Joint Meeting
North Pacific Fishery Management Council
and
International Pacific Halibut Commission

June 11, 1996
1 p.m. - 5 p.m.

Red Lion Hotel Downtown
Portland, Oregon

AGENDA

(a) Introduction

(b) Area 4 biomass distribution and effects on catch sharing plan

(c) Bycatch compensation model and stock assessment changes

(d) Halibut gridsorting in the groundfish fisheries

(e) Halibut Bycatch in the groundfish fisheries

(f) Public comments

(g) General IPHC-NPFMC discussion

North Pacific Fishery Management Council Members

Richard Lauber (Council Chair) -- Pacific Seafood Processors Assn., Juneau, AK

Capt. William Anderson -- 17th U.S. Coast Guard District, Juneau, AK

Dr. Morris Barker -- Washington Dept of Fish & Wildlife, Olympia, WA

Linda Behnken -- Alaska Longline Fishermen's Assn., Sitka, AK

David Benton -- Alaska Dept. of Fish & Game, Juneau, AK

William E. Dilday -- U.S. Department of State, Washington, D.C.

Dr. David Fluharty -- School of Marine Affairs, University of Washington, Seattle, WA

Dr. David Hanson -- Pacific States Marine Fisheries Commission, Portland, OR

Kevin O'Leary -- Kodiak Vessel Owners Assn., Kodiak, AK

Robert Mace -- Oregon Dept. of Fish & Wildife, Central Point, OR

Steve Pennoyer -- Alaska Regional Director, NMFS, Juneau, AK

Dr. Walter Pereyra, Vice Chairman -- ProFish International, Seattle, WA

Everett Robinson-Wilson -- U.S. Fish & Wildlife Service, Anchorage, AK

Robin Samuelsen -- Bristol Bay Economic Development Corporation, Dillingham, AK

Clem Tillion -- Halibut Cove (Homer), AK

IPHC MEMBERS

Richard J. Beamish (Chair) -- Pacific Biological Station, Dept. of Fisheries & Oceans, Nanimo, B.C.

Gregg Best -- Fishing Industry Association Representative, Comox, B. C.

Ralph G. Hoard -- Icicle Seafoods, Seattle, WA

Kris Norosz -- Icicle Seafoods, Petersburg, AK

Steve Pennoyer -- Alaska Regional Director, NMFS, Juneau, AK

Brian Van Dorp -- Processing Industry Representative, Richmond, B.C.

MEMORANDUM

TO: Council, SSC and AP Members

FROM: Clarence G. Pautzke
Executive Director

DATE: June 3, 1996

ESTIMATED TIME
4 HOURS

SUBJECT: Joint Meeting of Council and International Pacific Halibut Commission on Halibut Issues

ACTION REQUIRED

(a) Introduction.
(b) Area 4 biomass distribution and effects on catch sharing plan.
(c) Bycatch compensation model and stock assessment change.
(d) Halibut gridsorting in the groundfish fisheries.
(e) Halibut bycatch in the groundfish fisheries.
(f) Public comments.
(g) General IPHC-NPFMC discussion.

BACKGROUND

(a) Introduction

At their January 22-25, 1996 annual meeting, the IPHC commissioners again noted their concern over halibut bycatch in U.S. groundfish fisheries, and passed a joint resolution (item C-2(a)(1)) that reaffirmed their bycatch recommendations from 1991 and encouraged development of a vessel incentive bycatch reduction program. The Commission called for a special U.S.-Canada meeting to discuss bycatch, and requested to meet in June with the Council to discuss bycatch issues.

In arranging the agenda for this joint meeting, and to facilitate our Council meeting, I went beyond bycatch to include other issues of mutual interest on halibut management, namely, IPHC staff reports on Area 4 biomass distribution and bycatch compensation, and a review of the halibut grid-sorting issue. Following those staff reports, we will have an overview of the bycatch issue, then receive public comments, and proceed into Council-Commission discussion.

(b) Area 4 biomass distribution and effects on catch sharing plan.

Steve Hoag, IPHC staff, will present two reports pertaining to setting Area 4 catch limits under Commission jurisdiction (item C-2(b)(1) & (2). The IPHC staff intends to recommend biomass-based catch limits for Areas 4A, 4B, and combined 4C-E to the Commission in November 1996. They are very similar to the traditional allocations adopted in the Council's Area 4 catch sharing plan (CSP) for 1996.

To use the new percentages in 1997, the Secretary would need to issue a rulemaking removing Areas 4A and 4B from the Council's CSP. The CSP would still be used to split up the combined 4C-E catch limit: 46% - 4C, 46% - 4D, 8% - 4E. The Council could task staff at this meeting with preparing an EA/RIR to amend the CSP,

contingent upon IPHC action in January 1997. Alternatively, if the IPHC waits until 1998 to use the new limits, the Council could amend its CSP to reflect the IPHC change as part of the 1997 IFQ cycle.

(c) Bycatch compensation model and stock assessment changes.

IPHC staff will review modifications to bycatch compensation and stock assessment methodology, which includes dividing bycatch into two components: a recruited component (length > 80 cm) and a migratory component. Recruitment compensation will occur in the region where the bycatch occurred. The migration component in the model will compensate juvenile bycatch "downstream" of the bycatch area. For 1985-94, the halibut stock assessment used a "catch-at-age" methodology known as CAGEAN. The new assessment model will modify how fishing mortality will affect each age class in each year included in the analysis. The new model better incorporates the effects of changing growth rates of halibut which has shown a rapid reduction in body growth in recent years. Average length-at-age is 20-25% lower than it was 15 years ago. No action is required now by the IPHC or Council.

(d) Halibut gridsorting in the groundfish fisheries.

IPHC staff prepared a draft regulatory amendment to evaluate a potential requirement that the deck crew on all factory trawlers and catcher boats that dump groundfish directly to a stern tank before sorting, use a grid over the entrance to the hold and sort out as much halibut bycatch as practicable for immediate return to the sea. The EA/RIR was distributed on December 14, 1995. The Executive Summary is included as item C-2(d)(1). Prior to final Council action, however, the IPHC withdrew its support of the deck-sorting program due to its concerns over the degradation of bycatch estimates, conflict with the Vessel Incentive Program, enforcement, and opportunities to presort other species in advance of observer sampling (item C-2(d)(2)).

The Council did not approve the amendment at their January meeting, but expressed strong support of the proposal because of the magnitude of projected savings in halibut discard mortality. The Council noted that grid-sorting was allowed under existing regulations, and may be undertaken voluntarily on unobserved vessels and during unobserved tows on observed vessels. The Council requested that NMFS provide a report addressing VIP and data quality issues related to grid-sorting. The NMFS report, first distributed at the April 1996 Council meeting, is attached under item C-2(d)(3) for informational purposes. No action is required now unless the Council wants to move ahead again on this issue.

(e) Halibut bycatch in the groundfish fisheries.

The 1996 IPHC resolution (referring back to item C-2(a)(1)) on bycatch refers to a special meeting of the Halibut Commission in July 1991 and resulting agreements on bycatch reduction. In advance of that special 1991 meeting, a Halibut Bycatch Work Group, co-chaired by Richard Beamish and Steve Pennoyer, met six times from March to July. I have a copy of the Work Group's full report, but have placed in the notebooks just their recommendations on reducing bycatch (item C-2(e)(1)). Under item C-2(e)(2) is a copy of an August 7, 1991 letter from Steve Pennoyer to Minister Crosbie with formal recommendations of the IPHC from their extraordinary meeting held July 22-24, 1991. The Council received these materials at the August 1991 extension of their June meeting.

Since 1991, there have been changes in halibut bycatch and in the measures that the Council uses to manage bycatch. As shown in item C-2(e)(3) halibut bycatch mortality was at a relative maximum of just over 18 million pounds (8,164 mt) in 1990, the year our observer plan was first implemented for the domestic groundfish fleet. This high level of bycatch could have provided much of the basis for heightened concern and for the work group activities in the first half of 1991. Overall bycatch declined 17% from 1990 to 1995. In Areas 3 and 4, there was a decline of 16%.

Several management measures have been implemented since 1991. These are listed along with an earlier history of measures in item C-2(e)(4). As noted there, the Council is in the process of developing a vessel bycatch allowance program, but further development has been stalled by recent legislation. Recent bycatch measures must be viewed in light of other more comprehensive measures whose purpose went beyond the bycatch issue, but contributed significantly to its mitigation. Comprehensive observer coverage is a good example. It has provided managers the best catch database ever available for North Pacific fisheries. Also, the Council has not raised the 2 million metric ton cap on groundfish harvests in the BSAI despite numerous proposals to raise it throughout the 1980s and a full General Accounting Office audit on the issue in 1990 and 1991. Halibut bycatches likely would have been much higher if the cap had not been maintained. Using 1995 as an example, the combined acceptable biological catches for all groundfish species exceeded 2.8 million mt, but the cap and other management measures restricted catch to only about 1.8 million mt. If the full combined ABC had been taken, there would have been an additional 1,500 mt of halibut bycatch mortality, a 26% increase over the 5,700 mt actually used in the combined GOA and BSAI groundfish fisheries. Also, the move away from using bottom trawls for BSAI pollock in recent years has reduced halibut bycatch in this largest fishery in the United States.

Halibut bycatch limits have proven to be the major constraint in groundfish fishing seasons off Alaska. Halibut PSC-related closures back to 1991 in the Gulf of Alaska and Bering Sea and Aleutians are shown in the tables compiled in item C-2(e)(5). Item C-2(e)(6) shows recent halibut PSCs by fishery and how much was actually taken.

COMMISSIONERS:
RICHARD J. BEAMISH
NANAIMO, B.C.
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INTERNATIONAL PACIFIC HALIBUT COMMISSION

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

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February 19, 1996

The Honorable Ronald H. Brown
Secretary of Commerce
U.S. Department of Commerce
Washington, D.C. 20230

Dear Sir:

The annual meeting of the International Pacific Halibut Commission was held in Bellevue, Washington, January 22-25, 1996. The Commission reviewed the halibut fishery of the past year and the results of research by its scientific staff and considered the views and recommendations of Canadian and United States fishermen and processors. The regulations proposed by the Commission for the 1996 halibut fishing season are being forwarded under separate cover for your approval as required by the Halibut Convention.

The Commission reports that the stocks will provide a yield of approximately 48.66 million pounds to the 1996 commercial fishery.

The Commission's staff has implemented a new stock assessment model that takes into account the changes observed in halibut growth rates. The staff reported that the model needs further testing before the biomass estimates are reliable. The application of other models and survey data indicate the stock biomass is as large or larger than previously believed, therefore, the staff recommended the previous years quotas as a conservative approach to the present uncertainty in the stock assessment. The Commission agreed and the 1995 catch limits were adopted for the 1996 fishery.

In addition to testing the new model during the coming year the staff will include in the model input data the age structure of the adult component of the bycatch.. This may change the biomass estimates somewhat. The regional stock compensation for the juvenile bycatch will be based on the migration model. Since these changes may effect the allocation of catch between regions the Commission will hold a stock assessment review in conjunction with the bycatch committee meeting in July or August of this year.

Canada expressed the concern that the U.S. has not complied with the agreement on bycatch reductions negotiated at a special meeting of the Halibut Commission in July 1991. Both countries agreed that an incentive program must be developed before reductions can be assured.

Canada introduced new measures to further reduce its halibut bycatch mortality. These include: bycatch caps on the trawl fleet; 100% observer coverage funded by industry; and individual vessel bycatch quotas.

The Commission agreed to the following resolution on bycatch reduction:

1996 RESOLUTION OF THE INTERNATIONAL PACIFIC HALIBUT COMMISSION ON BYCATCH REDUCTION

The Commission,

RECALLING its July 22, 1991, recommendations of the Special Bycatch Meeting of the International Pacific Halibut Commission for the Parties to reduce halibut bycatch mortality:

RECOGNIZING that concerns continue for the productivity, biomass decline, recruitment status and the impact of bycatch on the directed fishery of both countries;

RECOGNIZING the efforts of both countries to reduce halibut bycatch while preserving each country's ability to harvest its groundfish resources;

RECOGNIZING that no single solution has been demonstrated by either country to adequately address the bycatch issue;

RECOGNIZING the Government of Canada plans to implement an Individual Bycatch Quota (IBQ) program, as well as 100 percent observer coverage for that portion of its trawl fleet which has exhibited high bycatch and will reduce its bycatch mortality significantly by 1997;

NOTING the United States had reduced total discard mortality estimated for the 1995 Alaska groundfish fisheries by 8 percent from 1994 and substantially reduced waste in the halibut fishery through implementation of an IFQ program;

NOTING the United States anticipates improved in-season management of halibut mortality allowances experienced in 1995 to continue, including implementing a new electronic reporting system for observer reports in the summer of 1996 to improve the quality and timeliness of observer data for in-season management of halibut mortality allowances;

NOTING the North Pacific Fishery Management Council (NPFMC) has initiated analyses of alternative gear allocations of Pacific cod to vessels using non-trawl gear which would be a means of reducing halibut discard mortality and which could be in place in 1997;

NOTING the NPFMC and the National Marine Fisheries Service is continuing its analyses for implementing an IBQ program off Alaska;

NOTING that bycatch reduction programs take time to implement;

RECOMMENDS that:

1. Both countries reaffirm their commitment to achieve the goals of the Commission's 1991 bycatch recommendations.

2. The United States move as quickly as possible to implement a vessel incentive bycatch reduction program which makes the achievement of these goals possible.

3. The Commission convene a special meeting of the parties in June 1996 to:

    a. review the effectiveness and further develop each country's bycatch reduction programs and,
    b. consider new procedures to compensate the halibut biomass for losses due to bycatch mortality.

4. The Commission convene a joint meeting with the NPFMC at its June 1996 meeting to discuss halibut reduction programs in U.S. fisheries, including implementation of an IBQ program or other similar incentive-based halibut reduction programs.

The Commission received an updated estimate of bycatch in Area 2A, the Washington/Oregon Coast. The current estimate based on 1992 data, but not yet including the shrimp fishery, is 590,000 pounds. The previous estimate for the 1987 fishery was 455,000 pounds. Unless methods can be employed to

reduce bycatch in this area the present allocations to sport, commercial, and treaty tribes may be difficult to maintain.. The Commission urges the U.S. to develop an observer program and a bycatch reduction program for Area 2A.

The Commission expressed its concern with the sport fish removal estimate for Area 2B (British Columbia). A committee has been organized to deal with the sampling needs, the estimation procedure, and the cost of obtaining acceptable estimates. The committee will include Canadian commissioner Mr. Gregg Best, senior staff biologist, Dr. Robert Trumble, and members of the Canadian Department of Fisheries and Oceans. The report from this committee is scheduled for May 1996 and will be discussed at the Commission's summer stock assessment meeting.

The Canadian sport fish representatives on the conference board met with Canadian commercial fishermen representatives and they jointly agreed to an increase in the Canadian sport fish possession limit from two fish to three fish. As a result of this agreement the parties agreed to negotiate a limit on sport fish removals in British Columbia. The Commission recommends the three fish possession limit.

The Commission approved a request from Northwest Food Strategies to distribute a small quantity of bycaught halibut, not to exceed 50,000 pounds net weight to various food banks. The halibut bycatch is from the pollock fishery that does not sort at sea and delivers their catch at Dutch Harbor, Alaska. The program is for 1996 only and will be evaluated for further consideration after that time

The Commission was urged to conduct an Area 2B stock assessment survey in 1996. The survey and commercial catch-per-effort data is not well correlated with the biomass estimate trend from

the stock assessment model in this area. The staff agrees this survey will provide useful information and has suggested that Area 2C will also be surveyed if possible. These surveys will be conducted in addition to the previously scheduled Area 3A and 3B surveys.

At the Finance and Administrative Committee meeting the Canadian representative made a proposal to change the U.S./Canada funding ratio. The representatives from the two countries agreed to hold a meeting later this year to discuss the proposal.

The Commission wishes to acknowledge the formation of a Processors Advisory Group (PAG) which will provide advice to the Commission in a similar manner now provided by the Commission's conference board.

The Commission wishes to acknowledge a debt of gratitude to the United States North Pacific Fishery Management Council, the National Marine Fisheries Service, the Canadian Department of Fisheries and Oceans, and the various other state and provincial agencies for the help their staff provided in Commission deliberations. The cooperation of all involved government agencies is excellent and assists in the development of proposed regulations.

Sincerely yours,

Richard J. Beamish
Chairman

SETTING CATCH LIMITS FOR PACIFIC HALIBUT IN AREA 4

by

Stephen H. Hoag and William G. Clark
International Pacific Halibut Commission

April 2, 1996

INTRODUCTION

The International Pacific Halibut commission (IPHC) is responsible for conducting biological assessments of the halibut resource and for setting catch limits to protect the resource and maximize yield. The North Pacific Fishery Management Council (NPFMC) has the responsibility of allocating fishing privileges among U.S. fisherman in waters off Alaska. McCaughran and Hoag (1992) provide a discussion of management authority of the IPHC and the NPFMC relating to halibut; Hoag et. al. (1993) and Skud (1977) provide a review of IPHC regulations and their rationale. The IPHC attempts to set catch limits in proportion to the biomass of adult sized halibut in each regulatory area. The purpose of this management policy is to avoid local depletion and reduce the risk of overexploiting any stock components.

The division of authority between the IPHC and the NPFMC has in Area 4 is currently unclear because regulations defining subareas within Area 4 (Figure 1) and the catch limits for these subareas have had both biological and allocation management goals. The problem in Area 4 has been that biomass estimates have only been available for the total area, and not for the subareas until recently. IPHC attempted to spread fishing effort over Area 4 by creating subareas, but the division of the catch was based more on anecdotal information from fisherman than on scientific assessment. Further, the subareas have become important to different local communities and fishermen for allocation reasons. The significance of the allocation objectives of the subareas has greatly increased under the new management regime involving individual or community quotas.

The IPHC staff estimated the biomass of halibut in each of the subareas by using area of the fishing grounds as a measure of habitat and the CPUE in the commercial fishery as a measure of density, and then applying the relative biomass in each subarea to the total biomass estimate for Area 4 (Sullivan and Parma, unpublished). Catch limit recommendations from the staff were presented at the 1995 IPHC Annual Meeting based on applying a constant exploitation rate to all subareas.

The IPHC was reluctant to adopt the staff recommendations because the new biomass based catch limits differed significantly from the catch limits calculated by the traditional method and the staff could not demonstrate that the resource would be harmed by continuing to set catch limits based on the traditional method until the NPFMC had an opportunity to fully assess the allocation objectives of halibut management within Area 4. The IPHC staff also acknowledged that further work could be done in perfecting the biomass estimates. Further the staff suggested

that some of the subareas could be combined and that the biomass-based catch limits could be calculated for these combined subareas.

This report summarizes research on the biology and distribution of halibut in Area 4 and provides additional information on estimates of biomass and the resulting catch limits for subareas within Area 4. Recommendations for future management are also provided.

SUMMARY OF RESEARCH

Dunlop et. al. (1963) reviewed the early fishery and research in the southeastern Bering Sea. Their report concluded that halibut are present over most of the shelf area, but concentrations of commercial-sized halibut are restricted to a narrow band on the edge of the continental shelf between Unimak Pass and the Pribilof Islands and to a lesser extent along the Aleutian Islands. (This area includes parts of 4A, 4B, and 4C.) They also noted that the distribution of halibut is related to depth and water temperature and varies seasonally. On the flats (Area 4E), commercial sizes are sparsely distributed while young halibut are abundant. Interchange of halibut between sections of the region was indicated from tagging studies. They also showed considerable emigration out of the region and concluded that halibut in the eastern Bering Sea are not biologically separated from those in the eastern Pacific.

Best (1977) documented the abundance and distribution of juvenile halibut in the southeastern Bering Sea and concluded that juveniles concentrate in the winter at the edge of the continental shelf. With spring warming, they move onto the shallow flats and disperse. Maximum northward distribution occurred in August or early September. Oceanographic circulation of the Bering Sea indicates that eggs and larvae spawned in the eastern Bering Sea may be transported northwesterly to nursery areas on the east coast of the Kamchatka Peninsula. Larval halibut from spawning in the Gulf of Alaska are carried into the Bering Sea and contribute to the large populations of juvenile halibut in the southeastern Bering Sea.

Gilroy and Hoag (1993) reported the results from an IPHC survey of the Bristol Bay region (Area 4E). The purpose of the survey was to assess the commercial stock and the incidence of fish below the legal size limit that might occur in a commercial fishery. The survey indicated a low density of commercial sized halibut (average catch per skate was 6 pounds). There was also a low incidence of sublegal fish. The report also reviewed the IPHC decision to extend the Area 4E boundary to allow commercial fishing in Bristol Bay in 1990.

Sadorus and St-Pierre (1995) summarized the results of IPHC research surveys near the Pribilof Islands (Area 4C) and reviewed the history of the fishery and management. They provide information on CPUE, age, size, and sex composition, and the results of tagging studies. A total of 208 tags have been recovered from releases in the Pribilofs: 8% in Canada, 52% in the Gulf of Alaska, 24% in Area 4C, 6% in other parts of Area 4, and 10% from unknown locations. These results suggest a substantial movement of halibut out of Area 4C into many other areas.

Additional information on tag releases and recoveries from experiments in Area 4 is available, but has not been analyzed. Information on fishing locations is also available but is confidential because it comes from fisherman log books. A composite of this log book information was the basis for the estimates of total area of fishing grounds in each subarea which were used by the IPHC staff along with CPUE data to estimate the relative biomass in each subarea. A report on the area of the fishing grounds and the estimated habitat is in progress.

In summary, the distribution of adult halibut in Area 4 appears concentrated along the edge of the continental shelf. There is also evidence that the distribution varies seasonally and that halibut tend to move into shallower water on the shelf as water temperatures warm during the summer. Anecdotal information from fishermen support this conclusion. Adult halibut are probably not available in areas 4C and 4E except during the summer. Adult halibut also tend to be more prevalent in the southern areas and along the Aleutian chain. There is also considerable movement of halibut out of the Bering Sea into the Gulf of Alaska.

CATCH LIMITS AND BIOMASS ESTIMATES

A summary of catch limits (in thousands of pounds, *net weight*) for each subarea since 1983 follows:

	Area 4A		Area 4B		Area 4C		Area 4D		Area 4E		Total
Year	lbs.	%	lbs.	%	lbs.	%	lbs.	%	lbs.	%	lbs.
1983	1,200	46.1	800	30.7	400	15.8	200	7.6	0	0	2,600
1984	1,200	39.3	1,000	32.7	400	13.1	400	13.1	50	1.6	3,050
1985	1,700	40.0	1,300	30.5	600	14.1	600	14.1	50	1.2	4,250
1986	2,000	39.6	1,700	33.6	600	11.8	700	13.8	50	1.0	5,050
1987	1,750	36.6	1,750	36.6	600	12.5	600	12.5	75	1.6	4,775
1988	1,900	35.1	2,000	37.0	700	12.9	700	12.9	100	1.9	5,400
1989	1,800	36.0	1,900	38.0	600	12.0	600	12.0	100	2.0	5,000
1990	1,500	36.5	1,500	36.5	500	12.1	500	12.1	100	2.4	4,100
1991	1,700	36.1	1,700	36.1	600	12.7	600	12.7	100	2.1	4,700
1992	2,300	36.3	2,300	36.3	800	12.6	800	12.6	130	2.1	6,330
1993	2,000	33.1	2,300	38.1	800	13.2	800	13.2	130	2.2	6,030
1994	1,800	33.1	2,100	38.8	700	12.9	700	12.9	100	1.9	5,400
1995	1,950	32.9	2,310	39.0	770	13.0	770	13.0	120	2.0	5,920
Total	22,800	36.4	22,600	36.1	8,070	12.9	7,970	12.7	1,105	1.8	62,605

Sullivan and Parma (unpublished) estimated the relative biomass and catch limit for each subarea using the same methodology that has been used in the Area 2A-2B assessment. The method uses historical fishing grounds as a measure of area and a 5 year average CPUE as a measure of density to partition total biomass for the area into separate biomass estimates for each subarea to which the exploitation rate is applied. Estimates of fishing grounds were provided by Hoag, St-

Pierre, and Forsberg (Unpublished) and were determined from fisherman's log books and IPHC research surveys. The average CPUE was from commercial fisherman's log books. The area of the fishing grounds, the 5-year average CPUE, and a comparison of resulting catch limits from this approach with the historical method is provided below. The percent biomass for each area is calculated from the sum of products of fishing grounds times CPUE.

	Biomass Based Method: Sullivan and Parma (unpublished)				Historical Method	
Area	Fishing Grounds (sq. nmi.)	5-year Average CPUE	% Biomass	1995 Catch Limit (lbs.)	Historical %	1995 Catch Limit (lbs.)
4A	8,183	386.85	41.3	2,440,000	33	1,950,000
4B	6,118	246.24	19.6	1,160,000	39	2,310,000
4C	561	225.25	1.6	90,000	13	770,000
4D	5,605	422.31	30.9	1,830,000	13	770,000
4E	4,910	100.5	6.4	338,000	2	120,000
Total	25,377	-	100.0	5,920,000	100	5,920,000

The results from the biomass-based method showed significantly more halibut in Area 4D and less halibut in 4C than indicated by the historical method of setting catch limits. Other differences included more halibut in 4A and 4E and less halibut in 4B.

Several technical concerns regarding the biomass-based estimates were raised by fishermen during the review process at the 1995 IPHC Annual Meeting: (1) the CPUE in Area 4D exaggerates the density of halibut in the area because nearly all of the fishing occurs on a small very productive ground, (2) Areas 4C, 4D, and Area 4E should be combined because halibut move seasonally among these areas and these areas were created to achieve allocation objectives, not biological objectives, and (3) fishing grounds and habitat in Area 4B are underestimated because strong tidal flows make the area difficult to fish.

We consider these criticisms valid and recalculated the biomass-based estimates. The modified biomass-based estimates assume that the density of halibut on the fishing grounds is the same in Areas 4A, 4B, 4C, and 4D, but lower in Area 4E. For calculation, we assumed an intermediate CPUE value of 300 pounds per skate for Areas 4A, 4B, 4C, and 4D, and 100 pounds per skate for Area 4E. A second modification involved assuming that the fishing grounds in Area 4B represent the same proportion of total bottom area as in Area 4A. This assumption is based on the two areas being adjacent, and that fishing grounds in Area 4B may have been underestimated. Hoag, St-Pierre, and Forsberg (unpublished) estimated that fishing grounds represented 37.9% of total bottom area inside 500 fathoms in Area 4A, but only 26.3% of the total bottom area in Area 4B based on log book data. If Area 4B is more difficult to fish, available log book data may under represent available fishing grounds. Applying 37.9% to the 23,234 square miles of total bottom area in Area 4B increases the estimated fishing grounds in Area 4B to 8,806 square miles.

These modifications result in the following:

Area	Modified Biomass-Based Method				Historical Method	
	Fishing Grounds (sq. nmi.)	Assumed CPUE	% Biomass	1995 Catch Limit (lbs.)	Historical %	1995 Catch Limit (lbs.)
4A	8,183	300	33.0	1,953,600	33	1,950,000
4B	8,806	300	35.5	2,101,600	39	2,310,000
4C	561	300	2.3	136,160	13	770,000
4D	5,605	300	22.6	1,337,920	13	770,000
4E	4,910	100	6.6	390,720	2	120,000
Total	28,065	-	100	5,920,000	100	5,920,000
4C, 4D, 4E	11,076	-	31.5	1,864,800	28	1,660,000

The modified biomass estimates are closer to the historical estimates for Areas 4A, 4B, and the total of Areas 4C through 4E. Areas 4D and 4E continue to show a higher biomass and Area 4C a lower biomass than indicated by the historical method.

We contend that the modified method is probably an improvement over the initial biomass-based method presented at the 1995 IPHC Annual Meeting, and that both methods more accurately reflect the biomass in each area than the traditional method of setting catch limits. Ideally, annual estimates of biomass should be made using catch, age, size, and CPUE data from each area, similar to the procedure used by the IPHC staff in other areas. However, we doubt that sufficient data will be available in the near term to provide this type of assessment.

The IPHC staff will continue to work towards improving biomass estimates for each subarea. Survey data may offer addition information on the distribution of biomass within Area 4, and the IPHC staff is considering a setline survey of the area in 1997. Data from NMFS trawl surveys are available for part of the area, but may not accurately reflect the abundance of adult halibut which can avoid trawl capture. Also much of Area 4B is difficult to trawl because of uneven bottom.

RECOMMENDATIONS

The IPHC staff strongly supports the conservation-based principle of setting catch limits in proportion to biomass. The staff recognizes that estimates of biomass for subareas within Area 4 are less precise than estimates for other regulatory areas and the amount of halibut in some of the subareas is small relative to other regulatory areas. Further, the seasonal movement of halibut within Area 4 may lessen the opportunity for local depletion even if the catch limits are not set in proportion to the biomass in each subarea. The possibility that individual stock components may be negatively affected by uneven exploitation rates cannot be ruled out although quantifying the effect of unequal exploitation is problematic. The NPFMC and IPHC should work closely together in setting catch limits that achieve allocation objectives while at the same time protect the resource.

The IPHC staff intends to continue to work towards improved estimates of biomass and will provide recommendations for catch limits prior to the 1997 IPHC Annual Meeting. We anticipate that staff recommendations for catch limits will probably be limited to Area 4A, 4B, and a combined Area 4C, 4D, and 4E.

