MEMORANDUM

TO: Council, AP, and SSC Members

FROM: Clarence G. Pautzke
Executive Director

DATE: September 21, 1989

SUBJECT: Future Management Planning

ACTION REQUIRED

a. Review limited access planning schedules for sablefish, halibut, groundfish and crab fisheries and determine whether they should be modified in any way or abandoned.

b. Consider approving the draft sablefish management package for public review.

c. Refine halibut IFQ, license, and individual choice options for final analysis.

BACKGROUND

(a) Limited access planning schedules.

At its June meeting, the Council reviewed progress to date on developing limited access programs and approved a series of dates when the planning schedules for sablefish, halibut, and all other groundfish and crab fisheries could be reviewed, revised or abandoned. These dates coincide with this meeting and the January and June 1990 meetings. The current schedule with these review dates noted is provided in item C-7(a).

First, the Council needs to decide if it wishes to continue with the development and analysis of limited access alternatives. If that is the case, then the Council should examine the planning schedule and see if the schedule is still the one it wishes to follow. The next opportunity to change, alter, or abandon the planning schedule is at the January meeting.

Several written public comments have been received since the last Council meeting. These are included in Item C-7(b). Additional proposals relating strictly to halibut are included under agenda item C-10.

The Fishery Planning Committee met in Anchorage on September 6. Their discussion focused on sablefish management and inshore-offshore allocations. A summary of the Committee's sablefish and inshore-offshore discussions is provided under Item C-7(c) and Item C-8, respectively. The Committee met again on September 25 and any recommendations from that meeting will be included in your supplemental folder. An oral report also will be made.

(b) Approve draft sablefish management package for public review.

The Council began development of sablefish limited access alternatives following its December, 1988 meeting. The possible options for limited access have been refined by the Fishery Planning Committee and by the Council in meetings since January. An analysis of the alternatives, including a new alternative recommended by the Fishery Planning Committee, was mailed to the Council family in the September 14 special mailing.

A new analysis of Alternatives 2 (IFQs) and 3 (Licenses) is included in item C-7(d), replacing Chapters 5 and 6 of the current document. Currently, all options include a provision that, to be eligible, persons must have participated as vessel owners or lease holders in the 12 months preceding final Council deliberation (1989 if final decision is in December). The analysis sent to you did not include 1989 data; they were unavailable. New figures, tables, and text changes reflecting the 1989 data are now available.

The amendment schedule currently provides for public review of the draft document following this Council meeting. Final action is scheduled for December 1989 with implementation scheduled for the 1991 fishery.

(c) Refine halibut IFQ, license, and individual choice options for final analysis.

The Council has been refining the possible options for halibut limited access systems during its past three meetings, mainly paralleling changes in the sablefish system. The amendment schedule currently provides for full analysis of the selected alternatives during the fall with public review following the December Council meeting. The current halibut alternatives are outlined in items C-7(e-f).

Proposed Schedules for Analyzing and Implementing Alternative Management Systems for Sablefish, Halibut, Groundfish and Crab

		Sablefish	Halibut	Groundfish/Crab
1989	April	Interim technical clarification	Interim technical clarification	Interim technical clarification
	June	Final technical clarification	↓	↓
	September	Review Schedule Approve for public review	Review Schedule Final technical clarification	Review Schedule
	November	Public review		
	December	Final approval	Approve for public review	
1990	January	Secretarial review begins	Review Schedule Public review	Review Schedule
	April	Prepare administrative infrastructure	Final approval	Final technical clarification
	May	↓	Secretarial review begins	
	June		Prepare administrative infrastructure	Review Schedule Approve for public review
	September		↓	Public review
	December			Final approval
1991	January	Implementation		Secretarial review begins
	April		Implementation	Prepare administrative infrastructure
	June			↓
	September			
	December			
1992	January			Implementation

Schedules.LA

HLA/989

AGENDA C-7(a)
SEPTEMBER 1989

AGENDA C-7(b)
SEPTEMBER 1989

ACTION	ROUTE TO	INITIAL
	Exec. Dir.	
	Deputy Dir.	
	Admin. Off.	
cc:DT	Exec. Sec.	Rla
	Staff Asst. 1	
	Staff Asst. 2	
	Staff Asst. 3	
	Economist	
	Sec./Bkkr.	
	Sec./Typist	

SEP 21 19[illegible]

Greg Beam
Fisherman
PO Box 1994
Sitka, AK 99835

North Pacific Fisheries Management Council

Please take A moment to Read my Comments

I feel the need for limited Access to our Sablefish, Halibut, groundfish and CRAB fisheries - At Least in SE. Alaska if NOT the entire State of Alaska

And personally I F Q's

Lets not side step the issue this year We Need limited Access - we CAN And will WORK out the best plan to give our Resource the fairest deal.

I have Read And STAND behind A.L.F.A.'s proposals to be Submitted to the

88th Session N.P.F.M.C.

The Trawler fleet Requires Stringent Observation to control Bycatch Abuse And piracy AS well AS Environment + HABITAT Destruction. The Resource Needs A future not A Dismal past.

The longline Fishery HAS not the incentive to mistreat OR pirate Bycatch And so Requires little Observation beyond DATA collection.

High-Seas gillnet Fisheries ARE Extremely destructive AND distasteful AND I would URge the council to take A Stand AgAinst such practice.

So many fellow fishermen feel AS I do but throw thier HANDS

up in Disgust, We Have certainly Sent ~~up~~ our feelings About limeted Access to the Council before, why are they Asking us Again?

Help us feel we are Heard we want to communicate with you please talk Back

Help us stop the Escalation

Im pleased if my comments are considered

Im Also willing to listen

Please work Hard For The North Pacific Fisheries

Sincerely Grey Beam

SEP 19 1989

38 Allen Road
Norwalk, CT 06851

September 9, 1989

North Pacific Fishery Management Council
P.O. Box 103136
Anchorage, AK 99510

Dear Members of the Council,

I had hoped to attend the September Council meeting to testify in person, but other commitments (i.e., school and the Chatham Strait sablefish opening) have made that impossible. I hope the depth of my concern is still apparent.

As you may remember, I submitted a proposal to the Council last May describing a combination license/ IFQ system for the Gulf of Alaska sablefish fishery. At the time I thought the issue at hand was selection of an appropriate, workable limited access system since the current situation under open access is, to me, so clearly intolerable. At the June meeting I realized that the intolerableness was not so clear to other members of the fishing industry, and that the issue was not what form of limited access but whether or not limited access at all. This is difficult for me to understand.

As I wrote in my proposal, the current management stategy has become unacceptable to anyone sincerely concerned about the long-term health and stability of this fishery. I am sure that you are familiar with the facts, but let me reiterate: the sablefish fleet has increased ten-fold since 1983 when the fishery achieved full American utilization, the crowding on the grounds is intense hence hundreds of miles of gear are being lost each year resulting in a frighteningly high deadloss rate, product quality decreases as the season shortens, and more boats sink and more people drown (the result of feeling compelled to fish in gale-force winds). I can not believe that the Council wishes to see these trends perpetuated. As a sablefish fisherman and an Alaskan resident, I certainly do not.

The low salmon prices this summer emphasized another factor that I hope the Council will consider. The Alaskan fishing industry is extremely vulnerable due to our dependence on foreign markets. Developing and expanding domestic markets is essential to the stability of North Pacific fisheries, and will only be accomplished by providing consumers with high quality seafood year round. Under the open access derby system this is impossible. Only by distributing effort and removing the pressure of short

openings--i.e., by implementing license limitations, IFQs, or some combination of the two--will the seafood supply to the domestic market be dependable.

Too often fishery management councils have moved a little too late on important issues, allowing the status quo to cripple even the richest fisheries. I urge the Council not to drop the sablefish limited access issue at this point, but to support those who are working to develop a system that will protect and enhance this valuable resource. I am convinced that ruling out limited access would be a mistake we would all come to deeply regret.

Thank you for your time and attention.

Sincerely,

Linda Behnken

Linda Behnken

Please send me notes from the meetings at your earliest convenience Thank you -

VOLUNTARY INDIVIDUAL NONTRANSFERABLE QUOTAS (VINQ)

A Proposal For Managing Pacific Halibut

by

James G. Norris
Marine Resources Consultants
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206-385-4486

Submitted To:

North Pacific Fishery Management Council
PO Box 103136
Anchorage, Alaska 99510

September, 1989

GROUNDFISH FISHERY MANAGEMENT PLAN AMENDMENT PROPOSAL
North Pacific Fishery Management Council

Name of Proposer: James G. Norris **Date:** 15 SEP 89
Address: Marine Resources Consultants
PO Box 816
Port Townsend, WA 98368
Telephone: 206-385-4486

Fishery Management Plan: Groundfish-Gulf of Alaska & Bering Sea/Aleutian Islands.

Brief Statement of Proposal: Each licensed halibut vessel will be given two harvesting options: (1) harvest a variable amount of halibut during a fixed amount of time; or (2) harvest a fixed amount of halibut (individual quota) in a variable amount of time. Option 1 is a "fleet quota" or "derby" fishery as in the past and is open to all vessels, including new entrants. Option 2 is a new Voluntary Individual Nontransferable Quota (VINQ) fishery. The amount offered to each vessel (the VINQ) is determined by that vessel's average landings over the past three years and a multiplier value that measures the recent trend in landings by an average vessel due to changes in Total Allowable Catch (TAC) and fleet size. VINQs are nontransferable. When a vessel is sold, the new owners must establish a catch record for that vessel to qualify for a VINQ. Vessels selecting the VINQ fishery may not participate in the "derby" fishery. The fleet quota for the derby fishery is determined by subtracting the sum of the individual quotas for vessels selecting the VINQ fishery from the TAC. (See Appendix I for details.)

Objectives of Proposal: (What is the problem?) Unrestricted halibut licensing has created a fleet capable of harvesting the allowable halibut catch in a short period of time (1-3 days). Short fishing seasons have led to unsafe fishing practices, poor at-sea fish handling, overloaded processing and transportation facilities, lack of fresh halibut throughout the year, and poor exvessel prices. Current proposals to solve these problems (e.g. License Limitation and Individual Transferable Quotas) have received strong opposition because they restructure the current laissez-faire method of allocating the halibut resource. The objective of the VINQ system is to solve the problems created by short fishing seasons without limiting access to the fishery or restructuring the current method of allocating the halibut resource. (See Appendix II for further discussion.)

Need and Justification for Council Action: (Why can't the problem be resolved through other channels?) The International Pacific Halibut Commission (IPHC) has authority to determine catch quotas, impose gear regulations, and set fishing seasons, but has no authority to offer annual quotas to individual fishermen. Regional Fishery Management Councils (North Pacific & Pacific) have responsibility for allocating the halibut resource among user groups and, therefore, are the only legal agencies with authority to implement this proposal.

Foreseeable Impacts of Proposal: (Who wins, who loses?) See Appendix III.

Are There Alternative Solutions? If so, what are they and why do you consider your proposal the best way of solving the problem? License Limitation will stop fleet expansion, but will not, in itself, solve the problems associated with short fishing seasons. ITQs will solve the short-season problems. However, ITQs threaten to disrupt the current allocation of halibut for two reasons: (1) the initial distribution of ITQs will be carried out through a political process; and (2) ITQs are transferable and may provide large companies or foreign investors an advantage in accumulating shares of the resource. The VINQ system is preferable because it solves the short-season problems without limiting access to the fishery and does not disrupt the current method of allocating the halibut resource.

Supportive Data & Other Information: What data are available and where can they be found? Further data are available from the International Pacific Halibut Commission and the Fishery Planning Committee of the North Pacific Fishery Management Council.

Signature: James G. Norris

APPENDIX I

CALCULATING VINQs

Calculating the Voluntary Individual Nontransferable Quotas (VINQs) for individual vessels is best illustrated by an example. Table 1 (page 3) provides landing and fleet size data for Areas 2C, 3A, and 3B for the years 1986-1988 and estimated values for 1989. The 1989 multiplier values for each area are determined by dividing the fleet's estimated average landing during 1989 by the fleet's average annual landing during the previous three years. For example, in Area 2C the estimated fleet average landing for 1989 is 5,278 lb/vessel and the fleet's average landing from 1986-1988 was 7,318 lb/vessel. The 1989 multiplier value is 5,278/7,318 = 0.7212.

Note that the multiplier value for each area measures how well the estimated average vessel's catch in the coming year compares to that of the average vessel over the past three years. A multiplier of 1.0 means that the average vessel's catch should be about the same as the previous three years; a multiplier that is less than, or greater than, 1.0 means that the average vessel's catch should be less than, or greater than, the previous three years, respectively. For example, in Table 1 notice that the multiplier for Area 2C is lower than the multiplier for Area 3B (0.7212 vs 0.9946). This is a result of a declining TAC and increasing fleet size for Area 2C, while Area 3B has a slightly increasing TAC and a stable fleet size.

Table 2 (page 4) illustrates how the multiplier values are used to determine an individual vessel's VINQ for the coming season. The sample vessel in Table 2 caught 30,000 lb of halibut in Area 2C in 1986, but did not fish in Area 2C in 1987 or 1988. Thus, the average catch by the sample vessel in Area 2C during 1986-1988 was 10,000 lb, which qualifies for a 1989 VINQ of 7,212 lb. In 1987 and 1988 the sample vessel fished in Areas 3A and 3B, landing 45,000 lb from Area 3A and 33,000 lb from Area 3B. These landings qualified the sample vessel for VINQs of 12,033 lb in Area 3A and 10,941 lb in Area 3B. All tolled, the sample vessel landed 108,000 lb of halibut during the period 1986-1988, for an average annual catch of 32,400 lb. The total 1989 VINQ offered to the sample vessel would be 30,186 lb. This value is lower than the vessel's average landings because the TACs are generally declining and the fleet size is generally increasing. Note that if the TACs had been increasing and the fleet size declining, the multiplier values would have been greater than 1.0 and the VINQ for the sample vessel would be larger than its average annual catch of 32,400 lb.

For the 1989 season, the sample vessel would be offered the following choice: (1) fish the regularly scheduled derby fisheries in whatever areas it desired; or (2) land 7,212 lb from Area 2C, 12,033 lb from Area 3A, and 10,941 lb from Area 3B, for a total of 30,186 lb. If the sample vessel selected the VINQ fishery, it would not be eligible to participate in the derby fishery for any area, but it would be free to land its catch at any other time of year. (Note that it may be necessary to impose a cut-off date for the VINQ fishery, such as Dec. 1, to allow the IPHC adequate time to compile data for the upcoming season.) Further, the sample vessel VINQs are not transfereable to another vessel.

As presently envisioned, VINQs also are not transferable between areas. That is, the sample vessel could not land all of its VINQ (30,186 lb) from a single management area; its catch must come from all three management areas as prescribed by the VINQs offered. This area restriction could be relaxed by allowing vessels to transfer VINQs between areas, provided the transfers are always made to an area with a higher multiplier value. Since multiplier values measure the trend in the catch by an average vessel, such a policy would encourage vessels to move out of areas with the most rapidly declining average catches.

Further examples and a discussion of how different vessel would be affected by the VINQ system are contained in Appendix III.

Table 1. Catch (millions of pounds) and fleet size (number of vessels landing the catch) for the years 1986-1988 and estimated values for 1989. The 1989 multiplier values for each area are determined by dividing the fleet's estimated average landing during 1989 by the fleet's average annual landing during the previous three years. For example, in Area 2C the estimated fleet average landing for 1989 is 5,278 lb/vessel and the fleet's average landing from 1986-1988 was 7,318 lb/vessel. The 1989 multiplier value is 5,278/7,318 = 0.7212. (Source: Catch and fleet size data for 1986-1988 are from the IPHC. TAC estimates for 1989 are from IPHC. Fleet size estimates for 1989 are estimates by the author.)

	1986	1987	1988	Average 86-88	Estimated 1989		Multiplier
Area 2C							
Catch	10.611	10.685	11.459	10.918	9.500	*	
Vessels	1,341	1,481	1,679	1,500	1,800	**	
Average	7,913	7,215	6,825	7,318	5,278		0.7212
Area 3A							
Catch	32.790	31.316	38.252	34.119	31.000	*	
Vessels	1,565	1,875	1,883	1,774	2,000	**	
Average	20,952	16,702	20,314	19.323	15,500		0.8022
Area 3B							
Catch	8.831	7.758	6.955	7.848	8.500	*	
Vessels	570	589	281	480	480	**	
Average	15,493	13,171	24,751	17,805	17,708		0.9946

* Catch quotas established by IPHC.
** Estimates by the author.

Table 2. Sample calculation of the 1989 VINQ for a vessel that fished the 1986 season exclusively in Area 2C and fished the 1987 and 1988 seasons in both areas 3A and 3B. The far right column is a worksheet for vessel owners to fill in their own catch records to estimate what their VINQs would have been for the 1989 season.

	Sample Vessel	Your Vessel
Area 2C		
1986 Catch	30,000	_____
1987 Catch	0	_____
1988 Catch	0	_____
Average (1986-1988)	10,000	_____
Multiplier	× 0.7212	× 0.7212
Quota Offered in 1989	7,212	_____
Area 3A		
1986 Catch	0	_____
1987 Catch	25,000	_____
1988 Catch	20,000	_____
Average (1986-1988)	15,000	_____
Multiplier	× 0.8022	× 0.8022
Quota Offered in 1989	12,033	_____
Area 3B		
1986 Catch	0	_____
1987 Catch	15,000	_____
1988 Catch	18,000	_____
Average (1986-1988)	11,000	_____
Multiplier	× 0.9946	× 0.9946
Quota Offered in 1989	10,941	_____
Total Catch 1986-1988	108,000	_____
Average Annual Catch 1986-1988	32,400	_____
Total Quota Offered in 1989	30,186	_____

APPENDIX II

OBJECTIVES OF THE VINQ PROPOSAL

Problems in the Halibut Fishery

The problems currently facing the halibut industry can be lumped into three categories: (1) overcapitalization; (2) short fishing seasons; and (3) allocation of the resource. All of these problems follow directly from allowing unlimited access to the resource. Thus, most proposals to solve these problems have involved some form of limited access to the resource. My approach is to consider these problem areas separately, because I believe they can be solved separately.

Overcapitalization. It has been recognized for many years that unlimited access to fishery resources leads to overcapitalization and profit dissipation. For the halibut fishery, this process has been tempered somewhat by increasing stock abundance and surplus production during the early 1980s. Halibut stocks peaked around 1986 and surplus production is now declining. Total Allowable Catches (TACs) will be declining by about 10%-15% per year during the next several years. If the fleet size continues to increase without an accompanying price increase, profits in the next several years will be dissipated even further.

Short Fishing Seasons. Unlimited access to the resource has created a fleet capable of harvesting the halibut TAC in a short period of time (1-3 days). Short fishing seasons have led to unsafe fishing practices, poor at-sea fish handling, overloaded processing and transportation facilities, lack of fresh halibut throughout the year, and poor exvessel prices. The end result is poor economic efficiency at all levels of the industry.

Allocating the Resource. At present, the halibut resource is allocated in a laissez-faire manner. Anyone can enter the fishery and compete for a share of the resource. Virtually all proposals put forth to solve halibut management problems have created an opportunity to significantly change the laissez-faire method of halibut allocation. The opportunity to use resource allocation as a means of achieving socio-economic objectives has created a political free-for-all and, so far, a political stalemate. Each of the many different political factions has a different socio-economic objective that can be achieved only at the expense of someone else's socio-economic objective. The result has been political gridlock on all halibut management problems.

Objective of the VINQ System

I believe the management problems outlined above can be separated and solved independently. **The objective of the VINQ system is to solve the problems associated with short fishing seasons without limiting access to the fishery or significantly changing the laissez-faire method of halibut allocation.** The VINQ system could be combined with other proposals to solve the overcapitalization and allocation problems. For example, the VINQ system could be combined with a License Limitation scheme to address overcapitalization. Licenses could be transferable and sold on the open market just like other Alaskan Limited Entry Permits. Permit holders would operate under the VINQ system outlined in this proposal (i.e. fish the derbies or accept the VINQs), the only difference being that the fleet size would be constant instead of variable. Reallocation problems to achieve socio-economic objectives could be addressed through grants, low interest loans, or other programs to help certain members of society in purchasing a limited entry permit. Such programs spread the cost of achieving socio-economic objectives over a large portion of society, rather than forcing the existing halibut fleet to bear the full economic burden by reducing their share of the resource.

APPENDIX III

FORESEEABLE IMPACTS OF THE VINQ SYSTEM

New Vessels. New vessels may enter the derby fishery but not the individual quota fishery.

Newly Purchased Vessels: Same as new vessels.

Existing Vessels. Table 3 (page 7) shows how seven sample vessels would have been affected by the VINQ system in 1989 based on their catch histories in 1986-1988. Vessels 1-6 each landed a total of 120,000 lbs of halibut during the three year period, but from different areas. Vessels 1, 2, and 3 fished exclusively in Areas 2C, 3A, and 3B, respectively. Although these three vessels landed the same amount of halibut, their VINQs are different because they fished areas with different multipliers. For example, the VINQ offered to Vessel 1 is lowest (28,849 lb) because the Area 2C multiplier is lowest (0.7212) and the VINQ offered to Vessel 3 is largest (39,782 lb) because the Area 3B multiplier is largest (0.9946). Vessels 4, 5, and 6 fished in multiple areas during the 1986-1988 period and, therefore, they are offered VINQs in multiple areas for the 1989 season. The size of the VINQ offered depends on how much each vessel caught from each area. In general, vessels that fished in areas with higher multipliers receive higher VINQs. Vessel 7 did not land halibut in 1986, but had the same catch as Vessel 5 for 1987 and 1988. Since it has only a two year catch history, its VINQ is less than that for Vessel 5 (25,180 lb vs 33,572 lb). In general, VINQs offered to existing vessels with fewer than three years of landings will be unacceptably low to most fishermen, because VINQs are based on a three year average. Thus, these vessels will most likely choose the derby fishery.

Derby Fishery. Fleet size for the derby fisheries will be smaller giving less competition on the grounds. Since the fleet quota also will be smaller, the fishing time for the derby fishery should be about the same as without the VINQ system. A year round supply of halibut from the VINQ fishery may raise the overall exvessel price level for halibut, which would benefit derby fishermen as well as VINQ fishermen.

VINQ Fishery. VINQ fishermen will enjoy safer fishing conditions and can implement better at-sea handling practices because they have minimal time constraints on their season. They will not be allowed to fish during the derby openings and they may have a fall deadline for catch reporting requirements. Exvessel prices should be higher because more of the fish landed can be sold in the fresh market.

Processors and Wholesalers. Processors and wholesalers will have a more continuous flow of product and fewer overloaded conditions. A continuous flow of fresh halibut should raise their profit margins.

Retailers and Restaurateurs. Continuous flow of fresh product means higher quality, higher prices, higher profits, and greater customer satisfaction.

Transportation and Cold Storage Facilities. Fewer overloaded conditions.

IPHC. More paperwork and administrative costs to administer the VINQ system.

Enforcement Agencies. The derby fishery can be enforced just as it currently is. Enforcement for the VINQ fishery would be similar to an ITQ fishery. For example, each vessel would be issued poundage/area coupons that would be collected as the fish are delivered. No vessel may have aboard more halibut than they have coupons for. Vessels harvesting between 90% - 100% of their VINQ would be given credit for their full VINQ in the following year. Vessels harvesting less than 90% of their VINQ would be given credit only for their actual catch. Vessels harvesting over their VINQ would have the overage value paid as a fine to support the enforcement operations and the overage poundage would be subtracted from their VINQ in the following year.

Table 3. Illustration of how seven sample vessels would have been affected by the VINQ system in 1989 based on their catch histories in 1986-1988. Vessels 1-6 each landed a total of 120,000 lbs of halibut during the three year period, but from different areas. Vessels 1, 2, and 3 fished exclusively in Areas 2C, 3A, and 3B, respectively. Although these three vessels landed the same amount of halibut, their VINQs are different because they fished areas with different multipliers. For example, the VINQ offered to Vessel 1 is lowest (28,849 lb) because the Area 2C multiplier is lowest (0.7212) and the VINQ offered to Vessel 3 is largest (39,782 lb) because the Area 3B multiplier is largest (0.9946). Vessels 4, 5, and 6 fished in multiple areas during the 1986-1988 period and, therefore, they are offered VINQs in multiple areas for the 1989 season. The size of the VINQ offered depends on how much each vessel caught from each area. In general, vessels that fished in areas with higher multipliers receive higher VINQs. Vessel 7 did not land halibut in 1986, but had the same catch as Vessel 5 for 1987 and 1988. Since it has only a two year catch history, its VINQ is less than that for Vessel 5 (25,180 lb vs 33,572 lb). In general, VINQs offered to existing vessels with fewer than three years of landings will be unacceptably low to most fishermen, because VINQs are based on a three year average. Thus, these vessels will most likely choose the derby fishery.

	Sample Vessel Number						
	1	2	3	4	5	6	7
Area 2C							
1986 Catch	40,000	0	0	40,000	10,000	0	0
1987 Catch	50,000	0	0	0	20,000	0	20,000
1988 Catch	30,000	0	0	0	10,000	0	10,000
Total (86-88)	120,000	0	0	40,000	40,000	0	30,000
Average (86-88)	40,000	0	0	13,333	13,333	0	10,000
Multiplier	0.7212	0.7212	0.7212	0.7212	0.7212	0.7212	0.7212
Quota Offered 1989	28,849	0	0	9,616	9,616	0	7,212
Area 3A							
1986 Catch	0	40,000	0	0	10,000	20,000	0
1987 Catch	0	50,000	0	50,000	20,000	25,000	20,000
1988 Catch	0	30,000	0	0	10,000	15,000	10,000
Total (86-88)	0	120,000	0	50,000	40,000	60,000	30,000
Average (86-88)	0	40,000	0	16,667	13,333	20,000	10,000
Multiplier	0.8022	0.8022	0.8022	0.8022	0.8022	0.8022	0.8022
Quota Offered 1989	0	32,086	0	13,369	10,695	16,043	8,022
Area 3B							
1986 Catch	0	0	40,000	0	10,000	20,000	0
1987 Catch	0	0	50,000	0	20,000	25,000	20,000
1988 Catch	0	0	30,000	30,000	10,000	15,000	10,000
Total (86-88)	0	0	120,000	30,000	40,000	60,000	30,000
Average (86-88)	0	0	40,000	10,000	13,333	20,000	10,000
Multiplier	0.9946	0.9946	0.9946	0.9946	0.9946	0.9946	0.9946
Quota Offered 1989	0	0	39,782	9,946	13,261	19,891	9,946
Total Catch (1986-1988)	120,000	120,000	120,000	120,000	120,000	120,000	90,000
Avg Annual Catch (1986-1988)	40,000	40,000	40,000	40,000	40,000	40,000	30,000
Total Quota Offered (1989)	28,849	32,086	39,782	32,931	33,572	35,934	25,180

The Committee clarified their recommendation that all hook and line and pot vessels be included under the plan in all areas. This is to ensure that gear allocations are not stretched further in the BSAI. This would not change the prohibition on catching sablefish with pots in the Gulf.

A new alternative allowing fishermen to choose, on a yearly basis, between open access and IFQs was proposed. All vessel owners and qualified lease holders would be allocated IFQ amounts based on 3 years' past participation. This would be a moving average. The owners would then have the choice each year of fishing in the open access fishery or declaring to NMFS that they wished to fish with IFQs. These IFQs would be non-transferable. It was arranged that a summary document elaborating on this alternative would be sent to the Council staff for analysis by the September Council meeting.

Due to a concurrent American Fisheries Society meeting, the Council was able to receive testimony from four managers and two fishermen with experience in license and share quota systems. These guests were Dan Anderson, commercial fisherman from Wisconsin; Ron Baldwin, Ontario Ministry of Natural Resources; Jim Jones and Gregory Peacock, Canadian Fisheries and Oceans; Max Short, Newfoundland union representative; and, Mike Talbot, Wisconsin Bureau of Commercial Fisheries.

Halibut Management Alternatives

The Committee recommended that the halibut alternatives be changed to parallel the sablefish alternatives. In addition, the fourth alternative allowing fishermen to choose between open access and IFQs should be added.

Alternatives for Addressing the Onshore-Offshore Allocation Issue

1. Allocate groundfish quotas between onshore and offshore components with priority access granted to onshore component. If demand exceeded available TAC, preference would be given to onshore component in the same manner that DAP is treated relative to JVP and TALFF.

American High Seas Fisheries Association
Cities of Kodiak, Sand Point, and Unalaska
Kodiak Island Borough
Wards Cove Packing Company
Coastal Coalition (Kodiak)

2. Allocate groundfish quotas between onshore and offshore components, but not grant priority access.

City of Unalaska

3. Identify specific communities that would be eligible for development and/or maintenance quotas.

Larry Cotter
Central Bering Sea Fish. Association - Pribilofs

4. Establish share quota system which grants quota to fishermen, processors, and coastal communities.

City of Unalaska

5. Establish a moratorium on new harvesting, processing, and catcher/processor vessels, exempting vessels less than 40 ft in length.

Profish

6. Reserve specific areas for use by shoreside or offshore operations (allowing crossover if conditions permitted).

Larry Cotter
Wards Cove Packing Compoany
Southwest Alaska Shorebased Processing Coalition
Coastal Coalition (Kodiak)
City of Unalaska

7. Begin pollock roe season in Bering Sea and Aleutians no earlier than April 1 to discourage pulse fishing on schooled spawning stocks and thus lengthen harvest period.

Southwest Alaska Shorebased Proceesing Coalition
Alyeska Seafoods
Icicle Seafoods
Trident Seafoods

8. Use other traditional management tools such as trimesteral releases, trip limits, etc to slow the harvest and solve the onshore-offshore allocation issue on a short-term basis.

Bob Alverson
City of Unalaska

Summary of Fishery Planning Committee meeting
September 6, 1989
Anchorage, Alaska

The Fishery Planning Committee met in Anchorage on September 6. Council members present were Joe Blum (chair), Bob Alverson, Larry Cotter, Ron Hegge, Tony Knowles, Henry Mitchell, Ken Parker (for Don Collinsworth) and John Peterson. Staff present were Clarence Pautzke, Marcus Hartley, and Dick Tremaine (NPFMC); Peter Fricke, Jon Pollard, and Jay Ginter (NOAA); and, Judith Merchant and Mark Pedersen (WDF). Members of the public were also in attendance.

Onshore-Offshore Allocations

Jon Pollard presented the Committee with a brief legal evaluation of the proposals received from industry. He stated that National Standards 4 and 5 would be of particular concern in Council deliberations. He also reminded the Council of GATT implications. The Council can restrict foreign processors but cannot tell fishermen where to land their fish.

The Committee began by attempting to define the problem(s) which need to be resolved. The biological concern of a limited resource being pursued by too many vessels was stated. To this was added the possibility of diminishing the conservation of the stocks biomass due to excess effort and the social impacts resulting from decreased season length. It was noted that changes in use patterns of a resource may upset the balance and increase the possibility of management error. There needs to be stability and continuity for participants, their communities, the entire industry, and investments. The necessary changes in management, in response to changes in use, could be too slow in coming and the resource could be put in jeopardy.

The economic aspects of the problem were discussed from several sides. Short seasons caused economic and social hardships to Kodiak this year. This is a specific example of a general trend which may be happening to coastal fishing communities near the resource. All this is a symptom of a highly mobile fleet competing against stationary processing facilities for a limited resource. A major issue is how much protection the Council should give to shore-based processors or whether it would be better to just leave survival to the fittest. The Council may need to determine if suitable niches exist for each sector to reduce operational problems.

The Committee was provided with a copy of the Council's Comprehensive Goals. Although some may conflict, several were seen to be directly applicable to the situation as it now exists. The specific goals noted were:

GOAL 2: Ensure that the people of the United States benefit from optimum utilization of the nation's publicly-owned fishery resources.

GOAL 3: Promote economic stability, growth and self-sufficiency in maritime communities.

GOAL 4: Achieve optimum utilization by the U.S. fishing industry of fishery resources in the Fishery Conservation Zone off Alaska.

GOAL 5: Minimize the catch, mortality, and waste of non-target species, and reduce the adverse impacts of one fishery on another.

GOAL 7: To the extent consistent with other comprehensive goals promote the economic health of the domestic fishing industry; encourage the profitable development of underutilized resources; discourage unneeded investments in fisheries with excess harvesting capacity.

The thought was expressed that the problems went beyond Gulf pollock and could touch on all species and aspects of the industry. It was generally agreed that the problem was or soon would be pervasive. It was also acknowledged that a great deal of economic information from and about the industry would be necessary to fully analyze the implications of various alternatives.

The Committee considered several alternative problem statements and will complete that examination at its September 25 meeting.

The Committee reviewed industry proposals (Attachment 1) and identified several general alternatives:

1. Status quo with no change in regulations to address the problems.
2. Grant priority access to shore-based deliveries and allocate the TAC accordingly.
3. Create inshore-offshore allocations by dividing the quota up between harvesters delivering to these locations. This could be done with or without specific areas of operation.
4. Prohibit catcher/processors in the Gulf of Alaska and reserve a certain portion of the BSAI resource and area for harvesters delivering onshore.
5. Use traditional tools to extend the seasons and preserve product flow to all sectors of the industry.

The Committee recommended that proposals in Attachment 1 dealing with limited entry (#4,5) be considered with other such programs now being reviewed by the Council. In addition, #7 is being dealt with already in the roe-stripping amendment.

