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**A Guide  
to Halibut Bycatch Rates  
and Mortality Information**

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# A GUIDE TO HALIBUT BYCATCH RATES AND MORTALITY INFORMATION

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## **A Guide To Halibut Bycatch Rates and Mortality Information**

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This booklet provides a listing of available datasets and/or reports which contain Pacific halibut (Hippoglossus stenolepis) bycatch and mortality information. The datasets and reports included in this paper are available from the Alaska Fisheries Center's REFM and RACE Divisions, the International Pacific Halibut Commission (IPHC), the Alaska Department of Fish and Game (ADF&G), or the Canadian Department of Fisheries and Oceans (DFO). Several of these datasets contain confidential information and are only available in summarized form.

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<sup>1</sup>Alaska Fisheries Center

<sup>2</sup>International Pacific Halibut Commission







**Datasets Available From The Alaska Fisheries Center's REFM Division**

(Contact: Jerald Berger)

**I. 1973-87 (also part of 1988) haul-by-haul collection of halibut, crab, and salmon catch data from the foreign and joint venture groundfish fisheries**

Haul-by-haul catch data have been collected by on-board U.S. observers. The data contain numbers and kilograms of each species and total groundfish catch for each haul sampled by an observer and contains total groundfish catch for other hauls retrieved (but not sampled) while an observer was aboard. Latitude and longitude, duration, and depth information are available for each haul. Length frequency and viability data are also available. Hundreds of thousands of data points are available for each species, and are stored as computer files to allow monthly, quarterly, and annual analysis.

Numerous reports and publications have been generated from these files, the most recent ones being:

Berger, J., R. Nelson, Jr., J. Wall, H. Weikart, and B. Maier. 1988. Summary of U.S. observer sampling of foreign and joint venture fisheries in the northeast Pacific Ocean and eastern Bering Sea, 1986. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-128. 167 p.

Berger, J. and H. Weikart. 1988. Summary of U.S. observer sampling of foreign and joint venture fisheries in the northeast Pacific Ocean and eastern Bering Sea, 1987. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-148. 141 p.

**II. 1981-89 weekly collection of halibut, crab, and salmon catch data from the foreign and joint venture groundfish fisheries**

Weekly catch data have been collected by on-board U.S. observers. These data contain numbers of crab and salmon, numbers and kilograms of halibut, and total groundfish catch, on a vessel and area basis. From 1981 to 1985, INPFC area was used. From 1986 to 1989, subarea was used. Data are available for about 40,000 vessel-area-weeks and are stored as computer files to allow weekly, monthly, and annual analysis. These data are used primarily to generate inseason management reports. The most recent publications are:

Berger, Jerald D. 1988. By-Catch Rates in the Bering Sea and Aleutian Islands Joint Venture Groundfish Fishery, 1986-88. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-155. 137 P.

Guttormsen, Michael A. and Timothy J. Clancy. 1989. Provisional Summary of U.S. Observer Activities and Foreign and Joint Venture Fisheries in the Northeast Pacific Ocean and Eastern Bering Sea, 1988. NWAFC Proc. Rep. 89-10, 34 p. Northwest and Alaska Fish. Cent., Natl. Mar. Fish. Serv., NOAA, 7600 Sand Point Way N.E., Seattle, WA 98115.

### **III. 1982-85 Halibut Bycatch and Mortality In Sunken Gillnets off the Pacific Coast**

Sunken gillnets, or setnets, have been fished for sablefish on an experimental basis off the northern Pacific coast from 1982 through 1985. The number of vessels fishing this gear has ranged from 2 in 1982 to 12 in 1985. Bycatch and mortality rates for all years are summarized in a halibut bycatch report to be published by IPHC in mid-1989. Halibut bycatch rates for 1982-84 have been reported by the National Marine Fisheries Service (NMFS) in the following publication:

Klein, Steve J. 1985. Review of the set-net fishery off the Washington coast, 1982-1984. NWAFC Proc. Rep. 85-06, 52 p. Northwest and Alaska Fish. Cent., Natl. Mar. Fish. Serv., NOAA, 7600 Sand Point Way N.E., Seattle, WA 98115.