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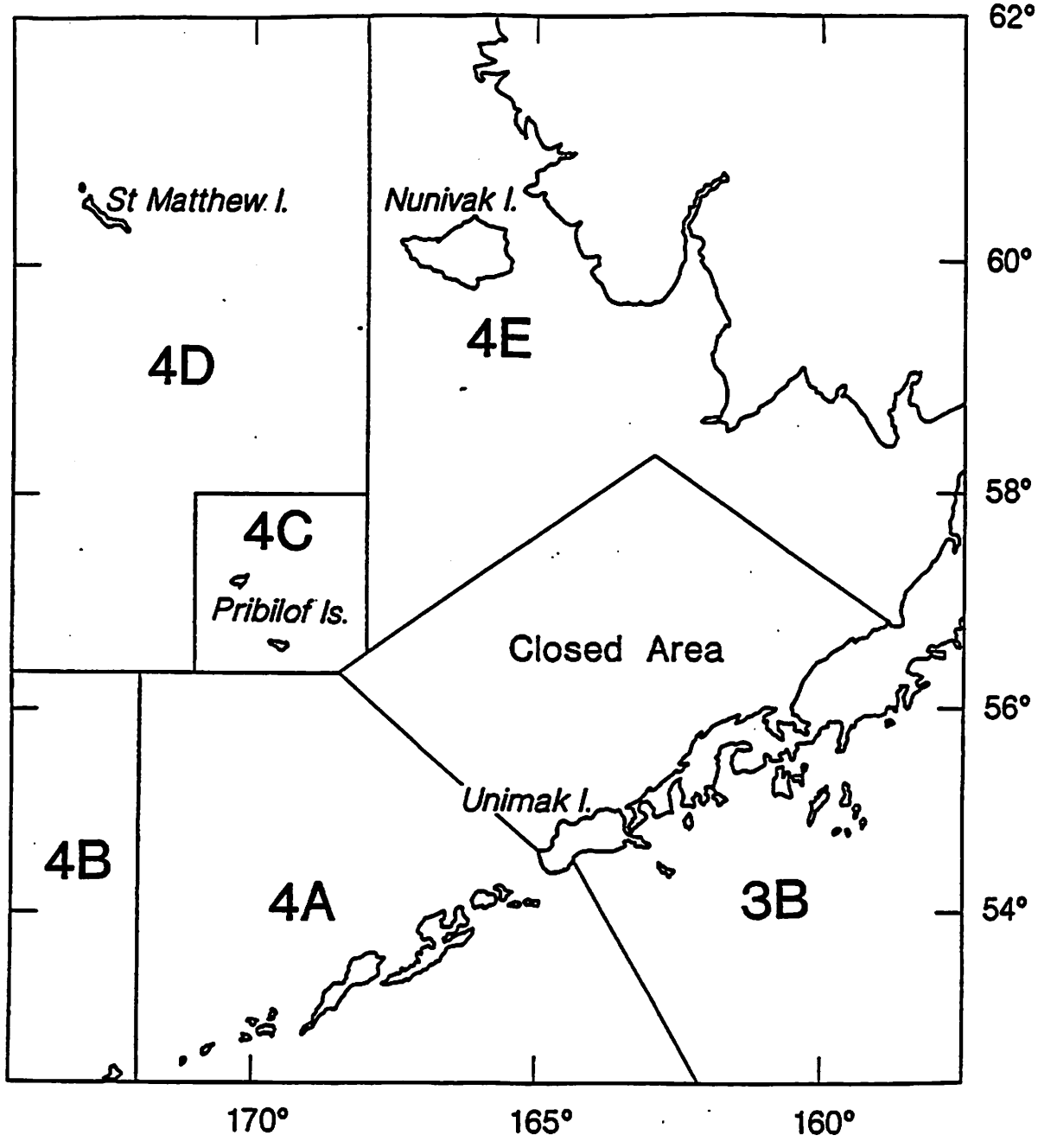

FIGURE 1. International Pacific Halibut Commission regulatory areas of the western Gulf of Alaska (Area 3B) and Bering Sea (Areas 4A through 4E) in 1996.

INTERNATIONAL PACIFIC HALIBUT COMMISSION

ESTABLISHED BY A CONVENTION BETWEEN CANADA

AND THE UNITED STATES OF AMERICA

P.O. BOX 95009
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April 2, 1996

Ms. Jane DiCosimo
North Pacific Fishery Management Council
605 W. 4th Avenue
Room 306 - 3rd Floor
Anchorage, Alaska 99501-2252

Dear Jane:

Enclosed are the two reports by the IPHC staff that pertain to the issue of setting catch limits in Area 4. Our staff will be prepared to discuss these with the Council in June.

The IPHC staff intends to recommend biomass-based catch limits for Areas 4A, 4B, and a combined Area 4C-4E to the IPHC commissioners next November. It is possible, but not likely, that independent biomass estimates may be available at that time. If independent estimates are not available, the recommendations would be based on the modified biomass apportionment shown in the report. These estimates are based on density (CPUE) and habitat. As it turns out, the modified biomass apportionment is very similar to the traditional apportionment:

	Modified biomass	Traditional
4A	33.0%	33.0%
4B	35.5%	39.0%
4C-4E	31.5%	28%

Although there is very little difference between the two apportionments, the staff understands that it has a responsibility to recommend catch limits once there is a biological basis for the catch limits.

Please let us know if we can be of further assistance.

Sincerely yours,

Stephen H. Hoag
Assistant Director

SHH:ps
Encls.
cc: IPHC commissioners
Jon Pollard, NMFS - Juneau
Jay Ginter, NMFS -

BOTTOM AREA ESTMATES OF HABITAT FOR PACIFIC HALIBUT

by

Stephen H. Hoag, Gilbert St-Pierre, and Joan E. Forsberg

INTRODUCTION

The staff of the International Pacific Halibut Commission (IPHC) estimates the biomass of halibut for major regulatory areas (Figure 1) from annual stock assessments that are based on a combination of catch at age and CPUE data from the commercial fishery (Quinn II et. al. 1985). Biomass estimates, however, are not available from annual assessments for smaller regulatory areas such Areas 4A, 4B, 4C, 4D and 4E in the Bering Sea or from regions within regulatory areas because CPUE or catch at age data are inadequate to reliably estimate biomass for these smaller areas. Estimates of habitat (area) in conjunction with CPUE (density) can be used to at least approximate the relative biomass in these smaller areas. Habitat estimates may also be used to improve future stock assessments for major regulatory areas.

Bottom area estimates of habitat have been previously calculated for specific studies in some areas (e.g. Hoag et. al. 1983; Trumble et. al. 1991) but measures of habitat have varied among areas and studies. In some cases, all bottom area within a depth stratum has been used as a measure of habitat. In other cases, only the bottom area of fishing grounds has been used. During 1994-1995, two measures of habitat were calculated for all IPHC regulatory areas. Further, habitat was calculated by depth strata and statistical area in the Pacific Ocean and by depth strata and regulatory area in the Bering Sea. The purpose of this report is to document the methods and results of this work. Comments regarding the suitability of each measure are also provided.

METHOD

Two measures of habitat were considered: total bottom area inside 500 fathoms and bottom area of fishing grounds based on commercial fishing logs and IPHC research surveys. Both measures were calculated in square nautical miles using a compensating polar planimeter. A discussion of each measure follows:

Total Bottom Area: This measure encompasses all bottom area inside 500 fathoms. Halibut may occasionally frequent all of this area, but the distribution of halibut varies with season and temperature. This measure exaggerates the amount of habitat that is important to halibut, particularly in Areas 2A and 4 which are at the extreme ends of the range where the distribution of halibut is extremely variable and there are large expanses of bottom where halibut are seldom found or are only found in small numbers during part of the year.

Fishing Grounds: This measure consists of the bottom area covered by plotting the daily fishing locations recorded in logs from the commercial fleet, occasionally supplemented by information from other sources. In Area 4, logs for the years 1958-1994 were used. The fishery in Area 4 was insignificant until the late 1950's and until recently was sporadic and tended to be concentrated in the southeastern Bering Sea and in the eastern Aleutian Islands which are closer to major landing ports. We suspect that the log data probably underestimates the habitat, particularly in the more northern and western regions. To augment the log data, data from IPHC and NMFS research charters were also used. Further there was a scarcity of commercial log and charter data in Area 4E and the northern portion of 4D, and some anecdotal information on fishing grounds was included.

In Areas 2B, 2C, 3A, and 3B, commercial fishing logs for the years 1930-1975 and 1994 were used along with IPHC research charter data. In Area 2A, commercial fishing logs for the years 1932-1975, 1965, 1970, 1975 and 1984-1994 were used along with IPHC research charter data. In addition, sport fishing locations obtained from the states of Oregon and Washington were included. The different sets of years used among

areas reflect when the data from commercial logbooks were originally plotted, supplemented by years when significant fishing activity occurred. The intent was to provide a composite of known fishing grounds for each area as efficiently as possible.

Although the density of halibut varies considerably both within and among fishing grounds, this measure provides a more consistent measure of habitat than total bottom area. Habitat may be underrepresented in areas that are lightly fished because of distance from major ports or hazardous fishing conditions. We suspect this underestimate might occur in Area 4B where tidal flows make fishing in some areas difficult, and in the western part of 4B and the northern part of 4D where there is a long distance to major ports. Also, the density of halibut varies seasonally, both among depth strata within a fishing ground and among fishing grounds. Halibut tend to be deeper during spring-fall and shallower during the summer. In some areas such as Areas 4D and 4E, halibut may only occur in shallower depths (less than 50 fm) for a few months or less.

RESULTS

The estimated habitat is provided in Appendix Table 1-8 by regulatory area, statistical area, and depth strata. Statistical areas are defined by Myhre et. al. (1977) and apply only to those regulatory areas in the Pacific Ocean, not the Bering Sea. Areas 4A and 4B which encompass both the Pacific Ocean and the Bering Sea, include statistical areas for the Pacific Ocean portion of the area. Appendix Figures 1through 9 depict the fishing grounds in each regulatory area.

The following table summarizes the results by Regulatory Area:

Regulatory Area	Total Bottom Area		Fishing Grounds	
	Square n.mi.	Percent	Square n.mi.	Percent
2A	16,368	4.3%	2,638	2.2%
2B	29,668	7.9%	14,622	12.4%
2C	16,129	4.3%	10,199	8.7%
3A	51,208	13.6%	40,463	34.4%
3B	31,817	8.4%	24,326	20.7%
4A	21,572	5.7%	8,183	6.9%
4B	23,234	6.1%	6,118	5.2%
4C	9,612	2.5%	561	0.5%
4D	108,388	28.7%	5,605	4.8%
4E	69,914	18.5%	4,910	4.2%
Total	377,910	100.0%	117,625	100.0%

Total bottom area indicates over 3 times the amount of habitat as does fishing grounds. This was expected as fishermen selectively fish where fish tend to concentrate. More interesting are the area differences in relative habitat as measured by total bottom area and the area of fishing grounds. In Area 2A, the fishing grounds comprise 16 percent of the total bottom area and indicate relatively less habitat (2.2 percent) compared to total bottom area (4.3 percent). Fishing grounds progressively comprise a higher proportion of the total bottom area when moving north and west toward the geographic center of the halibut distribution. Area 3A is approximately in the center of the range, and fishing grounds comprise 79 percent of the total bottom area. As a result, habitat in Area 3A represents 34.4 percent of the total for all areas when measured by fishing grounds compared to only 13.6 percent when measured by total bottom area. Continuing toward the north-west end of the range, fishing grounds again decline as a proportion of total bottom area with lowest estimates occurring in Areas 4C, 4D, and 4E. As expected, the relative habitat for these areas is much higher when measured by total bottom area compared to fishing grounds.

We conclude that fishing grounds provide the best measure of relative habitat among areas. On the other hand, fishing grounds undoubtedly underestimate total habitat because fishermen only fish in the most productive areas and not all productive areas are fished. We suspect the problem of underestimation to be greatest in Area 4 because some productive areas are a long distance from major ports and may not be fished by the commercial fishery. This source of underestimation may be at least partially offset by greater seasonal movements of halibut in Area 4. These seasonal movements resulting from changes in bottom temperature mean that some of the estimated habitat is not being used at any given time. Generally, Area 4 fish are more concentrated in the winter along the edge of the continental shelf and dispersed over the shelf during the summer. By including fishing grounds that are fished in the winter as well as those fished during the summer, we may have overestimated the relative habitat.

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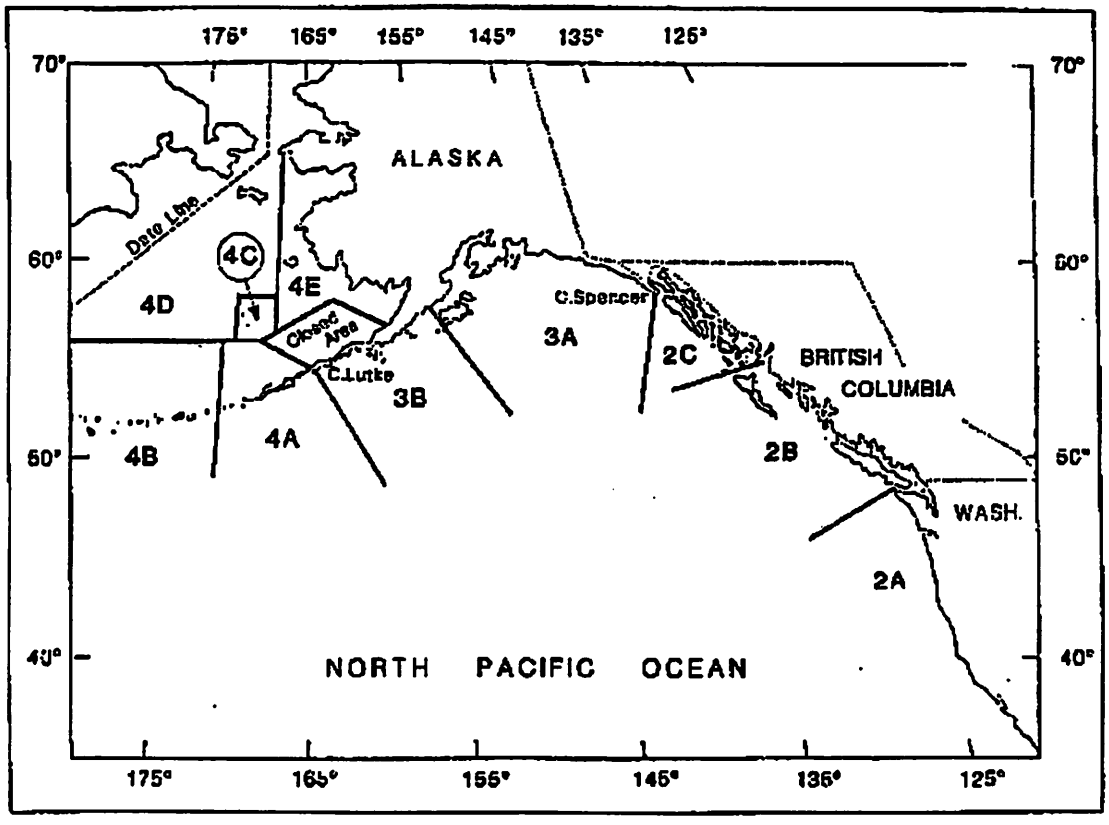


Figure 1. IPHC Regulatory Areas.

APPENDIX

Appendix Table 1. Estimated area of fishing grounds and total bottom area inside 500 fm by 60-mile statistical area and depth strata in Regulatory Area 2A.

Fishing Grounds (square nautical miles) in 2A

	Depth Strata (fathoms)					
Stat. Area	0-20	20-50	50-100	100-200	200-500	Total
7	-	-	16	8	-	24
8	-	-	36	16	2	54
9	-	-	95	32	-	127
10	-	170	225	66	9	470
20	1	121	203	273	61	659
30	-	25	179	115	26	345
40	-	28	91	56	26	201
50	1	39	328	120	32	520
U.S. 060	-	2	80	58	4	144
U.S. Strait	23	52	11	8	-	94
Total	25	437	1,264	752	160	2,638
Summary						
California	-	-	27	14	1	42
Oregon	1	294	645	481	90	1,511
Washington	24	143	592	257	69	1,085

Total Bottom Area (square nautical miles) in 2A

7	193	325	231	118	440	1,317
8	162	277	309	104	694	1,546
9	131	256	399	231	438	1,455
10	81	489	908	225	423	2,126
20	107	413	478	436	843	2,277
30	187	387	817	297	484	2,172
40	316	614	560	111	382	1,983
50	334	400	590	252	470	2,046
U.S. 060	-	4	256	114	71	445
U.S. Strait	220	286	371	104	-	981
Total	1,731	3,461	4,919	1,992	4,245	16,348
Summary						
California	305	520	363	166	878	2,232
Oregon	496	1,576	2,695	1,228	2,372	8,367
Washington	930	1,365	1,861	598	995	5,749

Appendix Table 2. Estimated area of fishing grounds and total bottom area inside 500 fm by 60-mile statistical area and depth strata in Regulatory Area 2B.

Fishing Grounds (square nautical miles) in 2B

	Depth Strata (fathoms)					
Stat. Area	0-20	20-50	50-100	100-200	200-500	Total
Can. Strait	8	23	16	-	-	47
Can. 060	2	359	504	74	-	939
70	11	50	226	34	-	321
80	3	185	138	53	-	379
90	86	580	943	306	-	1,915
100	57	494	1,671	845	70	3,137
110-I	122	468	1,292	925	93	2,900
110-O	6	22	47	47	15	137
120-I	646	458	515	49	-	1,668
120-O	4	13	48	21	6	92
130-I	261	500	639	324	53	1,777
130-O	35	201	205	231	47	719
Can. 140	2	40	202	281	66	591
Total	1,243	3,393	6,446	3,190	350	14,622

Total Bottom Area (square nautical miles) in 2B

Can. Strait	112	117	226	71	-	526
Can. 060	209	724	982	159	274	2,348
70	269	420	817	341	463	2,310
80	214	349	197	187	232	1,179
90	482	939	1,947	981	238	4,587
100	293	816	1,634	1,791	535	5,069
110-I	392	493	1,461	1,724	188	4,258
110-O	45	26	73	69	133	346
120-I	1,491	615	584	51	-	2,741
120-O	63	34	59	46	157	359
130-I	1,307	588	663	584	91	3,233
130-O	124	233	218	286	480	1,341
Can. 140	19	52	258	849	193	1,371
Total	5,020	5,406	9,119	7,139	2,984	29,668

Some of the 60 square mile statistical areas within this Regulatory Area were further subdivided in recent years. The subdivided statistical areas are shown in Appendix Figure 2 and correspond to the 60 mile divisions as follows:

60-square mile statistical areas	includes subdivided statistical areas:
60	60, 61
70	70, 71
80	80, 81
90	90, 91
100	100, 102
110-I	112
110-O	110
120-I	121
120-O	120
130-I	132, 133, 134
130-O	130, 131
Can. 140	142

Appendix Table 3. Estimated area of fishing grounds and total bottom area inside 500 fm by 60-mile statistical area and depth strata in Regulatory Area 2C.

Fishing Grounds (square nautical miles) in 2C

	Depth Strata (fathoms)					
Stat. Area	**0-20**	**20-50**	**50-100**	**100-200**	**200-500**	**Total**
US 140-I	38	220	311	324	54	947
US 140-O	4	101	739	576	18	1,438
150-I	98	221	175	221	10	725
150-O	38	402	758	1,087	60	2,345
160-I	95	235	337	405	92	1,164
160-O	26	147	568	463	38	1,242
170-I	11	190	190	358	44	793
170-O	46	202	380	127	3	758
180-I	15	176	219	148	29	587
180-O	7	26	115	47	5	200
Total I	257	1,042	1,232	1,456	229	4,216
Total O	121	878	2,560	2,300	124	5,983
Total I&O	378	1,920	3,792	3,756	353	10,199

Total Bottom Area (square nautical miles) in 2C

US 140-I	506	456	460	510	389	2,321
US 140-O	57	121	751	825	107	1,861
150-I	603	319	284	308	150	1,664
150-O	310	469	763	1,087	336	2,965
160-I	359	238	361	411	425	1,794
160-O	104	148	575	511	289	1,627
170-I	326	264	218	394	289	1,491
170-O	226	205	392	128	159	1,110
180-I	153	234	303	290	45	1,025
180-O	31	28	115	47	50	271
Total I	1,947	1,511	1,626	1,913	1,298	8,295
Total O	728	971	2,596	2,598	941	7,834
Total I&O	2,675	2,482	4,222	4,511	2,239	16,129

Some of the 60 square mile statistical areas within this Regulatory Area were further subdivided in recent years. The subdivided statistical areas are shown in Appendix Figure 3 and correspond to the 60 mile divisions as follows:

60-square mile statistical areas	**includes subdivided statistical areas:**
140-I	141, 142, 143, 144
140-O	140
150-I	151, 152, 153
150-I	150
160-I	161, 162, 163
160-O	160
170-I	171, 173
170-O	170
180-I	182, 183, 184
180-O	181

Appendix Table 4. Estimated area of fishing grounds and total bottom area inside 500 fm by 60-mile statistical area and depth strata in Regulatory Area 3A.

Fishing Grounds (square nautical miles) in 3A

	Depth Strata (fathoms)					
Stat. Area	0-20	20-50	50-100	100-200	200-500	Total
185	20	61	1,173	334	157	1,745
190	13	513	1,512	460	53	2,551
200	46	175	1,786	884	79	2,970
210	23	347	778	771	103	2,022
220	39	213	706	487	45	1,490
230	30	1,091	1,643	329	102	3,195
240	44	491	1,913	1,237	227	3,912
250	1	215	3,056	1,975	132	5,379
260	629	2,232	3,523	956	84	7,424
270	259	2,180	2,087	538	30	5,094
280	160	1,744	1,342	1,409	26	4,681
Total	1,264	9,262	19,519	9,380	1,038	40,463

Total Bottom Area (square nautical miles) in 3A

185	68	61	1,173	334	205	1,841
190	139	615	1,512	460	79	2,805
200	224	255	1,790	887	141	3,297
210	305	415	779	771	251	2,521
220	387	297	729	487	206	2,106
230	757	1,271	1,728	417	353	4,526
240	494	624	2,019	1,394	537	5,068
250	81	245	3,077	1,991	353	5,747
260	3,198	2,675	3,645	961	244	10,723
270	1,380	2,375	2,315	554	388	7,012
280	680	1,827	1,439	1,408	208	5,562
Total	7,713	10,660	20,206	9,664	2,965	51,208

Some of the 60 square mile statistical areas within this Regulatory Area were further subdivided in recent years. The subdivided statistical areas are shown in Appendix Figure 4 and correspond to the 60 mile divisions as follows:

60-square mile statistical areas	includes subdivided statistical areas:
230	230, 232
240	240, 242
260	260, 261
270	270, 271
280	280, 281

Appendix Table 5. Estimated area of fishing grounds and total bottom area inside 500 fm by 60-mile statistical area and depth strata in regulatory area 3B.

Fishing grounds (square nautical miles) in 3B

	Depth Strata (fathoms)					
Stat. Area	0-20	20-50	50-100	100-200	200-500	Total
290	817	1,714	1,184	2,174	188	6,077
300	85	1,831	2,047	1,661	77	5,701
310	16	1,481	2,716	516	16	4,745
320	25	1,734	1,366	164	16	3,305
330	142	1,325	1,433	62	25	2,987
340	102	1,036	331	25	17	1,511
Total	1,187	9,121	9,077	4,602	339	24,326

Total Bottom Area (square nautical miles) in 3B

290	1,453	1,983	1,238	2,174	861	7,709
300	409	1,846	2,086	1,661	417	6,419
310	221	1,514	2,741	556	294	5,326
320	499	2,430	1,366	205	237	4,737
330	1,183	1,350	1,442	125	325	4,425
340	493	1,868	560	76	204	3,201
Total	4,258	10,991	9,433	4,797	2,338	31,817

Appendix Table 6. Estimated area of fishing grounds and total bottom area inside 500 fm by 60-mile statistical area (for Pacific Ocean portion) and depth strata in Regulatory Area 4A

Fishing Grounds (square nautical miles) in 4A

	Depth Strata (fathoms)					
Stat. Area	0-20	20-50	50-100	100-200	200-500	Total
Pacific Ocean						
340	-	10	1	-	-	11
350	21	605	258	18	-	902
360	16	177	417	265	-	875
370	25	258	279	2	-	564
380	24	182	221	167	7	601
390	7	18	47	-	-	72
400	-	-	7	-	-	7
Total	93	1,250	1,230	452	7	3,032
Bering Sea	87	654	842	1,561	2,007	5,151
Total	180	1,904	2,072	2,013	2,014	8,183

Total Bottom Area (square nautical miles) in 4A

Pacific Ocean						
340	-	25	2	1	8	36
350	88	1,268	937	186	277	2,756
360	60	428	639	240	256	1,623
370	134	375	534	98	123	1,264
380	53	199	291	441	176	1,160
390	31	52	106	474	840	1,503
400	-	-	31	120	77	228
Total	366	2,347	2,540	1,560	1,757	8,570
Bering Sea	271	877	5,516	2,271	4,067	13,002
Total	637	3,224	8,056	3,831	5,824	21,572

Appendix Table 7. Estimated area of fishing grounds and total bottom area inside 500 fm by 60-mile statistical area (for Pacific Ocean portion) and depth strata in Regulatory Area 4B.

Fishing Grounds (square nautical miles) in 4B

	Depth Strata (fathoms)					
Stat. Area	0-20	20-50	50-100	100-200	200-500	Total
Pacific Ocean						
400	5	60	91	41	9	206
410	10	212	269	75	17	583
420	18	114	270	240	40	682
430	17	106	163	104	27	417
440	17	105	131	115	22	390
450	36	132	65	22	8	263
460	3	29	86	22	16	156
470	-	13	45	4	7	69
480	-	7	84	37	3	131
490	8	212	236	-	-	456
500	-	-	18	-	-	18
510	n/a	n/a	n/a	n/a	n/a	n/a
Total	114	990	1,458	660	149	3,371
Bering Sea	87	782	1,255	514	109	2,747
Total	201	1,772	2,713	1,174	258	6,118

Total Bottom Area (square nautical miles) in 4B

Pacific Ocean						
400	32	232	326	268	143	1,001
410	72	307	343	91	120	933
420	74	115	351	254	296	1,090
430	93	136	166	111	269	775
440	48	78	130	174	562	992
450	93	132	127	127	436	915
460	13	57	188	124	331	713
470	18	116	241	136	739	1,250
480	-	8	289	363	634	1,294
490	96	283	672	73	208	1,332
500	2	32	137	111	397	679
510	-	-	45	71	89	205
Total	541	1,496	3,015	1,903	4,224	11,179
Bering Sea	611	1,334	2,337	1,579	6,194	12,055
Total	1,152	2,830	5,352	3,482	10,418	23,234

Appendix Table 8. Estimated area of fishing grounds and total bottom area inside 500 fm by depth strata in Regulatory Areas 4C, 4D, 4E and the closed area.

