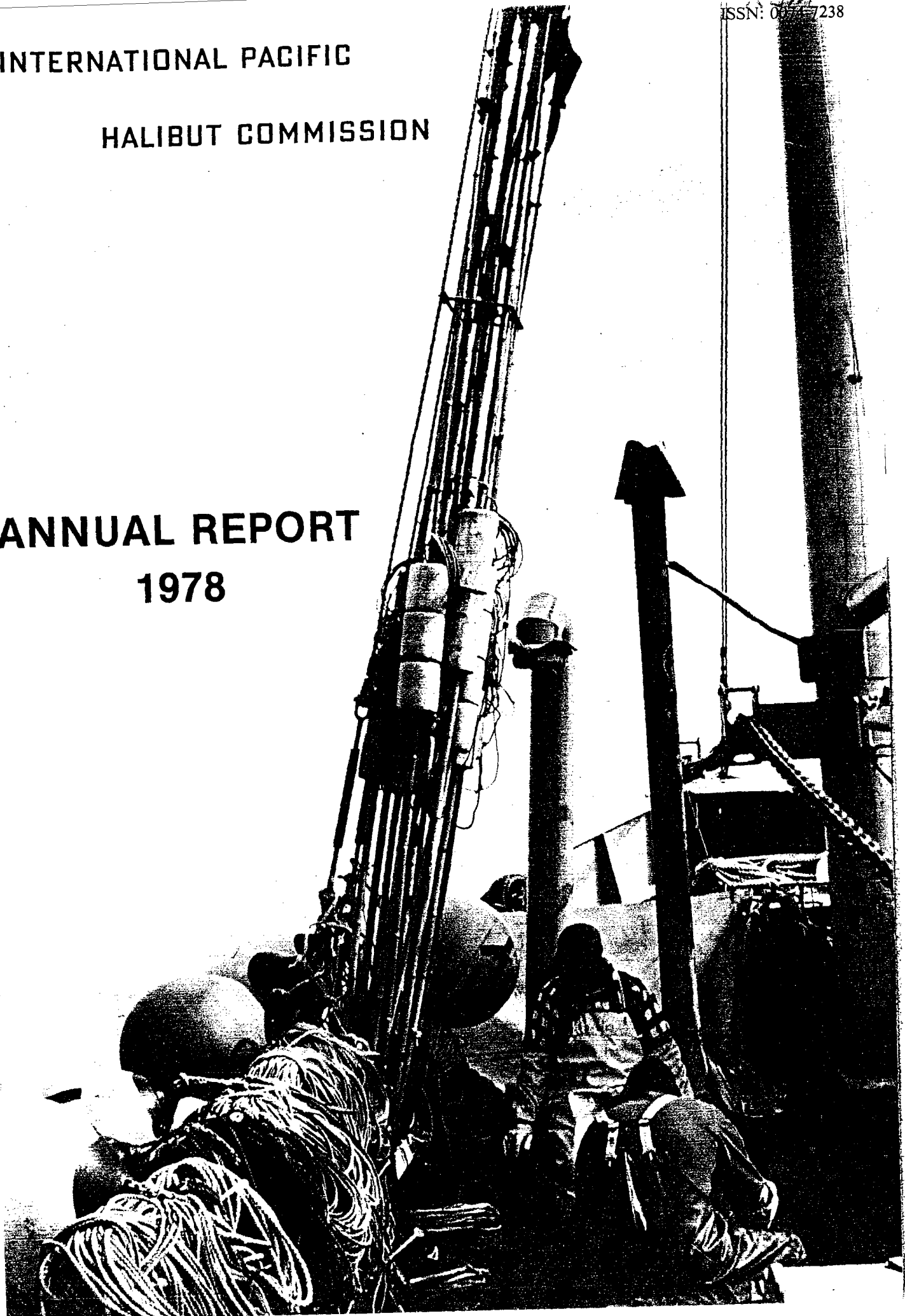


**INTERNATIONAL PACIFIC  
HALIBUT COMMISSION**

**ANNUAL REPORT  
1978**



**INTERNATIONAL PACIFIC HALIBUT COMMISSION**

**ESTABLISHED BY A CONVENTION BETWEEN  
CANADA AND THE UNITED STATES OF AMERICA**

**ANNUAL REPORT  
1978**

**COMMISSIONERS**

**NEILS M. EVENS**

**JOHN A. O'CONNOR**

**WILLIAM S. GILBERT**

**ROBERT W. SCHONING**

**CLIFFORD R. LEVELTON**

**PETER C. WALLIN**

**DIRECTOR**

**DONALD A. McCAUGHRAN**

**SEATTLE, WASHINGTON**

**1979**

## COMMISSIONERS

### CANADA

John Pease Babcock . . . . . 1924-1936  
William A. Found . . . . . 1924-1936  
A. J. Whitmore . . . . . 1936-1948  
George L. Alexander . . . . . 1936-1937  
Lewis W. Patmore . . . . . 1937-1943  
George W. Nickerson . . . . . 1943-1953  
Stewart Bates . . . . . 1948-1949  
George R. Clark . . . . . 1949-1955  
Harold S. Helland . . . . . 1953-1963  
Richard Nelson . . . . . 1953-1964  
S. V. Ozere . . . . . 1955-1957  
William M. Sprules . . . . . 1957-1973  
Martin K. Eriksen . . . . . 1963-1973  
Jack T. Prince . . . . . 1974-1976  
Francis W. Millerd . . . . . 1964-1977  
Clifford R. Levelton . . . . . 1974-  
Peter C. Wallin . . . . . 1977-  
John A. O'Connor . . . . . 1978-

### UNITED STATES

Miller Freeman . . . . . 1924-1932  
Henry O'Malley . . . . . 1924-1933  
Edward W. Allen . . . . . 1932-1955  
Frank T. Bell . . . . . 1933-1940  
Charles E. Jackson . . . . . 1940-1946  
Milton C. James . . . . . 1946-1952  
Seton H. Thompson . . . . . 1952-1959  
J. W. Mendenhall . . . . . 1954-1958  
Mattias Madsen . . . . . 1955-1964  
William A. Bates . . . . . 1958-1964  
Andrew W. Anderson . . . . . 1959-1961  
Harold E. Crowther . . . . . 1961-1972  
Haakon M. Selvar . . . . . 1964-1972  
L. Adolph Mathisen . . . . . 1965-1970  
Neils M. Evens . . . . . 1970-  
William S. Gilbert . . . . . 1972-  
Robert W. Schoning . . . . . 1972-

## STAFF

Bernard E. Skud . . . . . Director (through July)  
Donald A. McCaughran . . . . . Director  
Richard J. Myhre . . . . . Assistant Director  
  
Edgar A. Best . . . . . Senior Biologist  
Lia Bijsterveld . . . . . Assistant Biologist  
Juanita M. Devoe . . . . . Laboratory Technician  
Kenneth W. Exelby . . . . . Associate Biologist  
William H. Hardman . . . . . Biologist  
Stephen H. Hoag . . . . . Senior Biologist  
Elizabeth E. MacNutt . . . . . Data Transcriber  
Ethel M. Margeson . . . . . Staff Secretary  
Ian R. McGregor . . . . . Associate Biologist  
Mary Ann Pape . . . . . Administrative Assistant  
Gordon J. Peltonen . . . . . Biologist  
Cyreis C. Schmitt . . . . . Associate Biologist  
Phyllis Severeid . . . . . Executive Secretary  
Linda Shen . . . . . Data Transcriber  
Norman D. Speedie . . . . . Administrative Officer  
Gilbert St-Pierre . . . . . Associate Biologist  
Ruth Trimmer . . . . . Receptionist/Secretary  
Raymond E. Walden . . . . . Programmer  
Jocelyne E. Watson . . . . . Librarian  
Gregg H. Williams . . . . . Assistant Biologist

## Preface

---

The International Pacific Halibut Commission (IPHC) was established in 1923 by a Convention between Canada and the United States for the preservation of the halibut (*Hippoglossus stenolepis*) fishery of the North Pacific Ocean and the Bering Sea. The Convention was the first international agreement providing for joint management of a marine resource. The Conventions of 1930 and 1937 extended the Commission's authority and the 1953 Treaty specified that the halibut stocks be developed and maintained at levels that permit the maximum sustained yield.

Three Commissioners are appointed by the Governor General of Canada and three by the President of the United States. The Commissioners appoint the Director who supervises the scientific and administrative staff. The scientific staff collects and analyzes statistical and biological data needed to manage the halibut fishery. The headquarters and laboratory are located on the campus of the University of Washington in Seattle, Washington. Each country provides one-half of the Commission's annual appropriation.

The Commissioners meet annually to review all regulatory proposals, including those made by the scientific staff and the Conference Board which represents vessel owners and fishermen. Regulatory alternatives are discussed with the Advisory Group composed of fishermen, vessel owners, and processors. The measures recommended by the Commissioners are submitted to the two governments for approval. Citizens of each nation are required to observe the regulations that are adopted.

The International Pacific Halibut Commission has three publications: Annual Reports (U.S. ISSN 0074-7238), Scientific Reports (U.S. ISSN 0074-7246), and Technical Reports (U.S. ISSN 0579-3920). Until 1969, only one series was published. The numbering of the original series has been continued with the Scientific Reports.

Cover: Halibut schooner M/V SEYMOUR with gear on the rail.

INTERNATIONAL PACIFIC HALIBUT COMMISSION  
P.O. Box 5009, UNIVERSITY STATION  
SEATTLE, WASHINGTON 98105, U.S.A.

# International Pacific Halibut Commission

## ANNUAL REPORT 1978

### Contents

---

Activities of the Commission .....	4
Director's Report .....	6
Regulations for 1978 .....	9
Regulatory Proposals .....	9
Regulatory Areas .....	10
Catch Limits and Length of Seasons .....	11
Other Regulations .....	12
Statistics of the Fishery .....	13
Commercial Fishery .....	13
Catch by Regulatory Area .....	13
Landings by Port .....	14
Number of Vessels .....	14
Sublegal Halibut .....	16
Sport Fishery .....	16
Other Fisheries .....	16
Assessment of Stocks .....	18
Abundance of Adult Halibut .....	18
Abundance of Young Halibut .....	18
Equilibrium Yield .....	21
Scientific Investigations .....	24
Tagging .....	24
Stock Assessment Survey .....	24
Juvenile Halibut .....	25
Fecundity and Maturity .....	27
Population Models .....	28
Computer System .....	28
Kachemak Bay Sport Fishery .....	29
Catch Sampling .....	29
Appendices .....	31
Publications .....	35
Calendar Year 1978 .....	35
Commission Publications, 1930-1978 .....	37

## Activities of the Commission

---

The Commission held its 54th Annual Meeting in Seattle, Washington, January 24-27, 1978. Mr. Robert W. Schoning served as Chairman and Mr. Clifford R. Levelton was Vice Chairman. The Commission staff presented a review of the 1977 halibut fishery and the results of scientific investigations, and presented regulatory proposals for the 1978 halibut fishery. The staff summarized responses to a questionnaire distributed to fishermen to obtain their views and recommendations for regulations for the 1978 fishery. The Conference Board, representing vessel owners and fishermen, presented and discussed their regulatory proposals with the Commission. The Commission reviewed all proposals with the Advisory Group before regulations for the 1978 halibut fishery were adopted and sent to the Canadian and United States Governments for approval.

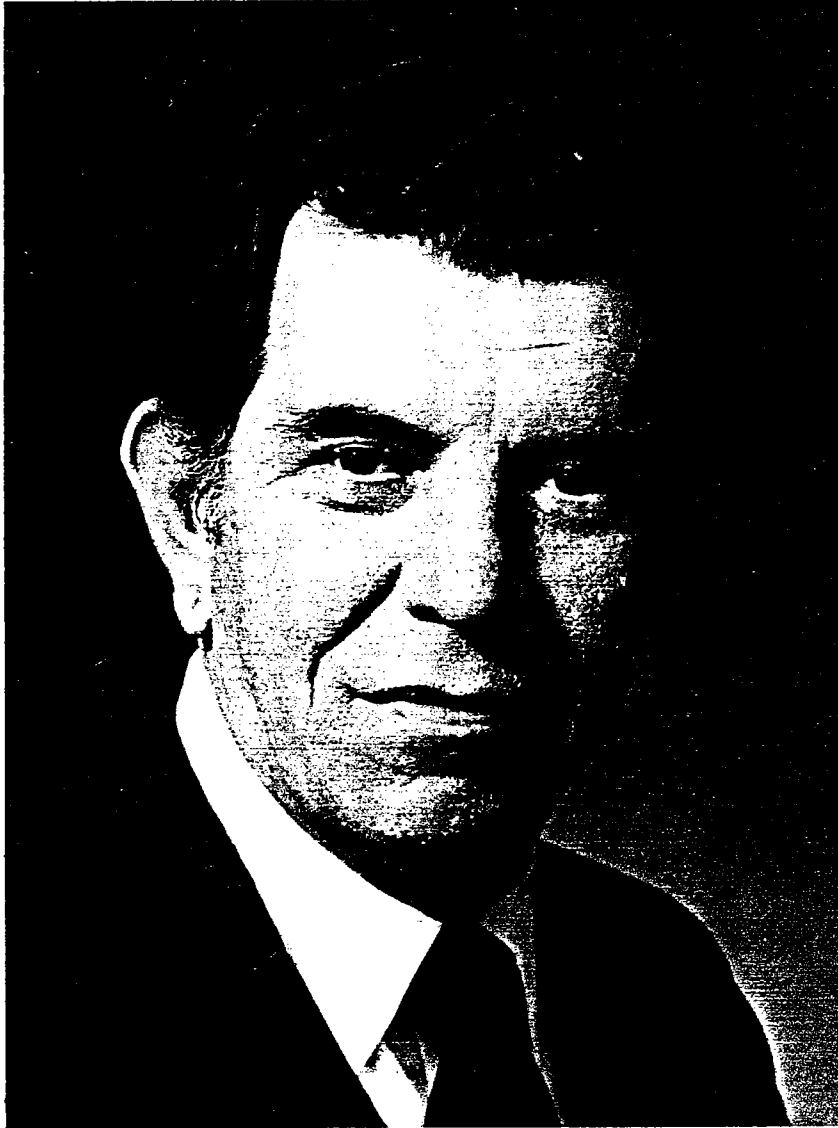
The Commission considered administrative and fiscal matters, approved research plans for 1978, and adopted the budget for fiscal year 1980-81. Mr. Levelton was elected Chairman for 1978 and Mr. Schoning was elected Vice Chairman. At the close of the meeting, a news release was issued explaining the Commission's recommendations and expressing concern for the continuing low level of stock abundance. This announcement also summarized regulations recommended to both governments for the 1978 fishing season.