### **IV. 1986-89 haul-by-haul collection of halibut, crab, and salmon catch data from domestic groundfish fisheries in Alaska**

Haul-by-haul catch data have been collected by on-board observers. The data contain numbers and kilograms of each species and total groundfish catch for each haul sampled by an observer and contains total groundfish catch for other hauls retrieved (but not sampled) while an observer was aboard. Latitude and longitude, duration, and depth information are available for each haul. Length frequency and viability data are also available. Hundreds of data points are available for each species and are stored by cruise both on NWAFC's mainframe Burroughs B7800 computer and on floppy disks in Lotus format. Reports generated from these files include:

Hare, S., and J. Wall. 1988. Provisional data summaries for the NPFMC Pilot Domestic Observer Program, Winter 1988. NWAFC Proc. Rep. 88-10, 30 p. Northwest and Alaska Fish. Cent., Natl. Mar. Fish. Serv., NOAA, 7600 Sand Point Way N.E., Seattle, WA 98115.

Hare, S. 1988. Report on the Port Moller Pacific cod trawl fishery, Summer 1988. NWAFC Proc. Rep. 88-25, 22 p. Northwest and Alaska Fish. Cent., Natl. Mar. Fish. Serv., NOAA, 7600 Sand Point Way N.E., Seattle, WA 98115.

**V. 1989 weekly collection of halibut, crab, and salmon catch data from the domestic groundfish fisheries**

Weekly catch data have been collected by on-board observers. These data contain numbers of crab and salmon, numbers and kilograms of halibut, and metric tons of the sampled hauls on a vessel and subarea basis. Data are currently available for about 62 vessel-subarea-weeks and are stored as computer files to allow weekly, monthly, and annual analysis.





**Datasets Available From The Alaska Fisheries Center's RACE Division**

(Contact: Richard Bakkala or Eric Brown)

**I. 1971-88 haul-by-haul collection of halibut and crab catch data from resource assessment surveys in the eastern Bering Sea**

Bottom trawl surveys have been conducted in the eastern Bering Sea each year since 1971.

These surveys are generally conducted during the summer months (June-August), but limited data are also available from the winter and spring periods. These data are stored as computer files and contain number and weights of all species of fish and invertebrates caught in each haul, and size data for halibut, crab, and other commercially important species of fish. Haul information includes position, tow duration, depth, and, in many cases, surface and bottom temperatures. Results and methods of these surveys have been documented in a series of data reports and other publications. The most recent of these data reports are:

Walters, G. E., K. Teshima, J. J. Traynor, R. G. Bakkala, J. A. Sassano, K. L. Halliday, W. A. Karp, K. Mito, N. J. Williamson, and D. M. Smith. 1988. Distribution, abundance, and biological characteristics of groundfish in the eastern Bering Sea based on results of the U.S.-Japan triennial bottom trawl and hydroacoustic surveys during May - September, 1988. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-154. 400 p.

Halliday, K. L. and J. A. Sassano. 1989. Data report: 1987 bottom trawl survey of the eastern Bering Sea continental shelf. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-162. 143 p.

**II. 1948-88 haul-by-haul collection of halibut and crab catch data from resource assessment surveys in the Gulf of Alaska and Aleutian Islands**

Comprehensive bottom trawl surveys of the Gulf of Alaska were conducted in 1984 and 1987.

Other bottom trawl survey data from 1948 to the present are also available. Bottom trawl surveys of the Aleutian Islands region were performed in 1980, 1983, and 1986. Data from the major surveys have the same structure as for the Bering Sea and are stored as computer files. Data from other years are not as readily available. The most recent of the reports summarizing these data are:

Zenger, H. H. and K. Wakabayashi. 1985. Groundfish survey, Central and Western Gulf of Alaska, June 20 - October 3, 1984. 165 p. Unpublished report. Northwest and Alaska Fish. Cent., Natl. Mar. Fish. Serv., NOAA, 7600 Sand Point Way N.E., Seattle, WA 98115.

Stark, J., K. Mito, E. Brown, and T. Yoshimura. 1988. Report to Industry: Results of the 1987 U.S.-Japan Cooperative Bottom Trawl Survey of the Central and Western Gulf of Alaska. NWAFC Proc. Rep. 88-15, 215 p. Northwest and Alaska Fish. Cent., Natl. Mar. Fish. Serv., NOAA, 7600 Sand Point Way N.E., Seattle, WA 98115.

