AGENDA D-4
JUNE 1986

# M E M O R A N D U M

TO: Council, AP and SSC Members

FROM: Jim H. Branson
Executive Director

DATE: June 17, 1986

SUBJECT: Gulf of Alaska Groundfish Fishery Management Plan

## ACTION REQUIRED

Review and approve Amendment 15 for public review. Review recommendations of industry workgroup on Kodiak trawl closures to protect king crab.

## BACKGROUND

Initial Council review of the Amendment 15 package and approval for public review is scheduled for this meeting. The package consists of a summary document, a draft Regulatory Impact Review/Initial Regulatory Flexibility Analysis (RIR), and a draft Environmental Assessment (EA). The summary document is provided as item D-4(a). The RIR and EA were sent to you in a June 13 mailing. The amendment package contains the presentation of the Council's draft goals and objectives, and four issues and their management alternatives.

We expected Amendment 15 to be a complete revision of the existing FMP with several framework management measures. However, NMFS comments on Bering Sea Amendment 10 imply that the frameworked measures they have reviewed to date are too broad, too general, and not approvable. It is their opinion that framework measures must be quite specific and are not intended to replace the plan amendment process. That's a change from their philosophy in 1982 when the frameworked king crab FMP was prepared.

Many of the framework measures being developed for the Gulf of Alaska groundfish FMP are probably too general in NMFS' eyes and could not be expected to survive the Secretarial review process. They need to be more specific. The plan team also is uncomfortable with several elements of the OY framework which address bycatch management. They want more time to interact with the Council and to develop the framework.

Because of these problems we decided to condense the Amendment 15 package to just those items that are considered critical for management in 1987. Those are:

1. New goals and objectives for management of groundfish;
2. An administrative framework procedure for setting harvest levels without plan amendment;
3. Redefinition of catcher/processor and mothership/processor for purposes of compliance with reporting requirements;
4. Establishment of a time/area closure scheme to protect king crab around Kodiak Island; and
5. An expanded field order authority for inseason adjustments.

The remaining items of the original amendment would be finalized and presented to the Council for public review at the March 1987 meeting. These items include: reformatting the plan, revising and updating the descriptive sections, developing a framework approach for the management of bycatch and a framework for setting seasons, and developing a comprehensive management program for rockfish. The Council's Gulf of Alaska FMP Working Committee and the plan team will need to meet prior to March to solve some of the outstanding problems with the bycatch framework.

At the request of the Council, an industry trawl/king crab bycatch workgroup met in Kodiak during May 20-21 to review the king crab bycatch problem and develop recommendations for future Council action. Their report, describing a 3-year time/area closure scheme and a chartlet of the areas, are included in your materials as items D-4(b) and D-4(c), respectively. Dr. Ron Dearborn, chairman of the workgroup, is available to present an oral summary of the workgroup's recommendations.

A few comments have been received on the FMP revision project and the industry king crab bycatch workgroup meeting. They are included with your supplemental materials.

# AMENDMENT 15 SUMMARY

1. Presentation of a revised set of goals and objectives for the management of groundfish fisheries in the Gulf of Alaska and their implications.

2. Problem 1: Inability to efficiently adjust harvest guidelines.

   Alternative 1 - Establish an overall harvest framework procedure which accounts for total fishing mortality of the groundfish resource and provides a procedure for adjusting individual quotas (TAC) on an annual basis.

   Alternative 2 - Establish an overall harvest framework procedure which accounts for total fishing mortality of the groundfish resource and provides a procedure for adjusting individual quotas (TAC) on an annual basis. Mortality shall be explicitly accounted for at the end of each fishing year.

3. Problem 2: Inadequate reporting requirements.

   Alternative 1 - Redefine domestic catcher/processor and domestic mothership/processor vessels and clarify reporting requirements for those vessels.

   Alternative 2 - Redefine domestic catcher/processor and domestic mothership/processor vessels, clarify reporting requirements for these vessels, and require all vessels to provide sale price information when filling out fish tickets.

4. Problem 3: King crab bycatch in Kodiak bottom trawl groundfish fisheries.

   Alternative 1 - Establish a time/area closure scheme for bottom trawling to help rebuild the Kodiak king crab resource.

5. Problem 4: Inadequate inseason management authority.

Alternative 1 - Authorize the NMFS Regional Director to close fisheries on the basis of all relevant information to promote fishery conservation.

Alternative 2 - Authorize the NMFS Regional Director to make time/area adjustments to promote fishery conservation and/or promote socioeconomic interests in the fishery on the basis of all relevant information.

# Report of the Industry Trawl/King Crab Bycatch Workgroup

May 20-21, 1986

Kodiak, Alaska

## Introduction

At the request of the North Pacific Fishery Management Council, a workgroup consisting of representatives of the Kodiak crab and groundfish industry met to discuss the problem of king crab bycatch in the domestic bottom trawl fisheries for groundfish conducted in the Kodiak Island area, and to develop recommendations for short-term (remainder of 1986) and long-term (1987 -) solutions. It was the intention of the workgroup to provide management alternatives to the Council for their use in future decision making.

At the invitation of the Council, the workgroup consisted of: Ron Dearborn, University of Alaska Sea Grant College Program (Chairman) and industry representatives Bill Jacobson, Ted Painter, Kent Helligso, Mike Haggren, Jim Majors, Ted West, Bernie Burkholder, and Mickey Serwold. Industry members were selected based on their current involvement in the pot, trawl, or longline harvesting sector, or their involvement as an offshore or shoreside processor. All industy members possessed recognized experience with fisheries in the Kodiak area.

In support of the industry workgroup, a scientific workgroup was assembled to provide information on the status of king crab stocks, results of domestic observer programs, and domestic catch statistics.

The scientific workgroup was composed of Doug Eggers and Dana Schmidt, Alaska Department of Fish and Game; Bob Otto and Jerry Reeves, Northwest and Alaska Fisheries Center; and Steve Davis, North Pacific Fishery Management Council. Other advisors were Larry Nicholson, Marty Eaton, Pete Jackson, and Dave Owen, Alaska Department of Fish and Game. Over 15 members of the fishing industry and public observed the meeting and participated in providing valuable input.

The meeting began with an overview of scientific information and analyses used by the Council and the Alaska Board of Fisheries in their recent decisions to close areas around Kodiak to bottom trawling and directed crab fishing for purposes of protecting king crab. Additional information on recent domestic trawl harvests of groundfish by time and area were also presented at the request of the workgroup. The scientific information indicates that Kodiak king crab stocks are severely depressed; consist of relatively old crab; and show no signs of significant recruitment. The industry workgroup believes that the future of the king crab resource is dependent on the ability of this brood stock to successfully produce crab. However, crab should not be protected at all costs. The workgroup believes the cost of protecting every single crab is too high and that a reasonable management program can be developed that will protect the majority of crab for rebuilding purposes while still providing groundfish fishing opportunities necessary to support the economic base of Kodiak communities.

Workgroup Recommendations and Comments

After a detailed review of king crab and groundfish information, public input, and discussion with the scientific workgroup, the following recommendations and comments were provided:

The workgroup expressed a reluctance to close areas to fishing except when absolutely necessary for conservation purposes, preferring instead to allow fishing of all gear types except when there was high bycatch of depressed species. Key reasons for this approach include:

a) a recognition of the importance of all types of fish and fishing practices to healthy and continuous shore based operations, and the interdependence of all the fisheries in maintaining a healthy and competitive market; and

b) that a closure of areas to fishing is also a closure of that area to an information base critical to understanding the nature of these multi-species areas.

The workgroup expressed a desire to have broad observer coverage of all fisheres, because they recognized that our information base is not adequate when it comes to identifying practices which will provide adequate protection for king crab stocks while enabling the development of a trawl fishery. This same concern for the need for observer coverage extends to other bycatch issues, which will very likely come before the Council in future years.

There is a burden associated with observer coverage that includes the cost of the observers, insuring those observers, and finding space on smaller vessels for non-harvesting personnel. The information which is provided by observers is valuable to the entire fishing industry. Therefore, the burden should be carried by the entire industry.

Even if observers were available to the industry, the workgroup agreed that because of the low populations of king crab stocks and the tight congregations of these stocks in certain areas, some areas should be closed to bottom trawling in order to provide an adequate opportunity for stock rebuilding.

Observer coverage of all fisheries in the future might enable us to manage other stocks adequately so that future closures to protect other stocks could be avoided.

As the workgroup addressed the issue of time and area closures around Kodiak, it is considered a variety of alternatives. The alternatives considered are summarized in the following table.

Table. Proposed area designations and alternatives for purposes of protecting king crab and managing bottom trawl fisheries.

| Area Type | Name and Definition |
|---|---|
| 1 | Rebuilding Areas (where crab concentrations are high) |
| | Alternative 1: Close year round; to all gear. |
| | Alternative 2: Close year round to bottom trawl only. Other gear allowed during open season. |
| 2 | Restricted Fishing Areas (where crab are found, but in less amounts; does not qualify as Type 1 area). |
| | Alternative 1: Close during soft-shell period; allow limited fisheries (with or without observers; close area or move when bycatch is high). |
| | Alternative 2: Open all year; allow limited fisheries (with or without observers; close area or move when bycatch is high). |
| 3 | Unrestricted Fishing Areas (few or no crab; all gear allowed during open season). |

There is a recognition by the workgroup that there will not be viable stocks of king crab around Kodiak Island in the immediate future. Significant protection of those stocks will have to be provided for some time. The workgroup also recognizes that once areas have been closed to fishing, there is often a reluctance to open those areas even when circumstances may have changed. Therefore, the workgroup has come to an agreement on closures which they wish to have in place for a period of three years from the year of implementation. At that time the workgroup would like to see the issue addressed again. It is believed that in conjunction with the Alaska Board of Fisheries closures, at least 85 percent of the king crab around Kodiak receive some protection under this agreement.

The agreement which the workgroup reached by unanimous decision and for which it seeks adoption by the Council is as follows:

I. Three types of fishing areas/closures are described.

Type 1 Areas are those king crab stock rebuilding areas where a high level of protection to king crab will be provided by closing the area year round to all bottom trawling. Fishing with other gear will be allowed.

Type 2 Areas are those areas sensitive for king crab populations and in which bottom trawling will be prohibited during the soft-shell season, February 15 to June 15. [It is noted that because of the soft-shell season there will be little handling of soft-shelled king crab by the other pot crab fisheries in these same areas at these times.]

Type 3 Areas are all federal waters not designated Type 1 or Type 2 and are areas where there will be no closures/gear type restrictions for any part of the year.

II. The workgroup agrees that the following areas fall into Type 1, where bottom trawling should be prohibited year round.

A. The Alitak and Towers areas at the southwest end of Kodiak Island. The boundaries of this area are the same as for the emergency order closure.

B. The Long Island to East Cape area of Marmot Flats. This area falls east of 152°W to 151°50'W and north of 57°42'N to 58°N.

III. The workgroup agrees that the following areas fall into Type 2, where bottom trawling will be restricted during the soft-shell season, February 15 to June 15.

The Chirikof Island area and the Barnabas Flats area enclosed by the same boundaries as described in the emergency order closure.

The workgroup also agrees that the adjacent state waters inside of three miles, including the area from Ugak I. to Chiniak Bay and all of Chiniak Bay, should have the same soft-shell season closure restrictions. The workgroup does not feel that it is important to keep these areas closed year round for the protection of king crab, and that prohibiting dragging year round in these areas will inhibit the development of the Kodiak based industry, both the harvesting side and the shore based facilities.

IV. All other federal waters around Kodiak fall into area Type 3 and should be open to all gear types year round.

A straw poll of the attending audience, including scientists showed a high degree of support for the agreement.

In terms of the short-term issue of whether to extend the current emergency order an additional 90 days, the workgroup anticipates very little trawl fishing in those areas over the next 90 days. Therefore, they see no reason to extend the emergency order. It is expected that trawl fishing around Kodiak Island will increase later this year. It is believed that the Kodiak based fleet can readily come to agreement on voluntary compliance in the short term, if these long-term measures are adopted by the Council. It is further hoped that the Council will seek voluntary compliance by the non-Kodiak based fleet.

The workgroup wishes to address one additional item which, although it falls outside the direct charge of the workgroup, may be helpful to the Council as it continues to work with the Alaska Board of Fisheries towards cooperative and effective fisheries management. The workgroup very much opposes the closure of areas to fishing without a compelling biological reason. In order to maintain and develop a vibrant and competitive fishery infrastructure and year round fishery around Kodiak Island, maximum flexibility must be given to that fishery. The workgroup agrees to soft-shell season closures of Westside Bays. Further closures should be based on biological data. It is believed

that shrimp fishing can occur in sensitive crab areas without significant bycatch of king crab. If the State of Alaska finds reason to open a shrimp fishery, this agreement is not intended to prohibit such an opening.

Submitted on behalf of the

Industry/King Crab Bycatch Workgroup

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by R. K. Dearborn, Chair

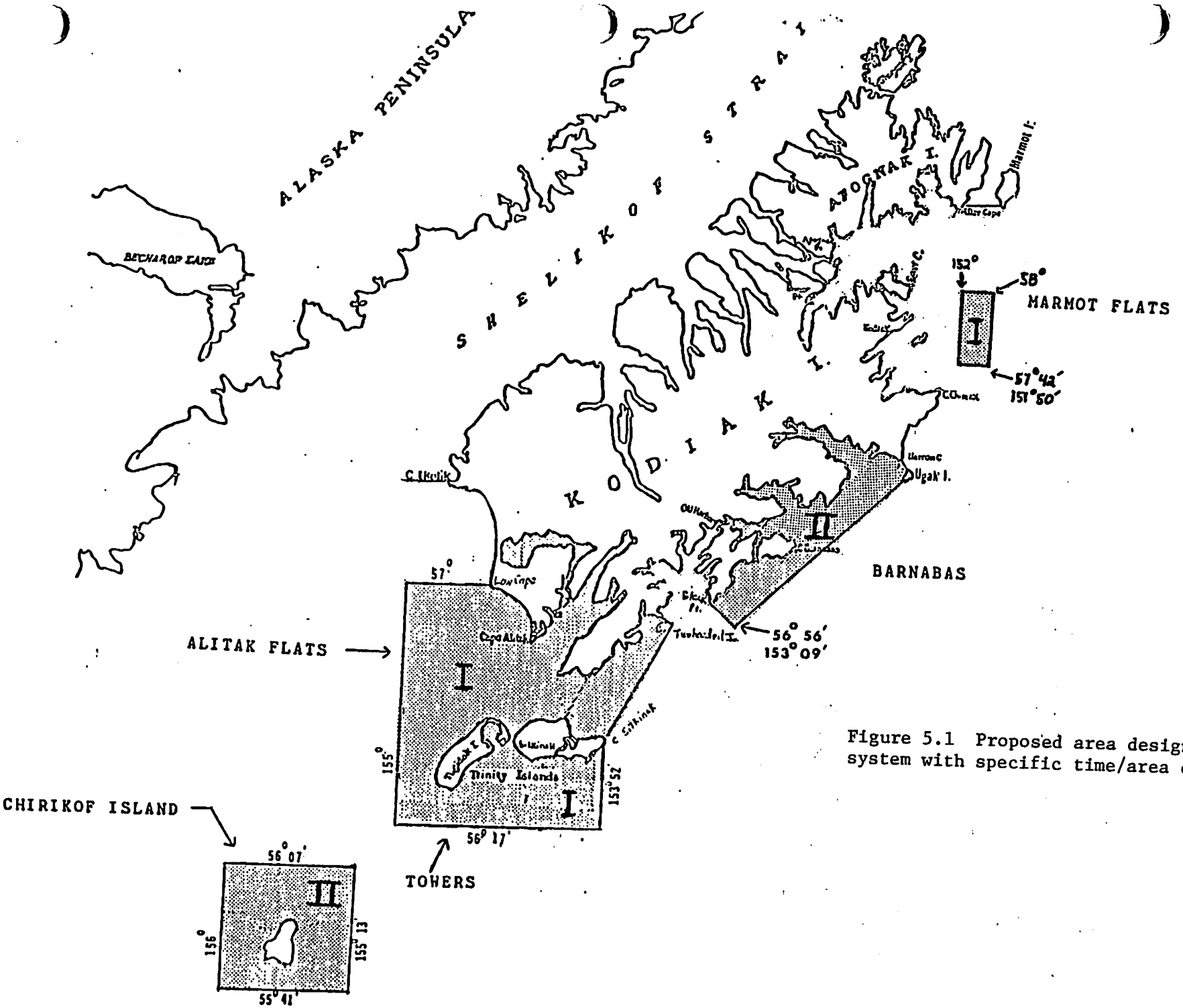



Figure 5.1 Proposed area designation system with specific time/area closures.

DRAFT:PJTRAVERS:~~5/19/1986~~ 6/23/1986 (rev.)