Letters were sent to the governments expressing concern for the condition of the halibut resource. The Commission supported action by both governments to reduce the impact of foreign fishing on the halibut resource and urged that additional protection for halibut be afforded wherever possible. The letters expressed the need for more research to determine how the incidental catch of halibut can be reduced while effectively providing for the catching of other species.

The Commission met again in Seattle, Washington on September 21, 1978, to briefly review the 1978 halibut fishing season and to discuss the status of negotiations of fishery matters between the two countries, particularly with respect to the Commission and to halibut management. At the close of the meeting the Commission sent a letter to both governments expressing deep concern about the impending termination of the Halibut Convention and the need for joint research and management owing to the extensive movement of halibut across national boundary lines at all stages of its life history.

A list of reports published by the Commission during 1978 is given at the end of this report. In addition, several documents were prepared at the request of the governments and the North Pacific Fishery Management Council.

Expenditures during the 1977-1978 fiscal year (April to March) were \$890,600. Commission expenses are shared equally by both governments as required under the Halibut Convention.



**BERNARD E. SKUD**  
Director, 1970-1978

The Commissioners and staff gratefully acknowledge the contributions of Mr. Skud during his tenure as Director.

## Director's Report

---

The United States Fisheries Conservation and Management Act of 1976 required renegotiation of all international fisheries treaties. Negotiations took place this past winter and a new west coast fisheries agreement between Canada and the United States was reached on March 29, 1979. As part of the agreement, the International Pacific Halibut Commission is to be continued in its traditional form. Had an agreement not been reached, the Commission would have been dissolved on April 1, 1979. Although this is a report on 1978 activities, it seems timely that I discuss the new settlement and its implications regarding the management of the Pacific halibut.

The most significant change caused by the new agreement is that reciprocal fishing privileges will end. United States fishermen will no longer be allowed to fish in Canadian waters, and Canadian fishermen will be phased out of United States waters over two years beginning with the 1979 season. Canadian fishermen will be allowed 2 million pounds from U.S. waters in 1979 and 1 million pounds in 1980. This restriction will cause a hardship on some fishermen and alter the distribution of fishing effort on certain components of the stock. The new protocol also requires that 60% of the catch limit in Area 2 be taken in Canadian waters and 40% in U.S. waters. The division is based on the catches by the two countries over the past several years. The Commission does not recognize separate stocks within Area 2 and will continue to set a quota for the area as a whole with a subdivision to satisfy the agreement.

A complicating factor in proportioning catch quotas under the new agreement is the substantial migrations halibut undertake. Eggs and larvae from halibut spawning off British Columbia drift north and west into Alaska waters, possibly as far as the eastern Bering Sea. In turn, juvenile halibut migrate east and south to waters off Alaska, British Columbia, Washington, and Oregon. Halibut also move seasonally across national boundaries for spawning and feeding. Due to this "transboundary" nature of halibut, fishing in one national zone will affect the yield from the other zone, thus complicating the determination of a fair proportionment of the harvest.

In addition, the incidental catch of halibut in trawl and pot fisheries presents a potential interception problem because mortality is inflicted on highly mobile juvenile halibut that may be destined to cross the international boundary and enter the other country's fishery. The longline fisheries also intercept older halibut destined for other regions, but adult halibut generally move less than juveniles. Halibut interception not only complicates international management, it also affects relative stock abundance between regions within national zones.

The new agreement has increased the need for more precise information on stock units and the extent and nature of halibut movements. Past data have provided considerable insight, but important questions remain unanswered. The Commission staff is recommending an expanded tagging program on juveniles: a winter spawning ground tagging survey, and a quantitative determination of egg and larval



drift. The results from these studies will allow the Commission to provide the two governments with more precise information on stock components and appropriate yields.

The Commission staff is confident that stocks can be rebuilt for the benefit of both countries under the new agreement if catches are kept below equilibrium yield and incidental catches can be reduced.

The excellent cooperation between the two countries over the past 55 years has produced one of the outstanding conservation records in world fisheries. If the same spirit of cooperation is maintained, future benefits from the halibut resource will be guaranteed.

## Regulations for 1978

---

### REGULATORY PROPOSALS

Regulatory proposals for the 1978 halibut fishery were submitted by the fishermen, vessel owners, processors, government agencies, the Fishermen's Marketing Association, and the Commission scientific staff. A summary of all proposals was distributed to all interested groups prior to the Annual Meeting. The staff recommended catch limits of 9,000,000 pounds in Area 2 and 11,000,000 pounds in Area 3. The proposed catch limit in Area 2 was 2,000,000 pounds less than the catch limit in 1977. No change was recommended in the Area 3 catch limit. The staff also favored a continuation of the split fishing season first adopted in 1977. A first opening date of May 8 was chosen to coincide with favorable tides. The staff proposed a modification of the regulatory areas in the Bering Sea and the Gulf of Alaska west of Unimak Island, so that the waters north and south of the Aleutian Islands could open and close at the same time. This change was possible because national fisheries jurisdiction was extended and the responsibilities of the International North Pacific Fisheries Commission were altered. The staff recommended that other regulatory provisions, such as nursery areas, size limits, gear restrictions, opening and closing hours, and sport fishery regulations remain the same as in 1977.

The Conference Board proposed a catch limit of 11,000,000 pounds in Area 2 and 12,000,000 pounds in Area 3, a continuation of the special fishing season in western Area 3 in late September, and a split fishing season with the first opening on May 13. The Conference Board also requested that a study be undertaken to examine the effect of the domestic trawl fishery and the sport fishery on the halibut stocks. Petersburg delegates to the Conference Board submitted a minority statement requesting catch limits of 7,000,000 pounds in Area 2 and 8,000,000 pounds in Area 3.

The Commission again circulated a questionnaire prior to the Annual Meeting to solicit regulatory proposals from vessel captains, many of whom are not members of vessel owner or union organizations. The questionnaire was intended to supplement information received from the Conference Board and to obtain advice from individuals who might not otherwise have an opportunity to make proposals. Over 2,200 questionnaires were mailed out and 390 or 18% replied. Although individual responses varied widely, the average response indicated a preference for an Area 2 catch limit of 11,000,000 pounds and 12,000,000 pounds in Area 3, and continuation of the split fishing season with a May 11 opening date, 17 day open periods and 13 day closed periods. Respondents strongly supported reciprocal landings (81%) and continued management of halibut by IPHC (94%).

The Fishermen's Marketing Association, an association of Washington trawlers, urged that more definitive steps be taken toward reducing the wastage of halibut caught incidentally by domestic trawlers.

All regulatory alternatives were discussed with the Advisory Group, consisting

of representatives of fishermen, vessel owners, and processors. Members of the Advisory Group in 1978 were Robert Alverson, Ralph Hoard, Richard Mathisen, Neil Sandvik (Seattle, Washington); William Anderson, Arne Baardsen, Gary Cadorn, George Dodman, Arthur Hellin, Donald Russell (Vancouver, British Columbia); Arthur Gallagher, Donald McCloud, Frank Stewart (Prince Rupert, British Columbia); Albert Davis (Kake, Alaska); John Jensen, Sig Mathisen, Tom Thompson (Petersburg, Alaska); Richard Eliason, Lee Higby (Sitka, Alaska); Jere Murray (Homer, Alaska); Kim Buckman and John Pugh (Kodiak, Alaska).

The regulations recommended by the Commission were approved by the United States Secretary of State on March 17, 1978, and by the Governor General of Canada by Order in Council on March 23, 1978, and became effective on the latter date. The 1978 halibut regulations are described below.

## REGULATORY AREAS

Regulatory areas in 1978 are shown in Figure 1. Regulatory Areas 2 and 3 were unchanged in 1978, except that reference to sub-Areas 3A and 3B was dropped. Sub-Area 3C was retained as a separate designation because it was open to fishing both before and after the general Area 3 fishery. Regions in Area 4 east of 175°W. longitude were consolidated to form Area 4-East. The closed nursery area, formerly called 4E, continued in existence and the region west of 175°W. longitude was

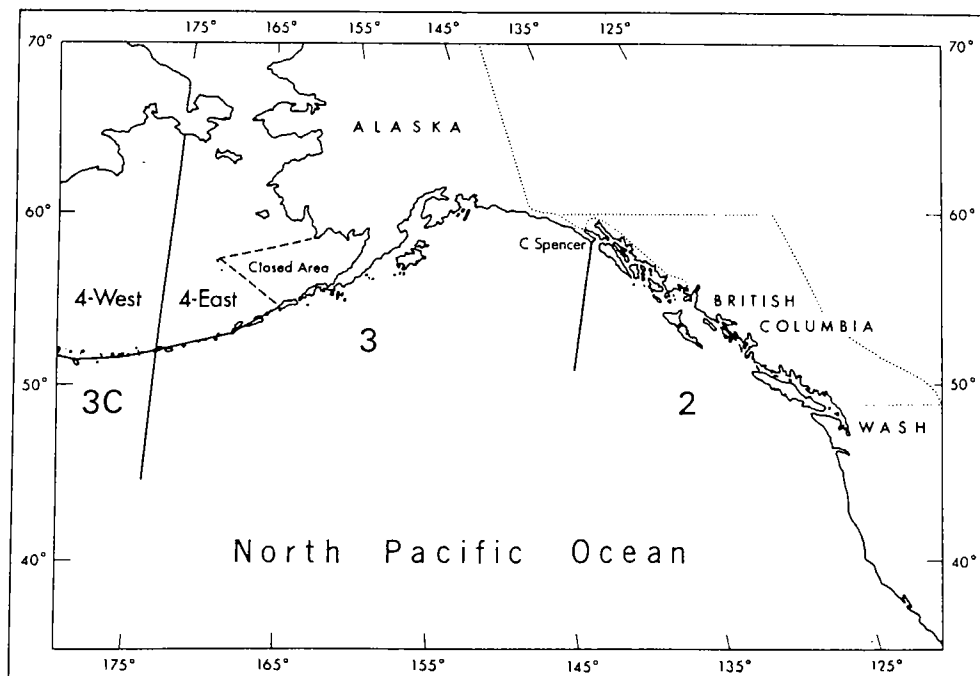


Figure 1. Regulatory areas for the Pacific halibut fishery, 1978.

renamed 4-West. The following is a description of the regulatory areas for the halibut fishery in 1978:

Area 2 - South and east of Cape Spencer, Alaska.

Area 3 - North and west of Area 2, excluding the Bering Sea.

3C: West of 175°W. longitude.

Area 4 - The Bering Sea.

4-East: East of 175°W. longitude, excluding the closed area.

4-West: West of 175°W. longitude.

Closed area: The southeastern flats.

## CATCH LIMITS AND LENGTH OF SEASONS

The 1978 catch limit in Area 2 was 9,000,000 pounds, 2,000,000 pounds less than the catch limit in 1977. In Area 3 the catch limit was 11,000,000 pounds, the same as in 1977. Areas 3C, 4-East, and 4-West were regulated by fishing season and not assigned catch limits.

The opening and closing dates and lengths of fishing seasons for 1977 and 1978 are given in Table 1. The fishing seasons in Areas 2 and 3, excluding Area 3C, consisted of four fishing periods of specified lengths, except that fishing was allowed during only part of the last period because the catch limit was taken. The fishing seasons in all areas began at 1500 hours and ended at 0600 hours PST.

Table 1. Opening and closing dates by area, 1977-1978.

