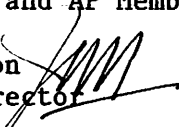


M E M O R A N D U M

TO: Council, SSC and AP Members

FROM: Jim H. Branson
Executive Director 

DATE: May 19, 1983

SUBJECT: Halibut Moratorium and Limited Entry

ACTION REQUIRED

- (a) *Report on status of moratorium.*
- (b) *Review draft staff synopsis of Northwest Resources Analysis final report.*
- (c) *Set schedule for public presentations by Robert Stokes.*
- (d) *Review Council objectives for halibut limited entry.*

BACKGROUND

Moratorium Status

Immediately after the Council voted on April 1, 1983 to recommend that a three-year moratorium on new entrants into the North Pacific halibut fishery be implemented prior to the 1983 season, a copy of the proposed rule as adopted was forwarded to the NOAA General Counsel for Fisheries. From April 4-11, the written comments received pursuant to the February 3 Notice of Proposed Rulemaking were summarized and responses to them drafted by Council staff.

On April 12 Ron Miller traveled to Juneau to work with NOAA General Counsel Pat Travers and Thorn Smith and National Marine Fisheries Service staff members Sue Salveson and Lewis Queirolo, in assembling the necessary support documents for the review of the final rule. This work was completed and all material forwarded to the appropriate offices in Washington D.C. on April 22.

During the week of April 25-29, Council staff mailed a notice on the moratorium [herein included as agenda item C-1(a)] to approximately 7,800 fishermen who held interim-use permits in all hook and line fisheries for 1983. The Commercial Fisheries Entry Commission assisted in this effort by printing mailing labels for the permit holders.

During the week of May 1-7 a group of fishing industry representatives were in Washington D.C. to meet with Congressional and agency representatives to discuss the need for the moratorium. A letter from one of the industry group, Mark S. Lundsten, concerning this trip is included as item C-1(b).

During the March meeting, Council members expressed a desire that a record be maintained of public requests for moratorium information and staff determinations of individual and vessel moratorium eligibility. From April 4 through May 20 the Council has received approximately 260 telephone calls regarding the moratorium. Most of the calls were requests for general eligibility information. Approximately 20% of the callers wanted to check if they or their vessels were listed in the records of fishermen and vessels with documented participation in the halibut fishery during the 1978 through 1982 time period. Those callers who requested an official determination of personal or vessel eligibility were advised to do so in writing to ensure that a record would be maintained. As of May 20, five such letters were received and responded to by the Council staff and five by the NOAA General Counsel's office in Juneau.

Staff Synopsis of "Limited Entry in the Pacific Halibut Fishery: The Individual Quota" Option by Northwest Resources Analysis. Public presentations by Robert Stokes. Council objectives for halibut limited entry.

At the March meeting, the Council directed the staff to prepare a synopsis of Northwest Resources Analysis final report on halibut limited entry. The Council also directed that a workgroup be appointed to evaluate the synopsis and reevaluate the Council's objectives for halibut limited entry. A list of the objectives included as item C-1(c). This workgroup consisting of Council members, Jim Campbell, Joe Demmert Jr., and Keith Specking, Richard Marasco from the SSC, and Tom Stewart from the AP met on May 24, 1983. In addition to the report synopsis and limited entry objectives, the workgroup also considered the matter of scheduling the three public presentations by Professor Stokes required in his contract with the Council. The workgroup will report on its deliberations to the full Council on May 25.

North Pacific Fishery Management Council

Clement V. Tillion, Chairman
Jim H. Branson, Executive Director



Mailing Address: P.O. Box 3136DT
Anchorage, Alaska 99510

605 West 4th Avenue
Anchorage, Alaska 99510

Telephone: (907) 274-4563
FTS 271-4064

NOTICE

You are hereby placed on notice that a 3-year moratorium on new entrants into the halibut fishery may be implemented prior to the 1983 season. The moratorium recommended by the North Pacific Fishery Management Council would permit only those who had legal commercial landings and legally recorded sales of halibut during any of the seasons from 1978 through 1982 to fish during the 1983, 1984 and 1985 halibut seasons.

If a person eligible to fish during the moratorium is not able to do so due to injury, disease, age or death, then he or his closest relative may designate in writing a substitute to fish his vessel. The substitute may be an individual who would not otherwise qualify to fish during the moratorium. The written designation of substitution must state the time period it is in effect and be in the possession of the substitute at all times that person is fishing for halibut.

Residents of rural Alaskan coastal villages located west of 156°W longitude are exempted from the moratorium in order that they may develop a commercial halibut fishery in the Bering Sea north of 56°N latitude. No other area is provided for this developmental fishery.

In order for vessels 5 net ton and over to be used during the moratorium, they must have been used in the legal commercial harvest of halibut during the base period. Vessels 5 net ton and over that were not used in the legal commercial harvest of halibut during the base period may be used during the moratorium provided they were acquired on or before March 31, 1983.

Replacement of a vessel five net tons or over that is sunk, destroyed or otherwise rendered unusable is allowed provided the replacement vessel has a net tonnage of no more than 10% greater than the vessel it replaces. This replacement restriction is not applicable to those vessels less than five net tons; however, a person who fished a vessel under five net tons during the base period could not use a vessel five net tons or over during the moratorium unless that vessel was used to land halibut during the base period or was acquired on or before March 31, 1983.

Fishermen should be aware that there are no guarantees that participation during the three-year moratorium period will be translated into eligibility criteria under any halibut limited entry system that may be implemented in the future.

Possession of a State of Alaska halibut interim-use permit and/or an International Pacific Halibut Commission license shall neither excuse nor constitute evidence of compliance with the requirement that a person must have had legal commercial landings and sales of halibut during the 1978 through 1982 base period to be eligible to harvest and sell halibut during the moratorium period.

A person found fishing in violation of moratorium regulations may be subject to a civil penalty of not more than \$25,000 per violation.

FIRST CLASS MAIL

NORTH PACIFIC FISHERY MANAGEMENT COUNCIL
P.O. BOX 3136 DT
ANCHORAGE, AK 99510

HALIBUT



King of the Sea

AGENDA C-1(b)
MAY 1983

Phone 783-2922
Area code 206

DEEP SEA FISHERMEN'S UNION OF THE PACIFIC

MAY 16 1983

5215 Ballard Avenue N.W.

Seattle, Washington

98107



DATE	ROUTE TO	INITIAL
	Exec. Dir.	
	Treas. Dir.	
	Admin. Off.	
	Exec. Sec.	
May 11, 1983	Asst. 1	
	Staff Asst. 2	
	Staff Asst. 3	
	Econ. Asst.	
	Sec./Bkkr.	
	Sec./Typist	

Jim H. Branson
Executive Director, NPFMC
P. O. Box 3136 DT
Anchorage, Alaska 99510

Dear Jim;

On May 1, 1983, Greg Baker from ALFA, Chip Threinen from Kodiak, Glenn Satero from FVOA, and I went to Washington, D. C., to discuss the Halibut Moratorium with the Senators and Congressman from Washington and Alaska and, in a single meeting, with John Byrnes, Bill Gordon, Robert McManus, NOAA General Counsel, and Stephen Holloway, Associate General Counsel for the Department of Commerce and, as I understand it, Commerce's liaison with OMB.

The meetings went well; and I think our efforts were well received. I am enclosing a self-explanatory letter that gives the thrust, I think, of our main argument while we were in town. I thought you would be interested in reading it.

I am going black cod fishing in about a week, before halibut, and so will miss any more Council meetings until the fall. But, I am sure I will see you then.

Sincerely,

Mark S. Lundsten,
President

MSL:rd
Enclosure

Deep Sea Fisherman's Union
of the Pacific
5215 Ballard Avenue N.W.
Seattle, Washington 98107

May 6, 1983

Congressman Joel Pritchard
House of Representatives
Washington, D.C.

Dear Congressman Pritchard,

We are requesting that this statement be read for the record of the Subcommittee on Fisheries, Wildlife, Conservation, and the Environment during their Oversight Hearing on the Development and Implementation of Fishery Management Plans on May 10, 1983.

Like many of the fishermen's groups in Washington and Alaska, the Deep Sea Fisherman's Union supports the Halibut Moratorium as passed by the North Pacific Fishery Management Council on April 1, 1983.

Although the stocks are considered to be rebuilding now, the fishery is suffering from overcrowding. On the same grounds where it was uncommon to see more than a few other boats on a sixteen-day trip, we now commonly see as many as a dozen on the first day alone. Consequently, our gear often crosses and quite frequently may be lost, with the fish still hooked and left for the sand fleas; processors are overcrowded and forced to treat fish in a sometimes sloppy fashion, resulting in a lower quality product; and, prices are driven down by the costs of storing fish from a few short, concentrated periods of effort. Plus, the Halibut Commission, an organization that has maintained a healthy resource for over five decades, is forced to keep quotas very low. If they were not conservative, with the intense effort that is present, and the resultant margin of error the Commission has to consider in their predicted catch per day, any given area could be overfished easily.

It is clear that the problems of conservation, management, quality of product, marketing, and economic viability are all intertwined in this particular issue.

Consequently, halibut fishermen, traditionally a group unable to agree on much of anything except that the Halibut Commission set up quotas and seasons according to information supplied by biologists and the industry, have found a consensus among ourselves in the last few years. We know that something must be done.

The Moratorium, a three-year period given to design and decide upon some form of limited entry plan or possibly an alternative open-access management plan, is how we have determined best to do this. The North Pacific Fishery Management Council, listening to our testimony and reading our letters, has agreed, and, accord-

ing to the authority given them by the Halibut Act, have approved the Moratorium.

The fishermen, participating fully and showing good faith in the Council process, have been heard and appreciated at the Council level. We have put in our time at hearings and meetings. We have used the system as it was designed to be used. On an issue as important as we consider this one to be, we expect the offices in Washington, D.C., that execute the final phases of the rule to respond in kind. It is their job and responsibility to understand and respond to the Council - and it is time to do it now.

Delay of the Moratorium until after this season's opening day, given the probable speculation on fishing permits well documented in other Alaskan fisheries, would exacerbate the already severe problem of overcrowding. The efficient and expedient actions of all parties concerned will be a benefit to all of us, including the fish.

Sincerely,



Mark S. Lundsten,
President

OBJECTIVES FOR HALIBUT LIMITED ENTRY AS
DESCRIBED IN COUNCIL RFP 82-1 AND CONTRACT 82-4

1. Distribute the hook and line halibut fishery in time and space to ensure resource conservation.
2. Reduce capitalization, thus encouraging development of an economically viable and efficient year-round domestic halibut hook and line fishery that, unconstrained by regulatory seasons, potentially could provide high quality fresh and frozen fish to the consumer twelve months of the year and that:
 - (a) is made up of owner/operator rights holders; and
 - (b) makes it possible for some fishermen to earn a major share of their income from hook and line halibut fishing.
3. Ensure that the costs of administration and enforcement do not exceed the benefits of the program.
4. Ensure that the extraction of royalties from the fishery at least sufficient to cover program costs is not precluded at some point in the future.
5. Minimize adverse biological impacts of the program on related fisheries.
6. Ensure that no particular entity acquires excessive control of rights to participate in a fishery.
7. Attempt to be compatible with IPHC objectives.
8. Minimize disruption of the present fleet by using past performance to distribute initial rights.
9. Use the market to transfer fishing rights after initial distribution.

North Pacific Fishery Management Council

Clement V. Tillion, Chairman
Jim H. Branson, Executive Director

605 West 4th Avenue
Anchorage, Alaska 99510



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HALIBUT WORKGROUP MINUTES

Anchorage, Alaska
May 24, 1983

The Halibut Workgroup met in Anchorage on May 24, 1983 at 2 p.m. All members (Jim Campbell, Joe Demmert Jr., Richard Marasco, Keith Specking and Tom Stewart with Clem Tillion as chairman) were present.

C-1(b) Staff Synopsis of Northwest Resources Analysis Final Report

The Workgroup reviewed the staff synopsis of the Stokes Report and recommends that it be released for public review after the addition of language in the synopsis preface stating that the Council has not endorsed any particular form of access limitation for the halibut fishery. The preface reads as follows:

The North Pacific Fishery Management Council contracted with Northwest Resources Analysis of Seattle, Washington, to perform a study of limited entry in the Pacific halibut fishery. Because there was substantial information already available about other forms of fishery access limitation, the Council directed that the study should determine whether the individual quota or share system would be feasible under current conditions in the fishery. This report has been completed and is available for public review. Since the report and its attachments are nearly 200 pages in length, the Council decided a synopsis should be prepared for public distribution. Included with this synopsis is the complete, "Summary and Conclusions" portion of the study. The full report will be mailed by the Council upon request. The release of this report for public distribution should not be interpreted as Council endorsement of any statement contained in the report or approval of any particular form of limited entry for the halibut fishery.

C-1(c) Public Presentations by Robert Stokes

The workgroup recommends that the three public presentations (to be held in Kodiak, Petersburg and Seattle) required in Professor Stokes contract with the Council be scheduled after the proposed moratorium regulation has either been enacted or formally disapproved, but not before October 1983. The workgroup is of the opinion that to hold the presentations earlier in the year would lead to confusion of their subject matter with the moratorium.

C-1(d) Council Objectives for Halibut Limited Entry

The workgroup recommends that the objectives for halibut limited entry stated in Council RFP 82-1 and Contract 82-4 be reaffirmed with editorial changes and

the addition of a preamble that the objectives are to be achieved by any halibut limited entry system, regardless of the particular form adopted by the Council. The formal changes are as follows:

- Objective 2(a) Change "owner/operator rights holders" to "owner/operator holders of halibut fishing privileges"
- Objective 6 Change "excessive control of rights to participate in a fishery" to "excessive control of halibut fishing privileges".
- Objective 8 Change "past performance" to "past participation", and "initial rights" to "initial halibut fishing privileges".
- Objective 9 Change "fishing rights" to "halibut fishing privileges".

The amended statement of objectives including the preamble are printed in their entirety as supplemental agenda item C-1(c).

The workgroup wanted the changes made to the stated objectives in order that it be understood the Council had not yet adopted a particular form of limited entry for the halibut fishery but was still considering the full range of management options available to it.



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Washington, D.C. 20235

5/20/83

TO: Distribution *Steve*
FROM: F - William H. Stevenson
SUBJECT: Status Report on the Halibut Moratorium Decision

Upon review of the regulatory and analytical documents proposed by the North Pacific FMC to establish a moratorium on further entry in the halibut fishery, NOAA/NMFS determined that the proposed rule was a major action under the provisions of Executive Order 12291 and that we would not use the emergency provision of that order to impose the rule without review by the Office of Management and Budget.

It was decided that the moratorium itself, as a major rule, has significant economic effects upon the fishery and therefore requires a very careful and complete evaluation prior to its being implemented. Whether or not the decision will cause a delay in the implementation of the regulations is not known at this time. It is the sincere objective of NOAA and the National Marine Fisheries Service to implement the moratorium, if approved, at the earliest possible time in order to minimize any adverse effects on the fishery or the fishery resource.

Distribution:

John Bovard, CAX2
Jay Johnson, GCF
Robert McVey, F/AKR
Mary Thompson, F/M11



HALIBUT MORATORIUM

DECISION IMPACTS

Decision

I concur with the objective of the moratorium (prevention of speculative entry into the fishery) but do not concur with the package as submitted because:

1. It is a major rule with significant adverse effect on the fishery
 - a. Significant adverse effects on competition, employment, investment productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.
2. It is not an emergency under E.O. 12291.

Background

Assumptions:- Jeff Stephan intervened - Kodiak fishermen rep.? - Executive Director, United Fishermen's Marketing Association, Inc.; multi-purpose vessels who have not engaged in fishery since 1978; Kodiak area also has possible new entrants

- Jay Hastings in town who commented negatively
- Alaska residents (over 50%)/included E.O. 12291 in comments

Re-read E.O. 12291 .

Significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

- Halibut is a non-Magnuson Act fishery - Halibut Act does not define fishery; Magnuson Act nearest "body of law" - fishery includes shore-based enterprises under Magnuson Act.

- Multi-purpose vessels, developmental grounds involved

Council Action

Council considered situation (partially) and found

- a. no justifiable standard to restrict by-catch fishermen
- b. Personal qualification criteria broad enough so that no individual who has demonstrated recent dependence on, and participation in fishery denied inclusion as qualified individual
- c. Future effect - "No provision...interpreted as guaranteeing that... participation during (base period) will be basis for allocating halibut fishing privileges under any halibut limited entry system..."

Fact

- RIR treats, with respect to harvesting only competition, innovation, investment, individuals, productivity, employment - no constraint under quota manage-
- does not treat
 - a. economic hardship appeal
 - b. ability of United States-based enterprises to compete with foreign based enterprises in domestic or export markets
 - c. the processing, markets world
- written as non-major
- assumes implementation in 1983
 - a. here we are a leg up since "notice of participation in 1983 non-qualifying in moratorium" is legal and not generally known outside the agency

Impact-economist days

- minimal rewrite from fisherman point of view - 2 days
- rewrite to include enough on processing and marketing to show we thought about it-4 days
- average rewrite-6 days

Recommendation: Ply in Lou Querrila: use Surdi: rewrite to include some processing

processing and marketing; export/import; major classifications; appeals
Rework action memorandum between CCF and F/M11

Rework regs especially above sections in preamble to make much stronger
the fact that we thought about it - F/M12 - Billik full time

Put NRIA in blue room at our disposal as top priority interrupt

HALIBUT SCHEDULE

FAST TRACK: MAYOR: NO SECTION 8: APPROVAL

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
16	17	18	19	20	21 AM, REGS	22
23	24 AM REGS RIA	25 RIA ← COUNCIL MEETING →	26 F (DRAFT)	27 A	28 PM APPEALS SECTION, AM, REGS	29
30	/	1	2 NOTICE FY 83 FISHING NOT QUALIFYING F RECOMMENDS APPROVAL	3 APPROVES	4 DOC TRANSMITS TO OMB; OMB REGS	5
6	7	8	9	10	11	12
13	14 10-DAYS FOR OMB	15	16 SEASON STARTS	17	18	19
20	21	22	23	24	25	26
All	All	All	All BUT 26	All	All	All
27	28	29	30	1 OMB 30 DAYS EXTEND/ DECISION NOTIFICATION	2	3
4	/	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
All	All	All	All	All BUT 26	All	All
25	26	27	28	29	30 NOTIFI- CATION 2- 3-60-DAY DAYS	31
1	2	3	4	5	6	7
8	9	10	11	12	13	14

MAY

JUNE

JULY

AUG

AUGUST

15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30 END OF 3RD EXTENSION DENIAL POINT	31	1	2	3	4
5	HEAD WE CAN PROTEST AS AN AGENCY SINCE 4A, 4B STILL HAVE QUOTA					11

SEPTEMBER

5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	1	2

SEPTEMBER

12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	1	2

OCTOBER

3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

DRAFT

LIMITED ENTRY IN THE PACIFIC HALIBUT FISHERY:
THE INDIVIDUAL QUOTA OPTION

Northwest Resources Analysis

Seattle, Washington

Report to the North Pacific
Fisheries Management Council
Anchorage, Alaska

Summary and Conclusions

Chapter 1 Verbatim of the Report - pp. 1-19

NPFMC Staff Synopsis

of Chapters 2 - 6 of the Report - pp. 20-62

The North Pacific Fishery Management Council contracted with Northwest Resources Analysis of Seattle, Washington, to perform a study of limited entry in the Pacific halibut fishery. This report has been completed and is available for public review. Since the report and its attachments are nearly 200 pages in length, the Council decided a synopsis should be prepared for public distribution. Included with this synopsis is the complete, "Summary and Conclusions" portion of the study. The full report will be mailed by the Council upon request.

SUMMARY AND CONCLUSIONS

SUMMARY AND CONCLUSIONS

This study has the broad purpose of developing limited entry alternatives for that portion of the Pacific fishery under the jurisdiction of the North Pacific Fisheries Management Council. Until recently most discussions of limited entry have focused on license limitation programs of the type currently applied to salmon and other Pacific Coast fisheries. As a result, fisheries managers now have an extensive literature and wide experience to turn to when considering new applications of license limitation. Unfortunately, license limitation has not performed well in the view of many of its practitioners. Because of the knowledge already available about license limitation and its limited success, the halibut limited entry working group of the North Pacific Fishery Management Council emphasized other alternatives when it established the objectives for this study. In particular, the group identified the individual quota, or share system, as a previously neglected approach holding considerable promise of being feasible under present circumstances and of achieving the Council's management objectives for the halibut fishery. That view is, in large measure, confirmed by the study results reported below.

Those results are summarized in Figure 1-1 and in the following discussion. We initially restate the relevant management objectives and evaluate the share system against each. Then, for each category of objectives, we compare the share system with the license limitation alternatives. The evaluation concludes with recommendations concerning future staff analysis and council decision making that, in the contractor's view, will lead to selection of the best feasible limited entry program for the Pacific halibut fishery.