DRAFT INSEASON MANAGEMENT AUTHORITY FOR THE TWO ALASKA GROUNDFISH FMPS (language in brackets would be included in the socioeconomic alternative)

The Secretary shall [open or] close fishing in all or part of a regulatory area, or [authorize or] restrict the use of any type of fishing vessel or gear, or change any previously specified TAC or PSC limit, when this is necessary to prevent one of the following occurrences:

(1) the overfishing of any species or stock of fish;

(2) the harvest of a TAC for any groundfish, or the taking of a PSC limit for any prohibited species, [the previous specification of which is plainly erroneous;] which on the basis of currently available information is found by the Secretary to be too high;

(3) the closure of any fishing for groundfish based upon the harvest of a TAC or the taking of a PSC limit [the previous specification of which is plainly erroneous][.] [;] which on the basis of currently available information is found by the Secretary to be too low

[(4) the failure to harvest a TAC for any groundfish as a result of weather conditions or the unavailability of facilities for the processing of that groundfish;]

[(5) the failure to maximize the quantity or quality of roe extracted from any groundfish of which roe is a principal product.]

BACKGROUND NOTES TO
DRAFT GOALS AND OBJECTIVES STATEMENT
FOR MANAGEMENT OF GULF OF ALASKA GROUNDFISH FISHERIES

The Committee has attempted to synthesize the priorities and concerns of the fishing industry and to articulate the current management philosophies and procedures, balancing and blending the two into a goal and supporting objectives that will guide the management process.

## Draft Goals and Objectives Statement

### Preamble

The North Pacific Council is committed to develop long-range plans for managing the Gulf of Alaska groundfish fisheries that will promote a stable planning environment for the seafood industry and will maintain the health of the resource and environment. In developing allocation and harvesting systems, the Council will give overriding consideration to maximizing economic benefits to the United States. Such management will:

(1) Conform to the National Standards and to NPFMC Comprehensive Fishery Management goals;

(2) Be designed to assure that to the extent practicable:

a. commercial, recreational, and subsistence benefits may be obtained on a continuing basis;

b. minimize the chances of irreversible or long-term adverse effects on fishery resources and the marine environment;

c. a multiplicity of options will be available with respect to future uses of these resources;

d. regulations will be long term and stable with changes kept to a minimum.

Principal Management Goal: Groundfish resources of the Gulf of Alaska will be managed to maximize positive economic benefits to the United States, consistent with resource stewardship responsibilities for the continuing welfare of the Gulf of Alaska living marine resources. Economic benefits include, but are not limited to profits, benefits to consumers, income and employment.

### Background and Discussion

Early discussions of the Goals and and Objectives Subcommittee focused on clarifying just how specific and detailed the goals and objectives would be. The Plan Team was asking for direction from the Council as to the Council's

priorities with respect to management. The team needed such direction before it could develop the alternative recommendations for the Gulf Plan for the Council's consideration. Additionally, industry urged the Council to develop goals and objectives so that it will be able to plan and develop with a minimum of risk. At the same time, industry was concerned that the goals and objectives would be inflexible and in fact inhibit development.

The Committee made it clear from the beginning that neither it nor the Council could nor should provide hard and fast rules or a standardized formula by which allocations would be made. Nonetheless, the Committee unanimously agreed that its task was to develop some guideposts for the industry that would minimize the instability in the industry planning processes. The Committee members agreed that the structure of our government and judicial systems precludes our ever being able to remove political issues from the decision-making process.

While the Committee members agreed that the fact that politics plays such a significant role in fish management frequently complicates and slows the process, this situation is exacerbated where guidelines are open to interpretation. The alternative -- a fixed, rigid system that could not accommodate the changing needs of industry, however, would be worse. Thus, the mission of the Committee was to develop goals and objectives that would provide stability to the planning process while still being responsive to changing conditions.

Council staff provided the Committee with some specific objectives for its consideration. While these suggestions were very helpful in facilitating discussion, the Committee declined to adopt the Staff's suggested definitive approach.

During its first meeting, the Committee identified what it believes should be the overriding goal; by overriding goal, the Committee means that principle or guideline that prevails when there are conflicting objectives under consideration when developing allocation and harvesting systems. That goal is to manage the groundfish resources of the Gulf of Alaska to maximize the positive economic benefits to the United States. It was understood that goal is consistent with the National Standards and would not result in irreversible adverse effects on the fishery resource.

While this goal may seem simplistic and overly broad, the Committee feels it, in fact, states a definite priority. We are not fishing for fish; we are

fishing for dollars. Certainly, we must protect the resource so there are dollars to be made in the future. There are many questions raised by this goal. Who gets the dollars? To what extent do we encourage or support one fishery at the expense of another? How do we determine maximum economic benefit? Those questions will have to be answered on a case-by-case basis using the objectives supporting the goal as guidelines.

As with the overall goals and objectives for fishery management developed by the Council in 1985, there are seeming inconsistencies between the individual objectives. While there are no precise answers, referring back to the overriding goal often helps to clarify or resolve inconsistencies. Hopefully, the following discussion of the objectives will help to answer any questions that may arise.

OBJECTIVE 1: The Council will establish annual harvest guidelines, within biological constraints, for each groundfish fishery and mix of species taken in that fishery.

In identifying this objective, the Committee intended to make it clear that managing the harvest of the resource in order to maximize economic benefit must always give consideration to biological constraints.

Also, the Committee wanted to clarify that management can no longer be single-species oriented, but that it needs to account for species complexes.

OBJECTIVE 2: In its management process, including the setting annual harvest guidelines, the Council will account for all fishery-related removals by all gear types for each groundfish species, sport fishery, and subsistence catches, as well as by directed fisheries.

With this objective, the Committee intended to establish clearly that a new accounting system for domestic fish harvest must be established. All fishing mortality from all fisheries must be counted and considered when making management decisions.

This system will require a new approach to monitoring the activity of U.S. boats.

OBJECTIVE 3: The Council will manage the fisheries to minimize waste by:

(a) developing approaches to treating bycatches as other than prohibited species. Any system adopted must address the problems of covert targeting and enforcement;

(b) developing management measures that encourage the use of gear and fishing techniques that minimize discards.

The Committee found itself hearing again and again concern from all fishermen about waste. The current system for enforcement, which employs the concept of prohibited species, is unacceptable and must be revised.

It was noted that Japanese trawl operations have much lower incidences of bycatch than do U.S. Either they have found a way to confound the accounting/ monitoring system, or they have developed gear and harvesting techniques that are more refined than those used by the United States.

Trawlers do not have an exclusive on bycatch and waste -- all gear types participate.

Thus, the Committee identified two avenues to achieve less waste:

(a) improved gear and fishing techniques;

(b) an alternative to prohibited species as an enforcement tool.

OBJECTIVE 4: The Council will manage groundfish resources of the Gulf of Alaska to stimulate development of fully domestic fishery operations.

The Committee's intent was simply to reiterate that our goal is a fully domestic fishery for all species in the FCZ.

OBJECTIVE 5: The Council will develop measures to control effort in a fishery, including systems to convert the common property resource to private property, but only when requested to do so by the industry.

The Committee recognized the continued on-going discussions with respect to limited entry; however, the Council should wait for a clear indication from the industry before proceeding.

OBJECTIVE 6: Rebuilding stocks to commercial or historic levels will be undertaken only if benefits to the United States can be predicted after evaluating the associated costs and benefits and the impacts on related fisheries.

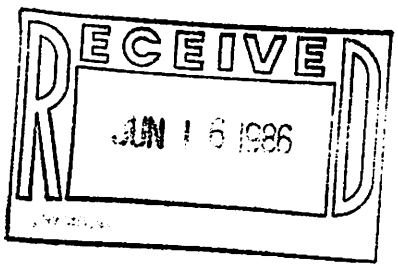
An example of the Committee's thinking with respect to Objective 6 would be that the Council may not choose to rebuild a particular stock of fish to commercially viable or previous levels because the sacrifice to do so of other

more valuable or important fisheries is too high; POP would be an example of such a situation.

OBJECTIVE 7; Population thresholds will be established for major species or species complexes under Council management on the basis of the best scientific judgments of minimum population levels required to maintain reproduction potential over the long term. If population estimates drop below those thresholds ABC will be set at zero until stocks rebuild.

The Committee was concerned that the major or important commercial species or species complexes, such as pollock, be managed to optimize the economic benefit over the long term. This means that with respect to these very important fisheries all efforts will be made to preserve the resource base at the highest continuing harvest level possible.

AGENDA D-4(a)
JUNE 1986
SUPPLEMENTAL




May 27, 1986

Mr. Steve Davis
Coordinator
Gulf of Alaska Groundfish Plan Team
North Pacific Fishery Management Council
P. O. Box 103136
Anchorage, Alaska 99510

Re: Gulf of Alaska Groundfish FMP Revision

Dear Steve:

The purpose of this letter is to express the concerns of the undersigned with respect to the plan team's revision of the Gulf of Alaska groundfish FMP. We have been concerned for some time about the extensive use of framework measures that has been proposed for the revised plan. While we agree that the flexibility provided by a framework arrangement may be desirable with respect to a very few issues where management decisions must be substantially adjusted each year, the frameworking that has been proposed for the revised FMP has been carried to an extreme unjustified by any legitimate need for flexibility. There is no reason to believe that better management decisions will be made if they are thrown into the already chaotic annual December Council meeting. Further, putting every basic management parameter up for grabs each year will not create the regulatory stability that is necessary to permit long-term planning and investment in the U.S. groundfish industry.

We are also concerned about the tentative decision of the plan team not to submit draft FMP language to the Council or the public when the FMP revision is submitted for public review. We understand that the plan team has decided to submit nothing more than a draft EA/RIR document. One of our primary objections to the framework measures that have been proposed is that they lack the concrete detail that would allow for intelligent review by the Council and by the public. What is needed is more specificity about what is being proposed. Instead of providing this, the plan team proposes to offer for review a highly generalized and theoretical document that will in no way resemble the plan which will eventually be presented to the Council for

adoption. This procedure might be appropriate as a preliminary step if the Council were planning to spend several more years in drafting an FMP. However, the Council schedule calls for adoption of specific FMP language and draft regulations at the Council meeting in September. The Council, the Council advisory bodies, and the public must be given the opportunity to comment on, revise and improve specific FMP language, as well as the draft regulations, prior to formal adoption by the Council. It is therefore absolutely essential that the plan team prepare draft language for both the proposed revisions to the FMP and the proposed regulations prior to the public review period. Most importantly, the operational details of each proposal must be clearly specified, so that the actual impacts of each proposal on the domestic fishery can be evaluated.

In the following comments, we discuss our chief concerns with the management proposals for the Gulf and outline our views as to how the management plan should be designed. Please take these comments into account as you prepare draft FMP language, draft regulations and supporting documentation during the next several months.

I. Frameworking Should be Minimized Because It is Inconsistent With the Management Stability Needed to Americanize the FCZ Groundfish Fisheries.

A primary goal of groundfish management should be to provide a stable and predictable management and regulatory environment within which the domestic groundfish fishery can make the kind of long-term business plans and long-term capital commitments which are necessary for the development of the underutilized groundfish fisheries in the Gulf of Alaska. Major groundfish operations must operate 365 days a year on a high volume/low margin resource. Long-term planning and related investment are impossible if the regulatory system is in a state of constant change.

The Council goals and objectives workgroup recognized the importance of management stability when it stated that resource management in the Gulf will be designed to assure that "regulations will be long-term and stable with changes kept to a minimum." Draft FMP, Goals and Objectives, § II.A.(2)(d). The frameworking of a wide range of key management decisions is inconsistent with the objective of providing stability and predictability in the management system.

The draft plan provided to the Council in March does not describe any of the measures that will actually be imposed for the management of bycatches in the groundfish fisheries. All key

decisions are deferred until the December Council meeting each year. This is not a procedure designed to assure management stability. If decisions on these key management issues cannot be made during the process of plan revision, it is even less likely that sound and rational decisions will be made in the hectic environment of the December Council meeting. No management decisions will be made until the very last minute. Every decision will be subject to constant revision on an annual basis. The result will be chaos.

Since framework measures do not provide the stable regulatory environment which is needed to Americanize the FCZ groundfish fisheries, use of framework measures in the groundfish FMPs should be minimized. Framework measures should be used only where significant annual adjustments in specifications are absolutely required. The standards for making "framework" decisions should be clearly stated, and the scope for discretion should be limited within a narrow range. The frameworked specifications should be reasonably predictable or certain, based on annual differences that can be objectively measured or assessed, and procedures should be specified for involving the public in the decision making process.

II. The Council Should Adopt a Simple and Easily Enforceable System for Setting Groundfish Harvest Guidelines and for Controlling the Bycatch of Groundfish and Prohibited Species in the Groundfish Fisheries.

A system for managing the Gulf of Alaska groundfish fisheries should provide for (1) setting annual harvest guidelines, (2) managing the bycatch of fully utilized groundfish species and (3) managing bycatch of halibut, crab and salmon in groundfish operations. The system should be as simple as possible, with specifications that must be set on an annual basis reduced to an absolute minimum. The system should be understandable to the fishing industry and easy and inexpensive to enforce. Finally, the system should promote, rather than restrict, the development of the domestic groundfish fishery targeting on underutilized species such as pollock, cod and flatfish. Our proposal for a management system that meets these goals is as follows.

A. Setting Annual Harvest Levels.

Specification of OYs or harvest guidelines on an annual basis is one of those limited exceptions where the use of a framework procedure is appropriate. It appears that for some groundfish species, annual fluctuations in biomass may be of sufficient magnitude that annual adjustments of the allowable

harvest level in order to maximize the yield or to protect the stocks would be a justifiable management practice. However, the framework procedure for setting such annual specifications must narrowly specify the criteria that will be applied. The harvest level specification should be tied as closely as possible to measureable biological standards, such as the annual biomass estimate for the species or species complex. An optimal harvest level for each species that will maximize long-term yield should be determined. The framework procedure should be designed according to these principles in order to provide the certainty and predictability required for the development of the domestic groundfish fishery.

Under these principles, the Council should set a harvest guideline on an annual basis for each species or species group that is managed under the FMP. The harvest guideline should not be allocated to any particular gear type or user group. All legal gears should have equal access to each species for which an annual harvest level is established. No distinction should be made as to whether the species will be taken as a directed catch or as bycatch. Any amounts that are retained and landed would count equally against the harvest guideline. When the harvest guideline has been reached, then retention of that species in groundfish operations would be prohibited for the remainder of the fishing year. Groundfish operations on other species would be permitted to continue so long as they discard incidental catches of species for which a closure has been announced. No other restrictions would be placed on groundfish operations that take the closed species as bycatch.

B. Bycatch of Fully Utilized Groundfish Species.

Groundfish species which are "fully utilized" -- either because a higher priority user group will harvest the available yield or (in-season) because the available yield has been harvested -- should simply be counted and discarded. JVP and TALFF fishermen would discard species fully utilized by DAP fishermen from the beginning of the year. DAP fishermen would discard species after the TAC for that species has been taken. This approach would minimize the harvest of the "fully utilized species," as defined, without disrupting the trawl fisheries for other species. Further, this approach would prevent competition in the marketplace between the DAP target harvest and the JVP and TALFF bycatch. Finally, this approach would be simple and easy to enforce.

We believe this approach is superior to the other approaches under consideration by the Council. While some "waste" of fish is involved in any discard rule, we believe that such waste would

be far less than the waste involved in overregulation of the groundfish bycatch issue. Given the relative volumes and values involved, a system which would close down any sector of the trawl fishery upon the taking of a bycatch quota for some minor bycatch species would be much more wasteful. The additional bycatch management costs involved in the creation and enforcement of an elaborate bycatch quota system -- including a DAP observer program and complex arrangements for allocation of the quotas among individual domestic companies or vessels -- would be enormously wasteful. When the costs of industry compliance with such a system are factored in, it is clear to us that a simple discard rule is vastly superior -- and much less wasteful -- than the alternative.

To the extent that bycatches of a particular species may be biologically significant, the TAC for that species should be appropriately reduced. Given the relative volumes and values of the target and bycatch species, it would never maximize net benefits to the United States to reduce the TAC of the target species in order to reduce bycatch.

C. Bycatch of Prohibited Species (Salmon, Halibut and Crab).

The Council should adopt a similar -- but slightly different -- approach to the bycatch of halibut, salmon and crab. This approach should again recognize that the groundfish harvest produces vastly greater benefits to the domestic fishing industry than the value of the associated bycatch. Thus, measures should not be considered which would result directly or indirectly in a reduction of groundfish harvests. However, we recognize that, unlike the fully utilized groundfish species, the traditional prohibited species support fully developed fisheries which are dependent upon these stocks. Thus, additional experimentation with measures aimed at minimizing the trawl bycatch of these species without damaging the groundfish fisheries may be justified.

However, such measures should be proposed and justified on a species-specific basis. Unless a problem with respect to the bycatch of a particular prohibited species can be identified which cannot be resolved by voluntary measures, no regulation is required. Likewise, when a particular problem can be identified (the king crab bycatch problem in the flatfish fisheries may be a case in point), then a species-specific solution should be considered. For some species, a time/area closure approach may be appropriate; for others, something different may be required. The issue simply cannot be approached generically.

Because such measures may have enormous impact on the groundfish fisheries, they should be adopted only after the most careful deliberation. Specific regulatory proposals should be identified, subjected to careful analysis under the legal standards applicable to the plan amendment process, and exposed to extensive public review and finally to secretarial review. These issues are simply too controversial and too important to be dealt with outside of the plan amendment process.