Stark, J. and V. Pashchenko. 1989. Report to Industry: Results of the 1987 U.S.-U.S.S.R. Cooperative Bottom Trawl Survey of the Central and Western Gulf of Alaska. NWAFC Proc. Rep. 89-05, 77 p. Northwest and Alaska Fish. Cent., Natl. Mar. Fish. Serv., NOAA, 7600 Sand Point Way N.E., Seattle, WA 98115.

### III. 1979-88 Longline Research Surveys

Longline surveys have been conducted in the Aleutian Islands, Bering Sea, and Gulf of Alaska by Japan since 1979. A domestic longline survey using similar methodology has been conducted in the Gulf of Alaska since 1987. These data are stored as computer files.





## **Datasets Available From The International Pacific Halibut Commission (IPHC)**

(Contact: Gregg Williams)

### **I. 1962-70 Study of the Canadian Trawl Fishery for Groundfish**

Information has been collected on the trawl fishery off B.C. by on-board observers. The program examined over 3,000 trawl hauls, operated during all months of the year and areas of the coast, and covered 1962 through 1970. The outcome from the program was the estimation of halibut bycatch rates by season (summer, winter), target fishery (flatfish, Pacific ocean perch, or lingcod/Pacific cod/other rockfishes), and region of the B.C. coast. Halibut were tagged during 1970 and mortality rates were estimated from the returns. The bycatch and mortality rates are discussed in detail in IPHC Scientific Reports 53 (1971) and 57 (1975). These data have not been put into computer files.

### **II. 1966 Analysis of Release Mortality of Longline-Caught Halibut**

The mortality of halibut caught on longlines rigged with J-hooks was estimated by Myhre (1974) in IPHC Scientific Report 55 from a tagging experiment conducted in 1966 off British Columbia. A total of 1,571 tagged halibut were released in 1966 and recoveries were observed during 1967-69. These data are stored as computer files but are not readily available for use.

### **III. 1971-84 ADF&G and NMFS Crab Research Surveys and Halibut Bycatch Rates**

ADF&G and the National Marine Fisheries Service lab in Kodiak conduct research surveys with pots to assess crab populations in the Gulf of Alaska and in the Bering Sea. The catch of halibut during these surveys is recorded and IPHC has obtained this information. Viability of the pot-caught halibut was also recorded. These data have been collected in all regions of the Gulf and Bering Sea over several years. The data are stored as computer files and will also be published in 1989 by IPHC as part of a manuscript on halibut bycatch information.

**IV. 1980 Experiment on Halibut Bycatch Rates In Crab Pots**

Halibut bycatch rates in top-loading and side-loading crab pots were compared in this experiment conducted off Yakutat in August, 1980 with the Alaska Department of Fish and Game (ADF&G). The effect of Tanner boards on bycatch rates was also examined. The experiment consisted of 257 potlifts over eight days of fishing by a chartered vessel. All halibut were measured and 87 percent were tagged; the tag returns have not been analyzed. The condition of all halibut upon pot retrieval was recorded. The results of the bycatch rate comparison have been published as IPHC Technical Report 19. The data are stored as computer files but are not readily available for use.

**V. Halibut Bycatch Information From ADF&G and NMFS Trawl Surveys for Shrimp and Tanner Crab since 1980**

NMFS and ADF&G have employed trawl surveys to assess shrimp and Tanner crab, respectively, in the Gulf of Alaska. IPHC has obtained information on halibut bycatch rates sporadically since 1980. No information on mortality was provided. The IPHC data have not been stored as computer files.

**VI. 1982-84 Comparative Trawl Experiments In the Bering Sea**

IPHC conducted a comparative trawl experiment with the Japan Fishery Resource Research Center (JAMARC) during 1982-84 in the southeastern Bering Sea. The experiments involved the fishing of bottom trawl nets designed to reduce the bycatches of halibut, salmon and crab. Halibut were tagged during all three years, but the returns have not been analyzed. The data are stored as computer files but are not readily available for use. The results of the bycatch rate comparisons have been reported in the 1982-84 IPHC Annual Reports and in documents submitted to the INPFC.