The Committee finished with several recommendations. The staff of all involved agencies should work to gather and organize baseline information. The Council should develop alternatives and finalize its definition of the problem at its September meeting. The public should be notified that proposals would be needed for the September meeting. A draft document, possibly an EIS, would be ready for approval at the April Council meeting and the Council should consider final action in June 1990 with implementation intended for 1991. The Committee intends that this schedule could be changed at any time.

The Committee also noted the need to define operational areas and communities where the problem might arise. The Council will need to know about the seasonal distribution of important groundfish stocks.

Sablefish Management Alternatives

The Committee reviewed the August 1989 draft sablefish management limited access analysis. They provided a number of substantive and editorial comments and instructed staff to incorporate them before the Council meeting. The comments were enough in quantity to require a supplemental conference call between NPFMC staff and Committee members with additional comments.

SUMMARY OF INSHORE-OFFSHORE PUBLIC COMMENTS

Alaska Factory Trawlers Association - The nature of the problem should be defined in detail. There is no hint of any super priority being created for either on shore or at sea processors in national policy. Presently, AFTA favors the status quo and requests that the Council accept their proposals at a later date.

Aleutian Dragon Fisheries - Unconditional support for the proposal submitted by the Coastal Coalition.

American High Seas Fisheries - Recommends three proposals concerning open access allocations. 1) Earmark a portion of the OY for allocation as "JVP transitional quota" to harvesting vessels switching from JV to domestic processors. 2) Concerning resource access preference, give weight to U.S. content at the harvesting level based on where costs were incurred in construction or conversion. 3) Implement a new preference system to the resource allowing vessels 50% or more U.S. built, owned and operated first priority.

Arctic Alaska Fisheries - The "problem " should be thoroughly reviewed and analyzed before any pubic proposals are requested or considered. The current Council agenda item is unclear in its description and intent. Until further clarification, Arctic Alaska requests an extension for submitting a proposal.

City of Kodiak - Recommends a shorebased processor preference for 1990.

City of Sand Point - Recommends a DAP (Direct Allocation) shorebased processor preference for 1990.

City of Unalaska - Recommends the analysis of five options for consideration in a plan amendment providing protection for the resource and the economic viability of coastal communities. 1) Area designation to identify near shore stocks for shoreplant use. 2) Priority allocations to shoreplants with consideration given to domestic support services. 3) Identification of a set portion of the quota for shoreplant use. 4) Establishment of a share quota system which grants quota to fishermen, processors, and coastal communities. 5) Time closures during periods of low fish quality.

Coastal Coalition - A four point proposal for groundfish quotas in the EEZ off Alaska. 1) Allocate groundfish quotas between shorebased and factory-trawler operations. 2) Give allocation preference to shorebased operations when dividing the TAC. 3) Designate certain time and/or area closures for factory-trawler operations to assure distribution of catch over the entire stock an to reduce gear conflicts. 4) Apportionments should be allocated as is done between DAP and JVP operations with any reapportionments done in a timely manner.

Larry Cotter - Separate the quota by percentage into at-sea processing and community maintenance quotas. This separation would provide stability for processors. For communities that have not yet developed a seafood industry, short term allocations could be made from adjacent stocks. This quota could be leased to assist in generating funds for development. When the development is completed, the quota would revert to where it came from and the community would fish from the overall maintenance quota.

Pribilof Islanders - Request an allocation of not less than 5% of the Bering Sea resource. They would be permitted to harvest or lease the quota with the proceeds assisting in their seafood industry development.

ProFish International, Inc. - The factory trawlers had every right to participate in the Gulf pollock fishery as did any other trawler regardless of where or how their catch is processed. The real problem is too many boats chasing too few fish. The only solution to shortened fishing seasons is to limit entry into all the fisheries under the Council's jurisdiction. Therefore, establish a moratorium date of June 23, 1989 except for vessels less than 40 feet in length or any qualified vessel which reports catch before June 1, 1991, and establish a buy-back program to reduce at-sea processing vessels.

Representative Don Young of Alaska (H.R. 2105) - Should a limited entry or access program be instituted in the Bering Sea, 10% of the TAC would be allocated to the Pribilof Islanders. They could lease this quota during the first five years. After that time all they did not harvest themselves would be reassigned by the Council.

Southwest Alaska Shorebased Processors' Coalition - A four point proposal for shoreside pollock processing preference in the Bering Sea. 1) Start the pollock season between April 1 and June 1. 2) Create a shoreside only zone around Dutch Harbor and Akutan (168 - 163 degrees West, 56 degrees North to the chain). 3) Allow

at-sea processors to operate in the zone during the roe season but restrict the percentage of pollock harvested by all vessels during that season. 4) Require full utilization (including meal) of all pollock harvested from the area.

Wards Cove Packing Company - Provide for priority access to the resource for shorebased harvesters. Items to consider in this issue include: species, gear types, areas, means of qualification, distribution by entity and time of priority access, and the socioeconomic and political justifications for such priority access.

Sablefish Limited Access

Public Meetings for Sablefish Limited Access

In **1988**, the Council held **5 workshops** aimed at discussing the generic types of sablefish limited access: licenses and IFQs. These meetings were designed to study how systems could be structured, not the merits of the systems. These workshops were held in Kodiak, Homer, Petersburg, Seattle, and Sitka. In **1989**, the Council held a series of **5 public scoping meetings** to gather public input concerning limited access in all species including sablefish. These meetings were designed to assess the possible impacts of limited access management. They were held in Anchorage, Dillingham, Kodiak, Seattle, and Sitka. Sablefish limited access has been a **Council** agenda item at the following **15 meetings**: December, 1985; March, 1986; January, May, September, and December, 1987; January, April, June, September, and December, 1988; and January, April, June, and September, 1989. The subject of limited access in general and halibut limited access in particular has been on the Council agenda on other occasions.

Possible Public Workshops on Sablefish Limited Access Alternatives

Based on current participation patterns in the sablefish resource, it is possible to reach the vast majority of current participants by holding meetings in 5 communities: **Anchorage, Kodiak, Petersburg, Seattle, and Sitka.** These locations would allow fishermen from surrounding locations to either fly, drive, or boat to a meeting. It would not be possible to reach all sablefish fishermen in their hometowns (approximately 50) within the time and monetary constraints allowed.

Chapter 5 and Chapter 6

to the

Draft

Sablefish Management in the Gulf of Alaska and the Bering Sea/Aleutian Islands EA/RIR

These Chapters 5 and 6 include data on 1989 participants.
They replace Chapters 5 and 6 in the September 14, 1989 document.

5.0 DESCRIPTION OF THE FISHERY UNDER EACH ALTERNATIVE

Note that in order to protect confidential information, some figures and tables have been adjusted. Where possible, confidential figures have been replaced by an "*". At other times, the numbers have been adjusted upward to 3 or 4. These data are preliminary and may change during the appeals process.

Five regions are used to describe the geographic distribution of owners and processors: Southeast, Southcentral, and Western Alaska; Washington; and other states. Southeast Alaska encompasses the panhandle area of Alaska from its southern border with Canada to Yakutat. Southcentral Alaska describes the coastal area north from Yakutat to Cook Inlet and all of the interior communities. Western Alaska covers the communities on Kodiak, the Alaska Peninsula, the Aleutian Islands, and along the Bering Sea. Washington includes that entire state while other states includes all remaining locations and any that are unknown.

5.1 Alternative 1: Open Access

5.1.1 Harvesting and Processing Sector

The open access alternative would cause no immediate changes, though the fishery and its management would continue to evolve. Entry to and exit from the fishery would continue unrestricted, and presumably, the number of vessels and fishing power would continue to expand until profits were reduced to a level just sufficient to cover expenses. Some fishermen would still do quite well while others would go broke. For the fleet as a whole, a dollar in profit to one fisherman would be matched by the loss of a dollar to another fisherman. Departures from this trend could occur because of risk factors such as poor weather and distance to the grounds, or interference with other fisheries such as salmon and herring. For example, fewer vessels fished in 1989 than in 1987 or 1988, perhaps because of stormy weather, alternative employment associated with the oil spill, or lower catch rates than in the past.

Additional vessels and crews entering the fishery could come from several sources. For example, Kodiak has many multi-purpose vessels capable of converting to longlining. Alternately, many joint venture or crab vessels could be converted to longlining. The freezer/longline portion of the fleet is also projected to increase (NRC, 1988). The amount of gear aboard each vessel will also increase as seasons become more competitive, especially if sablefish stocks begin to decline. Additional crew will be needed for the extra gear and longer working hours. Though the number of jobs would increase, length of employment would decrease with season length. Profits and crew shares would remain the same overall, but would be split among more people. Those who rely on sablefish for some or all of their income would be forced to make do with less or participate in other fisheries or shoreside employment.

Shortened seasons will place a premium on time on the fishing grounds. Fishing vessels may minimize their delivery times by using floating processors or installing processing equipment which could reduce shorebased processors product flow and profits.

Management necessarily will involve more regulations to control effort and its impact on the stocks. These regulations might include changes in opening dates, multiple short seasons, gear limitations, trip limits, and other options listed in Table 4.1.

5.1.2 Maritime Communities

The number of floating processors and longline/processors is expected to increase as will their volume of product processed under open access. This increase in offshore activity will reduce the number of available shoreside processing jobs and the working hours. The number of vessels delivering to shorebased plants would be expected to decrease as would purchases of supplies and fuel. Considering just the sablefish fishery, these reductions are not expected to be great under open access, but they may have localized impacts.

5.1.3 Consumers and Markets

Because sablefish freezes well, is primarily marketed in Japan, and its main domestic market is smoked product, only a few market changes would be expected from any of the alternatives including open access. If a fresh market were to develop due to a change in consumer tastes, if the major market were to shift from Japan to the U.S., or if the yen-dollar ratio were to radically shift, then other changes may be expected. However, these latter changes would probably be similar under all alternatives.

5.2 Alternative 2: Individual Fishing Quotas

5.2.1 Harvesting Sector

Qualifications of the Analysis

Some of the records had incomplete or incorrect information for social security numbers and management areas. These data were dropped from the analysis, so the number of individuals reported is slightly less than it will be in the end. Likewise, the area qualifying totals are slightly lower than they would otherwise be.

Those errors point out the need for accurate social security numbers (SSN) on the owner and registration files. Also, because access rights will be granted to the owner of record (according to the SSN) it will be important for legal owners (companies, corporations, partnerships, etc.) to recognize the importance of the SSN and to make legal arrangements (if necessary) to secure ownership of IFQs tied to that identifying number.

Allocations

To examine the impacts of an IFQ management system for longline-caught sablefish, landings records for fishermen who caught sablefish by longline at any time during the period 1984-88 were examined. The "catch history" data base, obtained from the State of Alaska's Commercial Fisheries Entry Commission (CFEC) fish ticket, was based on individuals listed as owners.

For each individual whose vessel fished both in 1989 and during the 1984-1988 qualifying period, a calculation was made to determine six qualifying amounts.[1] These amounts are based on the six options: best year, average of two best years, these two repeated with those making first landings

[1] Landed weight accounts for some on-board processing (Eastern cut, Western cut, etc.) and thus is less than whole weight. The database reports landed weight and therefore landings are used throughout this analysis. Landed weight is also the appropriate way to track fishery performance at the processor level. A conversion to round weight, however, is necessary in establishing the sablefish TAC and shares to gear groups.

options: best year, average of two best years, these two repeated with those making first landings in 1987 or 1988 having their weights count 75%, and this latter process repeated for those making their first landing in 1988. If the individual only landed fish in one year, that single year's landing was used. These individual amounts for each option were then totalled and the percentage contribution of each individual calculated by management area and option.

For example, if an individual landed 1,000, 2,000, 3,000, and 4,000 lbs of sablefish each in the years 1984-87 they would: (1) have a best year poundage of 4,000 lbs; (2) have a two year average poundage of 3,500 lbs [best two years (3,000 lbs plus 4,000 lbs) divided by two]; and have the same poundages for the 75% options. If an individual only fished in 1988 and landed 2,000 lbs, they would: (1) have a best year poundage of 2,000 lbs; (2) have a two best year average of 1,000 lbs; (3) have a best year 75% poundage that is 1,500 lbs; and (4) have a two best year 75% poundage that is 750 lbs. Note that the total qualifying poundage will tend to be greater than any one year's actual total catch. (A worksheet to calculate a qualified participants share following the procedure described here is included in Appendix I).

All the following analyses examine fleet profiles by management area, as this is the method of allocation. It is therefore possible for an individual to qualify for IFQs in more than one area. ~~This is why in each option considered, the total number of qualifiers exceeds the total number of vessels or owners operating off Alaska (compare to Table 3.4).~~ These totals can be compared to historical participants (Table 3.4).

The data base described above was first sorted by vessel owner by management area. This means that vessel owners could appear more than once on the data base. The fish tickets for each owner were then totalled for the fishing year. Next, owners were counted for each of six management areas: Bering Sea, Aleutian Islands, Western Gulf of Alaska (WG), Central Gulf of Alaska (CG), West Yakutat (WYK), and Southeast Outside/East Yakutat (SEO/EYK). Those counts are shown in Table 5.1. Figure 5.1 is a graphical summary of the information in Table 5.1, the graphic summary being somewhat easier to interpret.

It is the vessels fishing in several areas, regardless of area of residence, that would be expected to compose the fleet dependent on and landing most of the sablefish. The distribution of qualified owners in Figure 5.1 (and Table 5.1) gives some idea of the distance vessels travel from their home ports depending on their area of residence. Notice, for instance, that Southcentral Alaskan residents are most represented in the West Yakutat and Central Gulf areas, the two areas closest to their home ports. Owners from Washington qualify in the SEO/E Yakutat and Central Gulf with similar numbers in each area (~~133 and 126~~54 and 47) while a smaller group of them qualified in the areas farther west, again in similar numbers in each area (~~55 to 69~~19 to 24). The vessels whose owners live in Washington compose one third or more of the fleet, by area, from the ~~Central~~Western Gulf westward (Figure 5.1). These vessels probably are part of the core of longline vessels that target on sablefish along the coast. This suggests that Washington vessels fish in more than one area more often than Alaskan vessels.

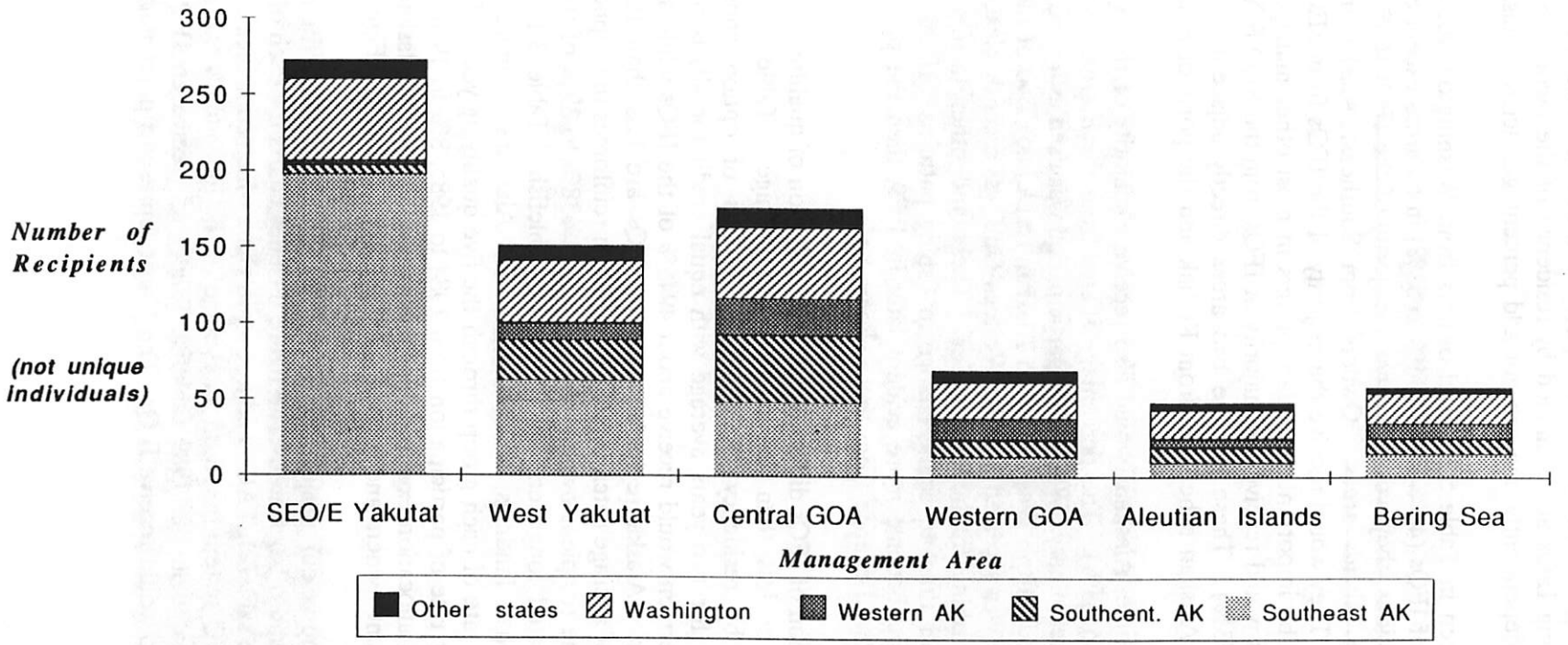
The next step was to determine the IFQ allocation for each qualifier. This was done by summing landings for each individual and dividing by two to determine the average (if necessary, depending on the operation). The total qualifying poundage (the sum of everybody's average) was then calculated and individual IFQs computed as the individual's average divided by the area's qualifying total. Appendix I shows how individual allocations are calculated.

Table 5.1 Number of vessel owners whose vessels landed longline caught sablefish, by management area and residency, under Alternative 2, IFQs.

	MANAGEMENT AREA						
RESIDENCY	SE Outside/ E. Yakutat	West Yakutat	Central Gulf	Western Gulf	Aleutian Islands	Bering Sea	Sum of Individual Owners
Qualified							
SE Alaska	197	62	48	13	9	15	202
SC Alaska	6	27	44	11	10	10	47
Western Alaska	3	11	24	14	6	10	34
Total Alaska	206	100	116	38	25	35	283
Washington	54	41	47	24	19	20	69
Other States or unknown	12	10	13	8	5	4	17
TOTAL	272	151	176	70	49	59	369

Note: Since some owners are issued IFQs in more than one area, it is not possible to add owners across management areas to total individuals.

Figure 5.1 ***Distribution of Sablefish Longline IFQ Recipients, by Management Area, by Area of Residency***



These area determinations were then aggregated to provide profiles on the distribution of the IFQs. Table 5.2 contains the results of this aggregation where, for each management area, the distribution of the resulting IFQs are examined by residence of the owner. Since each management area is calculated independently one can not add percentages across areas.

As can be seen in Table 5.2, vessel owners from Washington would out qualify all other regions for portions of IFQs (~~41% to 71%~~34% to 53%) in all areas except SEO/E Yakutat (22% to 25%). ~~Under all options, they would receive a majority of the IFQs (60% to 71%) in the Western Gulf and Aleutian Islands areas.~~ Owners from Southeast Alaska are the other major group of participants. They would receive the majority of the IFQs from SEO/E Yakutat (~~66% to 70%~~68% to 71%) and be important secondary players in most other management areas. Overall, Alaskan vessel owners would receive the majority of IFQs from the SEO/E Yakutat and Central Gulf areas (~~52~~51% to 73%). These are the two areas directly adjacent to the highest concentrations of participating Alaskan fishermen, from Kodiak and the ports of Sitka, Petersburg, and Juneau.

Most of the time, Alaskans would also receive a majority of the Aleutian Islands and Bering Sea IFQs (46% to 63%). The percentage shares from these areas and the Western Gulf should be considered preliminary. When 1989 participation was used as a necessary condition, the distribution shifted markedly from Washington to Alaskan residents. Two of these areas were still open when the data base was accessed and the Western Gulf was recently closed. In addition, there had been no directed fishing in the Bering Sea. These and other factors might be responsible for the changes rather than an actual change in fishing patterns. If this is the case and the historical fishing patterns become more evident later in 1989, then the percent distribution of landings by region might well change from those shown here.

The distribution of IFQs differs from the distribution of qualifiers to the extent that certain groups catch more or less than the overall fleet average. Table 5.2 shows that the overall IFQ distributions by residency are similar regardless of option chosen. A comparison of two distributions (for two years average with equal credit for all) is presented in Figure 5.2. Non-Alaskan fishermen would receive about ~~49~~45% of the IFQs while accounting for about ~~27~~23% of the qualifiers. Alaska region's shares of IFQs are less than their share of qualifiers. This comparison of average catch versus participation reinforces the supposition that Washington vessels (~~21~~19% of the recipient owners and ~~43% to 44%~~38% to 39% of the IFQs) represent a large part of the dedicated longliners that target on sablefish. Table 3.14 shows that 141 owners from Washington had landings in 1988 versus 504 Alaskans. Figure 3.3 demonstrates the relative participation rate of each group through the five qualifying years. For instance, Western Alaskans doubled their rate of participation from 1984 to 1985, 8% to 19%. By 1988 they had dropped to 12%. In the allocation example of two best years, Western Alaskans would comprise ~~13.7%~~9.2% of the recipient owners and receive ~~10.8%~~8.1% of the IFQs (Figure 5.2).

Figure 5.3 shows our projections of the distribution of IFQs for owners from Alaska and from Washington and other states. The figure includes charts for each of the six management sub areas which receive sablefish TACs, and a seventh chart which combines the areas and TACs. The charts assume an IFQ system based on an average of the individual's two best years. An individual must have participated in the 1989 sablefish fishery to receive an IFQ. The vertical bars show the qualifiers who would receive IFQs. The X-axis represents percentage ranges of the TACs in which

Table 5.2 Distribution of quota (percent) to qualified vessel owners who longline sablefish, by management area and residency, under Alternative 2, IFQs.

BEST YEAR, FULL CREDIT FOR ALL PARTICIPANTS

	MANAGEMENT AREA						
RESIDENCY	SE Outside/ E. Yakutat	West Yakutat	Central Gulf	Western Gulf	Aleutian Islands	Bering Sea	Overall
SE Alaska	68.5%	29.3%	19.0%	24.6%	22.7%	27.9%	32.8%
SC Alaska	1.5	9.6	17.6	12.7	21.4	24.4	13.0
Western Alaska	1.3	8.4	15.0	9.7	9.2	10.4	9.5
Total Alaska	71.3	47.3	51.6	47.0	53.3	62.7	55.3
Washington	25.1	46.9	40.0	43.6	42.7	33.6	38.3
Other States or unknown	3.6	5.8	8.4	9.4	4.0	3.7	6.4
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0

AVERAGE OF 2 BEST YEARS, FULL CREDIT FOR ALL PARTICIPANTS

	MANAGEMENT AREA						
RESIDENCY	SE Outside/ E. Yakutat	West Yakutat	Central Gulf	Western Gulf	Aleutian Islands	Bering Sea	Overall
SE Alaska	71.0%	27.6%	22.1%	26.2%	22.7%	27.5%	34.4%
SC Alaska	1.3	8.3	18.8	8.5	17.5	21.6	12.1
Western Alaska	1.0	7.9	10.4	13.7	7.2	11.1	8.1
Total Alaska	73.3	43.8	51.3	48.4	47.4	60.2	54.6
Washington	21.9	50.2	40.8	41.5	50.5	36.9	39.1
Other States or unknown	4.8	6.0	7.9	10.1	2.1	2.9	6.3
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 5.2 Continued

BEST YEAR, 75% CREDIT FOR NEW ENTRANTS IN 1987 OR 1988

	MANAGEMENT AREA						
RESIDENCY	SE Outside/ E. Yakutat	West Yakutat	Central Gulf	Western Gulf	Aleutian Islands	Bering Sea	Overall
SE Alaska	68.6%	29.4%	19.0%	24.8%	22.6%	28.7%	32.9%
SC Alaska	1.4	9.6	17.4	12.8	19.0	21.6	12.5
Western Alaska	1.1	7.9	15.2	9.9	10.0	11.0	9.7
Total Alaska	71.1	46.9	51.6	47.5	51.6	61.3	55.1
Washington	25.4	48.0	40.4	42.6	44.7	35.6	38.8
Other States or unknown	3.5	5.1	8.0	9.9	3.7	3.1	6.1
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0

AVERAGE OF 2 BEST YEARS, 75% CREDIT FOR NEW ENTRANTS IN 1988

	MANAGEMENT AREA						
RESIDENCY	SE Outside/ E. Yakutat	West Yakutat	Central Gulf	Western Gulf	Aleutian Islands	Bering Sea	Overall
SE Alaska	71.2%	27.9%	22.2%	26.5%	23.0%	28.1%	34.6%
SC Alaska	1.3	7.8	18.5	8.3	15.5	19.3	11.6
Western Alaska	0.9	7.6	10.5	14.1	7.6	11.6	8.2
Total Alaska	73.4	43.3	51.2	48.9	46.1	59.0	54.4
Washington	21.8	51.1	41.2	40.6	52.2	38.7	39.5
Other States or unknown	4.8	5.6	7.6	10.5	1.7	2.3	6.1
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 5.2 Continued

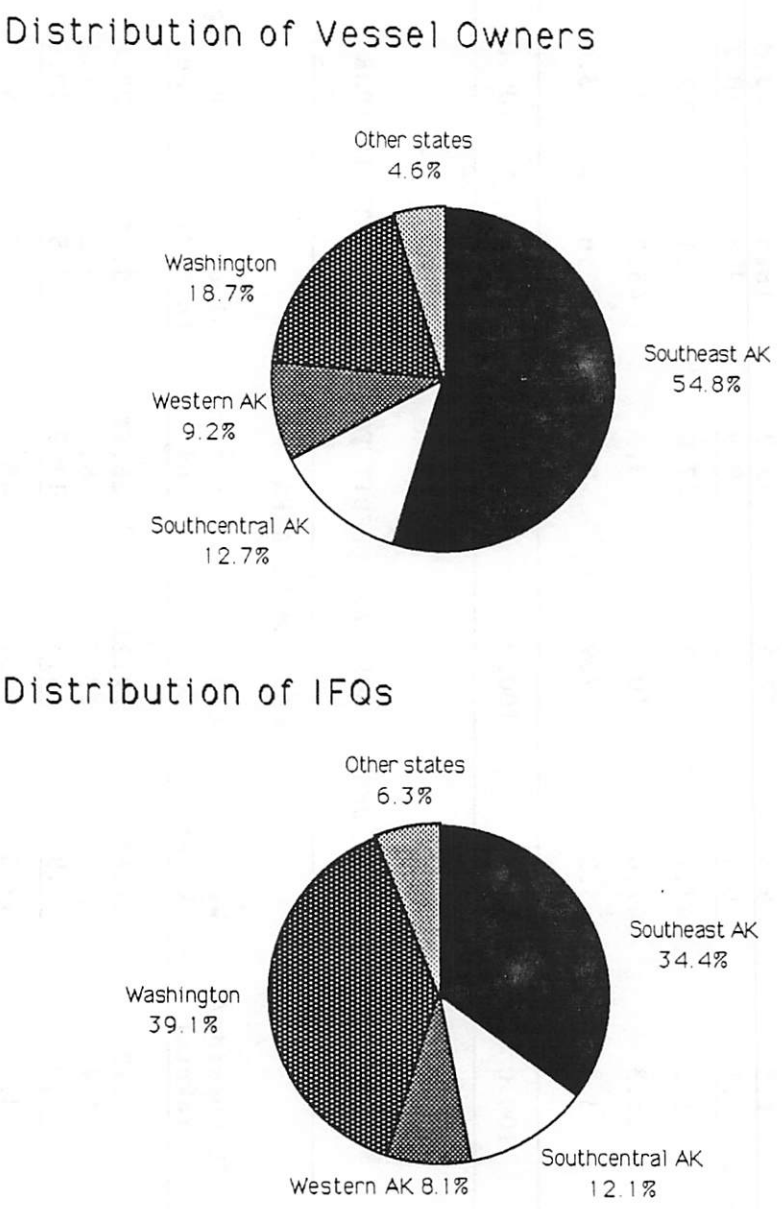
BEST YEAR, 75% CREDIT FOR NEW ENTRANTS IN 1988

	MANAGEMENT AREA						
RESIDENCY	SE Outside/ E. Yakutat	West Yakutat	Central Gulf	Western Gulf	Aleutian Islands	Bering Sea	Overall
SE Alaska	68.6%	29.2%	19.0%	24.9%	23.0%	28.3%	32.9%
SC Alaska	1.5	9.5	17.4	12.2	18.5	23.8	12.5
Western Alaska	1.1	8.4	15.3	9.9	9.6	10.2	9.7
Total Alaska	71.2	47.1	51.7	47.0	51.1	62.3	55.1
Washington	25.3	47.6	40.4	43.5	45.3	34.1	38.8
Other States or unknown	3.5	5.3	7.9	9.5	3.6	3.6	6.1
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0

AVERAGE OF 2 BEST YEARS, 75% CREDIT FOR NEW ENTRANTS IN 1988

	MANAGEMENT AREA						
RESIDENCY	SE Outside/ E. Yakutat	West Yakutat	Central Gulf	Western Gulf	Aleutian Islands	Bering Sea	Overall
SE Alaska	71.1%	27.6%	22.2%	26.4%	23.0%	27.8%	34.5%
SC Alaska	1.4	8.1	18.7	8.1	15.2	21.1	11.8
Western Alaska	0.9	7.9	10.5	13.9	7.5	10.9	8.1
Total Alaska	73.4	43.6	51.4	48.4	45.7	59.8	54.4
Washington	21.9	50.7	41.1	41.4	52.7	37.4	39.5
Other States or unknown	4.7	5.7	7.5	10.2	1.6	2.8	6.1
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Figure 5.2 Distribution of Vessel Owners and IFQs, by Region of Residency, for Average of 2 Best Years With Equal Credit for All

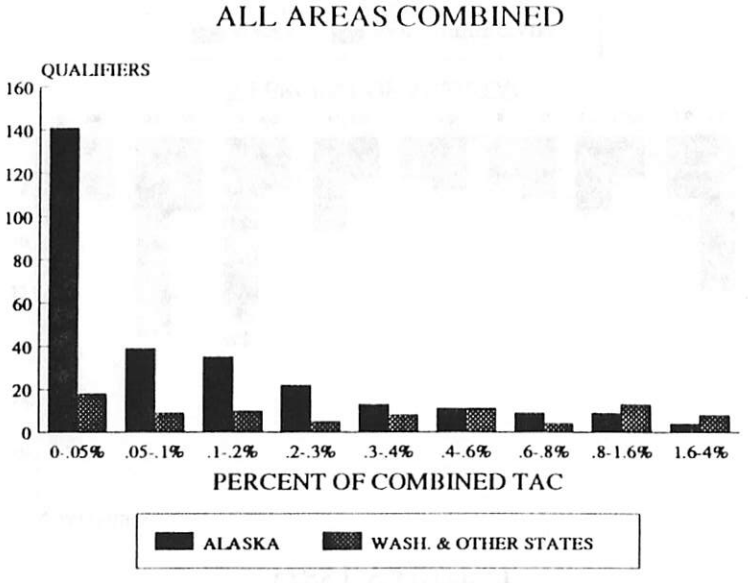


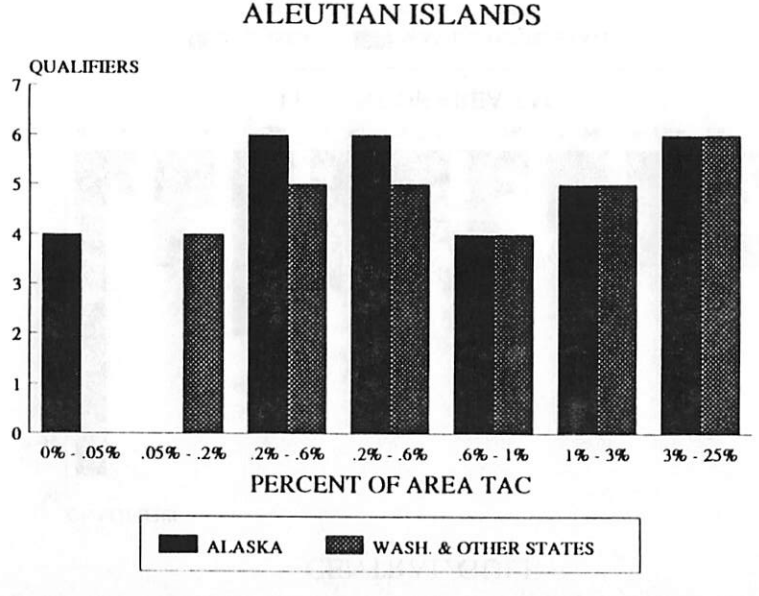
Note: In the top pie chart, all owners are counted only once. Therefore, an owner who would receive IFQs from 5 different areas is counted only one time. Likewise, IFQs are counted as a percentage of the overall TAC. That is, percentages from each area are adjusted to 1989 TACs, added together, and then regional percentages determined.