The revised plan should correct the substantial inadequacies of the current "framework" PSC regulation governing halibut bycatch. The existing halibut PSC framework suffers all of the defects of framework regulations that we have described above. The method for calculation of the overall PSC limit is not specified, whether and how PSC limits will be allocated to specific gear groups, companies or vessels is not specified, and the method of monitoring and enforcement of the PSC limits is not specified. Procedures are not prescribed which will assure adequate public input on the setting of halibut bycatch limits. These issues should be resolved and specified in the framework measure. In particular, the PSC restrictions should be applied equally and fairly to all user groups. The current regulation that accounts for halibut bycatch by all gear groups but unfairly limits its restrictions to bottom trawlers, should be revised or eliminated.

III. Observers.

The management system that we have outlined does not require a domestic observer program for monitoring and enforcement. We believe that this is one of the primary advantages of our proposed system. A domestic observer program would be costly and intrusive. It would pose a management burden that could slow or prevent the development of a healthy domestic groundfish fishery. As a fundamental principle, we believe that management measures in the Gulf should be designed so that monitoring and enforcement through observers is not necessary.

Many of the management proposals that have been considered by the Plan Team assume the use of domestic observers for monitoring and enforcement. While we doubt that the cost of such programs would ever justify their use, we are not opposed to a domestic observer program in principle. However, before the Council can even consider domestic observers as a management tool, certain fundamental issues must be resolved.

First, the Council must consider the purpose of observers. Will observers merely collect data for biological and statistical purposes, or will observers serve to enforce restrictive catch, bycatch and PSC limits? Second, who will pay the direct costs of the observer program? Third, who will assume liability for the observers? Finally, what amendments to the Magnuson Act and other federal law are required in order to authorize a domestic program?

If these issues are resolved, and the Council clearly justifies the use of observers in managing the domestic groundfish fisheries, then the observer program should conform to the following principles:

1. The specific goals of the observer program should be clearly defined.

2. The program should sample and monitor all user groups uniformly.

3. Observer costs should be borne by the management entities, including the cost of liability insurance.

4. The observer program design should be reviewed by the affected industry groups.

5. The observer program for the FCZ should be under the direction of federal authorities.

No management proposals for the domestic groundfish industry that require observers for monitoring or enforcement should be included in the revised FMP until the Council and NMFS establish a legal, fully funded, functioning observer program that conforms to these principles.

IV. Conclusion.

Development of the major underutilized groundfish fisheries in the Gulf of Alaska requires a coherent management approach to bycatch issues that will foster and encourage business planning and development. The approach that we have outlined above meets those needs. Through this letter we are proposing that you consider the plan that we have outlined as a single, comprehensive alternative for the management of bycatch in the groundfish fisheries. If the plan team wishes to propose alternatives that differ from our proposed plan, then these alternatives should be described with at least the same specificity as our proposal. We will of course be happy to work

with the plan team to clarify or expand on any of the issues raised by our proposal.

Very truly yours,

Alaska Factory Trawlers Assoc.

North Pacific Fishing Vessel Owners

Alaska Draggers Association

Alaska Groundfish Data Bank

Marine Resources Co. International

Westward Trawlers, Inc.

Northern Deep Sea Fisheries

ProFish International

75:27

Alaskan Joint Venture Fisheries

For Discussion Purposes
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DRAFT

# REGULATORY IMPACT REVIEW/INITIAL REGULATORY FLEXIBILITY ANALYSIS FOR AMENDMENT 15 TO THE FISHERY MANAGEMENT PLAN FOR THE GROUNDFISH FISHERY OF THE GULF OF ALASKA

PREPARED BY THE PLAN TEAM FOR THE
GROUNDFISH FISHERY OF THE GULF OF ALASKA
AND THE STAFF OF THE
NORTH PACIFIC FISHERY MANAGEMENT COUNCIL

JUNE 13, 1986

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# 1.0 INTRODUCTION

The Gulf of Alaska groundfish fishery consists of a number of distinct fisheries that can be defined by gear, target species, and mode of operation. Each of these fisheries is a multispecies fishery to some degree due to the use of partially selective gear or targeting strategies. These fisheries are characterized by: (1) resources that are subject to large fluctuations; (2) the rapid (and for most species complete) replacement of foreign fisheries by wholly domestic and joint venture fisheries; and (3) changing market conditions and opportunities as the domestic groundfish industry strives to become fully developed. The Gulf of Alaska Groundfish Fishery Management Plan (FMP), as implemented in 1978 and as amended through 1985, is not adequate in managing such a fishery. It has a number of major deficiencies, the costs of which have increased as the foreign fisheries have been replaced by wholly domestic and joint venture fisheries. These deficiencies will tend to prevent the fishery management goals from being met in the Gulf of Alaska. These goals as defined by the Magnuson Fishery Conservation and Management Act (MFCMA), related federal policy, and the Council are to: (1) protect the long-term productivity of living marine resources by preventing overfishing and fishing related degradation to fishery habitat; and (2) within the bounds set by this conservation goal, provide a management environment that will result in the allocation of these resources that will generate the greatest benefit for the nation. The Council has primarily used harvest guidelines to meet the first goal and to control the preseason allocations of groundfish resources; and it has primarily used separate guidelines for a species or species group for the wholly domestic, joint venture, and foreign fisheries to control inseason allocations of groundfish.

The effectiveness of using overall harvest guidelines has been limited by an inability to accurately predict how a stock or the fishery as a whole will respond to a given harvest guideline and by the lack of an administratively efficient method for changing annual harvest guidelines in response to new information concerning the fisheries. The effectiveness of using separate guidelines for wholly domestic, joint venture, and foreign fisheries to control the inseason allocation of groundfish has decreased as the former two fisheries have replaced foreign fisheries. This is because once the domestic fisheries have replaced the foreign fisheries and have attained a harvest guideline, further growth of some domestic fisheries may only be possible by reducing the amount of the resources available to other domestic fisheries.

## 1.1 Background: Council Action to Date

Work toward a revised Gulf of Alaska Groundfish FMP was initiated during the December 1984 meeting of the North Pacific Fishery Management Council. Primary motivation for a revision was a continual increase in the number of proposed annual changes to the FMP. The Council formed a workgroup to begin work toward developing a set of goals and objectives for fisheries management in the Gulf of Alaska and also directed the Gulf of Alaska groundfish plan team (PT) to identify specific areas in need of change. In particular, the team was asked to identify management measures that require frequent revision and develop alternative measures that would streamline the plan and eliminate administrative delays.

The Council met in special session in August of 1985 to review the progress of both the plan team and the Goals and Objectives Workgroup and to provide direction for subsequent work. The workgroup has met five times since that August meeting, independently, and in conjunction with the plan team and Council staff. The product of those meetings are the goals and objectives approved for public review by the Council at its March, 1986 meeting. These goals and objectives are found in Chapter 2 of this document. The interaction between the workgroup and the plan team was intended to provide a set of alternatives that reflect the intent of industry as well as adhere to biological and economic principles.

To facilitate the analysis of alternative solutions to these problems, the problems have been placed into four groups. It should be noted that the groups of problems and, therefore, the solutions are interdependent. The four groups of management problems that have been identified for inclusion into this amendment package are:

(1) The inability to adjust harvest guidelines efficiently.
(2) Inadequate reporting requirements.
(3) Inadequate protection of king crab in the vicinity of Kodiak Island.
(4) Inadequate inseason management authority.

## 1.2 Purpose of the Regulatory Impact Review/Initial Regulatory Flexibility Analysis (RIR/IRFA)

In compliance with Executive Order 12291, the National Marine Fisheries Service requires the preparation of a Regulatory Impact Review (RIR) for all regulatory actions or for significant DOC/NOAA policy changes that are of public interest. The RIR: (1) provides a comprehensive review of the level and incidence of impacts associated with a proposed or final regulatory action; (2) provides a review of the problems and policy objectives prompting the regulatory proposals and an evaluation of the major alternatives that could be used to solve the problems; and (3) ensures that the regulatory agency systematically and comprehensively considers all available alternatives so that the public welfare can be enhanced in the most efficient and cost effective way.

The RIR also serves as the basis for determining whether any proposed regulations are major under criteria provided in Executive Order 12291 (E.O. 12291) and whether or not proposed regulations will have a significant economic impact on a substantial number of small entities in compliance with Regulatory Flexibility Act (P.L. 96-354, RFA). The primary purpose of the RFA is to relieve small businesses, small organizations, and small governmental jurisdictions (collectively, "small entities") of burdensome regulatory and record keeping requirements. This Act requires that if regulatory and record keeping requirements are not burdensome, then the head of an agency must certify that the requirement, if promulgated, will not have a significant effect on a substantial number of small entities.

This RIR analyzes the impacts that implementing the alternative solutions would have on the Gulf of Alaska groundfish fisheries. Certain information in this RIR is presented to satisfy basic requirements of E.O. 12291 and the RFA. The information presented addresses the objectives of and legal basis for the proposed rules; a description of and an estimate of the number of vessels

(small entities) to which the proposed rules will apply; and an identification of all relevant Federal rules which may duplicate, overlap, or conflict with these proposed rules. A description of alternatives that accomplish the stated objectives and which minimize economic impacts of the proposed rules on small entities is presented in Chapters 3 through 6.

1.2.1 Statement of the objectives of, and legal basis for, the proposed rule.

This amendment is proposed under authority of the Magnuson Act. The Magnuson Act authorized promulgation of regulations implementing the management regime under which the Gulf of Alaska groundfish resources have been managed. The management regime was adopted by the Council to achieve the FMP's objectives and secondary objectives for the conservation and management of groundfish resources. This proposed amendment package will further these objectives (see Chapter 2).

1.2.2 Description and estimate of the number of small entities to which the proposed rule will apply.

The vessels fishing groundfish in the Gulf of Alaska are considered to be small entities within the meaning of the Regulatory Flexibility Act. These vessels vary considerably in size and capacity to harvest and/or process groundfish. Vessels are from Alaska, Washington, and Oregon. The primary fishing gear used is hook and line gear (longlines), trawls, and pots. The latter gear type is being phased out in the sablefish fishery in the Gulf of Alaska as a result of Amendment 14 to the FMP, which was approved under authority of the Magnuson Act on September 26, 1985. A part of Amendment 14 banned a directed pot fishery for sablefish in the Eastern Area, effective in 1986; in the Central Area, effective in 1987, and in the Western Area, effective in 1988. Numbers of vessels to which this proposed rule will apply were obtained from the Alaska Department of Fish and Game's data on groundfish landings in the Gulf of Alaska in 1985 (Table 1.1).

Table 1.1 Numbers of vessels by gear type, including longline, pot, and trawl, that made groundfish landings in the regulatory areas and districts of Gulf of Alaska during 1985 (Source: Alaska Department of Fish and Game).

| FMP MANAGEMENT AREA | GEAR | | |
|---|---|---|---|
| | Longlines | Trawl | Pot |
| SOUTH EAST/EAST YAKUTAT | 275 | 2 | 5 |
| WEST YAKUTAT | 82 | 2 | . |
| CENTRAL GULF | 167 | 35 | 7 |
| WESTERN GULF | 57 | 14 | 6 |
| TOTAL GULF OF ALASKA[1/] | 440 | 46 | 5[2/] |

1/ Total numbers represent actual vessel numbers by gear type that made landings during 1985 in the Gulf of Alaska. They are less than the sum of the numbers for each of the gear types by management area, because some of the vessels made landings in more than one management area.

2/ Five vessels used pots as a gear type to target on groundfish in 1985. Eight more pot vessels targeting on crab caught and delivered small amounts of groundfish.

### 1.2.3 Federal rules which may duplicate, overlap, or conflict with the proposed rules.

The Secretary is not aware of any other Federal rules that may duplicate, overlap, or conflict with any of the proposed alternative management measures.

## 1.3 Methodology

The report addresses solutions to four identified fishery management problems. Chapters 3 through 6 specify the problems, propose solutions and analyze the regulatory impact of choosing one of the proposed solutions. The solutions are evaluated in light of the proposed revised goals and objectives for management of the groundfish in the Gulf of Alaska. Those objectives are presented and discussed in the next chapter.

Since this is a regulatory analysis the potential impacts on all users of the resource are examined: harvesters, processors, wholesalers, retailers and consumers. The analysis uses the perspective of cost-benefit analysis where costs are defined as losses (revenue loss, increased costs, etc.) and benefits are gains (revenue gain, decreased costs, etc.). These cost and benefits are quantified when possible. When lack of data prevents quantification the direction and rough magnitude of the gain or loss is presented.

A cost-benefit analysis is directed towards learning the net benefits of adopting a new management strategy. As such there are two ways to quantify the change. For the first, the analyst calculates the benefits and costs of the proposed management regime; calculates the benefits and costs of the status quo; and calculates the difference. For the second, the analyst calculates the changes in benefits and costs brought about by changing management from the status quo. The second approach is used in this document as it is simpler and requires less data.

## 2.0 THE GOALS AND OBJECTIVES OF FISHERIES MANAGEMENT IN THE GULF OF ALASKA

### 2.1 A Revised Set of Goals and Objectives for Management of the Gulf of Alaska Groundfish Plan - Implications

Two years ago industry requested that the Council develop a set of goals and objectives which would apply to all FMPs and with specific goals and objectives developed for each plan. The overall goals and objectives for management were adopted by the Council in December 1984.

A Council-appointed workgroup on goals and objectives for the Gulf of Alaska FMP has drafted a revised set of goals and objectives for insertion in the Gulf FMP[1/]. The group's recommendations to the Council were approved for public review at the March 1986 meeting and are listed below.

#### Gulfwide Groundfish Management Goals and Objectives

The North Pacific Fishery Management Council is committed to develop long-range plans for managing the Gulf of Alaska groundfish fisheries that will promote a stable planning environment for the seafood industry and will maintain the health of the resource and environment. In developing allocation and harvesting systems, the Council will give overriding consideration to maximizing economic benefits to the United States. Such management will:

(1) Conform to the National Standards and to NPFMC Comprehensive Fishery Management goals.

(2) Be designed to assure that to the extent practicable:

(a) commercial, recreational, and subsistence benefits may be obtained on a continuing basis;

(b) chances of irreversible or long-term adverse effects on fishery resources and the marine environment are minimized;

(c) a multiplicity of options will be available with respect to future uses of these resources;

(d) regulations will be long term and stable with changes kept to a minimum; and

(e) the productive capacity of the habitat required to support the Gulf of Alaska groundfish fishery will be maintained.

Principal Management Goal: Groundfish resources of the Gulf of Alaska will be managed to maximize economic benefits to the United States, consistent with resource stewardship responsibilities for the continuing welfare of the Gulf of Alaska living marine resources. Economic benefits include, but are not limited to, increased profits, benefits to consumers, and gains in income and employment.

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1/ The current goals and objectives for the Gulf of Alaska FMP can be found in Section 2.1 of the plan.

To implement this goal, the Council establishes the following objectives:

Objective 1: The Council will establish annual harvest guidelines, within biological constraints, for each groundfish fishery and mix of species taken in that fishery.

Objective 2: In setting annual harvest guidelines, the Council will account for all fishery related removals by all gear types for each groundfish species, including bycatches, prohibited species, sport fishery, and subsistence catches as well as by directed fisheries.

Objective 3: The Council will manage the fisheries to minimize waste by:

(a) Developing alternative approaches to treating bycatches as prohibited species. Any system adopted must address the problems of covert targeting and enforcement.

(b) Developing management measures that encourage clean fisheries through gear and fishing technique modifications to minimize discards.

Objective 4: The Council will manage groundfish resources of the Gulf of Alaska to stimulate development of fully domestic groundfish fishery operations.

Objective 5: Only when requested to do so by the industry will the Council develop measures to limit the number of participants in a fishery, including systems to convert the common property resource to private property.

Objective 6: Rebuilding depleted stocks will be undertaken only if benefits to the United States can be predicted after evaluating the associated costs and benefits and the impacts on related fisheries.

Objective 7: Population thresholds will be established for major species or species complexes under Council management on the basis of the best scientific judgements of minimum population levels required to maintain strong reproductive potential over the long term. If population estimates drop below those thresholds, continued harvest will be constrained until stocks rebuild. The allowable catch indicates the surplus above threshold levels that is available for harvest.

In the remainder of this chapter we examine the management implications of adoption of this set of goals and objectives. This examination is important from two perspectives: (1) as a change in the FMP itself; and (2) as a new "yardstick" against which all management alternatives are evaluated.

The most significant point of departure for the revised goals and objectives is the adoption of one overriding goal--that of maximization of economic benefits from the groundfish resources of the Gulf of Alaska. Although maximization of economic benefits is part of the National Standards its adoption as the principal management goal is new.

The seven objectives proposed by the work group serve to focus the overall management goal on particular problems. Objectives 1 and 2, taken together, imply that the Council will account for all fishing mortality and that the

Council will establish harvest guidelines for all catch in the fisheries under Council control. Adopting this objective requires a catch accounting scheme which considers target catch, bycatch and the catch from non groundfish fisheries. A catch accounting procedure which accomplishes this objective is presented in Chapter 3.

Minimizing waste by avoiding the prohibited species approach (Objective 3) will be difficult given the current management situation. First, the absence of fishery observers on fully domestic fishing vessels complicates inseason accounting of catch discarded at sea and limits the ability to control targeting on valuable fully utilized species should the retention of fish be allowed. Second, it is the current interpretation of NOAA general counsel that domestic fisheries cannot be shut down while any retainable bycatch amounts remain in the joint venture or foreign fisheries. Thus, any measures which the Council can put in place to limit the incidental harvest of fully utilized species may not be enforceable for the wholly domestic fisheries, at least from the NMFS perspective.