Area	1977			1978		
	Opening	Closing	Fishing Days	Opening	Closing	Fishing Days
2	May 10	May 29	19	May 15	May 31	16
	June 16	July 4	18	June 19	July 6	17
	July 20	Aug. 7	18	July 25	Aug. 10	16
	Aug. 23	Sept. 10	18	Aug. 26	Sept. 8	13
3 (3A, 3B)*	May 10	May 29	19	May 15	May 31	16
	June 16	July 4	18	June 19	July 6	17
	July 20	July 30	10	July 25	Aug. 4	10
(3B)*	Sept. 15	Oct. 3	18			
3C	Apr. 1	Nov. 15	227	Apr. 8	Nov. 15	220
4-East (4A, B, C, D-East)*	Apr. 1	Apr. 21	19	Apr. 8	Apr. 28	19
	Aug. 9	Aug. 29	19	Aug. 16	Sept. 3	17
4-West (4D-West)*	Apr. 1	Nov. 15	227	Apr. 8	Nov. 15	220

\*Area designations in brackets were used in 1977.

## Statistics of the Fishery

### COMMERCIAL FISHERY

A compilation of historical statistics was published in 1977 as Technical Report Number 14, "The Pacific Halibut Fishery: Catch, Effort and CPUE, 1929-1975." The report summarizes catch and effort data by statistical area, region, regulatory area, and country; data on landings also are given by port and country. Appendix tables in this Annual Report and the 1977 Annual Report are in the same format and update those statistics to 1978.

#### Catch by Regulatory Area

The total commercial catch in 1978 was 22.0 million pounds, almost identical to the 1977 catch of 21.9 million pounds. The division of the catch between Canada and the United States was nearly the same as in 1977 with Canadian vessels taking 8.6 million pounds (39%) and the United States vessels taking 13.4 million pounds (61%). The catch by country and regulatory area is shown for 1974 through 1978 in Table 2.

Table 2. Catch by country and regulatory area, 1974-1978.

Regulatory Area	1974	1975	1976	1977	1978
Catch in Thousands of Pounds					
Area 2					
U.S.	5,771	6,461	5,648	3,113	3,746
Canada	<u>4,973</u>	<u>7,369</u>	<u>7,400</u>	<u>5,707</u>	<u>5,274</u>
Total	10,744	13,830	13,048	8,820	9,020
Area 3					
U.S.	7,898	9,442	9,430	9,446	9,013
Canada	<u>2,227</u>	<u>3,819</u>	<u>4,534</u>	<u>2,921</u>	<u>3,297</u>
Total	10,125	13,261	13,964	12,367	12,310
Area 4					
U.S.	269	356	461	542	624
Canada	<u>168</u>	<u>169</u>	<u>62</u>	<u>139</u>	<u>34</u>
Total	437	525	523	681	658
All Areas					
U.S.	13,938	16,259	15,539	13,101	13,383
Canada	<u>7,368</u>	<u>11,357</u>	<u>11,996</u>	<u>8,767</u>	<u>8,605</u>
Total	21,306	27,616	27,535	21,868	21,988

## OTHER REGULATIONS

The minimum size limit for halibut was the same as in 1977. However, the wording of the regulation was changed so that the head-on limit of 32 inches applied only when the head was on the fish, and the head-off limit of 24 inches applied only when the head had been removed. This change was made to eliminate the possibility that the head-off measurement could be applied when the head was on the fish.

The sport fishery regulations for halibut remained the same as in 1977, except that the captain or operator of any vessel used in charter service for sport fishing was made responsible for violations of the regulations by any person on board the vessel.

All other regulations pertaining to licensing and gear restrictions remained unchanged from 1977.

The Area 2 catch was 9.0 million pounds, 0.2 million more than in 1977 and the same as the catch limit. In southeastern Alaska, the catch was about 1.2 million pounds higher than in 1977, reflecting an improved catch per unit effort (CPUE) in that region. Conversely, the catch in the Charlotte and Vancouver regions declined 0.9 million pounds from the previous year.

In Area 3, the catch was 12.3 million pounds, 0.1 million pounds less than the 1977 catch. The catch during the regular season which closed on August 4 was 11.9 million pounds, 0.9 million over the catch limit. The catch limit was inadvertently exceeded due to an unforeseen increase in CPUE during the third fishing period which, coupled with good weather, allowed the fishing fleet to maximize its fishing effort. The catch in the Kodiak and Yakutat regions was 10.3 million pounds in 1978 compared to 8.6 million pounds in 1977; whereas the catch in the Chirikof and Shumagin regions was only 1.3 million pounds in 1978, down 2.0 million from the 3.3 million pounds taken from these regions in 1977. In the Aleutian region, the catch was 0.7 million pounds of which 0.5 million were taken in Area 3C during the fall months.

In Area 4 (the Bering Sea) the total catch was 658,000 pounds, slightly below the 681,000 pounds landed in 1977. United States vessels caught 624,000 pounds: 174,000 during the spring season and 450,000 pounds during the summer and fall seasons. Two Canadian vessels caught 34,000 pounds, all during the summer and fall. Most of the Area 4 catch was taken from fishing grounds adjacent to the Aleutian Islands.

The total value of the catch has generally increased since 1929. The lower landings in recent years have been offset by higher prices, and the landed value of the 1978 catch was a record \$37 million (U.S. dollars). Fishermen received an average price of \$1.70 per pound. Previously, the most valuable catch was \$34.7 million in 1976, and the previous high price per pound was \$1.31 in 1977. Appendix II shows the annual landings, average ex-vessel price (price to the fisherman), and value of the landings from 1929-1978.

## **Landings by Port**

For the second year in a row, Kodiak, Alaska led all ports on the Pacific coast with landings of 3.7 million pounds. Seward, Alaska recorded the second highest landings with 3.4 million, followed by Prince Rupert, British Columbia with 3.1 million pounds. Landings generally increased in Washington and southeastern Alaska ports and declined in most central Alaska and British Columbia ports. Details of the landings by port for 1978 are given in Appendix I, Table 5.

## **Number of Vessels**

Table 3 shows the number of vessels, the number of trips, and the catch by vessel category in 1978. Licensed vessels are those 5 net tons or larger that fish halibut with setline gear. Unlicensed vessels are setliners less than 5 net tons and trollers and handliners. The number of licensed vessels in Areas 2 and 3 decreased from 1,204 in 1977 to 1,166 in 1978. The number of unlicensed vessels also declined in 1978. The overall decline was due to a reduction (19%) in the number of Canadian vessels. A moderate increase in the number of United States vessels occurred in all vessel categories.

Licensed vessels caught 92% of the catch in 1978, a 2% increase over 1977. Licensed vessels took 86% of the catch in Area 2 and 96% of the catch in Areas 3 and 4.

**Table 3. Number of vessels, number of trips, and catch by licensed and unlicensed vessels in Areas 2 and 3, 1978.**

Vessel Category	Canada			United States			Total		
	No. of Vessels	No. of Trips	Catch 000's Pounds	No. of Vessels	No. of Trips	Catch 000's Pounds	No. of Vessels	No. of Trips	Catch 000's Pounds
<b>AREA 2</b>									
Unlicensed									
Trollers	489	827	61	981	2,051	112	1,470	2,878	173
Setliners	97	179	98	350	1,259	564	447	1,438	662
Other**	-	-	309	-	-	3	-	-	312
Total	586	1,006	468	1,331	3,310	679	1,917	4,316	1,147
Licensed									
5-19 tons***	557	1,271	2,511	175	808	1,381	732	2,079	3,892
20-39 tons	37	97	1,334	35	110	672	72	207	2,006
40-59 tons	3	7	63	6	16	122	9	23	185
60+ tons	1	4	156	1	3	116	2	7	272
Total	598	1,379	4,064	217	937	2,291	815	2,316	6,355
All Vessels	1,184	2,385	4,532	1,548	4,247	2,970	2,732	6,632	7,502
<b>AREA 3*</b>									
Unlicensed									
Trollers	-	-	-	73	215	28	73	215	28
Setliners	1	4	55	480	1,403	559	481	1,407	614
Other**	-	-	-	-	-	1	-	-	1
Total	1	4	55	553	1,618	588	554	1,622	643
Licensed									
5-19 tons***	6	26	341	204	623	1,785	210	649	2,126
20-39 tons	16	48	1,787	81	283	4,685	97	331	6,472
40-59 tons	4	10	352	21	86	2,842	25	96	3,194
60+ tons	12	32	1,538	7	16	513	19	48	2,051
Total	38	116	4,018	313	1,008	9,825	351	1,124	13,843
All Vessels	39	120	4,073	866	2,626	10,413	905	2,746	14,486
Grand Total	1,223	2,505	8,605	2,414	6,873	13,363	3,637	9,378	21,988

\*Includes vessels that fished in both Areas 2 and 3, and those that fished in Area 4.

\*\*Deliveries of unknown origin.

\*\*\*Includes small vessels of unknown tonnage.



## **Sublegal Halibut**

Regulations require that incidentally caught halibut that are below the legal size limit (32 inches) be released. To estimate the magnitude of this catch, data on the number of undersized halibut rejected at sea were collected from fishermen's log books in 1976, 1977, and 1978. The rate of survival varies with conditions and was estimated by fishermen to be 67% in 1976, 60% in 1977, and 65% in 1978. Data from IPHC stock assessment cruises indicate that the average weight of these small fish in Area 2 was 8.0 pounds in 1976, 7.7 pounds in 1977, and 7.5 pounds in 1978. In Area 3, the average weight was 4.8 pounds, 5.8 pounds, and 5.6 pounds, respectively. Extrapolating the results to the entire fleet shows that the total catch of undersized halibut for the coast as a whole was about 2.1 million pounds (332,000 fish) in 1976, 1.3 million pounds (194,000 fish) in 1977, and 2.1 million pounds (325,000 fish) in 1978.

## **SPORT FISHERY**

IPHC relies on state and federal agencies for estimates of the sports catch of halibut.

According to preliminary estimates made by the Alaska Department of Fish and Game, 37,085 halibut were caught by sport fishermen in 1978. The catch in the Cook Inlet area was 28,300 fish, followed by southeastern Alaska with 6,131 fish, Kodiak area with 1,721 fish, and Prince William Sound with 933 fish.

The number of fish caught by Alaskan fishermen reported in the 1977 Annual Report was a preliminary estimate. The final, revised numbers are as follows: Cook Inlet area - 15,171 fish, southeastern Alaska - 5,832 fish, Kodiak area - 994 fish, and Prince William Sound - 1,247 fish.

Canadian sport fishermen caught 453 halibut with an average weight of about 25 pounds according to a preliminary tally of fishery officer reports. The 1978 catch is about half the catch reported for 1977. Most of the 1978 catch was from the area between Prince Rupert and Milbanke Sound and from the Strait of Juan de Fuca.

The Washington Department of Fisheries reports that sport fishermen caught 531 halibut in 1978. This is 40% below the 1977 catch of 893 fish. The catch was evenly divided between the Washington coast and the Strait of Juan de Fuca.

## **OTHER FISHERIES**

Halibut are caught inadvertently by foreign and domestic fishermen seeking other species. Although regulations prohibit the retention of incidentally caught halibut in these fisheries, many of the released fish die from injuries received during capture. The magnitude of the incidental catch is not precisely known, but is estimated from data collected by observers who sample the catch at sea. Some estimates are based on meager data or on data that may not be entirely representative, and all of the estimates may change as additional information becomes available. The majority of the incidental catch consists of small halibut, below the size caught in the commercial fishery.

In 1977, the most recent year for which data are available, the total incidental catch was estimated at 12.7 million pounds: 1.9 million pounds in the eastern Bering Sea and 10.8 million pounds in the northeast Pacific Ocean. In the eastern Bering Sea, 1.4 million pounds were caught by foreign trawls and 0.5 million pounds by domestic pot gear. The catch in the northeast Pacific Ocean consisted of 4.4 million pounds by foreign trawls, 0.2 million pounds by foreign setlines, 5.2 million pounds by domestic trawls, and 1.0 million pounds by domestic pot gear. The mortality that results from incidental capture varies with conditions, but is near 100% for foreign trawls and domestic pot gear, and about 50% for domestic trawls and foreign setlines.

The incidental catch in recent years has declined from the 15 - 20 million pounds level of the mid-1960's and early 1970's. The decline can be attributed to several factors, including reduced foreign trawling and the closure of certain grounds to trawling when halibut are most vulnerable. The above estimates exclude any deliberate catch of halibut by other fisheries.

## Assessment of Stocks

---

Stock assessment studies suggest that the long-term decline in halibut stocks has been halted but that the resource remains in poor condition. The population of adult halibut still is far below that of earlier years, and more importantly, the production of juvenile halibut continues to be critically low. The number of juveniles must improve substantially before a major increase in adults can be expected.

Our understanding of the resource has improved as a result of several studies that were completed in 1978. We now have estimates of the actual magnitude of halibut stocks, i.e., the total poundage of halibut in the northeast Pacific Ocean. Previously, catch per unit effort (CPUE) has been used as an index of relative stock size. The new estimates of abundance follow the same basic trends as CPUE but are more useful in interpreting changes in stocks and evaluating the effect of regulations. The abundance of spawners also has been estimated and the relationship between spawners and the production of young has been examined.