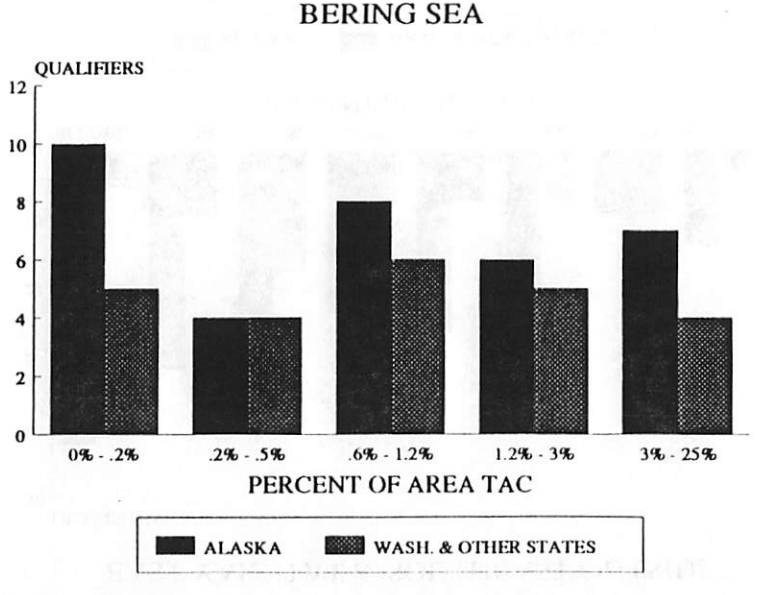
Source: CFEC/NMFS landings tickets and records.

Figure 5.3 Numbers Of Individuals Receiving IFQs, By Percentage Of Area TAC.*

These graphs represent the number of qualifiers for IFQs from Alaska and from Washington and other states. The bars show the number of individuals who would receive IFQs in the given ranges of the TAC for each area. The individual must have fished in 1989 to qualify for IFQs. For example, in the graph representing the Aleutian Islands, there are approximately six individuals from Alaska, and five from Washinton and other states who would receive IFQs ranging from 0.2% to 0.6% of the Aleutian TAC.



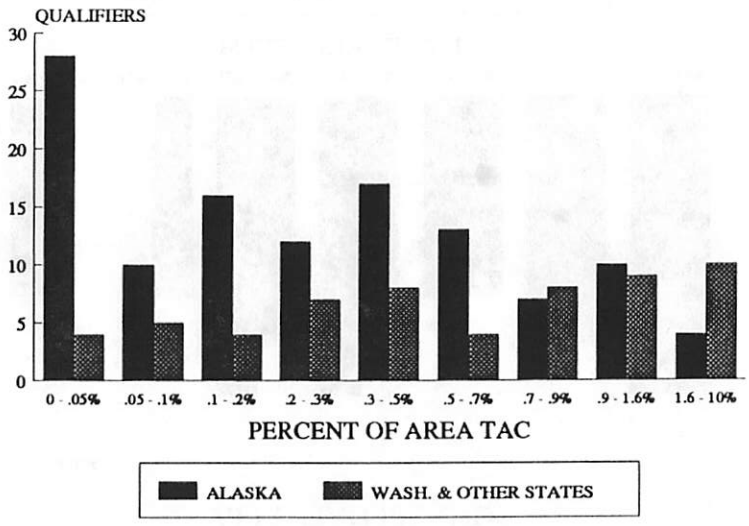




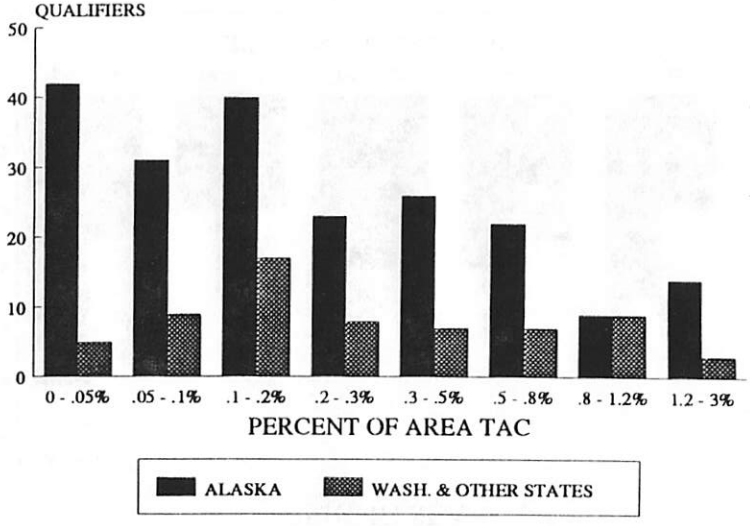
*All Graphs have been adjusted to protect confidential information.

Figure 5.3 Numbers Of Individuals Receiving IFQs, By Percentage Of Area TAC.*

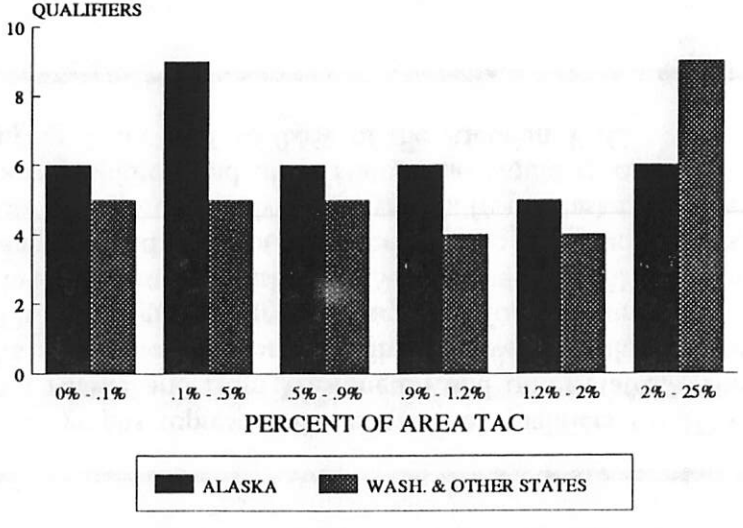
CENTRAL GULF



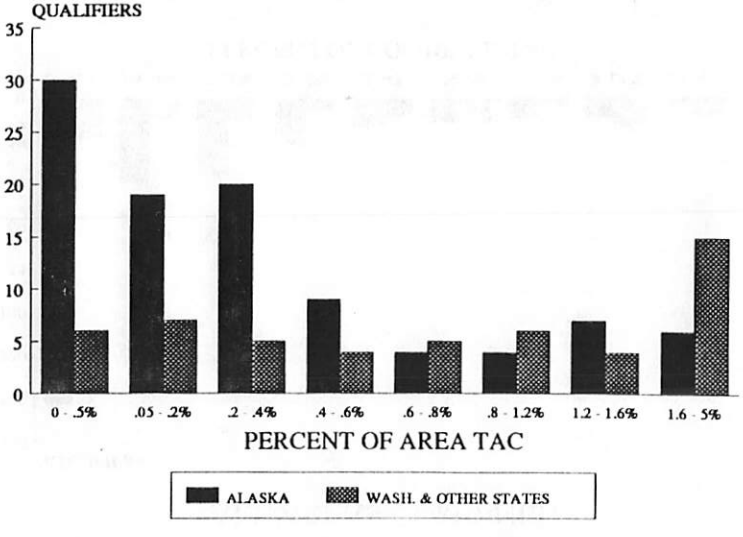
EAST YAKUTAT & SOUTHEAST OUTSIDE



WESTERN GULF



WEST YAKUTAT



*All Graphs have been adjusted to protect confidential information.

the IFQs fall.[2] For example, in the Bering Sea there are approximately 8 individuals from Alaska, and 6 from Washington and other states, who would receive quotas allowing them to catch from 0.6% to 1.2% of the Bering Sea TAC.

Taken alone, the charts representing the different areas are useful in examining the distribution of area catch among groups of fishermen. In the Aleutian Islands, there is a fairly even distribution of IFQs in the upper percentage ranges of the TAC. The smallest IFQs, up to 0.05% of the TAC for the Aleutians would be distributed to 4 individuals from Alaska, while 4 fishermen from Washington would receive slightly larger IFQs from 0.05% to 0.2% of the TAC.

In the Bering Sea, fishermen from Alaska are the majority in all percentage ranges. The smallest IFQs will be distributed to 10 Alaskans and only 5 individuals from the Lower 48 states. In the highest range of percentages of the TAC, 7 Alaskans will receive IFQs to catch from 3% to 25% of the TAC, while 4 fishermen from Washington and other states would receive IFQs in the highest range.

In the Central Gulf, fishermen from Alaska would receive a far greater number of IFQs than fishermen from Washington and other states. 28 Alaskans compared to 4 fishermen from the Lower 48 would receive IFQs to catch up to 0.05% of the TAC. Alaskan would dominate the fishery in numbers of fishermen in percentage ranges up to 0.7% of the TAC. From 0.7% to 1.6% of the TAC the IFQ would be fairly evenly distributed. In the highest range IFQs however, fishermen from Washington and other states outnumber fishermen from Alaska 10 to 4.

East Yakutat and Southeast Outside sablefish IFQ's would be dominated by fishermen from Alaska. Approximately 42 would receive quotas for 0 to 0.05% of the TAC. 32 would receive IFQs to catch between 0.05% and 0.1% of the TAC. Approximately 40 would be allowed to catch up to 0.2% of the TAC and 25 would receive quotas up to .3% of the TAC. Approximately 22 Alaskans would receive IFQs for up to 0.8% of the TAC and 10 for up to 1.2% of the TAC. The highest range is also dominated by Alaskans. Approximately 15 would receive IFQs to catch up to 3% of the TAC compared to 4 from Washington and other states.

Alaskans would outnumber fishermen from the Lower 48 states in all but the highest ranges of IFQs for sablefish in the Western Gulf. In the highest range, allowing individual quotas up to 25% of the TAC, there would be 9 fishermen from Washington and other states and 6 from Alaska.

The West Yakutat fishery can be described with a distribution nearly identical in form to that of the Central Gulf. The smaller ranges are dominated by local fishermen, the middle ranges are fairly evenly distributed, and the highest ranges are dominated by fishermen from Washington and other states.

The chart titled "ALL AREAS COMBINED," shows the distribution of IFQs of within the different ranges of the combined TACs. This summary chart shows that approximately 140 Alaskans would be given quotas to fish up to 0.05% of the combined longline quotas. Alaskans would be issued at least as many IFQs than fishermen from the lower 48 States in all ranges of the combined TAC up to 0.8%. In the highest ranges, from 0.8% to 4% of the combined TAC, fishermen from Washington and other states outnumber Alaskans.

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[2]Percentage ranges will vary among the seven charts, and were selected to facilitate grouping, and the protection of confidential information.

Table 5.3 allows easy conversion of the percentages in Figure 5.3 to representative poundage and values based on sablefish TACs for 1989. For example, the bar graphs in Figure 5.3 show that approximately 40 Alaskans would receive IFQs between .1% and .2% of the TAC for East Yakutat and Southeast Outside. Using the 1989 TAC of 12,498,200 lbs, shown in Table 5.3, these 40 individuals would qualify from somewhere between 12,498 lbs and 24,996 lbs worth between $10,973 to $21,947.

Description of the Fishery

The IFQ allocation process described above, regardless of the option chosen, would initially reduce the number of active participants almost in half. Because of this, eligible individuals would receive IFQs for close to double their past harvests. The expected result would be fishermen deciding if they wished to fish harder for sablefish or sell or lease their IFQs instead. Those fishermen who are already fishing for sablefish for most of their catch might have to acquire a larger vessel in order to use all of their IFQs. Others, who participate in sequential fisheries, might have to choose between fisheries. In either case, the excess IFQs could be sold or leased in the short term until a fisherman makes a final decision.

The design of the IFQ system allows the fishermen themselves, rather than managers, to determine the size and structure of the fleet following the initial allocation process. This is accomplished by the transferring of IFQs on either permanent or yearly bases. Individual operators would decide if their IFQ holdings are the proper size for their individual operations. Those who determined they had a surplus of IFQs (possibly due to retirement from the fishery, changing fisheries, or using a smaller vessel) would sell or lease them. Those who determined they required more IFQs (possibly due to entering the fishery, changing fishing areas, using a new vessel, for bycatch in other longline fisheries, or to expand present operations) would purchase or lease IFQs. Some would choose to leave the fishery altogether.

In order to fully describe the fishery under IFQs it would be necessary to accurately predict how many recipients would sell their IFQs, how many would lease, how many new entities would become owners of IFQs, the distribution of these transfers by region of ownership, and the magnitude of these transfers. It would also be necessary to accurately predict the magnitude of use of IFQs in directed fishing and as bycatch and the seasonal distribution of landings. An IFQ system does not lend itself to these types of descriptions in a quantitative manner. This is because the individuals owning the IFQs are making the decisions rather than managing agencies. However, since the active fleet will be reduced so much, it is possible that more vessels would participate than were allocated IFQs. If this were the case, it might only be a few years until individual operators made permanent adjustments to their effort levels. When these permanent changes occurred, the size of the fleet should begin to decrease.

The extent to which crew size and crew shares in the sablefish longline fleet would diminish in the long run is not known. ~~Regardless of who receives the IFQs,~~There would be a decrease in the number of crewmen. This would be related to two factors dictated by market forces. Since the rush to harvest fish before the TAC was reached would no longer exist, it would be possible for vessel owners and skippers to reexamine their labor requirements. It is probable that many vessels have more crew than would otherwise be needed, due to the rushed nature of the fishery. These excess crewmen would probably be let go under an IFQ regime, although the process may take several years due to uncertainty on the part of skippers, owners, and other fishermen. In addition,

Table 5.3 Conversions of percentages in Figure 5.3 To weights and values, based on 1989 total allowable catches (TACs) in subareas.

These tables provide the approximate pounds and dollars associated with percentges in Figure 5.3. For example, the bar graph for the Western Gulf, shows that approximately 9 Alaskans would receive IFQs allowing them to catch between 0.1% and 0.5% of the quota. Below, in Table 5.3a under the column labeled "WESTERN GULF" and on the line labeled 0.1%, this percentage of the 1989 quota in the Western Gulf is 6,635 pounds. Similarly, 0.5% of the Western Gulf quota is equivalent to 33,176 pounds (see shaded numbers). Thus, these 8 individual would receive allocations between 6,635 lbs. and 33,176 lbs. Catch values are shown in Table 5.3b on the next page: 6,635 lbs (0.1% of the Western Gulf quota) would have grossed approximately $6,071 and 33,176 lbs would have grossed $30,356 in 1989. The numbers in Table 5.3a are round weights. Ex-vessel values in Table 5.3b are calculated using the latest 1989 Pacfin round weight prices shown at the bottom of Table 5.3b. [Pacfin Report #130, August 7, 1989] Fishermen should not use this table to calculate their IFQs, but rather should refer to the worksheet in Appendix 1.

Table 5.3a Round weight pounds for all areas.

PERCENT OF TAC	E. YAKUTAT S.E. OUTSIDE	W. YAKUTAT	WESTERN GULF	CENTRAL GULF	ALEUTIANS	BERING SEA
0.00%	0	0	0	0	0	0
0.05%	6,249	4,755	3,318	10,296	2,805	1,540
0.1%	12,498	9,510	6,635	20,592	5,610	3,080
0.2%	24,996	19,019	13,270	41,184	11,220	6,160
0.3%	37,495	28,529	19,906	61,776	16,830	9,240
0.4%	49,993	38,038	26,541	82,368	22,440	12,320
0.5%	62,491	47,548	33,176	102,960	28,050	15,400
0.6%	74,989	57,057	39,811	123,552	33,660	18,480
0.7%	87,487	66,567	46,446	144,144	39,270	21,560
0.8%	99,986	76,076	53,082	164,736	44,880	24,640
0.9%	112,484	85,586	59,717	185,328	50,490	27,720
1.0%	124,982	95,095	66,352	205,920	56,100	30,800
1.2%	149,978	114,114	79,622	247,104	67,320	36,960
1.4%	174,975	133,133	92,893	288,288	78,540	43,120
1.6%	199,971	152,152	106,163	329,472	89,760	49,280
1.8%	224,968	171,171	119,434	370,656	100,980	55,440
2%	249,964	190,190	132,704	411,840	112,200	61,600
3%	374,946	285,285	199,056	617,760	168,300	92,400
4%	499,928	380,380	265,408	823,680	224,400	123,200
5%	624,910	475,475	331,760	1,029,600	280,500	154,000
10%	1,249,820	950,950	663,520	2,059,200	561,000	308,000
25%	3,124,550	2,377,375	1,658,800	5,148,000	1,402,500	770,000
100%	12,498,200	9,509,500	6,635,200	20,592,000	5,610,000	3,080,000

Table 5.3b 1989 Ex-vessel values for all areas.

PERCENT OF TAC	E. YAKUTAT S.E. OUTSIDE	W. YAKUTAT	WESTERN GULF	CENTRAL GULF	ALEUTIANS	BERING SEA
0.00%	$0	$0	$0	$0	$0	$0
0.05%	$5,487	$4,175	$3,036	$8,885	$2,581	$1,352
0.1%	$10,973	$8,349	$6,071	$17,771	$5,161	$2,704
0.2%	$21,947	$16,699	$12,142	$35,542	$10,322	$5,408
0.3%	$32,920	$25,048	$18,214	$53,313	$15,484	$8,113
0.4%	$43,894	$33,397	$24,285	$71,084	$20,645	$10,817
0.5%	$54,867	$41,747	$30,356	$88,854	$25,806	$13,521
0.6%	$65,841	$50,096	$36,427	$106,625	$30,967	$16,225
0.7%	$76,814	$58,445	$42,498	$124,396	$36,128	$18,930
0.8%	$87,787	$66,795	$48,570	$142,167	$41,290	$21,634
0.9%	$98,761	$75,144	$54,641	$159,938	$46,451	$24,338
1.0%	$109,734	$83,493	$60,712	$177,709	$51,612	$27,042
1.2%	$131,681	$100,192	$72,854	$213,251	$61,934	$32,451
1.4%	$153,628	$116,891	$84,997	$248,793	$72,257	$37,859
1.6%	$175,575	$133,589	$97,139	$284,334	$82,579	$43,268
1.8%	$197,522	$150,288	$109,282	$319,876	$92,902	$48,676
2%	$219,468	$166,987	$121,424	$355,418	$103,224	$54,085
3%	$329,203	$250,480	$182,136	$533,127	$154,836	$81,127
4%	$438,937	$333,974	$242,848	$710,836	$206,448	$108,170
5%	$548,671	$417,467	$303,560	$888,545	$258,060	$135,212
10%	$1,097,342	$834,934	$607,121	$1,777,090	$516,120	$270,424
25%	$2,743,355	$2,087,335	$1,517,802	$4,442,724	$1,290,300	$676,060
100%	$10,973,420	$8,349,341	$6,071,208	$17,770,896	$5,161,200	$2,704,240

1989 Longline sablefish ex-vessel prices per pound [Pacfin Report #130, August 7, 1989]

1989	E. YAKUTAT S.E. OUTSIDE	W. YAKUTAT	WESTERN GULF	CENTRAL GULF	ALEUTIANS	BERING SEA
PRICE/LB	$0.878	$0.878	$0.915	$0.863	$0.920	$0.878

the overall number of vessels actively longlining for sablefish would decrease, at least from current levels, as the poor profit of certain size operations became apparent.

Most of the IFQs are expected to continue to be used in directed sablefish fishing. This fishing may occur throughout much of the year since fishermen have different uses for vessels at different times of the year. Some of the IFQs would be used when fishermen longline for Pacific cod, turbot, and halibut. The use of IFQs as directed harvest or bycatch ~~would likely~~might become indistinguishable because fishermen would take sablefish at their convenience and to "top-off" catches of other species.

The use of IFQs might lead to high-grading with some fishermen discarding small sablefish in order to maximize the value of their landings. Similarly, they would have more time to fish than under open access, fishermen might target on larger sized populations and on concentrations of sablefish and other species. It is not possible to estimate the magnitude of high-grading or the resultant discard mortality of undersized fish. The IPHC estimates halibut hooking mortality to be 25% for the halibut longline fishery, an estimate that could be applied to sablefish until better data become available (Bracken, 1989).

Under IFQs, conditions would be favorable to reduce gear crowding and loss and having to fish in poor weather. Fishermen would not feel pressured into fishing under those conditions. It is not known to what extent the decrease in lost gear and resultant sablefish mortality would offset possible losses from high-grading discussed above. And, it is not known how many fishermen might choose to concentrate on areas of high fish abundance at certain times of the year despite the potential for overcrowding.

The use of IFQs would increase the possibility of blackmarket sales of sablefish. Since sablefish landings would occur during most of the year it would be easier to conceal illegal landings than under management involving seasonal restrictions. The illegal sale of sablefish would stretch IFQ allocations for those who had them and would bring extra income for those who did not. The magnitude of such illegal fishing can not be estimated. The ability of NMFS to trace landings ~~through~~to the wholesale level should assist in decreasing such landings, since illegal landings could be detected on at least three levels (harvesting, processing, and wholesale).

The market for IFQs could result in private sector development of IFQ exchange(s) to facilitate transfers. Transfers would also occur between individuals who were acquainted with each other without passing through an exchange. All IFQ transfers would be tracked by NMFS due to confidentiality restrictions. It is probable that some entities not otherwise affiliated with the fishing industry would acquire IFQs. It would also be possible for community corporations, etc. to acquire IFQs.

5.2.2 Processing Sector

IFQs would change the flow of product to the processors and thereby change the manner in which processing schedules and capacities are managed. Under open access, especially for processors in southeast Alaska, sablefish is a seasonal product which requires a great deal of processing capacity for a short period of time. This is often a useful situation since it allows processing facilities to run at or near capacity. If this amount of product requires capacity that is idle during the rest of the year then excess costs may be incurred by processors. The flow of product over a much longer period would mean that processors would either have to adapt schedules to allow processing to

occur throughout the season, arrange for deliveries only during specified periods, or cease processing sablefish.

Floating processors currently used elsewhere during other fisheries would have to modify their schedules or only process sablefish seasonally. It is unclear how much, if any, such changes would increase processing costs by increasing necessary capacity.

The possibility of poor quality due to processor bottlenecks would not be as prevalent under the IFQ alternative. There would be no opening with large sablefish landings unless the processors and/or fishermen decide this is a preferable marketing approach. Sablefish landings throughout the year could, perhaps, lead to small, specialty market niches.

Sablefish deliveries spread throughout the year would require fewer processing workers for a longer period of time. It is not clear whether this change in labor requirements would result in an increase or decrease in labor costs.

5.2.3 Administrative and Enforcement Considerations

A number of administrative and enforcement changes would be required by the implementation of an IFQ system. These would involve creation of a new administrative department and a change in management and enforcement practices. NMFS would be required to issue IFQs on a yearly basis and to track them from owners through processors, perhaps on a real-time basis. Enforcement would involve increased examination of landing documentation and could occur at the vessel, processor, and/or wholesale level.

The increased administrative costs would be offset by yearly charges made to IFQ recipients. This would have the effect of slightly decreasing the purchase price of IFQs. It would also relieve some of the financial burden of management currently placed on taxpayers. Enforcement costs would probably increase overall although there would be a switch from at-sea to onshore enforcement.

5.2.4 Maritime Communities

Sablefish longlining would have the added cost of leasing or purchasing IFQs. This would make new entry more expensive. However, the possession of IFQs would allow fishermen the opportunity to earn profits from the fishery, thereby bringing more money into the community.

5.2.5 Consumers and Markets

Because of the general uncertainty surrounding the IFQ system, the market for sablefish could overreact. The Japanese market seems to have stockpiled sablefish before regulation changes in the past (Jacobson, 1982) and can be expected to do the same again. Such a reaction would tend to drive the price for sablefish up before implementation of the management system with a resulting decrease in price due to oversupply during the first year of the system.

The availability of sablefish on a year round basis would allow domestic markets to secure a source of supply. It would not be as cost efficient for Japanese buyers to purchase all of a processors output since additional storage costs would be required by the processors. Instead, the processors would be in a better position to fill specific order quantities. Since domestic requirements are relatively small but consistent, such a system would allow better supply. This could also allow a great deal of control over quality and consistency of supply.

5.3 Alternative 3: License Limitation

5.3.1 Harvesting Sector

Qualifications of the Analysis

As in the discussion of Alternative 2, IFQs, a caveat is in order. Since ownership of record is established by a social security number, it is important that owners make certain they submit accurate information and that arrangements are made should the owner-of-record and the legal owner not dcoincide. ~~Also, as in the IFQ alternative, the total number of licenses exceeds the total number of vessels registered in any year (Table 3.2) as licenses are issued for each management area: Gulf of Alaska and Bering Sea/Aleutian Islands.~~

Allocations

Adoption of this alternative would result in the issuance of one or two kinds of licenses (transferable and non-transferable) to qualifying vessel owners, depending on the option chosen. Non-transferable licenses would expire after a set period and thus, at that time, the number of participants would be reduced accordingly.

Only those vessels which landed in sablefish in 1989 would qualify an owner for any type of license. In order to qualify for a transferable license a person's vessel must have made sablefish landings during the period 1984-86. Three qualification catch levels were examined: 10,000 lbs, 25,000 lbs, and 50,000 lbs. The two latter qualification amounts would apply only to vessels over 50 ft. If the individual owner did not meet the qualification level in any of these years or if the owner landed any amount of fish for the first time in 1987 or 1988, then he or she might be granted a non-transferable license or no license (depending on the option chosen).

All licenses are to be issued by vessel class. The classes are as shown below:

Vessel Class	Size range, ft
A	0-40
B	41-50
C	51-60
D	61-70
E	71-100
F	over 100

If the owner qualifies for a transferable license, the license would be issued for one of the above vessel classes in one of the management areas (Gulf of Alaska and Bering Sea/Aleutian Islands). Of course, it is possible for an owner to be issued licenses for each area.

Each license holder would be allowed to replace an existing vessel with a new vessel of the same class. If, however, the person wished to fish a larger vessel, he or she would need to trade in two licenses of a lower class to attain a license for a higher class (larger vessel). For example, two Class A licenses could be converted to one Class B license, two Class B licenses to one Class C license, and so forth.

The number of owners who qualified under these criteria are presented by management area and vessel class (Table 5.4) and graphically by management area (Figure 5.4 a&b) and by residency and vessel class (Figure 5.5 a-c).

Several generalizations can be made concerning these results (Table 5.4). First, at the 10,000 lb qualification level more owners overall have landed the minimum amount than have not by a ratio of about 3:1 (300 to 117 in the Gulf of Alaska and 63 to 27 in the Bering Sea/Aleutina Islands). ~~in the Gulf of Alaska, overall more owners have landed the amount than have not, 670 versus 462. In the Bering Sea/Aleutian Islands the ratio is almost 3:1, 146 to 55.~~ Second, not surprisingly, increasing the minimum landings necessary for qualification, reduces the proportion of owners qualifying. Third, the proportion of eligible owners landing the qualifying amount tends to vary with vessel size. Vessels from Class ~~A (less than 40')~~B (41' to 50') landed 10,000 lbs ~~31~~81% of the time in the Gulf of Alaska and over 50% of the time in the BSAI. Class E vessels (71' to 100') landed 10,000 lbs in both areas and 25,000 lbs in the Gulf over 50% of the time. However, this class landed the qualifying amount ~~less than~~ 50% of the time or less in the other three instances.

By examining Table 5.4 and Figures 5.4 together at 10,000 lbs, the change in fleet composition between management areas is apparent. Vessels under 40 ft potentially comprise ~~17~~21% of the fleet in the Gulf and 6~~5~~% in the Bering Sea/Aleutian Islands. This compares with past participation, where 34% of the Gulf vessels and 7% of the BSAI vessels were less than 40 ft. Conversely, the combined Classes E and F, those vessels over 71 ft, could possibly comprise ~~14~~8% of the fleet in the Gulf and ~~29~~19% in the BSAI. Only at the 50,000 lbs qualification level in the BSAI do more owners not qualify than qualify.

Qualification for licenses would vary by area of residency and option chosen (Table 5.5). At a 10,000 lb minimum, Washingtonians had the highest rate of landing the qualifying amount, ~~71%~~80%, followed by residents of other states (~~64%~~77%), Western Alaskans (~~60%~~74%), Southcentral Alaskans (~~46%~~68%), and those from Southeast Alaska (~~56%~~54%). ~~Southcentral owners are worthy of further notice (Figure 5.5a).~~ Similar comparisons can be made for other qualifying poundages.

The data in Table 5.5 and Figures 5.5 a-c, taken together with the data presented for Alternative 2 (IFQs), indicate that the Alaskan fleet which longlines in their local management areas is primarily vessels from Classes A and B, under 50 ft. This is possibly a direct result of salmon vessel size regulations since the vessel may also participate in salmon fisheries and be limited to less than 50'. The owners may not feel that a new vessel can be purchased just for longlining and are forced to use their existing vessel.

The year owners qualified was also examined (Tables 5.4, 5.5 and Figures 5.4). Recall that an owner might qualify differently by landing sablefish for the first time in 1987 or 1988 or by failing to land the minimum specified amount of fish in 1984, 1985, or 1986 (10,000, 25,000, or 50,000 lbs). As can be seen, at 10,000 lbs, the majority of individuals in each region and ~~management area~~the Gulf who failed to qualify did so by virtue of weight.

Four figures (Figures 5.6-5.8b) together demonstrate the possible effects of a license limitation program. Figure 5.6 depicts the exploitable biomass of sablefish in the Gulf of Alaska. Assuming average recruitment, 30,000 mt of sablefish can be removed from the Gulf without harming the sablefish stocks. Figure 5.7 describes the history of the sablefish longline fishery in the entire EEZ off Alaska. Since 1984, the number of vessels has increased 170%, while the catch has risen 250%. The catch per vessel has increased accordingly. A comparison with Table 3.2 shows that

Table 5.4 Numbers of sablefish longline licenses by management area and vessel class, under Alternative 3 (license limitation) assuming 10,000, 25,000, or 50,000 lb qualification level.

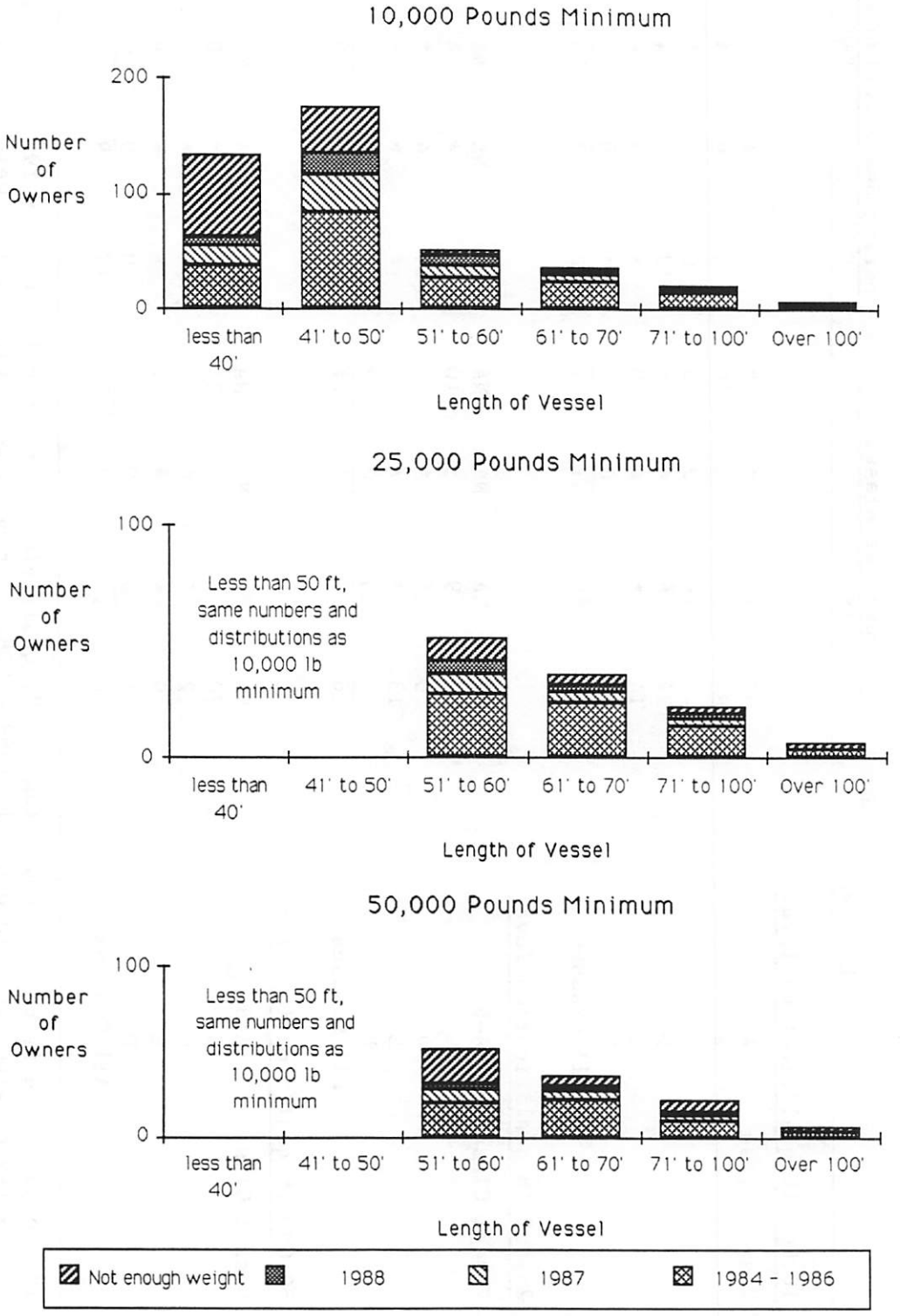
License Type[1/]		MANAGEMENT AREA: Gulf of Alaska T	Gulf of Alaska T87	Gulf of Alaska T88	Gulf of Alaska W	Bering Sea Aleutian Islands T	Bering Sea Aleutian Islands T87	Bering Sea Aleutian Islands T88	Bering Sea Aleutian Islands W
10,000 lb qualification level									
Vessel Class	A	38	17	7	72	0	*	0	*
	B	84	33	18	40	4	9	*	6
	C	27	10	9	5	6	*	*	6
	D	24	6	*	*	12	4	4	4
	E	14	*	4	0	*	*	*	5
	F	*	0	0	*	*	0	0	*
	All Classes	190	69	41	117	28	22	13	27
25,000 lb qualification level									
Vessel Class	A-B	NA	NA	NA	NA	NA	NA	NA	NA
	C	27	9	5	10	4	*	*	10
	D	23	5	*	5	11	4	*	6
	E	13	*	*	*	*	*	*	8
	F	*	0	0	*	0	0	0	*
	All Classes	66	17	11	21	18	10	9	27
50,000 lb qualification level									
Vessel Class	A-B	NA	NA	NA	NA	NA	NA	NA	NA
	C	20	8	*	21	4	*	0	11
	D	22	5	*	6	10	*	0	12
	E	9	*	*	7	*	*	*	9
	F	*	0	0	*	0	0	0	*
	All Classes	54	16	9	37	17	9	3	35

1/ Licenses type is either qualifying - "T", qualifying with first landings in 1987 - "T87", qualifying with first landings in 1988 - "T88", or not qualifying based on weight - "W".