Managing to stimulate development of fully domestic groundfish fisheries (Objective 4) can be accomplished, in part, by the frameworked catch accounting procedures presented as alternatives to problems 1 through 3; however, the alternatives listed do not explicitly give priority to developing fisheries.

Objective 5 simply states that the Council will not adopt any procedure which converts the common property resource to private property unless requested to do so by the industry. This precludes adoption of all limited access systems including limited entry, share quota systems, license ceilings, etc., unless the industry so requests. Such an objective implies that overcapitalization of the fleet may continue to be a problem.

Objectives 6 and 7 are concerned with rebuilding and overfishing. Rebuilding will not take place unless the benefits from that rebuilding outweigh the costs, including costs to other fisheries which harvest the species incidentally (Objective 6). However, if the population under management should drop below the identified threshold level, that is, the biomass below which the ability to produce a sustainable yield is in doubt, rebuilding must take place (Objective 7). Thus, there is an ambiguity between Objective 6 and 7 which can be resolved by stating a priority of one objective over the other. If Objective 7 takes priority then rebuilding will take place if a population estimate drops below the threshold estimate regardless of the benefits of doing so. If Objective 6 takes priority and if the population estimate approaches the threshold, rebuilding will take place provided benefits exceed costs.

Identification of the threshold level of a population is critical to the definition of overfishing. The Magnuson Act is explicit in prohibiting overfishing. Unfortunately, given the current precision in the fishery population models, the plan team will be unable to establish any meaningful threshold population point estimates for most, if not all, of the managed groundfish species. This implies that a definition of overfishing related to some probability of long-term negative impacts needs to be developed.

The proposed solutions to the management problems identified in Chapters 3 through 6 will be examined in light of these proposed management goals and objectives.

# 3.0 REGULATORY IMPACTS OF THE PROPOSED SOLUTIONS TO PROBLEM 1: INABILITY TO EFFICIENTLY ADJUST HARVEST GUIDELINES

## 3.1 Introduction

This chapter considers two alternatives to the present procedure of establishing an optimum yield for each species or species group in the Gulf of Alaska groundfish complex annually via emergency rule. Both alternatives are framework procedures which allow annual adjustment of harvest guidelines within an overall OY range for the Gulf groundfish complex. These alternatives are thus similar to the overall OY framework used in managing the Bering Sea groundfish fisheries. The alternatives satisfy conservation objectives, establish harvest guidelines, and satisfy the Council's proposed management objective to account for all groundfish fishing mortality. Annual changes in harvest guidelines have become expected and routine and it is inappropriate to use emergency rule-making procedures and inefficient to amend the plan annually for anticipated revision of harvest guidelines.

The alternatives presented are thus an accounting stance and as such make no allocation of harvest to specific gear groups (other than that contained in Amendment 14).

### 3.1.1 The management problem.

Under the existing plan, specific optimum yields (OYs) are established for every groundfish species or species group being managed by the plan. Due to changes in stock status, most OYs have to be adjusted on an annual basis. Development of a domestic groundfish fishery and expansion of joint ventures also require considerations in establishing OYs for the domestic and joint venture fleets. Under the current plan actual setting of OYs require a plan amendment and may take 11 months or longer to implement. Emergency action has been required to have the most current OYs in effect when fisheries begin. To provide the administrative flexibility to set quotas on an annual basis, the Council directed the Gulf of Alaska plan team to develop management framework alternatives that would address this problem. In addition, they requested that the new framework measures encompass the Council's Gulf of Alaska revised groundfish management objectives where possible.

Specific OYs place two constraints on fishery management. One is that the amount, species, or area of a harvest guideline can be temporarily adjusted with an emergency rule but cannot otherwise be adjusted without a plan amendment. The other constraint is that DAP, JVP, and TALFF must be defined by species and area and, therefore, the allocation options available are severely limited.

The former constraint has resulted in the plan being amended eight times to adjust harvest guidelines in response to changes in the status of stocks and the other determinants of the appropriate harvest guidelines. It has also resulted in the repeated use of emergency rules to enact harvest guidelines at the beginning of the new fishing year. Emergency rules are intended to be used to implement temporary solutions to unanticipated management problems. Annual adjustments to harvest guidelines are not unanticipated; therefore, it is inappropriate to use emergency rules for such adjustments. The second constraint has not resulted in repeated plan amendments and the associated

emergency rules, but it will prevent the attainment of the plan's proposed principal management goal and Objective 3.

If it is assumed that the first constraint affects the cost of adjusting harvest guidelines but not the actual harvest guidelines, the magnitude of this problem is determined by the additional administrative cost associated with not having an efficient procedure for adjusting harvest guidelines in response to changes in the fishery.

The magnitude of the problem associated with the second constraint is determined by the net loss resulting from the additional groundfish discards that result. Because this loss will be dependent on a large number of factors, including the actual management measures that are implemented, the loss is difficult to estimate, although a hypothetical example is provided in Section 3.2.

3.1.2 The alternatives.

The alternatives to the status quo described in some detail and analyzed below are two framework procedures that specify a single OY as a range for the groundfish complex and permit harvest guidelines to be adjusted within the OY range without an emergency rule or amendment.

A. Do nothing - status quo. Each species or species group has an OY specified. If, in the current fishing year, the level of overall fishing mortality is to change from that level the regulations must be amended via emergency rule.

B. Alternative 1: Establish an overall harvest framework procedure which accounts for total fishing mortality of the groundfish resource and provides a procedure for adjusting individual quotas (TAC) on an annual basis.

A framework procedure has been developed whereby the Council can set harvest levels and specify a total allowable catch limit (TAC) for each groundfish fishery on an annual basis. The framework procedure is best illustrated as a flow diagram presented in Figure 3.1. The procedure consists of three steps:

(1) Setting a fishing mortality guideline (FMG) for each species or species group by area as a limit on total fishing mortality, where total fishing mortality for a species consists of removal due to commercial groundfish fisheries that either target on that species (target mortality) or take it as bycatch (bycatch mortality) and removals due to all other fisheries (other fishing mortality).

(2) Establishing quota measures (TACs) designed to prevent the FMGs from being exceeded.

(3) Summing retainable catch allowed (TAC) for all groundfish excluding nonspecified species to assure that the sum is within the OY range specified in the FMP.

An OY range for the Gulf of Alaska groundfish resources has been determined based on historical fishery performance. A base period of 1965 to 1985 was

Figure 3.1. Overall harvest framework for management of groundfish in the Gulf of Alaska (Alternatives 1 and 2).

| NMFS Region | | Plan Team | | | SSC | | | AP | Public |
|---|---|---|---|---|---|---|---|---|---|
| DAP | JVP | ABC | FMG | TAC | ABC | FMG | TAC | TAC | TAC |

COUNCIL

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| STEP 1 (Mortality accounting) | FMG | = | TM | + | BM | + | OFM | (for each managed species) |
| STEP 2 (Catch accounting) | TC | = | TAC* (DAP, JVP, TALFF) | + | OFC | | | (for each managed species) |

| | | | | | |
|---|---|---|---|---|---|
| STEP 3 (Comparison with OY range) | 115,000 mt | __ | TAC | __ | 810,000 mt (Alternative 1) |
| | 115,000 mt | __ | TGFM | __ | 810,000 mt (Alternative 2) |

where FMG = fisheries mortality guideline; TM = target mortality; BM = bycatch mortality; OFM = other fishing mortality; TGFM = total groundfish fishing mortality; TC = total catch (all sources); TAC = total allowable catch; OFC = other fishing catch

*Established by the Council--for fully utilized species amounts may be retainable or prohibited for JVP or TALFF.

selected since the 21 years encompasses all recent fishing trends and accounts for potentially large harvests of both Pacific ocean perch and pollock. A summation of all historical commercial groundfish species' highest harvest during the period 1965 to 1985 provides an upper limit to the range of 810,000 mt (Table 3.1). The lower end of the range is 115,000 mt, the lowest observed catch during the 21-year period.

C. Alternative 2: Establish an overall harvest framework procedure which accounts for total fishing mortality of the groundfish resource and provides a procedure for adjusting individual quotas (TAC) on an annual basis. Mortality shall be explicitly accounted for at the end of the fishing year.

This alternative is very similar to the procedure described in Alternative 1. The Council will determine a fishing mortality guideline (FMG) for each species or species group being managed by the plan. Under both alternatives it is intended that guidelines not be exceeded. Similarly, total allowable catches (TAC) will be set for the fishing year based on a predicted fishing mortality. The DAP, JVP, and TALFF apportionments are also defined for the Gulf as a whole with specific allocations to each by species and area.

Alternative 2 differs by explicitly accounting for all groundfish fishing mortality at the end of the fishing year. Under Alternative 1 predictions of fishing mortality are used in setting quotas with the sum of total allowable catch (which itself is a predicted retainable harvest) compared to the 115,000-810,000 mt OY range. Alternative 2 uses the same approach in setting quotas, but, at the end of the year, requires an analysis where actual fishing mortality is computed for each groundfish species being managed (FM), then summed for all species and areas to produce a total groundfish fishing mortality (TGFM). The TGFM is then compared to the OY range. The average TGFM for each three-year period (the three-year periods would be 1987-89, 1990-92, etc.) shall not exceed the upper end of the OY range, and the measures that are established to control TGFM shall permit TGFM to at least reach the lower end of the OY range.

With Alternative 1, TACs are estimated before the season starts, and with Alternative 2, all fishing mortality is counted once it has occurred. Since the final accounting is at the end of the fishing year with Alternative 2, the comparison to OY must be for a period longer than one year.

The Framework Procedure for Alternative 1 and Alternative 2.

The timing of actions to be taken under Alternative 1 and Alternative 2 in establishing total allowable catch (TAC) and an overall harvest guideline for comparison with the OY range is as follows:

(1) September. The plan team prepares draft Resource Assessment Document (RAD) which establishes preliminary TACs for all managed groundfish species. TACs will be specified for DAP, JVP, and TALFF. For fully utilized species the TACs specified for JVP and TALFF may be retainable bycatch amounts for prohibited species catch limits (PSC). Each TAC may be apportioned among the regulatory areas and districts of the Gulf of Alaska.

Table 3.1 Historical annual groundfish catch, weight and value, in the Gulf of Alaska (in metric tons), 1965-1985.

| | SPECIES Landings, mt | | | | | | | Exvessel Value[1/] ($1,000,000s) |
|---|---|---|---|---|---|---|---|---|
| Year | Pollock | Cod | Sablefish | Rockfish | Flatfish | Atka mackerel | TOTAL | |
| 1965 | 2,746 | 583 | 3,458 | 382,481 | 4,697 | 0 | 393,965 | 282.0 |
| 1966 | 8,940 | 459 | 5,178 | 148,439 | 4,928 | 0 | 167,944 | 116.4 |
| 1967 | 6,432 | 2,154 | 6,143 | 112,741 | 4,506 | 0 | 131,976 | 92.0 |
| 1968 | 6,168 | 1,046 | 15,049 | 108,594 | 3,468 | 0 | 134,325 | 100.2 |
| 1969 | 17,914 | 1,357 | 19,375 | 79,238 | 2,676 | 0 | 120,560 | 86.2 |
| 1970 | 15,970 | 1,830 | 25,694 | 63,674 | 3,859 | 7,281 | 118,308 | 83.5 |
| 1971 | 9,458 | 703 | 25,542 | 77,985 | 2,365 | 0 | 116,053 | 92.1 |
| 1972 | 34,166 | 3,572 | 36,453 | 77,564 | 8,942 | 6,282 | 166,979 | 111.9 |
| 1973 | 36,989 | 5,548 | 27,487 | 61,414 | 19,566 | 9,494 | 160,498 | 91.9 |
| 1974 | 61,474 | 5,353 | 28,006 | 61,193 | 9,733 | 17,531 | 183,290 | 93.2 |
| 1975 | 53,568 | 5,985 | 26,094 | 58,908 | 5,487 | 27,776 | 177,818 | 87.1 |
| 1976 | 79,526 | 7,089 | 27,733 | 56,983 | 6,092 | 15,539 | 192,962 | 91.8 |
| 1977 | 118,062 | 2,261 | 17,135 | 23,729 | 16,724 | 19,455 | 197,366 | 60.1 |
| 1978 | 97,405 | 12,167 | 8,875 | 10,198 | 15,180 | 19,586 | 163,411 | 39.0 |
| 1979 | 105,783 | 14,872 | 10,352 | 11,489 | 13,922 | 10,959 | 167,377 | 43.4 |
| 1980 | 115,037 | 35,327 | 8,509 | 16,088 | 15,889 | 13,166 | 204,016 | 51.6 |
| 1981 | 147,743 | 36,086 | 9,917 | 18,214 | 12,532 | 18,727 | 243,219 | 58.6 |
| 1982 | 168,746 | 29,380 | 8,557 | 10,731 | 7,729 | 6,760 | 231,903 | 51.2 |
| 1983 | 215,608 | 36,401 | 9,002 | 10,557 | 12,661 | 12,260 | 296,489 | 61.0 |
| 1984 | 306,610 | 22,848 | 10,057 | 6,153 | 6,683 | 1,152 | 353,503 | 66.1 |
| 1985 | 291,489 | 14,442 | 11,887 | 3,221 | 3,369 | 1,848 | 326,256 | 61.3 |
| SUMMARY: | | | Catch Range | | | | | Value Range: |
| Min. (1965-1985) | 2,746 | 459 | 3,458 | 3,221 | 2,365 | 0 | 116,053 | 39.0 |
| Max. (1965-1985) | 306,610 | 36,401 | 36,453 | 382,481 | 19,566 | 27,776 | 393,965 | 282.0 |
| Mean (1965-1985) | 90,468 | 11,403 | 16,214 | 66,647 | 8,619 | 8,944 | 202,296 | 87.2 |
| (1976-1985) | 164,601 | 21,087 | 12,202 | 16,736 | 11,078 | 11,945 | 237,650 | 58.2 |
| (1981-1985) | 226,039 | 27,831 | 9,884 | 9,775 | 8,595 | 8,149 | 290,274 | 59.6 |

Total of annual minimums: 12,249 Total of annual maximums: 809,296

1/ Computed using 1986 exvessel domestic prices (PacFIN).

Source: Lynde, Marcel. 1986. The historical annotated landings database documentation of annual harvest of groundfish from the Northeast Pacific and E. Bering Sea, 1956-1980. NOAA Technical Mem., NMFS F/NWC-103.

(2) September Council meeting. Council will approve preliminary TACs and release RAD for 30-day public review.

(3) October 1. As soon as practicable after October 1 the Secretary, after consultation with the Council, will publish a rule-related notice in the FEDERAL REGISTER specifying the proposed TACs for DAP, JVP, and TALFF. Public comments on the proposed TAC will be accepted by the Secretary for 30 days after the notice is published.

(4) November. Plan team prepares final RAD.

(5) December Council meeting. Council reviews public comments, takes public testimony and makes final decisions on annual TAC limits.

(6) December 15. Secretary will publish rule-related notice of final TAC limits in FEDERAL REGISTER.

(7) January 1. Annual TAC limits take effect for the current fishing year.

The Resource Assessment Document (RAD) will contain the following information:

(1) Current status of Gulf of Alaska Groundfish resources, by major species or species group.

(2) Estimates of equilibrium yield (EY), constant exploitation yield (CEY), and maximum sustainable yield (MSY).

(3) Estimates of groundfish species mortality from nongroundfish fisheries, subsistence fisheries, and recreational fisheries.

(4) Catch statistics (landings and value) for the current year.

(5) The projected responses of stocks and the fisheries to alternative levels of fishing mortality.

(6) Any relevant information relating to changes in groundfish markets.

(7) Plan team recommendations for fishery mortality guidelines (FMG) and total allowable catch (TAC) by species or species group.

(8) Any other biological or economic information which is useful in determining FMGs and TACs.

The process is initiated by the PT and Scientific and Statistical Committee (SSC) making recommendations with respect to the FMGs and the quota measures that will tend to prevent the FMGs from being exceeded and keep the sum of retainable catch within the OY range.

The FMGs are, therefore, similar to single species OYs in that their development is not assumed to be based on only biological information and are not comparable to the ABCs developed under the current FMP.

The Council will use:

(1) recommendations of the plan team and SSC and information presented by the PT and SSC in support of these recommendations;

(2) information presented by the AP and the public; and

(3) other relevant information,

to develop its own preliminary recommendations.

It should be noted that with Alternative 1 and Alternative 2 the attainment of a TAC for a species is intended to close the target fishery for a species. Under the status quo further harvest of the species would be prohibited; although, under the status quo, the Regional Director may choose to close certain fisheries in certain areas.

With the exception of the "other species" management category, the framework procedure described above is used to determine TACs for every groundfish species and species group managed by the plan. Groundfish that support their own fishery, and for which a sufficient data base exists that allows each to be managed on the basis of its own biological, social, economic, and ecological merits, are called "target species". Groundfish species that are not specified as a target species are collectively grouped in the "other species" category. These species currently are of slight economic value and are generally not targeted upon. This category, however, contains species with economic potential or which have importance to the ecosystem, but which lack sufficient data to allow separate management. Accordingly, a single TAC, equal to 5% of the combined TACs for target species shall apply to this category. Records of catch of this category must be maintained.