### ABUNDANCE OF ADULT HALIBUT

Trends in the estimated abundance of adult halibut as well as CPUE in the setline fishery since 1935 are shown in Figure 2. Adults are defined as 8- to 20-year-olds and represent most of the fish available to the commercial fishery. The estimates are in terms of pounds and indicate the total biomass or weight of the halibut stocks in each area. In Area 2, biomass increased from about 100 million pounds in the late 1930's and early 1940's to about 200 million in the early 1950's; it then declined to 90 million pounds in 1976. Biomass has increased slightly since then and was estimated at 106 million pounds in 1978. In Area 3, biomass also increased during the 1930's and the 1940's and averaged about 300 million pounds during the 1950's; it then declined sharply to about 100 million pounds by the mid-1970's. Biomass has increased slightly in recent years and was estimated at 123 million pounds in 1978.

As previously mentioned, trends in the estimated abundance are nearly the same as those shown by CPUE. CPUE in 1978 was 59 pounds in Area 2 and 75 pounds in Area 3, up from the 1977 values but well below those in the 1950's and 1960's.

### ABUNDANCE OF YOUNG HALIBUT

The primary reason for the present low stock size is a long-term reduction in the number of young halibut. IPHC surveys in the Gulf of Alaska and reports from fishermen indicate a slight increase in 1978, but the increase is not sufficient to begin any substantial rebuilding of the resource.

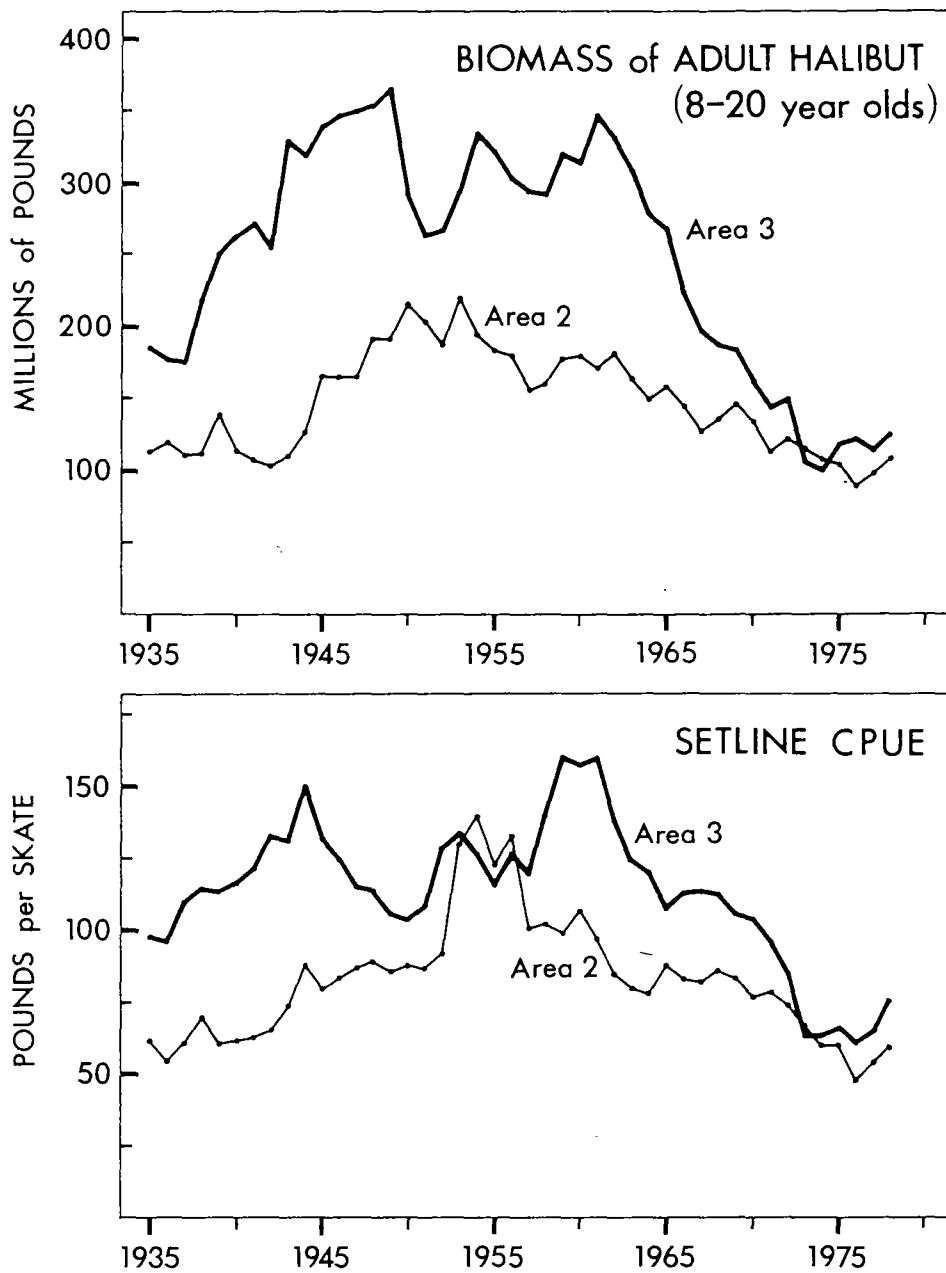
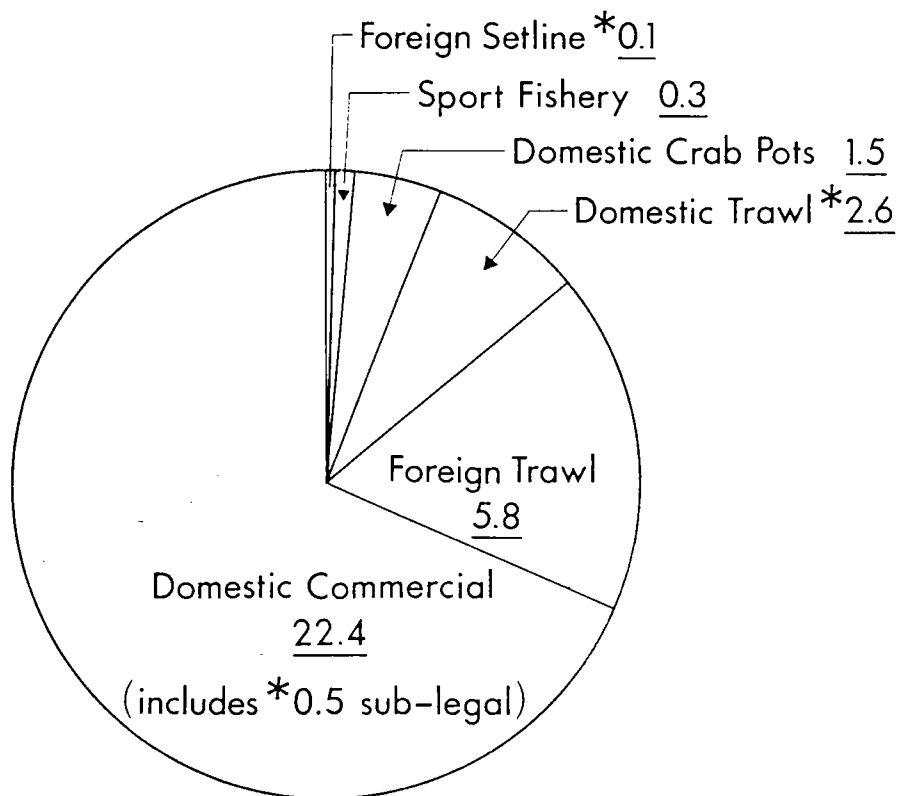


Figure 2. Biomass of adult halibut and setline CPUE in Areas 2 and 3, 1935-1978.

Although not fully understood, several factors have contributed to the scarcity. The production of young has declined, perhaps as a result of adverse environmental conditions or inadequate spawning stocks, and incidental catches have reduced survival. Recent studies indicate that the spawning potential has been sharply reduced, but whether this reduction is responsible for the low abundance of young is unclear.

Since the early 1960's, the decline in spawners coincides with a reduced production of young. However, the opposite pattern occurred during the 1940's and early 1950's, that is, spawning stocks increased while the production of young declined. In fact, the population of young halibut was very high during the 1930's,—a time when spawning stocks were nearly as low as they are today. This would suggest that the low abundance of spawners is not the major problem, although conditions are different now and the low spawning potential, combined with other factors such as incidental catches, may be adversely affecting production.

Recent data suggest a decline in the incidental catch of young halibut in other fisheries and, in time, this should help to improve the number of older halibut available to the setline fishery. The incidental catch, however, is still a sizable part of the total removals by man and is partly responsible for the poor condition of the resource. Figure 3 illustrates the relative magnitude of each source of removal in



\* Values equal 50% of actual catch

Figure 3. Total halibut removals (millions of pounds) in 1977; catch estimates were adjusted to indicate mortality of released fish.

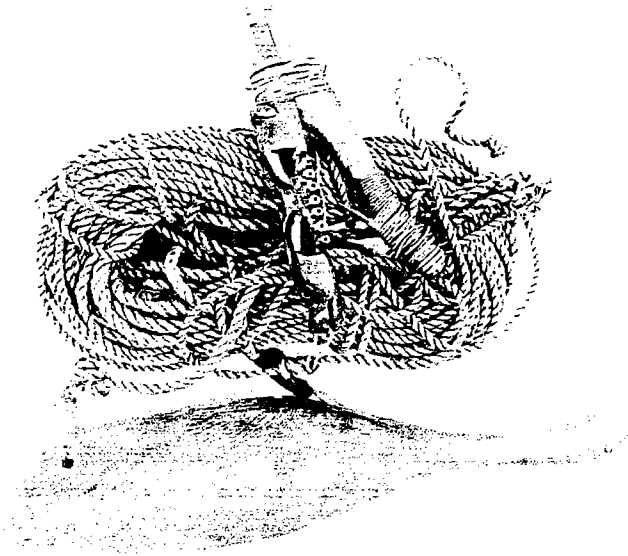
1977, the most recent year for which estimates are available. The 1977 catch by domestic commercial and sport fishermen also is included for comparison. Some of the estimates are based on meager data, and all of the estimates are subject to change as additional information becomes available. No attempt was made to include any illegal catch that may have been taken by domestic or foreign fishermen.

The results show a total removal of 32.9 million pounds of which 22.4 million (68.7%) occurred in the domestic commercial fishery. The commercial catch includes 0.5 million pounds of fish below the legal size limit; these fish were released but died from injuries during capture. Foreign trawls removed 5.8 million pounds (17.6%), down substantially from the 15 to 20 million pounds that were caught annually during the 1960's and early 1970's. The loss from domestic trawlers was estimated at 2.6 million pounds (7.9%). The actual catch was twice this amount, but about half of those released from domestic trawlers probably survived. Domestic crab pots accounted for 1.5 million pounds (4.6%), the sport fishery 0.3 million pounds (0.9%), and the foreign setline fishery 0.1 million pounds (0.3%). It is worth noting that if present trends continue, most of the incidental catch in future years will occur in domestic fisheries, not in foreign fisheries.

## **EQUILIBRIUM YIELD**

Equilibrium yield is the catch that can be taken without changing stock size from one year to the next. If the catch is held below the equilibrium yield, a subsequent increase in stocks should occur. Analyses show that the equilibrium yield for the domestic commercial fishery is about 11 million pounds in Area 2 and 13 million pounds in Area 3. These estimates, however, are dependent on past levels of growth, mortality, and recruitment. For example, a decline in the abundance of young halibut could reduce the equilibrium yield in future years. The 1978 catch by the halibut fishery was 9 million pounds in Area 2 and 12 million pounds in Area 3. If this level of catch continues and the estimates of equilibrium yield are correct, stocks should continue to improve slightly next year in each area, other factors being equal.