NOTES: Since licenses are issued by management area, the total across management areas does not represent unique vessels or owners.
Vessel classes A and B were not totalled for the 25,000 and 50,000 minimums.
*Denotes 3 or fewer licenses, number removed to protect confidentiality.

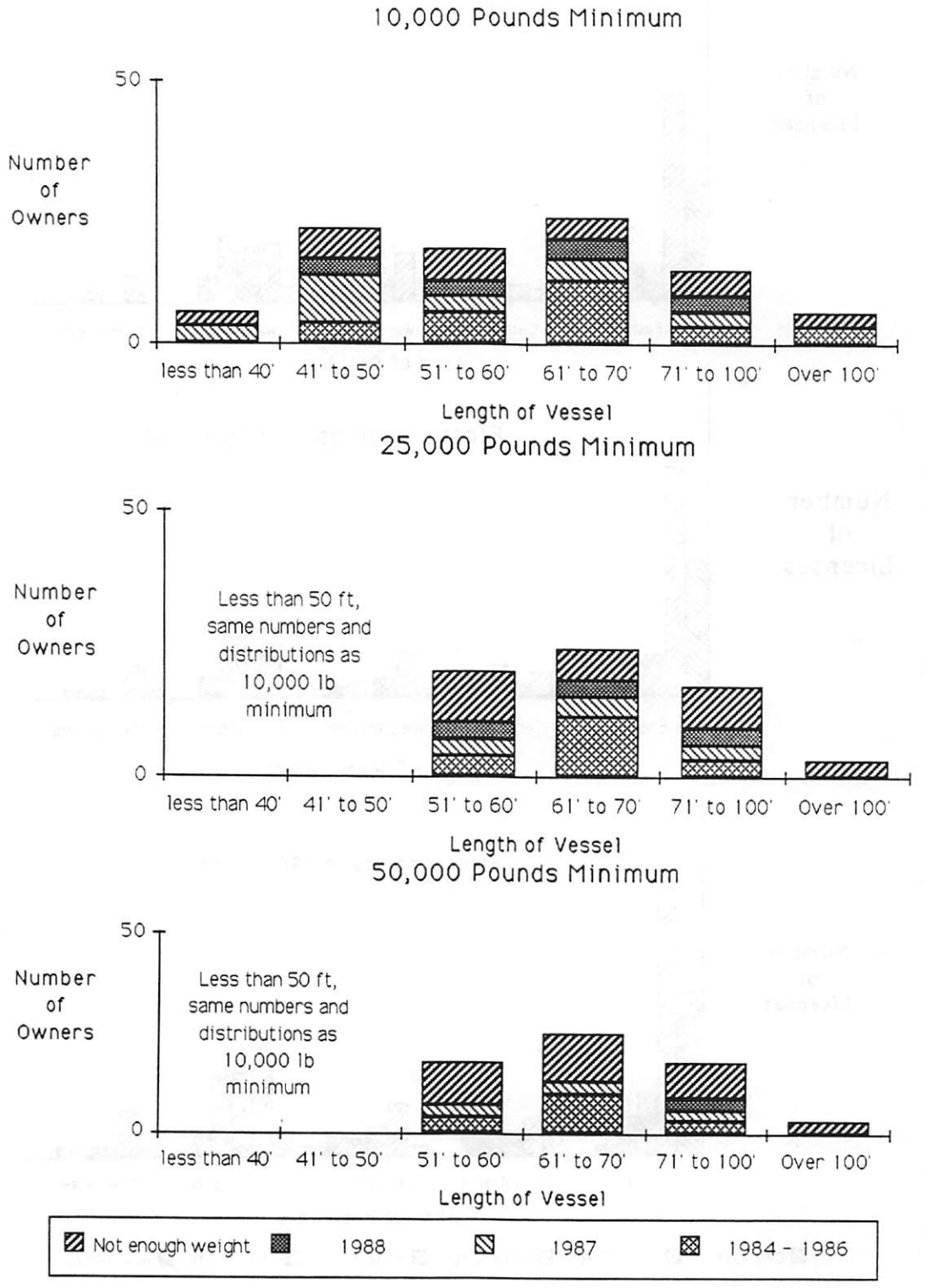
Source: ADF&G landing tickets; CFEC files.

Figure 5.4a How Vessel Owners Would Qualify for Licenses in the Gulf of Alaska, by Vessel Size and Minimum Poundage



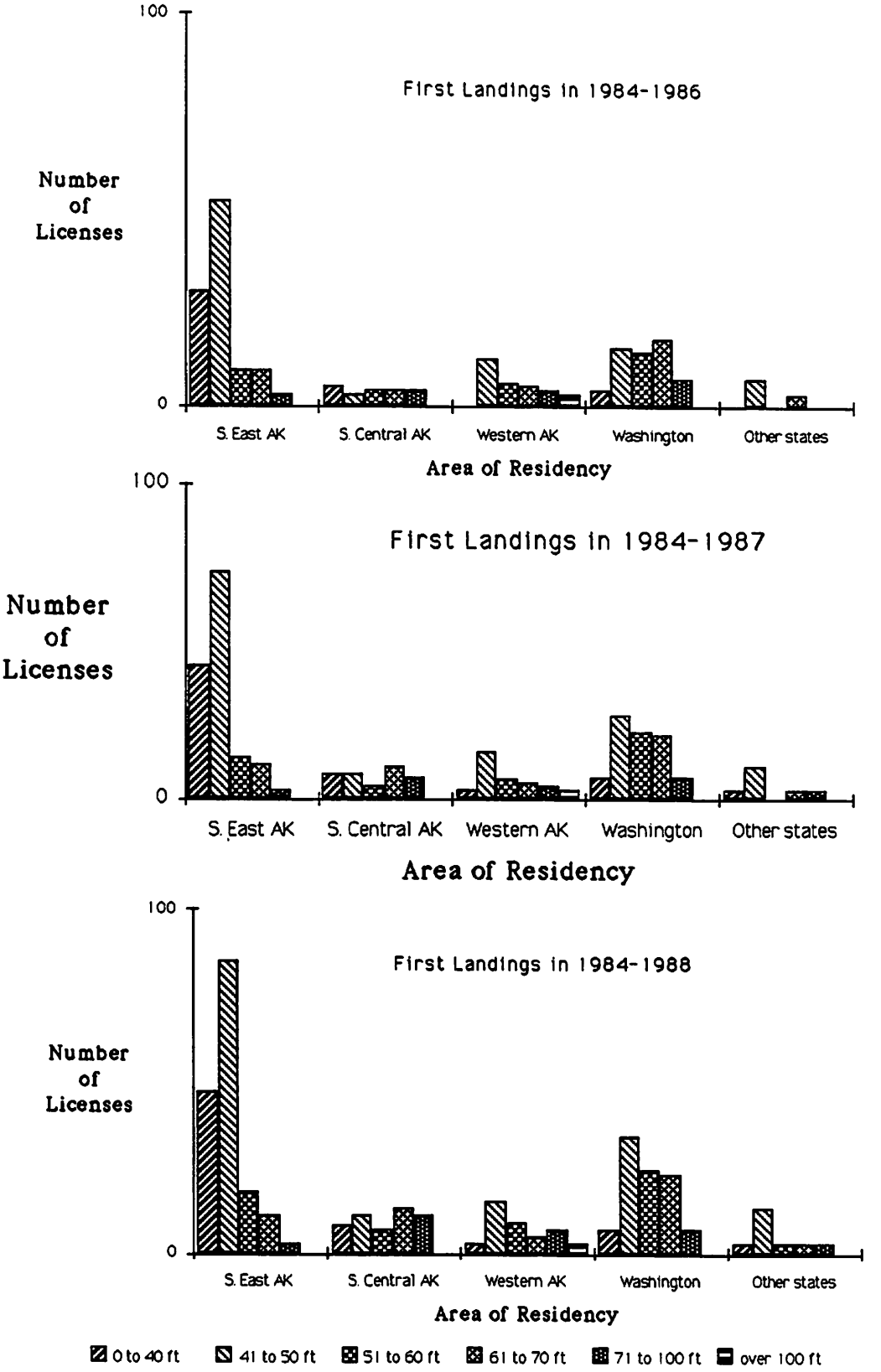
Source: NMFS fish tickets and CFEC data files.

Figure 5.4b How Vessel Owners Would Qualify for Licenses in the Bering Sea/Aleutian Islands, by Vessel Size and Minimum Poundage



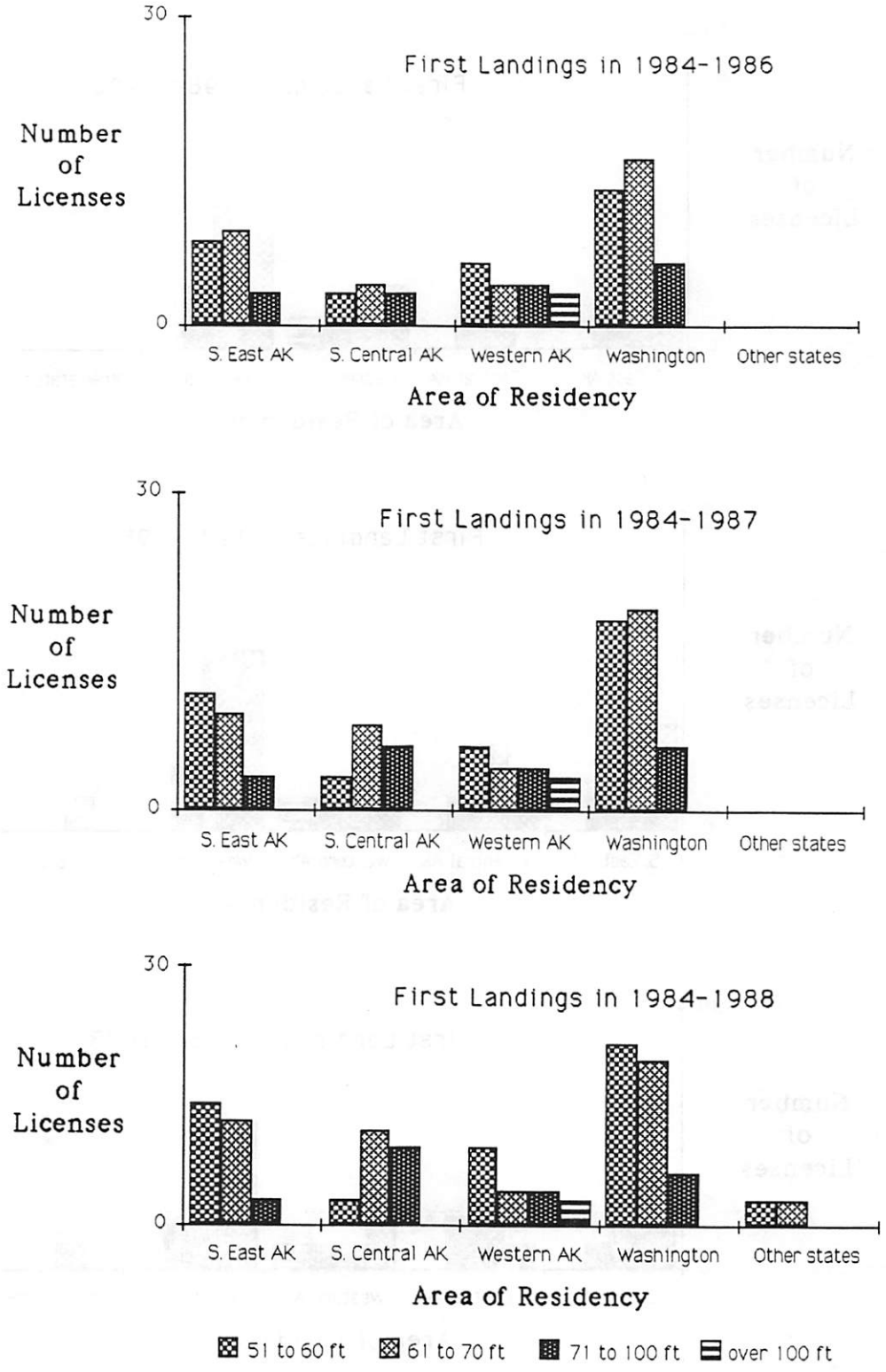
Source: NMFS fish tickets and CFEC data files.

Figure 5.5a Number of Sablefish Licenses to Vessel Owners, 10,000 Lb Minimum Qualifying Landings, by Residence and Vessel Class.



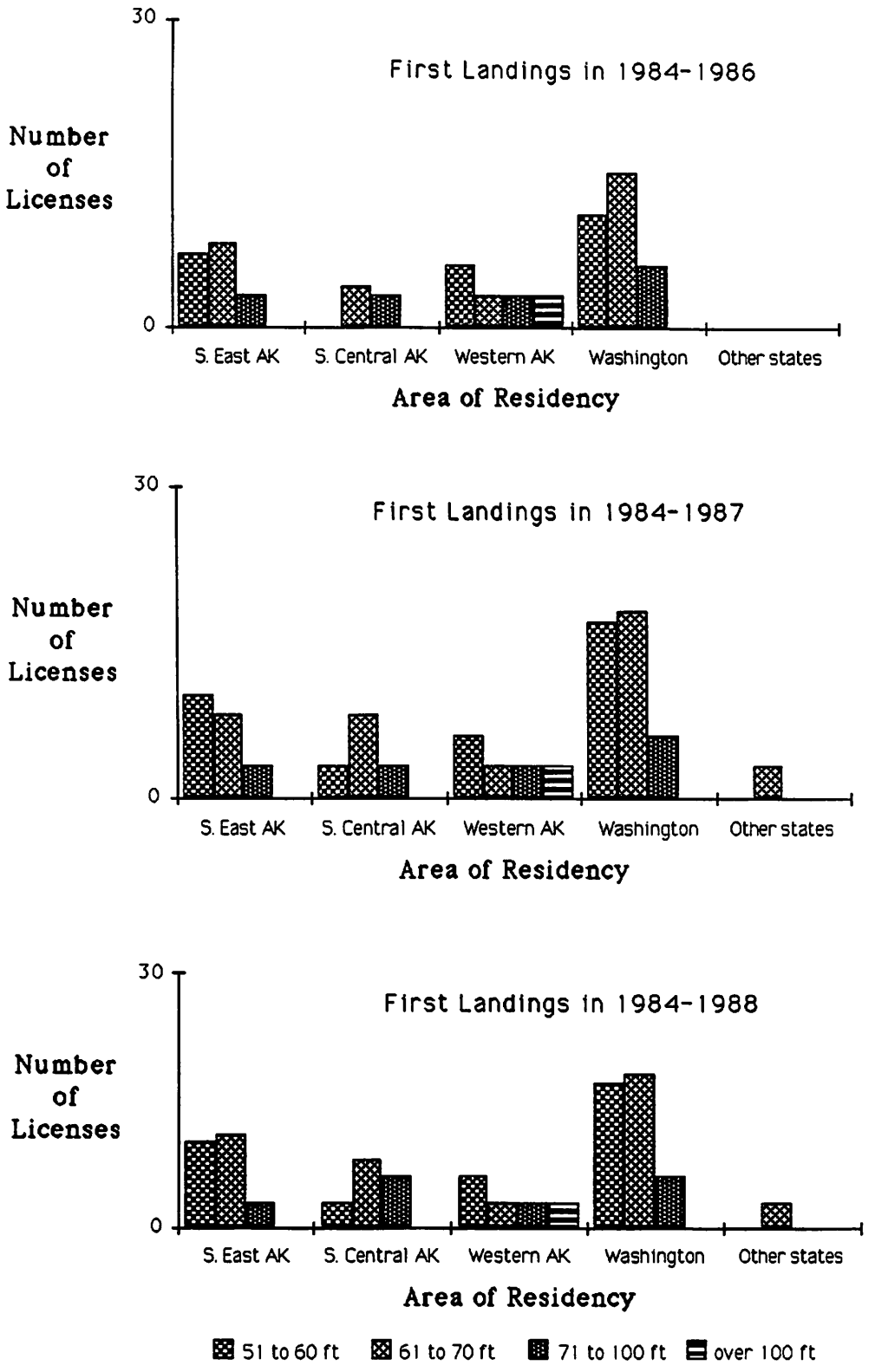
Note: Graphs have been adjusted to protect confidential information.
Source: CFEC/NMFS fish tickets data base.

Figure 5.5b Number of Sablefish Licenses to Vessel Owners, 25,000 Lb Minimum Qualifying Landings, by Residence and Vessel Class.



Note: Graphs have been adjusted to protect confidential information.
Source: CFEC/NMFS fish tickets data base.

Figure 5.5c Number of Sablefish Licenses to Vessel Owners, 50,000 Lb Minimum Qualifying Landings, by Residence and Vessel Class.



Note: Graphs have been adjusted to protect confidential information.
Source: CFEC/NMFS fish tickets data base.

Table 5.5 Number of vessels landing minimum poundage by region of vessel owner.

		Year of First Landing			Did not land minimum poundage
		1984-1986	1987	1988	
10,000 lbs					
	SE Alaska	102	38	25	113
	SC Alaska	19	19	11	23
	W Alaska	29	7	*	14
	Washington	56	25	12	23
	Other States or unknown	9	*	9	6
25,000 lbs					
	SE Alaska	20	5	4	13
(not including	SC Alaska	10	8	5	9
vessels under	W Alaska	15	*	*	6
50 ft.)	Washington	34	10	*	20
	Other States or unknown	*	0	4	*
50,000 lbs					
	SE Alaska	17	4	*	18
(not including	SC Alaska	6	6	*	18
vessels under	W Alaska	11	0	*	11
50 ft.)	Washington	32	8	*	25
	Other States or unknown	*	0	*	6

NOTES: Since licenses are issued by management area, the total across management areas does not represent unique vessels or owners.

Vessel classes A and B were not totalled for the 25,000 and 50,000 minimums.

*Denotes 3 or fewer licenses, number removed to protect confidentiality.

Source: ADF&G landing tickets; CFEC files.

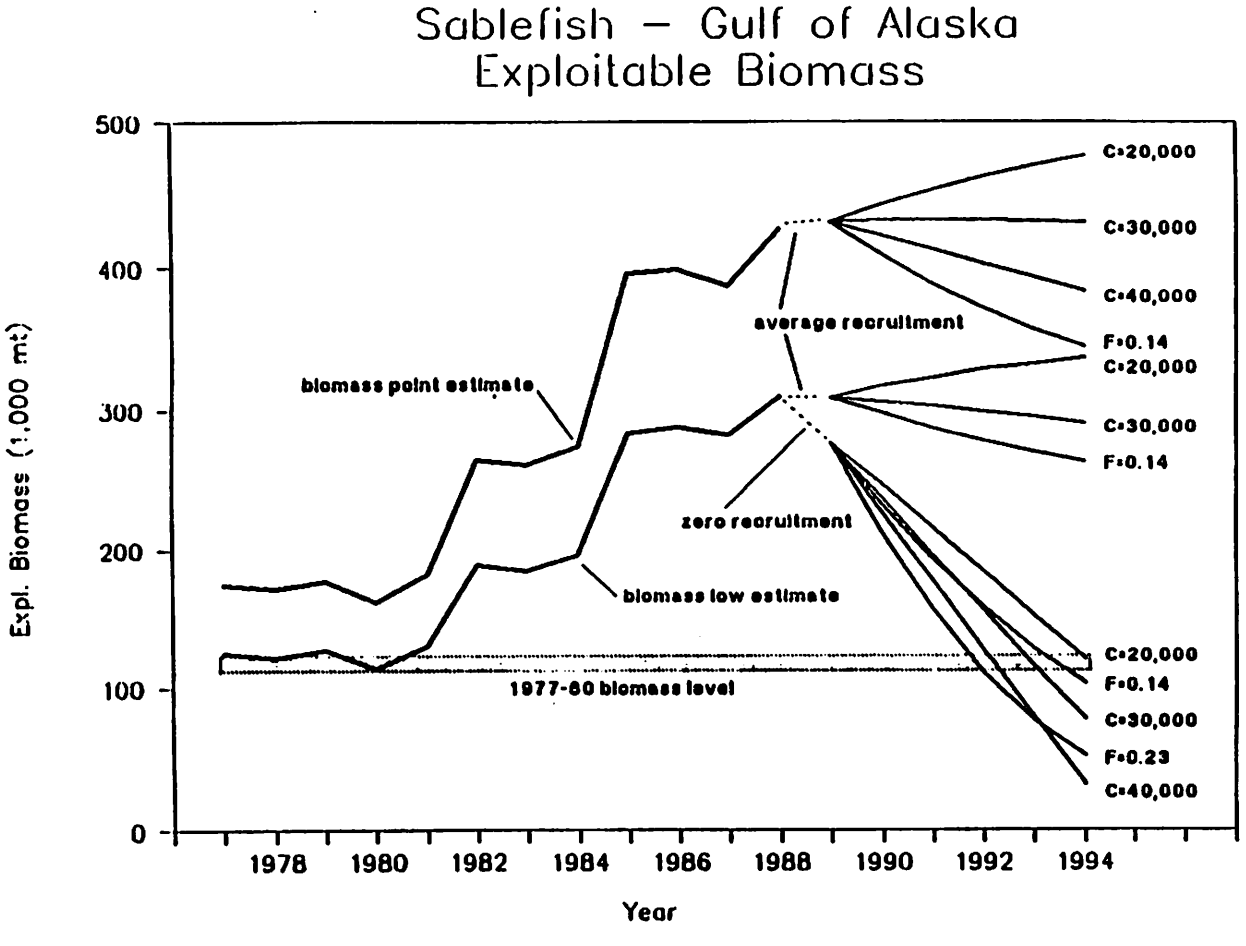


Figure 5.6 **Estimated population trend over time as estimated by the 1979-87 longline survey, and as projected by the SRA model beyond 1987 at various catch levels (scaled to the point estimate and to the lower confidence bound of the biomass). The projected levels are estimated assuming average constant recruitment for the point estimate and zero recruitment for the more pessimistic scale.**

Source: Gulf of Alaska Resource Assessment Document (November 1988).

FIGURE 5.7

HISTORY OF THE FULLY DOMESTIC SABLEFISH LONGLINE FISHERY

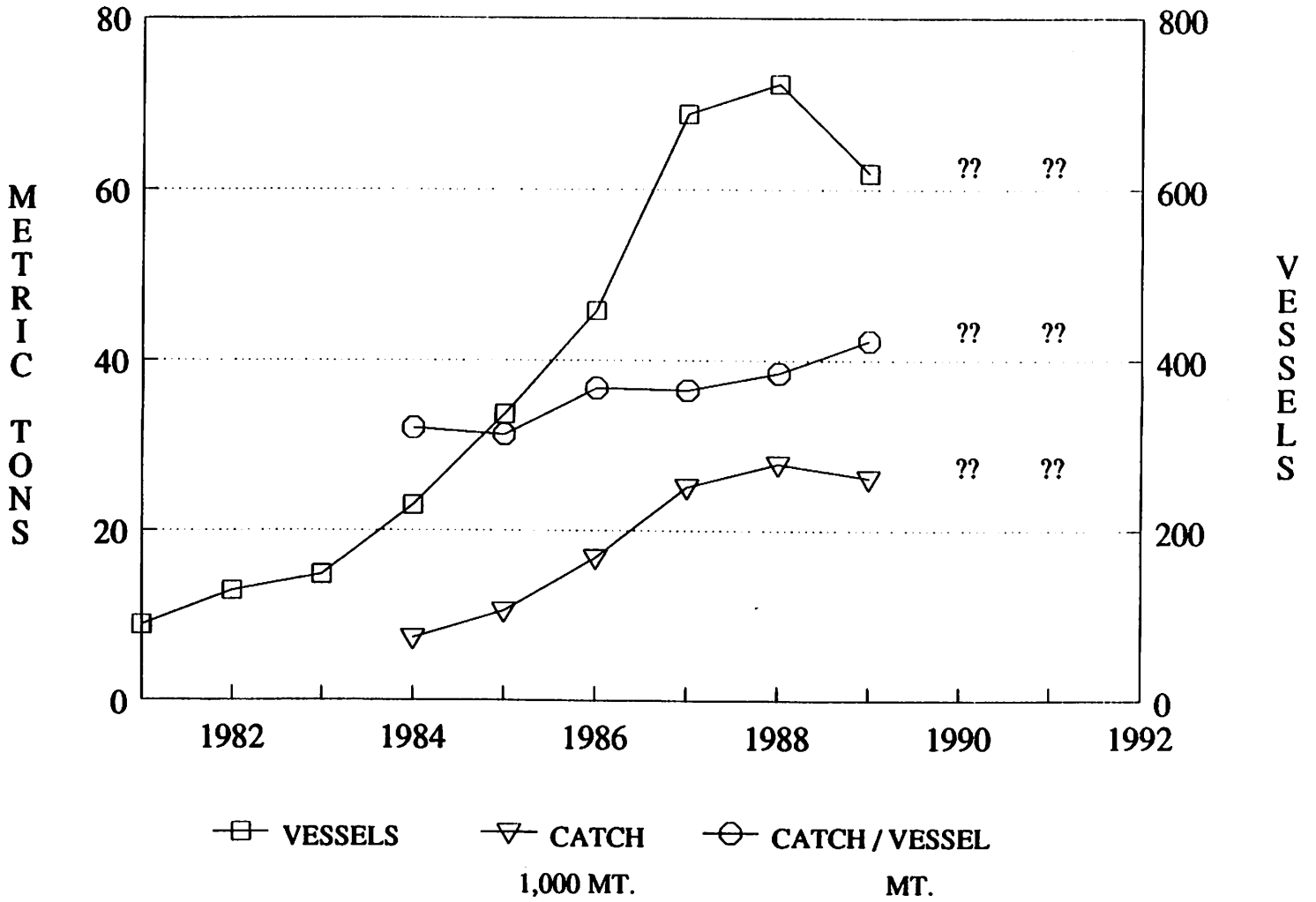


FIGURE 5.8a

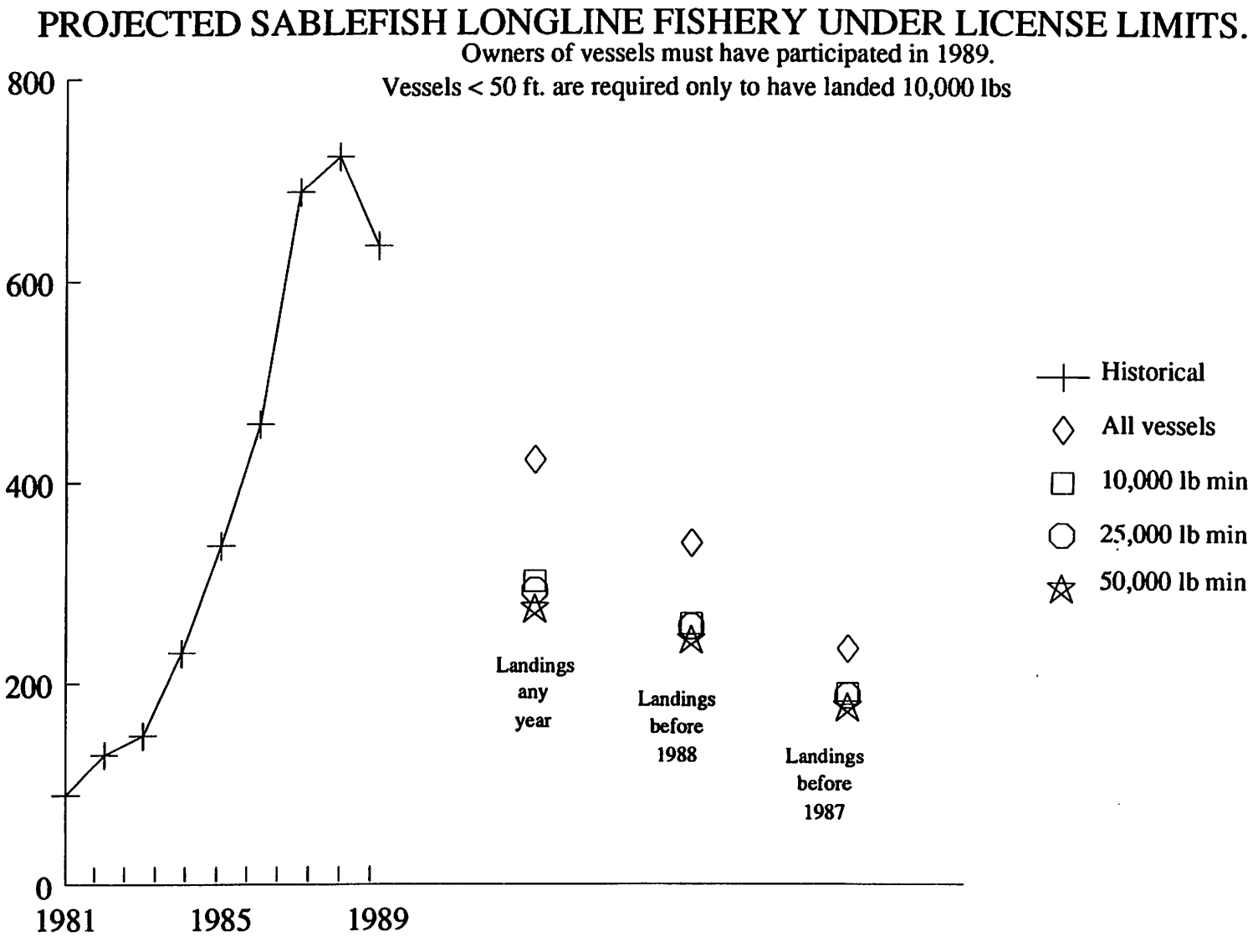
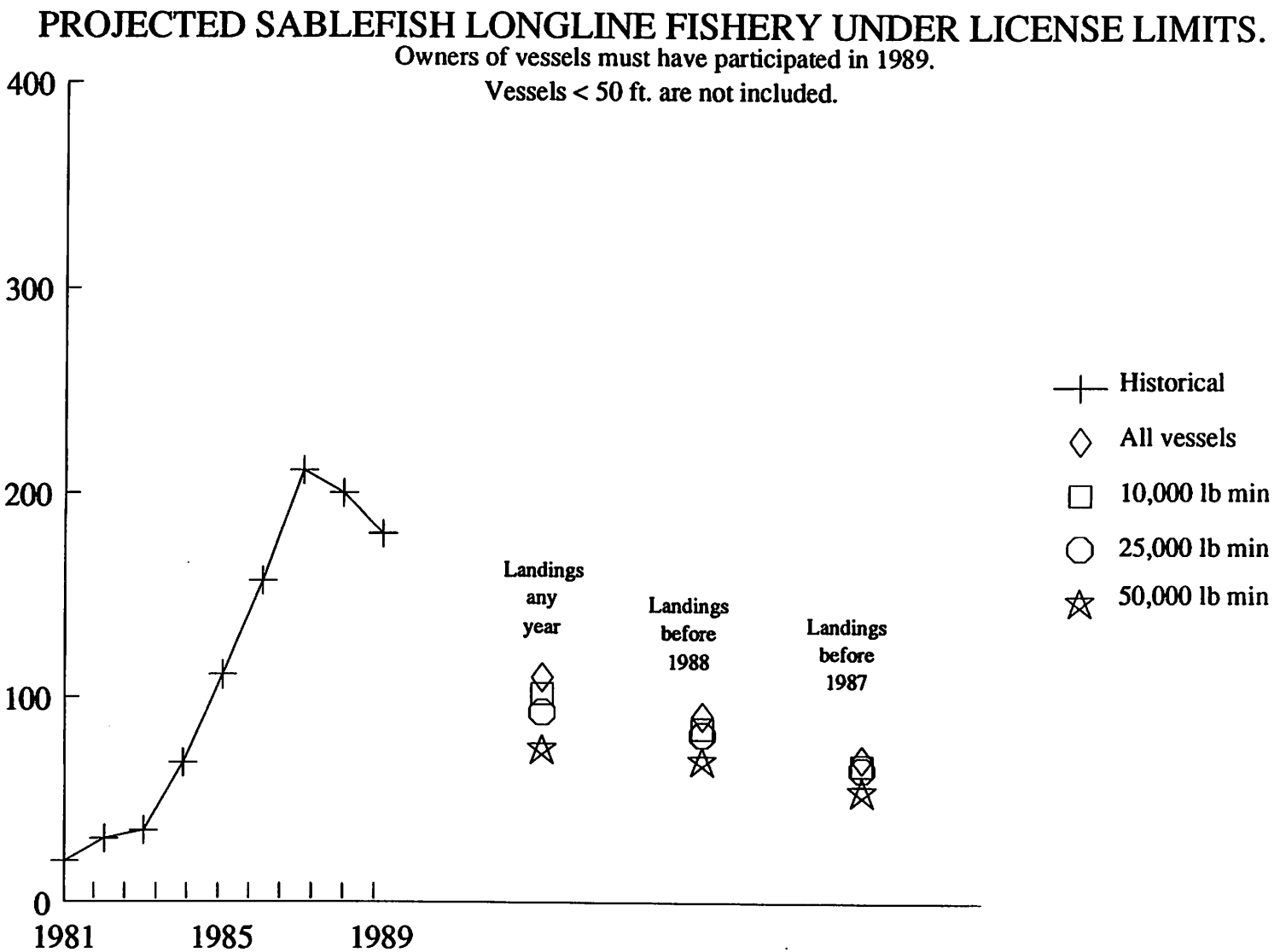

PROJECTED SABLEFISH LONGLINE FISHERY UNDER LICENSE LIMITS.
Owners of vessels must have participated in 1989.
Vessels < 50 ft. are required only to have landed 10,000 lbs
800
600
400
200
0
1981
1985
1989
Landings any year
Landings before 1988
Landings before 1987
Historical
All vessels
10,000 lb min
25,000 lb min
50,000 lb min

FIGURE 5.8b


PROJECTED SABLEFISH LONGLINE FISHERY UNDER LICENSE LIMITS.
Owners of vessels must have participated in 1989.
Vessels < 50 ft. are not included.
400
300
200
100
0
1981
1985
1989
Landings any year
Landings before 1988
Landings before 1987
Historical
All vessels
10,000 lb min
25,000 lb min
50,000 lb min

much of the increase is in large vessels which employ bigger crews, more skates and have greater operating costs.