All other species of fish and invertebrates taken incidentally that are not managed by other FMPs and are associated with groundfish fisheries, are designated as "nonspecified species" and catch records need not be kept.

## 3.2 Fishery Costs and Benefits

Both framework alternatives eliminate the constraints that are the sources of the problems with the status quo and both are consistent with the new goals and objectives of this plan. Either would remove the first constraint by providing an efficient mechanism for adjusting harvest guidelines in response to changes in the fisheries, and either would remove the second constraint by replacing species specific OYs with a complex wide OY.

The frameworks specifically address the first three objectives of this plan which are: (1) to establish annual harvest guidelines; (2) to account for all fishing mortality in setting these guidelines; and (3) to minimize the waste associated with the discard of bycatch. They would also address the seventh objective if ABCs as defined in objective seven are used as upper bounds on total fishing mortality guideline FMGs. The current FMP is to some degree inconsistent with Objectives 1, 2, and 3 because it lacks an effective mechanism for adjusting annual harvest guidelines, because there is no explicit reference to total fishing mortality, and because it requires the discard of groundfish bycatch in joint venture fisheries once an OY is taken.

In choosing between the alternative frameworks, it should be noted that although there are differences between what is counted and when it is counted with respect to the OY range, in practice the two frameworks would be expected to have similar results due to the large OY range of 115,000 mt to 810,000 mt. Only if fishing mortality summed over all groundfish species excluding nonspecified species exceeded 810,000 mt would there be a difference. In this unlikely case, under Alternative 2 more restrictive measures would have to be imposed for the next two years or the OY range would have to be changed by a plan amendment. With the first framework, no change is necessary unless the sum of the TACs exceeds 810,000 mt. This is less likely to occur because it would be associated with a much higher total groundfish fishing mortality (TGFM).

Although in practice the two frameworks are similar, the accounting of total fishing mortality is explicitly more complete in the latter and the ability to make corrections over a multiyear period is also more explicitly defined.

By eliminating two constraints associated with the status quo, either framework will tend to benefit the fishery by an amount equal to the part of the cost of these constraints borne by the fishery. This would include the cost of uncertainty due to the lengthy amendment process and uncertain emergency rule process and the cost associated with the additional groundfish bycatch discards.

The net benefits with respect to a change in uncertainty are difficult to estimate because the uncertainty cost with the status quo is not known and because the net change in uncertainty in going from the status quo to either framework is not known. There may eventually be a small decrease in uncertainty with either framework if the timing of the process for adjusting management measures is both better understood than that of the emergency rule process and more compatible with planning schedules of fishermen.

The benefits associated with reduced groundfish bycatch discards for either framework are difficult to estimate. However, a hypothetical example suggests that this benefit can be significant in terms of the economic viability of a fishery.

If joint ventures targeting on a species other than pollock harvest 20,000 mt of groundfish including 1,000 mt of sablefish taken as bycatch, and if the exvessel prices of the target species and sablefish are $160 and $800 per metric ton, respectively, the gross exvessel value of the total catch is $800,000 or 26% higher if the sablefish can be retained. If the additional cost of landing the sablefish rather than discarding it is 50% of the exvessel price, and if the cost of harvesting and landing the other groundfish is 75% of their exvessel price, the net exvessel value of the catch increases by $400,000 or 53% if the sablefish can be retained. This example demonstrates that retention of a bycatch species that accounts for as little as 5% of the total catch, can result in a substantial increase in gross exvessel value and a relatively greater increase in net value.

Since under either Alternative 1 or 2 an overall OY range of 115,000-810,000 metric tons is specified, it is useful to examine the probable range of fishery revenue that could occur if either framework were adopted. The lower limit of the OY range (115,000 mt) was determined by selecting the lowest

historical harvest from the period 1965-1985. The upper limit represents the sum of the highest historical landings for each species in whatever year they occurred. Let this range be the range of possibility. Another range, a range of probability, can be derived from the time series of landings shown in Table 3.1 and Figure 3.2.

Using the most recent history of Gulf groundfish landings (1981-85) and allowing for a confidence interval of 95% (an interval in which we would expect the total annual landings to fall 95% of the time) indicates that, on average, landings should be about 290,000 mt, worth approximately $60 million (of current domestic prices), with a range of 251,000-329,000 metric tons. Note that the 1985 landings are currently at the upper end of this statistical range due to the relatively high abundance of pollock (Table 3.2).

Exvessel values of these landings range from $51 million to $69 million, if domestic exvessel prices are used to capture the potential value of a fully Americanized fishery. Of course, the DAP fisheries contribute value beyond the exvessel level given in these figures. In sum, recent trends in the fisheries indicate a range of probable groundfish landings of 251,000-329,000 metric tons, with an exvessel value between $51 million and $69 million. Unless there are substantial shifts in the groundfish populations in the near future, shifts different than that observed over the last 21 years, this range captures the probable limits on harvests on revenues. Thus, it is unlikely that the sum of the TACs or the sum of the TGFMs will fall outside this OY range of 115,000-810,000 metric tons.

## 3.3 Reporting Costs

A change from the status quo to either framework is not expected to affect reporting costs.

## 3.4 Administrative, Enforcement, and Information Costs and Benefits

The costs associated with implementing an adjustment to a harvest guideline with either framework is expected to be $100,000 less per year than with the status quo (Table 3.3). The enforcement and information costs are expected to be similar with the status quo or either framework.

## 3.5 Impacts on Consumers

The impact on consumers is expected to be similar with the status quo or either framework because neither the change in uncertainty, nor the change in discards and, therefore, the economic viability of the fisheries are expected to measurably affect the price or quantity of fishery products available in the U.S.

## 3.6 Redistribution of Costs and Benefits

The replacement of the status quo with either framework is expected to result in benefits or no change to all concerned by eliminating inefficient administrative requirements for changing harvest guidelines and by reducing waste associated with the discard of groundfish. The latter is not expected to result in a large enough increase in the supply of groundfish to measurably affect exvessel prices.

# HISTORICAL ANNUAL GROUNDFISH CATCH

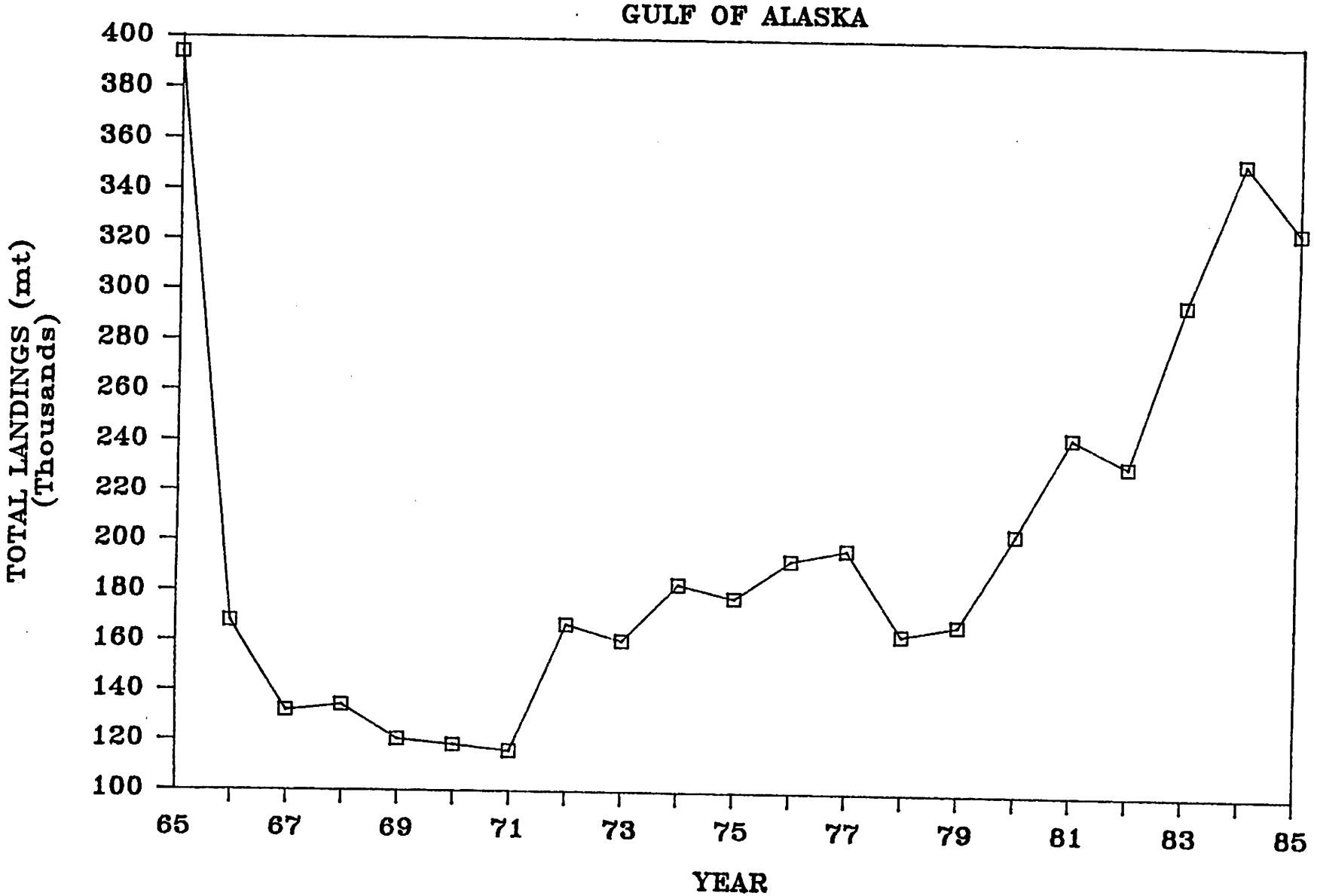


FIGURE 3.2

Table 3.2 1985 groundfish landings, Gulf of Alaska by amount (mt) and exvessel value ($1,000s)

| | WEIGHT (mt) | | | VALUE ($1,000s)[1] | | |
|---|---|---|---|---|---|---|
| Species | DAP | JVP | TALFF | DAP | JVP | TALFF |
| Flatfish (flounders and soles) | 752 | 2,447 | 170 | 219 | 338 | 22 |
| P.O.P. group | 863 | 254 | 8 | 242 | 50 | 3 |
| Other rockfish | 1,956 | 45 | 2 | 1,393 | 8 | 1 |
| Thornyheads | 81 | 8 | 4 | 40 | 2 | 1 |
| Atka mackerel | -- | 1,846 | 2 | -- | 281 | 0 |
| Pacific cod | 3,090 | 2,266 | 9,086 | 845 | 399 | 2,571 |
| Sablefish | 11,623 | 226 | 39 | 14,964 | 72 | 24 |
| Pollock | 22,012 | 237,860 | 31,616 | 1,213 | 22,835 | 3,857 |
| Other | 486 | 2,253 | 102 | | | |
| TOTAL | 40,863 | 247,205 | 41,029 | 18,916[2] | 23,988[2] | 6,479[2] |
| % of Grand Total | 12 | 75 | 12 | 38 | 49 | 13 |
| GRAND TOTAL | | 329,096 | | | 49,383[2] | |

1/ Assuming retention and sale of the landed groundfish.

2/ Does not include value of "Other" species category.

Source: Landings by weight, 1985 PacFIN (2/11/86). Values were computed using DAP, JVP, and foreign exvessel prices taken from 1985 PacFIN (2/11/86); Janet Smoker, pers. comm., and 1985 NMFS Foreign Fee Schedule, respectively.

Table 3.3. Administrative Costs of Plan Amendment versus Rulemaking for an OY Framework.

| NPFMC | Plan Amendment | Annual Rulemaking |
|---|---|---|
| Council Time | $ 63,700 | $ 25,200 |
| Plan team meetings | 12,000 | 4,000 |
| Direct Staff | 66,800 | 25,000 |
| Supervisory and Support Staff | 5,000 | 5,000 |
| Mailing and Printing | 3,500 | 1,800 |
| Communications | 2,700 | 1,800 |
| Supplies | 500 | 500 |
| Travel | 2,000 | 1,000 |
| NMFS | | |
| NMFS-AK | 11,630 | 4,720 |
| NMFS-DC | 11,200 | 0 |
| | $179,030 | $ 69,020 |

## 3.7 Benefit-Cost Conclusion

If, as assumed, the harvest guidelines that would be implemented with the inefficient adjustment mechanism of the status quo are similar to those that would be implemented with the efficient mechanism of either framework, the major effects of a change to either framework would be an administrative cost reduction and a groundfish discard cost reduction. Therefore, there would be a net benefit to the U.S. and no measurable costs to those individually involved in harvesting, processing, marketing, or consuming fishery products.

# 4.0 REGULATORY IMPACTS OF THE PROPOSED SOLUTIONS TO PROBLEM 2: INADEQUATE REPORTING REQUIREMENTS

## 4.1 Introduction

### 4.1.1 The management problem.

Amendment 14 to the FMP (50 CFR 43193, October 24, 1985) included a reporting requirement that was applicable to any catcher/processor and mothership/processor vessel that freezes or dry-salts any part of its catch on board that vessel and retains that fish at sea for a period of more than 14 days from the time it is caught, or who receives groundfish at sea from a domestic fishing vessel and retains that catch for a period of more than 14 days from the time it is received. Any such vessel must submit to the Regional Director, Alaska Region, NMFS a weekly catch or receipt report for each weekly period, Sunday through Saturday during which groundfish were caught or received at sea. The Council recommended and the Secretary approved this regulation to aid management agencies in the inseason monitoring of groundfish catches. Such reports are needed by these agencies because the large amounts of catches that might be onboard catcher/processor and mothership/processor vessels may not otherwise be reported for weeks or months. Without such reports, management agencies may close fisheries based on incomplete and unsatisfactory information. This may lead to either underharvesting or overharvesting of groundfish stocks. Some of these vessels, however, have been returning to port to sell or deliver their catches to shorebased processors in less than 14 days, thus avoiding the reporting requirement. The vessel operator, or at his request, the purchaser, must complete and submit a fish ticket to the Alaska Department of Fish and Game (ADF&G) within one week of such sale or delivery.

Because the same catcher/processor or mothership/processor vessels may sometimes submit catch reports to the Regional Director and sometimes fish tickets to the ADF&G, some double counting has taken place which makes monitoring of the fishery more difficult. Also, when these vessels land their catches within the 14-day period such that reports of landings via the fish ticket system is required, the receipt of the catch information is sometimes late due to delay in the mail system or delay by the vessel operators or purchasers in submitting the tickets.

### 4.1.2 The alternatives.

A. Do nothing - status quo. Vessels are required to report their landings via fish tickets. Catcher/processors (defined as those vessels whose trip length is in excess of 14 days) are required to file weekly reports with NMFS.

B. Alternative 1: Under this alternative any domestic catcher/processor vessel that freezes or dry-salts any part of its catch on board that vessel, or which delivers any part of its catch to a domestic mothership/processor where it is retained at sea for any time period, would be required to report its catches for each Sunday through Saturday period, regardless of how many days it had been fishing.

C. Alternative 2: This is identical to Alternative 1 with an additional stipulation which requires that any vessel which must fill out an Alaska Department of Fish and Game fish ticket shall include the sale price in the appropriate place on the ticket. If the price is not known at that time, the fisherman shall provide NMFS-Juneau Regional Office with that information within two weeks of the sale of the product. If the product is frozen or salted on board, then the price shall be product form specific. Those vessels not required to fill out a fish ticket (e.g. catcher/processors who unload their catch outside of three miles) shall provide price by weight and by product form to NMFS-AK Regional Office within two weeks of the first sale of the product. U.S. companies representing joint ventures shall provide quarterly reports to NMFS-AK Regional Office with prices paid to U.S. catcher vessels, by species. Foreign vessels shall report weight by product form of landed catch quarterly to NMFS-AK Regional Office.

## 4.2 Fishery Costs and Benefits

There is an oversight in the reporting requirements for catcher/processors which allows vessels to alternate their status and report as a catcher/processor one week and then land the following week under the Alaska Department of Fish and Game fish ticket system. As a result NMFS receives inconsistent catch reports to project landings and close fisheries before harvest quotas are exceeded. By reporting under both systems, harvests are double counted and locating and eliminating those twice counted catches requires valuable time.

Alternative 1 reduces the reporting period from 14 to 7 days. The two-week lag is too long for tracking sablefish harvests given the large increase in effort. This reduction would reduce the probability of overharvests or underharvests. In the 1986 sablefish fishery the 20% trawl apportionment of 1,230 mt was exceeded by 303 mt (see Table 4.1). If NMFS shuts down all sablefish fisheries when OY is reached, this 303 mt will constitute a loss to the remaining longline or pot fisheries. Using 1985 PacFIN price information ($0.621/lb. longline; $0.331/lb. trawl), the change in value would be $193,753. The changes to the status quo reporting requirements would improve the ability of NMFS to track all catches and reduce the chances of overharvests or underharvests. The costs of overharvests are obvious. Excessive catches place the biological health of stocks in jeopardy and could require lower harvests in subsequent years for rebuilding purposes.

The cost of underharvests result from foregone harvests in any year. The costs to the industry would equal the profit loss from unharvested fish. The fishery could reopen later in the year in order to take any remaining quota after a fishery was closed prematurely, but this is a major disruption to fishery participants and imposes increased costs on vessels due to increased travel to and from grounds as well as reoutfitting the fishing vessel for the reopened fishery.

