

**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 13

**REGULATION AND INVESTIGATION
OF THE PACIFIC HALIBUT
FISHERY IN 1947**

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**SEATTLE, WASHINGTON
1948**

PRINTED IN CANADA
Wrigley Printing Co. Ltd., 1112 Seymour St., Vancouver, B. C.

FOREWORD

The present is the thirteenth report published by the International Fisheries Commission under the terms of the Convention 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.

It is a general review of conditions and events in the Pacific halibut fishery and of the Commission's regulatory and investigational activities in 1947. It is issued at the request of halibut fishermen and vessel owners, of halibut dealers and of others interested in the success of the Commission in rebuilding the previously depleted halibut fishery.

The Commission has not heretofore published annual reports. This being the first such report, it has seemed desirable to include some background material to make current information understandable and significant.



**REGULATION AND INVESTIGATION OF THE PACIFIC
HALIBUT FISHERY IN 1947**

CONTENTS

Introduction.....	7
Regulation of the halibut fishery.....	10
Statistics of landings.....	13
Landings of incidentally caught halibut.....	14
Size of fleets.....	15
Length of season.....	17
The Area 3 fishery.....	18
Abundance of halibut.....	19
Changes in composition of stocks.....	20
Trawling investigations in Area 2.....	22
Observations on Bering Sea stock.....	26
Marking experiments.....	28
Appendix. Pacific Halibut Fishery Regulations, 1947.....	30



INTRODUCTION

The Pacific halibut fishery began in 1888, soon after an eastern market was opened by completion of the first transcontinental railway to the northwest coast of the United States. From the beginning it has been an international deep sea fishery, engaged in by the nationals of both the United States and Canada, mainly side by side in extra-territorial waters.

The history of the fishery is similar to that of other great modern fisheries. Expanding markets and increasing prices constantly added new and more efficient vessels to the fleet. Improvements in type of construction, in power and in methods of fishing, enabled these vessels to extend their operations to more and more distant banks as fishing on the more accessible banks became less and less profitable.

From a small beginning off Cape Flattery and the southern end of Vancouver Island, the fishery expanded rapidly in sheltered waters and by 1910 extended some seven hundred miles northward to Cape Spencer in southeastern Alaska. Subsequent expansion took the fishery both south and north and into offshore waters. By the late 1920's, fishing was being conducted throughout the known range of the halibut on the North American coast from northern California to Bering Sea, a distance of more than two thousand miles.

Comparatively early in the fishery, it was recognized that the stock of halibut on the older banks was being rapidly reduced but no concern was shown. The supply on the new banks seemed inexhaustible. Thus, when control of the fishery was first advocated, in 1914, it was urged not to conserve the supply but to curtail production. A winter closed season was proposed shortly thereafter to eliminate a period of dangerous fishing during which spawning fish of poor quality were caught, and to provide a period for the sale of accumulated stocks of frozen fish each year. Conservation was only an incidental consideration.

A change of attitude was produced by subsequent events. Investigations sponsored by the British Columbia Department of Fisheries demonstrated conclusively a sharp decline in the abundance of halibut on the older banks. Annual landings declined after 1915 in spite of increased fishing and the exploitation of new fishing grounds. The need for conservation became more and more apparent.

Joint action by the United States and Canada to conserve the fishery was urged with increasing insistency by the halibut industry and by individuals concerned about its condition. Many delays were encountered, and it was not until 1923 that a treaty for the preservation of the halibut fishery was signed, and not until 1924 that this treaty was ratified and became effective.

The Convention of 1923 between the United States and Canada for the preservation of the halibut fishery of the northern Pacific Ocean, was unique

in two respects. It was the first treaty entered into by Canada as a nation, and it was the first treaty concluded anywhere for the conservation of a depleted deep sea fishery.

This treaty established a three-month winter closed season and provided for the appointment of an International Fisheries Commission of four members, two from each country. It instructed the Commission to investigate the decline of the Pacific halibut fishery and to make recommendations for its preservation and development.

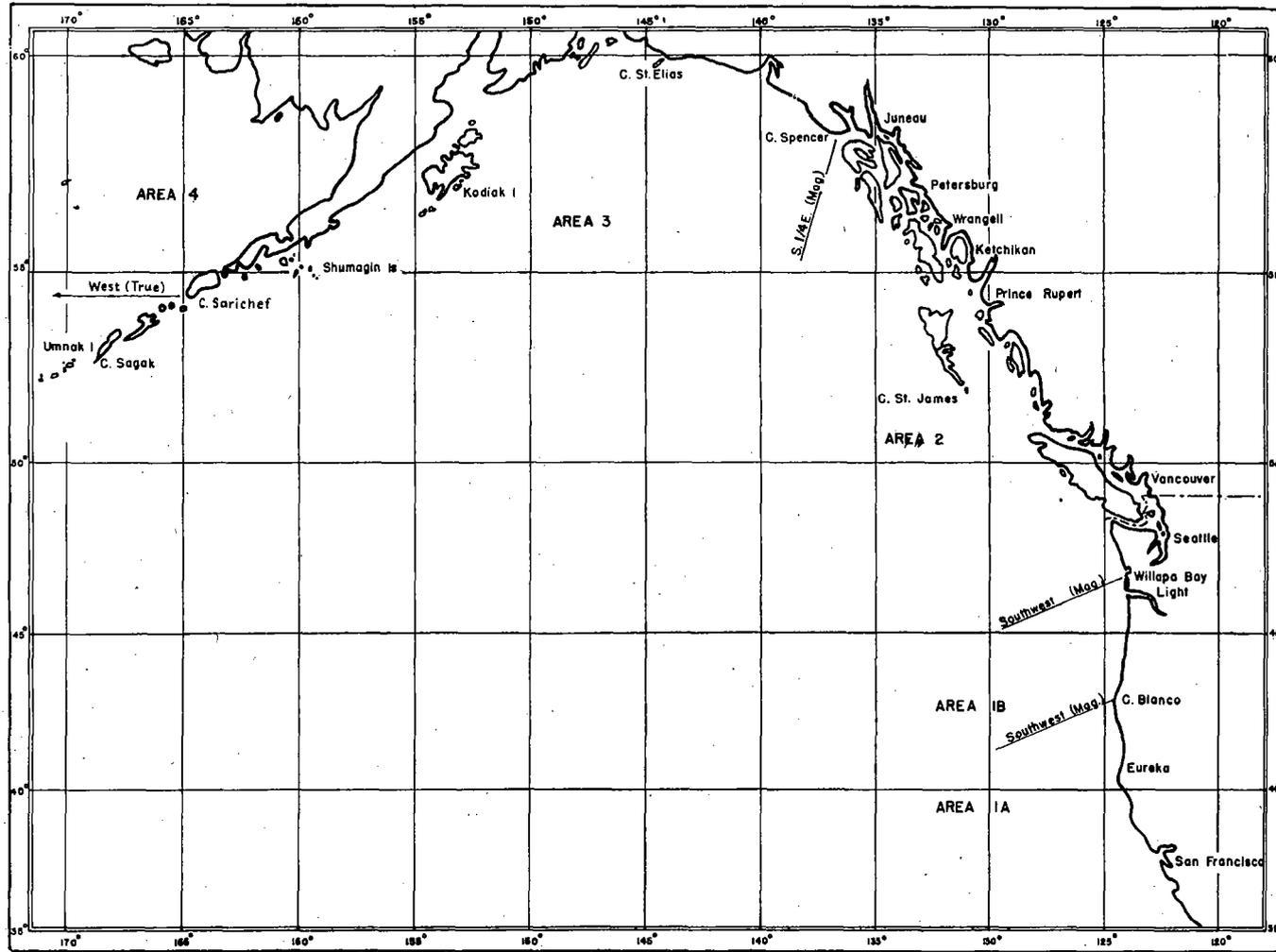
In fulfillment of its duty, the Commission engaged a staff and began practical scientific investigations of the life of the halibut, of the supply of halibut and of the fishery. These revealed that the fishery was in a very unsound condition, and that landings were being maintained only by constant increases in the intensity of fishing. The abundance of halibut had declined greatly on all grounds and was continuing to decline in spite of the closed season. Conditions were particularly serious on the long-fished grounds off British Columbia and southeastern Alaska. Perpetuation of the fishery on the older grounds would require prompt action to reduce the intensity of the fishery.

Recommendations, based upon the above and other findings, led to the Convention of 1930. This continued the winter closed season and the power and duty of the Commission to conduct investigations of the halibut. The most important feature of the new treaty, however, was its grant of the power to regulate the fishery. This regulatory authority was broadened slightly by the later Convention of 1937, under which the Commission now functions.

In each year subsequent to 1931, the Commission has prepared and, upon approval by the President of the United States and the Governor General of Canada, has issued regulations governing halibut fishing off the Pacific coast of the United States, Canada and Alaska. Enforcement of the regulations is the duty of the Coast Guard, the Customs Service and the Fish and Wildlife Service in the United States and of the federal Department of Fisheries, with particular assistance from the Customs Division of the Department of National Revenue in Canada.