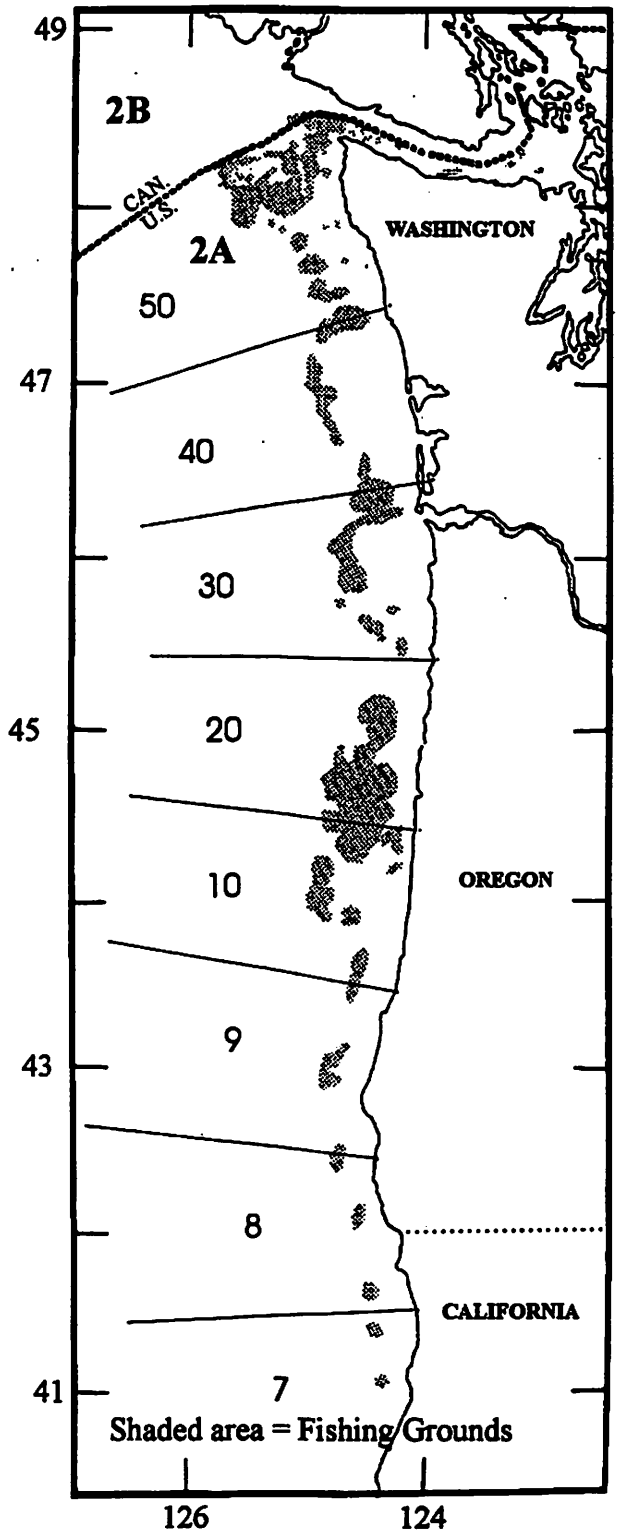
Fishing Grounds (square nautical miles)

	Depth Strata (fathoms)					
	0-20	**20-50**	**50-100**	**100-200**	**200-500**	**Total**
Area 4C	110	390	61	-	-	561
Area 4D	556	819	690	2,310	1,230	5,605
Area 4E-SE	1,037	293	-	-	-	1,330
Area 4E-NW	3,395	185	-	-	-	3,580
Closed Area	71	215	417	-	-	703

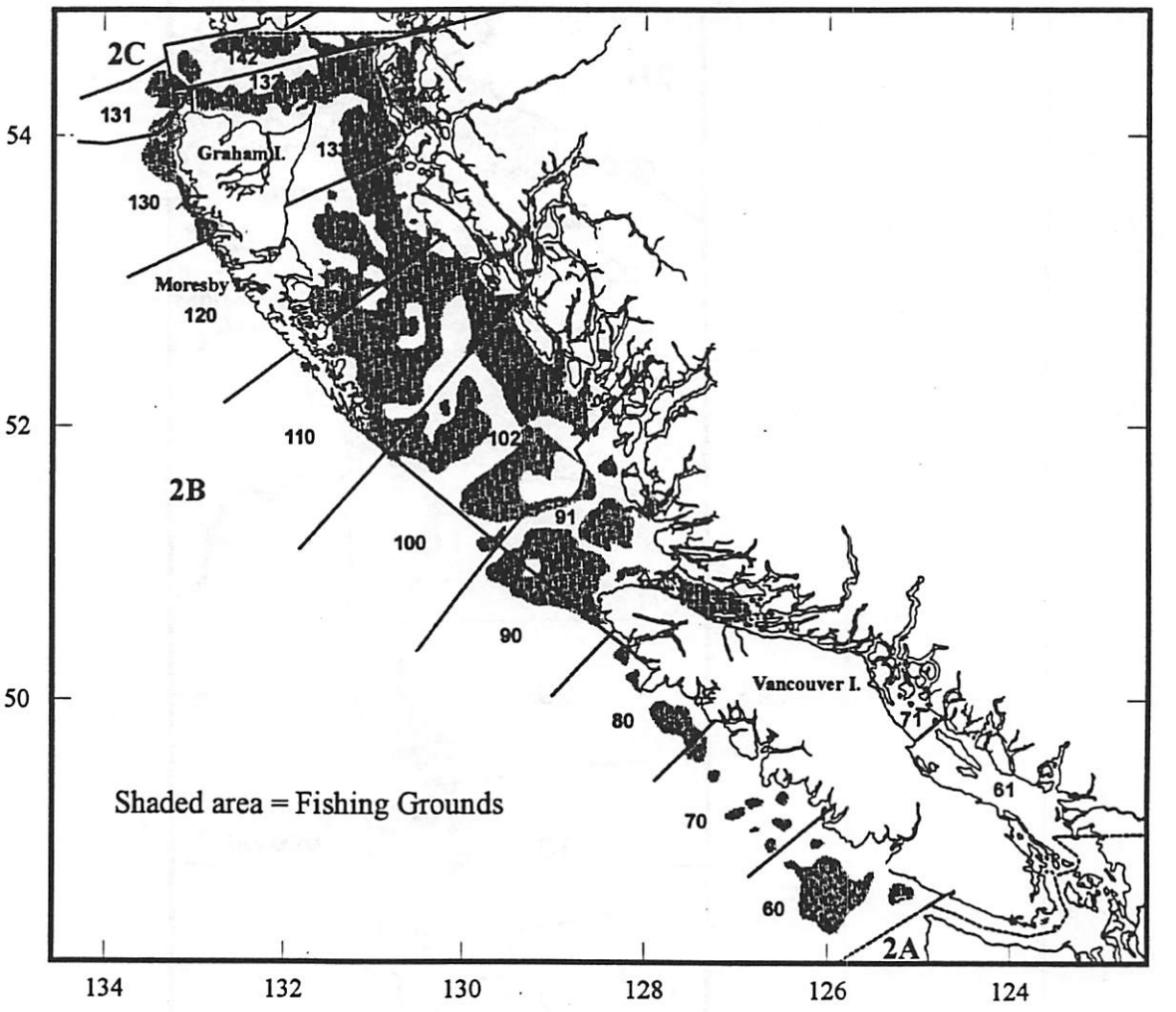
Total Bottom Area (square nautical miles)

Area 4C	150	7,114	2,348	-	-	9,612
Area 4D	12,177	58,805	32,980	2,451	1,975	108,388
Area 4E-SE	7,505	4,780	-	-	-	12,285
Area 4E-NW	45,016	12,397	216	-	-	57,629
Closed Area	2,798	24,213	8,588	-	-	35,599

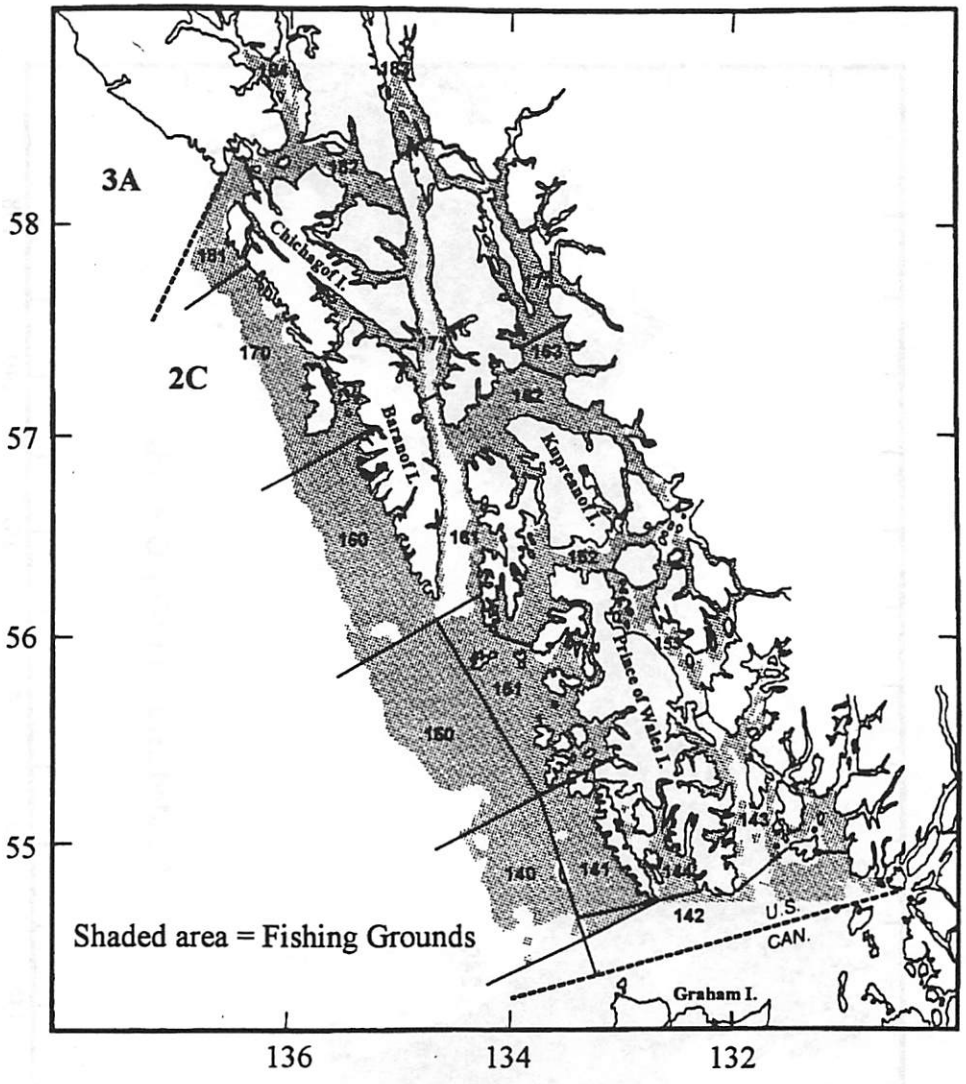
Appendix Figure 1. Fishing grounds by statistical area in Regulatory Area 2A (from commercial, survey, tribal and sport data)

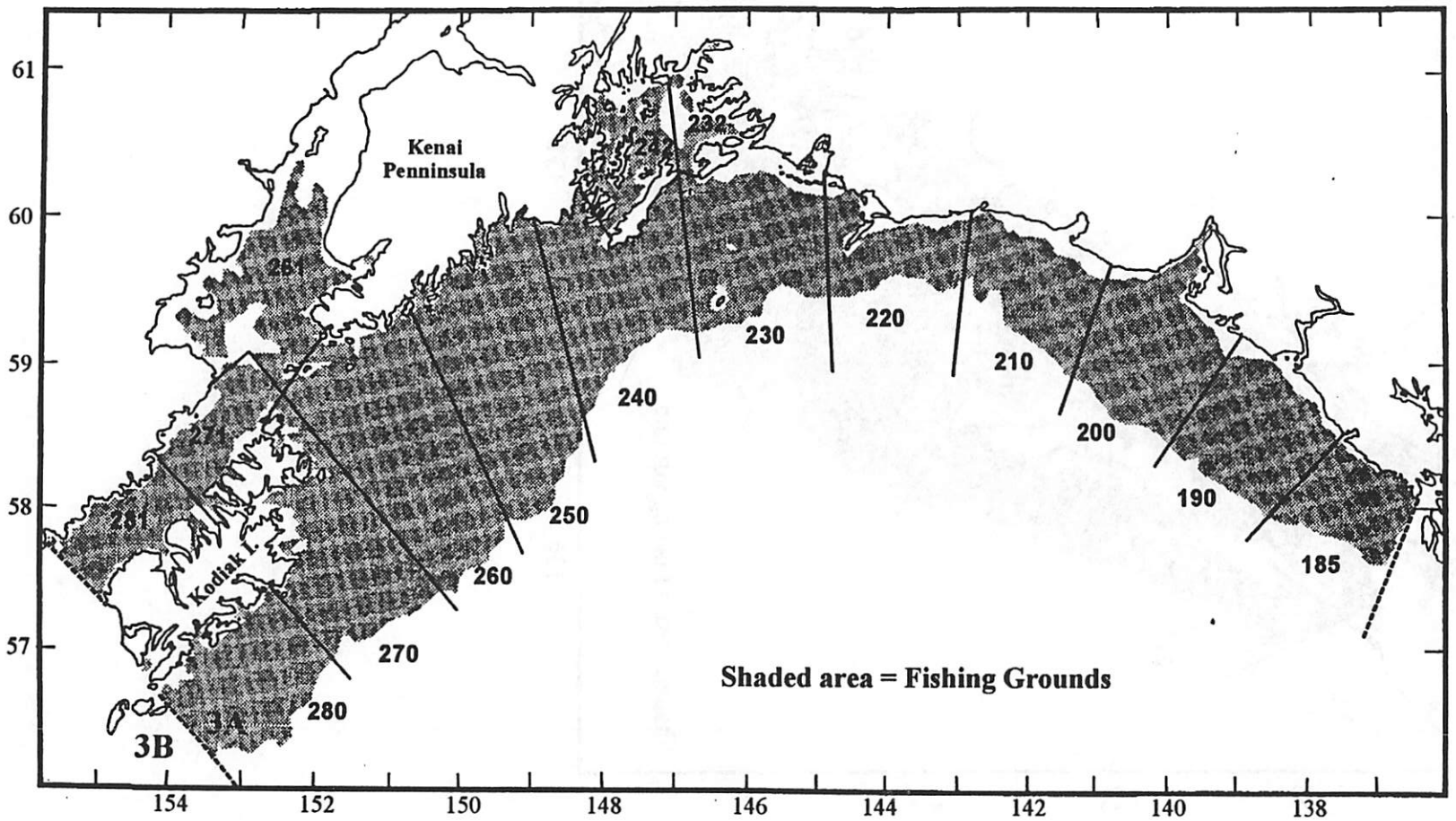


Appendix Figure 2. Fishing grounds by statistical area in Regulatory Area 2B.



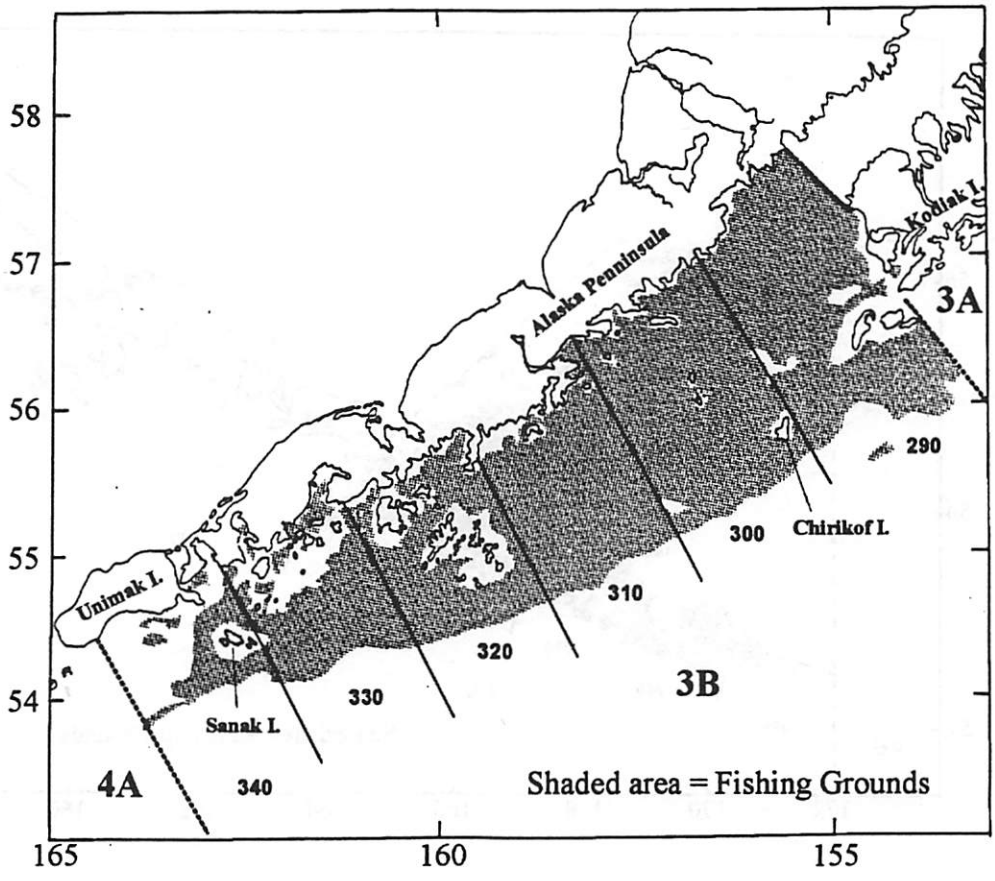
Appendix Figure 3. Fishing grounds by statistical area in Regulatory Area 2C.



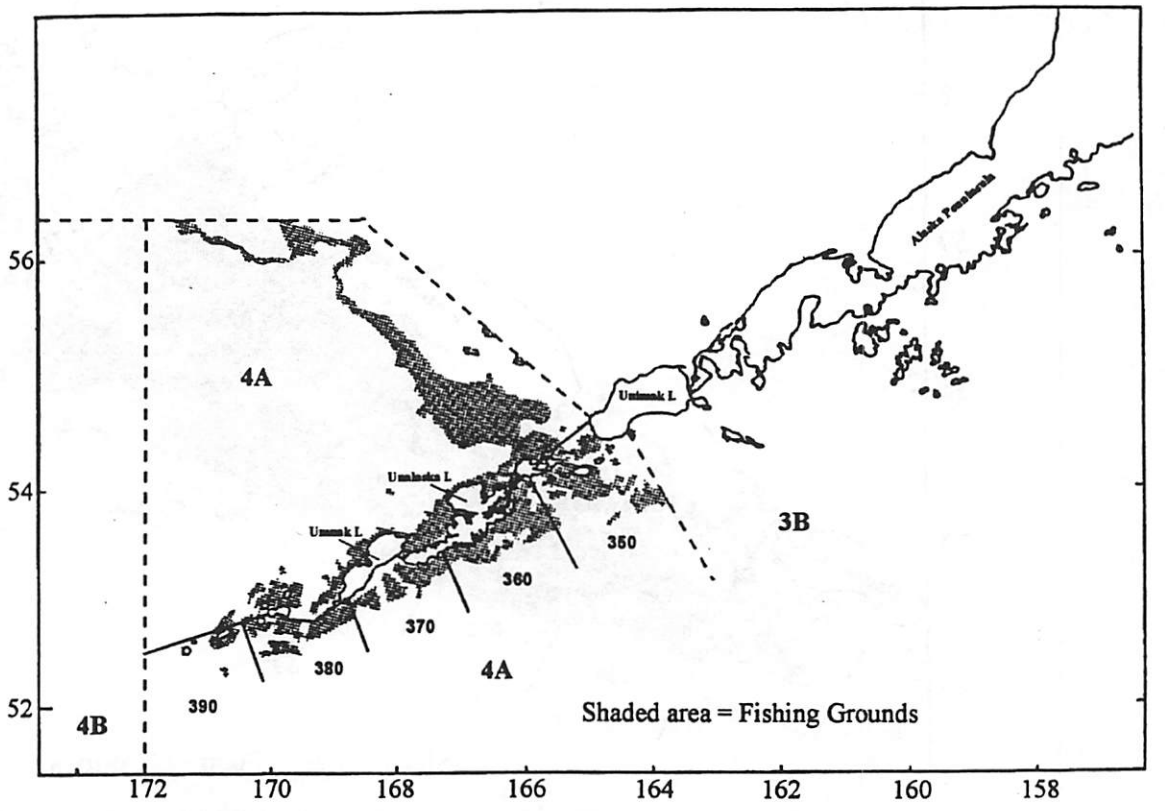


Appendix Figure 4. Fishing grounds by statistical area in Regulatory Area 3A.

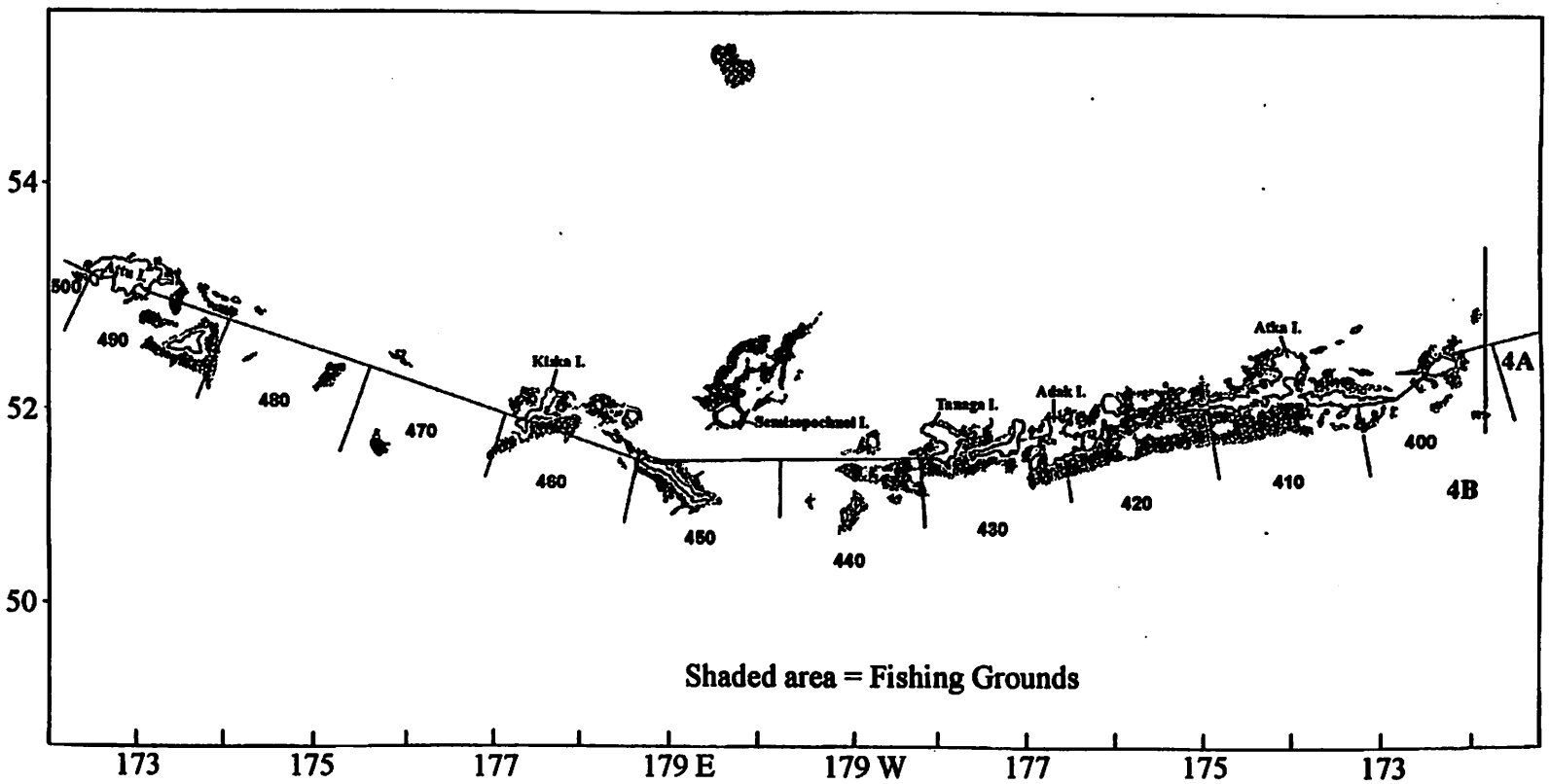
Appendix Figure 5. Fishing grounds by statistical area in Regulatory Area 3B.



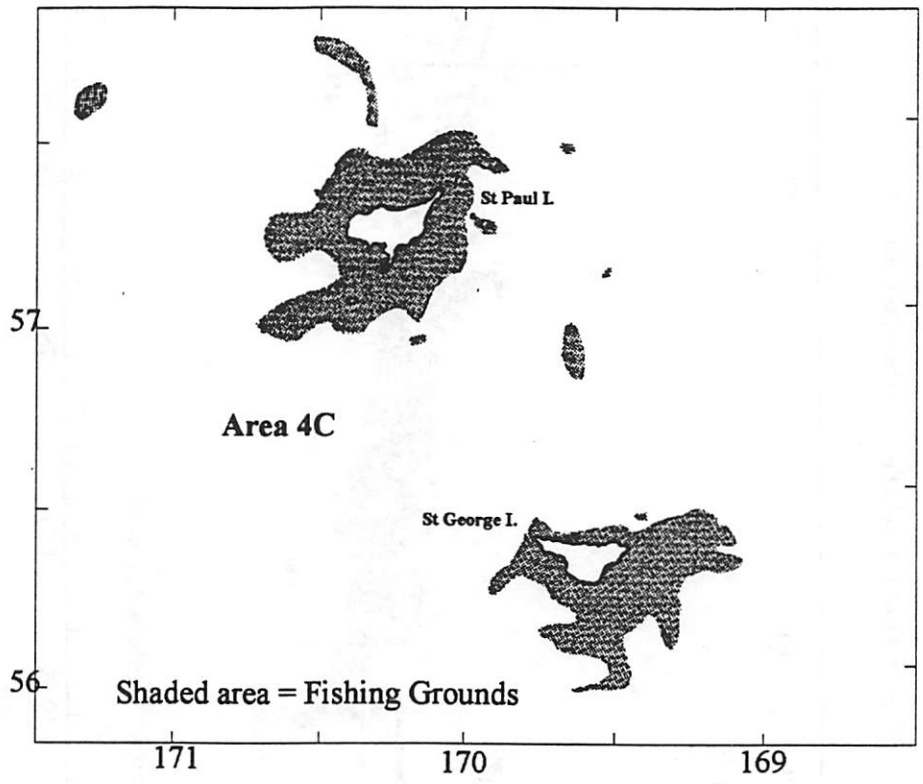
Appendix Figure 6. Fishing grounds in Regulatory Area 4A (by statistical area in Pacific Ocean portion).



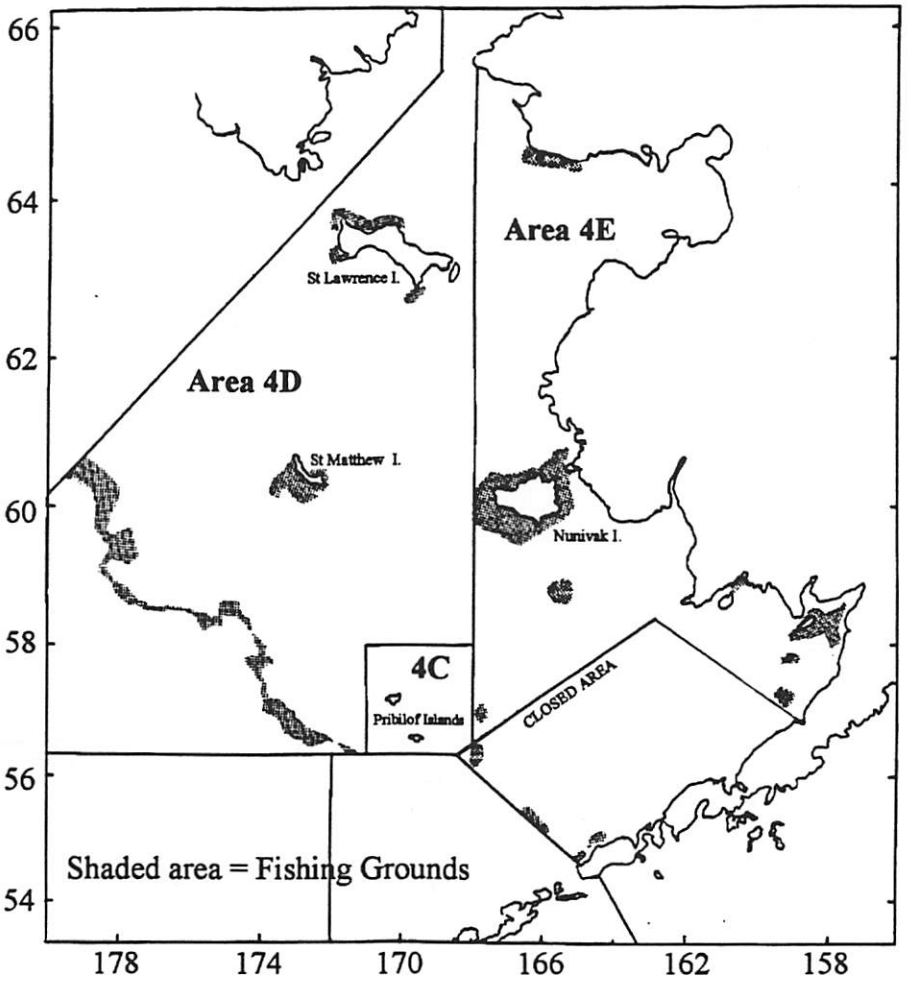
Appendix Figure 7. Fishing grounds in Regulatory Area 4B (by statistical area in Pacific Ocean portion).



Appendix Figure 8. Fishing grounds in Regulatory Area 4C.



Appendix Figure 9. Fishing grounds in Regulatory Areas 4D and 4E.



1.0 EXECUTIVE SUMMARY

The primary goal of in-season management is to conserve groundfish resources while promoting attainment of Total Allowable Catch (TAC), avoiding unnecessary waste and discards of groundfish, and limiting mortality of prohibited species in the groundfish fisheries. Reducing halibut mortality attributable to the groundfish fisheries is consistent with the goals of both the International Pacific Halibut Commission and the North Pacific Fishery Management Council.

The specific objective of this proposed regulatory amendment is to evaluate a potential requirement that the deck crew on all factory trawlers and catcher boats that dump groundfish directly to a stern tank before sorting use a grid over the entrance to the hold and sort out as much halibut bycatch as practicable for immediate return to the sea.

Two alternatives are considered:

Alternative 1. Status quo. Normal sorting in the factory below deck. Typically, a single, short conveyer leads from the hold to the exit chute.

Alternative 2. Require that the deck crew on all factory trawlers and catcher boats that dump groundfish directly to a stern tank before sorting use a grid over the entrance to the hold and sort out as much halibut bycatch as practicable for immediate return to the sea. Specific fisheries may be selected. The grid will be of 9 in by 11 in dimensions.

OPTION 1) Require vessels to grid-sort all halibut, but observers would not collect data for grid-sorted halibut.

SUBOPTION 1) Use special projects to establish discard mortality rates.

SUBOPTION 2) Establish a window for the first 20 minutes after the net comes on board during which bycatch would not count against bycatch mortality limits.

OPTION 2) Require vessels to grid-sort only the hauls that the observer does not intend to sample.

OPTION 3) Require vessels to grid-sort all hauls, and observers count, measure, and determine viability on a subsample of grid sorted halibut.

SUBOPTION 1) Vessel deck crews would be required to sort halibut for the entire catch, regardless of time to sort.

SUBOPTION 2) Vessel deck crews would be required to sort halibut only for the first 20 minutes of dumping, and could not sort after 20 minutes; the observer would be on deck for all sorting.

SUBOPTION 3) Vessel deck crews would be required to grid-sort halibut on deck only for the first 20 minutes of dumping, and additional sorting would be voluntary; the observer would be on deck for all sorting.

COMMISSIONERS:

RICHARD J. BEAMISH
NANAIMO, B.C.
RALPH G. HOARD
SEATTLE, WA
KRIS NOROSZ
PETERSBURG, AK
STEVEN PENNOYER
JUNEAU, AK
ALLAN T. SHEPPARD
PRINCE RUPERT, B.C.
BRIAN VAN DORP
RICHMOND, B.C.