Alternative 2 will enhance the ability of fishery managers to use the most recent year's data in fulfilling Objective 1, "maximize economic benefits to the United States". This should translate into enhanced ability for fishermen to maximize revenues.

Table 4.1 1986 Gulf of Alaska and Bering Sea/Aleutians Sablefish Catches (mt)
(Date of report - May 15, 1986)

| Area | | 1986 OY | Catch to Date | Season | Dates |
|---|---|---|---|---|---|
| Southeast/E. Yakutat | | 3,450 | 3,426 | closed | (4/1 - 4/17) |
| W. Yakutat | | 2,550 | 2,221 | closed | (4/1 - 5/10) |
| Central | LL (55%) | 3,382 | 1,619 | open | (4/1 - |
| | Pot (25%) | 1,538 | 377 | open | (4/1 - |
| | Twl (20%) | 1,230 | 1,533 | closed | (1/1 - 4/26) |
| Western | LL (55%) | 1,567 | 520 | open | (4/1 - |
| | Pot (25%) | 713 | 50 | open | (4/1 - |
| | Twl (20%) | 570 | 129 | open | (1/1 - |
| TOTAL | | 15,000 | 9,875 | | |

## 4.3 Reporting Costs

Catcher/processors would have to increase their catch reporting under Alternatives 1 and 2. Since the infrastructure of the reporting process is already in place, this should not dramatically increase costs. Some catcher processors, however, avoid the status quo reporting requirements by landing on the 13th day. The cost of effort and lost fishing time in landing catches would seem to exceed the costs of reporting catches to NMFS. It is not possible to estimate these costs, but the behavior of some fishermen implies that reporting costs may be substantial. It is possible, however, that vessels are landing catch in less than 14 days for reasons that have nothing to do with the current reporting requirements.

Under Alternative 2 any vessel operator which does not know the price of his product when landed will have to take the time to report that price when it becomes known. This may be difficult since some sales do not occur until six months after harvest. Since joint venture and foreign fishing company representatives will also have to report prices and/or sales, reporting costs for them will increase.

## 4.4 Administrative, Enforcement, and Information Costs and Benefits

The infrastructure for NMFS reporting requirements already exists, thus Alternatives 1 and 2 should not substantially increase the administrative costs. By eliminating double counting, NMFS could eliminate the costs of finding and adjusting double counted catches.

Enforcement costs may increase to ensure that reporting requirements are adhered to by catcher/processors. This cost is not necessarily exclusive to Alternative 1 or 2 as there are currently improvements that should be made in enforcement of the status quo. At-sea enforcement costs should not increase due to Alternative 1 or 2.

Under Alternative 2 NMFS-AK Regional Office would incur increased management costs in collecting, compiling, and recording value information collected from the fleet. Increased information on revenues and improved accuracy in data should benefit the Council in making decisions at the September and December meetings.

One should note that enforcement of the additional reporting requirements in Alternative 2 may be difficult considering the current substantial difficulties in the status quo reporting requirements.

## 4.5 Impacts on Consumers

The alternatives proposed should not affect price paid or product quality.

## 4.6 Redistribution of Costs and Benefits

The benefits of Alternative 1 and Alternative 2 to this management measure do not accrue to any specific sector of the industry. If overharvesting is prevented all participants benefit equally.

The costs from adoption of Alternative 1 or Alternative 2 take the form of increased reporting costs borne by the catcher/processors, joint venture companies, and foreign fishing companies.

## 4.7 Benefit-Cost Conclusion

Alternative 1 is proposed to close an oversight in the reporting requirements implemented in Amendment 14. The benefits should be decreased probability of both overharvesting and underharvesting. Alternative 2 also leads to the same benefits with an additional benefit from timely revenue reporting.

Both alternatives increase reporting costs. Out-of-pocket cost differs little from the status quo; however, if fishermen find the additional reporting requirements particularly burdensome out of pocket costs may underestimate the true costs.

# 5.0 REGULATORY IMPACTS OF THE PROPOSED SOLUTIONS TO PROBLEM 3: INADEQUATE PROTECTION OF KING CRAB IN THE VICINITY OF KODIAK ISLAND

## 5.1 Introduction

### 5.1.1 The management problem.

The number of mature red king crab in the waters around Kodiak Island are at historically low levels. As a result, the Kodiak commercial king crab fishery has been closed since 1983. During this same period a developing domestic groundfish fishery using a variety of gear has displaced most foreign fisheries.

In January 1986, the Council approved an emergency rule to close specified areas around Kodiak Island to bottom trawling while king crab were in their soft-shell condition. This action was believed necessary to protect the severely depressed Kodiak king crab stocks. The stocks have experienced little or no recruitment in recent years, and are likely subject to high mortalities from bottom trawls while in the soft shell condition. The emergency rule expired on June 15, 1986, when the soft shell period is believed to end. The Council action was intended to help rebuild the Kodiak king crab resource while still providing bottom trawl opportunities for groundfish fishermen. The action was to be an interim measure until a long-term solution could be developed.

In an attempt to allow industry to negotiate a solution to its problems, an industry workgroup was assembled at the request of the Council to review recent actions taken by federal and state management agencies and to develop a long-term solution that would meet the needs of all interested fishing industry groups. Supporting the workgroup were fishery scientists and managers who presented the latest biological and fishery information on the status of the king crab stocks and on areas where commercial fishing operations for groundfish, crab and shrimp are conducted. The workgroup developed a management alternative which is described under Alternative 1.

### 5.1.2 The alternatives.

A. Do nothing - status quo.

Under the status quo there is no specific control of king crab bycatch in the Gulf of Alaska groundfish fisheries. The PSC framework for halibut established by Amendment 14 remains in effect (50 CFR 672.20e). The retention of halibut, salmon, and king and Tanner crab, are prohibited in all domestic, joint venture, and foreign groundfish fisheries.

B. Alternative 1. Establish a time/area closure scheme as shown in Figure 5.1 and Table 5.1 for bottom trawling to help rebuild the Kodiak king crab resource

This alternative was developed by the industry workgroup and proposes establishing an area designation system with specific time/area closures. The area designations and management actions are as follows:

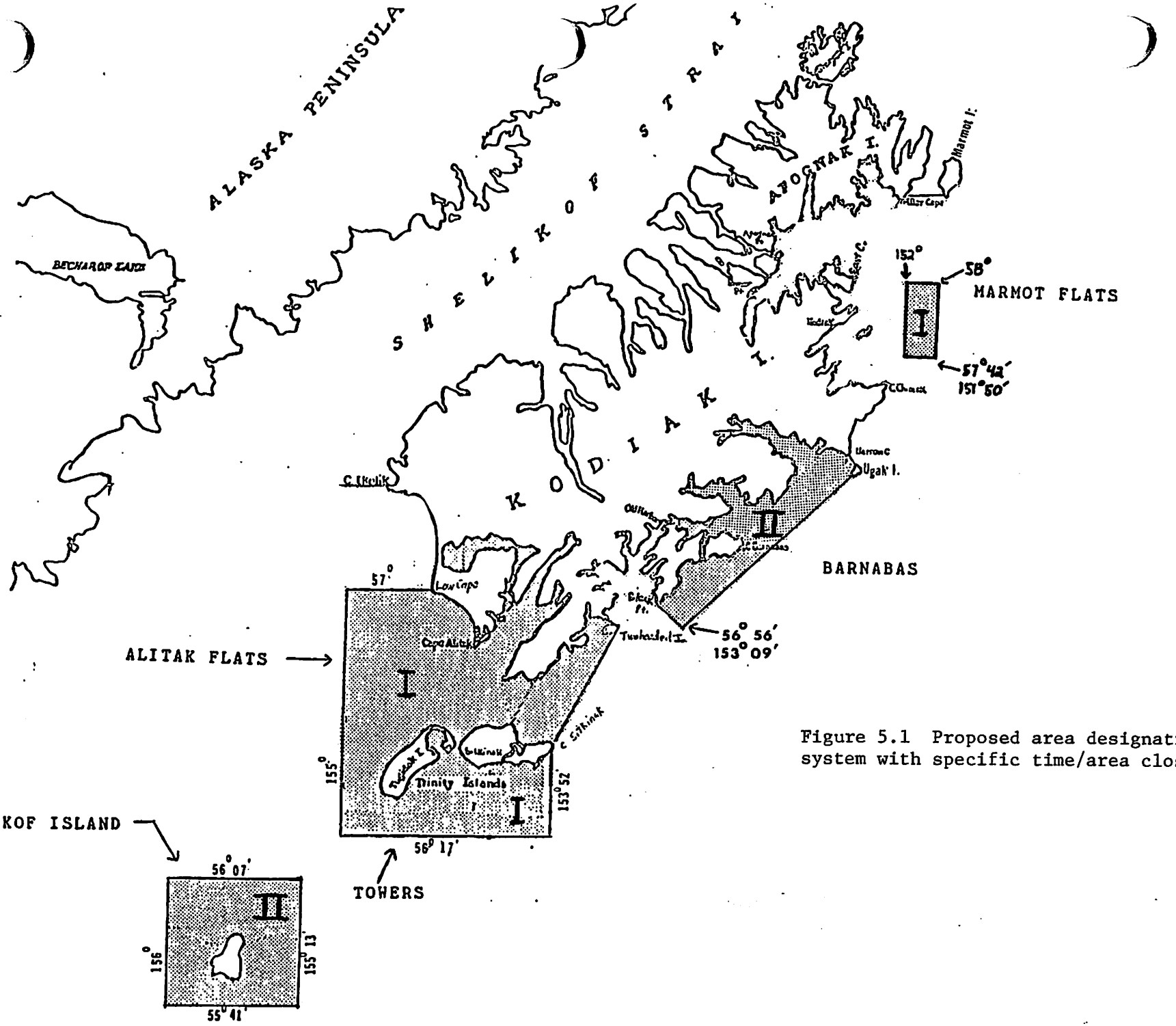


Figure 5.1 Proposed area designation system with specific time/area closures.

Table 5.1 Definitions of King Crab Bycatch Areas

| Area Type | Name and Definition |
|---|---|
| 1 | Rebuilding Areas (where crab concentrations are high)<br><br>Closed year-round to bottom trawl only. Other gear allowed during open season. |
| 2 | Restricted Fishing Areas (where crab are found, but in less amounts; does not qualify as Type 1 area).<br><br>Closed during soft-shell period (February 15-June 15); limited fisheries allowed (with or without observers; close area or move when bycatch is high). |
| 3 | Unrestricted Fishing Areas (few or no king crab; all gear allowed during open season). |

Areas designated as either Type 1 or 2 are shown in Figure 5.1.

In developing this alternative, the industry workgroup recognized that the future of the king crab resource is dependent on the ability of existing brood stock to successfully produce crab. Scientific data show that Alternative 1 provides protection to 85% of the Kodiak red king crab stocks, protects the most highly concentrated crab areas all year round, yet provides for groundfish fishing opportunities necessary to support the economic base of Kodiak communities. The workgroup also recognizes that once areas have been closed to fishing, there is often a reluctance to open those areas even when circumstances may have changed. Therefore, the time/area closure scheme presented in Alternative 1 will be in effect for three years from the year of implementation. At that time the Council will review the situation, the status of the king crab resource, the apparent effectiveness of the time/area closures, etc., to determine whether this approach to the king crab bycatch problem should be continued, abandoned, or replaced with a new alternative.

## 5.2 Fishery Costs and Benefits

The alternative to the status quo will affect two harvesting and processing sectors: those who harvest and process groundfish and those who harvest and process king crab and other nongroundfish species.

When faced with closures of areas in which they normally fish bottom trawlers must alter their current pattern of fishing. If we assume the current distribution of effort optimal, trawlers will face a potential decrease in profits. We assume that the fishermen will not simply accept the loss of total harvest from the closure, but redistribute their effort in other areas. This will increase costs to the trawlers by forcing them to scout new areas in search of bottomfish. The worst case is that they do not redistribute effort. If this is so the catch foregone in 1985 would have been about $17,000 (Table 5.2). Catch figures in the area were provided by ADF&G and prices used were 1985 annual average trawl prices in the Central Gulf of Alaska as reported in the May 12, 1986 PacFIN report.

Table 5.2 1985 Harvest and Harvest Values of Groundfish in Proposed Trawl Closures in the Vicinity of Kodiak Island.

| Species | Quantity (mt) | Value ($) |
|---|---|---|
| Sablefish | 2 | $ 1,460 |
| Pacific Cod | 27 | 7,799 |
| Rock Sole | 39 | 7,568 |

The catch figures used were aggregated from Alaska Department of Fish and Game Statistical Areas which do not coincide exactly with the proposed closed areas. It is not clear whether the impacts are over or understated since some portions of the statistical areas include areas outside the closure and some areas within the closure are not included in any statistical areas.

There will be some positive effect on fishermen and processors who target on species prohibited in the groundfish fisheries in the areas closed due to the proposed regulation if the closed areas lead to increased protection and subsequent increased recruitment of these species, since the areas, although chosen to protect depressed red king crab stocks, will presumably prevent bycatch of other prohibited species such as Tanner crab and halibut. However, an unknown redistribution of effort will not only result in unknown catches of groundfish in the new areas, but also unknown quantities of bycatch of prohibited species. Whether this would result in higher or lower catches of those other prohibited species cannot be estimated without knowledge of how effort would be redistributed.

The areas were chosen to protect regions with particularly high abundance of red king crab. This protection may lead to increased recruitment into the king crab fishery which in turn would presumably result in increased directed harvests of king crab. It is impossible to forecast this effect since there is no satisfactory spawner recruit model available for the Gulf of Alaska red king crab stock. Unfortunately, the fact that there has been no significant recruitment in the red king crab fishery in the last seven years implies that the removal of trawl effort may not benefit the directed fishery.

## 5.3 Reporting Costs

The proposed time/area closures should not change the reporting costs of any vessels in the fishery.

## 5.4 Administrative, Enforcement, and Information Costs and Benefits

As areas are closed enforcement of fishing prohibitions in the areas becomes more difficult. The proposed alternative would require increased enforcement expenditures unless funds are reallocated from other enforcement activities.

## 5.5 Impacts on Consumers

The decrease in trawl catches is such a small percentage of the Gulf total that consumer prices should not be affected by the closures. If the closures contributed to the return of healthy red king crab stocks around Kodiak then may be an increase in benefits to consumers who purchase king crab at a lower price may result.

## 5.6 Redistribution of Costs and Benefits

The costs of the proposed time and area closures are borne by the harvesters and processors of bottom trawl caught groundfish. There may also be increased enforcement costs from the adoption of this regulation.

The benefits will accrue to the harvesters of red king crab should the adoption of Alternative 1 lead to a future directed fishery.

## 5.7 Benefit-Cost Conclusion

The costs of harvests foregone due to the time/area closures depends upon whether the effort can be redistributed and whether the lost harvests can be compensated for in other areas. There will be costs in terms of increased operating costs or lower catches if current effort patterns are optimal.

The benefits associated with the time/area closures depend upon the level of bycatch of prohibited species with the redistributed effort. It also depends on the ability of the red king crab stocks to reproduce.

This management measure is for three years only and will be reevaluated at the end of that period.

# 6.0 REGULATORY IMPACTS OF THE PROPOSED SOLUTIONS TO PROBLEM 4: INADEQUATE INSEASON MANAGEMENT AUTHORITY

## 6.1 Introduction

### 6.1.1 The management problem.

The Regional Director, is currently authorized by the FMP to make inseason time/area adjustments in the Gulf of Alaska groundfish fishery. These adjustments are accomplished by field orders, which are regulations published in the FEDERAL REGISTER. The FMP states that the Regional Director may issue such field orders for conservation reasons only. His adjustments are to be based on the following considerations:

(1) The effect of overall fishing effort within the area in comparison with preseason expectations.

(2) Catch per unit of effort (CPUE) and rate of harvest.

(3) Relative abundance of stocks within the area in comparison with preseason expectations.

(4) The proportion of halibut, salmon, or crab being handled.

(5) General information on the condition of stocks within the area.

(6) Information pertaining to the optimum yield for stocks within the the statistical area.

(7) Any other factors necessary for the conservation and management of the groundfish resource.

Except for 4 above, the implementing regulations at 50 CFR Part 672.22 roughly follow the language contained in the FMP. Concerning item 4, the implementing regulation only provides for consideration of the amount of halibut, not the amount of crab or salmon. This difference may simply be an oversight when the regulations were first drafted during 1978. The implementing regulations require the Regional Director to make adjustments on the basis of a determination that: (1) the condition of any groundfish or halibut stock in any portion of the Gulf of Alaska is substantially different from the condition anticipated at the beginning of the year; and (2) such differences reasonably support the need for inseason conservation measures to protect groundfish or halibut stocks.

The FMP requires the Regional Director to compare the effect of overall fishing effort and the relative abundance of stocks with preseason expectations. Hence, the implementing regulation also requires the Regional Director to make his determination on the basis of preseason expectations of groundfish conditions. Except for the April 1 starting date for the hook-and-line and pot fishery for sablefish, the fishing year starts on January 1. Hence, preseason expectations are those that must be made during the prior fishing year.

Such limited comparisons prevent the Regional Director from using newly obtained information, which can, and often does, give him reason to make time/area adjustments. For example, results of scientific surveys often become available during the current fishing season. The overall effects of fishing effort, when compared with the survey results, may justify continuing or stopping fishing for a certain groundfish species in a management area. Under the FMP's current regime, the Regional Director is not technically allowed to compare the effects of fishing effort against the survey results, because such results were not derived preseason.