**VII. 1983 Study on Crab Pot Inserts to Reduce Bycatch**

A study examining the effect on the halibut bycatch rate of a plastic crab pot insert designed to increase the retention of Tanner crab was conducted by IPHC and ADF&G in June, 1983, in southeast Alaska. The study took place over nine days and included 56 potlifts. All halibut were measured and viability recorded. No halibut were tagged. The results have been published in the 1983 IPHC Annual Report. The data are stored as computer files but are not readily available for use.

**VIII. 1983 observations of the B.C. Sablefish Pot Fishery**

DFO has had observers on sablefish pot vessels since 1979, but records of halibut bycatch are incomplete. IPHC obtained information on the bycatch and mortality of halibut from three vessels in 1983, but nothing for earlier or later years. To obtain these data or information summaries, contact: G.A. "Sandy" McFarlane or Mark Saunders, DFO, Nanaimo, B.C.

**IX. 1987 Observer Trip on a Longliner Fishing Pacific Cod**

IPHC put an observer on board a longliner fishing for Pacific cod around Kodiak Island during August, 1987. The vessel fished two trips over a nine day period, and fished 501 skates of cod gear. The bycatch of halibut was recorded, but the halibut were not measured. The observer visually estimated the approximate weight of each halibut. A copy of the data has been forwarded to ADF&G in Kodiak. The data are stored as computer files.

**X. 1988 Analysis of Halibut Bycatch In the Sablefish Longline Fishery**

IPHC staff conducted a survey of Alaskan halibut fishermen during the May, 1988 halibut landing period inquiring about halibut bycatch in the April, 1988 sablefish fishery. Approximately 200 sablefish fishermen were interviewed. Responses were categorized into one of four levels of bycatch according to the amount of halibut bycatch observed by the captain. No inquiry was made for viability/mortality or size information. Although not stored as computer files, the data are readily available. A report on this study can be found in IPHC's 1989 Stock Assessment Document and will also be published in the 1988 IPHC Annual Report, available in mid-1989.

**XI. 1988 Study of the Kodiak Trawl Fishery for Flatfish**

IPHC placed two observers aboard local shore-based trawlers in late July, 1988 fishing for deepwater flatfish off Kodiak. The two vessels observed made 22 hauls during four vessel-days of fishing. All halibut were measured and only those that were alive (174 fish--64 percent) were tagged. Additionally, the release condition (excellent, fair or poor) of the tagged fish was noted. The catch of other species was not recorded. A report on this study can be found in IPHC's 1989 Stock Assessment Document and will also be published in the 1988 IPHC Annual Report, available in mid-1989. Only the halibut length data are stored as computer files (LOTUS spreadsheet).





**Information Available from the Alaska Department of Fish and Game (ADF&G)**

(Contact: Peter Craig)

**I. ADF&G database containing groundfish catches in the Bering Sea and Gulf of Alaska, 1978-89 (primarily focuses on the Kodiak shore-based operations)**

The methodology used in collecting these data are similar to that used by the NMFS Foreign Fisheries Observer Program, but catch rates are generated in terms of catch per ton of landed catch reported on the fish ticket, while NMFS catch rates are in terms of catch per ton of groundfish brought aboard the vessel. The database can be queried by gear type, target species, and area. Numerous releases and quarterly reports have been generated and are available upon request.

**II. 1978-81 information on halibut injury and mortality in trawl catches**

Information for 1978-81 on halibut injury and apparent mortality in trawl catches is available in the following report:

Blackburn, Jim and Dana Schmidt. 1988. Injury and Apparent Mortality from Incidental Trawl Catches for Halibut, King Crab, and Tanner Crab, in the Kodiak area, 1978-81. ADF&G Reg. Info. Report No. 4K88-21. 11 p.