AGENDA C-2(d)(2)
JUNE 1996

INTERNATIONAL PACIFIC HALIBUT COMMISSION

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

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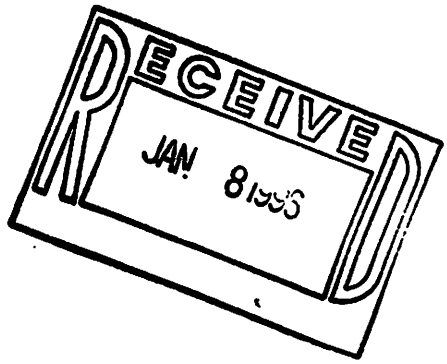
January 3, 1996



Dr. Clarence Pautzke, Executive Director
NPFMC
605 W 4th Avenue, Room 306
Anchorage AK 99501

Dear Clarence:

The International Pacific Halibut Commission reviewed with Commission staff the proposal to require a grid to sort and discard Pacific halibut from the deck of factory trawlers. The Commissioners developed the following policy and directed me to provide it on their behalf. While the Commission strongly supports the concept of more rapidly returning halibut to the sea to reduce discard mortality rates, it does not believe that the proposal should be approved at this time.

We agree with the analysis that discard mortality rates of halibut would be lower with grid sorting, and that some savings of bycatch could occur. However, the magnitude of the projected savings are not sufficient to overcome problems identified in the analysis. Approving grid sorting would degrade bycatch estimates and would conflict with the Vessel Incentive Program. Enforcement would be more difficult if grid sorting were limited to selected fisheries. Grid sorting would offer an opportunity to presort other species in advance of observer sampling, and make compliance problematic during unobserved hauls.

The Commission supports individual vessel incentives to reduce bycatch mortality. It may be possible to combine some aspects of grid sorting with incentive programs to overcome the problems identified. We recommend that the Council hold onto the grid sorting concept as a possible enhancement to future bycatch reduction programs, but recommend against implementing it as a stand alone requirement.

Sincerely,

Donald A. McCaughran
Director

cc. Commissioners

UNITED STATES DEPARTMENT OF COMME
National Oceanic and Atmospheric Administrati
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

AGENDA C-2(d)(3)
JUNE 1996

February 26, 1996

Richard B. Lauber, Chairman
North Pacific Fishery Management Council
605 West 4th Avenue, Suite 306
Anchorage, Alaska 99501-2252

Dear Rick:

During its January 30-February 4, 1996, meeting, the North Pacific Fishery Management Council (Council) decided not to approve a regulatory amendment that would have required vessels to use a grid to sort fish in the non-pelagic trawl groundfish fisheries. The Council's decision was based, in part, on lack of support for this measure by the International Pacific Halibut Commission (Commission). The Commission withdrew its support for grid sorting, because it believed that the anticipated increase in halibut survival would have been too small to justify the loss of observer-collected data necessary for halibut bycatch management.

During Council discussions, you expressed your concern about the industry being constrained by current regulations that prohibit a vessel from returning halibut to the sea as soon as possible, which would promote their survival. You will recall that regulations implementing the Council's Vessel Incentive Program (VIP) require a NMFS-certified observer to sample a vessel's hauls, selected at random, prior to sorting or discarding any catches by the vessel's crew. This provision was necessary to provide the statistical tools necessary to implement the VIP program.

Nonetheless, a crew is allowed to sort all hauls on unobserved vessels as well those hauls on observed vessels, which will not be sampled for VIP purposes. A vessel would not obtain any particular benefit, however, by doing so. NMFS only uses observer-reported information for bycatch management purposes, and applies this information as being representative for the total catch in each specified target fishery category. I question, therefore, whether a vessel would imposes costs on its operations as a result of slowing down its operations for purposes of sorting and discarding halibut from its catches, given the competitive nature of an open access fishery.

I am also concerned about additional monitoring burdens that would be imposed on observers, should they be requested by vessel operators to monitor grid sorting activity on deck. Additional

observer coverage likely would be necessary if on-deck monitoring of grid sorting were expected of observers.

I believe that the Council needs to take a fresh look at management measures intended to reduce halibut mortality in the groundfish fisheries, and in so doing, be prepared to reject measures that have not been effective. As the industry has continually stressed, these measures must rely on individual vessel accountability. The Council's consideration of the Vessel Bycatch Allowance Program as suggested by the industry might be the answer. I look forward to the Council's June 1996, meeting, when it will consider this issue.

Sincerely,

Steve

Steven Pennoyer,
Director, Alaska Region

cc: Bill Karp
Rich Marasco

INTERNATIONAL PACIFIC HALIBUT COMMISSION

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

Technical Report No. 25

Report of the Halibut Bycatch Work Group

Principle Authors:

S. Salveson, U.S.
B. M. Leaman, Canada
L.-L. Low, U.S.
J. C. Rice, Canada

Co-chaired by
Richard Beamish and Steven Pennoyer

SEATTLE, WASHINGTON
1992

TARGET LEVELS FOR REDUCTION OF HALIBUT BYCATCH IN THE GROUNDFISH FISHERIES AND RECOMMENDATIONS TO THE COMMISSION

General

In making the following recommendations, the HBWG considered carefully the objectives given it by the Commission. These objectives address current management measures' adequacy, additional measures needed to reduce bycatch, and appropriate targets for bycatch reduction. Given these objectives, we recommend measures that are needed to reduce halibut bycatch mortality in the groundfish fisheries of the U.S. and Canada. The HBWG was clearly aware that measures which reduce halibut bycatch mortality may have significant impacts on the prosecution of other fisheries. Therefore, we attempt to avoid recommending measures which we believe to be clearly impractical. For example, if we were to consider only the halibut setline fishery, we could simply state that the optimum bycatch level in other fisheries should be zero. Advice of that nature, however, would do little for the Commission or the halibut resource since it is not economically, socially, or politically feasible to reach that endpoint. Any effective program for the management of bycatch in the groundfish fisheries of the U.S. and Canada, would be best served by laying out realistic, achievable, and measurable programs that allow the two countries to manage the complex fisheries that exist in their zones at some optimal level while minimizing halibut bycatch mortality.

Accordingly, the HBWG adopted as its primary goal the design of a program to identify and work toward restriction of halibut bycatch in groundfish fisheries to levels that would allow each nation to reasonably harvest its groundfish resources while minimizing halibut bycatch mortality. The HBWG recognizes that the Commission could choose to recommend that even greater steps be taken to reduce halibut bycatch mortality. Such steps might impose significant costs on groundfish fisheries. This is a political/allocative decision and beyond the scope of the HBWG, although many of the same considerations, procedures, data needs, etc., outlined here would apply to such a program.

The HBWG recognized that many uncertainties, research needs, and data gaps exist regarding how bycatch occurs, its effects on stocks, the levels of past and present bycatches, mortality mechanisms, and a host of other issues. Many of these are highlighted and prioritized in this report. Nevertheless, action on bycatch cannot wait until the last data gap is bridged. As can be seen from the summary of measures already taken or being considered by the governments for implementation, bycatch control programs are ongoing. However, the HBWG believes that additional focus and direction is needed. The U.S. has taken major steps to limit and control bycatch in groundfish fisheries off Alaska, and to improve accounting of bycatch so that existing limits are as effective as possible. Nonetheless, bycatch has continued to increase. Comparable measures are not implemented for groundfish fisheries off Canada, Washington, or Oregon. Some additional areas of control are suggested below, but it is clear that existing measures do not force governments or industry toward a reduction in current bycatch levels. We propose what we consider to be a reasonable goal against which to judge the efforts of the parties, a series of actions/management measures to approach that goal, a timetable for action against which progress can be monitored, and highlight some necessary programmatic improvements.

Bycatch Reduction Goals

During foreign fisheries domination of the harvests off Alaska, the estimates of halibut bycatch mortality varied from a high of 15,000 mt round weight (25 million pound net weight) down to 4,000 mt (7 million pounds). These data, particularly for early years, are not verifiable, and early bycatches by some estimates may have been as high as 24,000 mt (40 million pounds) in the early 1960s. The trend of these estimated bycatches was generally downward—reaching a low of 4,000 mt (7 million pounds) in 1985, under a system of comprehensive regulation and enforcement. These bycatches exhibited considerable annual variation. Enforcement actions suggest that a significant amount of uncertainty exists surrounding the accuracy of the estimates. Nevertheless, the trend is apparent and, from 1983 -1986, the coast-wide bycatch mortality is estimated to have been as low as 4,000 mt (7 million pounds) and averaged about 5,400 mt (9 million pounds), as opposed to the 11,000 mt (18 million pounds) taken by the domestic fleet in 1990.

During these years the foreign fisheries generally were able to harvest amounts and species composition of groundfish similar to that being taken by the domestic fleet today. It seems reasonable to use these levels as an initial goal for halibut bycatch mortality reduction. The timetable to achieve such a goal, an appraisal of its realism, and the methods by which it could be achieved require an understanding of how it may have been achieved by the foreign fleets. Foreign fishing was regulated by a series of time and area fishing restrictions, but it is our assessment that the key to their success was their ability to set quantitative bycatch limits for individual companies and vessels and remove the vessels from the fishery when limits were exceeded. This provided the incentive for individual operators to fish at times, areas, and in manners to minimize bycatches and maximize their groundfish catch.

Rate driven incentive programs are currently being developed for fisheries off Alaska. These may be effective in reducing bycatch, but their evolution into an individual vessel bycatch quota program may be the best approach. The rate program and the vessel quota program are being tested and developed. This will continue in 1992, but full implementation may not be feasible until 1993.

Recommended Actions

We endorse initiatives by the North Pacific Fishery Management Council to reduce halibut bycatch mortality. The HBWG notes the low recruitment to the halibut stock in recent years, the potential for bycatch to equal or exceed the directed fishery harvest in the near future with dramatic impacts on the viability of this fishery, and the uncertainties regarding the bycatch mortality compensation procedures currently utilized by the IPHC staff. The HBWG believes further action to immediately reduce bycatch mortality levels is warranted and recommends that the Commission support the following programs:

U.S. Fisheries

(1) Bring all groundfish fisheries off Alaska under existing caps in 1992 and ensure that all fisheries adhere to specified bycatch controls.

(2) Support development and expansion of incentive programs in 1992.

(3) Promote a downwards ratcheting of caps starting in 1993 at 10 percent per year based on a rate or vessel quota incentive program. The goal would be to reduce mortality as far as possible over time consistent with the need to harvest the groundfish resources. The foreign fishery levels achieved in the mid-1980s shall provide an initial yardstick for monitoring success.

(4) Measures to address the estimation and control of bycatch off the Washington-Oregon coast should be developed, but as of this time, no data exist on which to base bycatch management measures. We therefore recommend that the IPHC develop procedures for estimation of bycatch in this area, using the best available information, and incorporate these estimates into yield estimation.

(5) Pending analysis of the 1990 observer data, incorporate revised mortality assumptions, rather than total bycatch amounts, for the BSAI trawl fisheries in the IPHC staff procedure used to develop annual setline catch quotas.

Canadian Fisheries

(6) The HBWG recommends that the Canadian observer program be expanded to cover all bottom-trawl fisheries and that DFO undertake research to examine the viability of trawl caught halibut in Canadian waters. Further, that the results of the observer program, and relevant U.S. experience, be used to develop and implement a bycatch control and reduction program for Canadian waters.

General

(7) Continue the HBWG and develop a schedule, with review and check points, to track progress of the issues and solutions. The progress would then be reported to the Commission during its "interim" and "annual" meetings.

(8) Support the research recommendations of the HBWG.

(9) Recognizing the uncertainties associated with present bycatch compensation procedures, the HBWG recommends that the IPHC continue its research into the adequacy of present procedures and develop alternative methodology where necessary.

INTERNATIONAL PACIFIC HALIBUT COMMISSION

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

August 7, 1991

Pennoyer
COPY

The Honourable John C. Crosbie
Minister of Fisheries and Oceans
Ottawa, Ontario K1A 0E6
Canada

Dear Sir:

At the January 1991 annual meeting of the International Pacific Halibut Commission, the Commission passed a resolution to address halibut mortality in non-directed fisheries throughout the Commission's jurisdiction. It created a bilateral technical group, hereby referred to as the Halibut Bycatch Working Group, to review scientific issues pertaining to:

- management measures being implemented in each country to control and reduce bycatch, and advise the Commission on their adequacy;
- appropriate target levels for bycatch mortality reduction; and
- to recommend additional measures which could be taken to reduce bycatch.

The resolution also called for a special meeting of the Commission to review the results of the working group and to:

> "Consider an appropriate agreed level for bycatch mortality reduction, based on biological requirements for stock rebuilding, realization of optimum yield from the fishery, and maintenance of the stock at that level."

The extraordinary meeting was held July 22-24 in Seattle, Washington. The Commission took public testimony on July 22 and received the report of the bycatch working group. After review of all pertinent information the Commission agrees that due to:

- the low recruitment to the halibut stock in recent years;
- the potential for bycatch to equal or exceed the directed fishery harvest in the near future with dramatic impacts on the viability of this fishery; and
- the uncertainties regarding the bycatch mortality compensation procedures currently utilized by the Commission staff,

immediate action to reduce halibut bycatch mortality levels is warranted.

Specific recommendations are made for both United States and Canadian fisheries as follows:

United States Fisheries

The Commission recommends the Government of the United States reduce halibut bycatch mortality as follows:

1. For 1991, the United States should maintain the existing package of regulations which are aimed at reducing overages in the Prohibited Species Catch (PSC) limits. It is anticipated that implementation of these measures will start the decline in bycatch mortality and achieve an approximate four percent reduction.

2. For 1992, bring all groundfish fisheries off Alaska under existing caps and ensure that all fisheries adhere to specified bycatch controls. In addition, the Government of the United States should support development and expansion of incentive programs to further reduce bycatch mortality. It is anticipated that these actions should provide an additional reduction in bycatch mortality of a minimum of 10% in 1992.

3. In 1993, implement a program to reduce the bycatch caps by a minimum of 10% per year based on a rate or vessel ;quota incentive program. The goals would be to reduce mortality as far as possible over time consistent with the need to reasonably harvest the groundfish resources. The foreign fishery bycatch levels achieved in the mid-1980s shall provide an initial yardstick for monitoring success. It is anticipated that bycatch mortality will be reduced by approximately 25% by the end of 1993. Additional increases in survival will be used to increase the setline quotas.

4. Measures to address the estimation and control of bycatch off the Washington-Oregon coast should be developed, but as of this time, no data exist on which to base bycatch management measures. We therefore recommend that the International Pacific Halibut Commission develop procedures for estimation of bycatch in this area using the best available information, and incorporate these estimates into 1992 yield estimation.

5. The Commission staff will conduct an analysis of the 1990 observer data to estimate halibut mortality rates for each gear type in the United States groundfish fishery. These mortality rates will be used in establishing the 1992 commercial halibut catch limits.

Canadian Fisheries

The Commission recommends that the Government of Canada expand the Canadian observer program to cover all bottom-trawl fisheries, and that Fisheries and Oceans undertake research to examine the viability of trawl caught halibut in Canadian waters. Further, that the results of the

observer program, and relevant United States experience, be used to develop and implement a bycatch control and reduction program for Canadian waters. A proposed program should be presented at the 1992 annual meeting of the International Pacific Halibut Commission.

General

The Commission will continue the Halibut Bycatch Working Group and tasks the group to develop a schedule, with review and check points, to track progress on these recommendations and their implementation. The progress would then be reported to the Commission during its "interim" and "annual" meetings and other meetings as necessary. In addition, the Commission will undertake, in conjunction with agencies of the national sections, the research recommendations of the Halibut Bycatch Working Group.

The Commission recognizes the uncertainties associated with present bycatch compensation procedures. It directs the Commission staff to continue its research into the adequacy of present procedures and develop alternative methodology, where necessary.

The Commission acknowledges a debt of gratitude to the staffs of the United States National Marine Fisheries Service, the Canadian Department of Fisheries and Oceans, and the International Pacific Halibut Commission for their contributions to the Halibut Bycatch Working Group Report and their participation in the many discussions concerning bycatch.

Sincerely yours,

Steven Pennoyer
Chairman

COUNCIL ACTION TO MINIMIZE HALIBUT BYCATCH 1977-96

To reduce the level of halibut bycatch in the groundfish fisheries in Federal waters of the Bering Sea/Aleutian Islands and Gulf of Alaska, the North Pacific Council and National Marine Fisheries Service have approved and implemented a number of management measures. Numerous plan and regulatory amendments have been made to the BSAI and GOA fishery management plans to reduce halibut bycatch using the following management measures. The Council is also considering individual bycatch quotas.

- prohibited retention of some species
- halibut bycatch limits by fishery
- vessel incentive program
- individual fishing quotas for fixed gear halibut and sablefish fisheries
- careful release regulations for longline fisheries
- at-sea and onshore observer programs
- inseason monitoring of bycatch rates
- groundfish quota reductions
- time and area closures
- gear restrictions

History of Groundfish Management Action to Reduce Halibut Bycatch

1983 BSAI Amendment 3: Established procedures for reducing the incidental catch of halibut, salmon, king crab, and Tanner crab by the foreign fisheries.

1983 BSAI Amendment 7: Modified the December 1 to May 31 depth restriction on the foreign longline fisheries in the Winter Halibut Savings Area.

1985 GOA Amendment 14: Established framework for setting and adjusting halibut PSC limits.

1987 BSAI Amendment 10/GOA Amendment 15: Closed an area in the Bering Sea to trawling and set PSC limits on halibut and crab.

1988 BSAI Amendment 12a/GOA Amendment 16: Revised definition of "prohibited species."

1989 GOA Amendment 18: Set 750 mt PSC for fixed gear fisheries, in addition to 2,000 mt PSC for trawl gear for 1991.

1991 BSAI Amendment 16/GOA Amendment 21: Amended halibut and crab bycatch management measures, including the adoption of a vessel incentive program (VIP) to impose sanctions on trawl vessels targeting Pacific cod with excessively high halibut bycatch rates.

1991 BSAI Regulatory Amendment: Delayed the yellowfin sole, Greenland turbot, arrowtooth flounder and other flatfish species opening date to May 1 to reduce crab and halibut bycatch.

1991 GOA Regulatory Amendments: Required groundfish pots to have halibut excluder devices and biodegradable panels. Frameworked apportioning halibut PSCs by gear group. Sablefish opening changed from April 1 to May 15 to reduce halibut bycatch.

1992 BSAI Amendment 19/GOA Amendment 24: Revised time/area closures (hotspot) authority in the BS/AI to reduce bycatch rates of prohibited species. Established hot spot authority in the GOA. Expanded VIP to include trawl fisheries in the BSAI. Established a halibut PSC limit of 5,033 mt for the BSAI trawl fishery and 750 mt for non-trawl fisheries for one year. Established new BSAI halibut and crab PSC apportionment categories. Revised Directed Fishing Standards to further limit halibut trawl bycatch amounts after a halibut PSC bycatch allowance has been reached.

1993 BSAI Amendment 15/GOA Amendment 20: Approved halibut and sablefish IFQ program.

1993 BSAI Amendment 21: Established Pacific halibut bycatch limits in terms of mortality rather than bycatch. Established limits for trawl (3,775 mt) and non-trawl (900 mt) gear. Established authority to annually apportion non-trawl halibut bycatch mortality limit among fisheries and seasons as bycatch allowances.

1993 BSAI/GOA Regulatory Amendments: Established careful release measures for PSC halibut taken by longline gear. Prohibited landing of undersized halibut and required offloading of PSC species caught beyond EEZ. Adopted performance-based pelagic trawl definition.

1994 GOA Regulatory Amendment: Apportioned trawl halibut PSC caps to shallow water and deep water complexes. Delayed rockfish season until July 1 to reduce halibut and salmon bycatch.

1995 BSAI/GOA Regulatory Amendment: Exempted the IFQ sablefish fishery from halibut PSC requirements, which effectively reduced the halibut PSC by 450 mt.

Estimates of bycatch mortality of Pacific halibut (*Hippoglossus stenolepis*), in thousands of pounds (*net weight*), by IPHC regulatory area for 1962 -1995.

Year	Area 2	Area 3	Area 4	TOTAL
1962	1,383	3,083	4,143	8,609
1963	1,283	6,102	2,038	9,423
1964	1,310	11,639	2,965	15,914
1965	1,640	16,539	3,182	21,361
1966	1,879	12,495	3,400	17,774
1967	2,091	9,528	4,718	16,337
1968	2,478	7,053	5,685	15,216
1969	2,651	4,980	7,599	15,230
1970	2,032	6,230	8,028	16,290
1971	2,284	4,341	13,095	19,720
1972	2,506	7,099	9,675	19,280
1973	2,357	7,147	8,029	17,533
1974	2,261	8,667	7,620	18,548
1975	2,548	5,231	3,650	11,429
1976	2,772	5,938	4,564	13,274
1977	2,399	5,988	2,914	11,301
1978	1,850	4,895	5,023	11,767
1979	2,674	6,715	5,419	14,807
1980	1,893	7,099	9,235	18,227
1981	1,694	6,282	6,408	14,384
1982	1,169	5,972	4,756	11,898
1983	1,248	4,892	4,269	10,408
1984	1,376	3,647	4,692	9,714
1985	1,440	1,578	4,207	7,225
1986	1,465	1,246	5,576	8,287
1987	1,952	3,113	5,738	10,803
1988	1,913	3,415	8,858	14,186
1989	1,803	4,085	7,282	13,171
1990	3,044	6,437	8,520	18,001
1991	3,198	5,367	7,567	16,132
1992	3,094	4,969	8,148	16,211
1993	2,879	5,251	6,959	15,089
1994	2,193	5,102	8,424	15,719
1995	2,344	4,497	8,058	14,899

Table 5

1995 Distribution of Red King Crab and Tanner Crab Prohibited Species Catch and Actual Bycatch by Fishery as of August 18, 1995

Fishery Group 1995	Red King Crab (animals) Zone 1	Tanner Zone 1	Tanner Zone 2	Occurrance of PSC limit closure	Date
Yellowfin Sole				Tanner PSC Zone1	April 4
PSC limit	50,000	225,000	1,525,000	Halibut PSC	May 1
Amount bycaught	5,906	254,488	479,594		
Difference	44,094	-29,488	1,045,406		
Rocksole/other flatfish				Halibut PSC	Feb. 21
PSC limit	110,000	475,000	510,000	Halibut PSC	April 17
Amount bycaught	20,536	340,151	95,230	Halibut PSC	Aug. 1
Difference	89,464	134,849	414,770		
Turbot/sablefish/arrowtooth				Halibut PSC	May 3
PSC limit			5,000		
Amount bycaught			3,301		
Difference			1,699		
Rockfish				Halibut PSC	March 15
PSC limit			10,000		
Amount bycaught			1,989		
Difference			8,011		
Pacific Cod				Tanner PSC Zone1	March 20
PSC limit	10,000	225,000	260,000	Halibut	April 24
Amount bycaught	2,450	217,653	44,924		
Difference	7,550	7,347	215,076		
Pollock/mackerel/o.species				Halibut PSC	Aug.22
PSC limit	30,000	75,000	690,000		
Amount bycaught	845	46,315	1,981		
Difference	29,155	28,685	688,019		
TOTAL					
PSC limit	200,000	1,000,000	3,000,000		
Amount bycaught	29,737	858,607	627,019		
Difference	170,263	141,393	2,372,981		

*Data from NMFS 1995 Bering Sea/Aleutian Islands Fisheries Prohibited Species Bycatch Mortality and NMFS 1995 closure notices

Table 6

1994 Distribution of Red King Crab and Tanner Crab Prohibited Species Catch and Actual Bycatch by Fishery

Fishery Group 1994	Red King Crab (animals) Zone1	Tanner Zone1	Tanner Zone2	Occurrance of PSC limit Closure	Date
Yellowfin sole				Tanner PSC Zone 1	May 6
PSC limit	40,000	175,000	1,275,000	Halibut PSC	July 5
Amount bycaught	11,436	245,977	895,620	Halibut PSC	Nov. 19
Difference	28,564	-70,977	379,380		
Rocksole/other flatfish				RKC PSC Zone 1	Feb. 28
PSC limit	110,000	475,000	260,000	Tanner PSC Zone 2	May 7
Amount bycaught	193,016	366,317	349,477	Halibut PSC	July 5
Difference	-83,016	108,683	-89,477		
Turbot/sablefish/arrowtooth				Halibut PSC	May 23
PSC limit			5,000		
Amount bycaught			60		
Difference			4,940		
Rockfish					
PSC limit			10,000		
Amount bycaught			105		
Difference			9,895		
Pacific cod				Halibut PSC	May 7
PSC limit	10,000	175,000	200,000		
Amount bycaught	788	78,833	147,346		
Difference	9,212	96,167	52,654		
Pollock/mackerel/o.species				Halibut PSC	Sept. 6
PSC limit	40,000	175,000	1,250,000		
Amount bycaught	39,401	61,759	309,997		
Difference	599	113,241	940,003		
TOTAL					
PSC limit	200,000	1,000,000	3,000,000		
Amount bycaught	244,641	752,886	1,702,605		
Difference	-44,641	247,114	1,297,395		

* Data from NMFS 1994 Bering Sea/Aleutian Islands Fisheries Prohibited Species Bycatch Mortality and NMFS Alaskan Groundfish Fisheries Closures 1986-1994

Table 7

1993 Distribution of Red King Crab and Tanner Crab Prohibited Species Catch and Actual Bycatch by Fishery

Fishery Group 1993	Red King Crab (animals) Zone 1	Tanner Zone 1	Tanner Zone 2	Occurrance of PSC limit closure	Date
Yellowfin Sole				Halibut PSC	June 6
PSC limit	40,000	175,000	1,220,916		
Amount bycaught	6,610	58,421	906,185		
Difference	33,390	116,579	314,731		
Rocksole/other flatfish				RKC PSC Zone 1	Feb. 16
PSC limit	80,000	475,000	199,333	Halibut PSC	Feb. 26
Amount bycaught	132,931	328,845	195,045	Halibut PSC	May 21
Difference	-52,931	146,155	4,288	Tanner PSC Zone 2	Aug. 9
Turbot/sablefish/arrowtooth				Halibut PSC	Feb. 11
PSC limit			10,000	Halibut PSC	May 1
Amount bycaught			0		
Difference			10,000		
Rockfish				Halibut PSC	Feb. 11
PSC limit			24,917	Halibut PSC	May 4
Amount bycaught			449		
Difference			24,468		
Pacific Cod				Halibut PSC	April 28
PSC limit	40,000	175,000	398,667		
Amount bycaught	501	150,989	67,603		
Difference	39,499	24,011	331,064		
Pollock/mackerel/o.species				Halibut PSC	Feb. 19
PSC limit	40,000	175,000	1,146,167	Tanner PSC Zone 2	May 14
Amount bycaught	43,671	493,730	1,168,602	RKC PSC Zone 1	May 21
Difference	-3,671	-318,730	-22,435	Halibut PSC	Aug. 25
TOTAL					
PSC limit	200,000	1,000,000	3,000,000		
Amount bycaught	183,713	1,031,985	2,337,884		
Difference	16,287	-31,985	662,116		

*Data from NMFS 1993 Bering Sea/Aleutian Islands Fisheries Prohibited Species Bycatch Mortality and NMFS Alaskan Groundfish Fisheries Closures 1986-1994

Table 8

1992 Distribution of Red King Crab and Tanner Crab Prohibited Species Catch and Actual Bycatch by Fishery

Fishery Group 1992	Red King Crab (animals) Zone 1	Tanner Zone 1	Tanner Zone 2	Occurrence of PSC limit closure	Date
Yellowfin Sole				Tanner PSC Zone 1	June 6
PSC limit	75,000	100,000	1,225,000		
Amount bycaught	26,362	168,048	1,058,703		
Difference	48,638	-68,048	166,297		
Rocksole/other flatfish				Halibut PSC	Feb. 23
PSC limit	85,000	700,000	300,000	Halibut PSC	April 4
Amount bycaught	46,138	451,433	73,185	Halibut PSC	July 1
Difference	38,862	248,567	226,815	Halibut PSC	Aug. 24
Turbot/sablefish/arrowtooth					
PSC limit					
Amount bycaught					
Difference					
Rockfish				Halibut PSC	April 26
PSC limit		0	50,000	Halibut PSC	July 8
Amount bycaught		0	1,788		
Difference		0	48,212		
Pacific Cod				Tanner PSC Zone1	Feb. 15
PSC limit	10,000	75,000	712,500	Halibut PSC	May 6
Amount bycaught	3	52,548	97,924	Halibut PSC	June 3
Difference	9,997	22,452	614,576		
Other				Tanner PSC Zone1	Feb. 15
PSC limit	30,000	125,000	712,500	Halibut PSC	Feb. 16
Amount bycaught	38,017	181,240	1,094,978	Halibut PSC	May 21
Difference	-8,017	-56,240	-382,478	Halibut PSC	Dec. 8
TOTAL					
PSC limit	200,000	1,000,000	3,000,000		
Amount bycaught	110,520	853,269	2,326,578		
Difference	89,480	146,731	673,422		

*Data from NMFS 1992 Bering Sea/Aleutian Islands Fisheries Prohibited Species Bycatch Mortality and NMFS Alaskan Groundfish Fisheries Closures 1986-1994

Opening and Closing Dates for Various BSAI & GOA Groundfish Fisheries for 1991, 1992 & 1993 to date.