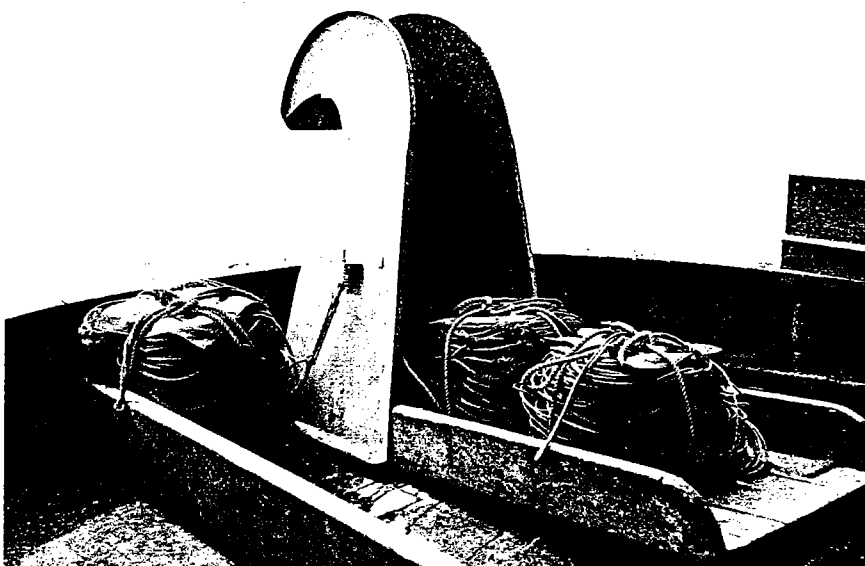
# HALIBUT



*Historical  
Indian gear*

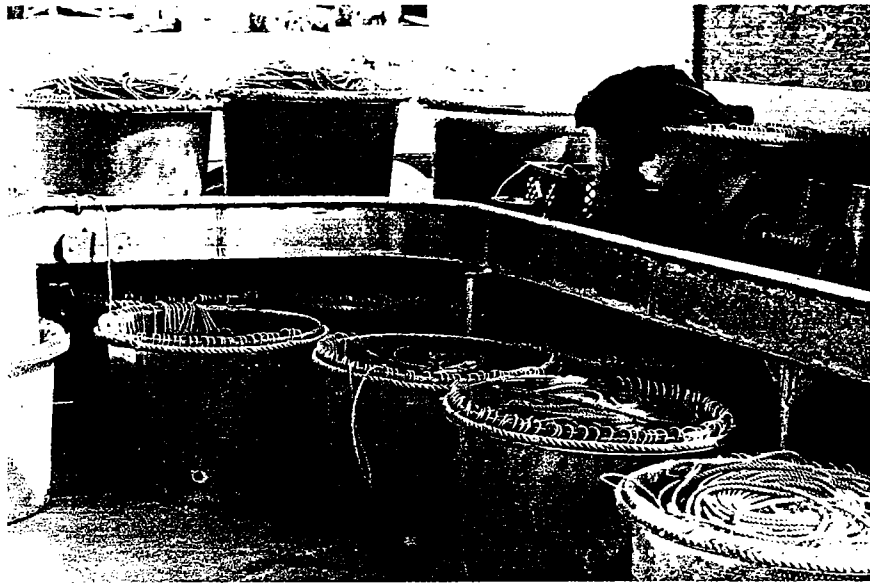


*Dory  
gear*

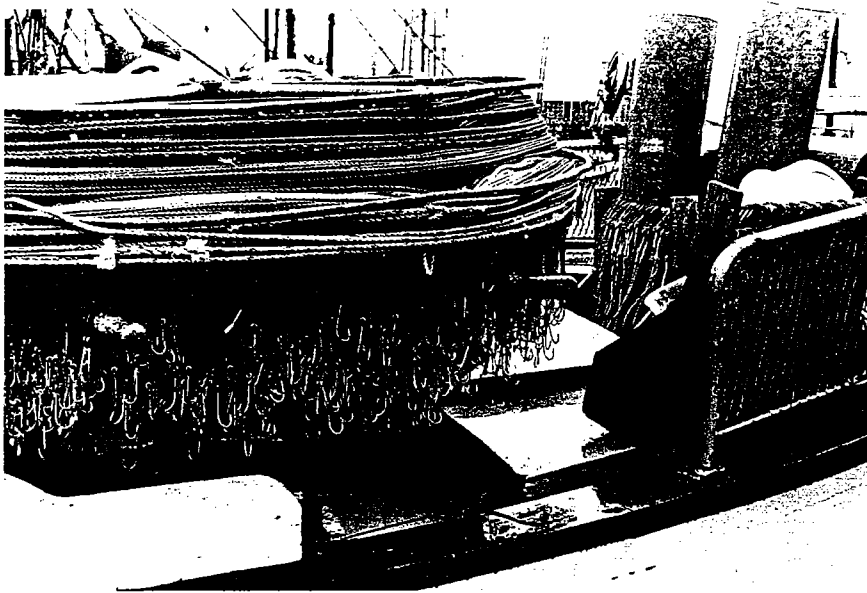


*Conventional  
gear*

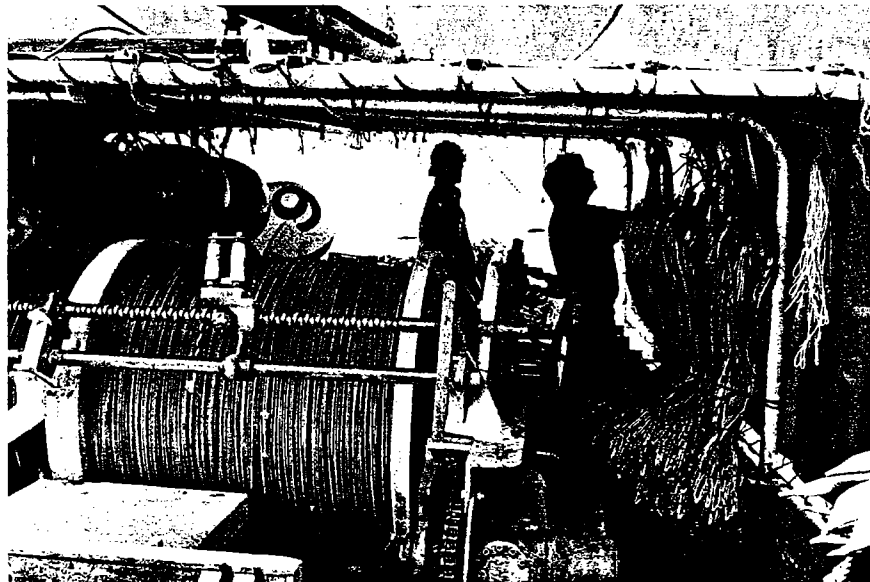
GEAR



*Tub gear*



*Christmas tree gear*



*Snap on gear*



## Scientific Investigations

---

### TAGGING

During the year, 109 tags were returned, the smallest number received in many years. In large part, this reflects the relatively small number of tags released in recent years. Further, large proportions of the releases were small fish which produce few returns. One purpose of tagging small fish is to obtain information on their movements prior to entering the commercial fishery. Present indications are that small halibut make extensive migrations before they reach commercial size.

The tags returned in 1978 had been released over the last eleven years. Two with the longest time at liberty were released in 1967 on the Bering Sea side of the Aleutian Islands. One was recovered near Yakutat and the other off southeastern Alaska. Of the 109 returns, 47 were below the minimum size limit (32 inches) when released, including the two mentioned above.

Premium rewards of \$100 were paid for the return of four tags that were on a specially pre-selected list. Three of these were returned by Canadian fishermen and one by a U.S. fisherman. In addition to the premium reward, IPHC paid a standard reward of \$5.00 for each returned tag. Before 1978, the standard reward was \$2.00 per tag.

During the year, 1,462 tagged halibut were released from three IPHC chartered vessels and a U.S.S.R. research vessel. The M/V TORDENSKJOLD released 335 tagged fish, mostly juveniles, on the flats in the eastern Bering Sea during the juvenile survey. During the stock assessment survey, the M/V VANSEE released 569 tagged fish east of Kodiak Island and the M/V CHELSEA released 358 on the northern British Columbia coast. A Soviet research trawler, the SESKAR, tagged 198 halibut in the northern Gulf of Alaska from Cape St. Elias to the Shumagin Islands. The tags used in this project were supplied by IPHC. The tags released by the TORDENSKJOLD and the SESKAR bear legends in Russian, English, and Japanese.

### STOCK ASSESSMENT SURVEY

During August and September, IPHC conducted its stock assessment survey with setline gear for the third consecutive year. The survey is designed to obtain information on halibut stocks over broad areas of the coast. Approximately 100 stations on a 6 x 24 mile grid were sampled in each of two areas: Hecate Strait - Queen Charlotte Sound in Area 2 and Portlock - Albatross grounds in Area 3. Information on size, age, sex, and CPUE were collected and all halibut without serious injuries were tagged. The catch of species other than halibut also was recorded. The halibut schooner M/V CHELSEA fished in Area 2 and the halibut schooner M/V VANSEE fished in Area 3 in the 1978 survey.

In Area 2, the CPUE in the 1978 survey was 22.4 pounds per skate, less than half of the CPUE reported by this year's commercial fishery but almost 40% more

than in last year's survey (16.4 pounds per skate). In Area 3, CPUE was 37.5 pounds per skate, approximately half of that in the commercial fishery and less than half of that obtained in last year's survey (78.6 pounds per skate). These differences suggest that changes in availability of fish, as well as stock size, affect the results.

Approximately 1,700 halibut were caught during the 1978 survey, of which slightly more than 900 were tagged. Recoveries from these tags will provide estimates of mortality and growth as well as information on migration patterns. All fish were measured and those fish deemed unsuitable for tagging were used to determine the size, sex, and age composition of the catch. The average weight of fish caught was 27 pounds in Area 2 and 23 pounds in Area 3. Females comprised 48% of the catch in Area 2, compared to 52% of the catch in Area 3.

Species other than halibut may affect the results from the survey because they compete with halibut for baited hooks. Hook competition apparently is greatest in Area 2 where halibut represented only 14% of the total catch. Spiny dogfish (*Squalus acanthias*) was the dominant species in the catch although skates (*Raja* spp.), black cod (*Anoplopoma fimbria*), and various species of rockfish (*Sebastes* spp.) also represented a sizable catch. In Area 3, halibut represented 59% of the catch. Pacific cod (*Gadus macrocephalus*), black cod, and various species of cottids, starfish, and skates comprised most of the remainder of the catch.

## JUVENILE HALIBUT

Juvenile halibut are defined as fish less than 65 cm long and most are under 7 years of age. A trawl survey is conducted annually to assess changes in abundance of juvenile halibut populations in the southeastern Bering Sea and the Gulf of Alaska. The survey is designed so that the fishing gear, timing, and location of fishing are comparable from year to year. The M/V TORDENSKJOLD, a Seattle-based trawler, was chartered from May 22 to August 21 to conduct the 1978 survey. A total of 236 hauls was made; 172 at offshore stations using a net with a 3.5-inch mesh cod end; and 64 at inshore stations with a 1.5-inch mesh cod end. Length, sex, stomach contents, and age data were collected in all regions, and tagging was conducted on viable halibut in the Bering Sea. To assist other agencies, all king crab caught were counted and sexed, and the males were measured.

In the southeastern Bering Sea, the abundance index is based upon the average CPUE (number per hour trawled) at 34 index stations, using a 3.5-inch mesh trawl. The CPUE in 1978 was 14.8, lower than the 18.9 recorded in 1977 but still well above the low levels noted in other recent years (Figure 4). The 1973-1975 year classes appear strong and should contribute to improvement in the setline fishery in a few years. The current upward trend coincides with a reduction in the incidental catch of juvenile halibut by foreign trawlers, but year-to-year changes in abundance also may be related to environmental factors such as water temperature. In 1978, the average bottom temperature was 3.3°C, nearly the same as recorded in 1977 but much warmer than the average of 1.2°C recorded for the 1971-1976 period. Perhaps as a consequence of the mild weather conditions, juvenile halibut were more dispersed and were distributed further into Bristol Bay in 1977 and 1978 than in previous years.

In the Gulf of Alaska, the index of abundance in 1978 is based on 110 offshore stations in four regions: 25 stations in Unimak Bight, 23 stations near Chirikof

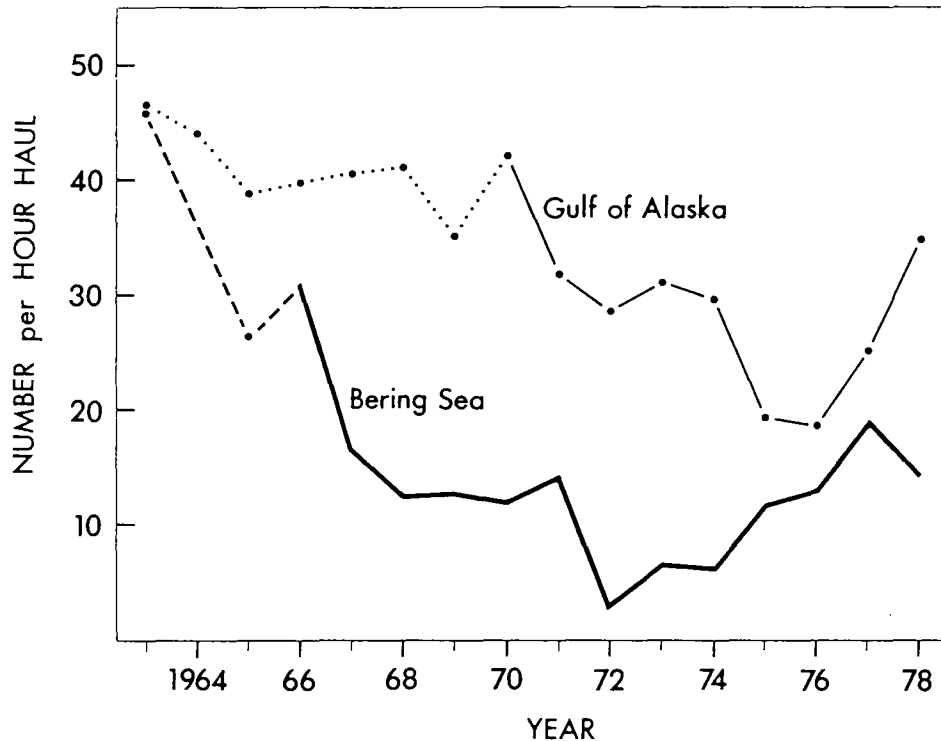


Figure 4. Index of abundance of juvenile halibut in the Gulf of Alaska and the southeastern Bering Sea. Dotted lines indicate meager data.