Figures 5.8a and 5.8b show the possible effects of a license program. This compares to the data in Table 5.4 although the figures count unique vessels, regardless of management area. Figure 5.8a shows all vessels regardless of size, while Figure 5.8b limits license consideration to those boats longer than 50 ft. In both figures, the historical numbers of vessels from 1981 to 1989 are shown in the left half of the figure, while the number of qualifiers are shown in the right half. There is no implication of time on the right half of the figures since the columns are arranged only for comparative purposes. In Figure 5.8a, vessels under 50 ft ~~are not required to land more than 10,000 lbs, for all three of the minimum poundage requirements~~are required to have landed only 10,000 lbs or more to qualify under the 25,000 and 50,000 lb license systems.

In Figure 5.8, if licenses went to all vessels regardless of length, catch and first year of landing, roughly 420 vessels would receive licenses. If a minimum amount of landings were requisite for licenses fewer vessels would qualify. Approximately 300 would receive licenses under a 10,000 lb minimum requirement. Similarly, about 290 vessel would qualify if 25,000 lbs were required to have been landed. A 50,000 lb minimum landing requirement would reduce the number to roughly 250 vessels. Boats less than 50 ft would never be required to have landed more than 10,000 lbs under these regimes.

If it was required that first landings of sablefish occurred before 1988, further constriction of the fishery would occur. About 340 would qualify with no minimum, 260 with a 10,000 lb minimum, 255 with a 25,000 lb minimum, and 245 with a 50,000 lb minimum. Again in the minimum landing scenarios, vessels under 50 ft would only be require to have land 10,000 lb, in any given year. By requiring the first landings of sablefish to have occurred before 1987, the number of licensees could be further reduced. Approximately 235 vessel would qualify, if there were no minimum. Under a 10,000 lb minimum requirement, 190 vessels would qualify. Around 185 vessels would qualify under a 25,000 lb minimum requirement, and 175 under a 50,000 lb minimum landing requirement. Figure 5.8b considers vessel 50 ft or longer. It is interpreted similarly to Figure 5.8a. This figure depicts what could result, if all vessels under 50 ft were given non-transferrable licenses or if they were drop from consideration altogether.

Both Figure 5.8a and Figure 5.8b show that major reductions in the number of vessels occur if a minimum landing requirement of 10,000 lbs is enacted. Further reductions from increasing the minimum landing requirement are only marginal. Requiring first landing to be made before 1988 or 1987 reduces the fleet more effectively, than minimum landing requirements of 25,000 lbs or 50,000 lbs.

Description of the Fishery

The illustrative maximum number of licenses was determined in the previous section. ~~However,~~ Since a single vessel could fish in both management areas, the actual number of vessels ~~fishing licenses~~ would be somewhat ~~less~~more. ~~After two years, this reduced fleet might still have the same harvesting capacity as the current fleet due to upgrades to and improvements in gear.~~

Some vessels would be expected to take advantage of the option of combining licenses to fish larger vessels. Such a practice has occurred in the mid-Atlantic surf clam fishery which is under permit moratorium. An increase in vessels larger than 70 ft is expected as longline/processors enter both the sablefish and Pacific cod fisheries.

The initial fleet would be composed of fewer vessels than currently participate. If non-transferable licenses were included then when they expired the fleet would be reduced even further. Vessels have increased their use of skates and hooks in the recent years but may be approaching a maximum with existing technology (Bracken, 1989). That being the case, the reduced fleet size would result in lengthened seasons, reduced crowding, etc. Improvements in gear, other equipment, and vessel upgrades in size would eventually increase effort levels and shorten seasons. It is not possible to accurately predict how soon this would occur or to what extent.

The introduction of transferable licenses which do not require the license holder to be present during fishing operations would probably result in absentee license holders. These would likely include processors assuring themselves a source of supply. However, license owners or leasers would have to be vessel owners. It is not possible to anticipate how many licenses would be held by those receiving allocations, how many would be sold, where these new owners would reside, whether they would be individuals or corporations, nor the distribution of such changes by fishing area.

5.3.2 Processing Sector

The processing sector would be ~~little~~somewhat changed from open access. The season would probably ~~not~~ lengthen ~~much, if any, and therefore~~some although the scheduling and pattern of sablefish processing would remain the same. Depending on how lengthened the seasons become, some processors might have to contend with conflicting fisheries. Licenses would allow greater vertical integration than under open access. Fishermen who were permanently licensed would have greater confidence integrating with processing or cooperative harvester-processor ventures. Processors would be slightly disadvantaged if they did not own or control vessels fishing for them. The fishermen would have slightly more negotiating leverage than under open access, but it is difficult to say to what extent because few vessels are currently controlled by processors.

5.3.3 Administrative and Enforcement Considerations

The enforcement of license limitation would require increased effort in identification of fishermen but otherwise should impose no additional costs. NMFS would have to establish a new department for administering licenses.

The license fishery would operate in the same manner as open access, with the same type ~~and amount~~ of enforcement required. The amount of enforcement might be reduced with a reduction in the number of vessels. However, this reduction would be moderated if the season lengthened appreciably. Inspection for valid licenses would be conducted during normal investigations and through fish tickets. This would increase shoreside enforcement slightly but would not change current at-sea enforcement.

The administrative department would issue licenses, record transfers, collect yearly administrative fees, and cross check with fish tickets. The department would not be very large and its expenses would be covered by administrative fees. A greater description is included in Appendix I.

5.3.4 Maritime Communities

License limitation would abruptly reduce the number of active vessels and crew and would do so even more after ~~the two year~~ non-transferable licenses expire. This ~~two year~~ lag would provide

fishermen who are to be phased out the opportunity to plan other employment. However, as Tables 5.4 and 5.5 indicate, the total number of fishermen looking for work could be substantial under this alternative.

5.3.5 Consumers and Markets

Since licenses would affect the processing sector ~~only slightly~~somewhat there would be little change in the marketing sector or to consumers. As with open access, only increases in quality and availability of product would improve conditions for end users of the product. To the extent that the use of longline/freezers increase under this alternative, relative to open access, it is possible that these two factors will improve. Due to the limited world supply of sablefish, it is possible that some of the cost of licenses would be passed on to the consumer.

5.4 Valuation of Limited Access Fishing Privileges

The market price of transferable licenses is based on the future expected above-normal profits from the fishery.[3] These profits for the next ten years or so are adjusted for inflation, reduced for the interest the money could earn in the mean time, and added together. They also must be adjusted for the interest which will be charged on the money borrowed and the uncertainties facing the fishery. If no future profits are expected, then the price of licenses would not be great. Few estimates of license value exist. The value of licenses in the Australian prawn fishery was estimated at approximately three times the expected annual above-normal profit for that vessel size (Haynes and Pascoe, 1988). A price of two to three times annual average exvessel revenues from the fishery is a general range for State of Alaska limited entry permits.

It is not possible at this time to estimate the market price of sablefish licenses. They would vary by vessel size class and might be influenced by their combinability. Below is a list of the average weight of sablefish caught in 1988 by vessels landing 10,000 pounds or more. The expected price of a Gulf of Alaska Class D license (70-100 ft) would be approximately $137,850 to $206,775. This is based on the Alaska limited entry permit range, 1988 harvests of class D vessels landing at least 10,000 lbs (78,592 lbs), and average 1989 prices per pound ($0.877 as of August). However, since the size of the fleet would be reduced significantly, the average landings per vessel would be expected to increase. If there was a halving of the current number of Class D vessels, the price of a license could be in the $275,000 to $413,550 range, based on the calculations above.

1988 landings (in pounds) for vessels landing over 10,000 lbs. by vessel size class.

	GOA	BSAI
Class A	23,421	43,936
Class B	40,956	21,899
Class C	66,191	60,984
Class D	78,592	77,251
Class E	75,465	139,116
Class F	167,005	89,923

[3] Above-normal profits are those in excess of a normal profit on invested capital, perhaps 10%.

Since licenses would have value, fishermen must believe that with the number of vessels involved and the amount of gear being used, they would still earn above-normal profits from the fishery. The value of the licenses, then, absorbs the extra profit of the fishery. People buying a license are willing to advance the projected extra profit in return for a normal return on investment. They probably also believe that they can outperform the norm and still make extra profits. Much of the profit would, over time, be reinvested into the fishery in the form of bigger vessels, more efficient and effective gear, and so forth. This process occurs as fishermen attempt to gain greater profits, or at least maintain their current ones. It has been observed in most if not all fisheries under license limitation (Townsend, 1985a).

The reinvestment of these extra profits, rather than keeping them in the value of the licenses, is one of the inefficiencies of license systems. The decision to improve gear and vessels is a rational one on the part of each fisherman but it constitutes too much effort from an overall national perspective (Anderson, 1976). Subsidized loans to purchase licenses can also contribute to the problem by reducing the cost of reinvestment (Karpoff, 1984). This reinvestment, however, would reduce the market value of transferable licenses since future extra profits would be reduced.

The valuation of IFQs could be determined in two ways. For sales, IFQs would be valued much as licenses. However, since the IFQ would denote a fairly discreet amount of sablefish, it would be easier to determine a price. A value of two to three times exvessel price would still be appropriate. Therefore, assuming a price of $0.86 per pound in the Central Gulf, IFQs for about 100 pounds might sell for between $172 and $258. Again, if there was no extra future profits expected, the price of IFQs would be much lower.

On a yearly basis, IFQs would be leased for some percentage of the profit. For instance, if the selling price of sablefish was $0.86 per pound and harvesting costs were $0.65 (including fixed, wage, and operating costs, and a normal profit), the lease price might be as much as $0.21 per pound.

The price of licenses or IFQs would vary by their area designation and, for licenses, by vessel size class. Any fisherman who could reduce his operating costs would be able to increase his profits, as is currently the case. However, under limited access, the system may provide more favorable conditions for fishermen to adjust the size of their operation. This would allow them to concentrate on maximizing profits rather than increasing their ability to catch fish faster than the other fishermen.

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6.0 IMPACTS OF THE ALTERNATIVES

6.1 Resolving the Problems Facing the Sablefish Longline Fishery

The Council has identified 10 major management problems in the sablefish, halibut, groundfish, and crab fisheries. In choosing among the three alternative management approaches -- continued open access, IFQs, and license limitation -- the Council must consider how each will help address the identified problems.

None of the choices maintains the status quo. Certainly the longline fishery is going to become more competitive. Foreign quotas of sablefish are no longer available for reapportionment to augment the supply of sablefish for the domestic fishery. The sablefish resource has rebuilt, yielding a maximum harvestable yield of about 30,000 mt. However, recent assessments indicate the stocks may decline in abundance over the next few years. The pressure for this limited resource will come from all gear groups; the directed fishery and the fishery that uses sablefish bycatch. Each of the gear groups can be expected to place increasing demands on the stocks.

The overriding concern of the Council will be to ensure the long-term conservation and abundance of the sablefish resource for future generations of fishermen, associated fishing industries, communities, consumers, and for the nation as a whole while balancing the competing and conflicting needs of the fisheries.

The following discussion weighs the advantages and disadvantages of each alternative in terms of the ten major problems identified. The comparisons are necessarily qualitative as future predictions of fleet size, fisherman choice, or resource abundance in the future are not possible.

A list of the open access management measures the Council expects to use in the future was presented in Table 4.1. Most of the proposed measures reduce fishing efficiency. That is, the measures increase harvesting costs for every pound of sablefish landed. Some of these measures may still be necessary in conjunction with license limitations and, to a lesser extent, IFQs.

Table 6.1 presents a comparison of how the three alternatives would impact the identified sablefish fishery problems. Also compared are four items suggested by the Fishery Planning Committee: administration, enforcement, fees and fleet operating costs. The remarks in the table attempt to encapsulate the discussions in the following sections. These impacts are compared to the present state of the fishery rather than to a future fishery under continued open access. An inter-agency team of managers concluded that the traditional open access management tools could solve or at least improve all of these problems with the exception of excess harvesting capacity (NPFMC, 1989b). However, since it is not known how the Council will use these measures, only a continuation of the status quo and the imposition of limited access are compared.

6.1.1 Allocation conflicts - Allocations between gear groups and between at-sea and shorebased harvesters.

The sablefish TAC has been totally allocated to different gear groups. The demands for more fish for directed fisheries and bycatch in other fisheries will continue to grow with increasing amounts of gear on the grounds. This pressure could become especially acute if sablefish stocks decline in abundance, other target fisheries grow in volume, or the Council decides to firmly control total fishing mortality on sablefish by closing fisheries when specified mortality levels are reached.

Table 6.1

A Comparison of the Impacts of Sablefish Management Alternatives on Identified Sablefish Fishery Problems

	Open Access	*IFQs*	*Licenses*
Allocation Conflicts	No direct effect	No direct effect	No direct effect
Gear Conflicts	More crowded	Reduced	Reduced with significant fleet reduction
Deadloss	No change	Reduced	Reduced
Bycatch Loss	No change if other regulations used	Reduced	Reduced
Discard Mortality	No change	Possible increase	No change
Excess Harvesting Capacity	Worsening	Significant improvement	Significant improvement
Product Wholesomeness	No change	Improved conditions	Improved conditions
Safety	Worsening	Improved conditions	Improved conditions
Economic Stability	Boom-Bust cycle	Improved stability	Improved stability
Rural Community Development	No change	Increased possibilities	Increased possibilities
Enforcement	Cost up	Cost up	Cost up
Administration	Cost up Service down	Cost up Service up	Cost up Service up
Fishermen's Fees	No fee Taxpayer More	Fees Taxpayer Less	Fees Taxpayer Less
Fleet Operating Costs	Costs Up Profits Down	Costs Down Profits Up	Costs Down Profits Up

None of the proposed management systems addresses the gear allocation issue directly. However, to the extent measures control or reduce growth in fishing effort, they could help mitigate the increasing demand for more fish by each gear type. Other measures such as limits on bycatch and overall mortality would be needed under open access if the Council wishes to limit the impacts of one gear group on another in terms of their demand for the resource.

The onshore-offshore allocation issue cannot be addressed in terms of the sablefish fishery alone because the resource, while valuable, is not the mainstay of many, if any, shorebased processors. As explained in Chapter 5, offshore processing is expected to increase under all proposed alternatives. Licenses and IFQs, to the extent they can be controlled by communities or local governments, would allow coastal interests to secure access to the resource for local vessels. However, without further regulatory action only, IFQs would foster a regulatory environment that potentially could provide stable, metered supplies of sablefish throughout the year for onshore processing.

6.1.2 Gear conflict - Overcrowding of longline gear.

The amount of longline gear on the grounds is not controlled. To alleviate intra-gear conflicts, the Council could use area closures and/or allocations, exclusive and/or super-exclusive registration areas, platooning of the fleet, prescribed fishing practices, education programs, incentives to use innovative technology, catch limits, and vessel and/or gear restrictions. Except for innovative technology, all these measures would reduce the catching efficiency of individual vessels and the fleet as a whole. Open access is expected to lead to more intense, crowded fisheries; while neither harvest levels nor available fishing grounds are increasing, fishing effort is.

License limitation would not address gear conflicts directly. ~~If~~Since the fleet ~~were~~would be reduced during the initial allocation, gear crowding ~~may~~would not increase as fast as under open access. However, there still would be a race for fish, and as new fishermen buy licenses, more gear or larger vessels likely would be used to recoup the investment in their license. As has been observed in the past few years, individual vessels are using more skates and it is not known when the physical and technical capacities of the vessels will be reached, although some limits are being approached (Bracken, 1989). ~~Until that time,~~ Gear crowding would continue~~, possibly~~ at a rate reduced from that observed under open access. The same measures, reductions and costs to control gear conflict would be expected in licenses as in open access.

An IFQ system potentially could create conditions favorable to reducing gear crowding and conflicts. Part of this relief would come from lengthening the season. Fishermen with IFQs could choose to fish elsewhere or at different times. Some crowding might occur during certain times in certain areas, especially where sablefish are large or abundant. It is not possible to anticipate the extent of this crowding. However, if fishermen found gear conflicts to be too costly, they could change their fishing habits, no longer constrained by restrictive seasons.

6.1.3 Deadloss - Ghost fishing by lost gear.

Though gear loss soon will be monitored by the Council's comprehensive observer program, no measures now exist to reduce it. Many areas fished by sablefish longliners have rough bottoms which cause gear loss. However, gear loss is increased by gear crowding, especially in certain areas. The Council has identified the following management measures which could be used under open access to reduce gear crowding and abandonment of gear: gear modifications, exclusive and/or super-exclusive registration areas, gear check-in/check-out reports, gear registration, platooning the

fleet, prescribed fishing practices, incentives to use innovative technology, catch limits, and vessel and/or gear restrictions.

License limitation ~~might~~would reduce the number of vessels but gear use would continue to increase as would the amount of abandoned gear. ~~The initial fleet reduction would reduce gear loss to some unknown extent in the near term. If gear loss became a problem,~~ the same management measures proposed for open access could be used to reduce deadloss under license limitation with similar results.

Using IFQs could substantially reduce gear crowding and gear abandonment, both symptoms of short, intense seasons. Likewise, fishermen would tend to be more cost effective and would not use excess gear. This would reduce or eliminate the amount of gear left on the grounds.

6.1.4 Bycatch loss - Sablefish not landed for regulatory reasons.

Bycatch loss occurs when the directed fishery is closed and other fisheries taking sablefish incidentally are required to discard the species. Longline fishermen targeting other groundfish species are allowed to retain a prescribed level of sablefish bycatch. For example, 4% is the allowable level in the Gulf of Alaska. When the bycatch allocation is taken, all sablefish must be discarded. Bycatch is currently regulated by setting aside part of the TAC for bycatch, and estimated by catch reporting, logbooks, and observer coverage. Because most of these measures will not be implemented until 1990 their effectiveness cannot currently be assessed. However, under open access the Council could control bycatch loss by prohibiting discards, closely monitoring total sablefish mortality in directed and bycatch fisheries, and closing these fisheries when a specified mortality level is reached. Other measures that could be used under open access include area closures, gear modifications, incentives to catch less PSC, seasonal closures, TAC reductions, incentives to use innovative technology, and vessel and/or gear restrictions.

License limitation could slow the development of excess fishing power that leads to short directed fisheries. ~~if the amount of gear per vessel also were controlled. However,~~ The same allocations between directed fishing and bycatch as under open access would have to be made. ~~This might not be a problem in the few years followig license limitation depending on the number of vessels licensed and technology improvements.~~ Many of the traditional measures noted above for open access would also be needed.

The use of IFQs could greatly reduce bycatch loss by allowing the integration of sablefish longlining with other longline fisheries. Fishermen would still take directed sablefish trips but could also save IFQs as bycatch in other longline fisheries. A fisherman could participate in multiple fisheries, allowing him to land bycatch for a large part of the year. Increased profits from eliminating or reducing storage costs might induce fishermen to land their fish throughout the year. The management agencies would not have to allocate between directed and bycatch fishing since the fishermen could do that themselves. However, unless the Council identifies a portion of the TAC for bycatch, non-IFQ holders would have to discard all sablefish, offsetting some gains discussed above.

6.1.5 Discard mortality - Fish not landed for economic reasons.

This problem includes highgrading sablefish and discard of other species. Beginning in 1990, discard data will be gathered by logbooks, and comprehensive observer coverage. If hold space is limiting, fishermen will be more selective of fish size and quality, especially with regard to their

market demands. Short competitive fisheries do not allow fishermen to be overly selective and they may not have time for additional gear sets to replace small fish thrown overboard. Perhaps highgrading occurred more frequently when seasons were longer.

There is some discard of species such as rockfish, which remain fresh only three days. It is possible that other, less valuable species, such as Pacific cod would be discarded if the season shortened sufficiently and hold space were limiting. An amendment to limit discarded fish parts is under discussion by the Council. Other proposed management measures are gear modifications, incentives to use innovative technology, and vessel and/or gear restrictions.

License limitation would not be expected to change the highgrading or discard situation.

Highgrading could increase under IFQs ~~although not necessarily~~. However, discards of other species probably would decrease since fishermen would want to increase their revenue. Since they could land sablefish throughout the year they would not have to save space only for sablefish. Fishermen would not have the pressure of competitive seasons and would tend to maximize their revenues by retaining only larger, more valuable sablefish. This happens in other IFQ fisheries in Wisconsin and Canada (D. Anderson, 1989; Baldwin, 1989; Talbot, 1989). The Council could offset this tendency by counting all sablefish caught, whether kept or discarded, against IFQs. Fishermen, now having more time, would try to avoid areas with less desirable species and would attempt to catch species such as rockfish only when they could be landed in good condition. ~~The initial reduction in fleet size would allow eligible fishermen to receive IFQs for almost twice as much fish as they are use to. This might relieve any pressure on fishermen to highgrade since they would not be limited by IFQs. To the extent that this were the case, fishermen would keep all the sablefish they caught.~~

6.1.6 Excess harvesting capacity - The presence of enough vessels, gear, labor and other investments to harvest the available resource in less time than is available or optimal.

Excess harvesting capacity is a problem endemic to open access management (NPFMC, 1989b) and it will not be possible to solve the problem on a fleet wide basis. However, certain areas or seasons might be relieved, at least temporarily, of the pressure of too many vessels using large amounts of gear to catch too few fish using measures such as area closures, exclusive and/or super-exclusive registration areas, platooning the fleet, prescribed fishing practices, seasonal closures and flexibility, catch limits, trip duration limits, limits on the number of trips a vessel can make, and vessel and/or gear restrictions. The problem of excess harvesting capacity is expected to worsen under open access management regardless of the measures used to moderate it.

Restricted access through license limitation ~~could~~would reduce the number of vessels participating in the fishery ~~(depending on the option chosen) but would not~~and, indirectly, would control total effort. Without ~~a large reduction in fleet size or~~ limits on amounts of gear per vessel, there would still be a race for sablefish. Fishermen would continue to use better technology, more efficient gear, larger and faster vessels, and more crew members. A large initial reduction in vessels would allow the longest time before harvesting capacity returned to its open access level.

An IFQ system should lengthen seasons and allow fishermen to remove vessels, gear, crewmen and other investments from the fishery in order to increase the profit from each IFQ. Individual vessels would each reduce their effort to a level that they felt was most profitable; fleetwide, there would be a reduction in all types of effort. One recent study (Lipton and Strand, 1989) shows that under an IFQ system a fleet might actually have more, smaller vessels with smaller average catches. A

larger number of smaller vessels may be able to harvest more profitably with IFQs than the larger ones encouraged by open access. IFQs would allow fishermen to reduce the number of hooks used per day to a level they felt comfortable with. If this occurred, it would reduce fishing pressure even if the number of vessels involved did not decrease. Many fishermen around the docks and in testimony to the Council have suggested that they would use less gear if they did not feel the pressure of the derby fishery (NPFMC, 1988d and 1989a). This reduction in gear use per day would also have side benefits for gear conflicts, deadloss, discard mortality, product wholesomeness, and safety.

6.1.7 Product wholesomeness - Acceptability of fishery products to consumers based on appearance, taste, smell, and other perceptions.

The management measures considered in this document do not directly address product wholesomeness. However, any type of management measure which slows the race for fish can provide better opportunities to maintain product wholesomeness. Efforts are underway in Congress to impose mandatory seafood inspection requirements. Depending on the outcome of that legislation, the alternatives considered here could have some effect on product wholesomeness. The Council has identified several future management measures which might increase product wholesomeness. These measures are mandatory price grading systems at the processor level, platooning the fleet, education programs, seasonal closures, incentives to use innovative technology, catch limits, trip duration limits, and vessel and/or gear restrictions.

Under license limitation, product wholesomeness would be affected to the extent that seasons were lengthened and processor gluts decreased. Whether these changes occur depends on how many licenses are allocated. The larger the number of licenses, the greater the need for other management measures.

Because the "race for fish" would be decreased under IFQs, an improved environment for product wholesomeness would exist. Fishermen and processors would be able to arrange delivery schedules which would ensure fresh fish and adequate processing capacity. Fishermen would also have more time to handle their fish properly.

6.1.8 Safety - Management measures might compromise fishermen's safety.

Expansion of the fleet or else shortening of the seasons caused by continued open access will result in increasingly unsafe situations. This will occur unless fishermen have the latitude to avoid bad weather and are not rushed in their work. Safety equipment standards, recently imposed by Congress, ensure minimal safety equipment on vessels but do not deal with working conditions. Several management measures have been identified which could lead to safer operating conditions. These measures are safety standards, seasonal closures and flexibility, catch limits, trip duration limits, and vessels and/or gear restrictions.

The use of licenses would ~~change the~~provide conditions for an improved safety environment. This would be the case since ~~only to the extent that~~ seasons ~~were~~would be lengthened ~~by~~because of less effort on the grounds.

IFQs would allow fishermen to choose when, where, and how to fish. With this flexibility, fishermen would not feel compelled to fish in poor weather and would not be rushed to get their share of the fish. By removing these pressures, fishermen should experience a safer working environment.

6.1.9 Economic stability in the fishery and communities - A stable flow of income to longline fishermen and fishing communities may be in jeopardy.

Economic stability in the fishery and in the fishery communities arises from a stable flow of income from the fishery. This income comes from the harvesting sector, from processors, and those sectors that provide support services to the fleet. Two basic conditions for income generations are a healthy, abundant resource and a profitable fishery. Contributors to instabilities in the fishery and dependent economies include: the depletion of the resource, a regulatory environment that varies annually or closes fisheries in mid-season, or the onset of a boom-bust cycle wherein fishermen periodically leave the fishery.

Under open access, the boom-bust cycle occurs as more fishing power enters the fishery and revenues are split among more and more participants. Fishermen begin to loose money and leave the fishery. However, as the remaining fishermen earn greater profits, new fisherman enter, starting the cycle over again. A decline in sablefish TAC could exacerbate the cycle. Communities suffer because a portion of their fishermen leave the fishery and, without alternative fisheries or employment, lose their income. In addition, an excessive share of the income from such a fishery may be spent outside the community on equipment and vessel upgrades in order to maintain a share of the resource. Overall income to the community may decrease even if certain local merchants and suppliers make money. Because sablefish longlining is the major source of income in only a few communities, especially in Southeast Alaska, the overall, economic impact of continued open access will be very regional.

License limitation would slow down the process described above. There would be fewer vessels involved and therefore fewer people affected. The vessels which would not be in the fishery (depending on the option chosen) would be those with lesser historical landings. The major producers would still be present and would continue to increase their catching capacity. Any fishermen who purchased licenses (if allowed) would have additional debt to service. Fishermen selling or leasing their licenses would bring additional income into the communities. As catching capacity increased, some vessels would be forced out of the fishery and/or the market price of licenses would decrease. Otherwise, the scenario presented for open access would hold true. If regulations allowed government entities to purchase and assign licenses to communities, stability of the areas could be improved. The initial reduction in the fleet size would cause vessels to look elsewhere for employment. Since there is a normal turnover in the sablefish fleet, it is unclear how many vessels this would affect.

IFQs could provide conditions favorable for stabilizing the boom-bust cycle in terms of the number of participants, vessels, and investments. Individual operators would adjust the size of their operations according to the amount of IFQs they controlled. Surplus harvesting effort would be retired from the fishery along with the sale or lease of the owner's IFQs. This would lead to a fishery where participants could plan their future harvests and make investments accordingly. Fishermen would be able to participate in multiple fisheries and would be able to enter or exit sablefish longlining by acquiring IFQs. Profits from the fishery would accrue to owners of IFQs and fishermen rather than being spent on faster and bigger harvesting gear. Overall income to the community could increase as more money is spent on secondary services and less on equipment purchased elsewhere. This should result in a more stable economic environment for fishermen, their families, and communities. The transition to IFQs would include a reduction in the number of vessels and crew participating. This would occur during the initial allocation process as the size of the fleet was significantly reduced. Over a several year period, the size of the fleet would

fluctuate as individual operators decided that they would be better off by selling or leasing their IFQs rather than fishing them. While this would result in a reduction in employment, those remaining in the fishery would enjoy a better income than under open access. If this reduction happened quickly or was very large, displaced fishermen and communities would suffer economic and social instability. If regulations allowed government entities to purchase and assign licenses to communities, stability of the areas could be improved.

Any stability that is provided to communities, etc. by a limited access system would still suffer from changes in the resource base. As was the case in the Bering Sea king crab fishery, the collapse of a resource can cause great financial hardship. The same is true of a dramatic change in market conditions. For instance, if the dollar strengthened to double its current value against the yen, sablefish prices would undoubtedly decrease dramatically. Therefore, a management system which allows fishermen flexibility and sets favorable conditions for reducing harvest costs would be advantageous in these circumstances.

6.1.10 Rural coastal community development of a small boat fishery

Rural coastal community development may not be an issue with sablefish. Though small vessels longline for sablefish off Southeast Alaska, most fishing grounds are in deep water where weather is a factor. An exception to this might be Atka in the Aleutian Islands, a community that has not entered the sablefish fishery but does longline for halibut. The TAC for sablefish has rarely been fully harvested in the Aleutian Islands management area. Short seasons could constrain development of the fishery but greatly increased effort would be needed before seasons would decrease that much. The Council may consider amendments which would allow for community development allocations.

Under license or IFQ systems, communities could purchase, lease, or be granted harvesting privileges. Since communities would be considered as "persons", they could qualify to control these privileges. With special rules, communities would not have to own a vessel and could act as a conduit for community members. Licenses would guarantee fishermen a chance to fish, while IFQs would guarantee them a certain quantity of sablefish.

6.2 Concerns by Which to Judge the Alternatives

The Council identified 21 concerns associated with limited access management. These concerns are divided into three general subgroups: social, management and business. Each concern is listed below and examined for relevance to the proposed limited access management measures.

6.2.1 Social Concerns

6.2.1.1 **Limited access is forever and, even if not working, will not go away.**

Limited access systems may not last forever although they may be more difficult to change than other management systems. Many license systems throughout the world have undergone major structural changes or been eliminated. For instance, license systems have been significantly modified for Norwegian groundfish, changed to IFQ systems in Canadian groundfish and Michigan chub fisheries, and totally removed from the Australian southern bluefin tuna fishery, although in this fishery an IFQ system was instituted three years later. There are few, if any, examples of license systems which have been eliminated with a permanent return to open access management. Once conditions have deteriorated to the point that license limitation is put in place, neither

fishermen nor managers seem to be confident that open access tools can adequately control effort. Some IFQ systems are in place on a yearly basis (Iceland) or for a set period of years (in Canada, five years for eastern groundfish). These set time periods allow the government to change the system structurally if needed or to eliminate the system if desired. There are no known instances of an IFQ system being permanently abandoned in favor of open access or licenses.

6.2.1.2 **Unequal economic advantage will be given to those possessing fishing privileges.**

This concern is not relevant under open access though many in industry have perceived at-sea processors to have unequal economic advantage. Options for allocating between at-sea and onshore deliveries are being considered by the Council. Open access, as it is practiced now, allows equal fishing opportunities to all participants.