Species	Year	Gear Type	Area	Open date	Close date	Reason for Closure
Pollock	1991	Trawl	Bering Sea	1-Jan	22-Feb	"A" Season TAC taken
				1-Jun	4-Sep	"B" Season TAC taken
			Aleutian Islands	1-Jun	23-Mar	TAC taken
	1991	Trawl	Gulf of Alaska	1-Jan	15-Feb	Interim TAC taken
				13-Jun	24-Jul	3rd quarter TAC taken
				21-Oct	25-Oct	4th quarter TAC taken
	1992	Trawl	Bering Sea	20-Jan	6-Mar	"A" Season TAC taken
				1-Jun	22-Sep	"B" Season TAC taken
			Aleutian Islands	20-Jan	15-Apr	TAC taken
				1-Jun	8-Jul	TAC taken
	1992	Trawl	Gulf of Alaska	20-Jan	7-Feb	1st quarter TAC taken
				1-Jun	17-Jun	2nd quarter TAC taken
				1-Jul	12-Jul	3rd quarter TAC taken
				1-Oct	8-Oct	4th quarter TAC taken
	1993	Trawl, Inshore	Bering Sea	20-Jan	24-Mar	"A" Season TAC taken
		Offshore	Bering Sea	20-Jan	22-Feb	"A" Season TAC taken
		Inshore	Aleutian Islands	20-Jan	9-Apr	TAC taken
		Offshore	Aleutian Islands	20-Jan	31-Mar	TAC taken
	1992	Trawl, Inshore	GOA, Area 61	1-Jan	24-Mar	1st quarter TAC taken
		Inshore	GOA, Area 62	1-Jan	25-Feb	1st quarter TAC taken
		Inshore	GOA, Area 63	1-Jan	25-Feb	1st quarter TAC taken
Pacific cod	1991	Trawl	Bering Sea/Aleutian Is.	1-Jan	8-Mar	Halibut PSC, quarterly
		Trawl	Bering Sea/Aleutian Is.	1-Apr	8-May	Halibut PSC, quarterly
		Trawl	Bering Sea/Aleutian Is.	1-Jul	8-Jul	Halibut PSC, quarterly
		Hook & Line	Bering Sea/Aleutian Is.	1-Jan	31-Dec	no closure for 1991
		All	Western Gulf	1-Jan	23-Mar	TAC taken
		All	Central Gulf	1-Jan	29-Apr	TAC taken
	1992	Trawl	Bering Sea/Aleutian Is.	20-Jan	16-Feb	Halibut PSC, quarterly
		Trawl	Bering Sea/Aleutian Is.	7-Mar	6-May	Halibut PSC, quarterly
		Hook & Line	Bering Sea/Aleutian Is.	1-Jan	5-Oct	Halibut PSC, Hook&Line
		Pot	Bering Sea/Aleutian Is.	1-Jan	30-Nov	TAC taken
		Trawl	Western Gulf	20-Jan	5-Mar	
		Hook & Line	Western Gulf	1-Jan	5-Mar	
		Trawl	Central & Eastern Gulf	20-Jan	4-Apr	TAC taken
		Hook & Line	Central & Eastern Gulf	1-Jan	4-Apr	TAC taken
		Trawl, Inshore	Central Gulf	1-Oct	16-Oct	TAC taken

Openings & Closures Countinued.

Species	Year	Gear Type	Area	Open date	Close date	Reason for Closure
P. Cod, Cont.	1993	Trawl	Bering Sea/Aleutian Is.	20-Jan	28-Apr	Halibut PSC, Trawl
		Hook & Line	Bering Sea/Aleutian Is.	1-Jan	11-May	TAC taken
		Pot	Bering Sea/Aleutian Is.	1-Jan	11-May	TAC taken
		All	Western GOA Inshore	1-Jan	9-Mar	TAC taken
		All	Central Gulf Inshore	1-Jan	24-Mar	TAC taken
Sablefish	1991	Hook & Line	Gulf of Alaska	15-May	17-Jun	TAC taken
			Bering Sea/Aleutian Is.	1-Jan	31-Dec	
	1992	Hook & Line	Gulf of Alaska	15-May	3-Jun	TAC taken
			Bering Sea/Aleutian Is.	1-Jan	5-Oct	Halibut PSC
	1993	Hook & Line	Gulf of Alaska	15-May	June ?	
			Bering Sea/Aleutian Is.	1-Jan	?	
Yellowfin Sole	1991	Trawl	Bering Sea/Aleutian Is.	1-May	15-Oct	
GL Turbot	1992	Trawl	Bering Sea/Aleutian Is.	1-May	31-Dec	
AT Flounder	1993	Trawl	Bering Sea/Aleutian Is.	1-May	?	
Other Flatfish						
Rocksole	1991	Trawl	Bering Sea/Aleutian Is.	1-Jan	6-Jun	Halibut PSC
	1992	Trawl	Bering Sea/Aleutian Is.	20-Jan	4-Apr	Halibut PSC
	1993	Trawl	Bering Sea/Aleutian Is.	20-Jan	26-Feb	1st Halibut PSC
	1993	Trawl	Bering Sea/Aleutian Is.	5-Apr		
Atka Mackerel	1991	Trawl	Bering Sea/Aleutian Is.	1-Jan	29-Mar	TAC taken
	1992	Trawl	Bering Sea/Aleutian Is.	20-Jan	16-Apr	TAC taken
	1993	Trawl	Bering Sea/Aleutian Is.	20-Jan	11-Mar	TAC taken
Rockfish (various species)		All Gears	Both Gulf and BSAI	Various openings and closures throughout the year		
Other Species	1993	all	Western GOA	30-Mar	2-Apr	TAC taken

Notes:
Closures are generally due to attainment of the TAC or attainment of a Prohibited Species Catch (PSC).
PSCs can be apportioned quarterly, seasonally, or by trimester, depending on the fishery and the management area.
TACs in the Gulf of Ak. are spacially apportioned into Eastern, Central and Western Gulf areas.
Closures listed are general, and aggregate some fisheries closures to the last day opened.
For 1993, the BSAI Pollock 'B' Season will start August 15.
This list is not inclusive of all species of fish managed by the NMFS.

GOA Groundfish Fisheries Closures Due to Halibut Bycatch Mortality, 1994-96*.

			1994				1995				1996			
Fishery	Gear	Area	From	To	Reason		From	To	Reason		From	To	Reason
Shallow W Flatf	Trawl	All	21-Mar	31-Mar	HAL		8-May	1-Jul	HAL-B		13-May	1-Jul	HAL
	Trawl	All	19-May	30-Jun	HAL								
	Trawl	All	15-Aug	30-Sep	HAL								
Deep W Flatfish	Trawl	All	22-Apr	30-Jun	HAL		1-Jan	31-Dec	SPEC	610	30-Jan	31-Dec	SPEC
	Trawl	All	29-Aug	30-Sep	HAL	DWC-Tr	27-Mar	1-Apr	HAL-B	DWC-Tr	21-Mar	1-Apr	HAL-B
						DWC-Tr	22-Apr	1-Jul	HAL-B	DWC-Tr	15-Apr	1-Jul	HAL-B
Sablefish	H&L	All	28-May	1-Sep	HAL		15-Nov	31-Dec	REG				
	H&L	610-40	1-Sep	12-Sep	HAL								
	H&L	650	1-Sep	31-Dec	HAL								
	H&L	610-40	14-Sep	31-Dec	HAL								
All (X 650 DEMS)	Trawl	All	29-Oct	31-Dec	HAL		16-Mar	18-May	HAL				
	H&L	All	28-May	1-Sep	HAL		18-May	31-Dec	HAL				

*TAC closures put fishery into bycatch status.

Halibut Prohibited Species Catch Limit and Actual Amount Bycaught by the Gulf of Alaska Fisheries.

Fishery	1994 PSC limit	1994 amount bycaught	1994 % PSC taken	1995 PSC limit	1995 amount bycaught	1995 % PSC taken	1996**** PSC limit	1996**** amount bycaught	1996**** % PSC taken
Trawl									
shallow water*	800	865	108%	800	740	93%	800	567	71%
deep water**	800	987	123%	800	751	94%	800	351	44%
combined	400	367	92%	400	560	140%	400	0	0%
TOTAL	2,000	2,217	111%	2,000	2,051	103%	2,000	918	46%
Hook & Line	750	867	116%	***300	330	110%	***300	157	52%
TOTAL GOA	2,750	3,084	112%	2,300	2,381	104%	2,300	1,075	47%

*shallow water complex = pollock, Pacific cod, sw flatfish, flathead sole, Atka mackerel, and "other species."
**deep water complex = sablefish, rockfish, rex sole, arrowtooth flounder, and DW flatfish.
***IFQ sablefish fishery is exempt from halibut bycatch restrictions and resulted in lowered PSC limit.
****as of 5/30/96

Halibut Prohibited Species Catch Limit and Actual Amount Bycaught by the Bering Sea / Aleutian Islands Trawl Fisheries

Trawl Fishery	1992 PSC limit	1992 amount bycaught	1992 % of PSC taken	1993 PSC limit	1993 amount bycaught	1993 % of PSC taken	1994 PSC limit	1994 amount bycaught	1994 % of PSC taken	1995 PSC limit	1995 amount bycaught	1995 % of PSC taken
Pacific cod	1537	1609	104.70%	1000	1082	108%	1200	1260	105%	1550	1478	95%
Yellowfin sole	849	719	84.70%	592	603	102%	592	580	98%	750	382	51%
Rock sole /other flatfish	755	746	98.90%	588	558	95%	688	809	118%	690	889	129%
PLCK/AMCK/other	1692	1889	111.70%	1257	1123	89%	957	866	90%	555	317	57%
Rockfish	200	207	103.60%	201	122	61%	201	44	22%	110	53	48%
Sablefish/Turbot/Arrowtooth				137	1	0%	137	374	273%	120	282	235%
Total	5033	5170		3775	3489		3775	3933		3775	3401	

* Data from NMFS 1992, 1993, 1994, 1995 Bering Sea / Aleutian Islands Fisheries Trawl Halibut Bycatch Mortality (Metric Tons)
* All Data in Metric Tons
* 1995 Data as of August 25, 1995

Halibut Bycatch and Bycatch Mortality in Metric Tons for the 1991- 1996 (thru 5/25/96) Groundfish Fisheries

	1991			1992			1993			1994			1995			1996		
BSAI - TRAWL Targets	**Bycatch**	**AMR***	**Mortality**	**Bycatch**	**AMR***	**Mortality**	**Bycatch**	**AMR***	**Mortality**	**Bycatch**	**AMR*(2)**	**Mortality**	**Bycatch**	**AMR*(3)**	**Mortality**	**Bycatch**	**AMR*(4)**	**Mortality**
Bottom Pollock	1159	0.60	695	569	0.60	341	701	0.60	421	350	0.60	210	332	0.77	256	112	0.78	87
Pelagic Pollock (1)	269	0.80	215	1646	0.80	1317	611	0.80	489	596	0.80	477	159	0.89	142	91	0.88	80
Pacific Cod	2969	0.60	1781	1709	0.60	1025	1804	0.60	1082	2088	0.60	1253	2323	0.65	1510	2374	0.63	1496
Rockfish	167	0.60	100	227	0.60	136	203	0.60	122	75	0.60	45	107	0.69	74	35	0.75	26
Flathead sole	na	na	na	na	na	na	na	na	na	na	na	na	189	0.75	142	192	0.73	140
Other Flatfish (+ flthd sole in '94)	na	na	na	na	na	na	na	na	na	218	0.70	152	39	0.75	29	4	0.73	3
Rocksole (+Othrflts in '92 & '93)	1367	0.70	957	823	0.70	576	798	0.70	559	929	0.70	650	988	0.75	741	697	0.73	509
Yellowfin Sole (+Othrflts '91)	785	0.70	550	794	0.70	556	862	0.70	603	794	0.70	556	729	0.76	554	343	0.73	251
Greenland Turbot/Arrowtooth	477	0.40	191	1	0.40	0	1	0.40	0	927	0.40	371	556	0.48	267	1	0.49	0
Sablefish (4)	41	0.40	16	1	0.40	0	1	0.40	0	9	0.40	4	30	0.48	14	0	0.49	0
Atka Mackerel	70	0.70	49	109	0.70	76	295	0.70	207	245	0.70	171	39	0.59	23	125	0.63	79
Other Species	8	0.40	3	4	0.40	2	17	0.40	7	0	0.40	0	0	0.40	0	0	0.82	0
Totals	**7312**		**4557**	**5883**		**4029**	**5293**		**3490**	**6231**		**3889**	**5491**		**3752**	**3974**		**2671**
BSAI - HOOK-AND-LINE Targets																		
Pacific Cod	4046	0.18	728	7117	0.18	1281	2173	0.18	391	6845	.125/.15	871	6946	0.115	799	3767	0.115	433
Sablefish	377	0.18	68	213	0.18	38	274	0.18	41	285	.125/.15	40	212	0.17	36	see (4)	0.17	see (4)
Greenland turbot	6	0.18	1	21	0.18	4	632	0.18	95	325	.125/.15	45	427	0.19	81	391	0.22	86
Rockfish										4	.125/.15	1	25	0.24	6	6	0.24	2
Other hook-and-line fisheries										17	.125/.15	2	6	0.15	1	0	0.115	0
Totals	**4429**		**797**	**7351**		**1323**	**3079**		**527**	**7476**		**959**	**7616**		**923**	**4164**		**521**
BSAI - OTHER Gear types																		
Groundfish JIG gear										96	0.05	5	0	0.08	0	0	0.07	0
Groundfish POT gear	64	0.05	3	107	0.05	5	8	0.05	0	57	0.05	3	141	0.08	11	115	0.07	8
Totals										**153**		**8**	**141**		**11**	**115**		**8**
BSAI - TOTAL BYCATCH	**11805**		**5357**	**13341**		**5357**	**8380**		**4017**	**13860**		**4856**	**13248**		**4686**	**8253**		**3200**

* AMR = Assumed Mortality Rate

	1991			1992			1993			1994			1995			1996		
GOA - TRAWL Targets	**Bycatch**	**AMR***	**Mortality**	**Bycatch**	**AMR***	**Mortality**	**Bycatch**	**AMR***	**Mortality**	**Bycatch**	**AMR***	**Mortality**	**Bycatch**	**AMR*(4)**	**Mortality**	**Bycatch**	**AMR*(4)**	**Mortality**
Bottom Pollock	228	0.55	125	161	0.55	89	216	0.55	119	60	0.55	33	147	0.63	93	24	0.54	13
Pelagic Pollock (2)	26	0.75	20	11	0.75	8	2	0.75	2	19	0.75	14	17	0.66	12	4	0.72	3
Pacific Cod	1272	0.55	700	852	0.55	469	714	0.55	393	1120	0.55	616	815	0.58	473	468	0.58	262
Deep Water Flatfish	1395	0.55	767	1048	0.55	576	873	0.55	480	707	0.55	389	147	0.59	87	143	.60/.52(5)	74
Shallow Water Flatfish	42	0.60	25	296	0.60	178	884	0.60	530	387	0.60	232	547	0.64	350	379	0.67	254
Flathead sole	na	na	na	na	na	na	na	na	na	163	0.60	98	123	0.64	79	52	0.67	35
Rex sole	na	na	na	na	na	na	na	na	na	970	0.55	533	820	0.59	484	470	.60/.52(5)	245
Rockfish	1315	0.60	789	810	0.60	486	521	0.60	313	204	0.60	123	456	0.66	301	11	0.57	6
Sablefish	22	0.55	12	2	0.55	1	13	0.55	7	27	0.55	17	20	0.60	12	5	0.57	3
Atka mackerel										23	0.60	13	2	0.60	1	0	0.48	0
Arrowtooth Flounder	171	0.55	94	0	0.55	0	99	0.55	54	140	0.55	84	265	0.60	159	49	0.47	23
Other Species	1	0.55	1	129	0.55	71	71	0.55	39	0	0.60	0	0	0.60	0	0	0.47	0
Total Bycatch	**4472**		**2533**	**3309**		**1878**	**3393**		**1937**	**3820**		**2152**	**3359**		**2051**	**1605**		**918**
GOA - HOOK-AND-LINE Targets																		
Pacific Cod	1006	0.16	161	3033	0.16	485	526	0.16	85	1002	.115/.14	135	1829	0.20	366	1263	0.12	151
Deep Water Flatfish	4	0.16	1	0	0.16	0	2	0.16	0	0	.115/.14	0	15	0.20	3	0	0.18	0
Rockfish	64	0.16	10	83	0.16	13	115	0.16	19	67	.115/.14	9	25	0.18	5	19	0.18	3
Sablefish	4800	0.205	984	3486	0.205	715	7992	0.205	1192	3577	.14/.17	575	450	0.25	112	see (4)	0.23	see (4)
Other Species	7	0.16	1	0	0.16	0	1	0.16	0	0	.115/.14	0	31	0.20	6	13	0.12	2
Total Bycatch	**5881**		**1157**	**6602**		**1213**	**8636**		**1296**	**4646**		**719**	**2350**		**492**	**1295**		**156**
GOA - OTHER Gear Targets																		
Groundfish - POT Gear	49	0.05	2	98	0.05	5	47	0.05	2	84	0.05	4	102	0.18	18	92	0.17	16
Groundfish - JIG Gear	53	0.16	8	49	0.16	8	13	0.16	2	0	0.16	0	0	0.14	0	0	0.17	0
Total Bycatch	**102**		**10**	**147**		**13**	**60**		**4**	**84**		**4**	**102**		**18**	**92**		**16**
GOA - TOTAL BYCATCH	**10455**		**3700**	**10058**		**3104**	**12089**		**3237**	**8550**		**2875**	**5811**		**2561**	**2992**		**1090**
TOTAL BYCATCH - BSAI & GOA	**22260**		**9057**	**23399**		**8461**	**20469**		**7254**	**22410**		**7731**	**19059**		**7247**	**11245**		**4290**

* AMR = Assumed Mortality Rate

1. The definition of the pelagic trawl pollock fishery in 1991 is based on whether or not 20 crabs or more were observed in a haul comprised mostly of pollock. The 1990, 1992, 1993, and 1994 definition is based on whether the catch is mostly pollock.
2. 1994 hook-and-line fisheries have two Assumed Mortality Rates (observed rate & unobserved rate).
3. 1995 Assumed Mortality Rates; BSAI Pacific cod H&L rate was changed from 12.5% to 11.5% based on 1994-1995 data.
4. 1995 halibut discard mortality in the sablefish IFQ fishery based on sablefish-only landings. 1996 halibut discard mortality in the sablefish IFQ sablefish fishery will be calculated at the end of the 1996 fishing season.
5. A mortality rate of 0.60 applied April 1 - Sept. 30; a rate of 0.52 applied Oct 1 - March 31

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Summary of A-Option Trawl Catch (in lbs) for Observed Trips (data to June 5).

Species	Retained Catch At Sea Estimate	Retained Catch Offload Weight	Ratio At Sea /Offload Weight	Discarded At Sea Marketable Dead	Discarded At Sea Marketable Live	Discarded At Sea Not Marketable	Ratio Discarded/ Kept Weight
Yellowtail	4,011,161	4,227,505	0.95	2,397	0	20,467	0.006
Widow	1,003,839	1,223,666	0.82	6,126	0	217	0.006
Agg 1 Total	5,015,000	5,451,171	0.92	8,523	0	20,684	0.006
Canary	390,521	377,457	1.03	3,482	0	705	0.011
Silvergrey	801,683	896,065	0.89	1,585	0	2,854	0.008
Agg 2 Total	1,192,204	1,273,522	0.94	5,067	0	3,559	0.007
POP	4,319,343	4,049,654	1.07	6,456	0	167,509	0.040
Yellowmouth	2,431,677	2,243,191	1.08	809	0	52,165	0.022
Agg 3 Total	6,751,020	6,292,845	1.07	7,265	0	219,674	0.034
Rougheye	800,391	786,129	1.02	1,948	0	2,607	0.006
Shortraker	118,325	84,930	1.39	439	0	168	0.005
Agg 4 Total	918,716	871,059	1.05	2,387	0	2,775	0.006
Redstripe	1,059,297	1,072,259	0.99	1,092	0	222,150	0.211
Sharpchin	217,174	315,422	0.69	895	0	141,582	0.656
Agg 5 Total	1,276,471	1,387,681	0.92	1,987	0	363,732	0.287
Oth. Rockfish Agg 6	1,008,433	994,086	1.01	2,293	0	136,146	0.137
S Spine Idiots	567,875	589,345	0.96	191	0	29,679	0.053
Sablefish	115,690	123,674	0.94	14,834	50,083	166,004	1.996
Pcod	459,574	603,783	0.76	3,745	10,759	27,445	0.091
Dover	2,005,974	2,219,467	0.90	4,033	17,599	157,860	0.089
Rock	828,175	877,824	0.94	36	329	142,849	0.173
Lemon	316,209	366,597	0.86	508	1,485	122,670	0.394
Petrale	300,025	303,618	0.99	100	609	11,486	0.041
Lingcod	617,651	871,869	0.71	606	5,461	18,668	0.040
Pollock	1,023,099	1,091,576	0.94	0	0	97,798	0.096
Hake	7,431	4,783	1.55	4	0	101,778	13.697
Dogfish	177,698	240,786	0.74	0	0	1,857,944	10.456
Turbot	4,282,201	4,965,885	0.86	0	100	2,003,785	0.468
Skate	251,859	458,767	0.55	0	0	325,774	1.293
All Species*	27,405,133	29,302,321	0.94	51,734	87,215	6,605,743	0.246

* - All species includes species other than those listed in this table.

Summary of A-Option Trawl Halibut Catch (in lbs) for Observed Trips.

Statistical Area	Retained Catch At Sea Est.	Retained Catch Offload Wt.	Released At Sea Alive	Released At Sea Dead	Total Catch
3C/D**	332	807	80,532	31,294	112,633
5A/B	7	1,017	71,851	33,887	106,755
5CD**	33	126	137,049	50,970	188,145
5E	0	17	36,592	14,590	51,199
Unspecified	0	2,525	8	1	2,534
All Areas	372	4,492	326,032	130,742	461,266

** - Managed By Area Bycatch Caps

↓ 3369 (NET wt) ↓ 98,057 ~~[illegible]~~ (NET wt)

98056 / 3364 / 101,420 total pounds (NET WEIGHT)

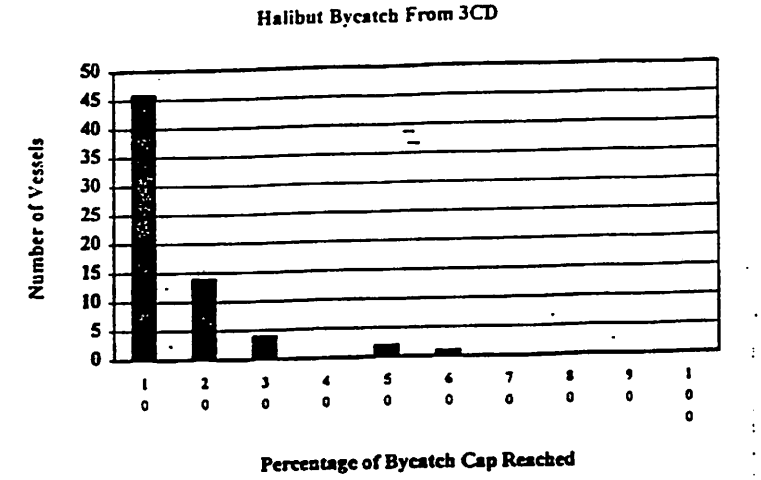
Prepared by Archipelago Marine Research Ltd.

Summary of At Sea Discards Including Dead, Live and Not Marketable Categories for A Option Observed Trips (Data to June 5).

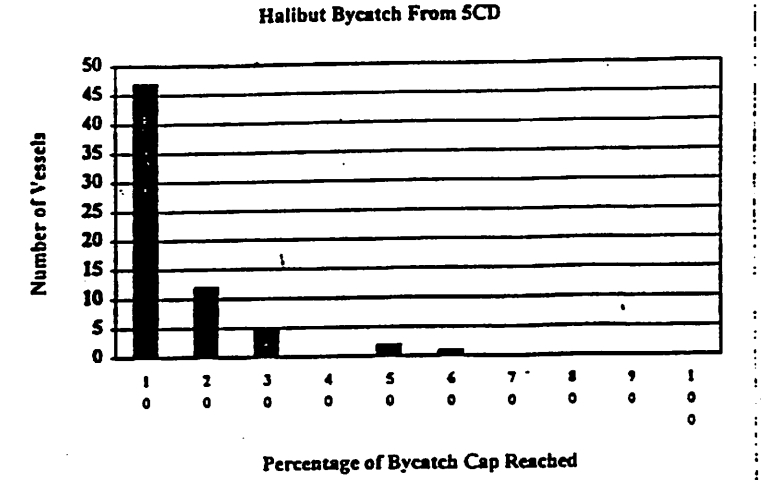
Species*	Code	Weight (lbs)	Weight (tonnes)	Species*	Code	Weight (lbs)	Weight (tonnes)
Turbot	602	2,003,885	908.96	Solaster Starfish	4TB	419	0.19
Dogfish	044	1,857,944	842.76	Tongue Worms (Pentastomida)	2EA	382	0.18
Halibut	614	457,172	207.37	Stony Corals	3J2	697	0.32
Ratfish	068	389,180	176.53	Purple Starfish	4ZA	1,180	0.54
Skate (misc. species)	048	326,736	148.21	Salmon Shark	038	425	0.19
Redstripe Rockfish	439	223,642	101.44	Sea Cucumbers	6NA	387	0.17
Sablefish	455	230,921	104.75	Harbour Seal	858	465	0.21
Pacific Ocean Perch	396	173,990	78.92	Red Squid	9SE	314	0.14
Sharpchin Rockfish	450	142,477	64.63	Sunflower Starfish	4XE	387	0.17
Rex Sole	610	167,385	75.92	Giant Squid	98C	238	0.11
Dover Sole	628	179,551	81.44	Ragfish	386	422	0.19
English Sole	628	124,663	56.55	Snailfish	568	329	0.15
Pollock	228	97,798	44.36	Sand Dab	595	215	0.10
Rock Sole	621	143,214	64.96	Halfmoon Fish (?)	650	214	0.10
Hake	225	101,782	46.17	Oregon Cancer Crab	XKI	200	0.09
Yellowmouth Rockfish	440	52,974	24.03	Twoline Eelpout	235	201	0.09
Darkblotch Rockfish	410	52,571	23.85	Sea Pens and Sea Whips	3U0	188	0.09
Herring	006	33,891	15.37	Yelloweye Rockfish	442	183	0.08
Short Spine Idiot Rockfish	451	29,870	13.55	Prawn	SDF	225	0.10
Starfish	4GA	36,443	16.53	Pacific Sand Lance	361	139	0.06
Greenstripe Rockfish	414	34,085	15.45	Shortraker Rockfish	403	607	0.28
Yellowtail Rockfish	418	22,884	10.37	Unid. Sea Urchin	8AB	203	0.09
Pacific Cod	222	41,949	19.03	Slender Sole	625	583	0.26
Lingcod	467	24,735	11.22	Pygmy Rockfish	448	142	0.06
Splitnose Rockfish	412	24,357	11.05	Pacific Electric Ray (?)	050	129	0.06
Sand Sole	638	18,848	8.55	Brown Cat Shark	038	313	0.14
Long Spine Idiot Rockfish	453	21,708	9.85	Ronquil	317	98	0.04
Petrale Sole	607	12,195	5.53	Anemone	3LO	400	0.18
Harlequin rockfish	448	8,642	3.92	Wattled Eelpout	244	97	0.04
Dungeness Crab	XKG	9,009	4.09	Coho Salmon	115	101	0.05
Butter Sole	619	8,471	3.84	Copper Rockfish	407	195	0.09
Widow Rockfish	417	6,343	2.88	Pacific Sanddab	598	888	0.40
Rosethorn Rockfish	421	7,926	3.60	Black Rockfish	426	66	0.03
Grenadier	249	16,119	7.31	Aurora Rockfish	400	63	0.03
Redbanded Rockfish	401	6,551	2.97	Quillback Rockfish	424	527	0.24
Sponges	2AD	6,973	3.16	Yellowfin Sole	623	54	0.02
Shad	095	4,335	1.97	Sturgeon Poacher	550	54	0.02
Flathead Sole	812	9,754	4.42	Vermilion Rockfish	428	50	0.02
Rougheye Rockfish	394	4,555	2.07	Sun Starfish	4TC	50	0.02
Squid	92A	4,756	2.16	Ragfish	386	48	0.02
Silvergray Rockfish	405	4,439	2.01	Rattail (Macrouridae)	250	41	0.02
Shark (misc. species)	024	3,729	1.69	Shiner Perch	304	41	0.02
Basking Shark	034	2,580	1.17	Shrimp	SAB	36	0.02
Spider Crab	ZAA	2,836	1.29	Shellfish (misc. species)	AAA	30	0.01
Tanner Crab	ZAD	9,125	4.14	Buffalo Sculpin	499	28	0.01
Sleeper Shark	043	2,345	1.06	Chum Salmon	112	02	0.04
Deepsea Sole	605	3,643	1.65	Blackfish Sculpin	519	58	0.03
Eelpouts	231	3,838	1.74	Smelt (Osmeridae)	136	30	0.01
Steller Sea Lion	853	2,300	1.04	Hermit Crab	VAC	45	0.02
Curlfin Sole	635	3,221	1.46	Queen Crab	VMD	27	0.01
Rockfish (misc. species)	388	1,621	0.74	Cephalopods (mostly squids)	91A	262	0.12
Chinook Salmon	124	1,603	0.73	Tubeworms	0FA	35	0.02
Anthozoans	3JO	1,474	0.67	(Hybrid) Sole	617	24	0.01
Octopus	97A	2,138	0.97	Unid. Salmon	108	13	0.01
Sturgeon	081	1,390	0.63	Gunnel (Pholidae)	344	21	0.01
Unid. Seal	850	1,600	0.73	Brittle Star	SAA	20	0.01
Misc. Unidentified Fish	068	1,113	0.50	Golden King Crab	VMC	20	0.01
Pacific Tomcod	226	865	0.39	Brachyuran Crab	WAA	17	0.01
Canary Rockfish	437	4,187	1.90	Unidentified	000	16	0.01
Starry Flounder	631	1,022	0.46	Deepsea Skate	054	35	0.02
CO Sole	633	915	0.42	Poacher (Agonidae)	548	22	0.01
Chilipepper Rockfish	420	1,422	0.65	Barnacle	HCA	16	0.01
Wolf Eel	351	1,710	0.78	Steelhead	128	15	0.01
Sculpin (misc. species)	472	852	0.39	Red King Crab	VNH	20	0.01
Unid. King Crab	VMB	1,909	0.87	Snail (Gastropods)	10A	17	0.01
California Sea Lion	854	500	0.23	Blackbelly Eelpout	245	14	0.01
Unid. Decapod (crab)	SAA	499	0.23	Bigmount Sculpin	505	27	0.01
Longjaw Rockfish	435	695	0.32	Unid. Hermit Crab	VAA	26	0.01
Green Sturgeon	082	455	0.21	Blacktail Snailfish	574	16	0.01
Sixgill Shark	027	500	0.23	Dagger tooth	177	10	0.00
Unid. Greenling	459	529	0.24	60 Misc. species<10lbs		228	0.10

* Species identifications are made by Observers and are not confirmed. Questionable identifications shown by "?".