<p>RESOURCE CONSERVATION</p> <p>Maintain compatibility with IPBC objectives.</p> <p>Distribute the hook-and-line halibut fishery by time and area to ensure resource conservation.</p> <p>Minimize adverse biological impact of the program on related fisheries.</p>	<p>INDIVIDUAL QUOTA SYSTEM</p> <p>Rules for allocating and transferring individual quotas conform with current IPBC area quotas, and adjust easily to changes. Dividing area quotas among individuals controls catch more precisely than setting seasons. Incentives to evade catch reporting present new, but manageable, problems. Conservation is enhanced by spreading effort more uniformly over substocks, and by providing more representative catch data.</p>	<p>LICENSE LIMITATION OF THE CURRENT FLEET, OR CONTINUED OPEN ACCESS</p> <p>Current fisheries management and economics literature and experience generally support the conclusion that license limitation, without significant fleet reduction, will slow, but not stop, growth in the halibut fleet. Thus, the consequences of fleet growth can be expected to continue at different rates, depending on whether license limitation or open access is chosen. From a conservation standpoint these consequences include: sharper focusing of effort on vulnerable substocks, declining reliability of catch and effort data, and greater difficulty in determining when seasons must be closed to achieve area quotas. The incentive to underreport catch will not be present, but other enforcement problems present in today's halibut and salmon fisheries will continue. A question not resolved by this study is the possibility of mitigating these consequences by "fine tuning" the license limitation approach, as was done here with the individual quota concept. Further work is required to determine if such an effort could produce results which are superior, from a conservation standpoint, to those prevailing today, or under the individual quota system.</p>		<p>LICENSE LIMITATION AND SIGNIFICANT FLEET REDUCTION</p> <p>Depending on the level of fleet reduction, such a program would be capable of achieving conservation and economic efficiency results comparable to those credited to the individual quota system.</p>	
<p>ECONOMIC EFFICIENCY</p> <p>Reduce capitalization, thus encouraging development of an economically viable and efficient year-round domestic halibut hook-and-line fishery.</p> <p>Provide high quality fresh and frozen fish to the consumer twelve months of the year.</p> <p>Ensure that the costs of administration and enforcement do not exceed the benefits of the program.</p>	<p>Attainable economic benefits are similar to those realized in agriculture, mining, forestry and elsewhere, where exclusive ownership or leasing has replaced open access to primary resources. Specifically, these benefits include: reduced harvest and storage costs, increased consumer value, and better utilization of halibut by-catches in other hook-and-line fisheries. Estimated gross annual benefits are \$9.3 million. Government administration and enforcement costs may rise, and unreported catches may impose costs. Net benefits, after subtracting these costs, range from \$8.9 to \$9.2 million per year, or \$.46 to \$.46 per pound of 1982 catch.</p>	<p>The economic performance of a nonfleet reducing license limitation program would be similar to its effects on resource conservation. Current experience indicates that net economic value will decline, although at a lower rate than without any limited entry program: "Fine tuning" would be required to preserve the halibut fisheries' current net economic value, or achieve gains of the type and scale credited here to the individual quota system.</p>			
<p>SOCIAL CONSIDERATIONS</p> <p>Minimize disruption of the present fleet by using past performance as the basis for distributing initial rights.</p> <p>Insure that the fishery is made up of owner/operator rights holders.</p> <p>Enable some fishermen to earn a major share of their income from hook-and-line halibut fishing.</p> <p>Distribute initial rights among historic participants in an equitable manner.</p> <p>Provide for development of halibut fisheries by Bering Sea residents.</p>	<p>The basic share concept preserves present fishing options while creating others, including fishing at preferred times and places, expanding output, and leaving the fishery without losing the economic value of past participation. An optional common property fishery permits those preferring present arrangements to continue as before without economic loss, and, when combined with transfer rules, permits new entry at approximate current entry costs. Other provisions prevent extensive absentee ownership of shares, preclude monopoly control, and allow for halibut fishery development by Bering Sea residents. The proposed allocation framework preserves the status quo for near term participation, and for receipt of income from quota sales. Effectiveness of Alaska programs to promote resident participation in fisheries is enhanced. Equitable allocation depends on choice of a fair and effective decision process for determining allocation, possibly based on principles learned in labor relations and commercial arbitration.</p>	<p>The social consequences of license limitation without fleet reduction will be different from those expected under the share system, or those prevailing today. Geographic, size class and other sectors of the fleet will gain or lose position under open access competition just as they will within the transfer mechanism set up by the share system. But one cannot say in advance what pattern will emerge in either one.</p>	<p>GOVERNMENT BUY BACK</p> <p>Similar in some respects to the individual quota system. Actual consequences would depend on specific buy back rules and criteria.</p>	<p>UNCOMPENSATED REMOVAL</p> <p>Significantly negative social consequences would undoubtedly result from evicting large numbers of fishermen from their established occupation.</p>	
<p>ADMINISTRATIVE/POLITICAL FEASIBILITY</p> <p>Provide for administration and enforcement by existing agencies with minimal increases in staff and budget.</p> <p>Insure that no major user group experiences a significant and uncompensated loss.</p>	<p>New administrative tasks include, entitlement allocation and transfer, quota accounting, and enforcement of accurate catch reporting. These tasks can be accomplished by existing agencies without significant budget increases. Implementation requires further study, including observation of a comparable program proposed for Canada's Pacific halibut fishery. Political opposition based on lifestyle issues is addressed, insofar as possible, by the common property fishery option. Opposition based on demonstrated economic loss is less evident today, but will become more significant when allocation issues are addressed, and its extent will depend, in part, on the perceived fairness of allocation decision making.</p>	<p>CONTINUED OPEN ACCESS</p> <p>Administratively feasible. Political feasibility depends on Council willingness to reverse its recent moratorium decision, and public hearings evidence of substantial halibut industry support for some form of limited entry.</p>	<p>NON-FLEET REDUCING LICENSE LIMITATION</p> <p>Administratively and politically feasible, all evidenced by numerous other Pacific Coast fisheries.</p>	<p>Public costs would undoubtedly exceed feasible general revenue appropriations. Self financed programs would conflict with Office of Management and Budget Policy.</p>	<p>Uncompensated eviction would create substantial and most likely unsurmountable, political opposition.</p>
<p>OTHER OBJECTIVES</p> <p>Provide that royalties from the fishery at least sufficient to cover the program costs may be recoverable at some point in the future.</p> <p>Let the market govern transfer of fishing rights after initial distribution.</p>	<p>Equally achievable under all limited entry options considered.</p>				

Figure 1-1. Evaluation of the Individual Quota Alternative

1.1 MANAGEMENT OBJECTIVES

The objectives governing design of a halibut limited entry program (Column 1 of Figure 1-1) are described in general in the Magnuson Fisheries Conservation and Management Act (MFCMA) and in the North Pacific Halibut Act of 1982. Other more specific statements of objectives either were included in the Council's request for proposals initiating this study or became evident as the study proceeded.

Resource conservation

Resource conservation (achievement of maximum sustained yield on a long run average basis) is implemented by the International Pacific Halibut Commission (IPHC) for the halibut fishery and by Alaska and federal agencies for related fisheries. Conservation is a limited entry objective in the sense that proposed measures should not impede and where possible should support, those conservation programs. In the first instance, limited entry measures should either provide economic incentives for accurate catch reporting by fishermen or, where this is not possible, should provide enforcement measures to minimize the extent of illegal unreported catch. They should also distribute the catch by time and area, both to place equal pressure on all substocks and to produce catch statistics from which stock abundance can be accurately inferred. Finally, measures should insure that, regardless of allocation and transfer provisions, total catch equals current conservation quotas, and that catches can be easily adjusted when conservation considerations dictate changes in either annual quotas or area designations.

Economic efficiency

MFCMA's mandate to recognize economic consideration is interpreted in this instance as calling for the evaluation of limited entry alternatives from the standpoint of their effect on economic efficiency, or the net economic

value of the halibut resource. Net economic value, as defined in economic theory, includes profits to fishermen, processors, and distributors, as well as "consumer surplus," the net value of halibut to consumers.

Net economic value can be increased in several ways through limited entry. Fishing costs can be lowered by reducing the number of vessels and increasing the ability of remaining fishermen to choose times, places, and methods of fishing without regulatory restraint. Processing and distribution costs can be reduced by relaxing regulations that prevent fishermen and processors from arranging the time and place of delivery to their mutual advantage. Net value to consumers is increased when producers are free to market halibut at times, places, and in forms (fresh or frozen) dictated by market demand rather than by fisheries regulations.

From the standpoint of this study, the economic efficiency objective dictates a benefit/cost analysis of the proposed individual quota program to determine, insofar as possible in monetary terms, whether total benefits exceed total costs inclusive of government costs of administration and enforcement.

Social considerations

The mandate to recognize social considerations in the design of limited entry programs is the least well understood of MFCMA's general objectives. In this case, though, prior council guidance gives more specific meaning to that mandate. The status quo distribution of effort by area, vessel size, and user groups is to be preserved by basing initial allocations on historic catch. Allocation, transfer, and other measures are to insure, after transfers occur, that the fishery consists primarily of owner-operators rather than absentee rights holders; that a core of fishermen remains who earn most of their

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annual income from halibut fishing; that monopoly does not result from concentration of rights; and that special consideration is given to the development efforts of certain Bering Sea residents.

Two other social objectives deserve consideration, even though not explicitly mentioned in prior legislative and Council guidance. The first is the recognition of the autonomy of individual fishermen. We know less about the noneconomic purposes of fishermen than about any other dimension of fisheries management. Past and ongoing studies of the social dimension should bring new information. However, in the meantime our current ignorance, as well as general principles of democratic government, dictate a strong preference for measures which relax regulatory restraints on individual action, and an aversion to new restraints on individual choice.

Finding a method for equitably allocating fishing rights will be essential to the success of any limited entry program. While limited entry is not the only management measure with allocative effect, it does involve government more directly than other measures in the allocation of fishing rights and resulting incomes. Hence a commitment to adopt limited entry implies an equal commitment to solve the resulting allocation problem.

Unfortunately, there is no objective way of identifying "fair and equitable" allocation rules. Each fisherman has his own concept of equity, usually one that favors himself and his group over others. We can, however, go further in defining an equitable allocation process than we can an equitable result. Such an equitable process would, if at all possible, involve negotiation among affected parties rather than imposed decisions. But if, as is likely, such negotiations fail to yield agreement, a decision must be made. That decision ought to be made after all parties have had a full hearing and should be made by individuals who are, and are perceived to be,

well informed about the circumstances of the fishery but who have no individual or group interest in the allocation itself.

Administrative/political feasibility

The meaning of administrative and political feasibility, apart from the above considerations, would include at least the following. Administrative feasibility, in this instance, requires that limited entry measures be implementable by existing agencies with minimal additions to staff and budget. In the current fiscal climate, new appropriations are unlikely, regardless of the public benefits they might produce. And, as the halibut fishery is small in terms of catch and value (the 1982 catch of 23.4 million pounds had a landed value of \$25.4 million), the economic benefits of even an extremely attractive limited entry program could easily be consumed by the cost of any substantial additions to management responsibilities.

Political feasibility is an issue whose resolution lies beyond the purview of this study. However, it would seem impossible to achieve that feasibility if either of two cases held true: the first would be substantial opposition by political groups; the second would be any regulation resulting in uncompensated economic losses to a major sector of the industry. However such a provision might be viewed initially, the resultant losses would inevitably arouse sufficient opposition to impede the adoption and implementation of the overall program.

Two final objectives are taxability and transferability of participation rights. Taxability is unlikely to be a factor in choice among limited entry measures. While the Council has no taxing authority, gross and net halibut revenues will be taxable by state and federal governments under any circumstances. While market transferability provisions need not be an inherent element of limited entry, they are a part of most existing programs and have

been included in all the measures considered here. However, market transferability is a social and political issue which will stimulate further discussion as the share system and its alternatives are debated.

1.2 EVALUATION OF THE INDIVIDUAL QUOTA SYSTEM

We now evaluate the proposed individual quota system, including its various options, from the standpoint of resource conservation, economic efficiency, social considerations, and administrative/political feasibility.

Resource conservation

Under the individual quota system described in Chapters 3 to 6, the IPHC's annual area quotas would be assigned to fishermen as transferable individual quotas, based on initial entitlements established when the program is initiated. Transfer provisions and the framework for allocation (specific allocation rules yet to be selected) were designed to insure that legal catches could not exceed the area quotas from which they were calculated. Annual changes in area quotas would be automatically apportioned among permanent entitlement holders. However, management area adjustments would require reapportionment of permanent entitlements according to rules best devised at the time such adjustments are adopted.

Under the current regulatory system the Halibut Commission initially announces a tentative list of season openings along with its area quotas. As the season progresses the Commission determines how many of those openings will actually be permitted, based on daily catch information provided by Commission port samplers. While this system generally keeps the actual catch within conservation quotas, mistakes are inevitable because the daily catch of today's large halibut fleet is so difficult to project. The share system would provide more precise control over harvests. Once an area quota was apportioned, it could not be legally exceeded. With the total thus

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controlled, the Commission's conservation objectives would not be adversely affected by the time that actual catches occur during the suggested March to October season or by whom halibut are caught, as determined by allocation and transfer.

As individual fishermen chose their fishing periods within the eight-month season, total catch would be distributed over a longer period, regardless of ultimate fleet size. This spreading of the catch would continue as long as transactions among fishermen consolidate the fleet into fewer, but longer running, fishing operations. Also with more fishing time, fishermen would be in a better position to explore new areas. All of these changes would benefit resource conservation. Taking the same catch over a longer period and from more areas puts more uniform pressure on all substocks and provides the Halibut Commission with catch data that better reflect overall stock abundance.

This conclusion that the share system would enhance resource conservation must be qualified with respect to unreported, and therefore illegal, catches. Assignment of individual quotas gives fishermen an incentive to underreport their catch so they can continue fishing. This need not be a problem if preventative enforcement is adequate or even if the amount of cheating can be determined. In the latter case the IPHC could, as a last resort, adjust its quotas to account for cheating. Enforcement and Halibut Commission personnel are confident that such cheating would not create conservation problems much more significant than those caused by current out-of-season poaching; that practice, in turn, would be reduced by keeping the season open for most of the year. A further offsetting factor would be provisions enabling other longline fishermen to legally land, and therefore report, catches of halibut that are now discarded.

Economic efficiency

There can be little doubt that the individual quota system would increase the net economic value of the halibut resource, defined to include fishermen, processor and distributor profits, and net value to consumers. In a general sense the nature of these economic benefits can be seen by comparing the economic performance of common property fisheries with agriculture, forestry, mining, and many other extractive industries in which primary producers own the basic resource or lease it on an exclusive basis. Many, if not most, of the problems confronted by fisheries managers originate in the "tragedy of the commons" that results from the absence of similar exclusive rights in the fishery.

This study has identified and, within the limits of available data, quantified the economic benefits likely to result from establishing a comparable exclusive rights system in the halibut fishery by adoption of the quota system. These benefits include reduced fishing and cold storage holding costs, improved utilization of bycatches in other hook and line fisheries, and consumer benefits from the increased availability of fresh halibut. Using a methodology explained in Chapter 5, gross annual economic benefits were found to have an expected value of \$9.3 million. Other summary values are reported, first with and then without, inclusion of a factor that evaluates the costs of a significant enforcement problem. The resulting values are: net benefits, \$8.9 to \$9.2 million; ratio of total benefits per pound of 1982 harvest, \$.44 to \$.46. Other calculations which impose more severe tests of confidence yield lower but still positive economic gains out to the 95 percent confidence level.

Social considerations

Given the variety and complexity of social concerns at issue, it is not possible to defend any overall social comparison of the share system with the status quo or (with one exception noted later) with other limited entry alternatives. However, many of the specific social objectives mentioned earlier can be effectively addressed, either by the share concept itself or by modifications designed for that purpose.

Even without modification to achieve specific social goals the share system reflects the general preference for minimum interference in individual choice by preserving most of the halibut fishermen's present options. With initial allocations based on historic catch, most current fishermen would, depending on the allocation rule, be able to take approximately what they have in past years and, on average, more than they will be permitted to take if open access continues to shorten seasons. They could take those quantities by fishing exactly as they have in the past, or by fishing at times, places, and in ways not currently permitted. Those who wish to increase their catch could still do so, provided they were willing and able to buy the necessary quotas and to make the other capital expenditures required under any system. Others could reduce their catch or sell out their quotas entirely. For those leaving the industry, the only difference would be that under the quota system they would take with them a gain from the sale of their quotas. Many might consider this a fair reward for past efforts; and for now making a decision which would benefit the remaining fishermen and society at large.

Still greater flexibility could be permitted by retaining an optional common property fishery. Under this option, those disliking the process of allocation and exchange established by the share system could elect to refrain entirely from active participation. Instead, they could continue to compete

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among themselves under common property conditions in a fishery that would guarantee them, in aggregate, what they would have received under the share system: that is, an amount which approximately equals their historic catch, and exceeds what they will get under continued open access.

New participants could still enter under the individual quota system. Those wishing to buy permanent entitlements would, to be sure, have to make a substantial front-end investment. But entrants could also lease quotas annually from other fishermen in order to reduce costs during their start-up years. The lowest possible entry cost would result from leasing the shares required to buy into the optional common property fishery. The fisherman willing to do so, and to bear the same risks he would currently face, could start halibut fishing for about what it now costs and, once in the fishery, could catch a quantity determined entirely by his luck and fishing ability.

Other provisions are designed to preserve favored patterns of ownership. These include a ceiling on the cumulative total quotas any fisherman can lease, which prevents long run absentee ownership or the control of several fishermen through leasing arrangements; a ceiling on the size of any single quota ownership which precludes monopoly control; and a three-year exemption for Bering Sea residents which permits that group to continue its current fisheries development initiative.

It is possible that voluntary transfers might eventually lead to changes in the distribution of participation both by vessel size and by geographic area. As proposed here, the share system contains no special provisions to preclude such change. However, since current data are used in determining initial allocations, the present distribution should be protected both for near-term participation and for the receipt of income from initial quota sales.

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While there is no stated federal interest in a particular geographic distribution, the State of Alaska has frequently declared its interest in increasing participation by Alaska residents in Alaska fisheries. Moving from open access to the individual quota system would, if anything, facilitate efforts to achieve this end. Funds received under current or newly devised state financial assistance programs could now be used to help Alaska residents buy into a larger share of the fishery. Gains from such programs would no longer be subject to dissipation due to competition from other fishermen, including those from out of state.

The question of equitable allocation is only partly addressed in this report. The format for allocation described in Chapter 6 has been designed to acknowledge historic catch as the basis for allocation and to conform with IPHC management practices. It provides that quotas be assigned on a management area (2c, 3, 4) basis. Historic (1978-1982) catch would determine, for each management area, who qualifies and the permanent poundage entitlement to be assigned to each qualifying fisherman. Annual quotas would be the product of those individual permanent entitlements and an adjustment factor equal to the IPHC area quota divided by the sum of each area's entitlements. A number of candidate allocation rules set in this format are examined from the standpoint of how they would distribute initial rights by region and by vessel size class.

What remains is to select a single formula relating historic catch to permanent entitlement, and also to deal with other allocation issues such as the current debate over assigning rights to vessel owners or to operators. Historically, making such allocation decisions has been the most difficult of all fisheries management tasks, because they vitally affect the interests of each fisherman and because there is no objective way of resolving them. The

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list of otherwise desirable programs that have faltered for want of an acceptable allocation of benefits is too long (and too familiar to this audience) to require reciting, the most immediate example being the U.S.-Canada salmon negotiations.

What is recommended here is that the Council recognize the crucial nature of its allocation decisions by separating them entirely from the rest of the process for devising and reviewing a limited entry plan. Experience in other policy areas shows that special bodies can be designed to accomplish the essential negotiation, mediation, or arbitration. Valuable guidelines can be found in the experience-tested methods used by government and private groups in commercial arbitration, labor-management relations, and elsewhere.

Administrative and political feasibility

The new administrative functions required to implement the individual quota system can be grouped into categories: entitlement allocation and transfer; quota accounting; and enforcement of catch reporting. Chapters 4, 5, and 6 discuss each in more detail and make tentative recommendations concerning agency responsibilities. Initial discussion with the affected agencies (IPHC, Alaska Commercial Fisheries Entry Commission, and enforcement agencies) indicates that these functions could be carried out with minimal additions to staff and budget. The subjects would, of course, have to be more fully discussed during subsequent phases of limited entry planning. If and when it occurs, implementation of an individual quota system for the Canadian halibut fishery will provide additional information on administrative feasibility and costs.

Political feasibility--the relative freedom from voiced opposition or uncompensated economic losses likely to generate it--is another matter. There is considerable opposition as well as support for halibut limited entry in

general and for the share system in particular. Opposition to the share system, as judged from press and public statements, appears to involve lifestyle rather than what income it produces and who gets it. More specifically, many opponents have declared that current open access arrangements, including short seasons, provide a work and lifestyle they prefer to what they expect would prevail under the share system.

The optional common property arrangement has been proposed here as a response to this lifestyle argument against the share system. It is hoped this measure provides a way to avoid the socially undesirable, and politically difficult, step of forcing all halibut fishermen to take part in a system that some quite evidently dislike. Given the option, fishermen could make their own choice: to participate in the share system or to follow their preference for the present common property competition.

The question of potential economic loss has not, as yet, roused much opposition, nor would one expect it to appear until the issues of allocation are more definitively stated. There may be some merit to deferring choice of allocation rules and the inevitable conflict over "dividing the pie" until other biological, economic, and social goals of this program have been widely discussed and generally understood within the industry.

1.3 ALTERNATIVES

The above discussion indicates that, with further development, a limited entry program based on the individual quota concept could advance, in varying degrees, all of the Council's limited entry objectives as they are stated in Figure 1-1. More to the point, though, is how such a program would compare with license limitation and other limited entry methods that have been applied elsewhere or proposed in the fisheries economic literature. While no in-depth analysis of these alternatives has been attempted in this study, a general

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understanding of the limited entry literature and experience permits the following tentative comparison, again on the basis of resource conservation, economic efficiency, social considerations, and administrative/political feasibility.

To compare the many types of license limitation with the individual quota system we group them into programs which do not reduce the fleet, and those which do so through government purchase (buy-back) or through uncompensated exclusion.* For reasons discussed below we treat the case of no fleet reduction as being similar to continued open access, at least under the circumstances prevailing in today's halibut fishery.

1.3.1 License limitation without fleet reduction

The limited entry programs that now cover the salmon fisheries of Alaska, British Columbia, Washington, Oregon, and California, typify the situation where license limitation is implemented without fleet reductions. This is not precisely accurate, as Alaska and British Columbia excluded (without compensation) some casual participants, and British Columbia and Washington initially experimented with government buy-back. However, fleet reductions were so small that the experience of these fisheries is comparable to the effects to be expected if a limited entry program were to admit virtually all present fishermen via license limitation under a grandfather clause.