Island, 26 stations near Cape Chiniak, and 36 stations near Cape St. Elias. The average CPUE improved from a low of 18.6 in 1976 to 23.7 in 1977 and then increased substantially to 38.8 in 1978 (Figure 4). Most juveniles caught at offshore stations are 3- to 6-year-olds but 2-year-olds of the 1976 year class were prominent in the 1978 catch, particularly in the Chirikof region. The 1974 and 1975 year classes which were relatively strong in the Bering Sea were poorly represented, but the 1973 year class was above average.

In 1978 exploratory trawling with the 3.5-inch mesh was conducted in British Columbia, off Masset and in Hecate Strait, at locations known to produce large numbers of small halibut in the setline fishery. As experienced in the past in this region, the CPUE of juveniles was low (10.3) compared to the average of stations in the Gulf of Alaska (38.8). The age composition of the catch at Masset was unusual in that one-year-olds (about 25 cm mean length) constituted the modal age group. One-year-old halibut usually are not prominent in catches off British Columbia. Recent analyses show that juveniles tend to move eastward around the Gulf of Alaska; consequently, the age at which year classes are most prominent increases from Unimak in the far west to Hecate Strait in the southeast. The young ages observed at Masset in 1978 suggest, however, that not all halibut in the eastern region are derived from an easterly movement of juveniles.

IPHC also samples annually at shallow inshore stations in the Gulf of Alaska and the eastern Bering Sea using a 1.5-inch mesh trawl to obtain information on juvenile halibut younger than 3 years of age. Data from these stations are too

variable to provide a reliable index of abundance, but are still useful in determining age and growth and give an early indication of year class strength. In 1978, 27 stations were fished at 5 locations in the Gulf of Alaska where 4,422 halibut were caught in 54 hauls. Five stations were fished in the southeastern Bering Sea where 543 were caught in 10 hauls. Halibut caught at inshore stations are usually 1- to 3-year-olds. In 1977, a large number of fish-of-the-year were taken in the eastern Gulf of Alaska and this class was prominent again as 1-year-olds in 1978.

A study of the feeding habits of young halibut was initiated in 1976 and continued in 1977 and 1978. The results have been similar in each year with Tanner crab, *Chionocetes bairdi*; hermit crab, family *Paguridae*; sand lance, *Ammodytes hexapterus*; and walleye pollock, *Theragra chalcogramma*, being important segments of the diet.

## FECUNDITY AND MATURITY

Abundance of Pacific halibut has declined since the 1940's, and this decline has been accompanied by an increase in the rate of growth. The changes in growth and abundance prompted a reexamination of the relations of fecundity and maturity to size and age. Comparison of data in Area 3 indicates that fecundity of fish at the same age has more than doubled since the 1920's, but the relationships between fecundity and length and weight have changed only slightly. Further, the age of maturity of females in Area 3 has decreased from 12 years to 11 years since the 1950's, and the length at maturity has increased by about 5 cm. The age of maturity



Figure 5. Relative population fecundity and abundance of progeny as 3-year-olds.

in Area 2 also has decreased, but the change was small.

The increase in fecundity, as well as the decrease in the age of maturity, apparently is a compensatory response to the decrease in abundance. Population fecundity, (the total number of eggs produced), increased during the 1930's and 1940's, but declined to its former level by the 1970's, indicating that the increase in the fecundity of individuals did not fully compensate for the reduced numbers of spawners (Figure 5). The number of 3-year-old progeny represents the abundance of juveniles before they become available to the trawl and setline fisheries. As shown in Figure 5, the abundance of progeny was inversely related to population fecundity before 1955 but paralleled it thereafter, an indication that factors other than population fecundity are affecting abundance. Perhaps the viability of the eggs and larvae has been affected by the rapid growth or by long-term, environmental changes.

## POPULATION MODELS

Changes in the halibut stocks are related to patterns of recruitment, fecundity, survival, growth, and migration. Recent studies have provided detailed information concerning each of these components (Annual Reports 1976-1977). IPHC is developing a unified mathematical model so that the effect of changes in population parameters can be easily forecast. The parameters are interrelated and vary annually according to the age of the fish. With suitable estimates of these parameters from other studies, the age composition and size of the population in each succeeding year can be predicted by repetitive application of the model on the computer.

The complete population model has many potential uses. Estimates of population parameters can be evaluated and the outcome of different regulatory alternatives can be predicted. For example, the model can show the effects of trawl and setline fishing, as well as the effects of catch limits and minimum size limits on population size and yield. The incorporation of migration into the model will help to quantify the degree of intermingling of halibut stocks and predict the effect of fishing in one region on the productivity of other regions. Thus, the model can be adapted as an integral part of the management and scientific investigation of the Pacific halibut resource.

## COMPUTER SYSTEM

The Commission purchased a computer along with accessory equipment including seven terminals in 1978. Previously, the Commission depended on the University of Washington computer center for its data processing needs. The new computer is a Prime P350 which has 192,000 characters of memory and 80,000,000 characters of disc storage. All IPHC data files will be stored in the computer system, and data can be entered directly without the use of cards.

The new system greatly expands the staff's research capabilities by making large data files readily accessible for analysis. Several staff members can interact simultaneously with the computer at various video terminals, and the data files can be manipulated and edited directly by the biologist without the aid of a programmer. Although not in service until late 1978, the system already has been extensively used.

Programs that were used on the old system have been converted, and data files are being expanded to include all useful data. The staff now has the capability of performing complex statistical analyses and developing intricate simulation models, much of which would have been prohibitively expensive or impractical on an outside computer.

## KACHEMAK BAY SPORT FISHERY

To obtain more detailed information on sport-caught halibut, the Commission conducted a study of the sport fishery in Kachemak Bay, Alaska in 1978. Kachemak Bay is a major sport fishing area, and most of the halibut are caught by fishermen on charter boats operating out of Homer. Three charter companies were involved, and 9 full-time vessels fished from mid-May to mid-September. Two of the companies fished exclusively for halibut and guaranteed the daily catch limit of 2 fish. Based on daily records of the number and weight of halibut, the total catch by charters in Kachemak Bay was estimated to be 8,500 fish (77,000 pounds, eviscerated, heads-off). The average weight was 9 pounds and the largest recorded in 1978 was 198 pounds. In 1977, a staff member was aboard a charter vessel during one trip in Kachemak Bay: 7 fishermen caught 20 fish, but 6 were considered too small (2 to 5 pounds) and were released. The released fish were in good condition and probably survived.

## CATCH SAMPLING

IPHC samples commercial halibut landings annually to obtain data on the age and size of fish in the catch. Sampling has been conducted at Seattle since 1935, Prince Rupert since 1949, and Petersburg since 1958. Landings from Vancouver were sampled during 1951-1955 and since 1960. The intensity of sampling was increased in 1963 with the addition of Ketchikan, but Ketchikan was dropped from the sampling scheme in 1971 and replaced by Kodiak as the pattern of landings shifted to the more western ports due to improved cold storage and transportation facilities. The ports of Seward, Sitka, and Pelican were added in 1973. During the 1978 fishing season samplers were stationed at Seattle, Vancouver, Prince Rupert, Petersburg, Sitka, Pelican, Seward, and Kodiak.

An attempt is made to sample one-third of the landings over 5,000 pounds and one-tenth of the landings between 1,000 and 5,000 pounds from setline vessels. Each sample consists of otoliths from all fish in systematically selected cargo slings that are used to unload the catch. The objective is to collect approximately 200 otoliths from each landing that is sampled. The number and frequency of the slings selected for sampling depends on the size of the catch and the size of the fish. Landings by troll vessels are sampled occasionally, but these data are not used to estimate the overall age or size composition of the commercial landings.

Landings from about 250 setline vessels were sampled in 1978. Nearly 36,000 otoliths were used to estimate fish lengths and over 10,000 were used for age determination. Additionally, 490 otoliths from 141 troll landings were collected and aged. IPHC also measured 11,000 halibut and collected 2,100 otoliths from vessels

chartered for the annual stock assessment and the juvenile halibut surveys. About 60 otoliths from recovered tagged halibut were aged.

Samples were obtained from most major fishing banks and represented about 6% of the total landings by weight in 1978. The percentage, however, varied with region:

Region Fished	Columbia	Vancouver	Charlotte	S.E. Alaska	Yakutat	Kodiak	Chirikof	Shumagin	Aleutian	Bering Sea
Percent Sampled	0.0	1.4	6.0	7.1	6.1	5.7	3.2	10.4	12.5	11.6

The catch from the Vancouver and Columbia regions was very small (0.2 million pounds) and few samples were obtained. Landings from the Shumagin, Aleutian, and Bering Sea regions were the most heavily sampled as a result of special seasons before or after the regular season.

The age composition of halibut in the 1978 setline landings and the mean age since 1974 are summarized by region in Table 4. Mean age decreased in all areas in 1978 with the exception of the Aleutian and Bering Sea regions. Data from the Aleutian and Bering Sea regions have been variable, but typically show a higher mean age than in other regions.

Table 4. Age composition in 1978 and mean age by region, 1974-1978.

Region	Age (1978)				Year				
	<9	9-11	12-14	>14	1974	1975	1976	1977	1978
	Percent				Mean Age				
Columbia	-	-	-	-	-	-	-	-	-
Vancouver	12.4	28.4	33.3	25.9	-	13.6	12.3	-	12.4
Charlotte (Inside)	35.8	35.4	18.8	10.0	10.8	11.0	9.9	10.4	10.1
Charlotte (Outside)	20.3	40.7	27.4	11.6	12.1	11.4	11.6	11.4	11.1
S.E. Alaska (Inside)	20.7	48.0	23.8	7.5	11.6	11.5	11.5	11.5	10.6
S.E. Alaska (Outside)	18.7	39.0	29.3	13.0	12.7	12.5	12.6	12.0	11.2
Yakutat	13.1	42.4	30.0	14.5	12.3	12.1	12.2	12.3	11.5
Kodiak	21.1	45.5	23.3	10.1	11.6	11.1	11.0	11.2	10.8
Chirikof	24.4	50.9	16.4	8.3	11.1	10.9	10.4	10.6	10.3
Shumagins	21.4	47.6	19.5	11.5	12.1	11.4	11.0	11.3	10.7
Aleutians	2.3	13.1	21.0	63.6	16.7	-	17.8	13.7	15.8
Bering Sea - 4A	-	-	-	-	-	-	11.7	13.0	-
Bering Sea - 4B	13.4	24.5	20.2	41.9	11.3	13.6	13.0	13.2	13.5
Bering Sea - 4C	-	-	-	-	-	-	-	12.4	-
Bering Sea - 4D-E	5.7	32.9	25.0	36.4	-	-	-	-	13.5
Bering Sea - 4D-W	3.4	21.2	21.1	54.3	-	14.6	-	15.1	15.1

## Appendices

---

The tables in Appendix I provide statistics for 1978 and are a supplement to Technical Report Number 14, "The Pacific Halibut Fishery: Catch, Effort and CPUE, 1929-1975". Appendix tables in the 1977 Annual Report updated these statistics for 1976 and 1977. A detailed explanation of the tables, the methods of compilation, and definitions of the statistical subdivisions are included in Technical Report Number 14 which is available on request. The poundage in these tables is dressed weight (head-off, eviscerated). Copies of the tables in metric units and round (live) weight are available on request.

### Appendix I.

- Table 1. Catch, CPUE and effort by statistical area and country, 1978.
- Table 2. Catch, CPUE and effort by region and country, 1978.
- Table 3. Catch, CPUE and effort by regulatory area, 1978.
- Table 4. Catch in thousands of pounds by regulatory area and country, 1978.
- Table 5. Landings in thousands of pounds by port and country, 1978.

### Appendix II.

- Annual landings, ex-vessel price, and value (U.S. dollars), 1929-1978.



TABLE 1. CATCH, CPUE AND EFFORT BY STATISTICAL AREA AND COUNTRY, 1978.