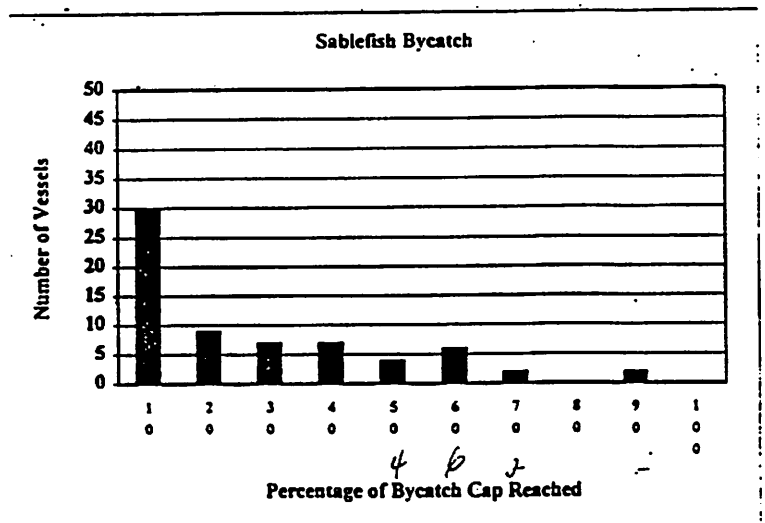
1996 Year to Date Trawl Bycatch Cap Status (to May 20)



Halibut: 3CD	
%age	Vessels
0-10	46
0-20	14
20-30	4
30-40	0
40-50	2
50-60	1
60-70	0
70-80	0
80-90	0
90-100	0



Halibut: 5CD	
%age	Vessels
0-10	47
0-20	12
20-30	5
30-40	0
40-50	2
50-60	1
60-70	0
70-80	0
80-90	0
90-100	0



Sablefish: Coastwide	
%age	Vessels
0-10	30
0-20	9
20-30	7
30-40	7
40-50	4
50-60	6
60-70	2
70-80	0
80-90	2
90-100	0

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Canada

Taken from the 1996 Groundfish Trawl management Plan - (Section 5) C-2

5. BYCATCH CAPS

Halibut bycatch mortality caps shall be in place for Hecate Strait (500,000 pounds) and the west coast of Vancouver Island (380,000 pounds).

Retention of the following groundfish species shall be permitted as a bycatch only: Pacific cod, Petrale sole and Sablefish. Halibut cannot be retained and shall be returned to the water as quickly as possible.

The following rules apply to vessels operating under Fishing Option A:

Petrale sole shall be managed by a fishing period limit issued to each vessel. The rules of fishing period averaging as discussed in section 10 apply to Petrale sole. For Pacific cod, two fishing period limits shall be issued to each vessel (one for Hecate Strait/Dixon Entrance and one for the remainder of the coast). If a vessel's Pacific cod limit for an area is exceeded by 50%, that vessel shall be restricted to midwater trawling, or bottom trawling in depths greater than 100 fathoms, for the remainder of the fishing period in that area.

In order to provide vessel operators with incentives to reduce bycatch, Sablefish and Halibut caps shall be managed by annual vessel allocations.

Vessels which exceed a Sablefish cap shall be permitted to continue fishing by means of bottom trawl, provided that they obtain additional Sablefish quota from the holder of a category `K' licence. This additional quantity of Sablefish may be obtained at any time during the year. The annual amount of additional Sablefish quota that may be obtained shall not exceed the amount of the original Sablefish vessel cap issued to the vessel. Once the entire quantity of permitted Sablefish is landed or discarded, the vessel shall be prohibited from bottom trawling for the remainder of the year.

In the case of Halibut, annual vessel allocations shall be provided for Hecate Strait/Dixon Entrance and for the west coast of Vancouver Island.

Annual individual vessel halbiut bycatch allocations are:

- ***Hecte Strait/Dixon Entrance*** - ***4,600 lbs mortality***
- ***West coast of Vancouver Island*** - ***6,100 lbs mortality***

Vessels which attain a cap inseason shall be prohibited from bottom trawling for the remainder of the year in the area for which the cap has been reached.

Note: For all species of groundfish, other than halibut, fish that are determined to be unmarketable and that are discarded at-sea shall not be deducted from fishing period limits or annual TACs. Marketability shall be determined by size. Lingcod and Sablefish marketability is determined by the legislated size limit for each species. A survey of major groundfish processors has provided the following definitions of marketability which shall be used for those species with no legislated size limits:

Rock, Lemon, Petrale and Dover sole	- 13 inches (33 cm) and larger[1]
Pacific cod	- 18 inches (46 cm) and larger[1]
Pollock	- 18 inches (46 cm) and larger[1]
Rockfish (not including Idiots)	- 12 inches (30 cm) and larger[1]

[1] Although these sizes are used to define marketability for the purpose of enumerating discards, the industry is advised that fish less than the indicated size may legally be retained, landed and processed. Sizes shall be measured from the tip of the nose to the fork of the tail. Where there is no fork, length shall be measured from the tip of the nose to the tip of the tail.

Fish determined to be marketable shall have set mortality rates for any fish discarded, as follows:

Soles and flounders	-	10% mortality for the first two hours fished or portion thereof and, 10% for each additional hour[1]
Lingcod	-	10% mortality for the first two hours fished or portion thereof and, 10% for each additional hour[1]
Sablefish	-	10% mortality for the first two hours fished or portion thereof and, 10% for each additional hour[1]
Pacific cod	-	25% mortality for the first two hours fished or portion thereof and, 25% for each additional hour[1]
Rockfish/Idiots	-	100% mortality regardless of time fished

[1] An hour fished is defined as the time that the net is in contact with the sea floor. For periods less than one hour, mortality shall be determined by multiplying that portion of an hour by the applicable mortality rate.

The above mortality rates do not reflect true mortality rates of fish discarded at-sea but, are solely intended to provide incentives in 1996 for vessels to reduce towing time and avoid bycatch wherever possible.

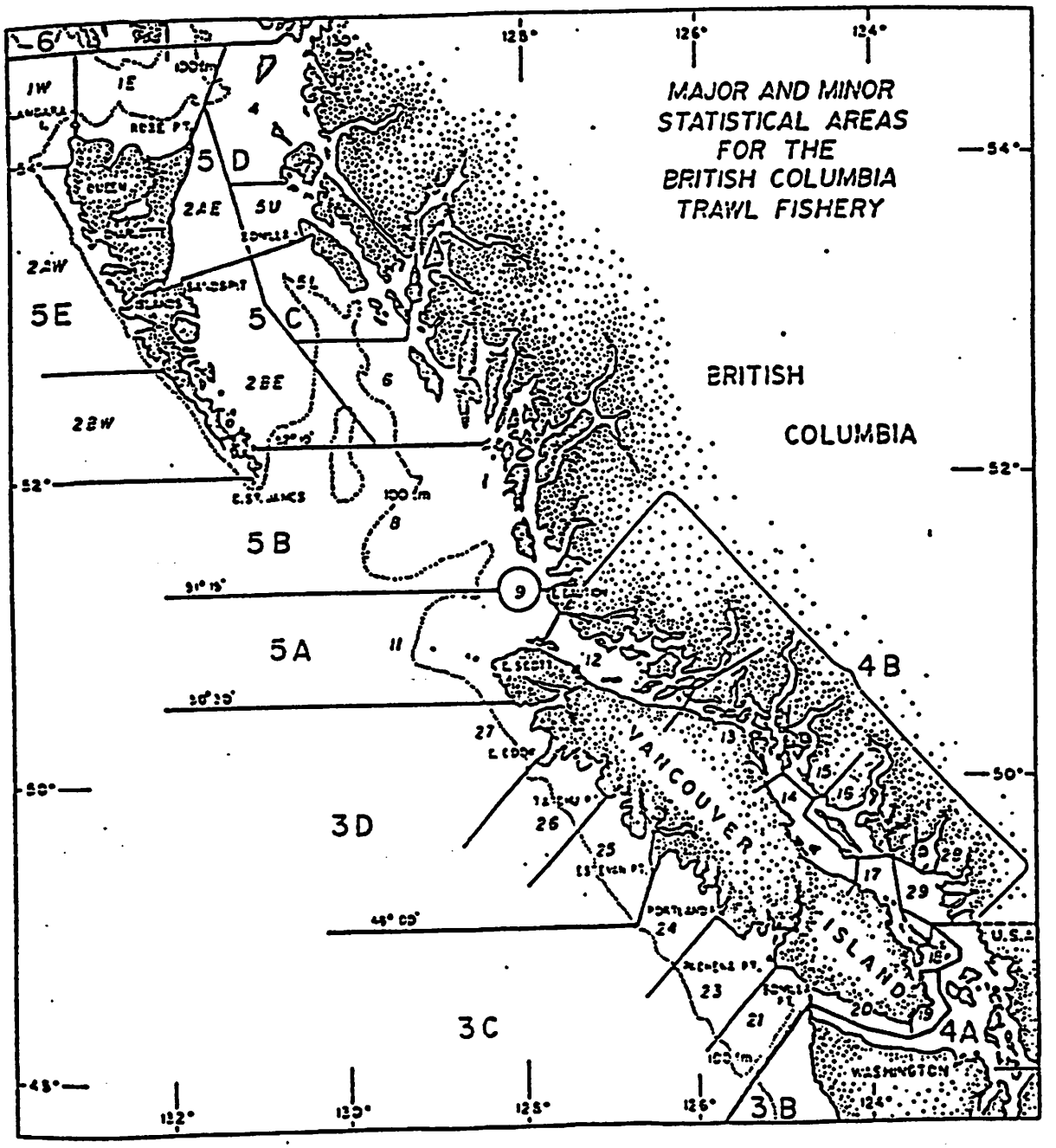
As in previous years under the dockside monitoring program, all fish landed, whether considered marketable or not, shall be deducted from the appropriate fishing period limits, bycatch caps and/or species TACs.

For halibut, the condition of the fish shall be assessed before it is returned to the water, in order to apply the appropriate mortality factor.

The following rules apply to vessels operating under Fishing Option B:

For Petrale sole and Sablefish, a monthly bycatch limit shall be provided to each vessel. Overages up to 20% of monthly limits shall be deducted from limits available in the next month. Overages in excess of 20% shall be both relinquished and deducted from limits available in the next month.

For Pacific cod and Halibut, all Option B vessels, as a group, shall be subject to a bycatch limit for each species, which shall be based on pre-determined mortality rates and incidence rates when fishing for other species. The bycatch limit for each species shall be divided equally among the three fishing periods. If an area-specific bycatch limit for Pacific cod (Hecate Strait/Dixon Entrance and the remainder of the coast) or Halibut (Hecate Strait/Dixon Entrance and west coast of Vancouver Island) is attained, all vessels operating under Fishing Option B shall be prohibited from fishing in the relevant area until the commencement of the next fishing period.


MAJOR AND MINOR
STATISTICAL AREAS
FOR THE
BRITISH COLUMBIA
TRAWL FISHERY
BRITISH
COLUMBIA
VANCOUVER
ISLAND
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5D
5C
5B
5A
4B
4A
3D
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128°
126°
124°
54°
52°
50°
48°
132°
130°
100 fm
U.S.

Table 1. Overview of 1995 Pacific halibut bycatch mortality limits and bycatch mortality by fishery, in the BSAI and GOA groundfish fisheries. All weights are in metric tons.

Fishery	Mortality limit	Mortality estimate	Remainder
BSAI trawl	3,775	3,752	+23
BSAI nontrawl[1]	900	887	+13
GOA trawl	2,000	2,051	-51
GOA H&L[1]	300	380	-80
TOTAL	6,975	7,070	-95
Additional mortality:			
BSAI/GOA pot	na	29	
GOA sablefish	na	112[2]	
BSAI sablefish	na	36[2]	
TOTAL		177	

TOTAL MORTALITY ESTIMATED FOR 1995: 7,247 mt

1/ Excludes the IFQ sablefish hook-and-line fishery
2/ Estimates of halibut mortality from IFQ sablefish vessels which did not retain any IFQ halibut on the same trip.

Table 2. Overview of 1994 Pacific halibut bycatch mortality limits and bycatch mortality by fishery, in the BSAI and GOA groundfish fisheries. All weights are in metric tons.

Fishery	Mortality limit	Mortality estimate	Remainder
BSAI trawl	3,775	3,889	-114
BSAI nontrawl	900	959	-59
GOA trawl	2,000	2,152	-152
GOA H&L	750	719	+31
TOTAL	7,425	7,719	-294
BSAI/GOA pot & jig	na	12	

TOTAL MORTALITY ESTIMATED FOR 1994: 7,731 mt

TABLE 3. FINAL SEASONAL APPORTIONMENTS OF THE 1996 PACIFIC HALIBUT BYCATCH MORTALITY ALLOWANCES FOR THE BSAI TRAWL AND NON-TRAWL FISHERIES.

Trawl Fisheries	Seasonal Bycatch Allowance
Yellowfin sole	
Jan. 20 - Mar. 31	160
Apr. 01 - May 10	150
May 11 - Aug. 14	100
Aug. 15 - Dec. 31	410
Total	**820**
Rock sole/flathead sole/"other flatfish"	
Jan. 20 - Mar. 31	453
Apr. 01 - Jun. 30	139
Jul. 01 - Dec. 31	138
Total	**730**
Rockfish	
Jan.20 - Mar. 31	30
Apr.01 - Jun. 30	50
Jul.01 - Dec. 31	30
Total	**110**
Pacific cod	
Jan. 20 - Oct. 24	1,585
Oct. 25 - Dec. 31	100
Total	**1,685**
Pollock/Atka mackerel/"other species"	
Jan. 20 - Apr. 15	330
Apr. 16 - Dec. 31	100
Total	**430**
Non-Trawl Gear	
Pacific cod hook-and-line[1]	
Jan. 01 - Apr.30	475
May 01 - Aug.31	40
Sep. 01 - Dec.31	285
Total	**800**
Other non-trawl[2]	
Jan. 01 - Dec 31	**100**

1/ Any unused portion of the first seasonal halibut bycatch allowance specified for the Pacific cod hook-and-line fishery will be reapportioned to the third seasonal allowance. Any overage of a seasonal halibut bycatch allowance would be deducted from the remaining seasonal bycatch allowances specified for 1996 in amounts proportional to those remaining seasonal bycatch allowances.

2/ The 1996 hook-and-line sablefish, groundfish pot, and groundfish jig gear fisheries are exempt from halibut bycatch restrictions.

Table 4. Final 1996 GOA Pacific Halibut PSC Limits, Allowances, and Apportionments. The Pacific halibut PSC limit for hook-and-line gear is allocated to the demersal shelf rockfish (DSR) fishery and fisheries other than DSR. Values are in metric tons.

Trawl gear		Hook-and-line gear			
		Other than DSR		DSR	
Dates	Amount	Dates	Amount	Dates	Amount
Jan 1- Mar 31	600 (30%)	Jan 1- May 17	250 (86%)	Jan 1- Dec 31	10 (100%)
Apr 1- Jun 30	400 (20%)	May 18- Aug 31	15 (5%)		
Jul 1- Sep 30	600 (30%)	Sep 1- Dec 31	25 (9%)		
Oct 1- Dec 31	400 (20%)				
Total:	2,000 (100%)		290 (100%)		10 (100%)

Table 5. Estimate of foregone harvest and revenue to the 1995 Alaska groundfish fishery as a result of halibut bycatch restrictions.

Bering Sea & Aleutian Islands	Unharvested	Value*
Pacific ocean perch	1,000 mt	$ 265,000
other red rockfish	2,300 mt	788,000
Flathead sole	10,800 mt	2,905,000
Pacific cod -- trawl	8,300 mt	2,342,000
Rock sole	4,900 mt	3,242,000
Yellowfin sole	36,600 mt	4,842,000
Gulf of Alaska**		
Deep water flatfish	5,900 mt	1,769,000
Shallow water flatfish	12,000 mt	3,784,000
Flathead sole	4,800 mt	1,291,000
Rex sole	4,000 mt	1,729,000
Total	90,600 mt	$22,857,000

* Based on standard exvessel prices published for Research Plan fee collection. Wholesale values or values based on products would be significantly higher.

** Gulf of Alaska numbers are based on amounts remaining in the West and Central GOA. Significant amounts of flatfish remain unharvested in the East GOA, but NMFS thinks that factors other than halibut bycatch are involved.

Taken from the 1996 Groundfish Trawl management Plan - (Section 5)

5. BYCATCH CAPS

Halibut bycatch mortality caps shall be in place for Hecate Strait (500,000 pounds) and the west coast of Vancouver Island (380,000 pounds).

Retention of the following groundfish species shall be permitted as a bycatch only: Pacific cod, Petrale sole and Sablefish. Halibut cannot be retained and shall be returned to the water as quickly as possible.

The following rules apply to vessels operating under Fishing Option A:

Petrale sole shall be managed by a fishing period limit issued to each vessel. The rules of fishing period averaging as discussed in section 10 apply to Petrale sole. For Pacific cod, two fishing period limits shall be issued to each vessel (one for Hecate Strait/Dixon Entrance and one for the remainder of the coast). If a vessel's Pacific cod limit for an area is exceeded by 50%, that vessel shall be restricted to midwater trawling, or bottom trawling in depths greater than 100 fathoms, for the remainder of the fishing period in that area.

In order to provide vessel operators with incentives to reduce bycatch, Sablefish and Halibut caps shall be managed by annual vessel allocations.

Vessels which exceed a Sablefish cap shall be permitted to continue fishing by means of bottom trawl, provided that they obtain additional Sablefish quota from the holder of a category `K' licence. This additional quantity of Sablefish may be obtained at any time during the year. The annual amount of additional Sablefish quota that may be obtained shall not exceed the amount of the original Sablefish vessel cap issued to the vessel. Once the entire quantity of permitted Sablefish is landed or discarded, the vessel shall be prohibited from bottom trawling for the remainder of the year.

In the case of Halibut, annual vessel allocations shall be provided for Hecate Strait/Dixon Entrance and for the west coast of Vancouver Island.

Annual individual vessel halbiut bycatch allocations are:

- ***Hecte Strait/Dixon Entrance*** - ***4,600 lbs mortality***
- ***West coast of Vancouver Island*** - ***6,100 lbs mortality***

Vessels which attain a cap inseason shall be prohibited from bottom trawling for the remainder of the year in the area for which the cap has been reached.

Note: For all species of groundfish, other than halibut, fish that are determined to be unmarketable and that are discarded at-sea shall not be deducted from fishing period limits or annual TACs. Marketability shall be determined by size. Lingcod and Sablefish marketability is determined by the legislated size limit for each species. A survey of major groundfish processors has provided the following definitions of marketability which shall be used for those species with no legislated size limits:

Rock, Lemon, Petrale and Dover sole	- 13 inches (33 cm) and larger[1]
Pacific cod	- 18 inches (46 cm) and larger[1]
Pollock	- 18 inches (46 cm) and larger[1]
Rockfish (not including Idiots)	- 12 inches (30 cm) and larger[1]

[1] Although these sizes are used to define marketability for the purpose of enumerating discards, the industry is advised that fish less than the indicated size may legally be retained, landed and processed. Sizes shall be measured from the tip of the nose to the fork of the tail. Where there is no fork, length shall be measured from the tip of the nose to the tip of the tail.

Fish determined to be marketable shall have set mortality rates for any fish discarded, as follows:

Soles and flounders	-	10% mortality for the first two hours fished or portion thereof and, 10% for each additional hour[1]
Lingcod	-	10% mortality for the first two hours fished or portion thereof and, 10% for each additional hour[1]
Sablefish	-	10% mortality for the first two hours fished or portion thereof and, 10% for each additional hour[1]
Pacific cod	-	25% mortality for the first two hours fished or portion thereof and, 25% for each additional hour[1]
Rockfish/Idiots	-	100% mortality regardless of time fished

[1] An hour fished is defined as the time that the net is in contact with the sea floor. For periods less than one hour, mortality shall be determined by multiplying that portion of an hour by the applicable mortality rate.

The above mortality rates do not reflect true mortality rates of fish discarded at-sea but, are solely intended to provide incentives in 1996 for vessels to reduce towing time and avoid bycatch wherever possible.

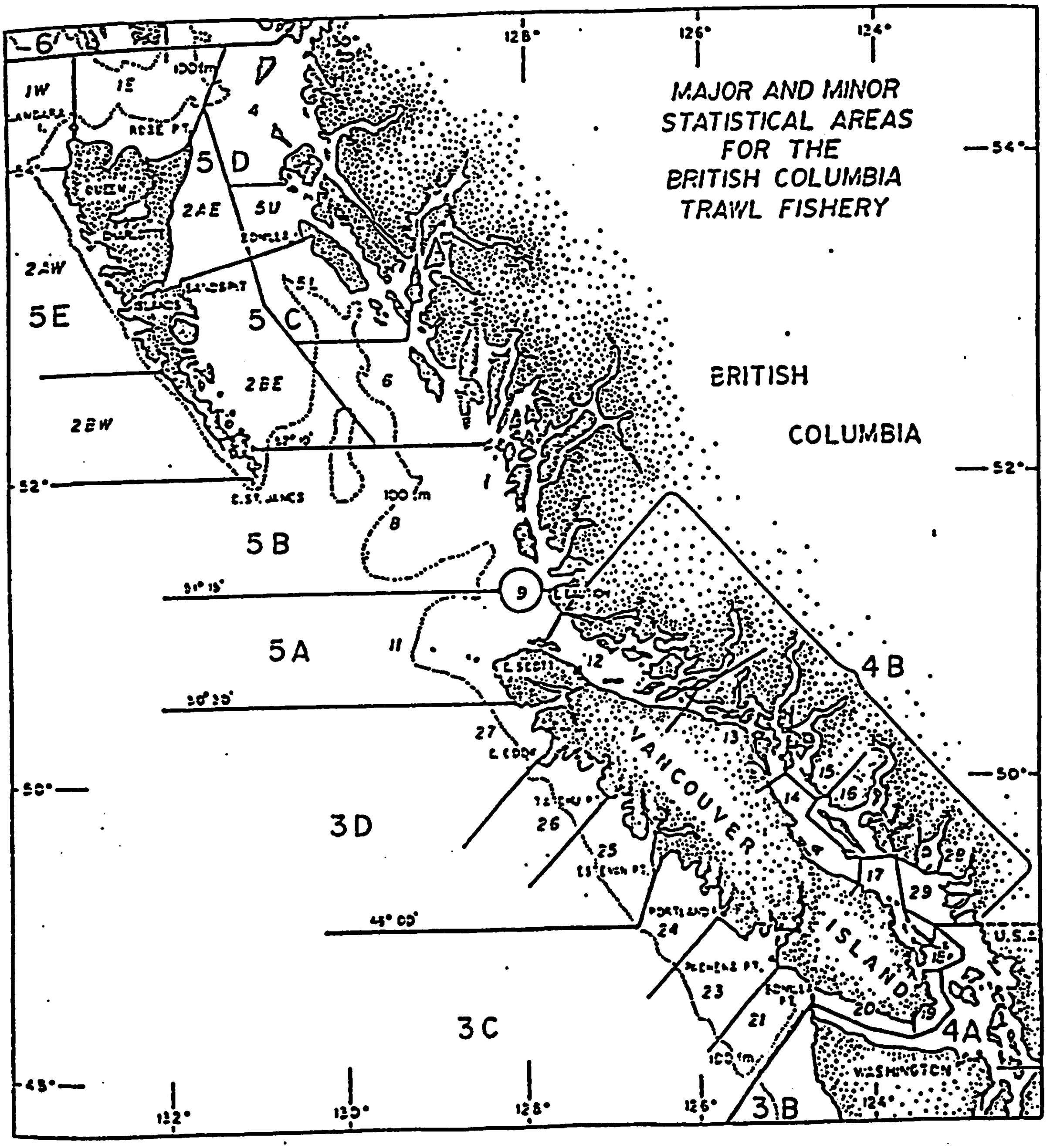
As in previous years under the dockside monitoring program, all fish landed, whether considered marketable or not, shall be deducted from the appropriate fishing period limits, bycatch caps and/or species TACs.

For halibut, the condition of the fish shall be assessed before it is returned to the water, in order to apply the appropriate mortality factor.

The following rules apply to vessels operating under Fishing Option B:

For Petrale sole and Sablefish, a monthly bycatch limit shall be provided to each vessel. Overages up to 20% of monthly limits shall be deducted from limits available in the next month. Overages in excess of 20% shall be both relinquished and deducted from limits available in the next month.

For Pacific cod and Halibut, all Option B vessels, as a group, shall be subject to a bycatch limit for each species, which shall be based on pre-determined mortality rates and incidence rates when fishing for other species. The bycatch limit for each species shall be divided equally among the three fishing periods. If an area-specific bycatch limit for Pacific cod (Hecate Strait/Dixon Entrance and the remainder of the coast) or Halibut (Hecate Strait/Dixon Entrance and west coast of Vancouver Island) is attained, all vessels operating under Fishing Option B shall be prohibited from fishing in the relevant area until the commencement of the next fishing period.


MAJOR AND MINOR
STATISTICAL AREAS
FOR THE
BRITISH COLUMBIA
TRAWL FISHERY
BRITISH
COLUMBIA
VANCOUVER
ISLAND
WASHINGTON
5D
5C
5E
5B
5A
3D
3C
3B
4B
4A
2AE
2AW
2BE
2BW
1W
1E
100 fm
54°
52°
50°
48°
132°
130°
128°
126°
124°

Summary of A-Option Trawl Catch (in lbs) for Observed Trips (data to June 5).

Species	Retained Catch At Sea Estimate	Retained Catch Offload Weight	Ratio At Sea /Offload Weight	Discarded At Sea Marketable Dead	Discarded At Sea Marketable Live	Discarded At Sea Not Marketable	Ratio Discarded/ Kept Weight
Yellowtail	4,011,161	4,227,505	0.95	2,397	0	20,467	0.006
Widow	1,003,839	1,223,666	0.82	6,126	0	217	0.006
Agg 1 Total	5,015,000	5,451,171	0.92	8,523	0	20,684	0.006
Canary	390,521	377,457	1.03	3,482	0	705	0.011
Silvergrey	801,683	896,065	0.89	1,585	0	2,854	0.008
Agg 2 Total	1,192,204	1,273,522	0.94	5,067	0	3,559	0.007
POP	4,318,343	4,049,654	1.07	6,456	0	167,509	0.040
Yellowmouth	2,431,677	2,243,191	1.08	809	0	52,165	0.022
Agg 3 Total	6,751,020	6,292,845	1.07	7,265	0	219,674	0.034
Rougheye	800,391	786,129	1.02	1,948	0	2,607	0.006
Shortraker	118,325	84,930	1.39	439	0	168	0.005
Agg 4 Total	918,716	871,059	1.05	2,387	0	2,775	0.006
Redstripe	1,059,297	1,072,259	0.99	1,092	0	222,150	0.211
Sharpchin	217,174	315,422	0.69	895	0	141,582	0.656
Agg 5 Total	1,276,471	1,387,681	0.92	1,987	0	363,732	0.287
Oth. Rockfish Agg 6	1,008,433	894,086	1.01	2,293	0	136,146	0.137
S Spine Idiots	567,975	589,345	0.96	191	0	29,679	0.053
Sablefish	115,690	123,674	0.94	14,834	50,083	166,004	1.996
od	459,574	603,783	0.76	3,745	10,759	27,445	0.091
er	2,005,974	2,219,467	0.90	4,033	17,599	157,860	0.089
Rock	828,175	877,824	0.94	36	329	142,849	0.173
Lemon	316,209	366,597	0.86	508	1,485	122,670	0.394
Petrale	300,025	303,618	0.99	100	609	11,486	0.041
Lingcod	617,651	871,869	0.71	606	5,461	18,668	0.040
Pollock	1,023,099	1,091,576	0.94	0	0	97,798	0.096
Hake	7,431	4,783	1.55	4	0	101,778	13.697
Dogfish	177,698	240,786	0.74	0	0	1,857,944	10.456
Turbot	4,282,201	4,965,885	0.86	0	100	2,003,785	0.468
Skate	251,859	458,767	0.55	0	0	325,774	1.293
All Species*	27,405,133	29,302,321	0.94	51,734	87,215	6,605,743	0.246

* - All species includes species other than those listed in this table.

Summary of A-Option Trawl Halibut Catch (in lbs) for Observed Trips.