Changes in the composition of the Pacific Coast salmon fleet following limited entry also illustrate why license limitation without fleet reduction can be considered equivalent to continued open access, at least from the standpoint of probable future trends in the halibut fishery. With total but not individual catch controlled, license fishermen continued to compete among

*For completeness it should be noted that heavy taxation of fishermen or assignment of the entire resource to a single owner have also been suggested as methods of limiting effort. However, neither would appear to be a viable option under present conditions. -14-

themselves as before. In the early British Columbia program, where a unit of gear was loosely defined, fishermen simply transferred their licenses from small to large vessels. Tighter rules prevented that practice, but not the alternative increases in fishing power that resulted from upgrading engines, gear, electronics, and the like. Nor did those rules prevent casual and intermittent fishermen from going full time or selling their licenses to those better able to do so. The result has been control over the number of license vessels or fishermen, and perhaps a somewhat restrained growth in fishing power, but there is general agreement that effective fishing power now substantially exceeds its pre-license limitation levels and that biological, economic, and other problems created by increased effort have worsened as a result.

For several reasons, the same trends would be likely to occur in the halibut fishery. One is simply the large number of participants--6,264 fishermen (Alaska interim-use permit holders) in 1982. The wide variety of vessel types now in use would also complicate efforts to control upgrading. Also, in recent years the discussion of limited entry has brought in many casual participants eager to establish speculative grandfather rights.

Resource conservation

From a conservation standpoint we can therefore expect the unfortunate trends of the last few years to continue, although at a slower rate than has occurred recently and than can be expected under continued open access. Ever shorter seasons will be set and catches will be more concentrated by time and area, thus focusing effort more sharply on certain substocks and making the Halibut Commission's data base less representative. The projecting of daily catches will also become more difficult leading to more serious errors in setting seasons lengths.

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There will be no incentive to underreport catches (as with the share system), but today's incentive to fish out of season will still be present. Also, as Alaska's salmon programs have illustrated, there will be new problems of license fishermen "sharing" their licenses with unlicensed fishermen, thus possibly biasing the effort component of the biological data base.

Since the current halibut conservation program copes with these conditions today, it can presumably do so in the future as well. And some of the problems might be mitigated by fine-tuning a license limitation program, as this report has done with the share concept. Additional regulation might include further season splitting, trip limits, layups, or other catch-spreading techniques. It might also be possible to divide the fleet into subgroups to fish at staggered intervals. Further analysis is required to determine if such measures could reverse the tentative conclusion reached here, that license limitation would make resource conservation more difficult than today, and more difficult than it would be under the share system.

Economic efficiency

A program of license limitation cannot be expected to produce economic gains due to fleet and harvest cost reductions. Instead, fishermen's profits would decline further as the application of greater fishing power to fixed area quotas increases aggregate costs but not revenues. The same would be true of shorter seasons which further restrict the fisherman's flexibility of operation.

Unless fine-tuning could produce better outcomes, other economic consequences would be equally unfavorable. Shorter seasons would mean higher cold storage costs, reduced fresh market sales, and more discards of halibut not legal for landing by other longline fishermen. To a degree, storage and fresh marketing problems could be addressed by the various season-stretching

devices discussed above. Only further analysis can determine whether such measures could yield economic benefits commensurate with those attainable under the quota system or could keep the halibut fishery's net economic value at current levels in the face of increasing effective effort.

Social consideration

The social consequences of license limitation without fleet reduction will differ both from those expected under the share system, and from those prevailing today. Sectors of the fleet categorized by area, size class, etc., would gain or lose position under the transfer mechanism set up by the share system just as they do under today's open access competition. But one cannot say in advance what pattern would emerge in either event.

Political/administrative feasibility

As to administrative/political feasibility, recent events make it imperative to distinguish again between open access and license limitation without fleet reduction. Both would seem administratively feasible, as open access in the halibut fishery (pending establishment of the moratorium) exists now and license limitation is well represented in other Pacific Coast fisheries. From the standpoint of political feasibility, neither course requires government to directly inflict economic losses on important user groups.

But the Council has already committed itself to some form of limited entry, at least for the duration of the proposed moratorium. And recent hearings indicate, with the exception of Kodiak, overwhelming support for that commitment, albeit with predictable disagreement on the way allocations are to be set, specifically the boat-versus-man issue. To return to open access, the

Council would have to reverse itself and ignore the now fairly clear message from industry which calls for some form of limited entry, regardless of differences over exactly where to go next.

1.3.2 License limitation with fleet reduction

If it were possible, in addition to adopting a license limitation program, to significantly reduce fleet size by either government buy-back or uncompensated exclusion, then many of the conservation and economic gains previously attributed to the share system could be achieved. Reductions in fishing power, however accomplished, would lengthen seasons, increase the profits of remaining fishermen, provide for more uniform harvests of substocks, improve market flexibility, and so on.

However, as one moves to the objectives of social concern and administrative/political feasibility that picture fades. A vessel buy-back program large enough to have any significant effect on seasons would require far more funding than could realistically be expected in the present fiscal climate, and financing such a program by taxing the remaining fishermen would undoubtedly meet with vigorous resistance from the industry. A self-financing buy-back program would also involve the special earmarking of federal revenues, a procedure requiring new legislation of a type historically opposed by the Office of Management and Budget.

The other alternative, evicting large numbers of fishermen without compensation, would seem unacceptable from a social standpoint, and politically at least as unlikely as raising enough money for a major buy-back program. Thus it would appear that, barring invention of some entirely new management techniques, the Council has essentially three feasible alternatives: continue with development of the share system; begin devising,

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from past experience, a license limitation program without fleet reduction; or proceed with the parallel development of both. Regardless of how effective this study may have been in building a case for the share system's overall superiority, it would seem that it makes a convincing argument for including the share system among whatever options the Council decides to pursue further.

STAFF SYNOPSIS

History and Description of the Northeast Halibut Fishery

Most of the world harvest of halibut occurs on the eastern side of the Pacific Ocean, in waters now controlled by the U.S. and Canada. Asiatic halibut make modest contributions to world production. Atlantic halibut were once a significant resource that supported fisheries in both Europe and North America; as late as 1940 there was a directed halibut fishery on the U.S. Atlantic coast as far south as Virginia. Overfishing has, however, considerably diminished Atlantic halibut production in recent years.

The halibut stocks in the eastern Pacific have also varied in abundance. The unregulated period prior to the 1930s saw a substantial decline, particularly in the more accessible fishing grounds off Oregon, Washington, and British Columbia. A U.S.-Canadian management program initiated in 1923 restored halibut stocks to the mid-50s, early-60s peaks reported in Figure 2-4, but thereafter abundance again declined. This time the primary cause was uncontrolled incidental catches by Japanese and Russian groundfish trawlers. The past few years (1975 to the present) give some hope this decline has again been reversed.

THE EASTERN PACIFIC HALIBUT FISHERY

The commercial fishery for Pacific halibut began in earnest in the late 1880s. The earliest halibut vessels were small two-man dories carried to the fishing grounds on larger sailing vessels. Catches were delivered to Seattle, Washington, Vancouver, British Columbia, and later to Prince Rupert, British Columbia.

The major technological change of the early 20th century was development of the diesel powered halibut schooner ranging from 50 to 80 feet in length.

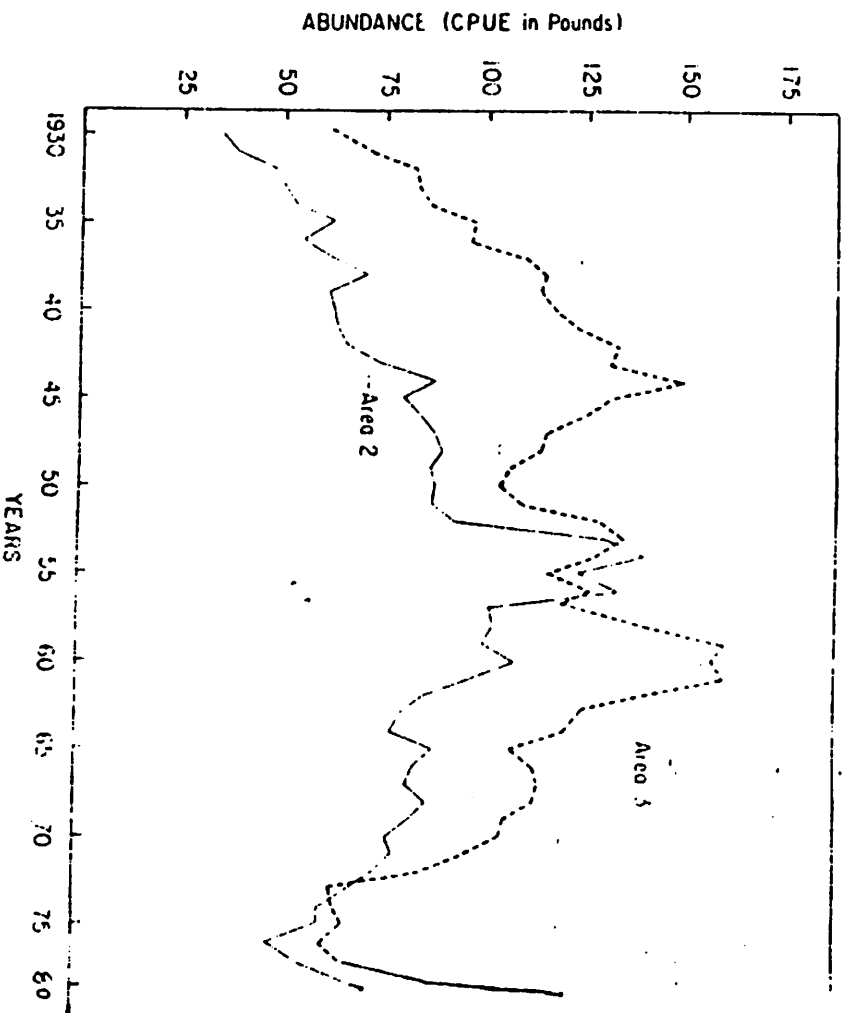


Figure 2-4,
Abundance indicated by setline CPUE in Areas 2 and 3

These vessels were capable of mechanically hauling longline gear directly from the deck, as well as independently running between the fishing grounds and port.

Vessel technology since the 1930s has emphasized diversity. Vessels recently entering the fishery are capable of seining or gillnetting salmon, as well as participating in several other fisheries.

In 1981 the U.S. fleet's 3,210 vessels harvested 20.078 million pounds of halibut. The Canadian fleet's 360 vessels harvested 5.654 million pounds. The number of Canadian vessels is controlled by a license limitation program instituted in 1979. As of this writing, entry into the U.S. fishery is still open, subject only to nominal licensing requirements imposed by IPHC and the State of Alaska. However, the North Pacific Fisheries Management Council has recommended a moratorium on entry with implementation still pending as of the date of this report.

The standard unit of gear in the setline fishery is the "skate," an 1,800-foot section of ground line. Two to ten of these are connected together, anchored at both ends and marked at the surface with buoys, flags, lights or radar detectors. Typically there are one hundred gangions (4 to 5 foot branch lines) per skate, each holding hooks baited with fresh or frozen bait. The groundline is generally left to "soak" for about 12 hours, after which it is retrieved and the catch of halibut gilled, gutted, and iced for delivery to port.

The recent development of snap-on gear means that the gangions can now be removed each time the gear is retrieved, allowing the groundline to be conveniently stored on a drum. This procedure is of considerable advantage to the operators of smaller vessels because it eliminates the need for a crewman

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to coil the line. Snap-on gear also permits the easy adaptation of salmon gillnet vessels to the halibut fishery. Because the gillnetter already has the required drum, he need only replace the gillnet used during the salmon season with groundline for the halibut fishing.

Vessel crews range from one on the smaller boats using snap-on gear to as many as eight on the larger schooners. Many fishermen with the longest history in the halibut fishery are Norwegians whose ancestors moved directly from Norway's Atlantic halibut fishery to the developing Pacific Coast halibut fishery. Recent entrants come from a variety of social, ethnic, and occupational backgrounds and include many "part timers" whose primary income is from other fisheries or shoreside employment.

Halibut fishermen are paid according to a crew share system similar to that in other commercial fisheries. The crew share formula divides gross revenue between expenses, and payments to owners, masters, and crewmen. For the larger boats the crew share formula is established by collective bargaining between fishermen's unions and associations of vessel owners.

Record high halibut catches occurred in 1915 (69 million pounds) and 1962 (75 million pounds). The former was the best of many early years during which the original halibut stocks were being "mined" down by the developing fishery. The latter was the best annual catch produced by the IPHC conservation program. The low points in 1931 (44 million pounds) and 1974 (21.3 million pounds) were the result of prior overfishing. Recent combined U.S. and Canadian catches have been 25.7 million pounds in 1981 and 28.7 million in 1982. Historic annual catches are plotted in Fig. 2-7, along with an IPHC projection of possible future catches by the hook and line fishery. The IPHC

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estimates that the hook and line halibut catch by the year 2000 could be between 35 and 44 million pounds, depending on the incidental catch in other fisheries.

By area, the largest current catches occur off central Alaska (IPHC Area 3, 1981 catch equals 57 percent of U.S.-Canadian total). The second most important area is British Columbia (Area 2B, 22 percent), followed by southeast Alaska (Area 2C, 16 percent). The Bering Sea (Area 4, 5 percent), and finally Washington/Oregon (Area 2A, 1 percent). By country, the U.S. catch dominates (78 percent in 1981).

The major ports for halibut landings are: Prince Rupert and Vancouver, British Columbia; Kodiak, Seward, and Ketchikan, Alaska; and Seattle, Washington. Through a reciprocal landing agreement U.S. and Canadian fishermen are free to land halibut in the ports of both countries. They choose their port by balancing the higher prices ordinarily paid in southern ports against the added time and dollar costs required to get to them. Recent short seasons have made the time factor more important, to the disadvantage of southern ports. For this and other reasons Seward, Kodiak, and Petersburg have gained in volume, with Kodiak leading all ports in 1981, while landings at Seattle and Ketchikan have declined.

The historically modest halibut sport fishery has been gaining ground recently, particularly off central Alaska. Over the period 1977-1981, British Columbia and Washington sport catches were relatively stable, ranging from 17 to 12 and from 17 to 20 thousand pounds respectively. By contrast, Alaska has seen considerable growth, from 437 to 1104 thousand pounds. The sport catch in the Kenai Peninsula/Cook Inlet area alone went from 285 to 517 thousand pounds.

- A=Incidental catch reduced to 50 percent of current levels
- B=Incidental catch maintained at current levels
- C=Continuation of current incidental catch trends

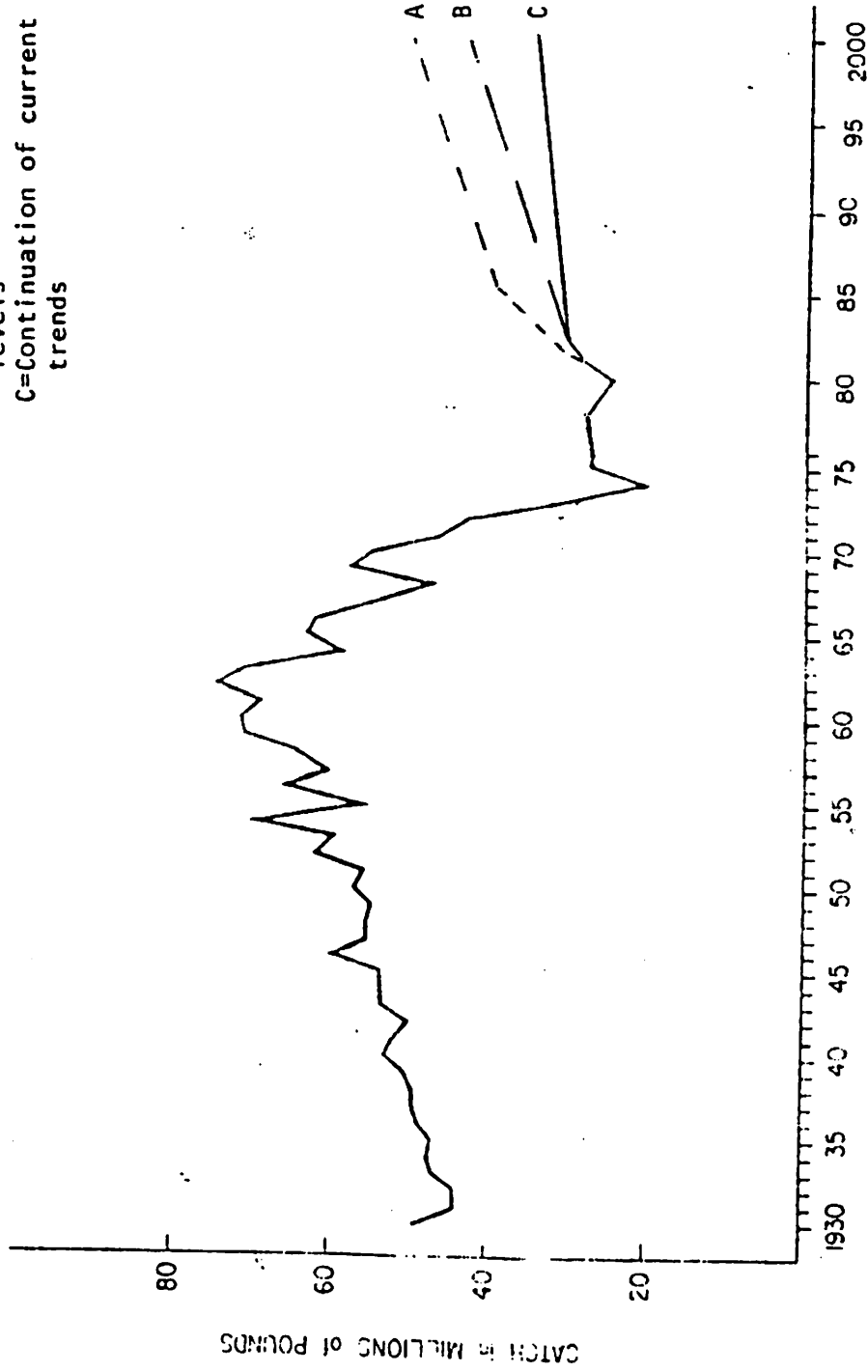


Figure 2-7, Past and projected setline catch of Pacific Halibut.

PROCESSING AND MARKETING

A number of factors other than price determine where and to whom the halibut will be sold. These include time and dollar costs of running to ports, the quality of services available for the vessel and crew, and finally any non-price inducements being offered by processors.

In some cases (notably Prince Rupert, British Columbia, and Bellingham, Washington) halibut are sold to fisherman-owned cooperatives. Under the typical arrangement, the fisherman agrees to sell exclusively to the co-op in return for a guaranteed market. The cooperative makes two payments: an initial payment on delivery, and a post-season settlement calculated to distribute the operation's profits among participating fishermen.

Grading by size and quality also affects prices paid for halibut. Size classes are medium (10-59 lbs), large (60-79 lbs), and "whales" (80- lbs). The small or "chicken" size class (under 10 lbs) was eliminated when the Halibut Commission increased minimum size limits from 26 to 32 inches. Within each size class fish are graded No. 1 or No. 2. Most now fall in the former category, partly due to the fact that split seasons discourage holding halibut on board for long periods. When halibut are graded No. 2 it is usually because of flesh damage (seal bites, etc.) that preclude use of the entire carcass.

The bulk of northeastern Pacific halibut is now landed and initially processed in Alaska, for eventual sale as frozen products in the lower 48 states. The other major U.S. port of landing is Seattle, Washington.

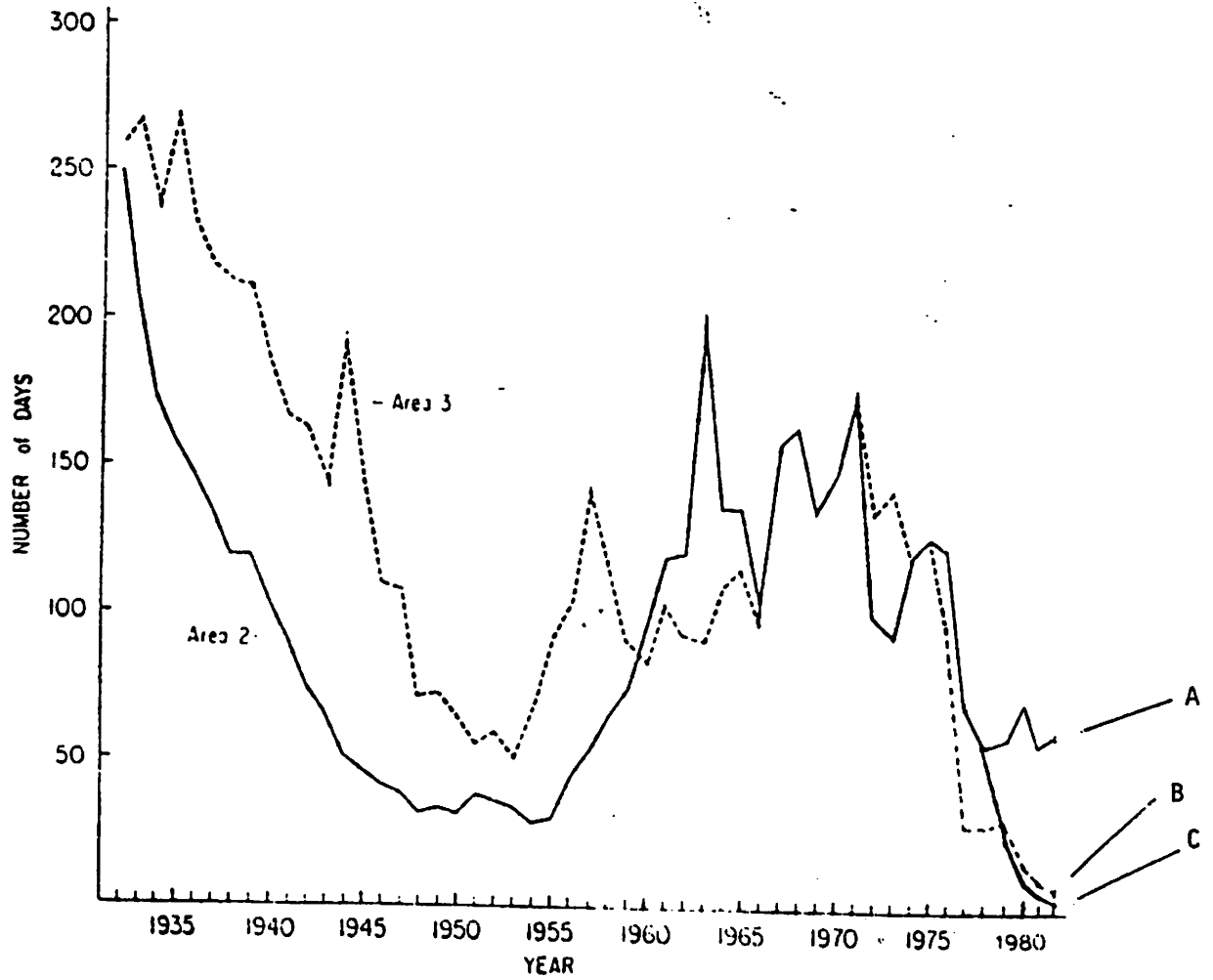
Eastern Pacific halibut dominate U.S. and world production and therefore price patterns. In 1980, eastern Pacific halibut accounted for 67 percent of

world halibut production. In 1981, halibut prices were 96 cents to \$1.17 per pound at ex-vessel level, \$1.80 to \$2.15 at wholesale, and \$3.91 to \$5.54 at retail.