Past experience in the regulation of other marine fisheries provided no basis for predicting the effect of regulation upon the halibut fishery and upon the stock of halibut. Thus, it was necessary to proceed carefully, a step at a time, basing each step on previously established facts and justifying it by observation of results before taking the next one. To this end, the Commission established and maintains a system of statistical and biological observations of the changes in the fishery and in the stocks of halibut, and conducts special investigations as the need arises.

The regulations, guided by investigations, stopped the decline of the fishery. They have improved the condition and increased the abundance of the stocks of halibut on the banks. The accumulation of larger stocks has



Pacific Coast of North America, showing the regulatory areas as defined by the International Fisheries Commission in 1947.

already made it safe to permit the taking of an annual catch of 56,000,000 pounds, an increase of 13,000,000 pounds over that obtained by the unrestricted fishery immediately prior to the inauguration of regulation. Present increased catches are taken with one-third less fishing effort than before.

The many expressions of appreciation of the success of the Commission in rebuilding the fishery are highly valued, but the Commission realizes probably more than any one else how much remains to be done. The Commission's objectives are to rebuild the stocks to an approximate level of maximum yield and to stabilize them there. Attainment of these ends will be exceedingly difficult but may be possible with an expansion of investigations to provide a broader base of knowledge.

The Commission has consistently maintained close contact with all branches of the halibut fishing industry. It has held public hearings in Alaska, British Columbia and the State of Washington, formal meetings with various branches of the industry, and numerous consultations with interested individuals and committees.

The Commission holds a meeting each year in conjunction with the Halibut Conference Board, which it voluntarily established in 1931, composed of representatives from the fishermen's and vessel owners' organizations in the principal halibut ports of Seattle, Vancouver, Prince Rupert, Ketchikan, Petersburg and Juneau. At the meetings with the Board, the delegates are informed about current biological findings and the statistics of the fishery. Both the Commission's proposals and the fleets' proposals respecting the regulations and related matters are freely discussed, after which the Commission holds its own executive meeting and makes its decisions.

Annual meetings of the Commission and the Conference Board were formerly held in November or December. At the request of the fleet, no such meeting was held in 1947, but the meeting was moved forward to the early part of January, 1948.

REGULATION OF THE HALIBUT FISHERY

The Commission's regulatory objectives have been, on the one hand, not to curtail commercial fishing unduly and, on the other hand, to hold the rate at which the stocks are removed by the fishery slightly below the rate at which they are replaced by reproduction and growth. This would allow the halibut to live longer on the average before capture and gradually result in the accumulation of larger stocks of larger fish possessing a greater proportion of mature spawners and capable of yielding greater annual catches.

Control of the rate of removal, or the amount of fishing on each stock, was made possible by provisions in the Treaties of 1930 and 1937, which authorized the division of the coast into areas and the limitation of the catch in each area. Under these the Commission has established areas containing stocks that are biologically independent in so far as this is practicable from

an administrative standpoint, has set annual catch limits for each important area or unit of stock and has closed each such area when its catch limit was attained.

To gain the maximum advantage from the above measures, it is desirable in the case of the halibut to defer, as long as possible, the capture of young by the fishery. This arises from the fact that the weight increase of halibut occurs at a rate greater than the loss of poundage due to death from natural causes. Furthermore, small undersized halibut are of much less value commercially, pound for pound, than the larger ones.

Control of the rate of capture of small halibut was made possible by treaty provisions which authorize the Commission to close areas populated by small fish, to limit the catch and to fix the size and character of fishing appliances. Secondary regulatory measures have accordingly been adopted, consisting of the closure of two nursery areas, the limitation of the catch to halibut over a specified minimum size and the prohibition of the use of types of gear known to capture undersized halibut in larger proportion than does the setline gear normally used in the halibut fishery.

As a protection to mature halibut on the spawning grounds, the Treaties of 1930 and 1937 continued the winter closed season established under the original halibut treaty. This closed season, which may be modified or suspended by the Commission, becomes effective if the areas are not already closed by reason of the attainment of the catch limits.

For purposes directly or indirectly connected with the administration of the regulations, the Commission has required halibut boats of five net tons or over to be licensed, to keep accurate log records of their fishing operations and to make statistical returns regarding the amount and area of origin of their catches. It has made the validity of those licenses contingent upon compliance with the statistical and other provisions of the regulations. It has also required halibut dealers to keep accurate records of their purchases of halibut and to make these available to the Commission.

Since 1937, under authority of the treaty of that year, setline boats fishing for other species in areas closed to halibut fishing have been allowed to secure permits to retain and sell one pound of incidentally caught halibut for each seven pounds of other salable species for a limited period after closure of the areas.

The Pacific Halibut Fishery Regulations for 1947, the sixteenth year of regulation, were approved by the Governor General of Canada in Council on March 4, and by the President of the United States on March 17, and became effective on the latter date. They were essentially the same as in 1946, except for a redefinition of the boundary line between Areas 3 and 4, and the setting of a catch limit for the latter area in anticipation of a fishery for halibut developing there. Copy of these regulations is appended.

The Convention waters were divided into five areas: Area 1A, the waters south of Cape Blanco Light on the northern California coast; Area 1B,

lying between Cape Blanco and Willapa Bay on the Washington coast; 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 Cape Sarichef line.

The catch limits of 24,500,000 and 28,000,000 pounds for Areas 2 and 3, respectively, were continued and a limit of 500,000 pounds was placed on Area 4. Areas 1A and 1B, where the catch of halibut is relatively inconsequential, were allowed to continue without catch limits.

Provision was made for the opening of the fishing season in all areas on May 1, and for the subsequent closure of each. The closure dates of Areas 2, 3 and 4 were contingent upon the attainment of their 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 to prevent illegal post-season fishing in Area 2 under pretense of fishing in Area 1B. The closure date of Area 2 or 3, whichever was later, was applied to Area 1A.

Other regulatory provisions included: 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 of 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 at midnight of June 8, and Areas 3, 4 and 1A were closed at midnight of August 17 on the basis of the estimated dates of attainment of the Area 2 and Area 3 catch limits. The closure dates were announced on May 27 and July 24, respectively.

STATISTICS OF LANDINGS

The landings of Pacific coast halibut reported from all areas by Canadian and United States vessels for the past five years are shown in Table 1. Similar figures for 1931, the year immediately prior to the beginning of regulation, are included for comparison.

TABLE 1.—Total declared United States and Canadian landings in thousands of pounds by areas from 1943 to 1947 and in 1931.

YEAR	AREAS* 1A & 1B	AREA 2			AREA 3†			AREAS 1, 2, 3		
	U.S.	U.S.	Can.	Total	U.S.	Can.	Total	U.S.	Can.	Total
1943	420	13,741	11,116	24,857	26,570	1,791	28,361	40,731	12,907	53,638
1944	319	14,958	11,150	26,108	24,783	2,190	26,973	40,060	13,340	53,400
1945	529	13,230	11,750	24,980	25,605	3,551	29,156	39,364	15,301	54,665
1946	605	14,068	14,451	28,519	27,067	4,058	31,125	41,740	18,509	60,249
1947	511	10,512	17,130	27,642	20,875	6,954	27,829	31,898	24,084	55,982
1931	923	14,629	7,018	21,647	20,887	765	21,652	36,439	7,783	44,222

* Prior to 1946, Areas 1A and 1B were combined as Area 1.

† In 1947, landings of 1314 pounds from Area 4 are included in the U.S. Area 3 total.

The totals include the landings during the halibut fishing season and landings of halibut caught incidentally and retained under permit while fishing for other species in areas closed to halibut fishing. The catch limits set for each area are exclusive of the poundage caught under such permits.

Corrections are not included for unreported illegal catches or for illegally caught poundage that was falsely reported from the wrong area. Such corrections would increase appreciably the catch figures for the coast as a whole in recent years. Since illegal catches were inconsequential in 1931, the restoration of the fishery is in excess of the amount shown in the table.

The Area 2 and 3 totals are usually in excess of their respective catch limits. The vagaries of the weather, the short term fluctuations in the availability of fish or of the unexpected withdrawal of vessels from the fishery must be anticipated several weeks in advance in announcing the dates of closure. With the present high daily rate of landing, particularly from Area 2, errors of one or two days in such estimates can lead to excesses or deficits from the catch limits reaching several millions of pounds.

Area 1 landings are made chiefly in northern California and Oregon ports from waters that include the southern extremity of the range where halibut is found in significant commercial quantities. The present landings at the one-half million pound level are somewhat below the three-quarter to one million pound level that prevailed in the early 1930's when the season of halibut fishing in these waters was much longer than at present.

Landings from Area 2 of 28,519,000 in 1946 and 27,642,000 pounds in 1947 are seven and six million pounds respectively above the 1931 total of 21,647,000 pounds. The Canadian share of the Area 2 catch has increased from 32 per cent in 1931 to 51 per cent and 62 per cent in 1946 and 1947 respectively. In amount the Canadian Area 2 catch of 1931 was more than doubled in 1946 and 1947. The sharp setback in the U.S. catches in 1947 was caused by almost complete cessation of fishing by the Seattle section of the U. S. fleet during the Area 2 season and the first two months of the Area 3 season, due to a dispute between vessel owners and fishermen.