Statistical Area	Retained Catch At Sea Est.	Retained Catch Offload Wt.	Released At Sea Alive	Released At Sea Dead	Total Catch
3C/D**	332	807	80,532	31,294	112,633
5A/B	7	1,017	71,851	33,887	106,755
5CD**	33	126	137,049	50,970	188,145
5E	0	17	36,592	14,590	51,199
pecified	0	2,525	8	1	2,534
reas	372	4,492	326,032	130,742	461,266

** - Managed By Area Bycatch Caps

↓ 3369 (NET WT) ↓ 98,057 (NET WT)

98056 + 3369 = 101,425 total incidentally (NET WEIGHT)

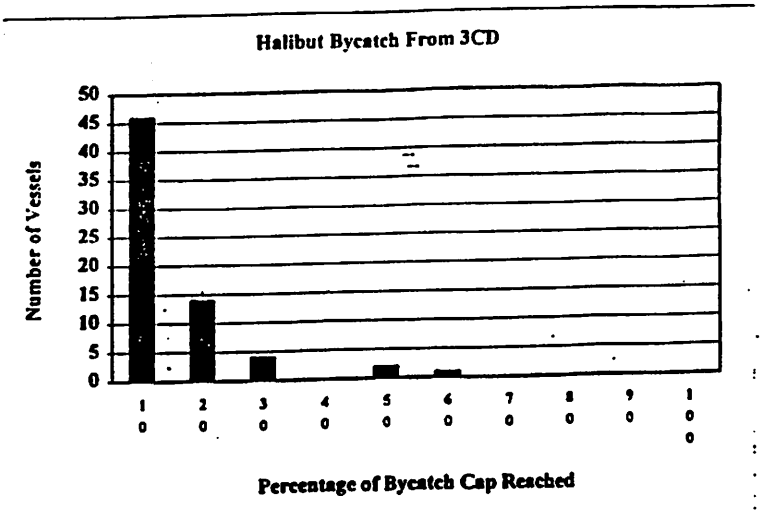
Prepared by Archipelago Marine Research Ltd.

Summary of At Sea Discards Including Dead, Live and Not Marketable Categories for A Option Observed Trips (Data to June 5).

Species*	Code	Weight (lbs)	Weight (tonnes)
Turbot	602	2,003,685	908.96
Dogfish	044	1,857,944	842.76
Halibut	614	457,172	207.37
Ratfish	066	389,180	176.53
Skate (misc. species)	048	326,730	148.21
Redstripe Rockfish	439	223,642	101.44
Sablefish	455	230,921	104.75
Pacific Ocean Perch	396	173,990	78.92
Sharpchin Rockfish	450	142,477	64.63
Rex Sole	610	167,385	75.92
Dover Sole	628	179,551	81.44
English Sole	628	124,663	56.55
Pollock	228	97,798	44.36
Rock Sole	621	143,214	64.96
Hake	225	101,782	46.17
Yellowmouth Rockfish	440	52,974	24.03
Darkblotch Rockfish	410	52,571	23.85
Herring	008	33,891	15.37
Short Spine Idiot Rockfish	451	29,870	13.55
Starfish	4GA	36,443	16.53
Greenstripe Rockfish	414	34,085	15.45
Yellowtail Rockfish	418	22,884	10.37
Pacific Cod	222	41,949	19.03
Lingcod	467	24,735	11.22
Splitnose Rockfish	412	24,357	11.05
Sand Sole	638	18,848	8.55
Long Spine Idiot Rockfish	453	21,708	9.85
Petrale Sole	607	12,195	5.53
Harlequin rockfish	448	8,642	3.92
Dungeness Crab	XKG	9,009	4.09
Butter Sole	619	8,471	3.84
Widow Rockfish	417	6,343	2.88
Rosethorn Rockfish	421	7,928	3.60
Grenadier	249	16,119	7.31
Redbanded Rockfish	401	6,551	2.97
Sponges	2AD	6,973	3.16
Shad	095	4,335	1.97
Flathead Sole	612	9,754	4.42
Rougheye Rockfish	394	4,555	2.07
Squid	92A	4,758	2.16
Silvergrey Rockfish	405	4,439	2.01
Shark (misc. species)	024	3,729	1.69
Basking Shark	034	2,580	1.17
Spider Crab	ZAA	2,639	1.20
Tanner Crab	ZAD	9,125	4.14
Sleeper Shark	043	2,345	1.06
Deepsea Sole	605	3,643	1.65
Eelpouts	231	3,838	1.74
Steller Sea Lion	853	2,300	1.04
Curlfin Sole	635	3,221	1.46
Rockfish (misc. species)	388	1,621	0.74
Chinook Salmon	124	1,603	0.73
Anthozoans	3JO	1,474	0.67
Octopus	97A	2,138	0.97
Sturgeon	081	1,390	0.63
Unid. Seal	850	1,600	0.73
Misc. Unidentified Fish	000	1,113	0.50
Pacific Tomcod	226	865	0.39
Canary Rockfish	437	4,187	1.90
Starry Flounder	631	1,022	0.46
CO Sole	633	915	0.42
Chilipepper Rockfish	420	1,422	0.65
Wolf Eel	351	1,710	0.78
Sculpin (misc. species)	472	862	0.39
Unid. King Crab	VMB	1,909	0.87
California Sea Lion	854	500	0.23
Unid. Decapod (crab)	SAA	499	0.23
Longjaw Rockfish	435	695	0.32
Green Sturgeon	082	455	0.21
Sixgill Shark	027	500	0.23
Unid. Greenling	459	529	0.24
Solaster Starfish	4TB	419	0.19
Tongue Worms (Pentastomida)	2EA	382	0.18
Stoney Corals	3J2	697	0.32
Purple Starfish	4ZA	1,180	0.54
Salmon Shark	038	425	0.19
Sea Cucumbers	6NA	387	0.17
Harbour Seal	858	465	0.21
Red Squid	95E	314	0.14
Sunflower Starfish	4XE	387	0.17
Giant Squid	98C	238	0.11
Ragfish	386	422	0.19
Snailfish	568	329	0.15
Sand Dab	595	215	0.10
Halfmoon Fish (?)	650	214	0.10
Oregon Cancer Crab	XKJ	200	0.09
Twoline Eelpout	235	201	0.09
Sea Pens and Sea Whips	3U0	188	0.09
Yelloweye Rockfish	442	183	0.08
Prawn	SDF	225	0.10
Pacific Sand Lance	361	139	0.06
Shortraker Rockfish	403	607	0.28
Unid. Sea Urchin	6AB	203	0.09
Slender Sole	625	583	0.26
Pygmy Rockfish	448	142	0.06
Pacific Electric Ray (?)	050	129	0.06
Brown Cat Shark	038	313	0.14
Ronquil	317	98	0.04
Anemone	3LO	400	0.18
Wattled Eelpout	244	97	0.04
Coho Salmon	115	101	0.05
Copper Rockfish	407	195	0.09
Pacific Sanddab	598	888	0.40
Black Rockfish	426	66	0.03
Aurora Rockfish	400	63	0.03
Quillback Rockfish	424	527	0.24
Yellowfin Sole	623	54	0.02
Sturgeon Poacher	550	54	0.02
Vermilion Rockfish	428	50	0.02
Sun Starfish	4TC	50	0.02
Ragfish	386	48	0.02
Rattail (Macrouridae)	250	41	0.02
Shiner Perch	304	41	0.02
Shrimp	SAB	36	0.02
Shellfish (misc. species)	AAA	30	0.01
Buffalo Sculpin	490	29	0.01
Chum Salmon	112	02	0.04
Blackfish Sculpin	519	58	0.03
Smelt (Osmeridae)	136	30	0.01
Hermit Crab	VAC	45	0.02
Queen Crab	VMD	27	0.01
Cephalopods (mostly squids)	91A	262	0.12
Tubeworms	0FA	35	0.02
(Hybrid) Sole	617	24	0.01
Unid. Salmon	106	13	0.01
Gunnel (Pholidae)	344	21	0.01
Brittle Star	5AA	20	0.01
Golden King Crab	VMC	20	0.01
Brachyuran Crab	WAA	17	0.01
Unidentified	000	16	0.01
Deepsea Skate	054	36	0.02
Poacher (Agonidae)	546	22	0.01
Barnacle	HCA	16	0.01
Steelhead	126	15	0.01
Red King Crab	VNH	20	0.01
Snail (Gastropods)	10A	17	0.01
Blackbelly Eelpout	245	14	0.01
Bigmount Sculpin	505	27	0.01
Unid. Hermit Crab	VAA	26	0.01
Blacktail Snailfish	574	16	0.01
Daggertooth	177	10	0.00
60 Misc. species<10lbs		228	0.10

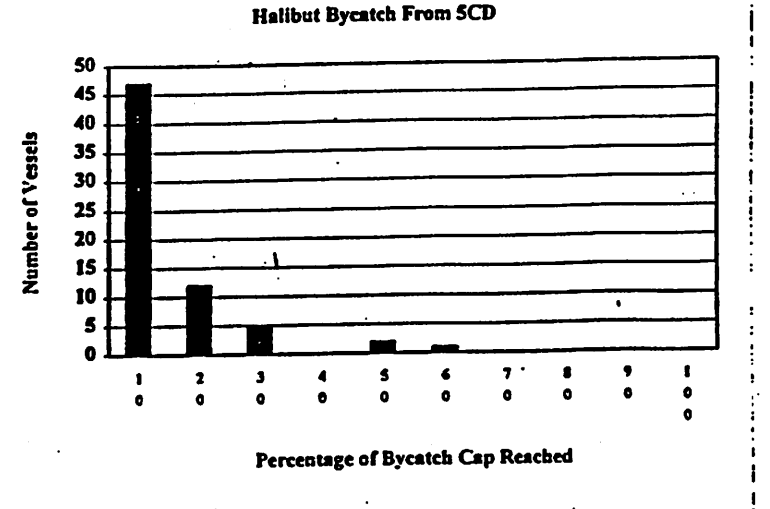
* Species identifications are made by Observers and are not confirmed. Questionable identifications shown by "?".

1996 Year to Date Trawl Bycatch Cap Status (to May 20)



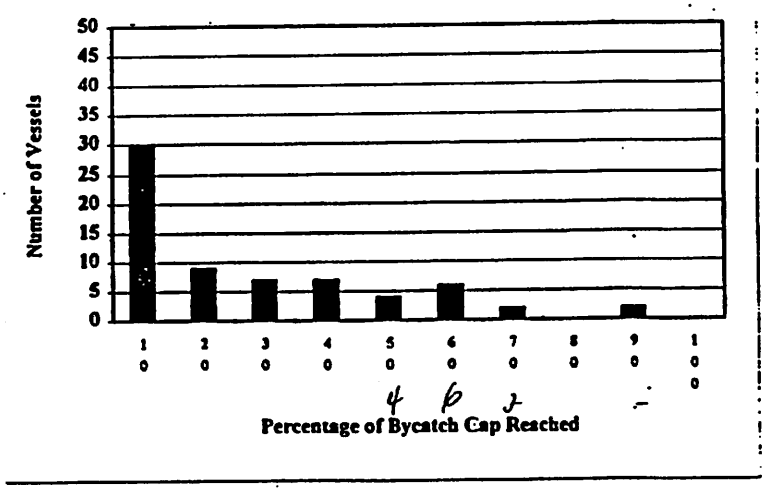
Halibut: 3CD

%age	Vessels
0-10	46
0-20	14
20-30	4
30-40	0
40-50	2
50-60	1
60-70	0
70-80	0
80-90	0
90-100	0



Halibut: 5CD

%age	Vessels
0-10	47
0-20	12
20-30	5
30-40	0
40-50	2
50-60	1
60-70	0
70-80	0
80-90	0
90-100	0



Sablefish: Coastwide

%age	Vessels
0-10	30
0-20	9
20-30	7
30-40	7
40-50	4
50-60	6
60-70	2
70-80	0
80-90	2
90-100	0

PACIFIC REGION

1996 MANAGEMENT PLAN

GROUNDFISH TRAWL

This Groundfish Trawl Management Plan is intended for general information purposes only. Where there is a discrepancy between this Plan and the regulations, the regulations are the final authority.

A description of Areas and Subareas referenced in this Plan can be found in the Pacific Fishery Management Area Regulations.

Licence holders are urged to communicate any comments or concerns to their respective GTAC representative for discussion at GTAC meetings.

STOCK STATUS

Shown below are the PSARC[1] Groundfish Subcommittee overviews on the current condition of groundfish species or species groups.

Species or Species Group	Current Stock Condition
Strait of Georgia lingcod	Very low
Offshore lingcod	Average
Pacific cod	Very low
Petrale sole	Very low
Rock sole	Average
English sole	Low
Dover sole	Low to average[2]
Sablefish	Average to low
Pacific hake	Average
Spiny dogfish	Average to high[2]
Walleye pollock	Low to average[2]
Slope rockfish	Low to average[2]
Shelf rockfish	Low to average[2]
Inshore rockfish	Low to average[2]

1 Pacific Stock Assessment Review Committee
2 Depending on the stock

1. APPLICATION

The management strategies contained in this plan apply to all category 'T' licensed fishing vessels, fishing by means of bottom and midwater trawls. All annual quotas, with the exception of hake and pollock (trawl only), apply to both trawl and hook and line gear. Refer to the chart at the back of this management plan for a description of the major areas referred to in the plan.

INTRODUCTION

This management plan was developed by the Department of Fisheries and Oceans (DFO) in consultation with the Groundfish Trawl Advisory Committee (GTAC), which represents both fishing and processing interests.

Fishing period limits and other management actions will be developed in-season through consultation with GTAC. Vessel owners and masters are advised to thoroughly read and familiarize themselves with all aspects of the 1996 Groundfish Trawl Management Plan and category 'T' licence conditions.

Note: The industry is advised that this plan only provides a general overview of groundfish management in 1996. In response to the need for in-season management changes, the Department may amend, at any time, the strategies contained in the plan and in licence conditions.

BACKGROUND

The 1996 management plan is the seventeenth such plan since 1980 that the Department and groundfish trawl industry have worked on co-operatively. The groundfish trawl fleet is made up of 142 licensed vessels. The trawl fishery is the largest fishery in the Pacific Region by volume of catch, with approximately 112,000 tonnes of groundfish landed in 1995.

ABORIGINAL FISHERIES

The Department of Fisheries and Oceans recognizes the importance of fish to the Aboriginal peoples of British Columbia. Through the Aboriginal Fisheries Strategy, the Department seeks to negotiate, with Aboriginal organizations, allocations for food, social and ceremonial purposes. Subject to conservation, these allocations will have priority over allocations for commercial and recreational user groups. Communal licences will be issued to individual Aboriginal organizations for food, social and ceremonial fishing.

CONSULTATION

The Department consults on a regular basis with the Groundfish Trawl Advisory Committee (GTAC), which represents both trawl fishing and processing interests. Meetings are held a number of times during the year to review in-season progress of the fishery and to make recommendations for new fishing period limits and other management actions.

2. IN-SEASON CHANGES

As the season progresses and area quotas are at or near attainment, or conservation concerns arise, the Department may, for conservation reasons, institute area and species closures at any time. Fishing period limits shall be varied through conditions of the category 'T' licence. The industry shall be notified of all closures via one or more of the following means: Fisheries Public Notices posted in Department of Fisheries and Oceans offices, faxed Notices to Industry or, recorded broadcasts over Canadian Coast Guard weather information channels.

Licence conditions shall be used to identify what fishing period limits a vessel is permitted to harvest. At the conclusion of each offloading (not including hake), and prior to the next trip of the vessel, licence conditions shall be amended to indicate permitted areas of fishing, permitted gear, and dates authorized for fishing. The quantity of groundfish remaining in the fishing period limits issued to the vessel shall be reflected in the Trawl Offload Log.

Note: it is the responsibility of the vessel owner to request amended licence conditions from the Department, when necessary. A form for this purpose, entitled *Request for Category 'T' Licence Amendment*, is available from DFO-certified observers or from the Groundfish Management Unit. Licence amendments shall be requested only from the Groundfish Management Unit and may be obtained in person or by fax (666-8525). Vessel owners wishing to designate an agent or agents to request licence condition amendments shall do so by completing the *Designation* section of the Trawl Licence Application or by completing a *Designation* form available from the Groundfish Management Unit.

3. SEASON LENGTH

The groundfish trawl fishery is expected to commence February 16, 1996, and remain open until December 31, 1996, subject to quota availability.

In order to provide year-round fishing opportunities for rockfish and other groundfish species, the calendar year has been divided into three fishing periods:

First Period	-	February 16 to May 31
Second Period	-	June 1 to September 15
Third Period	-	September 16 to December 31

4. GROUNDFISH HARVESTING

Rockfish aggregation will continue on a limited basis in 1996. Fishing period limits for rockfish shall be based on the following species and aggregates:

Aggregate 1: Yellowtail/Widow
Aggregate 2: Canary/Silvergrey
Aggregate 3: Pacific Ocean Perch/Yellowmouth
Aggregate 4: Rougheye/Shortraker
Aggregate 5: Redstripe/Sharpchin
Aggregate 6: All other rockfish including Shortspine Thornyheads
Longpine Thornyheads

Annual groundfish quotas shall be divided, by species or aggregate, among the three fishing periods of the year as follows:

All quota rockfish and Thornyheads, except Canary/Silvergrey	35%	30%	35%
Canary/Silvergrey	33%	34%	33%
Dover sole	35%	35%	30%
Rock/Lemon sole	35%	30%	35%
Lingcod (Area 3C/D)	20%	50%	30%
Lingcod (rest of coast)	30%	40%	30%

The quantities of fish identified in each fishing period shall be the minimum amount available at the start of that fishing period. TAC overages from previous periods will not be deducted. Any underages of period TACs shall be added to succeeding periods by dividing the tonnage equally among the remaining periods.

5. BYCATCH CAPS

Halibut bycatch mortality caps shall be in place for Hecate Strait (500,000 pounds) and the west coast of Vancouver Island (380,000 pounds).

Retention of the following groundfish species shall be permitted as a bycatch only: Pacific cod, Petrale sole and Sablefish. Halibut cannot be retained and shall be returned to the water as quickly as possible.

The following rules apply to vessels operating under Fishing Option A:

Petrale sole shall be managed by a fishing period limit issued to each vessel. The rules of fishing period averaging as discussed in section 10 apply to Petrale sole. For Pacific cod, two fishing period limits shall be issued to each vessel (one for Hecate Strait/Dixon Entrance and one for the remainder of the coast). If a vessel's Pacific cod limit for an area is exceeded by 50%, that vessel shall be restricted to midwater trawling, or bottom trawling in depths greater than 100 fathoms, for the remainder of the fishing period in that area.

In order to provide vessel operators with incentives to reduce bycatch, Sablefish and Halibut caps shall be managed by annual vessel allocations. Vessels which exceed a Sablefish cap shall be permitted to continue fishing by means of bottom trawl, provided that they obtain additional Sablefish quota from the holder of a category 'K' licence. This additional quantity of Sablefish may be obtained at any time during the year. The annual amount of additional Sablefish quota that may be obtained shall not exceed the amount of the original Sablefish vessel cap issued to the vessel. Once the entire quantity of permitted Sablefish is landed or discarded, the vessel shall be prohibited from bottom trawling for the remainder of the year. In the case of Halibut, annual vessel allocations shall be provided for Hecate Strait/Dixon Entrance and for the west coast of Vancouver Island. Vessels which attain a cap inseason shall be prohibited from bottom trawling for the remainder of the year in the area for which the cap has been reached.

Note: For all species of groundfish, other than halibut, fish that are determined to be unmarketable and that are discarded at-sea shall not be deducted from fishing period limits or annual TACs. Marketability shall be determined by size. Lingcod and Sablefish marketability is determined by the legislated size limit for each species. A survey of major groundfish processors has provided the following definitions of marketability which shall be used for those species with no legislated size limits:

Rock, Lemon, Petrale and Dover sole	- 13 inches (33 cm) and larger[1]
Pacific cod	- 18 inches (46 cm) and larger[1]
Pollock	- 18 inches (46 cm) and larger[1]
Rockfish (not including Idiots)	- 12 inches (30 cm) and larger[1]

1 Although these sizes are used to define marketability for the purpose of enumerating discards, the industry is advised that fish less than the indicated size may legally be retained, landed and processed. Sizes shall be measured from the tip of the nose to the fork of the tail. Where there is no fork, length shall be measured from the tip of the nose to the tip of the tail.

Fish determined to be marketable shall have set mortality rates for any fish discarded, as follows:

Soles and flounders	- 10% mortality for the first two hours fished or portion thereof and, 10% for each additional hour[1]
Lingcod	- 10% mortality for the first two hours fished or portion thereof and, 10% for each additional hour[1]
Sablefish	- 10% mortality for the first two hours fished or portion thereof and, 10% for each additional hour[1]
Pacific cod	- 25% mortality for the first two hours fished or portion thereof and, 25% for each additional hour[1]
Rockfish/Idiots	- 100% mortality regardless of time fished

1 An hour fished is defined as the time that the net is in contact with the sea floor. For periods less than one hour, mortality shall be determined by multiplying that portion of an hour by the applicable mortality rate.

The above mortality rates do not reflect true mortality rates of fish discarded at-sea but, are solely intended to provide incentives in 1996 for vessels to reduce towing time and avoid bycatch wherever possible.

As in previous years under the dockside monitoring program, all fish landed, whether considered marketable or not, shall be deducted from the appropriate fishing period limits, bycatch caps and/or species TACs.

For halibut, the condition of the fish shall be assessed before it is returned to the water, in order to apply the appropriate mortality factor.

The following rules apply to vessels operating under Fishing Option B:

For Petrale sole and Sablefish, a monthly bycatch limit shall be provided to each vessel. Overages up to 20% of monthly limits shall be deducted from limits available in the next month. Overages in excess of 20% shall be both relinquished and deducted from limits available in the next month.

For Pacific cod and Halibut, all Option B vessels, as a group, shall be subject to a bycatch limit for each species, which shall be based on pre-determined mortality rates and incidence rates when fishing for other species. The bycatch limit for each species shall be divided equally among the three fishing periods. If an area-specific bycatch limit for Pacific cod (Hecate Strait/Dixon Entrance and the remainder of the coast) or Halibut (Hecate Strait/Dixon Entrance and west coast of Vancouver Island) is attained, all vessels operating under Fishing Option B shall be prohibited from fishing in the relevant area until the commencement of the next fishing period.

6. ANNUAL TOTAL ALLOWABLE CATCHES (TACS)

The following TACs have been set for the 1996 groundfish fishery (trawl and hook & line):

Species	Area[1]	Period	TAC[2]
Yellowtail/Widow	Coastwide	first	2,707
		second	2,320
		third	2,707
		TOTAL	7,734
Rougheye/Shortraker	Coastwide	first	459
		second	393
		third	459
		TOTAL	1,311

Species	Area[1]	Period	TAC[2]
Redstripe/Sharpchin	Coastwide	first	708
		second	608
		third	708
		TOTAL	2,024
Pac Ocean Perch/Yellowmouth[3]	Coastwide	first	2,409
		second	2,066
		third	2,409
		TOTAL	6,884
Canary/Silvergrey	Coastwide	first	688
		second	709
		third	688
		TOTAL	2,085
Idiots[4]	Coastwide	first	263
		second	226
		third	263
		TOTAL	752
Sablefish[5]	Coastwide	annual	304
Pacific cod[6]	Coastwide[7]	annual	-
	5C/D	annual	-
Dover sole	3C/D	first	635
		second	635
		third	543
		TOTAL	1,813
Dover sole	5C/D/E	first	385
		second	385
		third	330
		TOTAL	1,100
Rock sole	5A/B	first	308
		second	308
		third	264
		TOTAL	880

Species	Area[1]	Period	TAC[2]
Rock sole	5C/D	first	236
		second	236
		third	201
		TOTAL	673
Lemon sole	5C/D	first	173
		second	173
		third	147
		TOTAL	493
Petrale sole[6]	Coastwide	annual	-
Lingcod	3C	first	308
		second	770
		third	462
		TOTAL	1,540
Lingcod	3D	first	132
		second	330
		third	198
		TOTAL	660
Lingcod	5A/B	first	544
		second	727
		third	544
		TOTAL	1,815
Lingcod	5C/D	first	330
		second	440
		third	330
		TOTAL	1,100
Pollock	4B[8]	annual	1,490
	Areas 11/12	Feb-Apr	1,898
	5C/D	annual	3,190
Hake	4B[8]	annual	11,000[9]
	3C/D	annual	42,000[9]
Dogfish	4B	annual	5,000
	Coastwide[10]	annual	12,000

1 to avoid area-specific quota over-runs, coastwide rockfish quotas will be divided into area quotas
2 all quotas are in round weight and metric tonnes
3 306 tonnes of Pacific Ocean Perch and Yellowmouth deducted for 9 Moresby Gully draw permits not issued in 1995 due to the early trawl closure.
4 TAC is for Shortspine Thornyheads only
5 by-catch only. TAC shown does not include 'K' quota transferred to trawlers in-season
6 by-catch only.
7 coastwide except for areas 5C/D
8 TAC applies only to Areas 13 to 18 and 29
9 TAC to be confirmed at a later date
10 not including area 4B

As applicable, TACs identified as "coastwide" and not identified as "bycatch only", will be divided into area quotas for in-season management purposes. The areas to be used are 3C (lower west coast Vancouver Island), 3D (upper west coast Vancouver Island), 5A/B (Queen Charlotte Sound), 5C/D (Hecate Strait and Dixon Entrance), 5E (west coast Queen Charlotte Islands) and 4B (Strait of Georgia). Area TACs shall be divided equally among the three fishing periods and further divided, by fishing period, into directed catch and bycatch (80% and 20% of the period quota, respectively). When a species directed catch is taken in an area, only bycatch retention shall be permitted. Certain species and/or areas may have no directed fishing opportunities. All marketable rockfish discards and other marketable fish returned to the water, as estimated by onboard observers, shall be deducted from the appropriate TACs. Observers shall also estimate all catches by area for management purposes.

7. HAKE FISHERY

The TAC for the Offshore hake fishery has yet to be finalized. Preliminary estimates put the Canadian harvest level at 42,000 t, which is below anticipated shoreside processing requirements and would provide no surplus hake for a foreign joint venture fishery. Using the preliminary harvest estimates for Canada, GTAC has recommended the following plan for Offshore hake. However, if the TAC is significantly larger and results in surplus fish being available for joint venture fishing, DFO will consult with GTAC on the management approach for hake and the following plan may not apply.

For management of the Offshore hake fishery, assuming no TAC surplus to shoreside processing requirements, the annual TAC shall be allocated based on two fishing periods, with a third fishing period as a clean-up:

Period 1 (May 1-August 10)	25,200 t (60% of the preliminary TAC)
Period 2 (July 20-October 1)	16,800 t (40% of the preliminary TAC)
Period 3 (October 2-December 31)	Clean-up fishery for any remaining quota. Subject to a 125,000 pound trip limit.

Any underages or overages in the first period shall be transferred to the second period. Vessels shall choose only one of the first two periods to fish. A fishing period limit shall be provided to each vessel. As licence fees will be based on the amount of fish allocated per licence amendment, vessels will have the opportunity to request less fish than the maximum amount specified by the Department. All vessels will be able to participate in the clean-up fishery starting October 2.

For management of the Strait of Georgia hake fishery, the annual TAC shall be divided into two fishing periods:

Period 1 (February 16-June 30)	8,000 t (73% of the preliminary TAC)
Period 2 (July 1-December 31)	3,000 t (27% of the preliminary TAC)

Any underages or overages in the first period shall be transferred to the second period. Vessels may fish in either or both periods. No fishing period limits or trip limits shall be imposed for the Strait of Georgia fishery.

8. FISHING OPTIONS

All category 'T' licenced vessels shall be required, prior to licence issuance, to choose one of three fishing options:

Option A
- fishing period limits or other catch restrictions on all groundfish species subject to TACs or other management actions.
- no limit on the quantity of Turbot, Dogfish and other species not subject to TACs or other management actions.
- bycatch limits for Halibut, Sablefish, Petrale sole and Pacific cod will be issued and monitored on an individual vessel basis. Exceeding bycatch limits results in restrictions against individual vessels, not the fleet.
- choose two of three periods to fish for all species, with the exception of hake.
- maximum of 5 landings per calendar month to a maximum of 14 landings per period for all species except hake.
- permitted to fish hake in all three fishing periods.
- permitted to fish by bottom trawl in all areas except 4B (Areas 12 to 20 and 29).
- permitted to fish by midwater trawl coastwide.
- subject to 100% onboard observer coverage for all fisheries with the exception of: midwater trawling for hake coastwide; midwater trawling for pollock in Areas 11 and 12 from February 16 to April 30; midwater trawling for pollock in Hecate Strait and Dixon Entrance from October 1 to December 31; and midwater trawling for pollock year-round in Areas

13 to 20 and 29. Observer exemptions for hake and pollock are only permitted when the vessel is engaged in directed fisheries for these species. A small bycatch allowance of other groundfish species may be permitted.

- subject to port monitoring for all landings.

Option B

- a 20,000 pound calendar month limit for all rockfish combined, subject to the following:
  - no more than 5,000 pounds (25%) of the calendar month limit shall be Canary and Silvergrey rockfish combined.
  - Rougheye and Shortraker rockfish and Thornyheads are not permitted to be retained.
- a 20,000 pound calendar month limit for Lingcod.
- a 15,000 pound calendar month limit for all other groundfish species in the aggregate, not including Turbot, Dogfish, Petrale sole, Sablefish and Pacific cod.
- a calendar month bycatch limit shall be determined for Sablefish and Petrale sole.
- no limit on the quantity of Dogfish and Turbot.
- bycatches of Halibut and Pacific cod shall be monitored on a fleet basis for all vessels choosing this option. Exceeding bycatch limits shall result in further restriction or the shut down of the entire Option B fleet.
- permitted to fish year-round.
- a maximum of 15 landings per calendar month.
- permitted to fish by bottom trawl coastwide.
- not permitted to fish by midwater trawl in any area.
- subject to 15 days of onboard observer coverage for the year.
- subject to port monitoring for all landings.

Option C

- a 15,000 pound calendar month limit for all groundfish species combined other than Dogfish and Lingcod, subject to catch restrictions on rockfish, Sablefish, Petrale sole and Pacific cod.
- a 15,000 pound calendar month limit for Lingcod.
- no limit on the quantity of Dogfish.
- permitted to fish year-round.
- a maximum of 15 landings per calendar month.
- permitted to fish by bottom trawl coastwide.
- not permitted to fish by midwater trawl in any area.
- no onboard observer coverage.
- subject to port monitoring for all landings.