1978	CANADA			UNITED STATES			TOTAL			LOGS %
	STAT. AREA	CATCH 000 LBS	CPUE LBS	EFFORT 00 SKS	CATCH 000 LBS	CPUE LBS	EFFORT 00 SKS	CATCH 000 LBS	CPUE LBS	
00-03	-	-	-	32	38.9*	8	32	38.9	8	-
04	-	-	-	6	39.0*	2	6	39.0	2	-
05	3	39.0*	1	56	38.9	14	59	39.3	15	7
06	76	64.8*	12	11	64.7*	2	87	62.1	14	-
07	23	64.8*	4	2	64.5*	0	25	62.5	4	-
08	76	66.5	11	3	66.7*	0	79	71.8	11	28
09 -0	23	49.7	5	7	49.6*	1	30	50.0	6	23
09 -I	175	62.1	28	1	62.5*	0	176	62.9	28	10
10 -0	-	-	-	9	49.7*	2	9	49.7	2	-
10 -I	615	52.8	116	202	81.0	25	817	57.9	141	20
11 -0	57	93.8	6	-	-	-	57	93.8	6	47
11 -I	1219	67.0	182	7	67.3*	1	1226	67.0	183	37
12 -0	94	81.1	12	-	-	-	94	81.1	12	3
12 -I	606	58.4	104	-	-	-	606	58.4	104	34
13 -0	300	71.1	42	-	-	-	300	71.1	42	30
13 -I	900	55.9	161	1	55.6*	0	901	56.0	161	24
14 -0	173	58.4	30	104	58.4*	18	277	57.7	48	4
14 -I	192	74.2	26	128	74.2*	17	320	74.4	43	25
15 -0	312	84.8	37	181	53.3	34	493	69.4	71	32
15 -I	-	-	-	262	38.0	69	262	38.0	69	3
16 -0	416	78.8	53	461	79.4	58	877	79.0	111	17
16 -I	-	-	-	680	47.0	145	680	47.0	145	56
17 -0	13	35.7	4	501	52.2	96	514	51.4	100	8
17 -I	-	-	-	98	38.9	25	98	38.9	25	16
18S-0	1	35.7*	0	117	35.2	33	118	35.8	33	5
18S-I	-	-	-	877	8.0	1096	877	8.0	1096	-
18W	62	79.8	8	265	75.1	35	327	76.0	43	47
19	404	98.6	41	295	67.2	44	699	82.2	85	46
20	333	79.5	42	321	76.4	42	654	77.9	84	51
21	220	87.2	25	138	38.8	36	358	58.7	61	37
22	512	91.4	56	230	93.8	25	742	91.6	81	50
23	49	45.8	11	278	74.3	37	327	68.1	48	39
24	235	87.3	27	612	66.4	92	847	71.2	119	37
25	282	72.4	39	1518	77.1	197	1800	76.3	236	59
26	237	92.5	26	2084	79.1	263	2321	80.3	289	54
27	12	45.5	3	949	80.3	118	961	79.4	121	58
28	461	85.6	54	798	70.4	113	1259	75.4	167	64
29	170	63.7	27	248	43.8	57	418	49.8	84	56
30	111	53.6	21	146	51.1	29	257	51.4	50	77
31	12	69.8*	2	294	69.8	42	306	69.5	44	68
32	72	22.7	32	194	68.1	28	266	44.3	60	55
33	8	32.9	2	40	42.8	9	48	43.6	11	79
34	4	81.6	0	21	69.8	3	25	83.3	3	80
35	-	-	-	2	58.8*	0	2	58.8	0	-
36	-	-	-	4	21.1	2	4	21.1	2	50
37	-	-	-	1	11.4	1	1	11.4	1	100
38	-	-	-	-	-	-	-	-	-	-
39	-	-	-	-	-	-	-	-	-	-
40	-	-	-	-	-	-	-	-	-	-
41	-	-	-	14	54.7	3	14	54.7	3	93
42+	113	128.6	9	561	109.1	51	674	112.3	60	71
4A	-	-	-	43	76.2	6	43	76.2	6	83
4B	-	-	-	207	69.6	30	207	69.6	30	64
4C	-	-	-	76	89.3	9	76	89.3	9	69
4DE	-	-	-	<del>283</del>	<del>42.2</del>	<del>66</del>	<del>283</del>	<del>42.2</del>	<del>66</del>	<del>77</del>
4DW	34	106.3	3	15	76.9	2	49	98.0	5	72
4E	-	-	-	-	-	-	-	-	-	-

\* NO LOG DATA, CPUE INTERPOLATED.

317 45.9 69 72

TABLE 2. CATCH, CPUE AND EFFORT BY REGION AND COUNTRY, 1978.

1978 REGION	CANADA			UNITED STATES			TOTAL			LOGS %
	CATCH 000 LBS	CPUE LBS	EFFORT 00 SKS	CATCH 000 LBS	CPUE LBS	EFFORT 00 SKS	CATCH 000 LBS	CPUE LBS	EFFORT 00 SKS	
COLUMBIA	-	-	-	32	38.9*	8	32	38.9	8	-
VANCOUVER	178	66.6	27	78	38.9	20	256	54.5	47	10
CHARLOTTE	3989	62.5	638	227	81.1	28	4216	63.3	666	28
CHAR-O	474	73.3	65	16	73.4*	2	490	73.1	67	26
CHAR-I	3515	61.3	573	211	81.0	26	3726	62.2	599	28
SE ALASKA	1107	78.5	141	3409	51.7	660	4516	56.4	801	19
SE AK-O	915	79.7	115	1364	62.5	218	2279	68.4	333	16
SE AK-I	192	74.2	26	2045	46.3	442	2237	47.8	468	22
YAKUTAT	1580	83.3	190	1527	75.9	201	3107	79.5	391	46
KODIAK	1227	84.2	146	5961	76.3	781	7188	77.5	927	55
CHIRIKOF	293	58.4	50	688	55.2	125	981	56.1	175	65
SHUMAGIN	84	26.1	32	262	59.7	44	346	45.5	76	60
ALEUTIAN	113	128.6	9	575	105.8	54	688	109.2	63	72
BERING SEA	34	106.3	3	624	56.0	111	658	57.7	114	71
TOTAL	8605	69.6	1236	13383	65.9	2032	21988	67.3	3268	49

\* NO LOG DATA, CPUE INTERPOLATED.

TABLE 3. CATCH, CPUE AND EFFORT BY REGULATORY AREA, 1978.

YEAR	AREA 2				AREA 3				AREA 4			
	CATCH 000 LBS	CPUE LBS	EFFORT 00 SKS	LOGS %	CATCH 000 LBS	CPUE LBS	EFFORT 00 SKS	LOGS %	CATCH 000 LBS	CPUE LBS	EFFORT 00 SKS	LOGS %
1978	9020	59.3	1522	23	12310	75.4	1632	55	658	57.7	114	71

TABLE 4. CATCH IN THOUSANDS OF POUNDS BY REGULATORY AREA AND COUNTRY, 1978.

YEAR	AREA 2			AREA 3			AREA 4			ALL AREAS		
	CAN.	U.S.	TOTAL	CAN.	U.S.	TOTAL	CAN.	U.S.	TOTAL	CAN.	U.S.	TOTAL
1978	5274	3746	9020	3297	9013	12310	34	624	658	8605	13383	21988

TABLE 5. LANDINGS IN THOUSANDS OF POUNDS BY PORT AND COUNTRY, 1978.

PORT	CAN.	1978	
		U.S.	TOTAL
CAL AND ORE	-	62	62
SEATTLE	42	256	298
BELLINGHAM	1201	625	1826
MISC WASH	-	107	107
VANCOUVER	1567	-	1567
MISC SO BC	158	-	158
NAMU	230	-	230
PR RUPERT	2967	111	3078
MISC NO BC	220	-	220
KETCHIKAN	127	162	289
WRANGELL	123	401	524
PETERSBURG	399	1666	2065
JUNEAU	-	445	445
SITKA	24	911	935
PELICAN	541	832	1373
MISC SE AK	74	626	700
KODIAK	377	3313	3690
P WILLIAMS	-	-	-
SEWARD	555	2831	3386
MISC CEN AK	-	1035	1035

Appendix II. Annual landings, ex-vessel price, and value (U.S. dollars), 1929-1978.

Year	Catch (000's pounds)	Price dollars/ pound)	Value (000's dollars)	Year	Catch (000's pounds)	Price dollars/ pound)	Value (000's dollars)
1929	56,928	.12	6,831	1955	57,521	.14	8,053
1930	49,492	.10	4,949	1956	66,588	.22	14,649
1931	44,220	.07	3,095	1957	60,854	.17	10,345
1932	44,454	.04	1,778	1958	64,508	.21	13,547
1933	46,795	.06	2,808	1959	71,204	.19	13,529
1934	47,546	.06	2,853	1960	71,605	.16	11,457
1935	47,343	.07	3,314	1961	69,274	.21	14,548
1936	48,923	.08	3,914	1962	74,862	.30	22,459
1937	49,539	.08	3,963	1963	71,237	.21	14,960
1938	49,553	.07	3,469	1964	59,784	.23	13,750
1939	50,903	.07	3,563	1965	63,176	.32	20,216
1940	53,381	.09	4,804	1966	62,016	.34	21,085
1941	52,231	.10	5,223	1967	55,222	.23	12,701
1942	50,388	.15	7,558	1968	48,594	.23	11,177
1943	53,699	.19	10,203	1969	58,275	.38	22,144
1944	53,435	.15	8,015	1970	54,938	.37	20,327
1945	53,395	.15	8,009	1971	46,654	.32	14,929
1946	60,266	.17	10,245	1972	42,884	.64	27,446
1947	55,700	.17	9,469	1973	31,740	.74	23,488
1948	55,564	.17	9,446	1974	21,306	.70	14,914
1949	55,025	.17	9,354	1975	27,616	.89	24,578
1950	57,234	.23	13,164	1976	27,535	1.26	34,694
1951	56,045	.17	9,528	1977	21,868	1.31	28,647
1952	62,262	.19	11,830	1978	21,988	1.70	37,380
1953	59,837	.15	8,976				
1954	70,583	.17	11,999				

## Publications

---

### CALENDAR YEAR 1978

Hamley, John M. and Bernard E. Skud

- 1978 Factors affecting longline catch and effort: II. Hook-spacing. [IN] International Pacific Halibut Commission, Scientific Report No. 64, pp. 15-24.

Hoag, Stephen H.

- 1978 Restrictions should show growth in halibut stocks. Western Fisheries, Volume 95, No. 6, pp. 25, 26.

Hoag, Stephen H. and Ronald J. McNaughton

- 1978 Abundance and fishing mortality of Pacific halibut, cohort analysis, 1935-1976. International Pacific Halibut Commission, Scientific Report No. 65, 45 p.

International Pacific Halibut Commission

- 1978 Annual Report 1977. International Pacific Halibut Commission, 38 p.

- 1978 The Pacific Halibut: Biology, Fishery, and Management. International Pacific Halibut Commission, Technical Report No. 16 (Revision of No. 6), 56 p.

- 1978 1978 Halibut Regulations, Information Bulletin No. 22, 1 p.

Myhre, Richard J.

- 1978 Halibut fishery benefits from 200-mile economic zone with more logical management. Western Fisheries, Volume 95, No. 6, pp. 21, 22.

- 1978 Review of the 1977 Pacific Halibut Fishery. Pacific Marine Fisheries Commission, 30th Annual Report, pp. 43-45.

Schmitt, Cyreis C. and Bernard E. Skud

- 1978 Relation of fecundity to long-term changes in growth, abundance, and recruitment. International Pacific Halibut Commission, Scientific Report No. 66, 31 p.

Skud, Bernard E.

- 1978 Drift, migration, and intermingling of Pacific halibut stocks. International Pacific Halibut Commission, Scientific Report No. 63, 42 p.

Skud, Bernard E.

- 1978 Annual halibut catch goes down again. *Western Fisheries*, Volume 95, No. 6, pp. 20, 55.
- 1978 Split season has few problems for majority. *Western Fisheries*, Volume 95, No. 6, pp. 42, 46, 47.
- 1978 Report of the International Pacific Halibut Commission. [IN] International Association of Fish and Wildlife Agencies, Proceedings of the Sixty-seventh Convention, pp. 139-140.
- 1978 Factors affecting longline catch and effort: I. General Review. [IN] International Pacific Halibut Commission, Scientific Report No. 64, pp. 5-14.
- 1978 Factors affecting longline catch and effort: III. Bait loss and competition. [IN] International Pacific Halibut Commission, Scientific Report No. 64, pp. 25-43.