The Area 3 catch of 31,125,000 pounds in 1946 was the largest ever recorded from that area and nearly 9,500,000 pounds greater than in 1931. In 1947 the catch was held down to 27,829,000 by reducing allowances for contingencies when calculating the date of closure for Area 3.

The catch from Area 4 was inconsequential, consisting of a small amount of frozen halibut landed by a vessel fishing for cod and 430 pounds retained in the course of tagging experiments by the Commission on board a commercial crab trawler.

The Pacific coast catch has averaged 55,600,000 pounds during the past five years. A maximum of 60,250,000 pounds was attained in 1946, which was 16 million greater than the 1931 catch. In only four other seasons, 1912 to 1915 inclusive, with almost virgin stocks in the two areas, has the annual catch exceeded 60 million pounds.

LANDINGS OF INCIDENTALLY CAUGHT HALIBUT

The regulations provide that setline boats may obtain permits to retain for sale a proportion of halibut caught incidentally while fishing for other species in areas which have been closed to halibut fishing by reason of the attainment of their catch limits. This provision, authorized in the 1937 Treaty, was to avoid wastage of halibut caught incidentally while fishing for blackcod, lingcod or rockfish. In 1947 permits to retain such halibut became invalid after midnight, November 15.

The amount of halibut landed from Area 2 under this provision was about 250,000 pounds in 1937. It increased four-fold by 1946 to a high of 1,184,000 pounds, due to expansion of the setline fleet fishing for blackcod and to a lesser extent for lingcod and rockfish. In 1947 landings of permit halibut from Area 2 declined to 422,000 pounds due to the weak market for blackcod. Small amounts of permit halibut were also landed from Areas 3, 1A and 1B.

On several occasions consideration has been given to extending the permit provision to other than setline vessels such as those fishing for bottom fish with trawl nets or for salmon and other species with troll gear. The latter type of gear is permitted to retain and sell halibut caught in any area while that area is open to halibut fishing.

The very large number of trollers, the small but exceedingly numerous landings made by such boats and the many isolated, unsupervised places where most of their catches are landed has made the extension of permits to such gear an almost insuperable administrative and enforcement problem. Present facilities of the enforcement agencies of both countries could not provide even the minimum control and supervision that would be necessary to assure reasonable compliance by trollers with the permit regulations governing the landing of incidentally caught halibut.

The retention of halibut caught by trawl-net gear is prohibited, but the extension of the permit provision to allow the retention of a limited quantity of such halibut at all times of year has been urged. The present treaty provides power only to control the retention of incidentally caught halibut during fishing in an area closed to halibut fishing. Until more flexible authority is provided by treaty to enable the Commission to control the incidental capture of halibut at all seasons of the year and by individual grounds, consideration of extending the permit provision to trawl gear has been deferred.

SIZE OF FLEETS

The number of vessels and men fishing regularly for halibut out of the major Pacific coast halibut ports in 1947 is shown in Table 2. They are

TABLE 2.—Number of regular halibut boats and fishermen operating primarily in Areas 2 and 3 out of major halibut ports and in Western Alaska during 1947.

FLEETS AND PORTS	AREA 2		AREA 3	
	No. of Boats	No. of Men	No. of Boats	No. of Men
U.S. FLEET				
Astoria.....	11	50	1	5
Seattle.....	53	276	93	727
Ketchikan.....	91	300	3	19
Petersburg.....	74	279	5	27
Juneau.....	59	207	6	32
Wrangell.....	18	50	—	—
Sitka.....	44	140	—	—
Western Alaska.....	—	—	11	77
TOTAL U.S.	350	1,302	119	887
CANADIAN FLEET				
Vancouver*.....	131	706	4	31
Prince Rupert*.....	125	613	1	9
TOTAL CANADIAN	256	1,319	5	40
TOTAL U.S. AND CANADIAN	606	2,621	124	927

* Includes some regular halibut boats landing at smaller ports such as Klemtu, Namu and Bull Harbor.

divided into two groups, those fishing primarily in Area 2 and those in Area 3. Numerous one- to three-man small boats landing chiefly at camps, and boats such as salmon trollers landing incidental quantities of halibut caught while fishing for other species, are not included.

The size of the fleets in recent years is given in Table 3, with that for 1931 shown for comparison. The number of men engaged, which reflects both the change in number and size of the vessels, is also included as a better indicator of fishing capacity.

TABLE 3.—Number of regular United States and Canadian halibut boats and fishermen operating in Areas 2 and 3 from 1943 to 1947 and in 1931.

YEAR	UNITED STATES				CANADIAN				TOTAL U.S. & CAN.			
	Area 2		Area 3		Area 2		Area 3		Area 2		Area 3	
	Boats	Men	Boats	Men	Boats	Men	Boats	Men	Boats	Men	Boats	Men
1943	247	1,037	107	942	172	797	3	24	419	1,830	110	966
1944	278	1,056	84	753	190	861	4	34	468	1,917	88	787
1945	316	1,253	97	837	188	919	3	26	504	2,172	100	863
1946	373	1,373	116	921	215	1,049	5	41	588	2,422	121	962
1947	350	1,302	119	887	256	1,319	5	40	606	2,621	124	927
1931	167	722	76	632	83	360	2	17	249	1,082	78	649

There has been a steady increase in the size of the regular fleet during the past 16 years. The fishing capacity of the regular Area 3 fleet in 1947 was about 50 per cent over 1931, and the Area 2 fleet about 250 per cent, with the Canadian section showing the greater proportionate increase.

In the past 10 years there has also been a marked increase in the number of small boats, of usually less than five net tons and with one- to three-man crews, landing halibut from Area 2. Although their production has now reached a significant proportion of the Area 2 total, they are omitted because their inclusion in the census of the regular halibut fleet would invalidate the usefulness of both series. There is no comparable small boat fleet fishing in Area 3.

These small boats are of many types: small longliners; salmon trollers temporarily using longline gear; gillnet boats using longline halibut or dog-fish gear and hauling the gear in a variety of ways; small handliners; jig boats and others.

In 1931 the small boat fleet landed about 882,000 pounds or four per cent of the Area 2 total. It contained about 125 boats, not including the salmon trollers catching some incidental halibut. In 1943 the small boat fishery landed about 2,582,000 pounds or ten per cent of the Area 2 total, and about 383 boats were involved. By 1947 the number of such small boats fishing for halibut was approximately 600 and their landings amounted to 4,000,000 pounds or 14 per cent of the Area 2 catch.

LENGTH OF SEASON

The closing of Area 2 at midnight of June 8, and of Area 3 at midnight of August 17, resulted in seasons of 39 and 109 days in the two areas, respectively.

The greater abundance of halibut, resultant larger trips and a greatly increased fleet attracted to the fishery thereby have been responsible for a marked decrease in the length of the fishing season over the past 16 years. The following tabulation shows the number of days of fishing season in Areas 2 and 3 for the past five years, compared with 1931. Deductions have been made for time lost due to fleet disputes and voluntary extension of the closed season.

Year	Area 2	Area 3
1943	66 days	145 days
1944	51 "	190 "
1945	46 "	147 "
1946	42 "	111 "
1947	39 "	109 "
1931	238 "	238 "

The length of the Area 3 season in 1944 was abnormally prolonged by price disputes, the diversion of vessels to other fisheries and wartime conditions in general.

In 1947 the Seattle Area 2 fleet did not fish and most of the large United States vessels fishing Area 3 commenced operations two months late due to a fishermen's lay dispute. It is anticipated that the seasons will soon approach what is believed to be the economic minimum for the two areas, namely, about 25 days for Area 2 and as short as 50 days for Area 3.

This concentration of fishing results in landings of halibut at the rate of over 27,000,000 pounds monthly when Areas 2 and 3 are both open and at the rate of about 13,000,000 pounds monthly after the closure of Area 2. Further concentration of fishing by a larger fleet will ultimately bring about the landing of halibut at rates in excess of 35,000,000 pounds per month while both areas are open, and 15,000,000 pounds monthly when Area 3 alone is open.

The present condition of concentrated landings is not normal in the halibut fishery. It is economically and biologically unsound with a species that is available for efficient capture eight to nine months each year. This was again brought to the particular attention of the two Governments by the Commission.

During the period from about 1924 to 1935, after the introduction of the diesel engine had permitted the exploitation of the species throughout its entire coastal distribution and after the inauguration of the winter closed season of three months had concentrated the fishing season into nine months, the monthly landings of halibut only occasionally exceeded 6,000,000 pounds from all areas combined.

THE AREA 3 FISHERY

The character of the Area 3 fishery is undergoing marked changes induced by the recent establishment of several cold storage plants in central and western Alaska, the growth of the fleets and the shortening of the Area 2 season.

From the outset of the fishery in 1913 to about 1932 the basic operation in Area 3 consisted of fishing by relatively large vessels, chiefly of the two-masted or "schooner" type. A few of these vessels fished with dories in Area 2 during the late spring and early summer months, but this type of operation ceased entirely by 1935 when the use of dories in Area 2 was prohibited. A few longline vessels of the typically Area 3 fleet also fished an occasional trip in Area 2, but the total poundage involved in all such Area 2 operations did not average over 500,000 pounds annually throughout the 1930's.