CONSERVATION MANAGEMENT

The eastern Pacific halibut fishery is managed under terms of a U.S.-Canadian treaty that established the IPHC and mandated it to achieve maximum sustained yield (MSY), or the greatest average catch which can be sustained in the long run, given environmental and other factors that determine natural productivity. Historically the IPHC has pursued this goal by setting catch quotas and seasons for the hook and line fishery.

Regulation of the 1982 fishery illustrates the basic system. In 1981, Commission scientists concluded that the next year's surplus production (recruitment less natural mortality) would be 64 million pounds. From this they subtracted the 28 million pounds expected to be caught in 1982 as an incidental catch by fleets over which the IPHC has no control. This incidental catch cannot be retained, but must be returned to the sea. The IPHC also decided to reserve 9 million pounds of the surplus production to increment the stock, in furtherance of the MSY goal. This left 27 million pounds for the hook and line fleet, apportioned into quotas for the major regulatory areas. Given fleet sizes in those areas, a sequence of 1982 openings in Alaska varying from 5 to 27 days was possible; after which area quotas had then been filled, and the fishery was closed for the year. Because the IPHC has no regulatory power over the size of the halibut fleet, its only recourse in the face of fleet growth is to close the season earlier. The resulting decline in season lengths, illustrated in Figure 2-12, is much



1977-1982

- A= Overall US and Canadian season in area 2
- B= Area 3A season only
- C= Area 2 season for US fishermen, or area 2C season.

Figure 2-12,
Length of fishing season in Areas 2 and 3A, 1932-1982

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like that in many other season-regulated fisheries. A variety of factors, including changes in resource abundance and catch per unit effort contributed to changes in season length. However, the major factor was fleet size.

The greatest decline in halibut seasons began with the start of the season regulation during which time the fleet grew from 384 vessels in 1933 to 661 in 1953, and the season declined from 268 days to 52 days.

The industry initiated voluntary layup and trip-limit programs during the 1930s and 1950s to limit this tendency toward short intense seasons. However, both attempts were abandoned, the first during World War II, and the second in 1977 after many new, smaller operators refused to participate. Thereafter, seasons again declined rapidly, culminating in the 1981 situation where 1590 vessels took the quota for Area 2C (Southeast Alaska) in 7 days and 1620 vessels took the quota for Area 3A (Central Alaska) in 13 days.

The incidental harvest of halibut in other fisheries, primarily the groundfish trawl fisheries, is a major conservation problem that largely falls beyond the control of the IPHC conservation program. Trawl-caught halibut are typically smaller than those caught in the hook and line fishery. Incidental catch rates (halibut per hour of trawling) appear to be increasing since the mid-1970s.

Groundfish trawlers from all nations are prohibited from retaining and selling halibut caught in the U.S. and Canadian 200-mile zones. Foreign trawlers, who have until recently dominated the Alaska trawl fishery, are also subject to time/area restrictions designed to control their halibut catch. U.S. trawlers who are increasing their share of groundfish catch are not subject to comparable restraints.

The IPHC's present regulatory system for the hook and line fishery culminates a process which began with a post-World War I initiative to achieve

international (U.S.-Canadian) regulation of the Pacific Halibut Fishery. Negotiations (begun in 1919 by those in the halibut industry concerned about the biological and economic consequences of three previous decades of unregulated fishing) led to a 1923 convention which closed the fishery for a three-month winter period starting in 1924. That convention also established an International Fisheries Commission (renamed International Pacific Halibut Commission in 1953) to study the halibut resource and to recommend further management measures.

In 1928 the Commission presented its recommendations. These included, among other things, establishment of regulatory areas with separate quotas, a vessel licensing program, and Commission control over vessel departures. These measures became the basic halibut management regime mentioned earlier. Notable among these measures was a provision permitting split seasons, which allowed the Commission to spread effort over a longer period. This in turn led to a more even harvest of all substocks, instead of a focus of effort on just those most accessible during the single open season.

More recent changes have adapted Pacific halibut management to the extension of national jurisdiction to 200 miles offshore and have begun the process of limiting entry. In 1979 the U.S. and Canada agreed that 60 percent of the Area 2 quota should be taken by Canadian fishermen in Canadian waters off British Columbia, and the remaining 40 percent by U.S. fishermen in U.S. waters off Washington, Oregon, and Southeast Alaska. Areas 3 and 4, Central Alaska and Bering Sea, became the exclusive preserve of U.S. fishermen. This ended the longstanding practice of allowing both nations' fishermen to compete throughout the IPHC area. In terms of total fishing opportunities, Canadian fishermen were the greater losers.

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Canada's response to this decline in accessible halibut resources and to the recent growth in its halibut fleet was a 1979 license limitation program which limited the fleet to vessels landing at least 3000 pounds in either of the preceding two years. The 1982 Pearce Commission report on Canadian Pacific Coast fisheries also recommended application of the individual quota system to several fisheries, including Pacific halibut.

The U.S. Congress adopted the 1982 Halibut Act which authorized the North Pacific Fisheries Management Council to consider limited entry in the Alaskan halibut fishery.

The Individual Quota Approach to Limited Entry

The problems that caused the North Pacific Council to consider limited entry for the halibut fishery have been with us as long as that fishery has been under any form of management. The IPHC was successful in bringing the fishery back from its depleted condition to nearly maximum sustained yield by the late 1950s; however, as stock abundance and catch rates increased, so did the number of fishermen, repeatedly forcing the Halibut Commission to shorten the season.

Growth in effort has been a major reason for many of the industry's historic economic and conservation problems. This growth has caused fleet overcapitalization and often requires fishermen to operate "flat out" when the season is open, regardless of the state of equipment, personal condition or weather.

More vessels and shorter seasons have also impeded the IPHC's efforts to achieve maximum sustained yield. It is increasingly difficult to decide when seasons should be closed and thus to prevent a large and growing number of vessels from exceeding annual quotas. Data on catch per unit of effort, now confined to a week or two, are more subject than before to transitory influences such as weather rather than stock abundance. Finally, short periods of intensive fishing expose vulnerable substock to overfishing while leaving others unexploited.

EVOLUTION OF HALIBUT LIMITED ENTRY

The North Pacific Council's 1979 decision to begin consideration of limited entry to the halibut fishery led to several specific actions. The first was formation of an ad hoc limited entry working group which designed and reviewed the progress of this study. The Council also proposed a

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moratorium on entry into the halibut fishery. Although not yet approved by the Secretary of Commerce, that moratorium is expected to take effect during 1983.

Federal legislation adopted in 1982 explicitly authorizes the North Pacific Council to implement a limited entry program for the halibut fishery. See Section 5(c) of the Northern Pacific Halibut Act of 1982.

The Council's limited entry study group decided early on to explore more effective limited entry measures than the restrictive licensing programs already in effect in the salmon fisheries of British Columbia and Alaska. Experience has shown that such licensing programs can only retard but not stop growth in fishing effort, or reduce fleet size unless government is also prepared to remove a significant number of fishermen from the fishery through buy-back programs or legislating current fishermen out of the fishery.

To explore alternatives to the licensing approach the North Pacific Council, on recommendation of the study group, chose to focus its attention on the individual quota option concept. This approach has been little used to date, but many who have studied it have concluded that it can achieve a variety of benefits through fleet rationalization, without impairing conservation objectives, and without creating the undesirable side effects resulting from license limitation. The North Pacific Council began further exploration of the individual quota concept by setting the following objectives for a limited entry system:

1. Distribute the hook and line halibut fishery by time and area to ensure resource conservation.

2. Reduce capitalization, thus encouraging development of an economically viable and efficient year-round domestic halibut hook and line fishery that, unconstrained by regulatory seasons,
 - (a) potentially could provide high quality fresh and frozen fish to the consumer twelve months of the year;
 - (b) is made up of owner/operator rights holders; and
 - (c) enables some fishermen to earn a major share of their income from hook and line halibut fishing.
3. Ensure that the costs of administration and enforcement do not exceed the benefits of the program.
4. Provide that royalties from the fishery at least sufficient to cover the program costs may be recoverable at some point in the future.
5. Minimize adverse biological impacts of the program on related fisheries.
6. Ensure that no particular entity acquires excessive control of rights to participate in a fishery.
7. Attempt to be compatible with IPHC objectives.
8. Minimize disruption of the present fleet by using past performance to distribute initial rights.
9. Let the market govern transfer of fishing rights after initial distribution.

As the effort to develop an individual quota system has proceeded, several objections have surfaced. No one, it is argued, should be granted a property right in any fishery, nor should any system be established that protects fishermen from the competition inherent in the present common property fishery.

Small boat fishermen protest that the share system would freeze the distribution of catch just when they have begun to make gains at the expense of larger operators. Others assert that the individual quota system would make fishing so much like other shoreside businesses and occupations that the

unique lifestyle it now provides would be destroyed. In the process, they say, the share system would also close one of the last avenues through which someone without a great deal of money or credit can get into Alaska fisheries. A final concern is that groundfish trawlers historically prohibited from marketing their incidental halibut catch might, under same share system, argue that "their money is as good as anyone else's." That is, if market forces are going to determine allocation among hook and line fishermen, why might they not equally well determine allocation between hook and line fishermen and trawlers.

DEVELOPMENT OF THE INDIVIDUAL QUOTA CONCEPT IN THE ECONOMIC LITERATURE

Early discussions of halibut limited entry alternatives largely eliminated taxation and sole ownership of fisheries on political and social grounds. Restrictive licensing has usually taken the form of a simple moratorium on effort, which merely defers the problem of effort reduction. In some cases, however, initial effort reductions have been attempted by disqualifying some historic participants (in Alaska and British Columbia) or by the government purchase (buy back) of licenses (in British Columbia and Washington).

In most cases, though, the economic performance of restrictive licensing has been disappointing. Because the fishery remains the object of unrestricted competition among licensed fishermen, there has been a tendency to overcapitalize the license fleet. To achieve significant effort reduction, managers must use other measures.

Proposals have been made to divide total quotas among nations in international fisheries, or among individual fishermen in the case of domestic fisheries. These measures are seen as a means to achieve economic efficiency in the fishing industry.

Proposals to allocate quotas among individual domestic fishermen went one step further in the pursuit of economic efficiency by recommending transferable shares. The intent behind this was to permit some participants to buy out others, and thus more efficiently take the allowable harvest throughout a season determined by weather, availability of fish, and other factors. Because this is the economic effect hoped for in the Pacific halibut fishery, we examine it in more detail below.

ECONOMIC THEORY OF INDIVIDUAL QUOTAS

The bare elements of a fishing fleet's response to the current season/quota arrangement in the halibut fishery and the expected response to an individual quota system are illustrated in Table 3-1. Current and potential fishermen are assumed to be identical with respect to both productivity and opportunity costs of participation.

Under season regulation, the fisherman's economic choice is whether or not to participate for the fixed season. He arrives at this decision by estimating daily net revenues (total revenue less variable costs) and comparing their sum over the season with his fixed costs of annual participation. If a significant number of potential as well as current fishermen conclude that the sum of daily net revenues more than covers annual fixed costs then entry will occur and the season will have to be reduced because of the new entrants in order to keep fishing mortality within the allowable quota.

Conversely, if the current season is too short to cover fixed costs exit will occur and the season can be lengthened. In Table 3-1 the equilibrium situation (no entry or exit) occurs where 900 fishermen harvest a hypothetical 10 million pound quota in a 22-day season.

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Now consider implementation of the same quota by allocating it equally among current fishermen in the form of freely transferable individual quotas, rather than by setting a season. Present and potential fishermen can now choose among the entire range of fishing programs described in Table 3-1. The economic goal of each fisherman is to select the most profitable combination of quota transactions and fishing operations open to him, given his own costs and productivity and the willingness of others to trade in quotas.

Over an initial range (20-40 fishing days) the spreading of fixed annual costs over increased output yields a decline in average cost. Eventually, however, increasing daily variable costs dominate, causing average costs to rise. The general economic principle of diminishing returns and, more specifically, the economic alternatives open to diversified fishermen support this conclusion that average costs will reach a minimum rather than decline continuously. Much of the opportunity of participating in the halibut fishery reflects income opportunities foregone in other fisheries or in shoreside employment.

The point of minimum average (40 days of fishing in Table 3-1) would be the economic equilibrium under an individual quota system. Fishermen who select that program can pay up to the difference between price and average cost for quotas; therefore they can, if necessary, outbid fishermen who select other programs. In a reasonably competitive quota market, one would therefore expect the price of quotas to move toward the difference between price and minimized average cost.

In the long term the economic advantages of this arrangement over season regulation will be reflected in the value of quotas and in economic rent earned by fishermen with inherently lower opportunity costs than others. In a sense, many fishermen will break even under either system. But with

<u>Number of Vessels</u>	<u>Catch per day (pounds)</u>	<u>Season length (days)</u>	<u>Total revenue (at 1.50/lb)</u>	<u>Annual fixed Costs</u>	<u>Daily variable costs</u>	<u>Average cost (dollars per pound)</u>	<u>Total cost</u>	<u>Profit</u>	<u>Quota value (dollars per pound)</u>
1000	500	20	15,000	3,000	614	1.53	15,280	-280	-.03
900	500	22	16,500	3,000	615	1.50	16,530	-30	.00
800	500	25	18,750	3,000	616	1.47	18,400	350	.03
700	500	29	21,750	3,000	617	1.44	20,893	857	.06
600	500	33	24,750	3,000	620	1.42	23,460	1290	.08
500	500	40	30,000	3,000	625	1.40	28,000	2000	.10
400	500	50	37,500	3,000	650	1.42	35,500	2000	.08
300	500	67	50,250	3,000	700	1.49	49,900	350	.01
200	500	100	75,000	3,000	750	1.56	78,000	-3000	-.06
100	500	200	150,000	3,000	800	1.63	163,000	-13000	-.13

Table 3-1 Hypothetical Halibut
Vessel Costs
Revenues and Profit

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individual quotas only a portion of the opportunity cost of fishing represents the sacrifice of real economic resources and opportunities. The remainder is represented by quota prices which reflect net economic gains to initial quota holders.

It is within this general framework that we now address specific tasks of share quota program design, benefit cost analysis and allocation.

Recommended Program and Options

This section describes the recommended elements of an individual quota system for the Pacific halibut fishery. Provisions discussed below were developed through discussion with industry leaders, fisheries management officials, and others.

ALLOCATION

No recommendation is made concerning specific individual quota allocation rules. Here we describe only a format for allocation which meets Council objectives of reliance on historic harvest and conformance with the IPHC conservation management program. All allocation options should be structured as follows.

1. Allocations should be based exclusively on recorded historic catch for the period 1978 to 1982, except as specified in the 1982 Halibut Act for certain residents of rural Alaskan coastal villages who fish in the Bering Sea north of 56°N latitude.
2. Assignment of individual catch quotas should proceed in two stages: initial assignment of permanent entitlements with an annual individual catch being calculated by application of an annual adjustment factor. The reader is referred to Table 6-1 of this synopsis for an example of how this allocation approach would work.
3. Permanent entitlements should be allocated on the basis of IPHC management areas rather than Alaska-wide; provision should be

made for automatic adjustment or apportionment of entitlements in the event IPHC subsequently changes management areas or boundaries.

4. Multiple area qualifications should be dealt with in one of the following ways:

- (a) No restrictions. Fishermen with recorded landings in two or more management areas would be allocated entitlements and annual quotas in each area based upon their history of fishing in each area. Fishermen would also be permitted to buy and sell quotas in two or more areas. Misreporting the area of catch would subject fishermen to the same legal penalties as not reporting their catch at all. Such misreporting is most likely to occur between Areas 2C and 3. To prevent this practice, one of the following measures could be adopted.
- (b) Restrictions on transfer. Only the original group of fishermen would be permitted to qualify in both Area 2c and 3. Thereafter, transfers would be permitted only if they reduced the extent of multiple qualification in those two areas. All initially qualified and subsequently entering fishermen would elect one of the two areas in which they could both buy and sell rights. New fishermen would be prohibited from buying entitlements in both Areas 2c and 3.
- (c) Combining initial rights. Under this option fishermen who would have qualified in both Areas 2c and 3 under (a) or (b) could sum their catch in both areas and use it as a basis for entitlement in the area where their historic catch was the greatest. Thereafter no one would be permitted to buy quotas in both Area 2C and 3.
- (d) Rights calculated for only one area. Each fisherman qualifying in both 2c and 3 would be required to elect his desired area of operation. His entitlement and annual quota would then be calculated from his historic catch in that area.

Supporting Analysis

Management area quotas. Assignment of quotas by management area rather than on an Alaska-wide basis seems the most compatible with the conservation objectives of the IPHC. Assignment of quotas on an Alaska-wide basis would allow fishermen to overharvest some management areas and underharvest others.

Multiple area qualification. It would seem that in deciding between these options the tradeoff is between enforceability and equitable treatment of fishermen who have historically fished in two or more areas. Enforcement problems may not be as serious as initially foreseen. In particular, Alaska fisheries officers already enforce a variety of area-type restrictions, notably in the shrimp and crab fisheries. If the enforcement problems should actually prove more serious, it could be dealt with by partly or totally restricting multiple area qualifications.

QUOTA ACCOUNTING

Possible quota accounting methods include a system of deducting overages during a season's harvest from the individual's quota the following season. An underharvest would result in additions to the permitted catch the following year. A system of penalties for overharvest and underharvest above a certain level, e.g., 10 percent of an individual's quota, could also be implemented as an incentive to comply with quota guidelines.

Another method that may be used is to cancel underages at the end of each season and levy fines for any overharvest. This might reflect the view that the flexibility provided by longer seasons is sufficient to allow fishermen to respond effectively to changing in-season conditions.

The recommended system for implementing either of these accounting approaches is a "reverse money" system. This system would require establishment, for each qualifying fisherman, of a checking account

denominated in pounds of annual halibut quota rather than dollars. Landings would be subtracted by writing checks against that balance and attaching them to fish tickets.

In-season transfers would be handled much like second party checks. One fisherman would buy quotas from another and attach the purchased check to his fish ticket, if necessary, along with a check of his own to cover the balance of the landing.

The poundance checks would be cleared through each fisherman's account just as a monetary check is cleared through the bank. And, in similar fashion, penalties or enforcement actions would be initiated against fishermen who overdraw, or otherwise abuse the system.

ENFORCEMENT

The enforcement system proposed would rely primarily on established recording procedures including the IPHC logbook system and the State of Alaska fish ticket system. Failure to comply with reporting provisions would subject fishermen to substantial penalties including, for repeated or flagrant offenses, the permanent cancellation of entitlements.

TRANSFERABILITY

Permanent entitlements would be freely transferable, subject to the following conditions: A limit on the number of shares owned; an individual's entitlement account would designate a single vessel on which fish harvested on that account must be taken; all transactions in permanent entitlements would have to be completed by December 1 of the year prior to their becoming effective.

To discourage absentee ownership, entitlement owners may be required to be present on the vessel whenever a catch is made on their account. This may, however, also restrict fishermen's flexibility.

The transfer of annual quotas between entitlement holders might be permitted anytime during the year of their assignment. Such sales would be recorded through the annual quota accounting system.

Supporting Analysis

In general, entitlement transfers would reflect long run decisions to begin, expand, reduce, or terminate halibut fishing. In-season quota transfers would result from short-term changes in circumstances.

Fishermen could also pyramid their quotas by making in-season transfers by selecting one of their number (who was previously designated a permanent entitlement holder) to fish the entire group's quota.

These transfer provisions should prevent speculative ownership or the amassing of rights beyond the fishing capability of a single vessel. Entitlements and quotas would be owned by an "entity" consisting of an individual and his vessel. The individual who bought more quotas than he actually intended to harvest would run a considerable risk of either losing some portion of those quotas due to the penalty provisions or of being forced to sell them at distress prices near the end of the season.

It may, however, be desirable to restrict or eliminate in-season transfers further in order to more effectively preclude speculation or absentee ownership. Total elimination of in-season transfers would achieve this objective, but at the cost of restricting active fishermen and increasing entry costs. An intermediate approach might be to limit quota sales to 40 percent of the entitlement holder's past five-year total allocation. This would prevent absentee ownership because the owner must actively fish in at least three of any five years.

Other restrictions on transferability might have to be imposed, such as limiting ability to fish in multiple areas. The share system would not

guarantee any long-run maintenance of the present distribution of effort by area and vessel size but market forces should do much to preserve the status quo. To see the reason for this, we must distinguish between two kinds of costs incurred in halibut fishing. Out-of-pocket expenditures such as fuel, bait, ice, interest, etc. will be unaffected by whether an individual is a long time or a new participant. However, foregone income alternatives are unique to each participant with present participants bearing lower opportunity because they only give up the chance to find better employment, while potential new entrants must give up jobs already held. Because of these lower opportunity costs, current participants will have a greater economic interest in holding their quotas than potential entrants will have in buying them out.

APPEALS

Because the agencies that may be given responsibility for administering this program already handle appeals under established procedures, no specific appeal procedures are recommended in this report; however, if necessary, a special appeals board might be advisable.