Only those people who were initially allocated licenses or IFQs would have an unequal economic advantage. Limited access uses fishing privileges in an attempt to control total effort. These privileges, by their very nature, allow some people to fish while restricting others. However, once in the limited access fishery, all participants have the same economic advantage. A system combining limited and open access fisheries would lessen any advantage to some extent.

6.2.1.3 **Concentration of fishing privileges.**

The concentration of fishing privileges, per se, is not relevant under continued open access management, though concentration of fishing power or control of that power is possible. This could occur through fleet expansion or collusion. However, because of the diverse nature of the longline fleet and processing industry it is unlikely that such concentration will occur. It is possible that the Japanese market forces could organize and dictate prices, etc. That is beyond the scope of both this plan and Council and NMFS jurisdiction.

The concentration of fishing privileges is not allowed under existing federal antitrust regulations. Many federal laws including the Sherman Antitrust Act of 1890, the Clayton Act of 1914, the Robinson-Patman Act of 1936 and the Celler-Kefauver Antimerger Act of 1950 would all apply (USDC, 1988). None of the limited access systems considered in this document have specific controls on the concentration of fishing privileges. National Standard 4 of the Magnuson Act stipulates that allocation of fishing privileges shall be "carried out in such manner that no . . . entity acquires an excessive share of such privileges" (Sec. 301(a)(1)). Based on the sablefish longline fleet structure and analysis of confidential ownership data no person would acquire an excessive share upon initial allocation (Chapter 5). If a person subsequently acquires additional shares, the U.S. Justice Department could rule on excessive concentration.

6.2.1.4 **Locking out proximate local communities from future participation.**

Communities proximate to the sablefish resource are participating and are not locked out. As the seasons shorten or if the timing of the seasons changes, perhaps local residents would not be able to participate. Typically, when local residents and communities do not participate in a nearby fishery, it is due to a lack of equipment, lack of market, or concurrent fisheries. The sablefish fishery is concurrent with few other fisheries (herring sac roe and some short salmon seasons). If the season began in the summer then many more fishermen and processors would have to choose between fisheries. With shorter seasons many fishermen might find it unprofitable to gear up and fish for sablefish. This is not the case with the halibut fishery, but sablefish are found farther offshore and there are some fishermen who have vessels which are too small to fish on sablefish

grounds. The only way for these fishermen to participate is to purchase or lease a larger vessel. Sablefish requires minimal processing and it is probable that all areas of sablefish fishing have processors or could establish them. There might be some areas with small vessels that do not harvest large amounts of sablefish and therefore have been unable to attract a processor.

Coastal communities would not be locked out from the sablefish longline fishery under licenses or IFQs under certain options. One option allows for direct allocations to communities. Another option allows communities to acquire licenses and operate them under a slightly different set of regulations. However, if neither of these options is chosen, communities and governments are still treated as "persons" under the proposed systems. Two of the proposed management systems include the possibility of leasing licenses or IFQs. Therefore, in these systems it would always be possible for local, state, or federal governments to acquire fishing privileges and lease them as a form of social welfare.

6.2.1.5 Keep any participation rights in the hands of those otherwise involved in the industry.

Only persons who own a vessel, or are a qualified lessee would be permitted to control licenses or IFQs. Subsequently, under one option, in order to control a license or IFQ, a person would have to provide proof of ownership or a qualified lease for a longline vessel. After acquiring control of a license or IFQ, a person could not sell their vessel or end their lease without losing the right to control a fishing privilege. Therefore, only persons who own or are the leaseholder of a longline vessel would control IFQs.

Under another option those controlling licenses or IFQs would not have to own or be a lease holder of a longline vessel. This would allow anyone to gain control of transferable limited access rights. In New Zealand some IFQs were purchased by investors not already in the fishery. Some of these investors still control IFQs as investments while others have sold them due to poor investment performance (Clark, 1987). If investors not already involved with the sablefish fishery acquired participation rights they would still be required to employ fishermen and vessels. Some profits would be funneled to these investors; although the fishermen would still experience the other changes brought about by these systems.

6.2.1.6 Changes will occur for fishermen, their families, and communities.

The continued increase in effort will result in less income to fleets as a whole (even though some fishermen will do well) and decreased economic activity in their communities, at least in the long term. The sablefish fishery, at least during the past few years, has been lucrative and fishermen have continued to make more money even with increased numbers of participants. This trend can be expected to change in the future. Shorter seasons and increased competition will, on average, reduce each vessel's harvest and revenues. Vessel owners will begin to spend more of their income on gear, fuel and vessel improvements and crew shares will decrease. This will result in less income to fishermen and their families but more income to merchants and suppliers. Some of the fishermen will have to enter other fisheries or other occupations. Since most, if not all, of the available fisheries are fully utilized, new entrants will lessen average income. In many of the communities involved there are few jobs available for fishermen wishing to change occupations. Therefore, some fishermen who leave the fishery might also leave these communities. The overall result would be less stability in the communities and a decrease in living standards. The continuation of open access does allow for the ability to share in striking it rich on the next fishing trip. Such unbridled optimism is part of the lifestyle of fishing and another of the social benefits enjoyed by fishermen and, vicariously, the community.

License limitation would result in changes of unknown magnitude, and direction, to fishermen, their families, and communities. Decreases in worker satisfaction may be felt by fishermen and their respective communities (NPFMC, 1988g; Townsend, 1985b). Social and economic changes, such as a shift of power to fishermen and an increase in fishermen's income, could also occur. These shifts or changes would be similar to those which occurred when the State of Alaska issued salmon licenses (Adasiak, 1978). From a social perspective, fishermen may misunderstand or misinterpret a license limitation system. For instance, managers may state that a fisherman's past harvests were not enough to qualify him for a license. The fisherman may perceive this to mean that he was ". . . not good enough to remain in the system, a reflection on (his) individual ability, and possibly even on (his) personal character" (Orbach, 1978). The issuance of non-transferable licenses would be an attempt to mitigate these responses. These decreases would be lessened by the understanding that most fishermen have gained from license systems in other fisheries. If effort levels were reduced and living standards were maintained or improved, these changes may become benefits. Since the fishery would operate much like open access, communities would be affected the same way. However, if the value of licenses is great, then added income may come to the fishermen, their families and communities.

IFQs would reduce the number of fishermen, change how success is measured, and provide greater long term stability to the community. Without a race for fish, fishing crews would be reduced in size. Likewise, without peak loads to processors, there would be fewer processing workers. However, all the people working in these sectors would work longer seasons, have more income, stability, and, possibly, the community as a whole have a greater income (NPFMC, 1988g). The initial reduction in fleet size would be accompanied by many of the same adverse social impacts described for license limitation, above. Some fishermen would be able to secure positions as full time longliners, an avocation which is disappearing in some areas. Communities would feel the benefits of more stable employment although with fewer people. Merchants would sell less, with those supplying fishing gear and supplies noticing the largest change. The actual extent to which this would occur with sablefish is unknown and would vary by community. In addition, communities (and some fishermen) would experience changes as fishermen sold or leased IFQs and spent or invested the proceeds.

6.2.1.7 Disruption of the traditional relationship between vessel owners, crewmen, and processors.

The traditional relationship between vessel owners, crewmen, and processors is changing because of the introduction of longline/freezer vessels. These vessels do not distinguish between harvesting and processing, at least for the owners of the vessels. In trawl fisheries some of these types of vessels have begun to change the way crewmen are employed and paid. As more of these vessels come on line the traditional relationships will continue to change.

Under license limitation processors would lose some of their negotiating leverage over fishermen but, otherwise, traditional relationships would not be disrupted. One of the reasons the State of Alaska began license limitation in salmon fisheries was to shift control of the fishery from processors to fishermen. They believed processors would have less control over who could fish for them and, would treat fishermen with greater equity. Sablefish licenses, with the controls on who could own them, would do little to change the relationship between vessel owners and crewmen.

The use of IFQs would result in fishermen and processors jointly scheduling trips, and IFQ owners gaining more negotiating leverage. There may also occur a change to the share wage system.

Since sablefish deliveries could be made most of the year, fishermen and processors would jointly decide the best time for trips. Such deliveries would take into account processors capacities and other fisheries the vessel might be engaged in. People owning or controlling IFQs would have a better negotiating leverage by being able to take their catch to other processors. They would not be constrained by a short season and therefore would not have to always land at the same port. With an (almost) guaranteed income from the IFQs, some owners or crewmen might want to institute a minimum trip wage. This is discussed more fully below.

6.2.1.8 **Processing will move almost entirely offshore.**

Processing in the sablefish longline fishery is beginning to move offshore and it is not possible to determine how much will remain onshore, under the status quo. The freezer/longline fleet has grown from 1 vessel in 1985 to over 25 in 1989. As the seasons shorten, there is an incentive for longliners to deliver to floating processors, thereby saving the travel time to more distant ports. Several floating processors, anchored in coves or bays, have operated in recent years with numbers expected to increase in the future. If the season(s) shorten to the length of only one trip (seven days) then more processing would stay onshore. This is because most vessels would want to resupply and because some type of check-in or out may be required.

Offshore processing may develop more quickly under a license system than under open access if additional profits exist. Since the licensed fishery would have a longer season than open access, this change might happen faster.~~be conducted in much the same manner as the open access fishery, the same incentives would exist for offshore processors.~~

Under IFQs, there would be greater incentives for offshore processing to increase. IFQs allow a prolonged season and a secure product flow. This greater security would be conducive to vertical integration and would allow both fishermen and processors to expand into longline/freezers. These longline/freezers would be able to catch sablefish as bycatch in other fisheries. Fisheries would be less concerned about sablefish bycatch and would not be limited to 4% retention, as occurs now in the Gulf of Alaska. The large initial reduction in vessels and increase in harvests per vessel would encourage vessels to expand their size or their profit margin. Either of these could lead to more longline/freezers or floating processors. Conversely, many fishermen in smaller vessels might be interested in sablefish trips during good weather. They might also be interested in returning to port more often to see their families. If this happened, shorebased deliveries would increase. It is unclear which of these competing interests would increase or if the present distribution of onshore processing would be maintained.

6.2.1.9 **Fishermen will begin to work for a wage rather than shares and their income will decrease.**

The trend towards wages rather than shares will probably not occur under continued open access. The increase in freezer/longliners could lead to a change in the share system. This would be especially true if crew switched between fishing and processing jobs. However, it is unlikely that this will occur to any significant extent under the current system. An increase in unions could also result in at least a guaranteed minimum wage for crewmen. This has happened with fishermen's unions in eastern Canada and other areas. However, the existing Deep Sea Fishermen's Union, the only major union for longline crewmen, has not asked for minimum incomes and guaranteed wages.

License limitation would not force fishermen to work for a wage instead of shares. License systems in Alaska, Washington, and elsewhere have not resulted in this change. Probably only union arbitration or social policy, as in open access fisheries, would effect such a change in labor.

Some crewmen would be offered the option of working for a wage, or at least a guaranteed minimum income, under an IFQ system. On fishing trips where most of the catch would be in the form of IFQs, the vessel owner or skipper would be able to guarantee crewmen a certain income for the trip (or at least the season). Since revenues would be more secure, the wages for crewmen might decrease as happened in one fishery on the Great Lakes. However, inseason changes in the market for sablefish or the exchange rate could negate any wage guarantees. Certainly, there would be pressure by IFQ owners to retain a larger share of revenue since owners would have a better bargaining position in terms of a guaranteed income to crew. There is no clear evidence that crew wages have replaced crew shares in those fisheries, worldwide, managed under IFQ systems. The switch to wage payment in eastern Canada was due to union pressure by crewmen to insure a minimum amount of income and probably would have occurred with or without IFQs.

6.2.1.10 Extremely high "buy in" costs for new entrants and an associated decrease in the ability of new entrants to make it on their own.

Open access fisheries have no "buy in" costs other than vessel and equipment. Fishermen entering the sablefish fishery have no financial requirement beyond their equipment costs. However, as more vessels enter the fishery total profits decrease and there is less revenue per vessel to pay debts. This means that as stocks decrease or if breakdowns occur there is little financial buffer to rely on. When a fishery has harvest capacity to its breakeven point, for every dollar profit made by one fisherman another fisherman is going in debt one dollar.

Licenses would pose a "buy in" cost for sablefish longlining above the cost of vessel and gear although this cost could be recoverable through increased profits or revenues. Depending on the option chosen, a license could be purchased. Under both options it could be leased. Purchases would have to be financed from private institutions, the seller, or any assistance programs which might exist. Leasing of a license, as a percentage of the gross revenues, would be possible under either option and would reduce or eliminate the need for extra "buy in" funds. Each vessel size class license would have a different price. The licenses would be traded on private markets as salmon licenses are now. It is not possible to estimate the cost of licenses but some guidelines are presented in Chapter 4. If licenses were only leasable then criteria would have to be established for reallocation when they were returned to the government. Regardless of the mechanism used, it would provide a means for new entrants to obtain a license without direct cost (provided the government is still prohibited from selling them). If licenses were saleable, it would be possible for owners to transfer them to any qualified person for any price they could arrange. For instance, a person could give their license to his or her child or sell it to a corporation. Therefore, some people could enter the fishery at little cost.

IFQs would pose a "buy in" cost for new entrants which should be recoverable. IFQs could be purchased or leased. The additional profits accruing to holders of IFQs would be reflected in the purchase or lease price (see Chapter 4). Purchases would have to be financed from private institutions, the seller, or any assistance programs which may exist. Leasing of IFQs, would be possible and would reduce or eliminate the need for extra "buy in" funds. IFQs for each management area would probably have a different price depending on availability, abundance, transportation costs, and so forth. Since IFQs can be sold or leased in small increments, fishermen could enter by acquiring enough for bycatch. Gradually they could acquire enough quota to

participate in a directed fishery for sablefish. Since IFQs would be saleable, it would be possible for owners to transfer them to any qualified person for any price they could arrange. For instance, a person could give his IFQs to his child, or sell them all to a corporation.

6.2.2 Management Concerns

6.2.2.1 **Highgrading.**

Highgrading, the discard of smaller or less valuable sablefish, is not expected to occur to any significant extent under continued open access. Highgrading reportedly does not occur under current management although it did occur when seasons were many months long. With shorter seasons and a limited quota, fishermen will tend to bring in all sablefish. They will not discard sablefish since time will be more important than hold capacity. Discards will, potentially, count against the total quota. Fishermen will not have the time to make extra sets to compensate for highgraded catch.

Highgrading would not be expected under a license system for the same reasons it is not expected under continued open access.

Highgrading of sablefish would occur under IFQs unless discouraged by the counting of discards against the quota. Without the pressure of competitive seasons, fishermen would tend to maximize their revenues per IFQ by targeting on larger, more valuable sablefish. Enforcement of discard accounting might increase expenses unless a standard highgrading rate were assumed. If highgrading were allowed, some of the immediate loss might be offset by recapture at a later time. The magnitude of this benefit is dependent on many factors (NPFMC, 1985a). For instance, highgrading can produce increased revenues at low discard fishing mortality rates on young fish. This is because the chances of a fish being recaptured before it can grow are lower. The fish that are recaught would weigh more and could command a price high enough to offset previous discarding. The initial reduction in fleet size would allow eligible fishermen to receive IFQs for almost twice as much fish as they are use to. This might relieve any pressure on fishermen to highgrade since they would not be limited by IFQs. To the extent that this were the case, fishermen would keep all the sablefish they caught.

6.2.2.2 **Development of a blackmarket with illegally caught fish.**

A blackmarket for illegally caught sablefish is reported to exist and can be expected to continue under open access. Data are lacking to determine how much is presently caught and sold illegally or how much of that is from trawlers. If illegal product is found at a processor or on a freighter it is difficult to trace back to a harvester. Some illegal longline sales are suspected to occur as at-sea transfers from harvesters to tramp freighters. Observer coverage might decrease this practice. As the seasons and quotas decrease and the number of vessels or gear increases the average profit per vessel will decrease. This lack of income will give some fishermen an added incentive to sell sablefish illegally. Increased enforcement and penalties might be necessary to prevent blackmarket sales.

Under license limitation, the market for and amounts of blackmarket sablefish probably would not change dramatically from that expected under continued open access. However, since licenses would be required, penalties could be modified to reflect the increased seriousness of the crime. Violators could have their licenses restricted or, for those with no license, increased penalties could be imposed.

A blackmarket for sablefish might develop under IFQs because of an extended season but tracking catch would be easier if appropriate tracking documents were required. Fresh sablefish would be legally landed most of the year under IFQs. However, all sablefish legally landed by longline would be traceable to a person, vessel, and processor. Since fresh sablefish would be present, it would be easier for a blackmarket to exist. Increased levels of enforcement and penalties would be required. Harvesting privileges in the form of IFQs would be a new system of management and should include new penalties, for example, IFQ owners could file civil suits against blackmarketers. Illegally caught sablefish could be accounted for in establishing future TACs.

6.2.2.3 **The management system allows for the full harvest of total allowable catch.**

Sometimes TAC is exceeded as happened in the West Yakutat area in 1989 when managers closed the areas prior to attainment of TAC and then reopened it under pressure to fully harvest the TAC. More commonly, TACs are exceeded because managers are unable to close the fishery quickly enough given existing effort levels and quota monitoring systems. Under open access management increased overharvests are to be expected. However, the Council and NMFS could set conservative TACs and leave harvestable fish on the grounds.

Allowing for the full harvest of TAC would be ~~unchanged~~improved under a license system since the seasons would be lengthened. Increased season length combined with the observer program could significantly rimprove the ability of NMFS to track landings and allow the full TAC to be harvested without overages.

The use of IFQs would reduce the current practice of overharvesting some area TACs. NMFS would not have to estimate landing rates. Individual fishermen would know what their maximum landings could be. There might be some quotas unharvested at the end of the year but that is unlikely because they are leasable. Sablefish may go unharvested because of fishermen's business decisions, not because of ineffective management.

6.2.2.4 **Biological conservation must be maintained.**

Biological conservation will be maintained to the extent that Council and NMFS philosophy mandates it. As was discussed above, the degree of conservatism in setting and maintaining quotas will be the primary basis for biological conservation. In other areas of the U.S. and world, managers have placed a higher value on present fisheries rather than reducing current harvests to provide abundant resources for the future. As a result, their fish stocks have declined as have total harvests. New data collection tools will be used in 1990 and should give the Council adequate catch information (see below). The Council also has the ability, if desired, to count bycatch and prohibited species discards against the quota. Therefore, in the future, it will be up to the Council and NMFS to decide how strongly to maintain biological conservation. Regardless of the management approach chosen, there will always be increasing pressure for higher TACs. To the extent that a license or IFQ system relieves fishing effort, the fishery will be more manageable and better off in the long run.

6.2.2.5 **Data collection must be sufficient to allow for sound biological management.**

The Council has already enacted the regulations it believes are adequate to collect the data necessary for sound biological management. These measures include observer coverage, logbooks and reporting requirements. They will begin in 1990 so it is not possible to judge their efficacy

now. These regulations will impose costs on the industry which will decrease profits. The extent to which this will be the case in sablefish longlining is not possible to estimate.

Data collection under licenses would not change from that under open access. The same documents would be collected although several new identification numbers may be required. In addition, license holders would be required to register with NMFS.

Data collection under IFQs would require several new documents. However, these would merely track landings and supplement rather than greatly improve the data requirements recently recommended by the Council.

6.2.2.6 **Enforcement costs may be excessive.**

Enforcement costs are expected to increase under continued open access management. Since the seasons are expected to be shorter there will be greater effort to ensure that quotas are not overrun. This will require checks of processors and rapid cross checks from landings tickets. In addition, at-sea checks will be required to ensure that no longlining occurs when the season is closed. Any enforcement aimed at blackmarket sales will have to be added to these previous costs. All enforcement costs will come from existing NMFS and Coast Guard budgets, funded by U.S. taxpayers, unless Magnuson Act changes are made. Administrative but not enforcement costs can be charged to vessels under existing law but NMFS and the Council have not done so to date.

Enforcement costs probably would not change much under a license system. They would be higher if it included an open access directed fishery. The enforcement of a license directed fishery with or without an open access bycatch fishery would be similar to that under open access. The same sort of regulations would govern both. Fishermen would be checked for a valid license but that would be the same as checking for a valid federal permit under the current system. A companion open access directed fishery would occur at a separate time and require a duplication of the monitoring, etc. This could almost double the necessary enforcement effort. Enforcement costs could decrease ~~if~~with a significant reduction in the number of vessels ~~occurred~~. This would result in ~~fewer~~ reports from fewer vessels and landings being monitored and less at-sea enforcement.

Enforcement costs would increase under an IFQ system, especially if it contained an open access portion. The issuance and tracking of IFQs would require new employees and equipment as described in Chapter 4. Enforcement efforts would be concentrated on tracking data and monitoring landings rather than on at-sea enforcement. At-sea enforcement would still be required although at a reduced level. If an open access fishery existed, at-sea and dockside enforcement would have to be increased for that time period. This could add a substantial cost to the program. Enforcement costs could decrease if a significant reduction in the number of directed sablefish trips occurred. This could occur if sablefish were landed as bycatch in other fisheries rather than being discarded for regulatory reasons. In turn, this would result in fewer reports and landings being monitored and less at-sea enforcement.

6.2.3 Business Concerns

6.2.3.1 **Provide a framework for the U.S. industry to be competitive in the world groundfish and crab markets within the principles of sound biological management.**

The U.S. will likely be able to compete on the world sablefish market regardless of the management system chosen. The world market for sablefish is limited with most of the product

going to Japan. Since almost half of the world sablefish supply is caught off Alaska, it is unlikely that this supply could be supplanted. The price paid for sablefish by the Japanese is strongly tied to the yen-dollar exchange rate (Chapter 3). This suggests that U.S. harvesters might have some latitude to increase prices but that most changes are outside of their control. In the recent past, there were large profits made in the sablefish fishery. This is the result of the elimination of Japanese directed fishing but, most importantly, the change several years ago in the yen-dollar exchange rate. As more vessels are entering the fishery and the costs of harvest increase, these profits are decreasing. The near use of shorter seasons combined with declining stocks and more harvesting effort (vessels and gear) suggest that in time most of these profits will disappear. At best, the season might resemble the halibut fishery. During that derby, it is lucrative to fish for a few days but does not provide enough income to be a fisherman's single or major fishery. If the exchange rate changes unfavorably (the dollar strengthens) then some fishermen could be forced to drop out of the fishery and others would have financial difficulties. However, because of increased effort, this might happen in several years even without a change in the exchange rate.

Licenses would absorb the above normal profits from the fishery, permit lower total harvesting costs than open access, and allow an extra cushion for competitiveness in the world market. As stated in Chapter 5, the value of the licenses reflects above normal profits in the fishery. These profits would not exist in the open access fishery, at least after a few more years. If it was necessary to cut prices on the world market, licensed fishermen would be able to adjust the price of the licenses without reducing harvest costs. This would not be costless since all those who had borrowed to purchase licenses would now have less revenue to pay the debt. Operating (as opposed to fixed) costs would be lower than under open access. Therefore, fishermen would have a bit longer to adjust their scale of operation should market competition increase.

IFQs would allow fishermen to reduce harvesting costs and be as competitive as possible on the world market. The introduction of IFQs to the Australian bluefish tuna fishery reduced harvesting costs by 40% (BRRU, 1988). There would be an estimated 20% reduction in total Australian fisheries harvesting costs combined if IFQs were universal (BRRU, 1988). The market price of IFQs would represent the extra profits to be expected. This value would decrease if world competition increased. IFQs are designed to allow fishermen the maximum latitude in operating their vessels, gear, and times of fishing. This would permit them great flexibility in adjusting their scale and time of operation in response to market conditions.

6.2.3.2 **The fear of increases in governmental controls, regulations, intrusion, and costs.**

According to Council projections, there will be many more regulations on the open access sablefish longline fishery within the next several years (Table 4.1) which will increase harvesting costs. The general thrust of these regulations will reduce the amount of time that vessels can operate rather than their ability to catch fish. They will encourage vessels to install larger engines, use more skates of gear (hooks), haul gear faster, have more crew, and operate with less rest. All these changes will increase operating costs and reduce total profits. As seasons shorten, there will be a tendency for the government to increase monitoring in order to prevent overfishing. This will probably be accomplished by increased monitoring of processors and reporting from at-sea observers. As has happened several times in the past, the season for an area(s) might be closed before the area TAC is reached and then reopened, only to have the allowable catch exceeded. In order to avoid this possibility the Council and NMFS will have to set area quotas conservatively (lower).

Licenses would impose only a few new regulations on industry and, depending on the number of licenses issued, might have fewer regulations than open access. The new regulations, controls and costs that would occur with licenses are described in Chapter 4. The only new reporting requirements would be permit cards and reporting sales and leases of licenses. Other regulations would resemble those under open access. If effort levels were significantly reduced by the number of licenses then even fewer regulations would be needed. Fees would be charged on a yearly basis but these would only represent a portion of the extra profits which would be earned by the licensed fishermen. Licenses might be viewed by some as intrusive by their very nature regardless of how the system works.

IFQs would impose several new reporting regulations but would reduce the number of effort control regulations expected under open access and decrease harvesting costs. The new regulations, controls and costs that would occur under IFQs are described in Chapter 4. New reporting requirements would include tracking IFQs, a new report when landing fish, increased processor reporting, and a change in enforcement techniques. Many of the regulations expected under open access would not be needed with IFQs. These regulations are designed to reduce fishing effort or to channel excess effort. IFQ systems in Wisconsin, Ontario, and Newfoundland have not greatly reduced the number of necessary regulations (Baldwin, 1989; Jones, 1989; Talbot, 1989). However, the fishermen have considered the tradeoff between IFQs and new and different regulations worthwhile (D. Anderson, 1989; Purvis, 1989; Short, 1989). IFQs would adjust effort by allowing fishermen to decide how, when, and where to fish. Fishermen with excess effort would reduce it themselves since they would be more concerned with decreasing costs rather than racing to the fishing grounds. This would result in reduced costs both overall and to individual fishermen. Fees would be charged on a yearly basis based on the quantity of IFQs issued. These fees would only represent a portion of the extra profits which would be earned by those controlling IFQs. IFQs might seem intrusive to some since the government would be more attentive to how much is landed and processed by whom. However, with fewer effort controls, there would be much less government interference with fishermen's business decisions.

6.2.3.3 **Flexibility in changing between gears and species.**

Fishermen and processors will have the ability and the need to change between gears and species under continued open access. The seasons will be too short for all but a few fishermen to harvest only or primarily sablefish. Many fishermen might be able to continue as longliners only by targeting on halibut, Pacific cod, turbot, and others. However, it is probable that at least some of them will have to switch to trawling, crabbing, tendering, or other occupations. Many vessels are already designed for other gear types and some already switch between gears. For these vessels there will be the increased costs of switching gear. Many longline vessels are not designed or able to switch gear types. These vessels will continue to longline as much as possible. If seasons for all species become too short, the crews may have to seek part-time employment in other fisheries or occupations. Vessel owners will be forced to pay costs and debt with less income, subsidize the vessel from other employment, or sell the vessel.

The use of licenses would be similar to open access in regards to flexibility except fishermen would be restricted in their ability to switch into the licensed fishery. Fishermen wishing to enter sablefish longlining would have to purchase or lease a license. If it became necessary to purchase a license, a fisherman would have to secure financing, even if he only intended to fish for one season. If leasing were possible, then the cost might be a percentage of the gross revenues. This might not require advanced payments and might allow easy entry and exit. Of course, there would be a limited number of licenses and if too many fishermen wanted one, some would be unable to

longline for sablefish. Fishermen who sell or lease licenses would have monetary gains which they might invest in other fisheries. This might cause an increase in fishing power in other, non-limited access fisheries. If exvessel prices decreased significantly, some marginal license holders would have their licenses and vessels repossessed by their lending agent. Repossessions would have occurred in the open access fishery but under licenses the fisherman might also lose the means of access to the fishery.

Fishermen would retain the ability to switch between gears and species although IFQs would somewhat restrict entry into sablefish longlining. Fishermen wishing to longline for sablefish would have to purchase or lease IFQs. This would involve initial financing if purchased or a percentage of the exvessel price per pound if leased. Fishermen who sell or lease IFQs would have monetary gains which they might invest in other fisheries. This might cause an increase in fishing power in other, non-limited access fisheries. Since fishermen would adjust the scale of their operation to their own circumstances, they would have added flexibility to enter other fisheries. For instance, longliners targeting on other species would be able to retain sablefish at any time provided they already had enough IFQs to cover the landing. Fishermen who fished several gears would be able to longline for sablefish when they wanted rather than during a set season. Since IFQs could be bought or leased and used in incremental amounts, fishermen could adjust the size of their investment.

6.2.3.4 **Allow for technological innovation.**

Technological innovation to be faster, bigger, and more productive per hour will be encouraged under continued open access. These innovations will focus on racing to the fish faster than the competition with more attention to capacity than cost. The total cost of producing one pound of sablefish will rise as each vessel attempts to maintain its competitive position. Suppliers and manufacturers will increase sales.

Licenses allow for technological innovation in the same manner that open access does although more money would be available. The same push to be faster, bigger and more productive per hour would exist. However, the extra profits which occur with licenses would allow fishermen to upgrade faster.

Technological innovation to lower harvesting costs, be fuel efficient and improve quality would be encouraged under IFQs. Since fishermen would want to increase their profits, they would be more concerned with cutting costs and increasing revenues than racing to the fish. Operations would tend towards the most profitable size rather than "bigger is better".

6.2.3.5 **Consumers receive a high quality product at a reasonable price.**

Product quality to the consumer will not increase under open access without restrictive quality control measures. As sablefish seasons shorten, processors will be less likely to refuse loads of sablefish for quality reasons, as has been the case with halibut. Japan, the main market, has a very complicated and confusing price structure for fish. This market does not send a clear message that product quality is poor or what improvements to make. Certain niche markets, especially for domestic consumers in certain restaurant chains, supermarkets or smoker/processors, might develop. These might be filled by freezer/longliners since consistent quality could be assured in both harvesting and processing. Processors taking deliveries from many vessels for several species will have less incentive to enforce rigorous quality standards. This is because sablefish will make up only a portion of each vessel's yearly deliveries. For instance, the processor will want to ensure

a supply of the other species during later fisheries and therefore will buy all the sablefish his future salmon supplier brings him.

The quality of sablefish produced under a license system would ~~not change~~have better conditions for improvement from that under open access. ~~The only difference would be if the effort level was reduced enough~~This would be due to significantly lengthen seasons.

Product quality would be better able to increase under IFQs. Since fishermen would not be rushed by a race for fish, at least on sablefish trips, they would be able to take more time and care in handling the fish. Processors would be in a better position to specify delivery condition of fish and to give a different price based on quality. Processors and fishermen would be able to coordinate deliveries to decrease gluts on the dock. Niche markets would improve over open access. For instance, since deliveries would occur during much of the year, it would be possible to develop stable fresh markets, something not possible under short seasons.

6.2.4 Fishery Planning Committee Concerns

The Fishery Planning Committee requested that 4 more items be added to Table 6.1. these 4 were: administration, enforcement, fees and fleet operating costs. Enforcement is covered in Section 6.2.2.6 and Appendix II. Administration structure and cost and fishermen's fees are reviewed together.

6.2.4.1 **Administration structure and costs.**

The administration of future open access is discussed in Section 6.2.3.2 and, to a lesser extent, throughout the document. As Table 4.1 shows, a large number of new regulations are possible and probable for continued open access management. These regulations will require increased action on the part of the Council, NMFS management, NMFS enforcement, and the Coast Guard. All of these added burdens must be accomplished with no increase in budgets. Therefore, all increases in regulations can be expected to reduce existing services by one means or another. Under existing law, fishermen can not be charged for anything other than administrative costs. These costs have not been well defined by NMFS or the law and current permit fees are low. Discussion is ongoing as to how to raise revenues from the industry but no relief can be expected in the near future. Overall, future open access management can be expected not to raise costs appreciably but to reduce the quality and coverage of administrative actions.

Both limited access alternatives provide for the direct passing along of administrative costs. Appendix II explains these expenses and estimates the increase in costs. These increases ~~are over and above~~would replace some administrative costs already incurred. No provision is made in this document to charge current administrative costs under the limited access systems. The cost of current regulatory, enforcement, and research activities are not included. License limitation is expected to cost approximately $160,000 the first year and $90,000 per year thereafter. IFQs are expected to cost $420,000 the first year and $235,000 per year thereafter. It should be noted that these costs are only approximate. All costs are to be passed directly along to fishermen instead of to U.S. taxpayers in general. If ~~600~~360 licenses were issued and all were charged equally, first year costs would be approximately ~~$267~~$440 over current permit fees. The IFQ system would cost approximately $0.007 per pound during the first year.

To the extent that administrative costs can be passed to sablefish consumers, the cost to the U.S. would increase only slightly. Since 90% of the sablefish is exported to Japan (Hastie, 1989), 90%

of the costs passed to consumers would also be passed along. However, all limited access alternatives are expected to result in greater profits to fishermen. These increased profits over continued open access are expected to be greater than the remaining administrative costs, resulting in a net benefit.