The increasing disparity between the lengths of the seasons in Areas 2 and 3 after 1931 resulted in an increasing number of the more seaworthy of the Area 2 vessels going to Area 3 after closure of the latter area. In 1932, the first year of regulation, a total of only about 250,000 pounds of halibut was caught in Area 3 by typically Area 2 vessels. By 1946 the total amounted to 6,000,000 pounds. In 1947, with the two-month tie-up of the regular United States Area 3 fleet, about 12,500,000 pounds were caught in Area 3 by the traditionally Area 2 fleet.

The pattern of fleet operations in Area 3 can no longer be resolved into the above two classes, namely, those by the traditional large Area 3 boat and those by the medium-sized boat made idle by the closure of Area 2.

Within the Area 2 fleet, particularly the Canadian section, recent years have seen the growth of a group of large, seaworthy vessels capable of fishing the entire range of the Area 3 fishery. Many of these boats are owned or controlled by distributing companies and fish Area 2 for one or two trips or to the end of that short season. They then repair to Area 3 for a few trips prior to engaging in other fisheries or for the remainder of the Area 3 season.

In 1947 the few United States boats in this category landed about 225,000 pounds from Area 2 before going to Area 3, from which they landed an additional 661,000 pounds. Canadian vessels in this group landed 3,187,000 pounds from Area 2 and then 4,713,000 pounds from Area 3.

In addition to these large seaworthy vessels, there is the traditional class of medium-sized Area 2 vessels that transfer to Area 3 for varying periods of time after the closure of Area 2. They are seaworthy to the extent of summer or early fall fishing on the close-in grounds of Area 3, between Cape Spencer and Cape St. Elias.

In 1947, United States Area 2 vessels of this category landed 5,516,000 pounds from Area 3 and Canadian vessels 546,000 pounds. The former fleet's

landings were considerably higher than in previous years, partly because many Area 2 vessels were endeavoring to recoup their loss of catch from Area 2 due to the tie-up. Unfavorable prospects for the albacore and black-cod fisheries also encouraged fishing in Area 3.

The development of new landing outlets in central and western Alaska has led to the establishment of a local small boat fishery in Area 3. These boats land their catches in Area 3 ports and consist of three classes: small boats resident at their landing places; former Area 2 boats fishing exclusively out of western Alaskan ports all season; and Area 2 boats fishing out of western Alaskan ports after closure of Area 2.

In the following tabulation, the landings in western and central Alaskan ports during the past three years are shown according to whether landed by "western" vessels of the traditional Area 3 type, or by boats of the above three categories.

Year	"Western" Vessels	Other Vessels	Total
1945	1,223,000	1,204,000	2,427,000
1946	757,000	1,527,000	2,284,000
1947	384,000	3,018,000	3,402,000

It is apparent that a "local" fleet is rapidly developing in western Alaska. This trend, though accentuated in 1947 by the Seattle lay dispute, was already apparent in 1946.

ABUNDANCE OF HALIBUT

The relative abundance of the stocks of halibut is determined by collecting and analyzing the fishing records kept in the halibut vessels' log books by their captains. These records give date, fishing location, amount of gear fished, estimated catch and other pertinent information. Useable log records collected in 1947 covered more than 40,000,000 pounds of the catch.

In the past sixteen years, under regulation, the abundance of halibut or size of stocks in Areas 2 and 3 have increased markedly despite a few temporary setbacks. In 1947 the abundance in each area was 2 per cent above the 1946 level. The size of the stock was 144 per cent greater in Area 2 and 89 per cent greater in Area 3 than in 1930. In the latter year the stocks in both areas reached the lowest point of their decline prior to the beginning of control by the Commission.

The abundance of halibut in Area 2 in 1947 was higher than in any year since 1915, but was still considerably below that prevailing in the earlier years of the fishery. The rate of improvement in catch per unit of effort, rapid during the first years of regulation, has slowed down in recent years. However, the past history of this stock indicates that higher levels may yet be attained.

The 1947 catch per unit of effort in Area 3 was slightly higher than in 1946, but the increase did not offset the moderate declines in abundance that occurred in the area in 1945 and 1946. This cessation of improvement of the stock is attributed to the fact that the recent annual rate of production of nearly 30 million pounds may be approaching the maximum yield that this area can produce. To counteract the decline in catch per unit of effort, the 1947 catch was held down by making only minimum allowances for bad weather and other contingencies that might occur after the date of closure was announced.

The problems of management have become more complex as the maximum levels of yield are approached. Securing the proper distribution of fishing in the different sections of each area becomes a matter of increasing importance.

CHANGES IN COMPOSITION OF STOCKS

Records of the catch per unit of fishing effort show changes in the overall abundance of halibut in the various areas and parts of areas, but they do not alone give a complete picture of the condition of the stocks. They must be supplemented by information regarding the changes in the composition of the stocks, resulting from fluctuations in the numbers of young entering the fishery and from changes in the intensity of the fishery, to ascertain the effects of past regulations and the probable effect of those contemplated.

Three types of information regarding the composition of the stocks are collected and used by the Commission. These are: (1) the landings according to trade categories¹ as recorded by dealers; (2) length-composition data secured by the measurement of the fish in the commercial landings by members of the Commission's staff; and (3) age-composition data derived from the above market measurements and from sample of otoliths collected at the same time. The first type is of limited and only general value because of the wide range of sizes included in each trade category and variable grading practices. The second and third types are supplemented to a limited extent by data collected on the fishing grounds, also by members of the Commission's staff.

Market sampling for size-composition and age-composition studies was begun in 1933 and has been carried on mainly at Seattle where the Commission's laboratory is located and the necessary personnel are normally available during the fishing season. Due to limited facilities, it was directed particularly to the Goose Island grounds which were found to be reasonably representative of Area 2, exclusive of the inside waters of southeastern Alaska, and to Portlock and Albatross Banks as reasonably representative of Area 3. A change in distribution of landings during and since the war has interrupted sampling in the latter area.

¹Trade categories of halibut are: "baby chickens" or "babies", weighing less than 5 pounds; "chickens", from 5 to 10 pounds; "mediums", from 10 to 60 pounds; and "large", over 60 pounds, all weights being with heads off and entrails removed.

The tie-up of the Seattle fleet throughout May and June in 1947 because of a dispute between vessel owners and fishermen, made it necessary to transfer operations to Vancouver, British Columbia. A total of 8,900 halibut were measured from ten trips during the Area 2 season. Otoliths for the determination of age were taken at the same time from 1,630 of the fish that were measured. The short season and the tie-up of the Seattle fleet reduced the amount of data collected to considerably below previous years.

Analysis of market measurement data has demonstrated an upward trend in the abundance, both relative and actual, of mature fish since regulation began. It has also revealed fluctuations in the abundance of young halibut entering the fishery of a magnitude not suspected prior to 1935. Unusually large groups of small chickens which entered the fishery in 1937 and 1938 and in 1943 and 1944 were largely responsible for sudden increases in the catch per unit of fishing effort in those years in Area 2 and for maintaining the catch per unit at a high level in succeeding years.

The 1947 samples from Area 2 indicated that chicken halibut were less numerous than in the preceding three years, but made almost as great a contribution to the catch because of their greater average size. Medium halibut, derived in part from the abundant groups of chickens that entered the fishery in 1943 and 1944, were more numerous than in any recent year and more than offset the reduction in chickens. Large, as usual, constituted an insignificant part of the catch.

Age-composition studies of a stock and of the year to year changes occurring therein provide a more exact index to the biological condition of that stock than do analyses of trade categories and of size-composition of the commercial catches. Unfortunately, age determinations are very time-consuming. This has made it possible for the Commission's small staff to make a continuous study of the Area 2 stock only.

Age studies have shown that more than ten age classes, derived from as many successive brood years, are always present in the Area 2 fishery. The young of a particular brood year do not all enter the fishery at the same time. They appear in appreciable numbers as six-year-olds and in significant numbers as seven-year-olds. They become increasingly available to the fishery as eight- and nine-year-olds, at which age all or practically all are subject to the fishery. The rate at which the young enter the fishery is greater than the rate at which they are caught by the fishery during the entry period and, consequently, the numbers of individuals from each brood year increase in the catch until they are eight or nine years old. Their numbers are reduced rapidly by the fishery in each succeeding year thereafter. Relatively few survive beyond the age of 12 years, the average age of maturity for females.

Halibut of seven, eight and nine years normally constitute about 70 per cent of the catch. Thus, the abundance of individuals of these age classes and, consequently, the relative size and survival of the brood years from which they are derived in any year, determines the level of abundance or

catch per unit of effort in Area 2. Conditions may be somewhat different in the inside waters of southeastern Alaska, where larger and presumably older fish constitute a higher percentage of the catch.

The increase in abundance in 1937 and 1938 was caused by the appearance of two good year groups which entered the fishery as seven-year-olds in 1936 and 1937. The sudden increase in abundance in 1943 and 1944 and maintenance of the stock at this new high level in 1945, 1946 and 1947 was produced by a succession of four good year groups which entered the fishery as seven-year-olds in 1943, 1944, 1945 and 1946. During the 1939 to 1942 period of lower abundance, no good brood years appeared in the fishery.