Supporting Analysis

No specific appeals procedures would be necessary if the Council chooses a clear-cut allocation rule which minimizes the number of hardship cases. To achieve this goal it may be necessary to base entitlements on the best catches over a certain period. It would not then be necessary to explain why events beyond a fisherman's control prevented him from making an adequate harvest during any one of several years. Allocation rules based on the harvest in one specific year would create many hardship appeals. The same is true to a lesser degree of allocation rules based on the average of several years.

Under any rule, disagreements will still arise between fishermen and managers over the accuracy of records, but present appeal procedures should be able to handle this kind of dispute satisfactorily.

TAXATION

The issue of taxation would not seem relevant to this analysis, as the Council has no independent taxing powers.

ADMINISTRATIVE RESPONSIBILITY

The Alaska Commercial Fisheries Entry Commission should be given responsibility for administering those aspects of the program having to do with assignment and transfer of entitlements and quotas, and the IPHC be given responsibility for quota accounting with one of these agencies designated as lead agency for the entire program. Catch reporting would be supervised by existing state and federal agencies as part of their overall enforcement responsibilities.

Supporting Analysis

These recommendations are highly tentative. A separate NOAA legal analysis deals with the question in more detail.

Currently, neither the North Pacific Council nor the National Marine Fisheries Service has the capability to administer a limited entry program.

The IPHC is not subject to personnel limitations currently placed on Federal agencies. Since the IPHC would be involved in quota accounting if the proposed Canadian system is adopted, it seems most efficient that it should consolidate such accounting for the entire halibut fishery. However, under its treaty mandate, the Halibut Commission cannot take responsibility for the allocation issues inherent in the assignment of initial rights and the administration of transfer provisions.

The agency with the most experience in these matters is the Alaska Commercial Fisheries Entry Commission which also maintains the catch, vessel, and license holder data required to make initial assignments of entitlements. To satisfy Alaska's confidentiality rules, any other agency would have to gain access to Entry Commission records through an intermediary.

PROVISION FOR BERING SEA RESIDENTS

The Northern Pacific Halibut Act of 1982 includes a provision for residents of rural coastal villages of Alaska to develop a halibut fishery in the Bering Sea north of 56° latitude. The following provisions are recommended to implement that special provision.

1. The qualification of these residents should be based on pre-1983 residence criteria rather than on historical participation in the fishery.
2. Entitlements and annual quotas should be calculated under the same allocation rules applied to other fishermen, except that one or more of the years 1983-1985 may be substituted for years otherwise included in the allocation formula.

Supporting Analysis

The above provisions, it is felt, reasonably incorporate the letter and spirit of the 1982 Halibut Act that certain rural Alaskan coastal residents may be granted three years to develop a local commercial halibut fishery. One legal point that may arise is exactly which future years should be included in the grace period allowed that group. A generous approach (1983-1985) would be reasonable, as relatively few fish or fishermen will be involved, and because a more restrictive approach (1982-1984) would likely result in litigation.

AN OPTIONAL COMMON PROPERTY FISHERY

Allowing fishermen the option of remaining in a common property fishery is recommended as a way (1) of allowing for individual preferences among

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fishermen; (2) of testing the share concept by experience; and (3) of achieving greater acceptance of, and compliance with, the share system. The proposed system works as follows. After assignment of entitlements, fishermen would be given a choice between participating in the share system or continuing in a common property fishery much like that in effect today.

Those in each area electing not to participate in the quota system would, on an annual basis, surrender their entitlements to a common pool in return for being allowed to continue fishing during a season established as follows. The total quota for the common property fishery would be the sum of quotas held by those electing not to participate in the share system. The IPHC would estimate how long it should take non-share fishermen to harvest the sum of their quotas. Based on these estimates a season (or series of seasons) would be announced during which non-share fishermen could fish without any limits on their individual catches.

Fishermen electing the share system might or might not be permitted to fish during the common property season. But they would still be subject to their annual catch quotas. Catches taken by share fishermen would not be considered in determining the length of the common property season.

Initially qualifying fishermen would be permitted to continue using their present vessels (or vessels of no greater tonnage) in the common property fishery, in return for surrendering an amount of quotas equal to the ratio of total area catch to total area tonnage (e.g., say 800 pounds of quotas per net vessel ton in Area 3). Any fisherman wanting to increase the size of his vessel, or any new entrant, would also be required to contribute to the pool an amount of quotas equal to that ratio.

Supporting Analysis

By providing the common property option it may be possible to satisfy many of the objections raised against the quota system while imposing no losses on fishermen who prefer the share system.

In either the dual option or the status quo, stock abundance would be determined by natural conditions and the IPHC conservation program. Similarly, seasons would continue to be shortened in either type of fishery. However, under the optional common property fishery the decline would be less rapid because of the required ratio between quota contributions and new tonnage. Those electing the optional common property fishery would have access to the same resources for at least as long as under the status quo. Thus fishermen who relish the risk of fishing under common property condition, who feel that they can do better than in the past, or who just don't want to change, can achieve all those aims independently of those who prefer the quota system.

To enter the quota fishery a fisherman would have to buy enough entitlements to allow him to land his expected harvest. By contrast, the same fisherman could enter the optional common property fishery by contributing to the common pool an amount of quotas less than his expected harvest. He would have the opportunity to catch his expected catch, possibly a larger harvest or a smaller harvest.

Entry costs would be even lower if a fisherman were to lease annual quotas and contribute to the common pool because annual quotas would sell for much less than permanent entitlements.

The second advantage of the optional common property fishery would be the opportunity to test the quota system. The analysis reported here indicates that the share system will offer economic advantages to the fisherman who

first choose it. With additional time to catch their quotas and the opportunity to trade quotas among themselves, quota fishermen would be able to plan their fishing to take account of weather, tides, participation in other fisheries, shoreside employment, and other options. They would also have more time to search out higher prices for their catch in existing markets or to penetrate more attractive markets. Other fishermen taking note of these advantages would be expected to opt for the share system the next time around.

If the prospective benefits fail to appear, initial participation would attract no followers. Indeed, they might themselves choose (and be allowed annually) to return to the common property fishery.

This capability to move incrementally toward a new management regime and to learn by doing is almost imperative when one considers the essentially irreversible nature of the step the Council is preparing to take. Once exclusive fishery rights are established under a limited entry system it is unlikely that they could later be significantly altered or canceled.

An optional common property fishery would avoid any such irreversible commitment. Instead, the two systems would coexist, or one or the other would wither away, as determined by the individual choices of fishermen based on their own continuing experience.

Economic Benefits and Costs of the Individual Quota System

This section discusses some of the changes in the halibut industry which are expected to occur if the share system of limited entry is adopted, and the types of economic benefits and costs which would likely result.

The method used for evaluating these changes is known as benefit/cost analysis, or B/C analysis. It has been used fairly widely in situations where a decision must be made concerning whether or not to commit public funds to a

project or activity. Simply put, the method compares two situations: the "status quo," or the current situation before any action is taken, and the situation after the project is undertaken.

Undertaking a major project will necessarily affect industries, individuals, and geographic regions which are in some way related to the project. Building a dam, for example, will provide jobs and increase economic activity in the nearby area during its construction, generate electricity, possibly reduce the habitat or populations of fish and wildlife, and change the nature of recreation activities in its vicinity. Benefit/cost analysis is used to measure and compare the beneficial and adverse economic consequences of the dam, compared to the situation where no dam is built, as an aid to making the decision whether or not to build it.

In the present case, the decision being evaluated by B/C analysis is whether or not to institute a share quota system for the halibut fishery off Alaska. Compared with the current situation in the halibut fishery, the benefits from adoption of the quota share system identified and discussed in this report are: (1) reduced fishing costs; (2) reduced inventory holding costs; (3) increased product value because of an increase in fresh market sales; and (4) better utilization of halibut taken incidentally in other hook and line fisheries. The costs of adopting the share quota system (again, compared to the present condition of the industry), have been identified as: (1) additional public (i.e., government) expenditures on administration and enforcement; (2) the economic cost of unreported catch; and (3) losses due to "hygrading," or throwing back lower grade fish to try to replace them with higher grade fish.

Before discussing each of these benefits and costs in turn, some further comments about benefit/cost analysis might be useful. The actual process of

measuring economic costs and benefits is a difficult one, largely because of limitations in the data which is available. Complex economic models typically must be simplified to be of use in estimation. Even then, there may be questions about the accuracy or representativeness of the data which is used. To help in making the decision, then, it is useful to know how much the data used in the model could be in error without changing the decision which results. That is, if your economic models tell you that benefits of the project are greater than the costs, the project should be undertaken; the question is, how much could the basic data be in error before the costs are greater than the benefits and the project should not be undertaken? This "what if" process of changing values of different variables (usually one at a time) to see how the results change is known as sensitivity analysis.

BENEFITS OF THE SHARE SYSTEM

Reduced Fishing Costs

The share system's effect on fishing costs will be determined by adjustments fishermen make if the current, short seasons are replaced by a longer (say eight months or so) season. With current season lengths, many fishermen's production of halibut is determined (constrained) by the length of the season rather than by economic conditions (cost of production vs. exvessel price). Their fishing in a given area is cut short because of closures before they reach their profit maximizing output, or the point where the cost of catching a halibut just equals the gross earnings received from it. As a result, the average cost of production for these fishermen is greater, and their profits are lower, with short seasons than would be the case if there were not season closures.

With a share quota system, each fisherman would be awarded a permanent entitlement to the resource based on historical participation in the fishery

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(how they are awarded is discussed at some length elsewhere in the report). Each year, a catch quota will be determined for each fisherman, based on his entitlement and the condition of the stocks. The fisherman will have the choice, then, to harvest that amount, increase his catch by buying more quotas, reduce his catch by selling some of his quotas, or not fish at all that year by selling all his quotas (while still retaining his entitlement).

The price of quotas will fluctuate year to year, depending on what the exvessel price and fishery-wide average cost of harvest is. The quota price should be equal (or very close) to the difference between exvessel price and minimum average cost per pound of harvest (excluding quota costs). If it were less than that, more fishermen could figure to make a profit by acquiring and fishing additional quotas from someone else than there would be fishermen willing to sell their quotas. Demand for quotas would outstrip the supply, and the price charged would rise. The point at which demand would just equal the supply of quotas would be when the price of quotas equals the difference between exvessel price and minimum average cost per pound of harvest.

Given this situation, each fisherman would be free of season length constraints to make the business decisions best for himself. Each fisherman's average cost of production would guide him to find the profit-maximizing output. For some fishermen it would involve buying additional quota shares if their average cost of production for those additional shares were lower than the fishery-wide average. Other fishermen might find that they increase profits by fishing less than their annual quota and selling off part of it. High cost producers (those whose average cost of production is higher than the fishery-wide average) might find that they could fish their annual quota and make a profit, but they could make a larger profit by selling the entire annual quota and not fishing at all that year.

The benefits of the share system would be the increased profits of fishermen who are currently constrained by short seasons from finding the profit-maximizing production level, where the cost of producing the last halibut just equals the gross earnings from its sale.

Cold Storage Holding Benefits

The quota system will also affect costs of processing and marketing halibut, particularly cold storage holding costs. Because of the present short seasons, the amount of halibut held in storage far exceeds levels required for orderly marketing. The share system could significantly reduce the levels held in storage.

With very short seasons, most of the annual supply of halibut must be added to inventory rather than being immediately consumed. Larger inventories are more costly to hold than smaller ones, both because of cold storage rates and interest costs to finance the inventory. In the case of self-financed inventories, there is still a cost, which is the foregone interest income of the money tied up in financing inventory.

Without any season constraints, the supply of halibut would be more spread out over the course of the year, as fishermen scheduled halibut fishing around other activities. More halibut could be marketed directly for consumption instead of being added to inventory, thereby reducing the costs of holding frozen product. There would be considerable incentive for processors and fishermen to work together on scheduling deliveries, splitting the savings on holding costs.

Spread-out deliveries of halibut should not increase processing or transportation costs, since the plants which process most Alaska halibut operate year-round to process other species, and would be able to handle small

quantities of halibut without much disruption. Halibut shipments could, if necessary, be combined with other species to ensure that full shipments were made.

Consumer Benefits

A substantial share of the Pacific halibut catch was marketed in fresh form before drastically shortened seasons reduced that practice. Consumers who are willing to pay premiums for fresh-marketed halibut will benefit if fresh halibut becomes available during a greater portion of the year.

Current demand for fresh halibut is less than it will likely be under the quota share system, because it does not now pay retailers and distributors to invest in the necessary equipment and market development efforts with fresh halibut so seldom available. As fresh halibut becomes available more regularly, these efforts will be made and the fresh market should grow. As the market grows, there will be an increase in consumers' surplus associated with the increased marketing of fresh halibut.

Consumers' surplus is the difference between what people are willing to pay for a commodity and what they actually have to pay at the going market

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Consumers' surplus is the difference between what people are willing to pay for a commodity and what they actually have to pay at the going market price. Downward sloping demand means that people are willing to pay higher prices for the first units of a commodity (like halibut), but they are willing to buy increased amounts only at lower prices. At the intersection of supply and demand, where the market price is actually determined, that price is lower than what the demand curve says people would have been willing to pay for the first units purchased. Thus, consumers enjoy a surplus from not having to pay as much as they would have been willing to for the first units; the amount of the surplus is the difference between what they would have been willing to pay

and what they actually paid. Because demand is downward sloping, the consumers' surplus decreases with each successive unit purchased at a given market price. the consumer's surplus for the last unit sold is zero.

One of the benefits of the quota share system, then, is the increase in consumers' surplus resulting from greater marketing of fresh halibut.

Another important benefit to consumers of the quota share system is an improvement in the quality of the frozen fish marketed, because of the shorter cold storage time. The improvement in quality should increase the demand for frozen halibut, and result in an increase in consumers' surplus similar to that described for fresh halibut.

Benefits to Other Hook and Line Fisheries

Another benefit of the quota system would be a reduction in the wastage of halibut caught in other hook and line fisheries. Currently all halibut caught out of season must be discarded (including those taken incidentally to other species), even though many do not survive. Much of this loss could be avoided if incidentally-caught halibut could be landed legally.

The quota share system provides a mechanism for this to occur. Fishermen targeting on other species could land halibut, regardless of when taken, if they had a sufficient quota. Many, like salmon troll fishermen, for example, would be allocated a quota based on historic halibut fishery participation. Others would be in a good position to purchase quota shares, because as multiple-species fishermen, they can reduce their fixed costs of operation by spreading them out over more species. Lower fixed costs attributed to halibut fishing means lower average cost of producing halibut and a greater chance of bidding successfully for halibut quotas.

One important exception might be the trawl fisheries, where for conservation reasons it is expected that the ban on retention of trawl caught halibut will be left in place.

Another benefit of the share quota system, then, is the value of incidentally-caught halibut in hook and line fisheries, times the proportion which, when discarded, do not survive to be caught again in the directed halibut fishery.

COSTS OF THE SHARE SYSTEM

Public Management Costs

Public management costs of the share quota system must be compared with those associated with the major alternatives to the share system, which are continuation of the current open-access system or adoption of a conventional license limitation program like that used for Alaska's salmon fisheries. Four major functions of public management were identified, and the effect of the share quota system on each was compared to the effects of the other alternatives.

(a) Stock Assessment - None of the alternatives change the nature of the IPHC stock assessment activities required for the setting of annual area quotas.

(b) Enforcement - Enforcement activities related to halibut may change significantly depending on which alternative is in place. Under open access or license limitation, there is no incentive to misreport quantities caught during the open season, and no reason to closely monitor individual catch reports; however, with the very short seasons characteristic of these alternatives, there is a considerable incentive to "poach" during the closed period, and a requirement for expensive at-sea patrolling.

The quota share system increases the need for accurate catch monitoring. Since each fisherman must quit when his own quota is reached, there is a strong incentive to misreport or underreport. (See Economic Costs of

Unreported Catch, below). However, with longer fishing seasons, the need for patrolling to deter poaching is reduced.

(c) Catch monitoring - Daily catch monitoring is needed under the open access or license limitation alternatives as a guide to closing the season. The share system should lessen, and possibly eliminate, this need since total catch is controlled by fixing catch per fisherman. The share system would, however, require some revision of the present fish ticket and logbook programs (see the "reverse money" discussion earlier in this report), though costs should not be significant.

(d) Establishment and adjustment of fishing rights - Assignment and adjustment of permanent fishing rights would be similar under quota share and license limitation systems. For a given number of fishermen, the quota share system would generate a larger number of appeals, and adjustments to and transfers of fishing rights, compared to conventional license limitation, since it governs the amount of permitted fishing in addition to access. However, the quota system, unlike conventional license limitation, has incentives which may reduce the total number of fishermen, so the effects on public management costs are partially offsetting. Continued open access would produce the largest number of fishermen but the smallest number of per-capita transactions.

Economic Costs of Unreported Catch

The share system reduces the incentive to fish out of season, or on someone else's permit, but it increases the incentive to underreport catch. It also affords a relatively greater chance of avoiding detection, since the time that the perpetrator is vulnerable to detection is shorter.

An economic model of "rational cheating as a business choice" is discussed. This is useful for estimating the likely maximum level of under-reporting, since it ignores factors such as personal ethics and social sanction, which tend to discourage cheating. The expected value of cheating in this model is the profit from cheating less the penalties paid weighted by

the chance of getting caught. Once the profit from cheating and the penalty for violation are known, the probability of detection required to ensure that "crime does not pay" can be calculated.

Additional enforcement costs might be required to raise the probability of detection to the point where cheating didn't pay. If this were infeasible, the effect of cheating on the health of the resource must be addressed. Underreporting of individual catches would lead to an overharvest of the resource unless it were detected and compensated for. If there are delays in the detection of cheating or the adjustment of harvest levels to compensate for it, the cheating could cause reductions in total physical yield of the resource, since harvest in subsequent years might have to be reduced to rebuild stocks depleted by cheating-induced overharvest. If no mechanism for controlling cheating can be found, it must be offset by permanent reductions in legal harvest.

The economic value of the loss is calculated by adopting prices for these physical gains and losses and an interest rate appropriate for comparing economic gains and losses over time.

Hygrading Costs

Under the quota share system, an individual fisherman catching a lower-priced halibut (a smaller or No. 2 fish) would gain by throwing it back and trying for a higher-valued fish if the difference in gross revenue (the difference in price times the weight of the fish) exceeded the additional cost of catching the higher-valued fish. The discard mortality of these fish represents a loss to society.

RESULTS

Each of the preceding benefits and costs were computed from empirical models described in a separate report. These models compared the share system

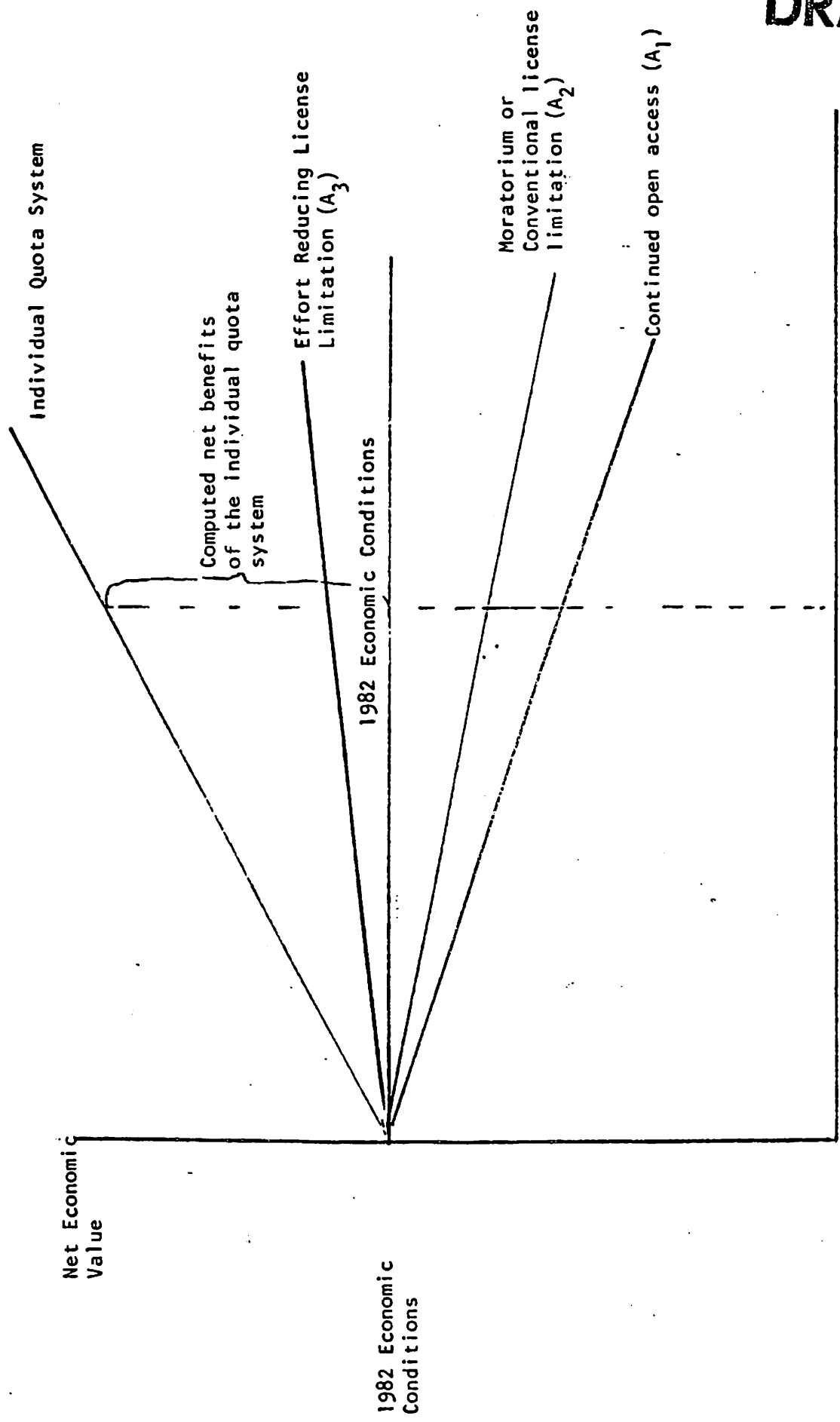


Figure 5-9: Economic Comparison of the Individual Quota System with Major Alternatives

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with present (1983) economic conditions in the halibut fishery. From those empirical models, it was possible to calculate the benefits, costs, the net economic benefits (benefits minus costs), benefit-cost ratio (benefits divided by costs), and net economic benefits per pound of fish landed in 1982. Each of these estimates is reported in Table 5-4.

