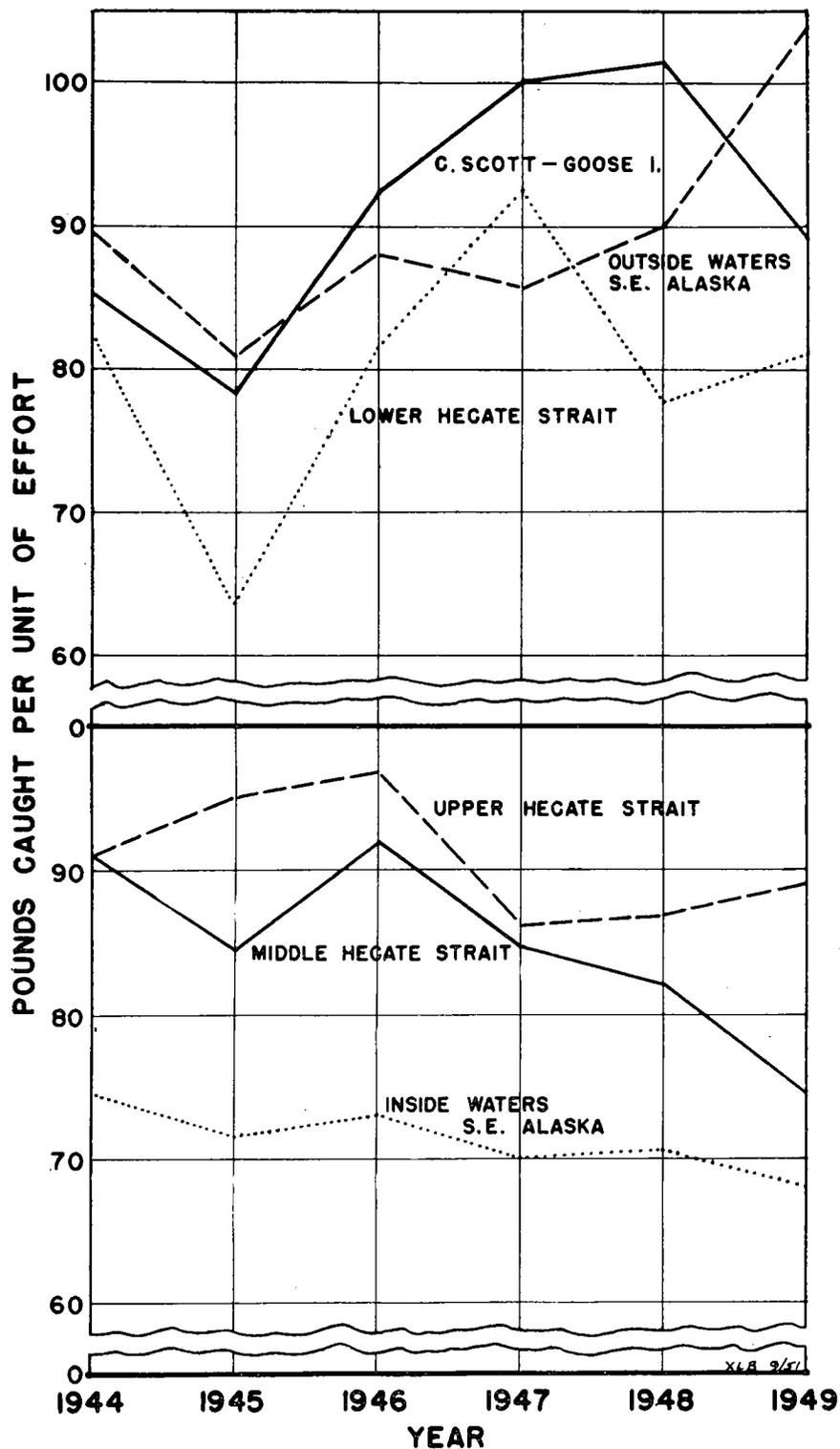
The increase in Area 3 was particularly important because it reversed an apparently downward trend in abundance which began in 1945. This reversal was attributable at least in part to efforts which were made during the preceding four years to see that the catch limit of 28.0 million pounds was not substantially exceeded.