Analysis of the 1947 sample indicates that the number of seven-year-olds was below the average of the preceding four years. However, the number of eight-year-olds was about average, that of nine-year-olds was above average, and the ten- and eleven-year-olds derived from the good brood year groups that entered the fishery in 1944 and 1943, respectively, were present in noteworthy abundance. The small weight of seven-year-olds was more than offset by the larger weight of nine-, ten- and eleven-year-olds. Continuance of the current high level of abundance in Area 2, at least during 1948, was indicated.

TRAWLING INVESTIGATIONS IN AREA 2

Although it is primarily concerned with the setline fishery for halibut, the Commission must also be interested in other fisheries which unavoidably capture some halibut during their operation for other species. Noteworthy among the latter is the trawl fishery for flounders and other bottom species.

A great growth has occurred recently in the Pacific coast trawl fishery. The fleet grew from approximately 65 vessels in 1941 to 250 vessels in 1943 and 500 vessels in 1945. There has been a reduction in the size of the otter trawl fleet since 1945, but no decline in the desire of its members to be allowed to retain incidentally caught halibut.

The incidental capture of halibut by the trawl fleet increased from about 100,000 pounds in 1941 to 700,000 pounds in 1943, although the fishery was not conducted upon important halibut grounds and the majority of trawler captains tried to avoid halibut at that time. The development of a primary interest in halibut on the part of an increasing number of otter trawl vessels, became apparent by 1943. This and the gradual expansion of the fishery to important halibut grounds and the expressed intention of some trawlers to fish purposely for halibut in 1944, made action by the Commission necessary.

The Commission was concerned because of the well-known efficiency of trawl gear in the capture of small bottom fish and its known ability to catch halibut far below the sizes that can be taken with setline gear of the type used in the Pacific halibut fishery. It saw in an uncontrolled trawl fishery for halibut a serious threat to its program for the rehabilitation of the halibut fishery. Such a fishery would increase the destruction of small

unmarketable halibut, upon which the future of the fishery depended, without in any way increasing the marketable catch which could be taken.

In 1944 the Commission exercised its only applicable authority and prohibited the retention and landing of halibut caught in nets of any kind. It recognized that this action, which would discourage but not prevent trawlers from fishing on recognized halibut grounds, might not be the final answer and subsequently requested broader and more flexible treaty powers to deal with the problem.

Through the cooperation of the captains of some trawl vessels, the Commission was able in 1943, 1944 and 1945 to place members of its staff upon commercial trawlers to observe the numbers, sizes and condition of the halibut caught on different grounds under various conditions. The results of these observations were quite variable, but demonstrated the complexity of the problem and showed the need for comprehensive investigations as a basis for rational action, if more flexible regulatory authority were granted.

A beginning of more intensive investigations of the relationship existing between the trawl fishery and the stocks of halibut was made in 1946 when the Canadian otter trawl vessel "Santa Maria I" was chartered and operated from mid-July to early October. During this time a total of 117 hauls were made in several sections of Hecate Strait and Dixon Entrance in Area 2, and extensive data were collected concerning the distribution of small unmarketable halibut, the numbers and sizes of halibut caught by trawl on different grounds, and the mortality of halibut caught by trawl under various conditions. The operations were also used to collect biological materials for age, growth and maturity studies, and to initiate a comprehensive tagging program.

This work was continued in 1947 with the charter and operation of the same vessel from mid-May to the latter part of June. During the period of operations a total of 78 hauls, of which 13 were not entirely successful for various reasons, were made on recognized halibut grounds between the north end of Vancouver Island and Dixon Entrance, using trawls with ground-rope of approximately 109 feet and the generally used mesh of $4\frac{1}{2}$ inches.

Catches of halibut were very variable, ranging from zero in some hauls up to 15,000 pounds in one haul on the Goose Island grounds. The average catch per haul was 105 halibut of all sizes, weighing 945 pounds. The amount of halibut taken on different grounds also varied greatly, as can be seen from Table 4, which shows the number of hauls and the estimated round-weight catch of halibut and of other species at each location.

TABLE 4.—Number of hauls and catch in pounds of halibut and other species, during trawling operations on various fishing grounds in May and June, 1947.

FISHING GROUNDS	NO. OF TRAWL HAULS	CATCH IN POUNDS		
		Halibut		Other Species
		Average per haul	Total	
Goose Island				
N.W. Edge.....	8	3,628	29,025	21,575
N.W. Corner.....	10	530	5,300	20,900
S.E. Edge.....	5	130	650	11,650
S.E. Corner.....	24	910	21,850	35,950
Cape Scott.....	7	686	4,800	7,800
Butterworth Rocks.....	6	525	3,150	11,450
Two Peaks.....	5	80	400	13,100
Rose Spit.....	4	37	150	1,150
Masset.....	9	933	8,400	5,100
Total.....	78	945	73,725	128,675

The significant catches of species other than halibut, in order of magnitude, were approximately as follows: flounders, 55,500; ratfish, 20,500; lingcod, 17,500; grey cod, 15,000; rockfish, 6,000; dogfish, 5,000; and skates, 4,500 pounds. Of these other species, almost 90,000 pounds were unmarketable, due in part to a current glut of the market.

The composition of the halibut catches differed widely from ground to ground, and also from one part of the large Goose Island ground to another. This is clearly indicated in Table 5, which gives for individual locations the total number of halibut caught and the percentage falling in the three important trade categories². The variations in composition show the existence of wide differences in the nature of the halibut stocks in the different locations.

Babies, weighing less than 5 pounds heads-off and thus below the legal size limit, ranged in the catches from a low of 16 per cent on the N. W. Edge of Goose Island to a high of 49 per cent off Butterworth Rocks in northern Hecate Strait, and constituted 31 per cent of the combined catch. Chickens varied from 41 per cent off Butterworth Rocks to 63 per cent on the N. W. Edge of Goose Island and 64 per cent on the Cape Scott grounds at the north end of Vancouver Island. They were the most abundant group except in two locations, and made up 53 per cent of the combined catch. Mediums varied from only 4 per cent on the Masset grounds in Dixon Entrance to 21 per cent on the N. W. Edge of Goose Island, and constituted 16 per cent of the combined catch. Large did not appear in significant numbers on any ground.

²See footnote, page 20.

TABLE 5.—Number of halibut caught and percentage falling in each trade category, during trawling operations in May and June, 1947.

FISHING GROUNDS	CATCH OF HALIBUT			
	Total No.	Per Cent of Total Number		
		Babies	Chickens	Mediums
Goose Island				
N.W. Edge.....	3,317	16	63	21
N.W. Corner.....	59	34	52	14
S.E. Edge.....	68	29	55	16
S.E. Corner.....	2,339	36	47	17
Cape Scott.....	518	26	64	10
Butterworth Rocks.....	372	49	41	10
Two Peaks.....	43	44	44	12
Rose Spit.....	7	—	—	—
Masset.....	1,463	45	50	4
All combined.....	8,186	31	54	15

The mortality of halibut caught in the trawls varied very widely. It ranged from practically zero in hauls with small total catches to almost 100 per cent in hauls with large total catches. This trend is demonstrated by the following data, in which the mortality observations from all useable 1946 and 1947 hauls are combined in three groups according to size of total catch.

Total Catch Per Haul	No. of Hauls	No. of Halibut	Average Per Cent Mortality
1 to 1,500 pounds	72	2,225	4
1,501 to 3,500 pounds	51	2,552	11
3,501 or more pounds	47	6,440	61

There was also a small but significant variation in mortality according to size of fish. It was greater for babies than for chickens, and greater for chickens than for mediums in hauls with total catches of comparable size.

Biological observers were placed on commercial trawlers to supplement the information obtained on the "Santa Maria I" concerning the nature of the catches of halibut taken on different grounds. Other observers were placed on commercial halibut vessels to collect data on setline catches for comparison with the trawl catches.

Adequate samples of halibut measurements, comparable as to time and place, were secured for trawl catches and setline catches on the S. E. Corner of Goose Island grounds and on the Cape Scott grounds. These data are summarized in Table 6, which shows the number of halibut, their average length in centimeters (2.4 centimeters = 1 inch), and the percentage of babies, chickens and mediums in the sample by each type of gear on each ground.

TABLE 6.—Number and average length of halibut and percentage falling in each trade category, for comparable samples of halibut caught by trawl gear and halibut setline gear on two fishing grounds in May and June, 1947.

FISHING GROUNDS AND TYPE OF GEAR	CATCH OF HALIBUT				
	Number	Average Length (cm.)	Per Cent of Total Number		
			Babies	Chickens	Mediums
S.E. Corner of Goose Island					
Trawl.....	2,339	70.6	36	47	17
Setline.....	1,830	77.6	13	49	38
Cape Scott					
Trawl.....	1,176	71.3	25	64	11
Setline.....	1,571	78.9	10	47	43

Of particular interest in the above data are the differences in the average length of the fish and in the percentage of babies or undersized caught by the two types of gear. The trawl-caught halibut were 7.0 and 7.6 centimeters (approximately 3 inches) shorter on the average than were those caught by setline. In contrast to the 10 and 13 per cent of undersized halibut in the setline catches, the trawl caught 25 and 36 per cent respectively of undersized.