Using the method of sensitivity analysis benefits and costs were determined at increasingly high confidence levels. Also, for each confidence level, results are calculated two ways: where the costs of unreported catch are included, and where they are excluded. Both calculations are provided because the likelihood of cheating and, therefore its costs depend on ethical and social factors rather than on economic condition. Thus, we can have a 70 percent confidence that the net benefits (with costs of unreported catch) are at least \$5.373 million, and 80 percent confidence that net benefits are at least \$3.644 million. Net benefits are positive under all but the severest (99%) confidence test.

Table 5-4 Net Economic Benefits of the Individual Quota System

	Net benefits		Benefit/cost ratio		Net benefits per pound	
	<u>with unreported catch</u>	<u>without unreported catch</u>	<u>with unreported catch</u>	<u>without unreported catch</u>	<u>with unreported catch</u>	<u>without unreported catch</u>
Sample mean	8.869	9.230	19.477	78.563	.44	.46
Values at confidence of: 70 percent	5.373	6.400	5.542	42.026	.27	.32
80 percent	3.644	5.101	3.226	29.339	.18	.25
90 percent	2.104	4.135	1.94	20.505	.11	.21
95 percent	.856	3.357	1.312	15.046	.04	.17
99 percent	(-)1.179	2.223	.681	8.692	(-) .06	.11

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ALLOCATION

The effects of an individual quota system on the initial make-up of the halibut fleet are examined in this section in terms of specific allocation rules.

A Numerical Example of the Proposed Allocation Format

The mechanics of quota allocations are illustrated by the hypothetical example in Table 6-1. Total harvest before and after implementation of an individual quota system is 20,000 pounds in Area 2c, 100,000 pounds in Area 3, and 10,000 pounds in Area 4.

Three allocation rules are examined in this example. Under the first, a fisherman must have made landings in 1979, 1980, or 1981, a condition all four fishermen satisfy. Each qualified fisherman is then granted a permanent entitlement equal to his best annual catch in the base period. Summing these yields total permanent entitlements of 23,500 lbs. in Area 2, 120,000 lbs. in Area 3, and 16,000 lbs. in Area 4.

Because these amounts exceed the area quotas, an adjustment must be made to keep the actual harvest within those quotas. To do this, each fisherman's entitlement is multiplied by an adjustment factor equal to the ratio of area quota to entitlements. In Area 2 this adjustment factor is $20/23.5 = .851$. As long as the Area 2 quota and total entitlements remain unchanged each fisherman's annual quota would be determined by multiplying each fisherman's entitlement by the adjustment factor.

Under the next rule a fisherman must have made landings in all three years to qualify with each qualifying fisherman's entitlement being his best annual catch during the base period. Permanent entitlements for qualifying fishermen and their adjustment to annual quotas are calculated as before.

Historic catch	Fisherman 1			Fisherman 2			Fisherman 3			Fisherman 4			Total			
	2c	3	4	2c	3	4	2c	3	4	2c	3	4	2c	3	4	
1979	10	30	3	7	40	2	0	20	2	3	10	3	20	100	10	
1980	9	30	2	8	40	4	2	20	4	1	10	0	20	100	10	
1981	10	50	5	7	30	2	2.500	10	1	.500	10	2	20	100	10	
Rule A																
Qualified fishermen	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	4	4	4
Permanent entitlement	10	50	5	8	40	4	2.500	20	4	3	10	3	23.500	120	16	
Annual adjust. factor													.851	.833	.625	
Annual quota	8.510	41.650	3.125	6.808	33.320	2.500	2.128	16.660	2.500	2.553	8.330	1.875	19.999	99.960	10.000	
Rule B																
Qualified fishermen	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	3	4	3	
Permanent entitlement	10	50	5	8	40	4	-	20	4	3	10	-	21	120	13	
Annual adjust. factor													.952	.883	.769	
Annual quota	9.520	41.650	3.845	7.616	33.320	3.076	-	16.660	3.076	2.856	8.330	-	19.992	99.960	9.997	
Rule C																
Qualified fishermen	Y	Y	Y	Y	Y	Y	N	Y	Y	N	Y	N	2	4	3	
Permanent entitlement	9.667	36.667	3.333	7.333	36.667	2.667	-	16.667	2.333	-	10	-	17	100.001	8.333	
Annual adjust. factor													1.176	1	1.200	
Annual qta.	11.368	36.667	4	8.624	36.667	3.204	-	16.667	2.800	-	10	-	19.992	100.001	10.004	

Table 6-1 Illustration of qualification and allocation rules

A = 1979, 1980, or 1981 catch greater than zero.

B = 1979, 1980, and 1981 catch greater than zero.

C = 1979, 1980 and 1981 catch greater than 1000 lbs.

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The final example differs in two respects: fishermen must land at least 1,000 lbs. in each base year, and their entitlement is the average catch over all base years rather than the best year's catch. Entitlements are the lowest under this rule, both because it excludes more fishermen and because average catch is usually lower than the best year's catch.

ANALYSIS OF CANDIDATE ALLOCATION RULES

Fleet Size and distribution

The effect of various allocation rules on the halibut fleet is discussed in this section. Base case (1982 season) conditions are compared with those expected under three allocation rules: Rule A (the most liberal), fishermen qualify if they landed any halibut in two of the years 1979 to 1982; Rule B (the intermediate) requires landings greater than 200 pounds in three of those years; Rule C (the most restrictive) requires landings greater than 500 pounds in each of the years 1979 to 1981.

The total number of fishermen in 1982 was 2,939, rising to 3,205 under Rule A, declining to 1,220 under Rule B, and 589 under Rule C.

The number of fishermen falling into each vessel size class and region follows a similar pattern, Alaska-wide and in Area 2c, increasing relative to 1982, under the most liberal rule, and then declining under more restrictive rules. In Area 3, though, all rules caused decline. Area 4 data is insufficient to reveal a trend.

Under the most liberal rule, Rule A, 2,804 Alaska residents would qualify, compared with 2,594 participating in 1982 and 1,060 under the intermediate Rule B. Finally, 398 non-Alaska residents would qualify under the most liberal rule versus 328 participating in 1982, 160 under Rule B, and 87 under Rule C.

Distribution of catch by vessel size

The way an individual quota system might change the distribution of catch between "small" and large" fishermen is a matter of considerable concern. This distribution is examined in terms of a base year (1982) and under the three rules discussed immediately above. Figure 6-1 illustrates these distributions. In general, Figure 6-1 shows modest changes in the distribution of catch between vessel size groups.

Geographic distribution of catch

The question of how an individual quota system will affect the geographic distribution of rights has much in common with the previous discussion of distribution of vessel size. These distributions are illustrated in Figure 6-2.

OTHER INCOME DISTRIBUTION EFFECTS

Owners and operators

One issue that has been widely discussed in the industry is the allocation of fishing rights between the vessel owner and operator. For sole operator-owned vessels this distinction is of no consequence. However, many halibut vessels, particularly the larger ones, are owned by several partners, and in some cases wholly owned by retired fishermen or other non-operators who lease their vessel or hire operators.

Some segments of the industry have objected to the possibility that the operator may be assigned all limited entry rights. They feel this unfairly deals with non-operating owners. If the licensed operator can take the vessel's limited entry rights with him, he can impose severe losses on non-operating owners, either by walking away from the vessel, or by forcing the renegotiation of income sharing arrangements.

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Crew

If the allocation of rights is to be based on an individual's economic dependence on the fishery, or some notion of what he has earned by past effort, then crewmen should be included in the allocation as well. But doing so would raise many problems of defining who should be included because the identity of crewmen, like non-operating owners, is not easily determined from established record.

For the most part these allocation issues must be addressed as part of any limited entry program. If anything, the quota system provides more flexibility in resolving them, as individual quotas, unlike vessel licenses, can at least theoretically be divided between owners, operators and crewmen, if such a policy were deemed desirable.

The individual quota system will also affect the position of crewmen and their incomes via changes in the structure and operation of the fleet. The first of these possible changes is the effect on the numbers of crewmen. To the extent that the quota system achieves its goals of lengthening the halibut season, it will most likely also lead to a corresponding reduction in the number of vessels and hence crewmen. However, remaining crewmen should earn greater per capita incomes, through longer seasons and reductions in non-labor costs.

Development of hook and line fisheries for sablefish and other groundfish species will provide additional employment opportunities for halibut crewmen. As discussed earlier, the development of these fisheries should be stimulated by adoption of the individual quota system.

The distribution of total revenue between owners, operators and crewmen may change through a share system if the size distribution of the fleet changes. Owner/operators could provide more labor if the season were longer.

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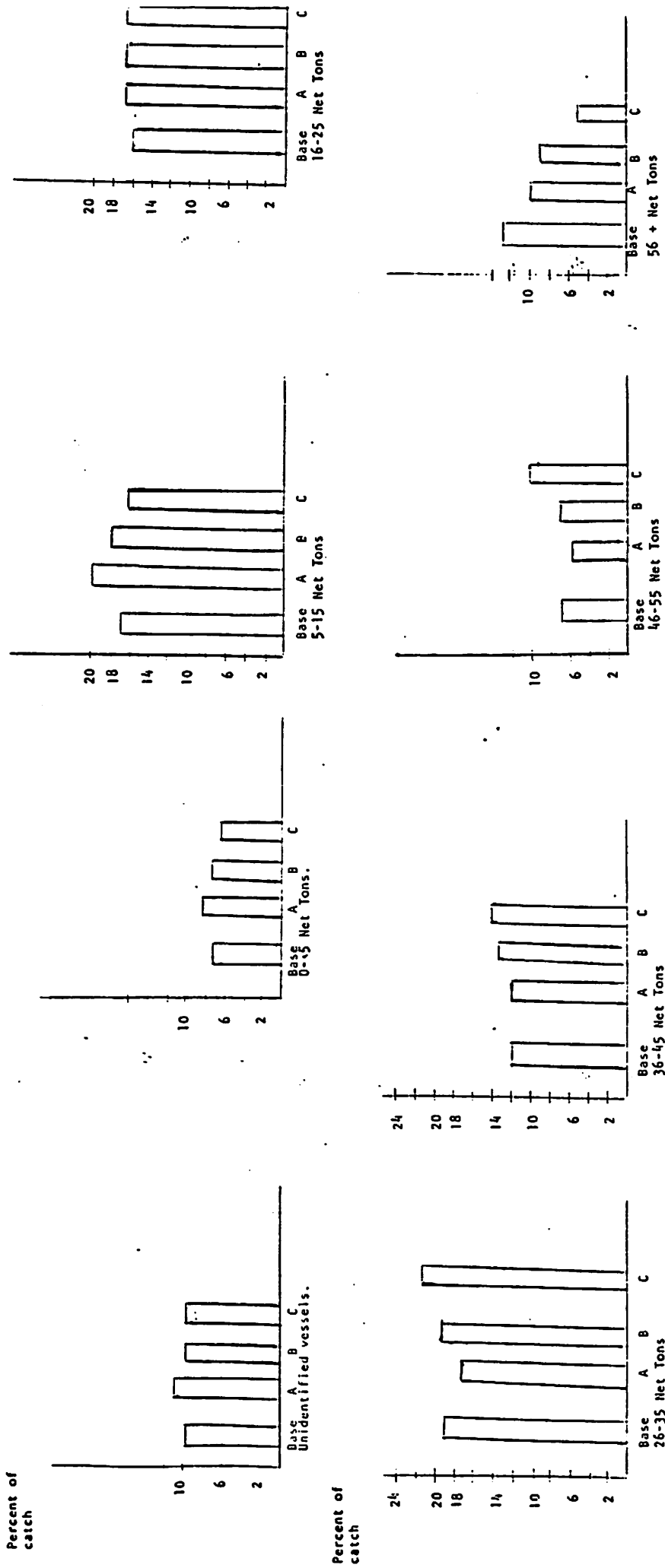
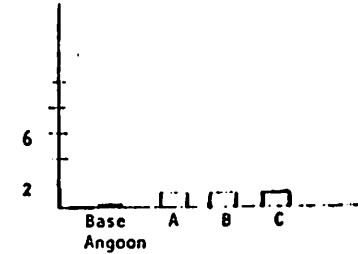
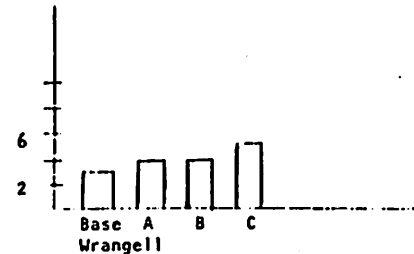
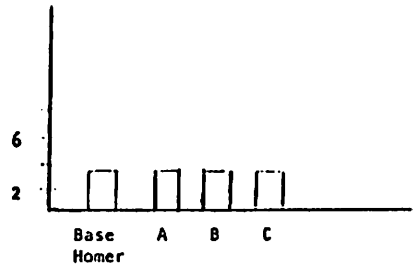
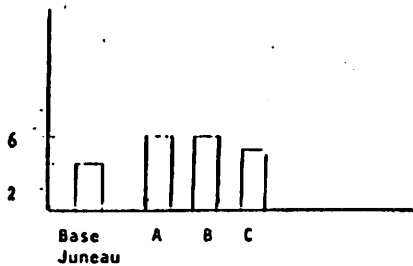
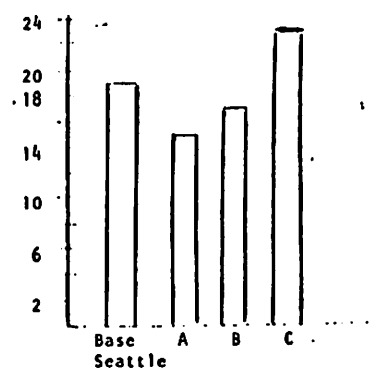
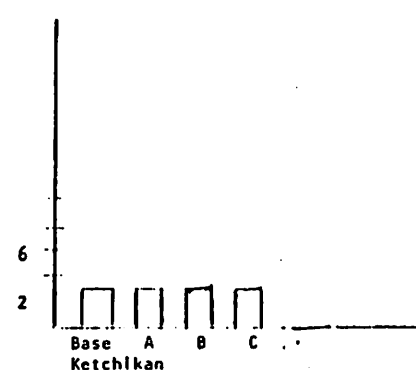
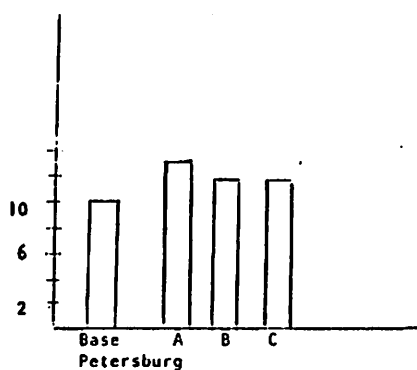
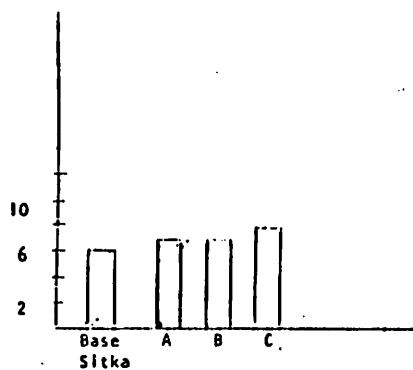


Figure 6-1. Distribution of catch by vessel size class.

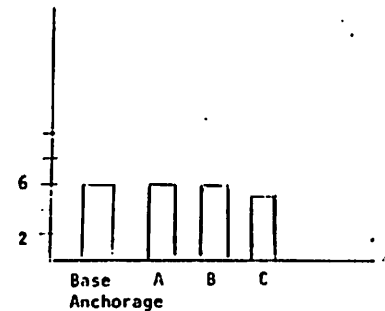
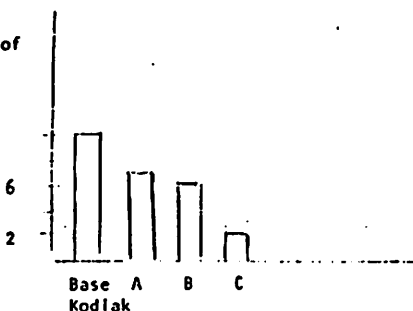
Percent of catch



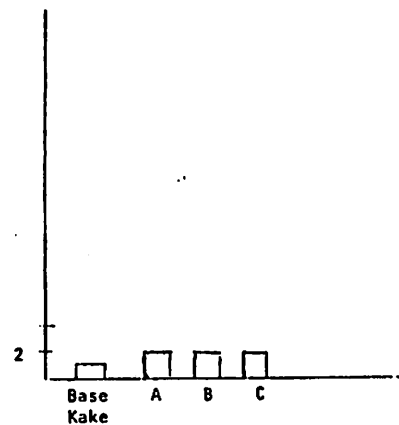
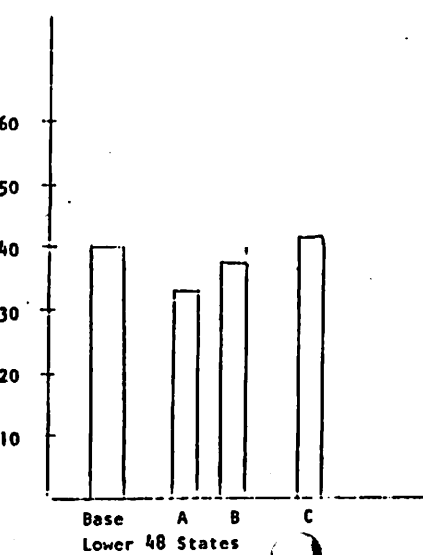
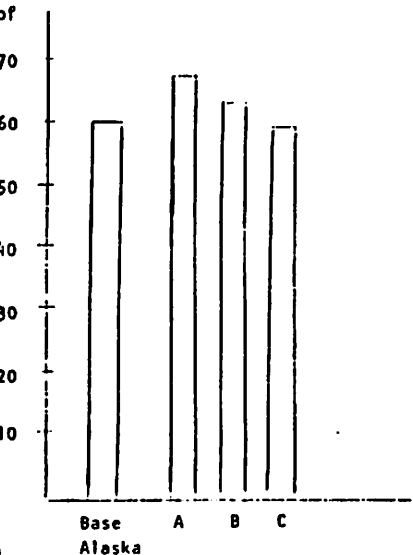
Percent of catch



Percent of catch



Percent of catch



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If the limited entry program and industry collective bargaining agreements permitted, operators might also pyramid their shares on fewer boats, serving in effect as each other's crewmen.

Fishermen, processors, distributors and consumers

Increased product value is the sum of the increased value of fresh products, any quality gains due to reduced storage periods and reduced cold storage and interest charges. A variety of factors will influence how this additional value will be shared between higher prices to fishermen, increased profits to processors and distributors, and increased net value to consumers. That additional value would be shared in a equitable manner determined by free market forces.

Today's short seasons put fishermen under intense pressure to deliver their catch to the closest market, regardless of price. Under the share system's eight month season they could pick and choose among more ports, still balancing running costs against prices, but not giving speed the attention that is now necessary. With months to plan, fishermen could respond to depressed prices (whatever their cause) by seeking entirely new marketing arrangements such as retailing halibut themselves, forming cooperatives, or making deals with entirely new buyers.

Coastal communities

The individual quota system is not likely to have a significant effect on local communities. The effect will be imperceptible in larger cities (Seattle, Anchorage, and Juneau) where the entire local fishing industry makes only a small percentage contribution to the economy. Even in smaller communities (Kodiak, Homer, Petersburg) which depend more heavily on fishing, changes in the halibut fishery are unlikely to be very noticeable. This is

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because of the halibut fisheries small size relative to the salmon and shellfish fisheries, and because most processing and fleet activities will go on in the same places and at much the same levels, regardless of which local halibut fleets gain or lose due to the share system.

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LIMITED ENTRY IN THE PACIFIC HALIBUT FISHERY: SUPPLEMENTAL REPORT

Northwest Resources Analysis
Seattle, Washington

Report to the North Pacific Fisheries Management Council

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List of Figures

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1. Economic theory underlying the consumer surplus approach

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INTRODUCTION

This document supplements the report "Limited Entry in the Pacific Halibut Fishery: The Individual Quota Option." (hereafter referred to as the report) (Northwest Resources Analysis, 1983). Specifically, this document describes the data and computations used to arrive at the monetary benefits and costs reported in Chapter V of the report. Section I below briefly restates the general benefit-cost and sensitivity analysis approach that was adopted. Section II then describes each benefit and cost calculation. Section III reports results and Section IV describes the data and assumptions used to perform those calculations.

I BENEFIT-COST AND SENSITIVITY ANALYSIS

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Halibut production costs and product values would be affected in several ways by a change from the current open access regime to an individual quota limited entry system. The general method of benefit/cost analysis, as articulated in the U.S. Water Resource Council principles and standards (1973) and elsewhere, (Sugden and Williams, 1978) is used here in assessing monetary magnitude of such impacts.

Estimated benefits include reduced fishing costs, reduced inventory holding costs, increased product value due to fresh market sales, and better utilization of halibut taken incidentally in other hook and line fisheries. Estimated costs include additional administrative and enforcement expenditures, the economic cost of illegal, unreported catch, and losses due to "hygrading" (the possible waste of lower grade, but still economically useful, halibut).

The method of sensitivity analysis is adopted as the most feasible and reliable method of estimating these values from available data. In its simplest form, sensitivity analysis produces results for all possible combinations of input variable values. For example, to compute a three-variable benefit or cost model on high and low values of each variable would require all eight calculations. The idea is for the user to inspect all eight cases and determine for himself which best represents reality.