Determination of the true extent of the above-mentioned downward trend must await the results of further refinement of the measurement of abundance now under way. Extensive changes in the character of the fishery from 1930 to 1950, and not inconsiderable ones even during the last five years, make comparisons over longer than three year periods hazardous, particularly in Area 3.

The trend of abundance of halibut in Area 2 as a whole has shown an almost uninterrupted rise since 1930, though at a somewhat lessened rate during the last decade. However, the rate of increase has not been uniform in all sections of the area. The magnitude* of the catches taken from each section of the Area 2 grounds have influenced the trend of abundance in each.

In upper and middle Hecate Strait and in the inside waters of southeastern Alaska where the stocks have been relatively more heavily fished, there has been a tendency toward a decline in catch per unit of effort in recent years, as shown in the accompanying chart. In lower Hecate Strait and on the Cape Scott and Goose Island grounds and in the outside waters of southeastern Alaska, where fishing has been relatively less intense, the catch per unit of effort has tended to maintain an upward trend.

*The changes in the catches from different subsections of Area 2 were shown in figure on page 15 of the Commission's Report No. 15.



Catch of halibut per unit of effort in subsections of Area 2.

CHANGES IN COMPOSITION OF STOCKS

The investigations of the changes in the size and age composition of the stocks, which were expanded in 1949, were further intensified during 1950.

Sampling of the commercial catches from Area 2 and Area 3 was carried on at Seattle and Prince Rupert. Measurements were made of over 43,000 halibut from 57 trips. In conjunction with the measuring, otoliths were collected from over 7,500 halibut for the determination of the age composition. These data and materials were supplemented by 7,800 measurements and 3,400 otoliths secured during tagging operations.

The localities covered, number of trips sampled, number of halibut measured, and the number of otoliths secured were as follows:

<i>Locality</i>	<i>No. Fares</i>	<i>No. Measured</i>	<i>No. Otoliths</i>
Goose Island grounds	10	10,905	2,345
Northern Hecate Strait	9	5,332	767
Other Area 2 grounds	5	4,365	583
Total Area 2	<u>24</u>	<u>20,602</u>	<u>3,695</u>
Cape Spencer to Cape St. Elias	4	4,034	500
Cape St. Elias to Trinity Is.	25	16,216	2,656
Trinity Is. and west	4	2,181	700
Total Area 3	<u>33</u>	<u>22,431</u>	<u>3,856</u>
Totals Areas 2 and 3	57	43,033	7,551

Most of the Area 2 samples originated from the productive Goose Island grounds off the north end of Vancouver Island and from the fishing grounds in northern Hecate Strait. The samples from Area 3 were secured from grounds distributed throughout that area.

For the third consecutive year, the numbers of small chicken halibut (5 to 8 pounds) entering the Goose Island fishery were appreciably below the average of the preceding 15 years. The fishery was maintained chiefly by large chickens (9 to 10 pounds) and the medium (10 to 60 pounds) class of halibut.

The age composition of the Goose Island samples showed a scarcity of 6 and 7 year olds, the youngest groups that ever make an appreciable contribution to the catch. The numbers of 8, 9 and 10 year olds were far above expectations both in numbers and weight and more than offset the decrease in small fish. It appeared that the prominence of the latter age classes had resulted from a fluctuation in availability, and that the prospects for the Goose Island fishery in the immediate future were unfavorable.

The period of years covered by the sampling in northern Hecate Strait was too short to indicate any trends.

Measurement data from Area 3 samples showed wide variations in the size composition of the stock from sample to sample and from place to place. Similar variations were found in the age composition of the corresponding samples. The variations appeared to be caused by the mixing of relatively independent stock components—immatures and matures, and males and females.