OBSERVATIONS ON BERING SEA STOCK

The initiation of a trawl fishery for crabs and bottom fish in the Area 4 section of Bering Sea during 1947, the construction of a cold storage plant in the vicinity, and the possible development of a longline fishery for halibut there, have made a knowledge of the stock of halibut in Area 4 desirable for purposes of regulation.

Thus, when the opportunity arose, the Commission made arrangements with the Pacific Exploration Company to place a biological observer upon the company's trawler "Alaska," during an exploratory crab-fishing trip to the Bering Sea region. Primary objectives were to study the nature of the stock by measuring all halibut caught, and to mark and release live halibut to ascertain the relationship of the stock in Bering Sea to that south of the Alaska Peninsula.

During the trip which extended from mid-July to mid-September, 1947, a total of 148 hauls were made, using otter trawls with a ground-rope of about 115 feet and with mesh ranging from 6 inches in the wings to 4.5 inches in the cod-end. Of the hauls, 15 were made south of the Alaska Peninsula in Area 3, between Sanak Island and Unimak Pass, and 133 north of the Peninsula in the Area 4 section of Bering Sea. Average and total catches of halibut, by number and estimated round weight in the two regions, are presented in Table 7.

TABLE 7.—Number of hauls, average catch of halibut per haul and total catch of halibut during trawling operations on the southern and northern sides of the Alaska Peninsula in Areas 3 and 4 in July, August and September, 1947.

FISHING AREA	NO. OF HAULS	CATCH OF HALIBUT			
		Number		Round Weight	
		Average Per Haul	Total	Average Per Haul	Total
South of Alaska					
Peninsula, Area 3.....	15	21.3	319	130.0	1950
Bering Sea, Area 4.....	133	3.3	434	34.7	4620
Total.....	148	5.1	753	44.4	6570

The catch of halibut was small, totalling only 753 fish with an estimated total round weight of 6,570 pounds. In only four hauls south of the Peninsula, and in only nine hauls in Bering Sea were 100 or more pounds taken. The average catch per haul was 21 fish or 130 pounds south of the Peninsula, and only three fish or 35 pounds in Bering Sea. The small size of the catches in Bering Sea suggests that the supply of halibut is very limited there.

The nature of the halibut catches in the two areas is shown in Table 8 which gives the number of halibut of all sizes and the percentage of babies, chickens, mediums and large taken in each.

TABLE 8.—Number of halibut caught and percentage falling in each trade category during trawling operations on the southern and northern sides of the Alaska Peninsula in Areas 3 and 4 in July, August and September, 1947.

FISHING AREA	Total No.	CATCH OF HALIBUT			
		Per Cent of Total Number			
		Babies	Chickens	Mediums	Large
South of Alaska					
Peninsula, Area 3.....	319	72	14	13	1
Bering Sea, Area 4.....	434	44	34	22	0

The high percentage of babies in the catches are of importance as indicators of the relatively high abundance of small halibut and of the efficiency of the trawl, even of large mesh, as a means of catching them.

The percentage of babies was very high and that of chickens and mediums was very low south of the Peninsula in Area 3 where halibut of marketable size have been subjected to an intensive fishery for many years. The percentage of babies was much lower, and that of chickens and mediums relatively much higher north of the Peninsula in Area 4 where there has not been any fishery for halibut.

Observations regarding the mortality of halibut caught in the trawl were in general agreement with the results obtained during the operation

of the "Santa Maria I" off the coast of British Columbia. The individual overall catches were moderate in size, with the result that only three per cent were considered unsuitable for marking.

MARKING EXPERIMENTS

Increases in the abundance of halibut and in the number of vessels fishing have shortened the Area 2 fishing season to the point where some important halibut grounds can no longer be fished at their previously normal season and have raised questions regarding the possible under-utilization of the stocks on such grounds. The probability of a fishery for halibut and other bottom fish developing in Area 4 has raised the question of the relationship existing between the long-fished stocks in Area 3 and those that may be found in Bering Sea or Area 4. These and other important current problems can only be solved by marking experiments which will show the movements of the stocks of fish in question and the rate at which the fish are removed by the fishery.

Halibut are marked by the Commission's staff by affixing numbered metal tags to halibut caught by chartered or commercial fishing vessels. The marked fish are released and later recaptured by commercial fishermen who are paid a reward for returning each tag with accurate data regarding the time and place of capture, length and other useful information. Tagging experiments contributed to the original definition of the regulatory areas.

With current problems in mind, marking experiments were undertaken in August of 1946 and continued in May and June of 1947, in conjunction with the investigations of the otter trawl fishery between the north end of Vancouver Island and Dixon Entrance in Area 2. Marking was also done west of Sanak Island in Area 3, and in the Area 4 section of Bering Sea by a

TABLE 9.—Numbers of halibut marked at different locations in 1946 and 1947.

FISHING GROUNDS	NUMBER MARKED		
	1946	1947	1946 and 1947
AREA 2:			
Masset.....	—	619	619
Northern Hecate Strait.....	207	283	490
Horseshoe.....	1,439	—	1,439
Goose Island.....	242	2,333	2,575
Cape Scott.....	—	308	308
Total.....	1,888	3,543	5,431
AREA 3:			
West of Sanak Island.....	—	85	85
AREA 4:			
North of Alaska Peninsula.....	—	287	287

biological observer during the crab fishing trip of the trawler "Alaska" to that region from late July to mid-September in 1947. The numbers of tagged halibut released in each location during the two years are shown in Table 9.

Recoveries of tagged fish from the above experiments do not yet cover a sufficient period of time to justify conclusions, but are of general interest. A total of 161, or 8.5 per cent, were recaptured during 1947 from the 1946 experiments. Longliners made 159 of the recoveries, and a trawler and a salmon troller one each. The percentage of recoveries from individual experiments was 4.4 for northern Hecate Strait, 10.2 for the Horseshoe, and 2.1 for Goose Island. Of 147 halibut recaptured from the Horseshoe experiment, 125 were recovered on the bank of origin. The remaining 22 were taken elsewhere in Area 2, as far south as Goose Island ground and as far north as Frederick Sound in southeastern Alaska.

INTERNATIONAL FISHERIES COMMISSION, 1947.

EDWARD W. ALLEN, *Chairman*

A. J. WHITMORE

MILTON C. JAMES

G. W. NICKERSON, *Secretary*

APPENDIX
PACIFIC HALIBUT FISHERY REGULATIONS,
EFFECTIVE MARCH 17, 1947

**Regulations of the International Fisheries Commission Adopted Pursuant to
the Pacific Halibut Fishery Convention between the United States of
America and the Dominion of Canada, Signed January 29, 1937**

REGULATORY AREAS

1. (a) Convention waters which include the territorial waters and the high seas off the western coasts of Canada and the United States of America including the southern as well as the western coasts of Alaska, shall be divided into the following areas, all directions given being magnetic unless otherwise stated.

(b) Area 1A shall include all convention waters southeast of a line running northeast and southwest through Cape Blanco Light, as shown on Chart 5952, published in February, 1935, by the United States Coast and Geodetic Survey, which light is approximately in latitude $42^{\circ} 50' 14''$ N., longitude $124^{\circ} 33' 45''$ W.

(c) Area 1B shall include all convention waters between Area 1A and a line running northeast and southwest through Willapa Bay Light on Cape Shoalwater, as shown on Chart 6185, published in July, 1939, by the United States Coast and Geodetic Survey, which light is approximately in latitude $46^{\circ} 43' 17''$ N., longitude $124^{\circ} 04' 15''$ W.

(d) Area 2 shall include all convention waters off the coasts of the United States of America and of Alaska and of the Dominion of Canada between Area 1B and a line running through the most westerly point of Glacier Bay, Alaska, to Cape Spencer Light as shown on Chart 8304, published in June, 1940, by the United States Coast and Geodetic Survey, which light is approximately latitude $58^{\circ} 11' 57''$ N., longitude $136^{\circ} 38' 18''$ W., thence south one-quarter east and is exclusive of the areas closed to all halibut fishing in Section 9 of these regulations.

(e) Area 3 shall include all the convention waters off the coast of Alaska that are between Area 2 and a straight line running from the light on Cape Kabuch at the head of Ikatan Bay as shown on Chart 8701 published in February, 1943, by the United States Coast and Geodetic Survey which light is approximately latitude $53^{\circ} 49' 03''$ N., longitude $163^{\circ} 21' 42''$ W., thence to Cape Sarichef Light at the western end of Unimak Island as shown on Chart 8860 published in December, 1942, (12th Edition) by the United States Coast and Geodetic Survey which light is approximately latitude $54^{\circ} 36' 00''$ N., longitude $164^{\circ} 55' 45''$ W., thence true west.

(f) Area 4 shall include all convention waters in Bering Sea which are not included in Area 3.

LIMIT OF CATCH IN EACH AREA

2. (a) The catch of halibut to be taken during the halibut fishing season of the year 1947 from Area 2 shall be limited to approximately 24,500,000 pounds of salable halibut, and from Area 3 to approximately 28,000,000 pounds of salable halibut, and from Area 4 to approximately 500,000 pounds of salable halibut, the weights in each or any such limit to be computed as with heads off and entrails removed.