This method cannot, however, be extended without modification to a very large number of input variables. The benefit and cost models employed here embody between 4 and 15 input variables which, by the above method, would require from 16 to 32,768 calculations. Those at the high end would require an enormous amount of arithmetic to compute. More importantly, it would be an

almost impossible task for users to inspect and decide among such a large number of cases.

Hence we modify the above approach by assuming that the full range of sensitivity calculations can be regarded as a normally distributed population, which, if sampled in an unbiased manner, will yield a representative and similarly distributed sample population. This makes the sensitivity analysis of larger models a more reasonable task, both from the standpoint of computation and communication. What is now required is the design and execution of a sampling strategy, and the reporting of results in familiar summary statistics such as the mean and variance of the sample, and the statistical likelihood of particular benefit/cost values.

II BENEFIT AND COST PROGRAMS

DRAFT2.1 Harvest sector benefits

The share system's effect on fishing costs will be determined by adjustments fishermen make if the current, short seasons are replaced by a longer (8 month) season accompanied by individual quantity constraints. The following is a verbal description of the computer program used to estimate those cost reductions. A full discussion of the economic process represented by that program is contained in Section 5.1.1 of the report. In the following and all subsequent programs, variables not defined within the program are the input variables described in Tables 4 and 5.

PROGRAM

Step 1 Determination of vessel class profit per pound under the quota system at zero quota prices. Select the first management area of 2c, 3 and 4, and the first vessel class of 1 to 65 and perform the following calculations.

1. X_{7d} (daily vessel catch rate) = $fct \div (fnu \cdot season)$
2. X_8 (unconstrained vessel quantity) = $day \cdot X_{7d}$
3. X_9 (unconstrained fleet quantity) = $fnu \cdot X_8$
4. X_{10} (halibut capital cost)* = $ccst \cdot hs$
5. X_{11} (annual fixed cost) = $(1 + FXD) [cap \cdot X_{10} + crw \cdot cs]$
6. X_{12} (fixed cost per pound with quota) = $X_{11} \div X_8$
7. X_{13} (fixed cost per pound with season) = $X_{11} \div [X_{7d} \cdot season]$
8. X_{15} (deductions per pound) = $[(day \div tri) ded] \div X_8$
9. X_{16} (profit per pound with quota) = $bs \cdot (hap - X_{15}) - X_{12}$
10. X_{17} (profit per pound with season) = $bs \cdot (hap - X_{15}) - X_{13}$
11. Repeat Step 1 for the remaining 7 vessel classes

Step 2 Determination of demand for individual quotas.

1. Rank the value of X_{16} for all eight vessel classes from low to high and redesignate $P_1 - - P_8$

2. Compute aggregate demand for all vessel classes

2.1 IF $X_{16} \geq P_1$ demand = X_9

2.2 IF $X_{16} < P_1$ demand = 0

2.3 Aggregate demand is the sum of X_{16} over all fleets

Step 3 Determination of market clearing quota price.

1. Compare aggregate demand for P_1 with quota. If aggregate demand is

*Subsequently reduced to values which yield non-negative profits under open access conditions.

less than or equal to quota, designate $P_a = P_1$ and $P_b = 0$.

2. If aggregate demand exceeds quota repeat Step 1 for the next highest price until a price is found at which aggregate demand is less than or equal to quota. Designate that price P_a and the next lowest price P_b .

Step 4 Calculation of benefits.

1. For each vessel class compare P_a with X_{16}

If $P_a \geq X_{16}$, $X_{19} = P_a \text{ fct}$

If $P_a < X_{16}$, $X_{19} = X_{16} \quad X_9 - P_a \quad (X_9 - \text{fct})$

2. For each vessel class compare P_b with X_{16}

If $P_b \geq X_{16}$, $X_{20} = P_b \text{ fct}$

If $P_b < X_{16}$, $X_{20} = X_{16} \quad X_9 - P_b \quad (X_9 - \text{fct})$

3. Compute gain for each vessel class

$$X_{21} = (X_{19} + X_{20}) \div 2$$

$$X_{22} = X_{17} \cdot \text{fct}$$

$$X_{23} = X_{21} - X_{22}$$

4. Total benefit is the sum of X_{23} over all vessel classes

Step 5 Repeat Steps 1 to 4 for the remaining management areas. 2.2 Cold storage holding benefits

2.2 Cold storage holding benefits

The quota system will also affect costs of processing and marketing, particularly cold storage holding costs. Because of the present short season, the amount of halibut held in storage far exceeds levels required for orderly marketing. While the share system would not eliminate this excess, it could significantly reduce it. Economic benefits from reduced cold storage holdings are computed as indicated below, and further discussed in Section 5.1.2 of the report.

PROGRAM

DRAFT

Step 1 SET M = SEASM

Step 2 Compute cold storage holdings under season regulation for each month of the year

STS(1) to STS(12) and as an annual total (STS)

$$STS(1) = (QUOTT \div M) - (QUOTT \div 12)$$

$$STS(2) = STS(1) + (QUOTT \div M) - (QUOTT \div 12)$$

$$STS(M) = (STS(M-1) + QUOTT \div M) - (QUOTT \div 12)$$

$$STS(M+1) = STS(M) - (QUOTT \div 12)$$

$$STS(12) = STS(11) - (QUOTT \div 12)$$

$$STS = \sum_{1}^{12} STS(i)$$

Step 3 Compute annual reductions in cold storage holdings under quota regulation (ST)

Set M = NUQ and repeat Step 2 to compute STQ

$$ST = STS - STQ$$

Step 4 Compute reductions in cold storage holding costs (B)

$$B = \overset{1}{\text{share}} \cdot \overset{2}{\text{yield}} \cdot ST \cdot [\text{Price } W \cdot \text{ints} + \text{hold } C] - \overset{3}{\text{NUQ}} \cdot \text{OPC}$$

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EXPLANATION

Step 1 sets the season length equal to that prevailing under season regulation.

Step 2 computes monthly cold storage holdings under season regulation, and an annual quota.

Step 3 determines the reduction in cold storage holdings due to quota regulation and an 8 month season.

Step 4 determines the reduction in cold storage holding costs due to adoption of the individual quota system.

1. Values calculated in Steps 1 to 3 are based on landed weight of the total halibut harvest. Here they are adjusted to reflect frozen carcass weight and the share of halibut sold in frozen form.

2. Computes the cost per pound/month of cold storage holdings.

3. Subtracts the cost of longer processing plant operation due to longer seasons.

2.3 Consumer benefits

Another benefit of the quota system, insofar as it extends fishing periods, would be an increase in fresh market sales. A large share of the Pacific halibut catch was formerly sold in fresh form, but shortened seasons substantially reduced that practice. Present sales of fresh Atlantic halibut, Pacific and Atlantic groundfish, and troll salmon show the extent to which fresh markets can be developed when deliveries span a sufficiently long period. Consumers who are willing to pay premiums for the fresh-marketed species would benefit if Pacific halibut regained its position as a fresh market product. These consumer benefits are estimated below by what are described as the consumer surplus and margins approach. Each is more fully

explained in Section 5.1.3 of the report.

Figure 1 illustrates the changes in the fresh halibut market which are expected to occur as a result of adoption of the individual quota system. Due to longer periods of availability, monthly demand for fresh halibut will shift from D_0 to D_1 . In any month during which fresh halibut is already available, this shift will increase consumer surplus by the amount $A'B'C - ABC$. In months when fresh supplies are not currently available the gain in consumer surplus will be the full amount $A'B'C$.

Assuming linear demand we can calculate these consumer surplus changes from information on present prices and quantities, assumptions about the horizontal shift ($B - B'$) and the elasticity of present demand N .

By the definition of demand elasticity ($N = \frac{dq}{dp} \frac{P}{Q}$) we can express the slope of the demand curve as $\frac{dp}{dq} = \frac{P}{QN}$. This slope is numerically evaluated at (P_0, Q_0) in Figure 1 and assumed to remain constant along both D_0 and D_1 .

The vertical height of the consumer surplus triangle ABC is the increase in price obtained by reducing quantity to zero:

$$P_1 - P_0 = \frac{dp}{dq} Q_0$$

Hence the area ABC is:

$$\frac{1}{2} \frac{dp}{dq} Q_0^2$$

similarly the area $A'B'C$ is:

$$\frac{1}{2} \frac{dp}{dq} Q_1^2$$

These expressions and other variables described in Tables 4 and 5 permit calculation of consumer benefits in the following manner.

DRAFT

PROGRAM

Step 1 Compute component variables

$$\text{slope} = \text{HAP} \div (\text{Elasf} \cdot \text{QUN}) = 1$$

$$\text{Time} = \text{NUQ} - \text{SEASM}$$

$$\text{NUQUN} = (1 + \text{GAIN}) \text{QUN}$$

$$\text{NUQUNS} = (\text{NUQUN})^2$$

$$\text{QUNS} = (\text{QUN})^2$$

Step 2 Compute benefits via the consumer surplus approach (B_1)

$$B_1 = \text{SEASM} \cdot \frac{1}{2} \cdot \text{slope} (\text{NUQUNS} - \text{QUNS}) + \text{time} \cdot \frac{1}{2} \cdot \text{slope} \cdot \text{NUQUNS}$$

Step 3 Compute benefits via the margins approach (B)

$$B_2 = [(\text{Price} - \text{hap} - (\text{cost})) \cdot (\text{seasm} \cdot \text{gain} \cdot \text{gun} + \text{time} \cdot (1 + \text{gain}) \cdot \text{gun}]$$

Step 4 Compute the final benefit value as the probability weighted sum of consumer surplus and margins approaches (B)

$$B = \text{Prob} \cdot B_1 + (1 - \text{Prob}) \cdot B_2$$

EXPLANATION

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Step 1 Define component variables

Slope $\frac{dp}{dq}$ is calculated from present prices (HAP) and quantities (QUN) and a demand elasticity (ELAS).

Time is the additional months of fresh market demand which result from adoption of the share system.

NUQUN is monthly fresh market demand (at current prices) resulting from adoption of the share system and longer seasons (Q in Figure 1).

Current and expected fresh market sales at present prices QUN and NUQUN are squared to facilitate subsequent calculations.

Step 2 Calculates consumer benefits via the consumer surplus approach

1. These terms calculate the area A'B'C - ABC during months that fresh halibut are already available. In terms of Figure 1 and the preceding discussion that gain in consumer surplus is: gain = (length of current season) · [1/2 · A'B'C - ABC]

$$= (\text{length of current season}) \left[\frac{1}{2} \cdot \frac{dp}{dq} \cdot Q_1^2 - \frac{1}{2} \cdot \frac{dp}{dq} \cdot Q_0^2 \right]$$

$$= (\text{length of current season}) \frac{1}{2} \cdot \frac{dp}{dq} \cdot (Q_1^2 - Q_0^2)$$

substituting program variables into the last of the above expressions yields the first segment of the Step 2 expression for B₁.

2. These terms calculate the area A'B'C during months that fresh halibut are only available under the individual quota system. In terms of Figure 1 and the preceding discussion that gain in consumer surplus is:

$$\text{gain} = \left(\begin{array}{l} \text{added months of availability} \\ \text{(due to the share system)} \end{array} \right) \cdot \frac{1}{2} \cdot \frac{dp}{dq} \cdot Q_1^2$$

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substituting program variables into this expression yields the second segment of the Step 2 expression.

Step 3 Calculate consumer benefits via the margins approach

1. These terms calculate the increase in economic value that results from shifting a pound of halibut from the frozen to fresh market; and subtract the harvest sector costs of such a shift.

2. These terms calculate the increase in fresh market sales during the current season. In terms of Figure 1 they incorporate the effect of the horizontal demand shift $B \rightarrow B^1$.

3. These terms calculate the increase in fresh market sales during months that fresh halibut are only available under the individual quota system. In terms of Figure 1 they reflect the quantity Q_1 .

Step 4 This expression computes consumer benefits (B) as the sum of results calculated via the consumer surplus and margins approach; as weighted by the relative likelihood (PROB) that each is a valid estimation technique.

DRAFT2.4 Benefits to other hook and line fisheries

Another benefit of the quota system would be a reduction in the wastage of halibut caught in other hook and line fisheries. Currently all halibut caught out of season must be discarded, including those taken incidental to other legal species. Although many of these halibut will not survive to be caught again, such a rule is essential if season closures are to be the primary conservation tool. Otherwise, fishermen could circumvent season closures by ostensibly seeking some other species while actually targeting on halibut.

Much of this loss could be avoided if total catch were controlled by issuing quotas, rather than through season closures. With two exceptions, managers would then no longer be concerned about when, or by whom, the total is taken. A notable exception would be incidental halibut landings by trawlers. For conservation and other reasons, the ban on retaining trawl-caught halibut would presumably continue if the quota system were adopted. A second, but minor, exception would be an expected conservation closure during the November-February spawning period. This closure should have an insignificant effect on incidental catches, as little hook and line fishing for other species occurs during that period.

Benefits from the utilization of halibut caught in other hook and line fisheries are estimated below and further explained in Section 5.1.4 of the report.

PROGRAM

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$$B = \left[\frac{\text{QTRDL}}{4} + \text{QBC} + \text{QPC} + \text{INC} \cdot (\text{HAP} - \text{PRQ}) \cdot \text{ELAS} \cdot (\text{QBC} \div \text{PRS} + \text{QPC} \div \text{PRPC}) \right] \cdot \text{INC} \cdot \text{MORT} \cdot \text{HAP}$$

EXPLAIN AT IDN

1. These terms introduce the current hook and line catch of troll salmon, black cod, and Pacific cod. Troll salmon catch is divided by 4 to reflect a much lower incidental catch rate than that which prevails in hook and line groundfish fisheries.

2. These terms introduce the added revenue per pound of hook and line catch that results from marketing halibut which are now discarded. INC is the volume of halibut taken per pound of target groundfish catch. (HAP - PRQ) is added revenue from each pound of halibut incidental catch, net of the price of individual quotas necessary to market incidentally caught halibut.

3. These terms introduce the increase in quantity black cod and Pacific cod landings expected to occur due to additions of net revenue. No troll fishery increase is expected due to resource constraints.

From the definition of supply elasticity ($N = \frac{dp}{dq} \frac{P}{Q}$) we see that the slope of the supply curve (here assumed to be linear) is $N \cdot \left(\frac{Q}{P}\right)$. Further the expected quantity response of a price change (dq) is $\frac{N \cdot Q}{P} dp$. As the two species are assumed to exhibit the same supply elasticity the sum of their quantity increases would be given by the following:

$$dQ_{BC} + dQ_{pc} = N \frac{Q_{BC}}{P_{BC}} + N \frac{Q_{pc}}{P_{pc}} = N \left(\frac{Q_{BC}}{P_{BC}} + \frac{Q_{pc}}{P_{pc}} \right)$$

substituting program variables into the latter expression yields the third segment of the above expression for incidental fishery benefits.

4. These terms introduce the economic value, (per pound of groundfish landings) of incidentally caught halibut which could be marketed rather than being discarded to die at sea.

2.5 Public management costs

Assessing the public costs of the quota system is a more complex task than just estimating its separable costs of implementation and enforcement. Such an approach would be appropriate only if the quota system were an add-on to otherwise unchanged management practices.

A more realistic way of viewing the costs of the quota system is to look at how it will effect the entire role of government in regulating the halibut fishery. The quota system represents but one of several alternative paths that could be chosen. Hence, an appropriate measure of government's costs would be total costs of managing the fishery, for conservation and economic purposes, within the context of the share system as compared with total costs under the major alternatives. This approach to public cost estimation is implemented below, and further explained in Section 5.2.1 of the report.

PROGRAM

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$$C = \overset{1}{QC} - \overset{2}{BC} \cdot \overset{3}{BCS} - \text{PROBA} \cdot \text{ACS} \cdot \text{QC}$$

EXPLANATION

1. This term introduces the administrative and enforcement costs of the individual quota system.

2. The first of these terms introduces base costs, the cost of all administrative and enforcement activities associated with the halibut fishery conservation and management, other than limited entry program costs. The second term introduces the percent savings in base costs likely to occur due to adoption of the individual quota system.

3. The first term introduces the probability that rejection of the individual quota system will lead to adoption of an alternative limited entry program. The second and third terms introduce the cost of such an alternative program.

2.6 Economic costs of unreported catch

Another effect of the quota system that must be counted as a cost is the adverse economic effect of the cheating it may stimulate. The share system would reduce some forms of cheating (out of season fishing and the landing of fish on someone else's permit). But it would also provide an incentive for underreporting of catch. While the net effect might be either an increase or a decrease in the amount of cheating, the following analysis assumes a net

increase. How such cheating would impose economic costs on the fishery is explained further in Section 5.2.2. Calculation of those costs is accomplished below.

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PROGRAM

Step 1 Calculate private net benefits from cheating

$$PNB = PRQ \cdot QI - PRBC [Fine + PROBR \cdot (PRQ + RENT) \div INT]$$

If $PNB \leq 0$ cost of cheating equals 0

If $PNB > 0$ cost of cheating is calculated as follows

Step 2 Calculate discount factors for social gains and losses from cheating

$$DISCL = (1 + INT) \text{ Power } (TDET + (TREST - TDET) \div 2)$$

$$DISCG = (1 + INT) \text{ Power } (TDET \div 2)$$

Step 3 Calculate (in quantity terms) the present value of the social cost of cheating, assuming certainty of a delayed management response

$$SNC = (CONSP \cdot CHEAT - TDET) \div DISCL - (CHEAT \cdot TDET) \div DISC$$

Step 4 Calculate (in dollar terms) the present value of social costs of cheating, assuming some probability of a delayed management response

$$C = SNC - PRBD \cdot HAP$$

EXPLANATION

The above program reflects the view that cheating (underreporting catch) only imposes an economic cost if it is likely to occur (i.e. is privately profitable), and if it is not promptly detected and responded to by the management agency. An immediate management response in the form of offsetting reductions in legal catch would transfer catches from honest to dishonest fishermen. While this would result in a clearly undesirable income transfer, it would not necessarily reduce net incomes to the fleet as a whole.

This approach is implemented by first calculating the private benefits and costs of cheating in Step 1. Then (Steps 2 and 3) we calculate (in quantity terms) the present value of social costs if cheating occurs, assuming certainly of a delayed management response. For purposes of this calculation an arbitrary assumption is made concerning the amount of cheating, time periods required for detection, management response and stock recovery. Finally, (Step 4) we adjust the results to reflect less than certainly of a delayed response, and convert quantity losses into dollar losses.

2-7 Hygrading costs

A final cost of the individual quota system is the incentive it creates to "hygrade." That is to discard lower valued fish. These would be smaller or No. 2 halibut which sell at a discount. From the standpoint of society, and of fishermen without an individual quantity constraint, it would still pay to land such fish once they have been caught, except in the unlikely event that they are worth less than the nominal cost of dressing and storing them prior to sale.

Under the quota system, however, the private opportunity cost of landing lower priced halibut would also include the price of quotas which must be expended to land them. Because of that additional cost fishermen could, under some circumstances, find it profitable to throw lower valued fish back; even though, from a social standpoint, their net worth would still be positive. This cost is estimated below and explained in more detail in Section 5.2.3 of the report.

DRAFT

PROGRAM

Step 1 Calculate private benefits of hygrading

$$PV = PRH2 - PRQ$$

Step 2 Calculate social costs of hygrading

$$\text{IF } PV > 0 \quad C = 0$$

$$\text{IF } PB \leq 0, C = PRH2 \cdot NU2PC \cdot QUOTT$$

EXPLANATION

Step 1 Computes the private value of number 2 halibut as their price less the cost of quotas required to land them.

Step 2 If the private value of No. 2 halibut exceeds the price of quotas required to land them ($PV > 0$) hygrading will not occur, and its social cost will be zero.

If hygrading occurs ($PV \leq 0$) then its social cost will be approximately the economic value of the No. 2 fish discarded.

III. RESULTS

The summary results discussed below compare projected economic conditions under the share system with present (1982) conditions in the halibut fishery. The calculations leading to them were performed by using the modified sensitivity approach discussed at the beginning of this report. Table 4 lists each of the input variables and indicates the programs in which it was used. R in Table 4 means that the low range value of the variable was run along with 5 randomly selected high or low values of the remaining variables in the program to yield 5 benefit or cost calculations. F means that both high and low values of the subject variable were each run in combination with all possible combinations of other variables.

For example the cold storage benefit program includes a total of 10 variables, 3 run randomly and 7 in full. Thus 143 separate runs of the previously discussed program were required ($3 \cdot 5 + 7 = 143$). In this case, then, the results reported below are statistics calculated from a sample of 143 observations. Other programs were computed in similar fashion to yield the results reported in Tables 1 and 2.

With these statistics in hand the next step was to calculate summary measures of the quota system's economic performance: net benefits, benefit cost ratios, and net benefits per pound of 1982 harvest, as reported in Table 3. In each case tests are applied that permit these results to be reported with 50 to 99 percent confidence. All these summary measures are computed with and without the cost of unreported catch.

The test most favorable to the share system is that which excludes cost of unreported catch and reports other benefits and costs at their respective means: that is, at values which have an equal likelihood of being over or underestimates. On that basis the share system's benefits of \$9.3 million exceed costs of \$.1 million by a net amount of \$9.2 million. The result is a benefit/cost ratio of 78.6 and net benefits per pound of 46 cents. The cost of unreported catch increases total costs to \$.5 million, thus reducing net benefits to \$8.7 million, the benefit/cost ratio to 19.5, and benefits per pound to .44 cents.

Applying more severe confidence tests necessarily reduces each of these summary measures of economic performance. This is because each requires selection of lower benefit values which have, respectively, a 70 to 99 percent chance of being underestimates, and of higher cost values which similarly have a 70 to 99 percent chance of being overestimates. But, by making such selections, we can assert that our summary statistics have a 70 to 99 percent chance of being at least as favorable as the values reported in Table 4.

For example, the benefit/cost ratio (without cost of unreported harvest) will exceed 42.0 with 70 percent confidence and 8.7 with 99 percent confidence. In each case the value greater than 1.0 implies that the quota system will improve the net economic value of the halibut resource. Including the cost of unreported catch permits such a determination to be made out to the 95 percent confidence level, where we can conclude that the benefit/cost ratio is greater than 1.3. The last, and most severe, test required to assert 99 percent confidence yields a benefit/cost ratio of only 0.7, less than the 1.0 required to demonstrate a gain in net economic value.