Analysis of size and age composition data and materials from the pre-war period, which might provide an explanation of the adverse trend in abundance from 1945 to 1949, and would provide a base for evaluation of current changes, was begun.

MARKING PROGRAM

Early recoveries of halibut marked and released in 1946 and 1947 between the north end of Vancouver Island and Dixon Entrance in Area 2 demonstrated that the stocks of fish on different grounds were contributing very unequally to the catch from that region. Differences in the rate of recovery indicated that some of the inequalities resulted from an uneven geographical distribution of fishing during the current short May fishing season, as had been indicated by statistical data. They also suggested very strongly that other inequalities of utilization resulted from some sections of the stocks being available to the fishery in months when there was no fishing, which had been suspected. More recent recoveries have added to the evidence.

In view of the evidence of great inequalities in the utilization of the stocks and sections of the stocks available on the fishing grounds in Area 2 and in the belief that similar conditions might exist in Area 3, a coastwide marking program was adopted in 1949. The program provided for the marking of halibut at different seasons on the important banks in Areas 2 and 3, to determine the degree to which different parts of their stocks were contributing to the fishery during the current short season and to ascertain what geographic and seasonal changes in the distribution of fishing might be necessary to secure full utilization.

As a beginning on this program, a commercial halibut vessel was chartered and operated from mid-July to mid-September in 1949 to capture halibut for marking. During the operations 2,511 halibut were marked with metal tags and released, 1,272 on Portlock and Albatross banks in Area 3 and 1,239 in Northern Hecate Strait in Area 2.

The program was carried forward vigorously during three and one-half months of operation of another chartered commercial vessel, from mid-July to late October, in 1950. Seven trips were made and a total of 4,338 halibut were tagged, mainly on the grounds west of Kodiak Island in Area 3. A small amount of tagging was also done in Southern Hecate Strait and in the Capt Flattery region in Area 2. The total number tagged was next to the largest number tagged in any year since the beginning of the Commission's investigations in 1925.

The following table shows the month, the locality fished, the number of skates fished, and the number and weight in pounds tagged for each of the seven trips made in 1950.

<i>Trip No.</i>	<i>Month</i>	<i>Region Fished</i>	<i>No. Skates</i>	<i>No. Tagged</i>	<i>Weight Tagged</i>
1	July	Shumagin Id.	224	596	8,594
2	Aug.	Sanak Id. vicinity	424	1,083	16,406
3	Aug.	Shumagin Ids.	307	1,023	17,272
4	Aug.-Sept.	Trinity Ids.	323	1,028	20,102
5	Sept.	S. Hecate Strait	169	355	5,324
6	Oct.	Cape Flattery	166	186	3,186
7	Oct.	do.	176	67	980
Totals			1,789	4,338	71,864

Commercial fishermen recovered and returned 246 halibut tags during 1950. Of these, 115 were from the 1946 and 1947 experiments, 129 from the 1949 experiments, and two from experiments in 1935 and 1940.

Recoveries from the 1946 and 1947 experiments in Area 2 followed the same general pattern as recoveries in the preceding years. Returns from experiments in the same months varied from one ground to another and those from May-June experiments were in every case appreciably higher than recoveries from experiments in July, August and September.

The return of tags from the experiment in northern Hecate Strait during July and September 1949 was much higher than from earlier Area 2 experiments at the same time of year. This inconsistency was apparently attributable to the fact that the tagging was done at the place where the Area 2 fishery is most intense. It showed the necessity of taking fishing intensities into account when evaluating the significance of recoveries.

Very few tags were recovered in 1950 from the 1949 July-August experiment on Portlock and Albatros banks in Area 3. The percentage of recoveries was so much lower than from the experiments in Area 3 twenty years earlier as to suggest that, as in parts of Area 2, the stocks on the banks in summer do not contribute extensively to the present May and June fishery in Area 3.