## Commission Publications — 1930-1978

### Reports

- 1.\* Report of the International Fisheries Commission appointed under the Northern Pacific Halibut Treaty. John Pease Babcock, William A. Found, Miller Freeman and Henry O'Malley. 31 p. (1931).
2. Life history of the Pacific halibut (1) Marking experiments. William F. Thompson and William C. Herrington. 137 p. (1930).
3. Determination of the chlorinity of ocean waters. Thomas G. Thompson and Richard Van Cleve. 14 p. (1930).
4. Hydrographic sections and calculated currents in the Gulf of Alaska, 1927 and 1928. George F. McEwen, Thomas G. Thompson and Richard Van Cleve. 36 p. (1930).
- 5.\* History of the Pacific halibut fishery. William F. Thompson and Norman L. Freeman. 61 p. (1930).
- 6.\* Biological statistics of the Pacific halibut fishery (1) Changes in the yield of a standardized unit of gear. William F. Thompson, Harry A. Dunlop and F. Heward Bell. 108 p. (1931).
- 7.\* Investigations of the International Fisheries Commission to December 1930, and their bearing on the regulation of the Pacific halibut fishery. John Pease Babcock, William A. Found, Miller Freeman and Henry O'Malley. 29 p. (1930).
- 8.\* Biological statistics of the Pacific halibut fishery (2) Effect of changes in intensity upon total yield and yield per unit of gear. William F. Thompson and F. Heward Bell. 49 p. (1934).
- 9.\* Life history of the Pacific halibut (2) Distribution and early life history. William F. Thompson and Richard Van Cleve. 184 p. (1936).
10. Hydrographic sections and calculated currents in the Gulf of Alaska, 1929. Thomas G. Thompson, George F. McEwen and Richard Van Cleve. 32 p. (1936).
11. Variations in the meristic characters of flounders from the northeastern Pacific. Lawrence D. Townsend. 24 p. (1936).
12. Theory of the effect of fishing on the stock of halibut. William F. Thompson. 22 p. (1937).
13. Regulation and investigation of the Pacific halibut fishery in 1947 (Annual Report). IFC. 35 p. (1948).
14. Regulation and investigation of the Pacific halibut fishery in 1948 (Annual Report). IFC. 30 p. (1949).
15. Regulation and investigation of the Pacific halibut fishery in 1949 (Annual Report). IFC. 24 p. (1951).
16. Regulation and investigation of the Pacific halibut fishery in 1950 (Annual Report). IFC. 16 p. (1951).
17. Pacific Coast halibut landings 1888 to 1950 and catch according to area of origin. F. Heward Bell, Henry A. Dunlop and Norman L. Freeman. 47 p. (1952).
18. Regulation and investigation of the Pacific halibut fishery in 1951 (Annual Report). Edward W. Allen, George R. Clark, Milton C. James and George W. Nickerson. 29 p. (1952).
19. The production of halibut eggs on the Cape St. James spawning bank off the coast of British Columbia 1935-1946. Richard Van Cleve and Allyn H. Seymour. 44 p. (1953).
20. Regulation and investigation of the Pacific halibut fishery in 1952 (Annual Report). Edward W. Allen, George R. Clark, Milton C. James, George W. Nickerson and Seton H. Thompson. 22 p. (1953).
21. Regulation and investigation of the Pacific halibut fishery in 1953 (Annual Report). IPHC. 22 p. (1954).
22. Regulation and investigation of the Pacific halibut fishery in 1954 (Annual Report). IPHC. 32 p. (1955).
23. The incidental capture of halibut by various types of fishing gear. F. Heward Bell. 48 p. (1956).
24. Regulation and investigation of the Pacific halibut fishery in 1955 (Annual Report). IPHC. 15 p. (1956).

\*Out of print.

### Reports

25. Regulation and investigation of the Pacific halibut fishery in 1956 (Annual Report). IPHC. 27 p. (1957).
26. Regulation and investigation of the Pacific halibut fishery in 1957 (Annual Report). IPHC. 16 p. (1958).
27. Regulation and investigation of the Pacific halibut fishery in 1958 (Annual Report). IPHC. 21 p. (1959).
28. Utilization of Pacific halibut stocks: Yield per recruitment. Staff, IPHC. 52 p. (1960).
29. Regulation and investigation of the Pacific halibut fishery in 1959 (Annual Report). IPHC. 17 p. (1960).
30. Regulation and investigation of the Pacific halibut fishery in 1960 (Annual Report). IPHC. 24 p. (1961).
31. Utilization of Pacific halibut stocks: Estimation of maximum sustainable yield, 1960. Douglas G. Chapman, Richard J. Myhre and G. Morris Southward. 35 p. (1962).
32. Regulation and investigation of the Pacific halibut fishery in 1961 (Annual Report). IPHC. 23 p. (1962).
33. Regulation and investigation of the Pacific halibut fishery in 1962 (Annual Report). IPHC. 27 p. (1963).
34. Regulation and investigation of the Pacific halibut fishery in 1963 (Annual Report). IPHC. 24 p. (1964).
35. Investigation, utilization and regulation of the halibut in southeastern Bering Sea. Henry A. Dunlop, F. Heward Bell, Richard J. Myhre, William H. Hardman and G. Morris Southward. 72 p. (1964).
36. Catch records of a trawl survey conducted by the International Pacific Halibut Commission between Unimak Pass and Cape Spencer, Alaska from May 1961 to April 1963. IPHC. 524 p. (1964).
37. Sampling the commercial catch and use of calculated lengths in stock composition studies of Pacific halibut. William H. Hardman and G. Morris Southward. 32 p. (1965).
38. Regulation and investigation of the Pacific halibut fishery in 1964 (Annual Report). IPHC. 18 p. (1965).
39. Utilization of Pacific halibut stocks: Study of Bertalanffy's growth equation. G. Morris Southward and Douglas G. Chapman. 33 p. (1965).
40. Regulation and investigation of the Pacific halibut fishery in 1965 (Annual Report). IPHC. 23 p. (1966).
41. Loss of tags from Pacific halibut as determined by double-tag experiments. Richard J. Myhre. 31 p. (1966).
42. Mortality estimates from tagging experiments on Pacific halibut. Richard J. Myhre. 43 p. (1967).
43. Growth of Pacific halibut. G. Morris Southward. 40 p. (1967).
44. Regulation and investigation of the Pacific halibut fishery in 1966 (Annual Report). IPHC. 24 p. (1967).
45. The halibut fishery, Shumagin Islands and westward not including Bering Sea. F. Heward Bell. 34 p. (1967).
46. Regulation and investigation of the Pacific halibut fishery in 1967 (Annual Report). IPHC. 23 p. (1968).
47. A simulation of management strategies in the Pacific halibut fishery. G. Morris Southward. 70 p. (1968).
48. The halibut fishery south of Willapa Bay, Washington. F. Heward Bell and E. A. Best. 36 p. (1968).
49. Regulation and investigation of the Pacific halibut fishery in 1968 (Annual Report). IPHC. 19 p. (1969).
50. Agreements, conventions and treaties between Canada and the United States of America with respect to the Pacific halibut fishery. F. Heward Bell. 102 p. (1969).
51. Gear selection and Pacific halibut. Richard J. Myhre. 35 p. (1969).
52. Viability of tagged Pacific halibut. Gordon J. Peltonen. 25 p. (1969).

### SCIENTIFIC REPORTS

53. Effects of domestic trawling on the halibut stocks of British Columbia. Stephen H. Hoag. 18 p. (1971).
54. A reassessment of effort in the halibut fishery. Bernard E. Skud. 11 p. (1972).
55. Minimum size and optimum age for entry for Pacific halibut. Richard J. Myhre. 15 p. (1974).
56. Revised estimates of halibut abundance and the Thompson-Burkenroad debate. Bernard Einar Skud. 36 p. (1975).
57. Survival of halibut released after capture by trawls. Stephen H. Hoag. 18 p. (1975).
58. Sampling landings of halibut for age composition. G. Morris Southward. 31 p. (1976).
59. Jurisdictional and administrative limitations affecting management of the halibut fishery. Bernard Einar Skud. 24 p. (1976).
60. The incidental catch of halibut by foreign trawlers. Stephen H. Hoag and Robert R. French. 24 p. (1976).
61. The effect of trawling on the setline fishery for halibut. Stephen H. Hoag. 20 p. (1976).
62. Distribution and abundance of juvenile halibut in the southeastern Bering Sea. E. A. Best. 23 p. (1977).
63. Drift, migration, and intermingling of Pacific halibut stocks. Bernard Einar Skud. 42 p. (1977).
64. Factors affecting longline catch and effort: I. General review, Bernard E. Skud; II. Hook-spacing, John M. Hamley and Bernard E. Skud; III. Bait loss and competition, Bernard E. Skud, 66 p. (1978).
65. Abundance and fishing mortality of Pacific halibut, cohort analysis, 1935-1976, Stephen H. Hoag and Ronald J. McNaughton, 45 p. (1978).
66. Relation of fecundity to long-term changes in growth, abundance and recruitment. Cyreis C. Schmitt and Bernard E. Skud, 31 p. (1978).

### TECHNICAL REPORTS

1. Recruitment investigations: Trawl catch records Bering Sea, 1967. E. A. Best. 23 p. (1969).
2. Recruitment investigations: Trawl catch records Gulf of Alaska, 1967. E. A. Best. 32 p. (1969).
3. Recruitment investigations: Trawl catch records eastern Bering Sea, 1968 and 1969. E. A. Best. 24 p. (1969).
4. Relationship of halibut stocks in Bering Sea as indicated by age and size composition. William H. Hardman. 11 p. (1969).
5. Recruitment investigation: Trawl catch records Gulf of Alaska, 1968 and 1969. E. A. Best. 48 p. (1969).
- 6.\* The Pacific halibut. F. Heward Bell and Gilbert St-Pierre. 24 p. (1970).
7. Recruitment investigation: Trawl catch records eastern Bering Sea, 1963, 1965 and 1966. E. A. Best. 52 p. (1970).
8. The size, age and sex composition of North American setline catches of halibut (*Hippoglossus hippoglossus stenolepis*) in Bering Sea, 1964-1970. William H. Hardman. 31 p. (1970).
9. Laboratory observations on early development of the Pacific halibut. C. R. Forrester and D. F. Alderdice. 13 p. (1973).
10. Otolith length and fish length of Pacific halibut. G. Morris Southward and William H. Hardman. 10 p. (1973).
11. Juvenile halibut in the eastern Bering Sea: Trawl surveys, 1970-1972. E. A. Best. 32 p. (1974).
12. Juvenile halibut in the Gulf of Alaska: Trawl surveys, 1970-1972. E. A. Best. 63 p. (1974).
13. The sport fishery for halibut: Development, recognition and regulation. Bernard Einar Skud. 19 p. (1975).
14. The Pacific halibut fishery: Catch, effort and CPUE, 1929-1975. Richard J. Myhre, Gordon J. Peltonen, Gilbert St-Pierre, Bernard E. Skud and Raymond E. Walden. 94 p. (1977).
15. Regulations of the Pacific halibut fishery, 1924-1976. Bernard E. Skud. 47 p. (1977).
16. The Pacific halibut: Biology, fishery, and management. International Pacific Halibut Commission, 56 p. (1978).

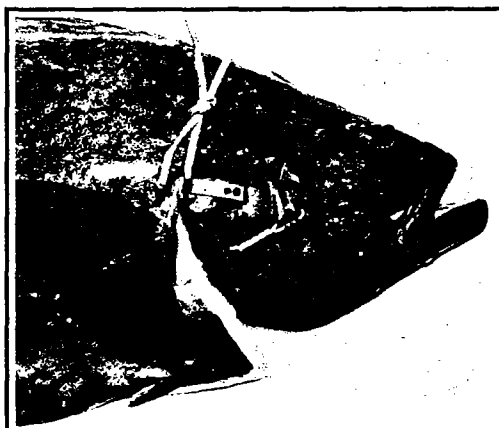


## ANNUAL REPORTS

Annual Report 1969. 24 p. (1970).  
Annual Report 1970. 20 p. (1971).  
Annual Report 1971. 36 p. (1972).  
Annual Report 1972. 36 p. (1973).  
Annual Report 1973. 52 p. (1974).  
Annual Report 1974. 32 p. (1975).  
Annual Report 1975. 36 p. (1976).  
Annual Report 1976. 40 p. (1977).  
Annual Report 1977. 38 p. (1978).

# TAGGED HALIBUT

The INTERNATIONAL PACIFIC HALIBUT COMMISSION attaches plastic or metal tags to the cheek on the dark side of the halibut. Fishermen should return all tags, even those from halibut below legal size or those caught in trawls.



## REWARD

**\$5.00 WILL BE PAID FOR THE RETURN OF EACH TAG.  
\$100.00 WILL BE PAID FOR SPECIAL PRESELECTED TAGS.**

**WHEN YOU CATCH A TAGGED HALIBUT:**

1. Record Tag Numbers, Date, Location and Depth in your log book.
2. Leave Tags on the fish.
3. Mark the fish with a gangion.

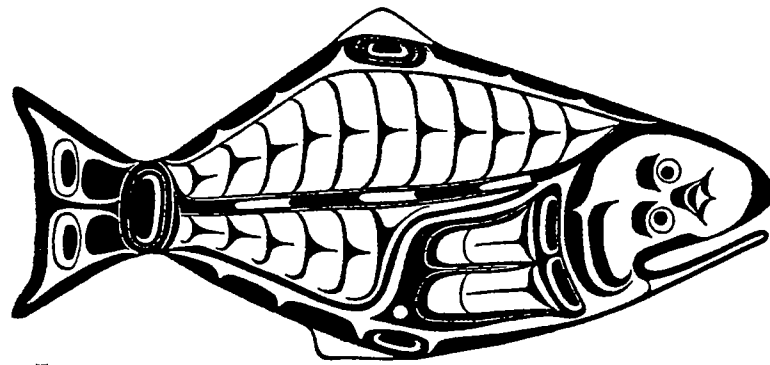
**WHEN YOU LAND A TAGGED HALIBUT:**

1. Report fish to a Commission Representative or Government Officer  
or
2. Forward tags to address below and enclose recovery information (see above), your name, address, boat name, gear, length of fish, and, if possible, earstones.

**FINDER WILL BE ADVISED OF MIGRATION AND GROWTH OF THE FISH.**

**International Pacific Halibut Commission**

P. O. Box 5009  
University Station  
Seattle, Washington 98105



HALIBUT CREST — *adapted from designs used by Tlingit, Tsimshian and Haida Indians.*