The FMP allows the Regional Director to make time/area adjustments for conservation purposes only. NOAA has consistently interpreted conservation of groundfish resources to mean protection of those resources rather than the more classical definition of wise use. Consequently, extended fishing time to more fully utilize a certain groundfish species, perhaps as a result of reopening an area after it had been closed, is done usually with much bureaucratic difficulty. Other new information obtained inseason, which is socioeconomic in nature and important to the fishermen and the processors, should also be considered by the Regional Director when making his determination in making time/area adjustments.

6.1.2 The alternatives.

A. Do nothing - status quo alternative.

Under the status quo, time/area adjustments would be made inseason by comparing commercial fishery data with information known at the beginning of the fishing year. These adjustments would be made for conservation reasons only.

B. Alternative 1: Authorize the Regional Director to close fisheries on the basis of all relevant information to promote fishery conservation.

Under this alternative, the Regional Director would not be constrained by the current requirement that he compare information obtained from the current fishery with information available at the beginning of the fishing year. Instead, he would be authorized to consider any relevant information. On the basis of such information, he shall close fisheries in any or part of a regulatory area, or restrict the use of any type of fishing vessel or gear, or change any previously specified TAC or PSC limit as a means of conserving the resource. Such closures must be necessary to prevent one of the following occurrences:

(1) The overfishing of any species or stock of fish.

(2) The harvest of a TAC for any groundfish, or the taking of a PSC limit for any prohibited species, the previous specification of which is plainly erroneous.

C. Alternative 2: Authorize the Regional Director to make time/area adjustments to promote fishery conservation and/or promote socioeconomic interests in the fishery on the basis of all relevant information.

This alternative is similar to Alternative 1, except that the Regional Director would be authorized to open fisheries for socioeconomic reasons, as well as close fisheries for conservation reasons after consultation with the Council. Socioeconomic factors that he may consider are (4) and (5), listed below. Using all available information, he shall open or close fisheries in any or part of a regulatory area, or authorize the use of any type of fishing vessel or gear, or change any previously specified TAC or PSC limit as a means of conserving the resource. Such actions must be necessary to prevent one of the following occurrences:

(1) The overfishing of any species or stock of fish.

(2) The harvest of a TAC for any groundfish, or the taking of a PSC limit for any prohibited species, the previous specification of which is plainly erroneous.

(3) The closure of any fishing for groundfish based upon the harvest of a TAC or the taking of a PSC limit, the previous specification of which is plainly erroneous.

(4) The failure to harvest a TAC for any groundfish as a result of weather conditions or the availability of facilities for the processing of the groundfish.

(5) The failure to maximize the quantity or quality of roe extracted from any groundfish of which roe is a principal product.

## 6.2 Fishery Costs and Benefits

The five occurrences listed under Alternative 2 which describe management actions to be taken by the Regional Director under the proposed inseason management authority include the two conservation only actions listed under Alternative 1. Accordingly, this section will discuss the economic impacts of adopting each one of the five actions with the understanding that the discussion of actions 1 and 2 apply to both Alternatives 1 and 2 while the analysis of actions 3 through 5 relates only to Alternative 2.

Action 1: Closure to prevent overfishing.

The MFCMA is specific in prohibiting overfishing. Overfishing is not allowed regardless of the cost. The Act's definition of overfishing is that level of fishing mortality which results in an inability of the stock to produce sustainable yields over the long term. This is a threshold population concept and as such is little understood and poorly quantified. The PT is presently unable to determine critical threshold population levels for the stocks managed under the Gulf FMP. The Regional Director has interpreted EY (a yield that without biological perturbation will lead to a steady state biomass equal to the current biomass) as a level of fishing mortality which ought not to be exceeded under the rationale that harvests above that level increase the probability of overfishing.

In sum, the definition of overfishing is critical to this action and that definition needs to be more precise than is currently the case. Second, cost-benefit analysis is not relevant under a strict interpretation of overfishing.

Action 2: Closures to prevent exceeding a TAC or PSC, the specification of which is plainly erroneous.

The words "plainly erroneous" mean "in error" thus, as in action 1, cost-benefit analysis is not strictly applicable. An example of a plainly erroneous determination was the initial determination of the PSC cap for Tanner crab in the Bering Sea flatfish fisheries in the Council's recent emergency action to protect crab stocks in the Bristol Bay pot sanctuary. Adoption of this part of Alternative 1 or 2 would allow the RD authority to close a fishery should the initial TAC or PSC be plainly erroneous (too low).

Action 3: Reopening a closed fishery or not closing an open fishery should the previous specification of a TAC or PSC be plainly erroneous.

This action is specific to Alternative 2 but is a mirror image of action 2 in allowing a reopening of a closed fishery or postponement of a planned closure should the initial specification of harvest limits (TAC, PSC) have been in error.

Again, the cost-benefit perspective of such an action is not necessarily relevant to the correction of a previous error in harvest determination, but an example from the current fishery may serve to illustrate the potential gains and losses of actions 2 and 3. If, for example, in 1986, the harvest of sablefish in the W. Yakutat area was 2,200 mt (it was 2,221), and the OY was 2,550, then 350 mt of sablefish would not have been harvested due to a premature closure. Using the current cumulative 1986 price of $0.48 per pound (PacFIN) this foregone harvest resulted in about $340,000 in lost income to the domestic longline fleet and additional losses to the processing, wholesale and retail sectors. If, on the other hand, the Central Gulf longline OY of 3,382 mt was exceeded (harvest to date is 3,666 mt) by 284 mt the vessels participating would realize an additional $302,000 in exvessel revenue which translates into even greater gains for the processing, wholesaling and retailing sectors. This current gain is offset by potential future reductions in the harvest amounts (TAC or OY) for sablefish.

Action 4: Reopening a closed fishery or not closing an open fishery should weather conditions or the availability of processing facilities prevent the attainment of a TAC.

Since all fisheries, including the sablefish fishery, have a fishing season which ends on December 31, reopening a closed season cannot occur. However, this action may be relevant under the following scenario. Suppose the current rate of harvest was used to establish a closing date for the fishery and this closure was published in the FEDERAL REGISTER). If bad weather prevents the harvesters from fishing or should there be a temporary difficulty in the availability of processing capabilities then the closure will lead to an underharvest of the resource. In this case the RD can modify the previous announcement by rule related notice.

We can illustrate the potential cost to the groundfish fleet by citing the example of the previous section. If bad weather (not an erroneous determination) resulted in a shortfall of 350 mt of sablefish to domestic longliners fishing in the W. Yakutat area then the income foregone, should an

announced closure have gone into effect, would be about $340,000. Additional losses would also occur in the processing, wholesale and retail sectors.

Action 5: An opening or closing of a fishery of which roe is a principal product, based on maximizing the quantity or quality of the roe extracted.

Presumably, this allows the RD to issue a rule-related notice to open and close a roe fishery based on the current roe content. For the Gulf groundfish fishery this action would apply to only pollock and would involve determination of a percentage which maximizes the economic value of pollock roe and would necessitate a test fishery to determine when the roe content of the fish reached this desired percentage.

6.3 Reporting Costs

Alternatives 1 and 2 contain no reporting requirements in addition to that required under the status quo.

6.4 Administrative, Enforcement, and Information Costs and Benefits

Administrative, enforcement, and information costs would not be expected to differ from that of the status quo under Alternative 1.

Under Alternative 2 increased administrative costs would result from (5) due to the planning and conduct of a test fishery to monitor roe content inseason. Enforcement costs would increase relative to the status quo if the pool concept in the pollock fishery resulted in some operations "jumping the gun" and if NMFS chooses to enforce the delayed opening. Information costs would increase as it would be necessary to process information from the roe test fishery in a timely manner.

6.5 Impacts on Consumers

No impact on consumers is expected as no significant quantity or quality change in fisheries product at the retail sector is expected.

6.6 Redistribution of Costs and Benefits

The closure parts of Alternatives 1 and 2 will result in an immediate short-term revenue loss from that previously expected. This loss will be partially offset by potential harvest increases in future years. Conversely, the reopening options of Alternative 2 will result in immediate gains in exvessel revenue and in other domestic sector profits. These gains will be partially offset by potentially reduced future harvests.

Under (5) of Alternative 2 significant gains to the fishery sector may be realized. Offsetting these gains will be increased administrative, enforcement, and information costs which will be borne by the U.S. government.

6.7 Benefit-Cost Conclusion

The hypothetical examples presented in Section 6.2 indicate that substantial benefits may accrue to the fisheries sector under Alternative 2 should such authority prevent a premature closure or should such authority produce significantly more revenue in the pollock fishery. Adoption of the pollock roe section of Alternative 2 will increase the costs of management.

Cost-benefit analysis of Alternative 1 and (1) and (2) of Alternative 2 may not be relevant under the current Act.

## 7.0 OTHER EXECUTIVE ORDER 12291 REQUIREMENTS

Executive Order 12291 requires that the following three issues be considered:

(1) Will the Amendment have an annual effect on the economy of $100 million or more?

(2) Will the Amendment lead to an increase in the costs or prices for consumers, individual industries, Federal, State, or local government agencies or geographic regions?

(3) Will the Amendment have significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of U.S. based enterprises to compete with foreign enterprises in domestic or export markets?

Regulations do impose costs and cause redistribution of costs and benefits. If the proposed regulations are implemented to the extent anticipated, these costs are not expected to be significant relative to total operational costs.

The Amendment should not have an annual effect of $100 million or more since the total value of the catch of all groundfish species is about $50 million. The value of the groundfish harvested by DAP fishermen in 1985 was $19 million with $24 million taken by JVP fishermen. However, only a small fraction of this catch might be effected by regulations implemented under this amendment. Where more enforcement and management effort are required, the cost to state and federal fishery management agencies will increase.

The Amendment should not lead to a substantial increase in the price paid by consumers, local governments, or geographic regions since the no significant quantity changes are expected in the groundfish markets.

The amendment will not have significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of U.S. based enterprises to compete with foreign enterprises in domestic or export markets.

## 8.0 IMPACTS OF THE AMENDMENT RELATIVE TO THE REGULATORY FLEXIBILITY ACT

The Regulatory Flexibility Act requires the examination of the impacts on small businesses, small organizations, and small jurisdictions. In 1985 491 vessels participated in the Gulf of Alaska groundfish fishery. Data are not available to estimate the number of small businesses that may be involved in the fisheries for salmon, crabs, halibut and other fully utilized species in the area, but it would total several hundred. The impacts of the amendment do not favor large businesses over small business. Both large and small businesses are impacted by the proposed management measures.

Compliance costs include a change in the mandatory reporting requirements. These costs have not yet been estimated but should not substantially increase the reporting costs for domestic fishermen. Frameworking an overall OY will lead to reduced administrative costs of approximately $100,000.

## 9.0 COORDINATION WITH OTHERS

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# ENVIRONMENT ASSESSMENT

# FOR AMENDMENT 15 TO THE FISHERY MANAGEMENT PLAN FOR THE GROUNDFISH FISHERY OF THE GULF OF ALASKA

PREPARED BY THE PLAN TEAM FOR THE
GROUNDFISH FISHERY OF THE GULF OF ALASKA
AND THE STAFF OF THE
NORTH PACIFIC FISHERY MANAGEMENT COUNCIL

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# 1.0 INTRODUCTION

The domestic and foreign groundfish fishery in the fishery conservation zone (3-200 miles offshore) of the Gulf of Alaska is managed under the Fishery Management Plan for Groundfish of the Gulf of Alaska (FMP). The FMP was developed by the North Pacific Fishery Management Council (Council) under the Magnuson Fishery Conservation and Management Act (Magnuson Act). It was approved by the Assistant Administrator for Fisheries, NOAA, (Assistant Administrator) and implemented December 1, 1978 (43 FR 52709, November 14, 1978). Amendments 1-11, 13, and 14 to the FMP have been approved by the Assistant Administrator. Amendment 12 was adopted initially by the Council at its July and December 1982 meetings but was later rescinded by the Council at its September 1984 meeting without having been submitted formally for Secretarial review.

The Gulf of Alaska groundfish fishery consists of a number of distinct fisheries that can be defined by gear, target species, and mode of operation. Each of these fisheries is a multispecies fishery to some degree due to the use of only partially selective gear or targeting strategies. These fisheries are characterized by: (1) resources that are subject to large fluctuations; (2) the rapid (and for most species complete) replacement of foreign fisheries by wholly domestic and joint venture fisheries; and (3) changing market conditions and opportunities as the domestic groundfish industry strives to become fully developed. The FMP, as amended through 1985, is not adequate in managing such a fishery. It has a number of major deficiencies, the costs of which have increased as the foreign fisheries have been replaced by wholly domestic and joint venture fisheries. These deficiencies will tend to prevent the fishery management goals from being met in the Gulf of Alaska. These goals as defined by the MFCMA, related federal policy, and the Council are to: (1) protect the long-term productivity of living marine resources by preventing either overfishing or fishing related degradation to fishery habitat; and (2) within the bounds set by this conservation goal, provide a management environment that will result in the allocation of these resources that will generate the greatest benefit to the nation.

Work toward a revised Gulf of Alaska Groundfish FMP was initiated during the December 1984 meeting of the North Pacific Fishery Management Council. Primary motivation for a revision was a continual increase in the number of proposed annual changes to the FMP. The Council formed a workgroup to begin work toward developing a set of goals and objectives for fisheries management in the Gulf of Alaska and also directed the Gulf of Alaska groundfish plan team (PT) to identify specific areas in need of change. In particular, the team was asked to identify management measures that require frequent revision and develop alternative measures that would streamline the plan and eliminate administrative delays.

The Council met in special session in August of 1985 to review the progress of both the plan team and the Goals and Objectives Workgroup and to provide direction for subsequent work. The workgroup has met five times since that August meeting, independently, and in conjunction with the plan team and Council staff. The product of those meetings are the goals and objectives approved for public review by the Council at its March, 1986 meeting. These goals and objectives are found in Chapter 2 of this document. The interaction

between the workgroup and the plan team was intended to provide a set of alternatives that reflect the intent of industry as well as adhere to biological and economic principles.

At its June 24-26, 1986 meeting, the Council reviewed the status of the FMP and certain problems that have been identified, either through experience gained from eight years of fishery management or through situations unforeseen as the domestic fishery has developed. These management problems are:

(1) Inability to adjust harvest guidelines efficiently.
(2) Inadequate domestic reporting requirements.
(3) Trawl-induced mortality on king crab stocks near Kodiak Island.
(4) Inadequate inseason management authority.

The Council received recommendations from the PT, the Advisory Panel (AP), and the Scientific and Statistical Committee (SSC) on alternative management measures that could be adopted, as Amendment 15 to the FMP, to resolve the problems. The Council adopted a "public hearing" package for consideration by the public, the fishing industry, and management agencies that analyzes the biological, ecological, and socioeconomic effects of these alternatives. One part of the package is the environmental assessment (EA) that is required by the National Oceanic and Atmospheric Administration in compliance with the National Environmental Policy Act of 1969. The purpose of the EA is to analyze the impacts of major Federal actions on the quality of human environment. It serves as a means of determining if significant environmental impacts could result from a proposed action. If the action is determined not to be significant, the EA and resulting finding of no significant impact (FONSI) would be the final environmental documents required by NEPA. An EIS must be prepared if the proposed action may be reasonably expected (1) to jeopardize the productive capability of the target resource species or any related stocks that may be affected by the action; (2) to allow substantial damage to the ocean and coastal habitats; (3) to have a substantial adverse impact on public health or safety; (4) to affect adversely an endangered or threatened species or a marine mammal population; or (5) to result in cumulative effects that could have a substantial adverse effect on the target resource species or any related stocks that may be affected by the action. Following the end of the public hearing, the Council could determine that Amendment 15 will have significant impacts on the human environment, and proceed directly with preparation of an EIS required by NEPA. This EA is prepared to analyze the possible impacts of alternative management measures to solve five management problems contained in Amendment 15. The management measures entailed in Amendment 15 allow forces of natural mortality to be considered in determining groundfish harvest levels. These forces of natural mortality may stem from either biotic or abiotic sources. Natural mortality resulting from biotic sources may include that stemming from predator-prey interactions. That is, in its framework for computing recommended harvest levels, proposed Amendment 15 enables managers to incorporate the effects of predation, e.g. predation on pollock by marine mammals and birds. When groundfish are harvested by the commercial fishery, the immediate effect on predator species may be negative, since a source of food will have been removed. However, the net effect may be either positive or negative, for two reasons. First, predator species may be able to switch to other food sources, thereby negating the effect of lowered groundfish abundance. Second, the indirect, ecosystem-level effects may counter-balance the direct effects,

since groundfish do not function in the marine ecosystem simply as prey species. Importantly, all groundfish species are predatory. Each consumes other groundfish as well as invertebrates.