**III. 1978-84 ADF&G Observer Program under a NPFMC contract**

ADF&G had a contract with the North Pacific Fishery Management Council in the late 1970s and early 1980s for a bycatch monitoring study. The study monitored trawlers fishing around Kodiak and trawlers in the Bering Sea. A total of 58 trips in the Gulf and 30 trips in the Bering Sea were observed. No mortality information was reported. The total incidental catch of halibut was estimated for the observed vessels. The availability of the original data is unknown, but bycatch rates were reported annually as part of the contract. Appropriate reports include:

Blackburn, James E. and Philip Rigby. An observer program for the domestic groundfish fishery in the Gulf of Alaska, September 30, 1977 through December 31, 1979. Final report for Contract 77-5 with the North Pacific Fishery Management Council. Unpublished report.

Blackburn, James E. and David L. Owen. An observer program for the domestic groundfish fishery in the Gulf of Alaska; Southern Bering Sea observation in 1980. Report period January 1, 1980 through September 15, 1980. Final report for Contract 77-5 with the North Pacific Fishery Management Council. Unpublished report.

Blackburn, James E. 1986. Westward region commercial groundfish fishery monitoring investigations, 1982 through 1984. Alaska Dept. of Fish and Game, Info. Leaflet No. 257, 87 p.

**IV. 1978-85 incidental catch information in the domestic Kodiak trawl fishery**

Information on the 1978-85 incidental catch in the domestic Kodiak trawl fishery is available in the following report:

Blackburn, Jim and Dana Schmidt. 1986. Summary of Incidental Catch Data of Prohibited Species in the Trawl Fishery Near Kodiak, from the Domestic Observer Program. ADF&G unpublished report. 25 p.

**V. 1978-87 bycatch maps for halibut caught in the domestic Kodiak trawl fishery**

Bycatch maps for the 1978-87 halibut catch in the domestic Kodiak trawl fishery are available in the following report:

Craig, P., J. Blackburn, D. Owen, L. Watson, T. Dinnocenzo, and K. Phillips. 1988. Bycatch Maps (By Statistical Area) for Trawl-Caught Halibut, Crab, and Salmon in the Kodiak Area, 1978-87. ADF&G Reg. Info. Report No. 4K88-30. 20 p.





## Reports Available From the Canadian Department of Fisheries and Oceans (DFO)

(Contact: G.A. "Sandy" McFarlane)

### I. 1977-79 observations of Halibut Bycatch in the Foreign Fishery off B.C.

DFO has observers on foreign vessels fishing within its FCZ, principally to monitor target catches. Halibut bycatch rates have been reported in the following publications:

Leaman, B. M., D. Davenport, W. R. Harling, D. A. Nagtegaal, W. A. Osterman, J. R. Selsby, and G. A. Thomas. 1978. Biological observer coverage of foreign fisheries off Canada's Pacific Coast, 1977, Part 1. Canadian Department of Fisheries and the Environment, Fisheries and Marine Service, Data Report Number 99. 171 p.

Leaman, B. M., D. Davenport, J. R. Selsby, and D. C. H. Yao. 1980. Biological observer coverage of foreign fisheries off Canada's Pacific coast, 1978. Can. Tech. Rep. Fish. Aquat. Sci. No. 956. 245 p.

.....1981. Biological observer coverage of foreign fisheries off Canada's Pacific coast, 1979. Can. Tech. Rep. Fish. Aquat. Sci. No. 1006. 64 p.

### II. 1978-80 Observations of the B.C. Trawl Fishery

DFO had observers on board domestic trawlers to monitor discards and obtain information on halibut bycatch during 1978-80. IPHC "loaned" several seasonal employees to DFO in 1980 to expand the program in order to gather more extensive halibut bycatch information. Further monitoring was conducted by DFO in 1981 and 1982, but none has occurred since then. The results of these studies have been published in the following reports:

Ketchen, K. S. 1981. Preliminary study of the incidence of halibut in catches by the Canadian west coast trawl fishery for groundfish, 1978-80. Can. MS. Rep. Fish. Aquat. Sci. 1628: iv + Rep. No. 1: 23 p., Rep. No. 2: 21 p.

Stanley, Richard D. 1984. Incidental catch of halibut (Hippoglossus stenolepis) by domestic trawlers in Queen Charlotte Sound and Hecate Strait, in 1981 and 1982. Can. Tech. Rep. Fish. Aquat. Sci. No. 1318. 45 p.