(b) The catch of halibut to be taken from each area during the halibut fishing season of the year 1947 shall also be limited to halibut which with the head on are 26 inches or more in length as measured from the tip of the lower jaw to the extreme end of the middle of the tail or to halibut which with the head off and entrails removed are 5 pounds or more in weight, and the possession of any halibut of less than the above length or the above weight, according to whether the head is on or off, by any vessel or by any master or operator of any vessel or by any person, firm or corporation, is prohibited.

(c) The International Fisheries Commission shall as early in the said year as is practicable determine the date on which it deems each limit of catch defined in paragraph (a) of this section will be attained, and the limit of each such catch shall then be that which shall be taken prior to said date, and fishing for or catching of halibut in the area or areas to which such limit applies shall at that date be prohibited until after the end of the closed season as defined and modified in Section 3 of these regulations, except as

provided in Section 5 thereof and in Article I of the Convention, and provided that if it shall at any time become evident to the International Fisheries Commission that the limit will not be reached by such date, it may substitute another date.

LENGTH OF CLOSED SEASON

3. (a) Under the authority of Article I of the aforesaid Convention the closed season as therein defined shall be modified so as to end at 12 midnight of the 30th day of April of the year 1947 and of each year thereafter and shall begin at 12 midnight of the 30th day of November of each year unless an earlier date is determined upon for any area under the provisions of paragraph (b) of this section of these regulations.

(b) Under authority of Article I of the Convention, the closed season as therein defined shall begin in each area on the date on which the limit is reached as provided in paragraph (c) of Section 2 of these regulations and the closing of such area or areas shall be taken to have been duly approved unless before the said date either the President of the United States of America or the Governor General of Canada shall have signified his disapproval, (the burden of proving any such signification being upon the person alleging it) and provided that the closing date of Area 2 or of Area 3, whichever shall be later, shall apply to Areas 1A and 4, unless Area 4 shall have been previously closed under this section of these regulations, and that the closing date of Area 2 shall apply to Area 1B.

(c) Nothing contained in these regulations shall prohibit the fishing for species of fish other than halibut or prohibit the International Fisheries Commission from conducting fishing operations as provided for in Article I of the Convention.

ISSUANCE OF LICENSES AND CONDITIONS LIMITING THEIR VALIDITY

4. (a) All vessels of any tonnage which shall fish for halibut in any manner or hold halibut in possession in any area, or which shall transport halibut otherwise than as a common carrier documented by the Government of the United States or of Canada for the carriage of freight, must be licensed by the International Fisheries Commission, provided that vessels of less than five net tons or vessels which do not use set lines need not be licensed unless they shall require a permit as provided in Section 5 of these regulations.

(b) Each vessel licensed by the International Fisheries Commission shall carry on board at all times while at sea the halibut license thus secured whether it is validated for halibut fishing or endorsed with a permit as provided in Section 6 of these regulations and this license shall at all times be subject to inspection by authorized officers of either of said Governments or by representatives of the International Fisheries Commission.

(c) The halibut license shall be issued without fee by the customs officers of either of said Governments or by representatives of the International Fisheries Commission or by fishery officers of either of said Governments at places where there are neither customs officers nor representatives of the International Fisheries Commission. A new license may be issued by the officer accepting statistical return at any time to vessels which have furnished proof of loss of the license form previously issued, or when there shall be no further space for record thereon, providing the receipt of statistical return shall be shown on the new form for any halibut or other species taken during or after the voyage upon which loss occurred. The old license form shall be forwarded in each case to the International Fisheries Commission.

(d) The halibut license of any vessel shall be validated before departure from port for each halibut fishing operation for which statistical returns are required. This validation of a license shall be by customs officers or by fishery officers of either of said Governments when available at places where there are no customs officers and shall not be made unless the area in which the vessel will fish is entered on the license form and unless the provisions of Section 7 of these regulations have been complied with for all landings and all fishing operations since issue of the license, provided that if the master or operator of any vessel shall fail to comply with the provisions of Section 7 of these regulations, the halibut license of such vessel may be validated by customs officers upon evidence either that there has been a judicial determination of the offense or that the laws prescribing penalties therefor have been complied with, or that the said master or operator is no longer responsible for, nor sharing in, the operations of said vessel.

(e) The halibut license of any vessel fishing for halibut in Area 1A as defined in Section 1 of these regulations after the closure of Areas 1B and 2 must be validated at a port or place within Area 1A prior to each such fishing operation.

(f) No halibut license shall be validated for departure for halibut fishing in Areas 1A or 1B or 2 more than three days, and in Areas 3 or 4 more than five days before the end of the closed season as defined in Section 3(a) of these regulations.

(g) No halibut license shall be valid for halibut fishing in more than one area, as defined in Section 1 of these regulations, during any one trip nor shall it be revalidated for halibut fishing in another such area while the vessel has any halibut on board.

(h) The halibut license shall not be valid for halibut fishing in any area closed to halibut fishing or for the possession of halibut in any area closed to halibut fishing except while in actual transit to or within a port of sale.

(i) The halibut license shall not be valid for halibut fishing in any area while a permit endorsed thereon is in effect, nor shall it be validated while halibut taken under such permit is on board.

(j) The halibut license of any vessel shall not be valid for the possession of any halibut in any area other than that for which validated, if such vessel is in possession of baited gear, except in those waters included within a twenty-five mile radius of Cape Spencer Light, Alaska.

RETENTION OF HALIBUT TAKEN WITH OTHER FISH UNDER PERMIT

5. (a) There may be retained for sale on any vessel which shall have a permit as provided in Section 6 of these regulations such halibut as is caught incidentally to fishing by that vessel in any area that is closed to halibut fishing under Section 2 of these regulations with set lines (of the type commonly used in the Pacific coast halibut fishery) for other species, not to exceed at any time one pound of halibut for each seven pounds of salable fish, actually utilized, of other species not including salmon or tuna, and such halibut may be sold as the catch of said vessel, the weight of all fish to be computed as with heads off and entrails removed, provided that it shall not be a violation of this regulation for any such vessel to have in possession halibut in addition to the amount herein allowed to be sold if such additional halibut shall not exceed thirty per cent of such amount and shall be forfeited and surrendered at the time of landing as provided in paragraph (d) of this section.

(b) The catch of halibut taken and retained under such permit shall be limited to halibut which with the head on are 26 inches or more in length as measured from the tip of the lower jaw to the extreme end of the middle of the tail or to halibut which with the head off and entrails removed are 5 pounds or more in weight, and the possession of any halibut of less than the above length or the above weight, according to whether the head is on or off, by any vessel or by any master or operator of any vessel or by any person, firm or corporation, is prohibited.

(c) Halibut retained under such permit shall not be landed or otherwise removed or be received by any person, firm or corporation from the catching vessel until all halibut on board shall have been reported to a customs, fishery or other authorized enforcement officer of either of said Governments by the captain or operator of said vessel and also by the person, firm or corporation receiving the halibut, and no halibut or other fish shall be landed or removed or be received from the catching vessel except with the permission of the said officer and under such supervision as the said officer may deem advisable.

(d) Halibut retained under such permit shall not be purchased or held in possession by any person other than the master, operator or crew of the catching vessel in excess of the proportion allowed in paragraph (a) of this section of these regulations until such excess whatever its origin shall have been forfeited and surrendered to the customs, fishery or other authorized officers of either of said Governments. In forfeiting such excess, the vessel shall be permitted to surrender any part of its catch of halibut, provided that the amount retained shall not exceed the proportion herein allowed.

(e) Permits for the retention and landing of halibut in the year 1947 shall become invalid at 12 midnight of the 15th day of November of said year or at such earlier date as the International Fisheries Commission shall determine.

ISSUANCE OF PERMITS AND CONDITIONS LIMITING THEIR VALIDITY

6. (a) Any vessel which shall be used in fishing for other species than halibut in any area closed to halibut fishing under Section 2 of these regulations must have a halibut license and a permit if it shall retain, land or sell any halibut caught incidentally to such fishing or possess any halibut of any origin during such fishing, as provided in Section 5 of these regulations.

(b) The permit shall be shown by endorsement of the issuing officer on the face of the halibut license form held by said vessel and shall show the area for which the permit is issued.

(c) The permit shall terminate at the time of first landing thereafter of fish of any species and a new permit shall be secured before any subsequent fishing operation for which a permit is required.

(d) A permit shall not be issued to any vessel which shall have halibut on board taken while said vessel was licensed to fish in an open area unless such halibut shall be considered as taken under the issued permit and is thereby subject to forfeiture when landed in excess of the proportion permitted in paragraph (a) of Section 5 of these regulations.

(e) A permit shall not be issued to, or be valid if held by, any vessel which shall fish with other than set lines of the type commonly used in the Pacific coast halibut fishery.

(f) The permit of any vessel shall not be valid unless the permit is granted before departure from port for each fishing operation for which statistical returns are required. This granting of a permit shall be by customs officers or by fishery officers of either of said Governments when available at places where there are no customs officers and shall not be made unless the area in which the vessel will fish is entered on the halibut license form and unless the provisions of Section 7 of these regulations have been complied with for all landings and all fishing operations since issue of the license or permit, provided that if the master or operator of any vessel shall fail to comply with the provisions of Section 7 of these regulations, the permit of such vessel may be granted by customs officers upon evidence either that there has been a judicial determination of the offense or that the laws prescribing penalties therefor have been complied with, or that the said master or operator is no longer responsible for, nor sharing in, the operations of said vessel.