6.2.4.2 **Fleet operating costs.**

The costs of production for the sablefish fleet under open access have not been determined. Without such a determination it would be difficult to accurately measure potential changes from alternate management systems. Recent case studies (BRRU, 1988; MAFMC, 1988; NRA, 1983a and b), theoretical models (Anderson, 1986; Clark, 1985), statements by managers (Baldwin, 1989; Clark, 1987; Jones, 1989; Talbot, 1989), and testimony by industry participants (Anderson, 1989; Purvis, 1989; Short, 1989) all confirm that limited access systems result in increased profits and reduced harvesting costs. There are probably circumstances when this would not be the case. All of these references acknowledge that each fishery is different and will react differently to a given set of management plans. How the sablefish fishery would adjust harvest costs under the three alternatives and options presented here is unknown.

As discussed by Townsend (1985a) and others, license systems result in much of the increased profits being reinvested into harvesting equipment. This is due in large part to the continuation of the derby fishery (Anderson, 1986). This same behavior could be expected under IFQs to the extent that a derby fishery continued. Works which compare different generic limited access systems (Anderson, 1986; Clark, 1985) suggest that IFQs would have the greatest increase in realized profit and decreased harvest cost.

One measure of the potential profits in a fishery is to estimate how a sole owner would conduct harvesting (Huppert, 1988). A preliminary model developed by Council staff suggests that in 1989 the sablefish TAC in the Southeast Outside/East Yakutat area could have been harvested with approximately 20 vessels each fishing about 160 days per year. This would be a reduction from an estimated 7,000 current vessel-days (386 vessels) to an estimated 3,400 vessel-days. Harvest costs would have decreased by over 25% and profits increased by about 30%. Overall landings, revenues and crew wages would remain unchanged but a dramatic decrease in the number of individual fishermen would occur. This result does not indicate that such a change would actually occur under IFQs, but, rather, that there is significant potential for fleet profitability and costs to change.

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Decision Points for Halibut Longline Individual Choice Management System

This outline presents the proposed individual choice system (IC) for longlining halibut. The grayed areas represent options under consideration. This series of choices will be presented to the Fishery Planning Committee at their September 25 meeting.

I. SCOPE OF PROGRAM
   A. **Halibut**
   B. **Longline boats**

II. THE WHO, WHAT, WHEN, WHERE, AND HOW OF ICS
   A. **What** - Each **IC** would allow the recipient the option of fishing in the open access fishery or in an IFQ fishery. The IFQs would be **defined as "units"** which could be subdivided into smaller units. The **amount of weight assigned to each unit would vary yearly** as the TAC varied from year to year.
   B. **Where - All IPHC management areas in the Gulf of Alaska, Bering Sea, and Aleutian Islands:** 2C, 3A, 3B, 4A, 4B, 4C, 4D, and 4E.
   C. **When** - IFQs would be issued **yearly to those who qualified for them. Initial allocations would be made for the 1991 fishing year.**
   D. **Who** - The person who owned or was a lease holder of a vessel that made halibut longline landings.
      1. **"Person"** - As defined by the Magnuson Act with the exclusion of non U.S. citizens. Any individual who is a U.S. citizen, any corporation, partnership, association, or other entity (whether or not organized or existing under the laws of any State but being controlled by U.S. citizens), and any Federal, State, or local government or any entity of any such government.
      2. **Initial** allocations to:
         i. **Vessel owner(s)** except when a qualified lease exists.
         ii. **Person leasing a vessel (lease holder)** - Qualified by a written bareboat contract. Evidence of a qualified lease would include paying the crew shares and supplying the fishing gear.
   E. **How** allocations will be made
      1. The vessel must have made longline landings of halibut in the **years 1986 or 1988 through 1990.**
      2. Allocations would be based on the recorded landings of the vessels (fish tickets). These landings could be in the IFQ or open access fisheries. The recorded landings would be either:
         i. **Average of the 3 preceding years**, 1988 through 1990 for initial allocations. Landings could have been made in any of the three years. Each vessel's average catch, by area, would be divided by the overall average catch for that area. This ratio would be multiplied by the projected average catch per vessel for the upcoming year.
         ii. **Average of the 3 of the 5 preceding years**, 1986 through 1990 for initial allocations. Landings must have been made in one area for 3 of the 5 years. Each individual vessel would have their average divided by the total of all averages for each area. The total of averages would be divided by the best 3 TACs, by area, resulting in a percentage of the TAC for the IFQ fishery. Individual allocations would be determined by multiplying these percentages by the new area TAC.

(continued)

F. **Individual choice**
   1. An open access fishery would exist in each area.
      i. An initial and minimum amount of 10-20% of the TAC, by area, would be allocated to the open access fishery each year.
      ii. The IFQ entitlements of those wishing to fish in the open access fishery would be added to this original allocation, by area.
   2. Each year each eligible vessel owner or lease holder would have the option of fishing in the open access fishery or in the IFQ fishery.
      i. Eligible people would have to notify NMFS by a specified date if they wished to fish IFQs.
      ii. They could fish either open access or IFQs but must do the same in all areas.
      iii. Owners of multiple vessels could share IFQs among qualified vessels but not among non-qualified vessels.
   3. Any vessel which was not eligible for IFQs could fish in the open access fishery.

III. TRANSFERABILITY
   A. All IFQs would be **totally non-transferable**. Sales, leasing, inheritance, gifts, etc. would not be allowed.
   B. IFQs are **IPHC management area specific** and may not be transferred between areas.
   C. **No specific limits** would exist **on** the amount of IFQs one person could **control**. Excessive ownership would be subject to U.S. Department of Treasury anti-trust enforcement.
   D. In order **to control IFQs**, a person would have to be a **U.S. citizen** and be the **owner or lease holder of the vessel using the IFQs**. **Proof** of citizenship may be required.

IV. DURATION OF IFQ HARVEST RIGHTS
   A. No specified ending date so that the IFQs would be good for an indefinite period of time.
   B. Allow for review of the system in 3 years. The system would not sunset but major structural changes could occur if required.

V. COASTAL COMMUNITIES
   A. Determining how coastal communities could gains access to halibut harvest rights for use by their members.
      1. Allocated - IFQs would go only to communities with no history of resident participation or to a government agency(s) for those communities. This may require changes to the Magnuson Fishery Conservation and Management Act.
      2. Allowed for communities to acquire IFQs by means of special regulations to buy, sell, and control them.
   B. Specific regulations which may be necessary if one of the above options are chosen. The following are a list of some questions which would have to be answered should that occur.
      1. Who receives or is allowed exceptions for IFQ control? Possible examples include individuals, coastal development organizations, communities, corporations, etc.
      2. What delineates those groups (above) eligible for these exceptions?
      3. What other definitions of persons and organizations are necessary?
      4. Would these entities be required to used the IFQs or could they lease them?
      5. Would these entities be required to be vessel owners or lease holders?
      6. If there are other transferability restrictions would these entities have exceptions?
      7. Would a special administrative panel be established to remove local conflicts and provide cohesion?
      8. Would limits be placed on the amounts each entity would be allowed to control?
      9. Would a total number or percentage be established for overall IFQ control by these entities?

(continued)

VI. ADMINISTRATION

A. **NOAA Fisheries regional office would administer the IFQs** although the duty could be contracted to the State of Alaska.

B. Settlement of appeals disputes during the allocation process.

1. The basis of **judgement for use in appeals will be fact**. That is, errors on fish ticket records will be considered. Lease holders would have to come to the Appeals Board with certified records and agreement of the owner of record of the vessel. If such agreement can not be reached, judicial proceedings outside of the Appeals Board would be required.
2. The **Appeals Board would hear initial appeals**. Subsequent appeals would go to NOAA Fisheries Regional Director followed by appeals to the Secretary of Commerce and then the court system.

<u>The Council is aware of the following items but the Council and NOAA Fisheries staffs will deal with the specifics.</u>

C. Enforcement

1. Nature of harvest right. - This must be defined (property, lease, harvest, etc) including its use as collateral and the ability of the government to censure the right.
2. Establishing a system to accurately account for catch including reporting, observer, and monitoring systems.
3. Adequate enforcement procedures need to be established. A new system might require new methods of enforcement including enforcement agents which have accountant type duties.
4. New regulations would be required.
5. New penalties would be required.

Distribution of Harvest Privileges by Alterantive

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Alternative	Overall Number			% of Distribution	
	Overall	Alaskan	Non-Alaskan	Alaskan	Non-Alaskan
Open Access	UNK	UNK	UNK	UNK	UNK
Individual Fishing Quotas					
Persons	369	283	86	76.7%	23.3%
Best Year	"	"	"	55.3%	44.7%
Avg 2 Best Yrs	"	"	"	54.6%	45.4%
Best Yr, 75% for 1988	"	"	"	55.1%	44.9%
Avg 2 Best Yrs, 75% for 1988	"	"	"	54.4%	45.6%
Best Yr, 75% after 1986	"	"	"	55.1%	44.9%
Avg 2 Best Yrs, 75% after 1986	"	"	"	54.4%	45.6%
Licenses					
(All adjusted for confidentiality)					
10,000 Lbs					
1984-86	215	150	65	69.8%	43.3%
1984-87	307	214	93	69.7%	43.5%
1984-88	367	253	114	68.9%	45.1%
No weight	179	150	29	83.8%	19.3%
(Over 50')					
25,000 Lbs					
1984-86	82	45	37	54.9%	82.2%
1984-87	108	61	47	56.5%	77.0%
1984-88	127	73	54	57.5%	74.0%
No weight	51	28	23	54.9%	82.1%
50,000 Lbs					
1984-86	69	34	35	49.3%	102.9%
1984-87	87	44	43	50.6%	97.7%
1984-88	99	50	49	50.5%	98.0%
No weight	78	47	31	60.3%	66.0%
Individual Choice					
Any 3 yrs	967	714	253	73.8%	35.4%
	"	"	"	50.3%	49.7%
3 of 5 yrs					
Any vessel	297	215	82	72.4%	38.1%
	"	"	"	48.4%	51.6%
Same vessel	238	164	74	68.9%	45.1%
	"	"	"	48.0%	52.0%

5.4 Alternative 4: Individual Choice

Alternative 4, Individual Choice (IC) combines open access and IFQ systems. This is one of the sub-options of Alternative 2, IFQs, but the IC system is different. Instead of having a fixed quantity or percentage of the TAC set aside for open access, fishermen are given the opportunity to choose IFQs if they think it is a better system. No one who is eligible for IFQs is forced to use them. Also, while a minimum percentage of the TAC is set aside for open access, the actual open access TAC would vary from year to year as fishermen choose to fish IFQs or not. Fishermen not making a selection would, by default, be placed in the open access fishery. This possible variation in choice does not allow an accurate description of the fishery or industry. In the following sections, the best that can be done in terms of analysis of impacts is to set parameters and bounds around the probable outcomes.

5.4.1 Harvesting and Processing Sector

The immediate result of implementing the individual choice alternative would be that vessel owners would have choices to make in early 1991. Depending on which option is chosen (most recent 3 years with participation in any year, or participation in 3 of 5 years) different fishermen would be making these choices. The years under consideration would be those just prior to the year to be fished. Therefore, for fishing year 1991 the qualifying years would be either 1986-1990 or 1988-1990.

The analysis of the number and distribution of qualified individuals under each of these options is not possible. This is because the options include landings for 1989 and 1990 and those data are either not available or the fishing has not occurred. To present data from only 1986 through 1988 as though it would be the final distribution would greatly distort the analysis. However, there is little choice but to use available data and state that results may be indicative but not definitive.

In order to give some indication of what might be expected under this alternative, the data from the years 1984 through 1988 are analyzed. This analysis does not infer that the same or similar distributions would occur when final analyzes were run in late 1990. However, since there would be no transferable harvest privileges and since an open access fishery would still exist, a rush of vessels into the fishery during 1990 would not be expected.

The number of individual vessel owners who have landed sablefish during the previous 3 years (1986-1988) was 967. Their distribution by management area fished and residency is shown in Table 5.6. The corresponding percentage distribution of IFQs is shown in Table 5.7. Overall, 74% of the individuals are Alaskans and they would be eligible for 50% of the IFQs. The distribution of IFQs varies somewhat from that for Alternative 2, IFQs. A comparison with Table 5.1 shows that Central and Western Alaskan vessel owners have been more active, relatively, in the past few years that in 1989. This might be related to oil spill employment in that area in 1989.

The eligibility of vessel owners is examined in two ways for Option 2. Vessel owners could receive IFQs only for the area in which they participated for 3 or more years regardless of the vessel used (Table 5.8a); or, owners could receive IFQs for all areas they participated in (1 to 3 years) provided they participated in at least one area with the same vessel for three years (Table 5.8b).

A comparison of Tables 5.8a and 5.8b show some changes of vessel ownership over the previous five years. By using the same criteria but mandating that owners qualify with the same vessel, the overall number of qualifiers drops from 297 to 238. However, since vessel owners receive IFQs

for all areas in which they participated with that vessel, the number of eligible owners increases in many areas. In West Yakutat, the overall number of owners eligible for IFQs doubled and in the Bering Sea it increased 600%. The areas with the greatest increase show that vessels with experience elsewhere have expanded into them for one or two years. Interestingly, the Central Gulf has almost the same number of eligible vessel owners under both scenarios. The SE Outside/East Yakutat area shows a decrease in overall eligibility form 5.8a to 5.8b. This can be explained by owners changing vessels but fishing in the same area. The largest change of this type happens with Southeast Alaskan vessel owners. For instance, 140 of these owners fished in the SE Outside/East Yakutat area 3 or more years but only 88 or fewer of them did it with the same vessel each year.

A comparison of Tables 5.6, 5.8a, and 5.8b demonstrates that the initial eligibility criteria has a tremendous impact on the size of the fleet which might fish IFQs. With a range of between 238 and 967 different individuals and between 422 and 1,748 eligible vessel/areas it is difficult to draw a generalized description of the fishery. Combined with this range of eligible persons is the unknown of how many would choose IFQs rather than open access.

Tables 5.9a and 5.9b show how percentage distributions of IFQs would change under the two scenarios of qualifying only in one area with any vessel or any area with one vessel. The greatest fluctuations are in West Yakutat and the Bering Sea where Alaskans would gain and Washingtonians would lose significant percentages of the allocations. Much of this gain is attributable to Western Alaska fishermen. These tables can be compared in much the same manner as Tables 5.8a and 5.8b.

A comparison of Tables 5.8 and 5.9 shows that Alaskans would compose between 69% and 72% of the vessel owners and be eligible for 48% of the IFQs. The percentage distributions vary by area and option, indicating performance characteristics as discussed above. For instance, in the Bering Sea, Washington vessel owners would be eligible for 44% of the IFQs for those qualifying in all areas with one vessel, 56% of the IFQs for those fishing any time between 1986 and 1988, and 70% for those fishing any vessel for 3 of 5 years.

Description of the Fishery

The larger the initial group of applicants, the greater would be the resemblance to open access. However, with more initial applicants than the current system and with non-transferable IFQs, owners would receive IFQs for less sablefish than they currently land. This might induce them to continue in the open access fishery, thereby lessening any improvements to crowding, etc. in that fishery. Since the IFQs would be non-transferable, fishermen may not feel obligated to use them. That is, that actual fleet size may be the same as under open access. Any IFQs not used would remain in the open access fishery. Vessels using IFQs would not be able to increase the amount they were eligible for. The only way for them to accomplish that would be for an owner to have several eligible vessels and shift the IFQs between them.

Allowing fewer vessels to be eligible for IFQs would be selecting for the long term longliners, or at least those who had not purchased a vessel recently. The difference between these two choices is not great in numbers of fishermen but the implications are important. By requiring that the same vessel be used for three years, fishermen would not have the ability to count on a known amount of catch and then purchase a vessel to suit that level of harvest.

The actual composition and size of the fleet would resemble something between open access and IFQs (Alternatives 1 and 2). The composition might vary over time and with that variation changes in crowding, gear use, and so forth would change.

After the initial allocation, some fishermen who would choose IFQs. Again, the absolute or even general number is not possible to estimate. If the initial allocation allowed fishermen sufficient IFQs to cover their needs, then more fishermen would be expected to choose IFQs. The conditions that would allow IFQ allocations to cover individual fishermen's current use would be slightly fewer eligible participants than the current fishery and the ability to fish in the areas historically fished. Since a portion of the overall TAC would be set aside for open access before IFQ allocations, all allocations would be that much less (10%-20% depending on the minimum open access option).

Because these IFQs would be non-transferable, the structure of the fleet would not change as under Alternative 2, even if all fishermen choose IFQs. Fishermen would not be able to expand their use of IFQs by area or quantity. This is because the requirement is that any vessel could only fish IFQs or open access and not mix the two between areas. New vessels into the fishery would fish in the open access portion until they had sufficient history (depending on the option) to be eligible for allocations. Operators with more than one vessel would be able to switch IFQs between those vessels but not to new, unqualified ones. Therefore, turnover in the IFQ fleet would be slowed down. Vessels would not necessarily leave because they could do better by selling or leasing their IFQs. Fishermen would choose IFQs if they felt they could do better with a longer or more relaxed season or if they wanted to use the IFQs as bycatch in other fisheries. Those remaining in the open access fishery would do so because they would see no advantage to switching to IFQs, because they were not eligible for sufficient allocations, or because they were not eligible for IFQs. No one would be forced into the IFQ system although some may be forced to stay in the open access system because of the reasons listed above.

5.4.2 Processing Sector

The flow of product to processors would be changed only to the extent that fishermen chose to use IFQs. The comparisons of the two systems, at the extremes, can be seen by comparing this section under Alternatives 1 and 2.

The use of longline/freezers would not be encouraged by this alternative. These vessels would have to qualify in the open access fishery for quantities sufficient for their needs. Depending on the option chosen, this qualification process could take 1 to 3 years. Owners with a freezer/longliner and other longliners could transfer IFQs to their most efficient vessel. It is unknown how many owners currently fall into this situation. Another way for owners to acquire IFQs would be to buy into a corporate owned vessel. In 1989, there were 63 active vessels which were corporately owned, about ten percent of the fleet.

5.4.3 Administrative and Enforcement Considerations

The use of both open access and IFQ systems simultaneously would require more infrastructure that either system separately. This increase may not be significant but, because the level of use of each system might vary from year to year, sufficient levels of administration would have to be kept for each. This alternative would issue new IFQs allocation amounts each year, requiring increased costs. Also, the IFQ tracking system would have to be in place regardless of the level of use. This is discussed more in Appendix II.

Enforcement might be complicated by concurrent open access and IFQ fisheries. Landing documents might be sufficient to cover this but initial organization of the system would take some time.

5.4.4 Maritime Communities

The individual choice system would disrupt the social pattern of maritime communities less than either of the other limited access systems. Fishermen would not be forcible dislocated from their traditional fishery. Likewise, if the system was designed to allow efficient use of IFQs, the boom-bust cycle could be lessened as fishermen voluntarily chose IFQs in lean times.

5.4.5 Consumers and Markets

The marketing sector would be affected to the extent that fishermen chose IFQs. Again, boundaries on the results are described in Alternatives 1 and 2.

Table 5.6 Number of vessel owners whose vessels landed longline caught sablefish, in any year during 1986-1988, by management area and residency, under Alternative 4, Individual Choice, Option 1.

	MANAGEMENT AREA						
RESIDENCY	SE Outside/ E. Yakutat	West Yakutat	Central Gulf	Western Gulf	Aleutian Islands	Bering Sea	Sum of Individual Owners
Qualified							
SE Alaska	396	103	96	17	15	20	409
SC Alaska	18	88	130	22	20	19	177
Western Alaska	7	24	100	37	16	31	128
Total Alaska	421	215	326	76	51	70	714
Washington	110	95	116	61	53	48	200
Other States or unknown	17	27	29	12	10	11	53
TOTAL	548	337	471	149	114	129	967

Note: Since some owners are issued IFQs in more than one area, it is not possible to add owners across management areas to total individuals.

Table 5.7 Distribution of quota (percent) to qualified vessel owners who landed longline caught sablefish during 1986-1988, by management area and residency, under Alternative 4, Individual Choice, Option 1.

	MANAGEMENT AREA						
RESIDENCY	SE Outside/ E. Yakutat	West Yakutat	Central Gulf	Western Gulf	Aleutian Islands	Bering Sea	Overall
SE Alaska	76.2%	26.5%	20.7%	10.0%	9.7	15.3%	31.1%
SC Alaska	2.4	9.3	13.0	5.7	12.3	13.0	9.2
Western Alaska	1.0	8.1	16.6	12.7	5.2	11.2	10.0
Total Alaska	79.6	33.9	50.3	28.4	27.2	39.5	50.3
Washington	17.5	51.5	43.5	66.1	69.6	56.0	45.0
Other States or unknown	2.9	4.6	6.2	5.5	3.2	4.5	4.7
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0

ble 5.8 Number of vessel owners whose vesse. landed longline caught sablefish in one area for at least 3 years (1984-1988), by management area and residency, under Alternative 4, Individual Choice, Option 2.

Table 5.8a Regardless of vessel used, credit only for area fished for 3 years.

	MANAGEMENT AREA						
RESIDENCY	SE Outside/ E. Yakutat	West Yakutat	Central Gulf	Western Gulf	Aleutian Islands	Bering Sea	Sum of Individual Owners
Qualified							
SE Alaska	140	26	32	5	2	2	155
SC Alaska	3	3	17	4	0	3	22
Western Alaska	1	3	28	11	0	0	38
Total Alaska	144	32	77	20	2	5	215
Washington	23	30	42	12	8	6	69
Other or unknown	5	5	8	2	0	0	13
TOTAL	172	67	127	34	10	11	297

Table 5.8b With only one vessel, credit for each area in which that vessel made landings.

	MANAGEMENT AREA						
RESIDENCY	SE Outside/ E. Yakutat	West Yakutat	Central Gulf	Western Gulf	Aleutian Islands	Bering Sea	Sum of Individual Owners
Qualified							
SE Alaska	88	65	49	9	6	13	115
SC Alaska	4	10	14	4	4	5	15
Western Alaska	6	15	21	21	10	17	34
Total Alaska	98	90	84	34	20	35	164
Washington	37	39	34	29	30	27	59
Other or unknown	9	8	8	6	3	5	15
TOTAL	144	137	126	69	53	67	238

Note: Since some owners are issued IFQs in more than one area, it is not possible to add owners across management areas to total individuals.

Table 5.9 Distribution of quota (percent) to qualified vessel owners who landed longline caught sablefish in one area for at least 3 years (1984-1988), by management area and residency, under Alternative 4, Individual Choices, Option 1.

Table 5.9a Regardless of vessel used, credit only for area fished for 3 years.

	MANAGEMENT AREA						
RESIDENCY	SE Outside/ E. Yakutat	West Yakutat	Central Gulf	Western Gulf	Aleutian Islands	Bering Sea	Overall
SE Alaska	82.9%	29.3%	20.2%	14.6%	10.6%	5.8%	32.9%
SC Alaska	1.5	2.3	11.3	6.4	0.0	24.6	6.8
Western Alaska	0.7	3.5	19.1	10.4	0.0	0.0	8.7
Total Alaska	85.1	35.1	50.6	31.4	10.6	29.4	48.4
Washington	13.6	59.9	43.4	63.4	89.4	69.6	47.8
Other States or unknown	1.3	5.0	6.0	5.2	0.0	0.0	3.8
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 5.9b With only one vessel, credit for each area in which that vessel made landings.

	MANAGEMENT AREA						
RESIDENCY	SE Outside/ E. Yakutat	West Yakutat	Central Gulf	Western Gulf	Aleutian Islands	Bering Sea	Overall
SE Alaska	67.7%	31.2%	20.6%	5.1%	5.5%	13.1%	28.9%
SC Alaska	1.9	5.1	3.0	1.8	6.2	14.6	3.9
Western Alaska	2.8	11.8	24.6	18.4	6.2	23.1	15.2
Total Alaska	71.4	58.1	48.2	25.3	18.9	50.8	48.0
Washington	23.8	46.1	41.4	66.4	80.4	44.4	45.2
Other States or unknown	3.8	5.8	10.4	8.3	1.7	4.8	6.8
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0

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6.0 IMPACTS OF THE ALTERNATIVES

6.1 Resolving the Problems Facing the Sablefish Longline Fishery

It is very difficult to anticipate exactly how the Individual Choice system, Alternative 4, would resolve the ten identified problems. This is because it is unknown to exactly what extent fishermen would choose to fish in the IFQ fishery. At the extremes, the system could resemble open access, Alternative 1, or IFQs with a minimum set aside for open access, a sub-option of Alternative 2. Because of this tremendous latitude, the analysis of this alternative is necessarily generic. As discussed in Section 6.2.4.2, based on models and experiences in other systems, many if not most fishermen are expected to voluntarily choose IFQs after several years. Regardless, to the extent that the fishery resembles Alternatives 1 or 2, the resolution of the problems will be similar.

6.1.1 Allocation conflicts - Allocations between gear groups and between at-sea and shorebased harvesters.

The IC system, as with licenses and IFQs, would not address gear allocations directly. Allocation between inshore and offshore users is also not directly addressed. Since the IC system incorporates IFQs, a similar regulatory environment would be possible.

6.1.2 Gear conflict - Overcrowding of longline gear.

Individual choice, an IFQ system combined with open access, would require two different fisheries with different sets of regulations. Overcrowding of gear might be a problem in either, depending on how many vessels participate in the open access fishery and how many decide to fish the same areas at the same time with IFQs. There would be more vessels in this fishery than in either of the other limited access systems and possibly as many as under Alternative 1, open access. This would lead to more gear conflicts than either of the other limited access alternatives. The extent to which fishermen decide to spread themselves out both spatially and temporally would determine the level of overcrowding. The IC system allows each fisherman to weigh overcrowding and determine what level is acceptable for him.

6.1.3 Deadloss - Ghost fishing by lost gear.

The use of both IFQ and open access systems would result in some combination of the effects discussed above. It is not possible to determine, before hand, how many vessels would fish in each fishery. Deadloss would be reduced to the extent gear crowding and abandonment are decreased and, possibly, by the use of additional management measures.

6.1.4 Bycatch loss - Sablefish not landed for regulatory reasons.

The IC system would produce some sablefish during the open access fishery with the rest landed as in the IFQ fishery described above. It is not possible to estimate the amounts that would be landed in each fishery so the degree of reduction in bycatch loss is not estimable. To the extent that fishermen choose to use IFQs for bycatch, bycatch loss would be reduced. If properly managed, those fishermen using IFQs would not run out of sablefish until the end of the year, thereby reducing bycatch loss in other longline fisheries.

6.1.5 Discard mortality - Fish not landed for economic reasons.

A system combining IFQs and open access would result in some highgrading and some avoidance of less desirable areas. The extent of each of these would depend on how many fishermen choose to use IFQs. Given the initial decrease in vessels in Alternative 2, IFQs, more highgrading would be expected under this alternative.

6.1.6 Excess harvesting capacity - The presence of enough vessels, gear, labor and other investments to harvest the available resource in less time than is available or optimal.

Excess harvesting capacity would not be reduced initially under an IC system. The same amount of vessels would exist but harvests would be spread out. Over time, some fishermen may drop out of the fishery. However, new entrants to the open access portion could be eligible to enter the IFQ portion. Overall, effort should be reduced in the worst of times, providing fishermen decide that they prefer not to fish then. What might happen most immediately, however, would be the decrease in the amount of hooks fished per vessel day, as with IFQs. Therefore, decreases in harvesting capacity in terms of hooks but not hulls would be expected.

6.1.7 Product wholesomeness - Acceptability of fishery products to consumers based on appearance, taste, smell, and other perceptions.

Because the race for fish would be decreased under IFQs, an improved environment for product wholesomeness would exist. Fishermen and processors would be able to arrange delivery schedules which would ensure fresh fish and adequate processing capacity. Fishermen would also have more time to handle their fish properly. This also would be the case in an IC fishery to the extent that fishermen choose IFQs.

6.1.8 Safety - Management measures might compromise fishermen's safety.

An IC system would increase safety conditions to the extent seasons were lengthened or less vessels operated simultaneously. Although there would be an open access fishery, it is possible that fewer vessels would participate than do now. If this reduction was significant, the open access season length might remain the same but fishermen would not feel as much pressure to rush. It is not possible to accurately estimate either the number of vessels who expect to fish the open access fishery nor how long the season will be. The more fishermen who choose IFQs, the longer the open access fishery would be expected to be. The IFQ portion would be expected to reflect the IFQ discussion, above.

6.1.9 Economic stability in the fishery and communities - A stable flow of income to longline fishermen and fishing communities may be in jeopardy.

The IC system with non-transferable IFQs would both stabilize the boom-bust cycle and cause less instability than a great reduction in fleet size. To the extent that fishermen used IFQs and adjusted their fishing effort, the continued increase in fishing effort would lessen and product flow would stretch out during the year. This has been the case in parts of Newfoundland where small vessel fishermen have used IFQs to lengthen seasons in their local communities and provide longer employment for processing workers (Short, 1989). The highliners in the Newfoundland fishery accepted a reduction in their normal harvest levels as a tradeoff for community stability (Short, 1989).

6.1.10 Rural coastal community development of a small boat fishery

The individual choice system would leave an open access fishery for any new entrants who wished to longline for sablefish. However, it might be that the season would shorten if most of the open access TAC was used for bycatch in other longline fisheries. Unless special rules existed for communities, they would not be able to secure access to or a portion of the overall TAC. However, once fishermen established a record in the fishery they would be in a position of being guaranteed a quantity of sablefish if they so desired.

6.2 Concerns by Which to Judge the Alternatives

As with the problems, above, the Individual Choice alternative would be addressed differently depending on what proportion of fishermen choose which system. The following examination tries to address these concerns. However, it is best to review the discussion on open access and IFQs when considering the impacts of the IC system.

6.2.1 Social Concerns

6.2.1.1 **Limited access is forever and, even if not working, will not go away.**

Unlike the license and IFQ systems, the individual choice system would not be used if fishermen decided they would all rather fish in an open access fishery. The IFQ system would still be available for use each year but fishermen would be placed in the open access system by default. The decisions of fishermen choosing between systems, not managers, would determine the eventual fate of this limited access system.

6.2.1.2 **Unequal economic advantage will be given to those possessing fishing privileges.**

The IC system would grant unequal economic advantage at first but would allow anyone the opportunity to increase their landings. Also, this advantage would only accrue to those who wished to exercise it. Since IFQs would not be transferable, fishermen would not be able to gain money by selling or leasing them. Instead, they would only have a yearly guarantee to a certain quota of sablefish.

6.2.1.3 **Concentration of fishing privileges.**

The IC system would not provide an environment for concentration of fishing privileges any more than open access would. Since harvest privileges would not be transferable, the only way fishermen could acquire a larger share would be to out-perform others in the open access fishery.

6.2.1.4 **Locking out proximate local communities from future participation.**

Local communities would always have access to an open access fishery under the IC system. The open access allocation would be maintained with a minimum of 10% so there would always be an opportunity for new entrants.

6.2.1.5 **Keep any participation rights in the hands of those otherwise involved in the industry.**

The participation rights in the IFQ portion of the IC system would be non-transferable. Therefore, anyone could gain access to these rights would be by participating and building a history.

6.2.1.6 **Changes will occur for fishermen, their families, and communities.**

The IC system, incorporating non-transferable IFQs, would lead to fewer social changes. Since anyone would be able to continue to fish in the open access fishery, many of the negative psychological aspects of limited access could be avoided. More fishermen would be employed since the number of vessels would be neither restricted nor allowed to decrease by the transfer of IFQs. No extra profits from the transfer of limited access privilege rights would exist. Some vessels fishing IFQs would reduce their crew size and equipment purchases. The extent to which this would occur is unknown and depends on individual fishermen's choices.

6.2.1.7 **Disruption of the traditional relationship between vessel owners, crewmen, and processors.**

To the extent that IFQs were chosen, the IC system would have effects similar to those described for IFQs. Since IFQs would be by choice and on a yearly basis, there would be less likelihood of a shift of power to owners away from crew. However, vessel owners and processors would see their balance of power shifted, either by one dictating to the other when deliveries would be made or by mutual agreement as to fishing season.

6.2.1.8 **Processing will move almost entirely offshore.**

The IC system does not allow an owner of IFQs to transfer them from one vessel to another unless he owns another vessel which also qualifies. Therefore, any new vessel entering the fishery would be required to build a performance history in the open access fishery before acquiring a sizable amount of IFQs. This would reduce the switch over to freezer/longliners, perhaps even to levels below that in open access. This would depend to what extent these vessels rely on sablefish and whether they intend to target on them or take them as bycatch.

6.2.1.9 **Fishermen will begin to work for a wage rather than shares and their income will decrease.**

The possibility of a wage versus a share of the revenues would occur in the IC system but to a lesser extent than under universal IFQs. Since IFQs would be temporary in this system, there would be a greater incentive to stay with shares. Also, unless the entire fleet chose IFQs, there would be fewer vessels involved in that system and therefore less chance of wages replacing shares.

6.2.1.10 **Extremely high "buy in" costs for new entrants and an associated decrease in the ability of new entrants to make it on their own.**

The IC system would not pose direct "buy in" costs since the IFQs would be non-transferable. Anyone could enter the open access fishery by paying a fee covering administrative costs.

6.2.2 Management Concerns

6.2.2.1 **Highgrading.**

Some fishermen using IFQs would begin to highgrade sablefish. This would occur for the reasons discussed under IFQs, above. Since it is not possible to accurately estimate IFQ use, it is not possible to project the amount of highgrading which might occur.

6.2.2.2 **Development of a blackmarket with illegally caught fish.**

To the extent that IFQs are used in the IC system, a blackmarket could change from what it currently is to that described for IFQs.