Once a fishing option has been chosen, no changes shall be permitted for the remainder of the calendar year.

9. FISHING LIMITS

Fishing period, calendar month and bycatch limits shall be developed in consultation with the Groundfish Trawl Advisory Committee, prior to the commencement of each period. Fishing period and calendar month limits shall be coastwide, subject to area closures and fishing option choice. Bycatch limits shall be either coastwide or area-specific (depending on the species). All limits shall be identified as conditions of the category 'T' licence. The amount of fish available for each vessel, for each fishing period, will be dependent on the number of vessels choosing that period to fish, the estimated fishing effort and the available quota.

As licence fees for rockfish, lingcod, soles, hake and pollock are based on the amount of fish allocated per licence amendment, vessels shall have the opportunity to request less fish than the maximum amount specified by the Department. The minimum amount of fish that may be requested is 25% of the specified fishing period limit.

10. FISHING PERIOD AVERAGING

As a condition of licence, fishing period averaging shall be permitted for all three fishing options.

The following rules apply to vessels choosing Fishing Option A:

Up to a 40% overage of the first fishing period limit for each species or aggregate shall be permitted to be retained. Overages of first fishing period limits in excess of 40% shall be relinquished. There are no retainable overages permitted for Sablefish. Petrale sole and Pacific cod have retainable overages of up to 40% and 50% respectively of the fishing period limit. **All overages of fishing period limits and bycatch limits incurred during the first fishing period of the vessel shall be deducted from the next fishing period limit.**

Overages that occur during the second of two permitted fishing periods shall be dealt with in a different manner. **All overages of second fishing period limits shall be relinquished.**

Vessels which exceed by 40% in their first fishing period, the fishing period limits for any three species or aggregates, or exceed one fishing period limit by 100%, shall be restricted to midwater trawl fisheries only, for the remainder of that fishing period. Vessels which exceed by 20%, in their second fishing period, the fishing period limits for any three species or aggregates, or exceed one fishing period limit by 30%, shall be restricted to midwater trawl fisheries only for the remainder of that fishing period.

Groundfish landed in excess of the permitted percentages in the first fishing period, and in excess of the fishing period limit in the second fishing period chosen, shall be relinquished through a *Relinquishment of Claim* form. Refer to Section 11 regarding relinquishment of overages.

The following rules apply to vessels choosing Fishing Options B and C:

Up to a 10% overage of the calendar month limit for each species or aggregate shall be permitted to be retained, except for rockfish in Option C. Overages of calendar month limits in excess of 10% shall be relinquished. Retainable overages are not permitted for those species designated as bycatch (i.e. Sablefish, Petrale sole and Pacific cod). **All overages of calendar month limits and bycatch limits incurred during the month shall be deducted from the next set of limits available to the vessel.**

Groundfish landed in excess of permitted quantities shall be relinquished through a *Relinquishment of Claim* form. Refer to Section 11 regarding relinquishment of overages.

11. RELINQUISHMENT OF OVERAGES

When an overage of a fishing period limit, calendar month limit or bycatch limit is determined at the completion of an offload, the following procedures shall apply:

a) for the first fishing period chosen by a Fishing Option A vessel, the proceeds from amounts in excess of the permitted overage percentage shall be relinquished.

b) for the second fishing period chosen by a Fishing Option A vessel, the proceeds from any overage of fishing period limits shall be relinquished.

c) for vessels choosing Fishing Options B and C, the proceeds from amounts in excess of the permitted calendar month overage percentage shall be relinquished.

d) for all vessels, the amount of fish relinquished shall be a stated percentage of all the fish of that species or species grouping validated and the value of the relinquished fish shall be the same percentage of the total value of that species or species grouping.

e) for all vessels, the proceeds from trip limit overages shall be relinquished by completion of a *Relinquishment of Claim* form provided by the observer or fishery officer.

12. PORT MONITORING

A comprehensive industry-funded port monitoring program shall continue in 1996. All category 'T' licensed vessels, regardless of the area or species fished, shall have their groundfish catches validated whether landed in Canada or in the United States to ensure that proper sorting and enumeration by species occurs. Archipelago Marine Research Ltd. of Victoria, B.C. is the designated contractor for this program and will provide port monitoring observers certified by DFO.

Monitoring requirements in effect for the 1996 groundfish trawl fishery are:

a) Hail-In:

The vessel master shall be required to hail-in prior to landing. Refer to 1996 licence conditions for full details on these requirements. An observer will be guaranteed when a minimum of 24 hours advance notice of landing is given. All requests for observer services which provide less than 24 hours advance notice will be handled as quickly as possible. The 24 hour toll-free hail number is 1-800-663-7152.

b) Port Monitoring Coverage Levels:

All trawl vessels shall be subject to one hundred percent (100%) port monitoring coverage of all species. This requirement includes fish caught in the Strait of Georgia.

c) Designated Offloading Locations:

Groundfish shall be landed and offloaded only at the following designated locations, subject to licence conditions:

In Canada:

Beaver Cove	Campbell River	Chemanius
Coal Harbour	Comox	Courtenay
Cowichan Bay	Deep Bay	French Creek
Ladysmith	Nanaimo	Port Alberni
Port Edward	Port Hardy	Prince Rupert
Sidney	Sooke	Tofino
Ucluelet	Vancouver (Greater)	Victoria
Winter Harbour	Zeballos	

In the United States:

Anacortes, Wa.	Bellingham, Wa.	Blaine, Wa.

Designated offloading locations shall be prescribed by condition of the category 'T' licence.

d) Offloading Procedure:

No offloading shall occur at-sea or at any unauthorized offloading location. At the time and place of landing the fish and in the presence of an observer:

(i) WHERE FISH ARE NOT PLACED IN CONTAINERS PRIOR TO LANDING AND ARE NOT FROZEN AT-SEA (e.g. fish held in refrigerated seawater):

- all fish, other than species comprising a rockfish aggregate (as defined in the category 'T' licence conditions), shall be sorted and weighed by individual species;
- species comprising rockfish aggregates shall be sorted and weighed by each aggregate or shall be sorted and weighed by individual species;
- when more than one species of rockfish are intermixed in an aggregate, a subsample of no less than 10% (ten per cent) of the weight of the intermixed fish shall be taken, as directed by an observer, and shall be accurately sorted and weighed by individual species;
- all fish segregated by species and/or aggregates shall be weighed prior to intermixing of those species or aggregates;
- if fish are placed into totes or other containers, each tote or container shall be weighed with ice, liners, etc. and labelled with the tote weight prior to use;
- totes or other containers that have been weighed and labelled before the landing are subject to weight verification at any time by an observer; and
- if fish are transported directly from the vessel across an in-line scale (e.g. automated hopper) then the weight recorded shall be the net weight.

(ii) WHERE FISH ARE PLACED IN CONTAINERS PRIOR TO LANDING AND ARE NOT FROZEN AT-SEA (e.g. fish boxed and iced at-sea):

- in the case of groundfish, other than rockfish, each container shall contain only one species;
- in the case of rockfish, each container shall contain either one species or one aggregate as defined;

- each container shall be clearly marked as to the species or aggregate contained therein;
- all containers shall be accurately weighed; and
- a sample of no less than 15% (fifteen per cent) of each type of container shall be taken, as directed by an observer. The containers shall be emptied and the contents sorted where necessary and weighed by individual species.

(iii) WHERE FISH ARE PLACED IN CONTAINERS PRIOR TO LANDING AND ARE FROZEN AT-SEA (e.g. fish frozen at-sea and stored in trays, boxes or bags):

- in the case of all groundfish, including rockfish, each container shall contain only one species;
- each container shall be clearly marked as to the species contained therein;
- all containers shall be accurately weighed; and
- a sample, of no less than 15% (fifteen per cent) of each type of container shall be taken, as directed by an observer. The containers shall be emptied and the contents sorted, where necessary, and weighed by individual species.

NOTE: the above-noted procedures for the verification of landed catches are provided for general information purposes only. The exact catch verification requirements are found in the 1996 Groundfish Trawl Licence Conditions issued to each trawl vessel.

All fish shall be weighed on a scale approved, in the case of fish landed in Canada, by the Legal Metrology Branch, Industry Canada, and in the case of fish landed in the United States, by the State of Washington Weights and Measures.

All fish weights shall be determined on the basis of net weights by deducting the weight of the container and the ice/slime or glaze allowance.

There shall be a 2% (two per cent) allowance for ice/slime in the case of fresh fish and a 4% (four per cent) allowance for glaze in the case of frozen fish.

For dressed fish, the conversion factors identified in the conditions of the category 'T' licence shall be used, to calculate net round weights. The conversion factors identified in section 14 shall be used unless modified on an individual vessel basis.

The observer shall be provided access, by the vessel master, at any time, to the vessel's fish holds, freezers and other fish storage areas. After offloading is completed, the observer shall confirm by inspection that the vessel's fish holds, freezers and other fish storage areas are empty.

The observer shall be provided access upon request to the vessel's category 'T' licence conditions in order to determine fishing and landing restrictions in effect.

The observer shall be provided access to the fishing log book supplied by the Department and shall take all of the completed original log book pages and yellow copies, before the completion of the offload.

Upon completion of the offload, the observer shall finalize the tally by assigning offloaded catches to quota areas. The information shall be recorded by the observer in the vessel's Groundfish Trawl Validation Record Book supplied by the Department. The completed original Record Book page shall be taken by the observer. The Groundfish Trawl Validation Record Book shall be retained on board the vessel at all times and be available, upon request, to an observer.

Individual vessels may request modified offloading procedures which are more applicable to their operation. If this is requested, Departmental and/or contract personnel shall determine the feasibility of the modifications. Any permitted changes to the offloading procedures shall be reflected in the vessel's licence conditions.

13. AT-SEA MONITORING

In order to strengthen stock assessment capabilities, return to area-specific management as a means of sustaining individual stocks, and to effectively monitor bycatch caps, a comprehensive at-sea observer program shall be instituted.

Vessels choosing Fishing Option A shall be required to carry a DFO-certified observer on each trip. The only fisheries exempt from this requirement are:

- midwater trawling for hake coastwide;
- midwater trawling for pollock in Areas 11 and 12 from February 16 to April 30;
- midwater trawling for pollock in Hecate Strait and Dixon Entrance from October 1 to December 31; and,
- midwater trawling for pollock in Areas 13 to 20 and 29 year-round.

To be exempt from observer coverage, the vessel shall be authorized only to fish for hake and/or pollock (small bycatch allowance of other groundfish may be permitted).

Vessels choosing Fishing Option B shall be required to carry a DFO-certified observer for fifteen (15) days during the year. The Department shall determine when and for how long an observer shall be carried (subject to the total number of days specified for observer coverage).

Archipelago Marine Research Ltd. of Victoria, B.C. is the designated contractor for this program at this time. Arrangements for observers can be made by calling 383-4535 or 1-800-663-7152.

14. CONVERSION FACTORS

To facilitate the conversion of product weight to round weight for the purposes of TAC and fishing period limit monitoring, the Department shall use set conversion factors and ice/slime and glaze allowances. Indicated below are the factors and allowances that shall be used at the commencement of the 1996 fishery. As changes may be made in-season, the conditions of the category 'T' licence are the final authority and should be referenced to determine what factors and allowances are in effect at any time.

Individual vessels may request to use different conversion factors and/or ice/glaze allowances which are more applicable to their operation. If this is requested, a quantity of fish, as directed by the Department, shall be supplied at no charge. Testing will be conducted by Departmental and/or contract personnel, and licence conditions may be amended to reflect the results. Further testing may be required in-season to verify the continued appropriateness of the amended factors.

All groundfish
round, fresh - 2% (two percent) ice allowance
round, frozen - 4% (four percent) glaze allowance

Rockfish/Thornyheads			
Japanese cut - fresh	1.57	Japanese cut - frozen	1.54
Western cut - fresh	1.51	Western cut - frozen	1.48
dressed head-on - fresh	1.16	dressed head-on - frozen	1.13
Sablefish			
Japanese cut - fresh	1.51	Japanese cut - frozen	1.48
Western cut - fresh	1.40	Western cut - frozen	1.37
dressed head-on - fresh	1.11	dressed head-on - frozen	1.09
Lingcod			
Japanese cut - fresh	1.64	Japanese cut - frozen	1.60
Western cut - fresh	1.36	Western cut - frozen	1.33
dressed head-on - fresh	1.11	dressed head-on - frozen	1.08

Pacific cod			
Japanese cut - fresh	1.51	Japanese cut - frozen	1.48
Western cut - fresh	1.28	Western cut - frozen	1.26
dressed head-on - fresh	1.11	dressed head-on - frozen	1.08
Soles			
dressed head-off - fresh	1.64	dressed head-off - frozen	1.60
dressed head-on - fresh	1.22	dressed head-on - frozen	1.20
Skates			
dressed flap/wing - fresh	2.45		

All of the above conversion factors for dressed fish include a 2% (two percent) ice allowance for fresh product and a 4% (four percent) allowance for frozen product.

15. GROUNDFISH SIZE LIMITS

Fishermen are reminded of the following groundfish size limits:

Lingcod
Head-on - not less than 65 cm in length, measured from the tip of the nose to the tip of the tail.
Head-off - not less than 50 cm in length, measured along the shortest length of the body to the tip of the tail.

Sablefish
Head-on - not less than 55 cm in length, measured from the tip of the nose to the fork of the tail.
Head-off - not less than 39 cm in length, measured from the origin of the first dorsal fin to the fork of the tail.

Sturgeon
Head-on - not less than 100 cm in length, measured from the tip of the nose to the fork of the tail or, where the tail has no fork, to the bottom tip of the tail.

NOTE: The size limits for English sole, Rock sole, Petrale sole and Starry flounder have been removed.

16. TRAWL GEAR RESTRICTIONS

Fishermen are reminded of the following gear restrictions:

a) (i) Subject to parts (ii) and (iii), the coastwide mesh size in any part of a bottom trawl or midwater trawl net, including the cod-end, shall not be less than 76mm (approximately 3 inches).

(ii) In management areas 13 to 19 and 29, the mesh size in a bottom trawl net shall not be less than 108mm (approximately 4.25 inches) in the final 50 meshes, including the cod-end. In all other parts of a bottom trawl net, the mesh size shall not be less than 76mm (approximately 3 inches).

(iii) In Hecate Strait and eastern Dixon Entrance, the mesh size in a bottom trawl net shall not be less than 140mm (approximately 5.5 inches) in the last 100 meshes of the net, including the codend. In all other parts of a bottom trawl net, the mesh size shall not be less than 76mm (approximately 3 inches). This restriction applies to that area bounded on the south by 52°51'N in Hecate Strait, bounded on the north by the Canada/U.S. International boundary, bounded on the west by 132°00'W in Dixon Entrance, and bounded on the east by the mainland of British Columbia.

b) For the purpose of preventing wear and tear to a trawl net, there may be attached to the underside of the cod-end any hides, canvas, netting or similar material.

c) For the purpose of preventing wear and tear to a trawl net, there may be attached to the topside of the cod-end, one of the following topside chafers:

(i) Regular Topside Chafer - a rectangular piece of netting that:
- is at least 1 1/2 times the width of the area of the cod-end that is covered, where the width is measured at right angles to the long axis of the cod-end;
- has a mesh size that is not less than the mesh size of the cod-end; and
- is fastened to the cod-end only along the forward and lateral edges of the netting in a manner that will permit it to extend
1) where a splitting strap is used, over not more of the cod-end than that part between the fourth mesh forward of the cod line mesh and the fourth mesh forward of the splitting strap, and
2) where a splitting strap is not used, over not more than one-third of the cod-end, measured from not less than the fourth mesh forward of the cod line mesh.

(ii) Modified Polish Topside Chafer - a rectangular piece of netting that:
- is made of twine of the same material and size as that of the cod-end, or of any single, thick, knotless twine material;
- has a mesh size that is twice as large as the mesh size of the cod-end;
- is attached to the rear portion of the topside of the cod-end; and
- is fastened to the cod-end along the forward, lateral and rear edges of the netting in a manner that will cause each mesh to exactly overlie four meshes of the cod-end over which it extends.

(iii) Multiple Flap-Type Topside Chafer - a series of pieces of netting where:
- the aggregate length extends less than two-thirds of the length of the cod-end; and
- each piece of netting
  1) is attached to the topside of the cod-end so that it overlaps the piece of netting immediately to its rear, if any,
  2) has a mesh size that is not less than the mesh size of the cod-end,
  3) is at least as wide as the cod-end, where the width is measured at right angles to the cod-end,
  4) is not more than 10 meshes long, and
  5) is fastened by its forward edge only across the cod-end at right angles to its long axis.

d) 'Mesh size' means the total length of twine measured along two contiguous sides of a single mesh, including the distance across the knot joining those sides but not including any other knots.

e) Where a minimum mesh size is prescribed, no person shall use any device by means of which openings that are smaller in size than the original mesh are created.

f) Mesh size shall be measured when the net is wet.

The above description of gear restrictions are noted for convenience of reference only. The original regulations (Fishery (General) Regulations and Pacific Fishery Regulations, 1993) should be consulted for all purposes of interpreting and applying the regulations.

17. TRAWL AREA CLOSURES

The following area closures shall be in effect for trawl vessels in 1996:

a) North of 54° - closed year-round in those portions of management subareas 101-2 and 101-3 westerly of a line from the intersection of the Canada/U.S. International Boundary and 133°09'W thence south westerly to 54°00'N 133°40'W. The intent of this closure is to continue with the second phase of the North of 54° experiment.

b) McIntyre Bay/Masset - closed year-round in those portions of Area 1 and Subarea 101-7, inside the 40 fathom contour, between Rose Point and Klashwun Point. The intent of this closure is to reduce harvesting pressure on localized stocks of fish.

c) Tide Marks - closed from February 16 through May 31 and October 1 through December 31 in Subareas 130-1 and 130-2, and those portions of Areas and Subareas 108-2, 109, 110 and 111 westerly of a line connecting the following coordinates: 51°47'N 129°37'W thence to 51°28'N 129°48'W thence to 51°15'N 129°11'W thence to 51°04'N 129°28'W thence to 50°52'N 129°06'W. The intent of this closure is to reduce harvesting pressure on Pacific Ocean Perch stocks during the spawning period.

d) Hecate Strait - closed from February 16 through April 15 in Subareas 102-1, 105-1, that portion of Subarea 102-2 north of 52°52'N, and that portion of Subareas 105-2 and 106-1 west of 130°40'W. The intent of this closure is to reduce the harvesting of Pacific cod during the spawning period.

e) Hecate Strait/Dixon Entrance - closed from June 1 through July 15 to bottom trawling in Subareas 1-3, 1-4, 1-5, 1-6, 2-1, 2-2, 2-3, that portion of Subarea 101-7 shoreward of the 40 fathom contour, those portions of Subareas 101-10, 104-1 and 104-4 south of 54°15'N, Subarea 102-1, that portion of Subarea 102-2 north of 53°00'N and west of 131°05'W, that portion of Subarea 104-2 south of 54°15'N and west of 131°00'W, Subarea 104-5, that portion of Subarea 104-3 west of 131°10'W, that portion of Subarea 105-1 north of 53°37'N and west of 131°10'W, that portion of Subarea 105-1 south of 53°37'N and west of 131°05'W, and that portion of Subarea 105-2 west of 131°05'W. The intent of this closure is to protect crabs during the soft shell period.

f) Area 23 (Barkley Sound) - closed from February 25 through March 25 to all trawling in Subareas 23-8 to 23-10. The intent of this closure is to reduce gear conflicts during the roe herring season.

g) Area 24 (Clayoquot Sound) - closed year-round to all trawling in Subareas 24-1, 24-2, 24-4 to 24-12 and 24-14. The intent of this closure is to address shellfish interception and shallow water habitat concerns.

h) Johnstone, Georgia and Juan de Fuca Straits - there are a number of Subareas closed to both bottom and midwater trawling. The closures have been implemented for a variety of reasons including herring spawn areas, salmon/herring holding areas, conflicts with crab gear, harbour congestion and reduction of harvesting pressure on localized groundfish stocks. Note: the closures described below may change in-season. Current Fisheries Public Notices should be referenced prior to fishing.

The bottom trawl closures by Subarea are:

Subarea(s)	Closure Description	Period Closed
12-6	applies to Indian and Village Channels only	all year
12-20	entire Subarea	all year
12-29,12-34	entire Subareas	Feb 16-Apr 30
12-39	applies to Retreat Pass only	all year
12-42	applies to Drury Inlet only	all year
12-46	entire Subarea	Feb 16-Apr 30
13-1 to 13-17	entire Subareas	all year
13-33,13-34	entire Subareas	all year
14-1,14-8	entire Subareas	all year
14-11,14-14,14-15	entire Subareas	all year
14-2 to 14-7	entire Subareas	Apr 1-Sep 30
14-9,14-10,14-12	entire Subareas	Apr 1-Sep 30
16-3,16-4	entire Subareas	all year
17-1,17-3,17-7	entire Subareas	all year
17-9,17-14,17-17	entire Subareas	all year
17-20,17-21	entire Subareas	all year
18-2,18-7,18-8	entire Subareas	all year
18-9,18-10	entire Subareas	all year
19-1,19-2	entire Subareas	all year
19-6 to 19-12	entire Subareas	all year
20-6,20-7	entire Subareas	all year
28-1 to 28-14	entire Subareas	all year
29-3,29-4,29-6	applies to shoreward of 50 fathom contour only	all year
29-7 to 29-17	entire Subareas	all year

The midwater trawl closures by Subarea are:

Subarea(s)	Closure Description	Period Closed
12-20	entire Subarea	all year
12-29,12-34,12-46	entire Subareas	Feb 16-Apr 30
13-1 to 13-17	entire Subareas	all year
13-33,13-34	entire Subareas	all year
14-1,14-8	entire Subareas	all year
14-11,14-14,14-15	entire Subareas	all year
16-3,16-4	entire Subareas	all year
17-1,17-7,17-9	entire Subareas	all year
17-14,17-20,17-21	entire Subareas	all year
18-7,18-8,18-10	entire Subareas	all year
19-1,19-2	entire Subareas	all year
19-6 to 19-12	entire Subareas	all year
20-6,20-7	entire Subareas	all year
28-1 to 28-14	entire Subareas	all year
29-7 to 29-17	entire Subareas	all year

18. TRAWL SPECIES CLOSURES

The following species closures shall be in effect for trawl vessels in 1996:

a) Lingcod - Strait of Georgia
- closed year-round in Areas and Subareas 12-1 to 12-6, 12-8, 12-11, 12-12, 12-15 to 12-48, 13 to 19, 20-5 to 20-7 and 29. Closed February 16 through May 14 and November 15 through December 31 in Subareas 12-7, 12-9, 12-10, 12-13, 12-14 and 20-1 to 20-4.

b) All Rockfish - Strait of Georgia
- closed year-round in Areas 12 to 20 and 29.

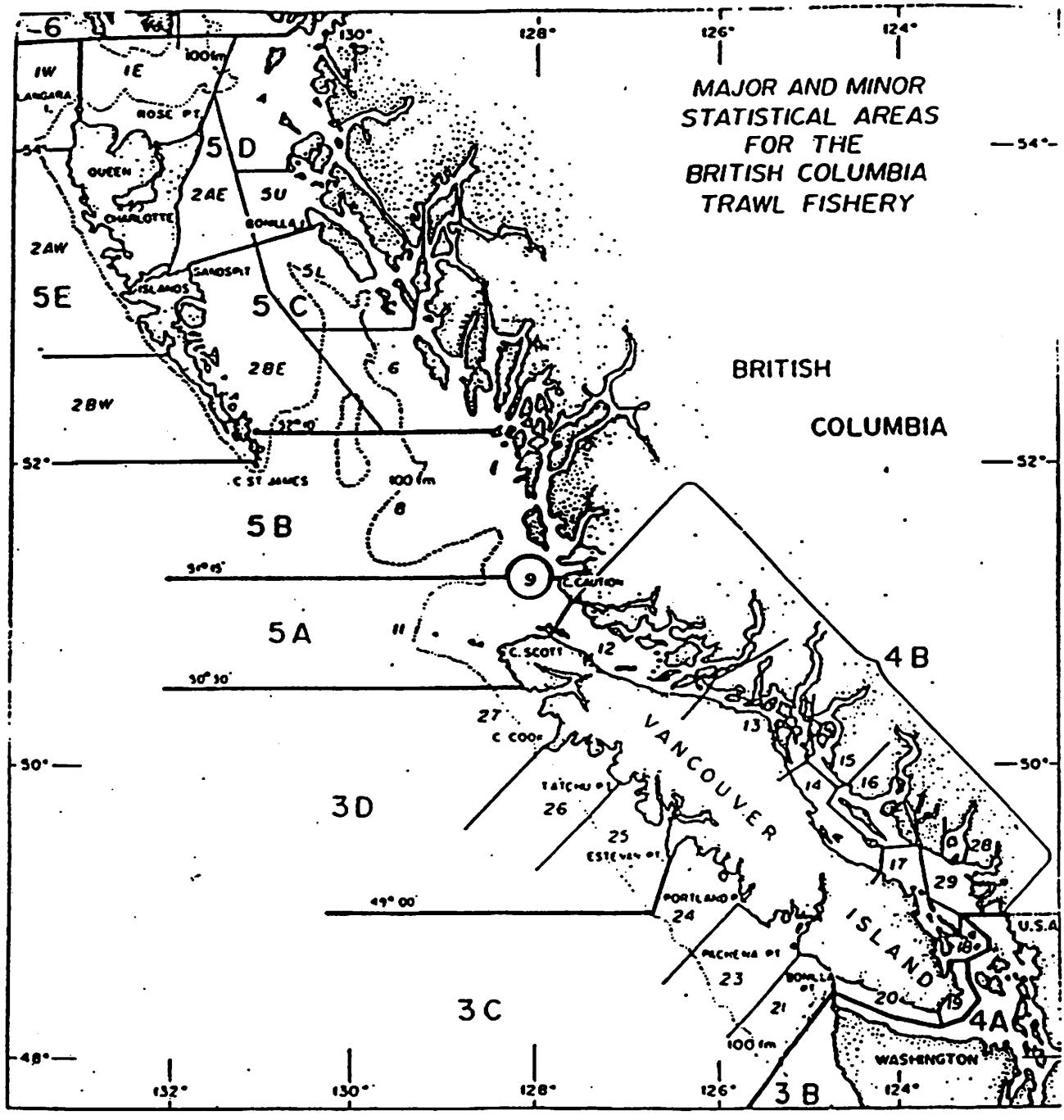
19. OBSERVE, RECORD, REPORT

Users of the groundfish resource have a responsibility to report any violations. Any suspected or actual fisheries-related or pollution violations can be passed on quickly and discreetly to appropriate enforcement officers by telephoning 1-800-465-4DFO (1-800-465-4336). This is a twenty-four (24) hour toll-free number available throughout British Columbia. Confidentiality is assured.

20. CONTACTS

For further information on any aspect of the management plan or groundfish trawl fishery, please contact:

Groundfish Management Unit:	Bruce Turris	666-9033
	Gary Buechler	666-0912
	Devona Adams	666-3279
	Fax	666-8525
Enforcement:		
Lower Mainland/	Sue Hahn	666-3444
Sunshine Coast	Carl Kennedy	666-8230
	Hans Segelken	666-6260
Lower Vancouver Island/		
Sunshine Coast	Bruce McDonald	754-0233
Northern Vancouver Island	Tom Hlavac	949-9609
West Coast Vancouver Island	Mike Spence	725-3468
North/Central Coast	Sam Saunders	627-3484
	Stefano Maestrello	627-3406


MAJOR AND MINOR
STATISTICAL AREAS
FOR THE
BRITISH COLUMBIA
TRAWL FISHERY
BRITISH
COLUMBIA
5D
5E
5C
5B
5A
3D
3C
3B
4B
4A
1W
1E
2AE
2AW
2BE
2BW
5U
5L
6
VANCOUVER
ISLAND
WASHINGTON
U.S.A.
130°
128°
126°
124°
54°
52°
50°
49°
48°
132°
100 fm

Joint V — J IPHC

ACTION ITEMS

We realize that the Commission is a single species management entity and that the Council has many species to manage which further complicates fishery management. We recognize also the need for fleet incentives to provide for reductions in halibut bycatch. We are extremely frustrated, however, with the very limited success of the VIP program. We agree that individual accountability promises the most success. Such a program, however, may be two to four years away from implementation in the North Pacific. We strongly believe that constructive steps need to be taken immediately.

Therefore, we respectfully request the Council to:

1. Have a vessel incentive program in place that allows a bycatch cap reduction of 10 percent in 1998 and further reductions in 1999.

2. Make decisions which favor lower bycatch rates and mortality by promoting cleaner gear types, gear modifications, and fishing practices. We are not asking for major disruptions in allocations to gear types, rather that each gear type must continue to strive to reduce its bycatch.

3. Recognize the need to create incentives for cleaner fishing practices. We believe bycatch savings should not be reallocated to other fisheries, but instead, these savings should be split between the fleet making the savings and the lowering of the bycatch caps. We ask the Council to consider this mechanism for 1997.

4. Create or encourage the immediate development of industry pools or joint efforts that encourage, promote, and reward success in reducing bycatch and mortality.

Further, we:

- recommend the promotion of voluntary grid sorting on an experimental basis in 1996, providing additional observers are employed to verify its viability and potential for success in reducing bycatch mortality; and

- urge the Council to join us in making bycatch and wastage reduction the number one priority, and that future funding of bycatch research be promoted and fully supported.

- propose that the Commission meet with the Council annually to coordinate bycatch management and facilitate formal and informal exchange of ideas.