(g) The permit of any vessel shall not be valid if said vessel shall have in its possession at any time halibut in excess of the amount allowed under paragraph (a) of Section 5.

STATISTICAL RETURN BY VESSELS

7. (a) Statistical return as to the amount of halibut taken during fishing operations must be made by the master or operator of any vessel licensed under these regulations and as to the amount of halibut and other species by the master or operator of any vessel operating under permit as provided for in Sections 5 and 6 of these regulations, within 48 hours of landing, sale or transfer of halibut or of first entry thereafter into a port where there is an officer authorized to receive such return.

(b) The statistical return must state the port of landing and the amount of each species taken within the area defined in these regulations, for which the vessel's license is validated.

(c) The statistical return must include all halibut landed or transferred to other vessels and all halibut held in possession on board and must be full, true and correct in all respects herein required. A copy of such return must be forwarded to the International Fisheries Commission at such times as the latter shall require.

(d) The master or operator and/or any person engaged on shares in the operation of any vessel licensed or holding a permit under these regulations may be required by the International Fisheries Commission or by any officer of either of said Governments authorized to receive such return to certify to its correctness to the best of his information and belief and to support the certificate by a sworn statement. Validation of a halibut license or issuance of a permit after such sworn return is made shall be provisional and shall not render the license or permit valid in case the return shall later be shown to be false or fraudulently made.

(e) The master or operator of any vessel holding a license or permit under these regulations shall keep an accurate log of all fishing operations including therein date, locality, amount of gear used, and the amount of halibut taken daily in each such locality. This log record shall be open to inspection of representatives of the International Fisheries Commission authorized for this purpose.

(f) The master, operator and/or any other person engaged on shares in the operation of any vessel licensed under these regulations may be required by the International Fisheries Commission or by any officer of either of said Governments to certify to the correctness of such log record to the best of his information and belief and to support the certificate by a sworn statement.

STATISTICAL RETURN BY DEALERS

8. (a) All persons, firms or corporations that shall buy halibut or receive halibut for any purpose from fishing or transporting vessels or other carrier shall keep and on request furnish to customs officers or to any enforcing officer of either of said Governments or to representatives of the International Fisheries Commission, records of each purchase or receipt of halibut, showing date, locality, name of vessel, person, firm or corporation purchased or received from and the amount in pounds according to trade categories of the halibut and other species landed with the halibut.

(b) All persons, firms or corporations receiving fish from a vessel fishing under permit as provided in Section 5 of these regulations shall within 48 hours make to an

authorized enforcing officer of either of said Governments a signed statistical return showing the date, locality, name of vessel received from and the amount of halibut and of other species landed with the halibut and certifying that permission to receive such fish was secured in accordance with paragraph (c) of Section 5 of these regulations. Such persons, firms or corporations may be required by any officer of either of said Governments to support the accuracy of the above signed statistical return with a sworn statement.

(c) All records of all persons, firms or corporations concerning the landing, purchase, receipt and sale of halibut and other species landed therewith shall be open at all times to inspection of any enforcement officer of either of said Governments or of any authorized representative of the International Fisheries Commission. Such persons, firms or corporations may be required to certify to the correctness of such records and to support the certificate by a sworn statement.

(d) The possession by any person, firm or corporation of halibut which such person, firm or corporation knows to have been taken by a vessel without a valid halibut license or a vessel without a permit when such license or permit is required, is prohibited.

CLOSED SMALL HALIBUT GROUNDS

9. (a) The following areas have been found to be populated by small, immature halibut and are hereby closed to all halibut fishing and the possession of halibut of any origin is prohibited therein during fishing for other species:

(b) First, that area in the waters off the coast of Alaska within the following boundary as stated in terms of the magnetic compass unless otherwise indicated: from the north extremity of Cape Ulitka, Noyes Island, approximately latitude $55^{\circ} 33' 48''$ N., longitude $133^{\circ} 43' 35''$ W., to the south extremity of Wood Island, approximately latitude $55^{\circ} 39' 44''$ N., longitude $133^{\circ} 42' 29''$ W.; thence to the east extremity of Timbered Islet, approximately latitude $55^{\circ} 41' 47''$ N., longitude $133^{\circ} 47' 42''$ W.; thence to the true west extremity of Timbered Islet, approximately latitude $55^{\circ} 41' 46''$ N., longitude $133^{\circ} 48' 01''$ W.; thence southwest three-quarters south sixteen and five-eighths miles to a point approximately latitude $55^{\circ} 34' 46''$ N., longitude $134^{\circ} 14' 40''$ W.; thence southeast by south twelve and one-half miles to a point approximately latitude $55^{\circ} 22' 23''$ N., longitude $134^{\circ} 12' 48''$ W.; thence northeast thirteen and seven-eighths miles to the southern extremity of Cape Addington, Noyes Island, latitude $55^{\circ} 26' 11''$ N., longitude $133^{\circ} 49' 12''$ W.; and to the point of origin on Cape Ulitka. The boundary lines herein indicated shall be determined from Chart 8157, as published by the United States Coast and Geodetic Survey at Washington, D.C., in June, 1929, and Chart 8152, as published by the United States Coast and Geodetic Survey at Washington, D.C., in March, 1933, and reissued March, 1939, except for the point of Cape Addington which shall be determined from Chart 8158, as published by the United States Coast and Geodetic Survey in December, 1923, provided that the duly authorized officers of the United States of America may at any time place a plainly visible mark or marks at any point or points as nearly as practicable on the boundary line defined herein, and such mark or marks shall thereafter be considered as correctly defining said boundary.

(c) Second, that area lying in the waters off the north coast of Graham Island, British Columbia, within the following boundary: from the northwest extremity of Wiah Point, latitude $54^{\circ} 06' 50''$ N., longitude $132^{\circ} 19' 18''$ W., true north five and one-half miles to a point approximately latitude $54^{\circ} 12' 20''$ N., longitude $132^{\circ} 19' 18''$ W.; thence true east approximately sixteen and three-tenths miles to a point which shall lie northwest (according to magnetic compass at any time) of the highest point of Tow Hill, Graham Island, latitude $54^{\circ} 04' 24''$ N., longitude $131^{\circ} 48' 00''$ W.; thence southeast to the said highest point of Tow Hill. The points on the shoreline of the above mentioned island shall be determined from Chart 3754, published at the Admiralty, London, April 11, 1911, provided that the duly authorized officers of the Dominion of Canada may at any time place a plainly visible mark or marks at any point or points as nearly as practicable on the boundary line defined herein, and such marks shall thereafter be considered as correctly defining said boundary.

DORY GEAR PROHIBITED

10. The use of any hand gurdy or other appliance in hauling halibut gear by hand power in any dory or small boat operated from a vessel licensed under the provisions of these regulations is prohibited in all convention waters.

NETS PROHIBITED

11. It is prohibited to retain halibut taken with a net of any kind or to have in possession any halibut while using any net or nets other than bait nets for the capture of other species of fish, nor shall any license or permit held by any vessel under these regulations be valid during the use or possession on board of any net or nets other than bait nets which are utilized for no other purpose than the capture of bait for said vessel.

RETENTION OF TAGGED HALIBUT

12. Nothing contained in these regulations shall prohibit any vessel at any time from retaining and landing any halibut which bears an International Fisheries Commission tag at the time of capture, provided that such halibut with the tag still attached is reported at the time of landing to representatives of the International Fisheries Commission or to enforcement officers of either of said Governments and is made available to them for examination.

RESPONSIBILITY OF MASTER

13. Wherever in these regulations any duty is laid upon any vessel, it shall be the personal responsibility of the master or operator of said vessel to see that said duty is performed and he shall personally be responsible for the performance of said duty. This provision shall not be construed to relieve any member of the crew of any responsibility with which he would otherwise be chargeable.

SUPERVISION OF UNLOADING AND WEIGHING

14. The unloading and weighing of the halibut of any vessel licensed or holding a permit under these regulations shall be under such supervision as the customs or other authorized officer may deem advisable in order to assure the fulfilment of the provisions of these regulations.

PREVIOUS REGULATIONS SUPERSEDED

15. These regulations shall supersede all previous regulations adopted pursuant to the Convention between the United States of America and the Dominion of Canada for preservation of the halibut fishery of the northern Pacific Ocean and Bering Sea, signed January 29, 1937, except as to offenses occurring prior to the approval of these regulations. These regulations shall be effective as to each succeeding year, with the dates herein specified changed accordingly, until superseded by subsequently approved regulations. Any determination made by the International Fisheries Commission pursuant to these regulations shall become effective immediately.

(Signed)

EDWARD W. ALLEN, *Chairman*
A. J. WHITMORE
MILTON C. JAMES
G. W. NICKERSON, *Secretary*

Approved by THE PRESIDENT OF THE UNITED STATES OF AMERICA, March 17, 1947.

Approved by THE GOVERNOR GENERAL OF THE DOMINION OF CANADA, by Order in Council of March 4, 1947, P. C. 782, effective March 17, 1947.