6.2.2.3 **The management system allows for the full harvest of total allowable catch.**

The IC system would allow some sablefish IFQs to be returned to the government due to vessel sinkings, etc. This quota would be added to the open access directed fishery or to any TAC set aside for bycatch. If such a set-aside were already depleted, the IFQ amount of sablefish might go unharvested.

6.2.2.4 **Biological conservation must be maintained.**

Regardless of the management approach chosen, there will always be increasing pressure for higher TACs. To the extent that a license or IFQ system relieves fishing effort, the fishery will be more manageable and better off in the long run.

6.2.2.5 **Data collection must be sufficient to allow for sound biological management.**

The IC system would combine current data collection and that required for IFQs (above and Appendix I). To the extent that IFQs were used, any new requirements would supplement existing data requirements and act as IFQ tracking documents rather than data collection tools.

6.2.2.6 **Enforcement costs may be excessive.**

An IC system would have results similar to the IFQ system, above. Since the total number of vessels would not decrease, enforcement costs would increase more than under IFQs. Also, the existence of a larger open access fishery would increase enforcement costs even more. Since it is not possible to determine what form the fishery would take between IFQs and open access, it is not possible to describe the magnitude of the cost increase. However, this system would probably be the most expensive since it would combine large portions of two systems and these portions would vary year to year.

6.2.3 Business Concerns

6.2.3.1 **Provide a framework for the U.S. industry to be competitive in the world groundfish and crab markets within the principles of sound biological management.**

Under the IC system, conditions would exist for fishermen to choose their type of fishery. This would also affect their costs of production as described for open access and IFQs. By allowing for this choice, fishermen could determine which management system allowed them to be most competitive on the world market.

6.2.3.2 **The fear of increases in governmental controls, regulations, intrusion, and costs.**

The IC system would represent an increase in regulations over the present system. The different components would operate as described for open access and IFQs, above. However, fishermen would be able to choose which set of regulations they wished to fish under.

6.2.3.3 **Flexibility in changing between gears and species.**

Fishermen would have total flexibility in switching between gears and fisheries under the IC system. There would be no extra financial barrier to entry in sablefish longlining except for an administrative fee. Since fishermen would not be required to invest in harvest privileges (IFQs or licenses) they would not feel obligated to fish as they might if they had additional debt to service.

6.2.3.4 **Allow for technological innovation.**

Technological innovation would be encouraged in both cost effect and harvest effective manners under the IC system. Since both open access and IFQ systems would co-exist, fishermen consistently choosing one or the other would tend towards different types of innovations.

6.2.3.5 **Consumers receive a high quality product at a reasonable price.**

The environment for improvements in quality and service would be provided for by the IC system. Fishermen could develop niche markets and thereby increase certain products lines. The extent to which fishermen would take advantage of this environment would be up to each individual.

6.2.4 Fishery Planning Committee Concerns

The Fishery Planning Committee requested that 4 more items be added to Table 6.1. These four were: administration, enforcement, fees and fleet operating costs. Enforcement is covered in Section 6.2.2.6 and Appendix II. Administration structure, cost and fishermen's fees are reviewed together.

6.2.4.1 **Administration structure and costs.**

The IC system would change administrative costs of both the open access and IFQ fishery to fishermen. This would represent a decrease from the existing as discussed for the other limited access systems. The overall cost charged to fishermen would probably be a bit more than that for IFQs unless most fishermen choose IFQs. This is because the open access fishery requires less new administrative costs but greater enforcement costs.

6.2.4.2 **Fleet operating costs.**

The IC system would test the premise that harvesting costs are less when IFQs are used. If the difference in harvesting costs were significant, then fishermen would be expected to choose them for purely business reasons. This would result in many, if not most, vessels eventually using IFQs. If the harvesting costs were not significantly decreased, then many fewer vessels would be expected to use IFQs. Fishermen with experience in IFQ systems have requested that additional fisheries be placed under IFQs (Anderson, 1989; Short, 1989). These changes were requested for both social and economic reasons (Jones, 1989; Talbot, 1989). Based on the studies and research into harvesting costs, a large number of vessels would be expected to realize harvesting cost savings with IFQs and therefore voluntarily choose them.

AGENDA C-7
SEPTEMBER 1989
SUPPLEMENTAL

COOPERATIVE EXTENSION
UNIVERSITY OF CALIFORNIA

DAVIS, CALIFORNIA 95616
(916) 752-1497

REPLY TO: Sea Grant Extension
University of California
Davis, CA 95616

September 18, 1989

Clarence G. Pautzke, Executive Director
North Pacific Fishery Management Council
P.O. Box 103136
Anchorage, AK 99510

Dear Clarence:

While attending the American Fisheries Society Meeting in Anchorage last week, I sat in on the Council's FPC meeting. I was particularly interested in the ITQ discussions because I had presented the preliminary results of my study of New Zealand's ITQ to your F.O.G. committee in December 1987.

I have enclosed a copy of my paper on New Zealand's ITQ which will appear in the next issue of the North American Journal of Fisheries Management. This paper should be helpful to your Council members in their upcoming decisions on ITQs. I hope you will distribute it to the Council or at least to your FPC.

Peter Fricke from the NMFS office in Washington, D.C., suggested that I develop a proposal to North Pacific Council, Pacific Council and/or NMFS to do a follow-up study of New Zealand's ITQ in 1991. The study would document the effects of the ITQs on the sample of fishermen and companies I studied in early 1987, and it would collect data on the overall effect of ITQs on New Zealand's fisheries. The results should be useful to those planning or considering ITQs. Please let me know what you think of this proposal idea.

I hope the enclosed paper is helpful to the Council. Good luck with the difficult management decisions ahead.

Sincerely,

Christopher M. Dewees

Christopher M. Dewees
Marine Fisheries Specialist

CMD/jf

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Assessment of the Implementation of Individual Transferable Quotas in New Zealand's Inshore Fishery

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Abstract.—In 1986, New Zealand implemented an individual transferable quota system (ITQ) for selected inshore fish species to promote conservation of stocks and to improve the economic efficiency of the fishing industry. The objectives of this study were to assess perceived problems and benefits of this new system and its effect on the fishing industry. Data were obtained through interviews with 62 industry participants from the Auckland region and 14 Ministry of Agriculture and Fisheries staff. Over 75% of the fishermen were making significant changes in their business because of ITQs. These changes included minimization of costs and maximization of price received for their catch, practices consistent with economic theory about ITQs. Industry and management agency interviewees generally recognized ITQ benefits of reduced competition, resource conservation, increased retirement security, reduced economic risk, possession of a valuable asset, improved ability to plan, and the professionalization of fishing. Problems with the system included discarding of catches not included in an individual's quota, discarding of the lower-priced portion of catch of some species, enforcement, accuracy of total allowable catch quotas, quota aggregation by companies, and high cost to youths interested in entering the fishery. After 6 months under ITQs, 56% of the fishermen and 100% of the agency staff interviewed felt this new system of managing fisheries would be successful.

catches

Theoretical concepts for managing fisheries with individual transferable quotas (ITQs) were developed by natural resource economists from the 1950s through the early 1970s (Gordon 1954; Christy 1973). The primary feature of ITQs is the assignment of exclusive property rights for harvest of common-property resources. Individual transferable quotas define the limit of each fisherman's catch, in contrast to limited-entry schemes, which restrict inputs such as number of vessels (Moloney and Pearse 1979). In theory, by providing each fisherman or company with rights to harvest a predefined portion of the sustainable catch, ITQs lead to both economic efficiency and resource conservation. Because an individual quota restricts each fisherman's catch, fishermen should be motivated to minimize costs and maximize price received for their catch. Motivations to overexploit stocks and to overcapitalize should be lessened because fishermen no longer have to compete for limited resources. As long as total allowable catch is reasonably accurate and individual quotas are not exceeded, fishery resources should be conserved.

Fraser (1979) and Sinclair (1979) studied the consequences of limited entry, but the present report is the first on how the fishing industry reacts to implementation of an ITQ system. Most of the ITQ literature consists of theoretical discussions and predictions of the methods, problems, and benefits likely to be encountered when ITQs are implemented (Moloney and Pearse 1979; Pearse

and Wilen 1979; Campbell 1984; Clark 1985; Copes 1986). This study's findings should help other fishing industries and management agencies learn from New Zealand's experience with converting ITQ theory into practice.

New Zealand's motivation to implement ITQs came from a strong feeling in the industry and the Ministry of Agriculture and Fisheries that inshore stocks were overfished and that the industry was overcapitalized. Three events in New Zealand helped set the stage for ITQ implementation. During 1982, a moratorium on new entrants into the inshore fishery was put into effect. During 1983–1984, new regulations prohibited participation by part-time fishermen. A participating fishermen had to earn 80% of his income or $10,000 per year (or both) from fishing. Finally, in 1983, company or enterprise allocations similar to those tried in Canada (Copes 1986) were made for deepwater fish such as orange roughy *Hoplostethus atlanticus*. These enterprise allocations involved allocation of portions of the total allowable catch to large fishing companies rather than to individual fishermen. Most of these companies caught, processed, and marketed their allocated fish. This "pretest" of an ITQ-type system in fisheries with few participants provided experience that helped with the transition to ITQs for inshore fisheries.

In 1986, after much consultation between the Ministry of Agriculture and Fisheries (MAF) and the fishing industry, the Fisheries Amendment Act of 1986 was passed, which made ITQ implementation possible. New Zealand's ITQ scheme is similar to the one proposed by Moloney and Pearse (1979), which emphasized transferability, perpetuity of rights, government buying and selling of quotas to adjust total catch, and payment of resource rentals. The basics of the New Zealand ITQ system are summarized below.

(1) Total allowable catches (TACs) were established for heavily exploited inshore finfish species for each of the nine management zones in New Zealand.

(2) The TACs were allocated among fishing vessel owners based on their average catches for their best 2 years during 1982–1984. Fishermen were given provisional pre-tender maximum and minimum ITQs for each species. The maximum was based on the fisherman's catch history and the minimum was the catch history minus a proportional cutback that MAF biologists determined was needed to reach the desired TAC in each management zone.

(3) Fishermen who felt their catch histories were inaccurate (because of computer errors, exceptional circumstances, etc.) could appeal to an Objections Committee, which reviewed catch data and made appropriate changes in ITQs.

(4) Where the government wanted to reduce catches below historical levels to meet the TACs, a competitive tendering process gave people an opportunity to voluntarily sell out completely or partially to the government. Fishermen were notified that if insufficient quotas were voluntarily tendered back to the government, across-the-board cuts in ITQs for that species would be made without compensation to reach the desired TAC level. Fishermen made tender offers to the government by calculating the lump-sum tax-free payment that would compensate them for leaving or reducing their landings in the fishery. The government accepted the lowest bids first until either the desired TACs were reached or the bids were unacceptably high. All fishermen with accepted bids were paid at the same rate per tonne. This rate was equal to the highest bid accepted. For some species (e.g., snapper *Chrysophrys auratus*) large pro rata cuts were necessary because insufficient quotas were tendered back to the government.

(5) After making their tenders, quota holders received their final ITQs, which were their pretender maximum (catch history) allocation minus what they sold back to the government and any pro rata cuts made by MAF to meet the TACs. These ITQs gave fishermen rights to catch a certain quantity of selected fish species each year within certain management zones. The quotas were allocated in perpetuity and were fully transferable (i.e., they could be bought, sold, and leased).

(6) A low annual fee (resource rental) was charged at first (NZ$3 per tonne). Future fees will be based on the economic return to the fishing industry.

(7) Adjustments of catches due to changes in TACs are handled by government auction of additional quotas or government buy-back of quotas from fishermen.

(8) No individual or company may possess ITQs that total more than 20% of the TAC for any species in any management zone.

(9) A thorough computerized reporting system was implemented, which included monthly reports from fishermen and fish buyers, catch logs for vessels, and reports of all quota transfers.

The system was implemented on 1 October 1986 and the tendering process was completed by the end of 1986. For a more detailed summary, see Crothers (1988).

The primary purposes of this study were to as-

sess the perceived problems and benefits of an ITQ system and the initial effects of the ITQ system on individual businesses.

Methods

Between 4 March and 26 May 1987, I interviewed 62 commercial fishermen and fishing company managers from an unstratified random sample of 100 people chosen from the 1 May 1986 MAF list of approximately 400 provisional quota holders in MAF's Auckland region. The list of provisional quota holders consisted of all permit holders who had been advised by MAF that they would receive a provisional ITQ and who were invited to participate in the tender rounds before final ITQ allocations. This list was used because it included those who sold out after 1 May 1986. I was unable to contact 30 provisional quota holders, and 8 fishermen refused to participate.

The questionnaire consisted of 34 questions. Whenever possible, questions were taken directly or adapted from related fisheries socioeconomic studies (Acheson and Reidman 1982; Levine 1984; Dewees and Hawkes 1988). The questionnaire was pretested by interviewing five industry leaders to identify vague questions, potential sources of bias, and typical ranges of answers. I did all interviewing, which eliminated variability due to the effects of multiple interviewers. To minimize potential antagonisms, I made it clear to interviewees that I was not associated with the MAF. Finally, interviewees were assured of confidentiality.

The interviews were used to collect data on (1) characteristics of the industry and the interviewees, (2) interviewees' perceptions of, adaptations to, problems with, and attitudes about ITQs, and (3) ITQ problems and benefits.

Although my primary focus was on the fishing industry, I used a shortened version of the questionnaire to interview a nonrandom sample of 14 MAF staff in the Auckland region (10) and the Wellington headquarters (4) in June 1987. The MAF sample included fisheries management, research, enforcement, and administrative personnel. The nonrandom sample made generalization to all of MAF inappropriate and statistical comparisons with industry problematical, but it was important to gain an understanding of perceptions and insights about ITQs held by some MAF personnel.

Results and Discussion

Fishing Industry Interviews

Attributes of fishing business.—Most interviewees were individual owner–operators of one or two small fishing vessels under 20 m long (Table 1). Some fishermen had diversified either by running their own retail market or by processing small quantities of fish themselves. Part of the sample included fish companies that owned two or more vessels and processed large volumes of fish. The ITQ scheme provided most individuals and companies an asset worth more than their vessels and gear.

The industry uses a diversity of gear. Many individuals use two or three methods during the year. Gill netters and longliners are most numerous and there has been a switch away from trawling and Danish seining as fishermen try to maximize revenues and lower costs under the ITQ system.

Personal characteristics.—Auckland-area fishermen and company managers earn almost all of their income from fishing. The industry is made up of experienced fishermen, and none of the interviewees were less than 25 years old (Table 2). Eighty-five percent of interviewees were continuing to fish; the remainder had sold out. Thirty-one percent of all interviewees were either trying to sell their business or to lessen their financial commitment to fishing. Twenty-two percent planned to increase their financial commitment to fishing and 47% intended to maintain their commitment to the business. Future changes in the attributes of fishermen and their businesses due to ITQs should be tracked, as suggested by Fairgray (1986).

Interviewees were significantly more optimistic ($P = 0.01$) about current (1987) economic fishing conditions than they had been about conditions during the 2 years prior to the ITQ system. No significant difference was detected between interviewees' ratings of current and future fishing conditions. On a scale of 1 (worst) to 10 (best), they rated pre-ITQ conditions 6.0 and current conditions 6.7; they anticipated conditions to be 7.1 in 1992 (Table 2). These ratings may reflect dissatisfaction with past management.

When asked how long it would take to find alternative employment if they could no longer fish, 74% of interviewees felt they could find work in a few months or less, 7% thought it would take a year or longer, and 19% said they could never find alternative employment. Those professing extreme trouble finding work tended to be older (over 45) or to lack a needed trade skill. When asked how long it would take to find work as enjoyable as fishing, 70% of respondents said they never could. Reductions in fishery employment would have costs primarily in losses of job satisfaction rather than in unemployment.

TABLE 1.—Characteristics of 62 fishing businesses interviewed in the Auckland region, 1987. Monetary values are in New Zealand dollars; at the time, NZ$1.00 ≈ US$0.55.

Characteristic	Percent
Type of business	
Individual fishermen	89
Fish company or processor	11
Number of vessels owned	
0	6
1	58
2	27
Year vessel was purchased	
1960–1976	21
1977–1982	34
1983–1985	32
1986–1987	13
Fishing methods used	
Gill net	61
Longline	47
Trawl	13
Beach seine	11
Handlines	11
Trolling	3
Other nets	8
Other	5
Most important fishing method	
Gill net	48
Longline	27
Trawl	10
Beach seine	8
Danish seine	2
Other	5
Value of 1986 catch	
<$5,000	13
$10,000–$49,999	35
$50,000–$99,999	24
$100,000–$199,999	13
>$300,000	15
Market value of vessel(s) and gear	
<$25,000	42
$30,000–$70,000	31
$100,000–$300,000	19
≥$1,000,000	8
Market value of quota holdings	
<$25,000	26
$30,000–$100,000	35
$120,000–$250,000	21
$300,000–$700,000	9
≥$2,500,000	8
Firm size (vessels, gear and quota)	
<$50,000	29
$50,000–$100,000	15
$110,000–$200,000	23
$203,000–$680,000	24
≥$1,000,000	9

Industry adaptations to ITQs.—A key finding was that over three-quarters (77%) of the industry were making substantial changes in their businesses because of ITQs (Table 3). The two primary types of adjustments were changes in fishing methods and reductions in costs and effort. Interviewees often stated that their changes in methods were aimed at maximizing the price received for the fish landed and at reducing costs; both are consistent with behavior predicted by economic theory (Christy 1973; Copes 1986). The primary price-maximizing strategy was development of innovative on-board handling methods for individual fish to supply a lucrative export market in Japan. The other change in method involved targeting species that are not currently covered by ITQs, such as kahawai *Arripis trutta*, tunas *Thunnus* spp., and squid *Nototodarus* spp.

Some fishermen said they could catch their quota by fishing a few days per week and some of these people were taking other jobs. Others were holding on to their quota as an asset even though they had sold their vessels.

Industry perceptions about ITQs.—Interviewees were asked for their opinions (strongly agree, agree, disagree, and strongly disagree) of 22 statements about New Zealand's ITQs (Table 4). In theory, new concepts such as ITQs are more likely to be accepted by individuals or organizations that perceive them as being simple, compatible with beliefs and practices, relatively advantageous, and

TABLE 2.—Personal characteristics and outlooks on fishing conditions of 62 fishermen and fishing company managers in the Auckland area, 1987. ITQ is individual transferable quota.

Characteristic	Mean (SD)	Range
Age	44.5 (10.5)	25–68
Fishing experience (years)	17.5 (10.6)	3–47
Percent income from fishing	79.5 (36.2)	0–100
Rating of economic fishing conditions[a]		
Pre-ITQ	6.0 (2.3)	1–10
1987	6.7 (2.7)[b]	1–10
Anticipated in 1992	7.1 (2.9)	1–10

[a] Measured on a scale of 1 to 10; 1 = worst possible, 10 = best possible.

[b] Significantly different from pre-ITQ (repeated-measures analysis of variance, $F = 7.29$, $P = 0.01$).

TABLE 3.—Industry adaptations to individual transferable quotas (ITQs) in the Auckland region.

Characteristic	Percent
Percent making changes in their business because of ITQs	77
Type of change	
Improve quality for export	23
Switch to longlining	17
Target non-ITQ species	17
Leave fishing industry completely	23
Reduce effort	10
Sell boat and keep quota	6
Lessen costs	4

TABLE 4.—Responses of industry and Ministry of Agriculture and Fisheries (MAF) interviewees to statements about attributes of the New Zealand system of individual transferable quotas (ITQs). Choice of responses were strongly agree, agree, disagree, and strongly disagree. Asterisks denote values significantly different from 50% (binomial chi-square test, $P < 0.05$*).

ITQ attribute	Percent that strongly agreed: Industry	MAF
Simplicity		
Easy to understand	69*	79
Reporting requirements easy to complete	58	57
Quota simple to trade	67	92*
Compatability		
Compatible with beliefs about fisheries management	56	86
Requires many changes in my fishing business	61	100*
Compatible with fishing lifestyle	55	54
Challenge and enjoyment		
Takes challenge and adventure out of fishing	51	23
Increases enjoyment of fishing as a career	19*	14
Chances of making big profits are less	48	38
Relative advantage		
Reduces competition with other fishermen	65	71
Reduces conflicts between different fishing methods	39	31
Improves ability to plan in business	65	93*
Earnings are more predictable	70*	79
Economic situation is improved	48	86
Fish stocks are conserved	56	92*
Perceived risk		
Fishing is riskier economically	39	15
More secure about future as fisherman	49	86
More secure about retirement	73*	100*
Other perceptions		
Difficult for young people to get started	95*	71
New Zealand's fishing industry better off under ITQs	58	100*
New Zealand's ITQ will be successful	56	100*
Objections Committee fair and equitable	28*	50

TABLE 5.—Positive effects of New Zealand's individual transferable quota system identified by fishing industry and Ministry of Agriculture and Fisheries (MAF) interviewees.

Positive effect	Percent of interviewees: Industry	MAF
Conserves fish stocks	53	71
Provides asset and security	42	36
Professionalizes fishing	37	50
Reduces fishing effort	23	21
Improves prices	13	0
Helps one sell out or retire now	5	7
Other	21	0
Provides economic return to government	0	29
Allows for better enforcement	0	14
Results in improved fish quality	0	14
Reduces allocation problems	0	7
Reduces competition between fishermen	0	7
Forces industry to diversify into underutilized species	0	7

not risky (Downs and Mohr 1976; Rogers 1983; Gramann et al. 1985).

There was a wide range of perceptions about ITQs. Most interviewees felt ITQ concepts and procedures were not unduly complex or difficult to follow. The majority saw advantages of reduced competition, improved planning, predictability of earnings, resource conservation, reduced economic risk, and possession of an asset that gives increased retirement security. Minorities felt that ITQs increased their enjoyment of fishing or reduced conflicts between gear types, and that the Objections Committees treated fishermen fairly. Most interviewees felt that ITQs required many changes in their fishing businesses and almost everyone expressed concerns about the cost barrier to entry for young people.

Benefits of ITQs.—The majority of fishermen (53%) identified conservation of fish stocks as a positive effect, whereas only 23% mentioned the other primary ITQ goal of reducing fishing effort (Table 5). The industry is also well aware of the value of the quota as an asset and of the increased financial security provided by that asset. Some interviewees (37%) also identified the professionalization of fishing as an ITQ benefit.

ITQ problems.—I categorized problems identified by the industry into three types: resource-related, administrative, and business-related (Table 6).

The primary resource-related problem, identified by 66% of the interviewees, was the high rate of fish discarding. This resource waste was due both to the discarding of fish (by-catch) for which the fishermen did not possess a quota and the culling of fish to insure that only the highest priced portion of a fisherman's catch was landed (high-grading). When I examined the MAF list of provisional quota holders, I noticed that numerous quota holders had tendered part or all of their historical by-catch. This only made the by-catch problem worse. High-grading was most prevalent for species with high price differentials such as snapper.

The primary administrative problem identified was enforcement. Concerns included the difficulty of stopping illegal and unreported sales, lack of

TABLE 6.—Problems with New Zealand's individual transferable quota (ITQ) system identified by the fishing industry and Ministry of Agriculture and Fisheries (MAF) interviewees. TAC is total allowable catch.

Problem	Percent of interviewees	
	Industry	MAF
Resource-related		
Discarding by-catch and lower-priced fish	66	64
Overexploitation of non-ITQ species	8	7
Estimated TACs inaccurate	5	29
Administrative		
Enforcement	40	57
Compliance with reporting procedures	0	50
Catch history problems	13	0
Excessive paperwork	10	7
System lacks flexibility	10	14
Alternative management techniques not considered	6	0
System inequitable	6	0
Deadlines and timing unrealistic	6	0
Poor communication within MAF	5	29
Requires many changes in MAF operations	0	14
System is complex	0	14
System not in place at implementation	0	14
MAF lacks proper skills	0	7
Lack of evaluation of ITQ consequences	0	7
Conflict of interest: lower TACs will reduce MAF resources	0	7
Business-related		
Companies gain too much control	26	29
Makes business uneconomical: cannot work at full capacity	23	0
Increased capitalization	15	0
Lack of fish for domestic supply	13	14
Young people cannot get started	10	7
Quota too expensive	8	0
Conflicts with recreational fishery	6	0
Conflicts with Maori fishing rights	0	14
Other problems	10	0

enforcement at sea, harassment for minor offenses, and strained relationships between MAF and industry. When interviewees were asked about the effects of ITQs on underreporting of catches, 41% felt that underreporting would decrease, citing the potentially severe penalties. However, 35% thought that underreporting would increase because of increased incentives to cheat, citing higher prices, low quotas, and scarcity of fish on the domestic market. Other administrative problems identified center on equitability, reporting requirements, and lack of flexibility.

Numerous business-related problems were identified. Some people (26%) were concerned that large fishing companies would gain too much control by aggregating quotas. Others (23%) felt that the cutbacks in their potential catch under (ITQs made their businesses uneconomical. Some fishermen who previously fished full-time now operate part-time under ITQs because their quotas were less than their present catching capacity. Some have taken other jobs to supplement their income; others are trying to buy quotas.

Three business problems were related to the high cost of quotas. Some expressed concern about economic barriers to young people entering the fishery, the high price of quotas now, and the increased capitalization required to obtain an adequate quota and to change fishing practices to maximize prices received for fish. There also were concerns about the decline in the amount of fish sold for the domestic market due to higher prices paid for export-quality fish and concerns about conflicts with the recreational fishery. Recreational fishery concerns included illegal sale of fish by sport fishermen, competition for the allocation of fish between recreational and commercial fishermen, and effects of recreational fishing on the resource.

Suggestions for solving major problems.—Five possible means of reducing the wastage caused by discards of by-catch and high-grading were frequently mentioned by interviewees. Two suggestions could easily be abused and cause TACs to be exceeded: (1) to allow a small percentage of fish above the quota held to be landed for the domestic market, and (2) to raise the price paid for surrendering the catch to the Crown from 10% of market price to a level that would make it worthwhile to land the by-catch without encouraging targeting. The suggestion to trade off quotas between species in economically equivalent units was implemented by MAF in mid-1987. This approach could also cause some TACs to be exceeded. Another suggested solution, to restrict or ban less-selective fishing methods such as trawling and Danish seining, could reduce the economic efficiency of the fleet. The fifth suggestion was to increase enforcement of antidumping regulations.

Industry enforcement suggestions included rapid and successful prosecution of major offenses with stiff penalties, including loss of quota and vessel. Some interviewees felt this approach would deter most cheaters. Fishermen frequently suggested (1) better communication between MAF and fishermen to rebuild trust and to communicate what is expected, and (2) hiring of more fisheries officers and providing them better training in public relations, enforcement techniques, and the practical side of fisheries.

Individual fishermen most frequently suggested lowering the quota aggregation limit to 5 or 10% to lessen the chance that a few companies would

gain too much control in the industry. Not surprisingly, several fishing company managers felt the aggregation limit should exceed 20% for some species. Other suggestions included (1) making quotas nontransferable, and (2) government intervention to encourage socially desirable distribution of quotas through price limits and redistribution of quotas. Nontransferability could lessen the economic efficiency of ITQs, and government intervention would involve difficult policy decisions.

The two most frequent suggestions for lessening problems of inequitability and inaccuracy of catch histories were (1) use of a longer time period (up to 10 years) for determining catch histories and (2) establishment of a minimum economically viable quota. While extending the time period might provide more representative catch histories for career fishermen, problems of new entrants, changes in fish abundance, changes in fishing methods, and lack of catch documentation would be likely. A minimum viable quota would be difficult to define, would reward those who underreported in the past, and would lessen the ITQ system's economic efficiency. Other frequent suggestions for solving catch history problems were appointment of retired fishermen to objections committees and use of buyers' receipts rather than fishermen's catch reports as the basis of catch histories.

Current conditions versus pre-ITQ conditions.—Fishermen and company managers were asked to compare the ITQ management system to previous methods used to manage New Zealand's inshore fisheries. Responses were distributed along an 11-point scale on which 1 equaled much worse, 6 the same and 11 much better. On average, the interviewees felt that the ITQ system was slightly better (mean, 7.1) than previous management; 58% felt it was better, 11% felt it was the same, and 31% felt it was worse. The predominant view expressed was that the previous systems were not working well and something had to be done to protect the resource.

The fishermen and company managers were also asked how their present conditions (economic and job satisfaction) compared to their pre-ITQ situations. On average, they felt slightly better off (mean, 6.6 on the same 11-point scale). About 52% rated their present condition better under ITQs, 19% felt about the same, and 29% felt worse off.

Interviews with MAF Personnel

Perceptions of the ITQ system.—Ministry of Agriculture and Fisheries interviewees were asked for their responses to the same 22 statements about New Zealand's ITQs that had been posed to fishermen. In general, the MAF interviewees were strong advocates of the ITQ scheme (Table 4). All those interviewed felt that their ITQ system would be successful and that New Zealand's fishing industry was better off under ITQs. They felt strongly about the economic advantages of ITQs to the industry and the reduction in risk. Government interviewees also perceived that ITQs were easy to understand and deal with and compatible with their beliefs about management; they also saw the ITQ system as a useful fish conservation technique and as a means to reduce competition among fishermen.

Perceived benefits of ITQs.—The list of perceived benefits by MAF personnel was remarkably similar to the benefits mentioned by industry representatives (Table 5). Conservation, provision of an asset and security, professionalization of fishing, and reduction in fishing effort were the most-often mentioned benefits by both groups.

ITQ problems.—Like industry people, MAF staff cited by-catch, enforcement, and quota aggregation by companies as the primary problems with New Zealand's ITQ system (Table 6). Compared to industry respondents, MAF professionals identified more internal administrative problems. Unlike industry representatives, most (64%) MAF interviewees felt that underreporting of catches would decrease under ITQs, while 29% felt it would increase.

Suggestions for solving major ITQ problems.—Solutions most frequently suggested by MAF interviewees for lessening the wastage problem appear to better protect the integrity of the TACs than the industry solutions. Some MAF interviewees suggested using the current scheme of trading off economically equivalent units of quota, but setting conservative TACs to protect the resource from quota overruns. Others felt that MAF should persevere and make industry buy or lease quotas to cover by-catches or else sacrifice catches to MAF. Several suggested working with industry to test different methods to reduce by-catch and developing gear restrictions or seasonal quotas to lessen by-catch. Reductions in by-catch would have to be balanced against possible changes in economic efficiency due to restrictions. MAF personnel, like industry respondents, suggested increased education and enforcement of antidumping regulations.

Suggestions by MAF interviewees for improving TAC estimates focused on increasing MAF re-

search resources and skills in population dynamics, species interactions, and prediction of the consequences of changes in fishing effort, markets, regulations, and TACs. Several interviewees suggested reducing the number of species under ITQs. The cost, complexity, and risk to the resource should be considered before a species is taken out of the ITQ system.

Suggestions for improved enforcement were almost identical to those of industry representatives: aggressive prosecution of major offenses, improved communication internally and externally, and increased numbers of better-trained enforcement officers. One unique MAF suggestion was to simplify the reporting system.

Current versus pre-ITQ conditions.—MAF interviewees were strong advocates of the ITQ system. All of them rated it better than previous systems. The predominant view that something had to be done to protect the resources was similar to that of the industry interviewees.

Most MAF interviewees (79%) felt that the industry was better off under the ITQ system. The predominant view was that fishermen had a valuable asset, more security, and a high likelihood of a sustainable catch.

Recommendations

I have tried as an independent observer to document some of the early benefits, problems, and effects of New Zealand's ITQ system. My foremost impression is that the implementation of an ITQ scheme requires major changes in the way that both the industry and regulatory agency operate. New Zealand's fishing industry and MAF have shown great courage in undertaking such a massive change. Due to the limited worldwide experience with ITQs, New Zealand has had to convert theory into practice. This transition has not been without problems. Specific recommendations follow.

(1) A well-thought-out education strategy is needed to inform industry and agency staff about ITQs to help them make wise decisions about developing ITQ policies.

(2) Both industry and agency staff should be committed to making the ITQ system work. Once the scheme is implemented, it would be difficult and expensive to reverse the process.

(3) Industry and agency personnel should try to predict benefits, problems, and consequences of the proposed scheme for industry, regulatory agencies, other groups, and fishery resources before ITQs are implemented. Major issues such as bycatches, aggregation limits, tendering processes, resource rentals, and reporting systems must be addressed.

(4) The tendering or government buy-back processes need to be as clear and understandable as possible to all participants. This is a critical part of the ITQs and it involves a career decision by fishermen.

(5) Restrictions on the selling back of historical by-catches during the tendering or buy-back processes should be considered. Such a restriction might lessen the by-catch discard problem.

(6) An accurate and equitable system for the initial allocation of quotas is essential. Accurate catch histories and an impartial appeals system are needed.

(7) Information, reporting, and quota-trading systems must be ready when ITQs are implemented. Industry reporting procedures should be concise and simple, yet still meet agency needs.

(8) The regulatory agency needs to allocate adequate resources to effectively manage the ITQ system. The transition to a multispecies ITQ system has large start-up costs. Additional resources are needed for educational and communication campaigns, development and daily operation of computerized information and reporting systems, enforcement, population dynamics research to set and adjust total allowable catches for each species, and monitoring of management effects on effort and economic efficiency.

(9) Quota trading and leasing should be simple, timely, and easily accessible by all quota holders. This will help industry to efficiently manage quota holdings and to adjust quotas to account for by-catches.

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