III DATA AND ASSUMPTIONS

The data inputs required to implement each of the above benefit and cost programs were obtained from project files, an earlier study of halibut limited entry (Tetra Tec, 1981), and interviews with halibut industry and management personnel.

Table 4 identifies each variable and indicates the programs it was used in. It also indicates whether the variable was subjected to full sensitivity analysis (F) or random selection,(R) as discussed above.

Table 5 describes each variable and indicates the range of values used. The notes following Table 5 indicate sources for each variable, and the basis upon which assumptions were made concerning the adopted range of values.

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Variable Name	Harvest Area 2c	Benefits Area 3	Benefits Area 4	Cold storage holding benefits	Consumer benefits	Benefits to other hook and line fishermen	Public management costs	Economic costs of unreported catch	Hygrading costs
ACS									
BC							F		
BCS							F		
BS	R	R	R						
CAP	F	F	F						
CCST	F	F	F						
CHEAT								R	
CONSP								F	
COST					F				
CRW	F	F	F						
CS	R	R	R						
DAY	F	F	F						
DED	R	R	R						
ELAS						F			
ELASF					F				
FCT	R	R	R						
FINE								F	
FNU	R	R	R						
FXD	R	R	R						
GAIN					F				
HAP	R	R	R		R	F		R	
HOLDC				F					
HS	F	F	F						
INT						R			
INTC				F				R	
MORT						F			
NU2PC									F
NUQ				F	F				
OPC				R					
PRBC								F	
PRBD								F	
PRH2									F
PRICF					F				
PRICW				F					
PROB					F				
PROBA							F		
PROBR								F	
PRPC						F			
PRQ						F			
PRS						F			
QBC						R			
QC							F		
QT								R	
QPC						R			
QTRQ						R			
QUOTA	F	F	F						
QUOTT				F					F
QUN					R				
RENT								F	
SEASH				F	F				
SEASON	F	F	F						
SHARE				F					
ST				R					
TDET								R	
T								R	
YIELD	R	R	R	R					

Table 7 Input Variables

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Variable Name	Description	Source	Units	Range	
				High	Low
ACS	Cost of alternative limited entry programs as a percent of individual quota system costs	1	percent	50	0
BC	Base cost of halibut conservation management	1	dollars	1,500,000	2,000,000
BCS	Percent savings in base costs of halibut conservation management due to adoption of the individual quota system	1	percent	0	5
BS	Boat share: vessel class 1	2	percent	55	45
	2			45	35
	15			35	25
	25			31	21
	35			31	21
	45			31	21
	55			31	21
	65			31	21
CAP	Annual cost per dollar of capital investment	.3	dollars	.30	.20

Table 5: Description of Input Variables

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Variable Name	Description	Source	Units	High	Low
CCST	Capital Vessel Cost:				
	Vessel Class 1	4	dollars	19,400	15,600
	2			25,520	20,880
	15			114,400	93,600
	25			229,680	187,920
	35			229,680	208,720
	45			510,400	417,600
	55			733,700	600,300
	65			759,000	621,000

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Variable Name	Description	Source	Units	Range	
				High	Low
CHEAT	Annual amount of underreporting engaged in if privately profitable	1	pounds	3,000,000	2,000,000
CONSP	Ratio of future catch reductions to current overharvests required to compensate for underreported catch	1	percent	200	150
COST	Added cost per pound (rounded weight) of delivering for fresh market sale: fisherman cost only	1	dollars	.05	.03
CRW	Fixed cost per crewman	4	dollars	638	522
CS	Crew size: vessel class 1	5	men	1.7	1.4
	2			2.2	1.8
	15			2.8	2.3
	25			3.3	2.7
	35			4.4	3.6
	45			4.4	3.6
	55			5.5	4.5
	65			5.5	4.5
DAY	Time available for halibut fishing during a March-October season: vessel class 1	6	days	171	140
	2			171	140
	15			171	140
	25			72	59
	35			171	140
	45			270	221
	55			171	140
	65			171	140
DED	Deduction per trip: vessel class 1	4	dollars	63.80	52.20
	2			127.60	104.40
	15			153.10	125.30
	25			191.40	156.60
	35			229.70	187.90
	45			229.70	229.70
	55			255.20	208.80
	65			255.20	208.80

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Variable Name	Description	Source	Units	High	Range Low
ELAS	9 row + Fish supply Elasticity of fresh halibut demand : Ratio of percent change in quantity to percent change in price	7	percent	200	100
ELASf	Elasticity of fresh halibut demand: Ratio of percent change in quantity to percent change in price	7	percent	-200	-100
FCT	Historic fleet catch;				
	Area 2; vessel class	8	pounds		
	1			784659	641993
	2			687045	562127
	15			1712240	1400924
	25			593189	485337
	35			385726	315594
	45			120689	98745
	55			109320	89444
	65			17373	14215
	Area 3; vessel class				
	1			1256322	1027900
	2			1230604	1006858
	15			3323216	2718995
	25			2393766	1958536
	35			3461745	2832337
	45			2006916	1642022
	55			1284259	1050757
	65			1454687	1190199
	Area 4; vessel class				
	1			70270	57494
	2			83919	68661
	15			59820	48944
	25			57527	47067
	35			238549	195177
	45			381005	311731
	55			45687	37381
	65			102548	83903
FINE	Fine per pound of illegally landed halibut	1	dollars	2.00	1.00
FNU	Historic fleet size;				
	Area 2c, vessel class	8	vessels		
	1			479	392
	2			479	392
	15			461	377

DRAFT

Variable Name	Description	Source	Units	High	Low			
FNU (cont'd)	Historic fleet size;	8	vessels					
	Area 2c; vessel class							
	25					106	86	
	35					55	45	
	45					10	8	
	55					4	4	
	65					4	4	
	Area 3; vessel class					1	551	450
	2					551	450	
	15					427	349	
	25					125	103	
	35					108	88	
	45					45	37	
	55					14	12	
	65					31	25	
	Area 4; vessel class					1	18	15
	2					18	15	
	15					3	2	
	25					3	2	
	35					9	7	
45	4	3						
55	4	3						
65	4	3						
FXD	Miscellaneous fixed costs per dollar of identified fixed costs	9	dollars	.07	.03			
GAIN	Percent increase in monthly fresh halibut demand due to longer availability	1	percent	75	50			
HAP	Ex-vessel price of halibut per pound of landed weight	10	dollars	2.00	1.00			
HOLDC	Monthly cold storage cost per pound of frozen halibut	1	dollars	.008	.006			
HS	Halibut landings as a percent of landings of all species based on volume;	11	percent					
	vessel class							
	1					24	20	
	2					22	18	
	15					20	16	
25	23	19						
	35	30	26					

DRAFT

Variable Name	Description	Source	Units	High	Low
HS (cont'd)	Halibut landings	11	percent	32	28
	vessel class 45				
	55				
	65				
INC	Incidental catch of halibut in other hook and line bottomfish fisheries percent of total landings	12	percent	8	4
INT	Interest rate	13	percent	15	5
INTC	Monthly interest charge per dollar of inventory value	14	dollars	.012	.004
MORT	Hooking mortality as a percent of halibut released	15	percent	50	25
NU2PC	Percent of halibut catch landed in No. 2 condition	16	percent	4	2
NUQ	Length of season in months with an individual quota system	1	months	8	5
OPC	Monthly fixed cost of maintaining processing facilities for halibut in otherwise operating plants	1	dollars	6000	3000
PRBC	Probability of conviction due to each unreported landing	1	percent	10	1
PRBD	Probability that significant underreporting will be detected and immediately responded to by management authorities	1	percent	60	40
PRH2	Ex-vessel price of No. 2 halibut per pound of landed weight	17	dollars	1.93	.93
PRICF	Price of halibut delivered to the fresh market per pound of landed weight	18	dollars	2.60	1.15

DRAFT

Variable Name	Description	Source	Units	High	Range	Low
PRICW	Frozen product price, per pound of frozen carcass	19	dollars	2.90		1.50
PROB	Probability that the ^{consumer supply} supply and demand approach to fresh market benefit estimation is valid	20	percent	60		40
PROBA	Probability that rejection of the share system will lead to adoption of other new limited entry provisions	20	percent	80		60
PROBR	Probability of permanent quota revocation due to any single conviction for illegal marketing	20	percent	10		1
PRPC	Ex-vessel price of Pacific cod per pound of landed weight	21	dollars	.33		.27
PRQ	Annualized price per pound of halibut quotas	22	dollars	.50		.25
PRS	Ex-vessel price of black cod per pound of landed weight	23	dollars	.86		.70
QBC	Hook and line black cod landings; landed weight	24	pounds	4,600,000		3,800,000
QC	Annual government expenditures required to implement the individual quota system	1	dollars	300,000		200,000
QI	Size of one load of halibut as a share of annual landings, assuming adoption of the quota system	25	percent	15		5
QPC	Hook and line Pacific cod landings; landed weight	24	pounds	330,000		270,000
QTROL	Troll salmon landings	26	pounds	13,390,000		11,390,000

DRAFT

Variable Name	Description	Source	Units	Range	
				High	Low
QUOTA	Area halibut quotas:				
	Area 2c	27	pounds	3,740,000	3,060,000
	Area 3			19,140,000	15,600,000
	Area 4			1,650,000	1,350,000
QUOTT	Total Alaska halibut quota	27	pounds	24,530,000	20,070,000
QUN	Monthly fresh halibut sales under present conditions, product weight	28	pounds	613,250	501,750
RENT	Average profit per pound earned by infra-marginal fishermen under the share system, net of all opportunity costs including the cost of individual quotas purchased or initially obtained	23	dollars	.15	.05
SEASON	Season length in days under current regulations:				
	Area 2c	24	days	7	7
	Area 3			13	13
	Area 4			42	42
SEASM	Months of fishing under current regulations	29	months	2.0	1.0
SHARE	Frozen market share of total landings under the quota system	1	percent	80	60
TDET	Future year in which underreporting is detected and responded to with reductions in legal harvest, or time lapse from beginning of underreporting to its discovery	20	years	5	2
TREST	Future year in which stocks are restored to levels prevailing prior to overharvest due to underreporting, or lapse time from beginning of underreporting to complete correction	20	years	13	9

DRAFT

Variable Name	Description	Source	Units	High	Range	Low
TRI	Average trip length:					
	Area 2c, Vessel class 1	5	days	1.1		.9
	2			7.8		6.4
	15			7.9		6.5
	25			11.2		9.2
	35			11.8		9.6
	45			12.5		10.3
	55			10.8		8.8
	65			10.8		8.8
	Area 3, Vessel class 1			1.1		.9
	2			5.6		4.6
	15			5.9		4.9
	25			8.4		8.4
	35			11.1		9.1
	45			11.8		9.6
	55			12.7		10.4
	65			12.9		10.5
	Area 4, Vessel class 1			1.1		.9
	2			4.4		3.6
	15			7.7		6.3
	25			8.8		7.2
	35			10.5		8.6
	45			10.5		8.6
	55			13.2		10.8
	65			13.2		10.8
YIELD	Frozen carcass weight as a percent of landed weight	1	percent	80		70

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NOTES TO TABLE 5

1. Assumption based on discussions with management and industry personnel.
2. Tetra Tec (1981) reported values \pm 10 percent vessel classes are as follows:
 1. less than 5 net tons (NT) and less than 26 Feet (FT)
 2. less than 5 NT and greater or equal to 26 FT
 15. 5 - 15 NT
 25. 15 - 25 NT
 35. 26 - 35 NT
 45. 36 - 45 NT
 55. 46 - 55 NT
 65. greater than or equal to 56 NT
3. Tetra Tec (1981) includes interest, depreciation and opportunity cost of owners equity. Reported values \pm 10 percent.
4. Tetra Tec (1981) report values adjusted to 1982 price levels reported values \pm 10 percent.
5. Tetra Tec (1981) reported values \pm 10 percent.
6. Assumption, based on review of alternative fishing capabilities of each vessel class, and open seasons for alternative fisheries, primarily salmon and shellfish.
7. Assumption, based on review of fisheries market studies and other literature.

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8. Project data file for 1981 ± 10 percent.
9. Tetra Tec (1981) ± 2 percentage points.
10. Based on 1970-1982 prices reported in IPHC (annual). Adjusted to 1982 dollars.
11. Project data file for 1981 ± 2 percentage points.
12. U.S. National Marine Fisheries Service (annual) average for Gulf of Alaska and Aleutian Island sablefish survey reported results ± 2 percentage points.
13. Assumption based on discussions with Seattle banking personnel familiar with fisheries.
14. Calculated from annual interest rate (INT) according to the formula:
$$(1 + INT) = (1 + INTC)^{12} .$$
15. Assumption based on Meyer (1974).
16. Average U.S. and Canadian percentage for 1979 - 1981 ± 1 percentage point.
17. Seven cents less than No. 1 halibut price (HAP) per discussion with industry personnel.
18. 115 to 130 percent of frozen prices (HAP) based on experience in the

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salmon troll fishery.

19. Assumption, based on discussions with buyers. Calculated assuming an ex-vessel price range (HAP) of \$1.00 to \$2.00.

20. Assumption.

21. Assumption based on Alaska and Seattle prices during 1982 for food and bait. Reported values ± 10 percent.

22. Assumption based on initial runs of fishing benefit programs ± 10 percent.

23. Weighted average of 1982 price for large black cod (\$1.05) and small black cod (\$.95), adjusted for a 75 percent recovery, ± 10 percent.

24. National Marine Fisheries Service, Northwest and Alaska Fisheries Center, average of 1980 - 1982 landings ± 10 percent.

25. Assumption, assumes 6 - 20 loads per year over a 5 to 8 month season.

26. Alaska Department of Fish and Game, 1981 landings ± 10 percent.

27. IPHC (1982), 1982 quota ± 10 percent.

28. Fifteen percent of 1982 total landings apportioned over an assumed 6 month season ± 10 percent.

29. Based on 1982 season lengths (IPHC, 1982) this variable was inadvertently not expressed as a range.

30. Assumption based on examination of total open periods in all areas during 1982 per IPHC (1982).

31. Tetra Tec (1981) ± 5 percentage points.

REFERENCES

Hoag, Stephen R. (1971), "Effects of Domestic Trawling on the Halibut Stocks of British Columbia," International Pacific Halibut Commission Scientific Report, Seattle, Washington. Meyer 74

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Sugden, Robert and Alan Williams (1978), Principles of Practical Cost- Benefit Analysis (Oxford University Press).

Tetra Tec, Inc. (1981), "The Applicability of Limited Entry to the Alaska Halibut Fishery," Bellevue, Washington.

U.S. National Marine Fisheries Service (annual), U.S. - Japan Longline Survey Program.

U.S. Water Resources Council (1973) "Water and Related Land Resources: Establishment of Principles and Standards for Planning," Federal Register Vol 38, No. 174, Part III.

Supplemental

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Washington, D.C. 20235



5/20/83

TO: Distribution
FROM: F - William H. Stevenson
SUBJECT: Status Report on the Halibut Moratorium Decision

Upon review of the regulatory and analytical documents proposed by the North Pacific FMC to establish a moratorium on further entry in the halibut fishery, NOAA/NMFS determined that the proposed rule was a major action under the provisions of Executive Order 12291 and that we would not use the emergency provision of that order to impose the rule without review by the Office of Management and Budget.

It was decided that the moratorium itself, as a major rule, has significant economic effects upon the fishery and therefore requires a very careful and complete evaluation prior to its being implemented. Whether or not the decision will cause a delay in the implementation of the regulations is not known at this time. It is the sincere objective of NOAA and the National Marine Fisheries Service to implement the moratorium, if approved, at the earliest possible time in order to minimize any adverse effects on the fishery or the fishery resource.

Distribution:

- John Bovard, CAX2
- Jay Johnson, GCF
- Robert McVey, F/AXR
- Mary Thompson, F/M11

AUGUST

15	16	17	18	19	20	21
21	22	23	24	25	26	27
28	29	30	31			

30 END OF
3RD EXTENSION
DEADLINE
POINT

↑
HEAD WE
CAN PROTEST, AS NO AGENCY SINCE 4A, 4B STILL HAVE 3B

SEPTEMBER

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21

OCTOBER

5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	1	2

NOVEMBER

3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						



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Jay Johnson, GCF
Robert McVey, F/AKR
Mary Thompson, F/MLI



HALIBUT MORATORIUM

DECISION IMPACTS

Decision

I concur with the objective of the moratorium (prevention of speculative entry into the fishery) but do not concur with the package as submitted because:

1. It is a major rule with significant adverse effect on the fishery
 - a. Significant adverse effects on competition, employment, investment productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.
2. It is not an emergency under E.O. 12291.

Background

Assumptions: - Jeff Stephan intervened - Kodiak fishermen rep.? - Executive Director, United Fishermen's Marketing Association, Inc.; multi-purpose vessels who have not engaged in fishery since 1978; Kodiak area also has possible new entrants

- Jay Hastings in town who commented negatively
- Alaska residents (over 50%)/included E.O. 12291 in comments

Re-read E.O. 12291 .

Significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

- Halibut is a non-Magnuson Act fishery - Halibut Act does not define fishery; Magnuson Act nearest "body of law" - fishery includes shore-based enterprises under Magnuson Act.

- Multi-purpose vessels, developmental grounds involved

Council Action

Council considered situation (partially) and found

- a. no justifiable standard to restrict by-catch fishermen
- b. Personal qualification criteria broad enough so that no individual who has demonstrated recent dependence on, and participation in fishery denied inclusion as qualified individual
- c. Future effect - "No provision...interpreted as guaranteeing that... participation during (base period) will be basis for allocating halibut fishing privileges under any halibut limited entry system...."

Pact

- RIR treats, with respect to harvesting only competition, innovation, investment, individuals, productivity, employment - no constraint under quota management
- does not treat
 - a. economic hardship appeal
 - b. ability of United States-based enterprises to compete with foreign based enterprises in domestic or export markets
 - c. the processing, markets world
- written as non-major
- assumes implementation in 1983
 - a. here we are a leg up since "notice of participation in 1983 non-qualifying in moratorium" is legal and not generally known outside the agency

Impact-economist days

- minimal rewrite from fisherman point of view - 2 days
- rewrite to include enough on processing and marketing to show we thought about it-4 days
- average rewrite-6 days

Recommendation: Fly in Lou Querrila: use Surdi: rewrite to include some processing

processing and marketing; export/import; major classification; appeals

Rework action memorandum between GCF and F/M1

Rework regs especially above sections in preamble to make much stronger
the fact that we thought about it - F/M12 - Bilik full time

Put NB1a in blue room at our disposal as top priority interrupt

HALIBUT SCHEDULE

FAST TRACK: MAYOR: NO SECTION 8: APPROVAL

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
16	17	18	19	20	21 AM RECS	22
23	24 AM RECS RIA	25 RIA	26 F (DRAFT)	27 A	28 FINALS APPEALS SECTION AM; RECS	29
30	/	1	2 NOTICE FY 83 FISHING NOT QUALIFYING F RECOMMEND APPROVAL	3 APPROVES	4 DOC TRANSMITS TO OMB; OMB RECS	5
6	7	8	9	10	11	12
13	14 10-DAYS FOR OMB	15	16 SEASON STARTS	17	18	19
20	21	22	23	24	25	26
ALL	ALL	ALL	ALL BUT 2C	ALL	ALL	ALL
27	28	29	30	1 OMB 30 DAYS EXTEND / DECISION NOTIFICATION	2	3
4	/	5	6	7	8	9
11	12	13	14	15	16	17
18	19	20	21	22	23	24
ALL	ALL	ALL	ALL	ALL BUT 2C	ALL	ALL
25	26	27	28	29	30 NOTIFICATION 2-4 EXTENDED	31 60-DAYS
1	2	3	4	5	6	7
8	9	10	11	12	13	14

MAY

JUNE

JULY

AUG

AUGUST

15	16	17	18	19	20	21
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22	23	24	25	26	27	28
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SEPTEMBER

29	30 END OF 3RD EXTENDING DEATH POINT	31	1	2	3	4
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↑
 HEAD WE CAN PROTECT AS AN AGENCY SINCE 3B, 4A, 4B STILL HAVE QUOTA
 FURTHER EXTENDING

SEPTEMBER

5	6	7	8	9	10	11
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12	13	14	15	16	17	18
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19	20	21	22	23	24	25
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OCTOBER

26	27	28	29	30	1	2
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3	4	5	6	7	8	9
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10	11	12	13	14	15	16
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17	18	19	20	21	22	23
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24	25	26	27	28	29	30
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31						
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To: GCAK - Pat Travers/Thorn Smith

From: GCF - Jay S. Johnson

Subject: Appeals, Second Version

(4) A person not authorized by this part to harvest and sell halibut or to operate a vessel of a certain net tonnage may petition the Regional Director for a special exemption from this moratorium. Each petition must state, in writing, his past participation in the commercial halibut fishery, the factual circumstances which prevented him from meeting the criteria in paragraph (a) of this section, his present investment in a commercial halibut fishing vessel and gear, and the financial loss that he will directly incur if denied the personal opportunity to both harvest and sell halibut or to operate a non-qualified vessel during the moratorium. The Regional Director may grant the petition and issue a special exemption if he is satisfied that the petition is not a new entrant to the commercial halibut fishery, is not intending to significantly increase his present investment in either vessels or gear, and will suffer serious and immediate financial loss if denied the personal opportunity to both harvest and sell halibut or to operate a non-qualified vessel during the moratorium. A written decision will be issued and provided to the petitioner and the North Pacific Fishery Management Council. A petition may be granted on an interim basis; the decision of the Regional Director will be the final decision of the Department of Commerce.

For purposes of determining historical participation or dependence on the commercial halibut fishery in any subsequent limited entry system, the grant or denial of a petition for special exemption and any harvest and sale of halibut or use of a non-qualified vessel thereby authorized will be disregarded.

Optional Definition: "Serious financial loss" means a likely reduction in personal after-tax income of at least \$2000 or 25% of gross personal income as defined by the Federal Internal Revenue Service.