Sablefish, for example, consume small pollock, Pacific cod, other sablefish, flounder, rockfish, herring, pink shrimp, crab, zooplankton, and bottom dwelling invertebrates (benthos). Pacific cod consume pollock, small flounders, dogfish, sculpins, herring, pink shrimp, crab, squid, octopus, and benthos. Pollock consume pelagic fish, other pollock, zooplankton, and pink shrimp. Some large mouth flounders such as arrowtooth flounder consume pollock, herring and other pelagic fish, pink shrimp, and zooplankton. Halibut consume Pacific cod, pollock, sablefish, other halibut, flounder, dogfish, sculpins, Pacific ocean perch and other rockfish, squid, octopus, salmon, herring and other pelagic fish, pink shrimp, crab, zooplankton, and benthos. Small mouth flounder consume pelagic fish, pink shrimp, crab, zooplankton, and benthos. Atka mackerel consume pollock, squid and octopus, herring, other pelagic fish, pink shrimp, and zooplankton. POP consume squid and octopus, pelagic fish, and zooplankton. Other rockfish consume pollock, flounder, squid and octopus, pelagic fish, pink shrimp, crab, zooplankton, and benthos.

When predatory fish such as groundfish are harvested by the commercial fishery, the abundance of prey species will be influenced. This, in turn, may have a positive impact on the abundance of species which prey on groundfish. Thus, the long-term net effect of groundfish harvests on predators such as marine mammals and birds may be either positive or negative. The ultimate effect of groundfish harvests will inevitably be difficult to predict. This is especially true in light of the fact that the influence of other factors such as (1) physical changes in ocean chemistry, temperature, and weather conditions, and (2) biological changes in animal populations resulting from disease, competition between and among species, and changes in the physical environment could well mask the direct effects of any management practice.

Underharvesting a groundfish species will most likely result in a greater abundance of that species in the ecosystem, at least in the short run. Depending on the role of the particular groundfish species in the ecosystem, this may result in the consumption of more prey and/or it may provide more biomass for predators (including marine mammals and birds) in the system. Less fish waste material is discharged into the system by floating and/or shorebased processors. Fewer nutrients from fish waste material are immediately available for animal life that otherwise would have consumed it. On the other hand, overharvesting a groundfish species will most likely result in a lower abundance of that species in the ecosystem; thus, less prey may be consumed by the overharvested groundfish species and less biomass may be provided for other predators, at least in the short run. More nutrients from fish waste material are discharged by floating and/or shorebased processors, thus making more nutrients from fish waste material immediately available for animal life that feeds on such material.

Descriptions of each of the management problems and the environmental impacts of each of the proposed alternative solutions to the problems follows. The environmental impacts of each alternative are analyzed within the guideline provided by the National Environmental Policy Act of 1969.

## 2.0 THE GOALS AND OBJECTIVES OF FISHERIES MANAGEMENT IN THE GULF OF ALASKA

### 2.1 A Revised Set of Goals and Objectives for Management of the Gulf of Alaska Groundfish Plan - Implications

The Council-appointed workgroup on goals and objectives for the Gulf of Alaska FMP has drafted a revised set of goals and objectives for insertion in the FMP. The group's recommendations to the Council were approved for public review at the March 1986 meeting and are listed below.

#### Gulfwide Groundfish Management Goals and Objectives

The Council is committed to develop long-range plans for managing the Gulf of Alaska groundfish fisheries that will promote a stable planning environment for the seafood industry and will maintain the health of the resource and environment. In developing allocation and harvesting systems, the Council will give overriding consideration to maximizing economic benefits to the United States. Such management will:

(1) Conform to the National Standards and to NPFMC Comprehensive fishery management goals.

(2) Be designed to assure that to the extent practicable:

(a) Commercial, recreational, and subsistence benefits be obtained on a continuing basis.
(b) Chances of irreversible or long-term adverse effects on fishery resources and the marine environment are minimized.
(c) A multiplicity of options will be available with regard to future uses of these resources.
(d) Regulations will be long term and stable with changes kept to a minimum.
(e) The productive capacity of the habitat required the Gulf of Alaska groundfish fishery will be maintained.

Principal Management Goal: Groundfish resources of the Gulf of Alaska will be managed to maximize economic benefits to the United States, consistent with resource stewardship responsibilities for the continuing welfare of the Gulf of Alaska living marine resources. Economic benefits include, but are not limited to, increased profits, benefits to consumers, and gains in income and employment.

To implement this goal, the Council establishes the following objectives:

Objective 1 - The Council will establish annual harvest guidelines within biological constraints, for each groundfish fishery and mix of species taken in that fishery.

Objective 2 - In setting annual harvest guidelines, the Council will account for all fishery related removals by gear types for each groundfish species, including bycatches, prohibited species, sport fishery, and subsistence catches as well as by directed fisheries.

Objective 3 - The Council will manage the fisheries to minimize waste by:

(a) Developing alternative approaches to treating bycatches of prohibited species. Any system adopted must address the problems of covert targeting and enforcement.

(b) Developing management measures that encourage clean fisheries through gear and fishing technique modifications to minimize discards.

Objective 4 - The Council will manage groundfish resources of the Gulf of Alaska to stimulate development of fully domestic groundfish fishery operations.

Objective 5 - Only when requested to do so by the industry will the Council develop measures to limit the number of participants in a fishery, including systems to convert the common property resource to private property.

Objective 6 - Rebuilding depleted stocks will be undertaken only when benefits to the United States can be predicted after evaluating the associated costs and benefits and the impacts on related fisheries.

Objective 7 - Population thresholds will be established for major species or species complexes under Council management on the basis of the best scientific judgements of minimum population levels required to maintain strong reproductive potential over the long term. If population estimates drop below those thresholds, continued harvest will be constrained until stocks rebuild. The allowable catch indicates the surplus above threshold levels that is available for harvest.

In the remainder of this chapter we examine the management implications of this set of goals and objectives. This examination is important from two perspectives: (1) as a change in the FMP itself; and (2) as a new "yardstick" against which all management alternatives are evaluated.

The most significant point of departure for the revised goals and objectives is the adoption of one overriding goal--that of maximization of economic benefits from the groundfish resources of the Gulf of Alaska. Although maximization of economic benefits is part of the National Standards its adoption as the principal management goal is new. Presently this directive as the primary goal for management of Gulf groundfish resources does not negate or reduce the resource stewardship responsibilities of the Council and that management actions must be consistent with the welfare of all living marine resources.

The seven objectives proposed by the work group serve to focus the overall management goal on particular problems. Objectives 1 and 2, taken together, imply that the Council will account for all fishing mortality and that the Council will establish harvest guidelines for all catch in the fisheries under Council control. Adopting this objective requires a catch accounting scheme which considers target catch, bycatch and the catch from nongroundfish fisheries. A catch accounting procedure which accomplishes this objective is presented in Chapter 3.

Minimizing waste by avoiding the prohibited species approach (Objective 3) will be difficult given the current management situation. First, the absence of fishery observers on fully domestic fishing vessels complicates inseason

accounting of catch discarded at sea and limits the ability to control targeting on valuable fully utilized species should the retention of fish be allowed. Second, it is the current interpretation of NOAA general counsel that domestic fisheries cannot be shut down while any retainable bycatch amounts remain in the joint venture or foreign fisheries. Thus, any measures which the Council can put in place to limit the incidental harvest of fully utilized species may not be enforceable for the wholly domestic fisheries, at least from the NMFS perspective.

Managing to stimulate development of fully domestic groundfish fisheries (Objective 4) can be accomplished, in part, by the frameworked catch accounting procedures presented as alternatives to problems 1 through 3; however, the alternatives listed do not explicitly give priority to developing fisheries.

Objective 5 simply states that the Council will not adopt any procedure which converts the common property resource to private property unless requested to do so by the industry. This precludes adoption of all limited access systems including limited entry, share quota systems, license ceilings, etc., unless the industry so requests. Such an objective implies that overcapitalization of the fleet may continue to be a problem.

Objectives 6 and 7 are concerned with rebuilding and overfishing. Rebuilding will not take place unless the benefits from that rebuilding outweigh the costs, including costs to other fisheries which harvest the species incidentally (Objective 6). However, if the population under management should drop below the identified threshold level, that is, the biomass below which the ability to produce a sustainable yield is in doubt, rebuilding must take place (Objective 7). Thus, there is an ambiguity between Objective 6 and 7 which can be resolved by stating a priority of one objective over the other. If Objective 7 takes priority then rebuilding will take place if a population estimate drops below the threshold estimate regardless of the benefits of doing so. If Objective 6 takes priority and if the population estimate approaches the threshold, rebuilding will take place provided benefits exceed costs.

Identification of the threshold level of a population is critical to the definition of overfishing. The Magnuson Act is explicit in prohibiting overfishing. Unfortunately, given the current precision in the fishery population models, the plan team will be unable to establish any meaningful threshold population point estimates for most, if not all, of the managed groundfish species. This implies that a definition of overfishing related to some probability of long-term negative impacts needs to be developed.

The proposed solutions to the management problems identified in Chapters 3 through 6 will be examined in light of these proposed management goals and objectives.

## 2.2 A Discussion of Impacts of the Goals and Objectives on the Environment

Environmental impacts under the existing objectives are potentially more adverse than those proposed in Amendment 15. Objectives to minimize wastage and account for all fishing mortality are not emphasized under the status quo as they are under Amendment 15. To the extent that possible overharvesting of

groundfish stocks could occur under this alternative causes the status quo to be inferior to Amendment 15. Overharvesting a groundfish species will most likely result in fewer numbers of that species in the ecosystem, at least in the short run. Depending on the role of the particular groundfish species in the system, this may result in the consumption of less prey and/or it may provide less biomass for predators (including marine mammals and birds) in the system. At first, more fish waste material from the harvested species is discharged into the system by floating and/or shorebased processors until fishing pressure drops as reduced abundance of the target species being overfished forces fishermen to abandon their effort. Actual impacts are difficult to quantify but are considered to be insignificant when compared to naturally occurring perturbations that occur in the environment.

New goals and objectives as part of Amendment 15 are more functional than those now contained in the FMP in providing fishery management policy that promotes the well-being of commercially important stocks in the long run while mitigating adverse social and economic impacts. This policy will encourage measures to reduce wastage of incidentally caught groundfish and other fish species. Rather than discarding incidental catches, they will be retained and processed. Such policy promotes better economic returns in the fishery. With respect to environmental impacts, differences between discarding incidental catches at sea or retaining them are believed to be minimal. However, as discussed above under the status quo alternative, risks of overharvesting a species are likely to be reduced under this alternative. Therefore, this alternative is considered superior to the status quo although, actual impacts are likely insignificant when compared to naturally occurring perturbations that occur in the environment.

## 3.0 DESCRIPTION OF MANAGEMENT PROBLEM 1 AND ENVIRONMENTAL IMPACTS OF THE PROPOSED ALTERNATIVE SOLUTIONS: INABILITY TO EFFICIENTLY ADJUST HARVEST GUIDELINES

This chapter considers two alternatives to the present procedure of establishing an optimum yield for each species or species group in the Gulf of Alaska groundfish complex annually via emergency rule. Both alternatives are framework procedures which allow annual adjustment of harvest guidelines within an overall OY range for the Gulf groundfish complex. These alternatives are thus similar to the overall OY framework used in managing the Bering Sea groundfish fisheries. The alternatives satisfy conservation objectives, establish harvest guidelines, and satisfy the Council's proposed management objective to account for all groundfish fishing mortality. Annual changes in harvest guidelines have become expected and routine and it is inappropriate to use emergency rule-making procedures and inefficient to amend the plan annually for anticipated revision of harvest guidelines.

The alternatives presented are thus an accounting stance and as such make no allocation of harvest to specific gear groups (other than that contained in Amendment 14).

### 3.1 The Management Problem

Under the existing plan, specific optimum yields (OYs) are established for every groundfish species or species group being managed by the plan. Due to changes in stock status, most OYs have to be adjusted on an annual basis. Development of a domestic groundfish fishery and expansion of joint ventures also require considerations in establishing OYs for the domestic and joint venture fleets. Under the current plan actual setting of OYs require a plan amendment and may take 11 months or longer to implement. Emergency action has been required to have the most current OYs in effect when fisheries begin. To provide the administrative flexibility to set quotas on an annual basis, the Council directed the Gulf of Alaska plan team to develop management framework alternatives that would address this problem. In addition, they requested that the new framework measures encompass the Council's Gulf of Alaska revised groundfish management objectives where possible.

Specific OYs place two constraints on fishery management. One is that the amount, species, or area of a harvest guideline can be temporarily adjusted with an emergency rule but cannot otherwise be adjusted without a plan amendment. The other constraint is that DAP, JVP, and TALFF must be defined by species and area and, therefore, the allocation options available are severely limited.

The former constraint has resulted in the plan being amended eight times to adjust harvest guidelines in response to changes in the status of stocks and the other determinants of the appropriate harvest guidelines. It has also resulted in the repeated use of emergency rules to enact harvest guidelines at the beginning of the new fishing year. Emergency rules are intended to be used to implement temporary solutions to unanticipated management problems. Annual adjustments to harvest guidelines are not unanticipated; therefore, it is inappropriate to use emergency rules for such adjustments. The second constraint has not resulted in repeated plan amendments and the associated

emergency rules, but it will prevent the attainment of the plan's proposed principal management goal and Objective 3.

If it is assumed that the first constraint affects the cost of adjusting harvest guidelines but not the actual harvest guidelines, the magnitude of this problem is determined by the additional administrative cost associated with not having an efficient procedure for adjusting harvest guidelines in response to changes in the fishery.

The magnitude of the problem associated with the second constraint is determined by the net loss resulting from the additional groundfish discards that result. Because this loss will be dependent on a large number of factors, including the actual management measures that are implemented, the loss is difficult to estimate, although a hypothetical example is provided in Section 3.2.

## 3.2 The Alternatives

The alternatives to the status quo described in some detail and analyzed below are two framework procedures that specify a single OY as a range for the groundfish complex and permit harvest guidelines to be adjusted within the OY range without an emergency rule or amendment.

A. Do nothing - status quo. Each species or species group has an OY specified. If, in the current fishing year, the level of overall fishing mortality is to change from that level the regulations must be amended via emergency rule.

B. Alternative 1: Establish an overall harvest framework procedure which accounts for total fishing mortality of the groundfish resource and provides a procedure for adjusting individual quotas (TAC) on an annual basis.

A framework procedure has been developed whereby the Council can set harvest levels and specify a total allowable catch limit (TAC) for each groundfish fishery on an annual basis. The framework procedure is best illustrated as a flow diagram presented in Figure 3.1. The procedure consists of three steps:

(1) Setting a fishing mortality guideline (FMG) for each species or species group by area as a limit on total fishing mortality, where total fishing mortality for a species consists of removal due to commercial groundfish fisheries that either target on that species (target mortality) or take it as bycatch (bycatch mortality) and removals due to all other fisheries (other fishing mortality).

(2) Establishing quota measures (TACs) designed to prevent the FMGs from being exceeded.

(3) Summing retainable catch allowed under 2 (TAC) for all groundfish excluding nonspecified species to assure that the sum is within the OY range specified in the FMP.

An OY range for the Gulf of Alaska groundfish resources has been determined based on historical fishery performance. A base period of 1965 to 1985 was

Figure 3.1. Overall harvest framework for management of groundfish in the Gulf of Alaska (Alternatives 1 and 2).

| NMFS Region | | Plan Team | | | SSC | | | AP | Public |
|---|---|---|---|---|---|---|---|---|---|
| DAP | JVP | ABC | FMG | TAC | ABC | FMG | TAC | TAC | TAC |

COUNCIL

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| STEP 1 (Mortality accounting) | FMG | = | TM | + | BM | + | OFM (for each managed species) |
| STEP 2 (Catch accounting) | TC | = | TAC* (DAP, JVP, TALFF) | + | OFC | | (for each managed species) |
| STEP 3 (Comparison with OY range) | 115,000 mt | __ | TAC | __ | 810,000 mt | | (Alternative 1) |
| | 115,000 mt | __ | TGFM | __ | 810,000 mt | | (Alternative 2) |

where FMG = fisheries mortality guideline; TM = target mortality; BM = bycatch mortality; OFM = other fishing mortality; TGFM = total groundfish fishing mortality; TC = total catch (all sources); TAC = total allowable catch; OFC = other fishing catch

*Established by the Council--for fully utilized species amounts may be retainable or prohibited for JVP or TALFF.

selected since the 21 years encompasses all recent fishing trends and accounts for potentially large harvests of both Pacific ocean perch and pollock. A summation of all historical commercial groundfish species' highest harvest during the period 1965 to 1985 provides an upper limit to the range of 810,000 mt (Table 3.1). The lower end of the range is 115,000 mt, the lowest observed catch during the 21-year period.

C. Alternative 2: Establish an overall harvest framework procedure which accounts for total fishing mortality of the groundfish resource and provides a procedure for adjusting individual quotas (TAC) on an annual basis. Mortality shall be explicitly accounted for at the end of the fishing year.

This alternative is very similar to the procedure described in Alternative 1. The Council will determine a fishing mortality guideline (FMG) for each species or species group being managed by the plan. Under both alternatives it is intended that guidelines not be exceeded. Similarly, total allowable catches (TAC) will be set for the fishing year based on a predicted fishing mortality. The DAP, JVP, and TALFF apportionments are also defined for the Gulf as a whole with specific allocations to each by species and area.

Alternative 2 differs by explicitly accounting for all groundfish fishing mortality at the end of the fishing year. Under Alternative 1 predictions of fishing mortality are used in setting quotas with the sum of TACs (which itself is a predicted retainable harvest) compared to the 115,000-810,000 mt OY range. Alternative 2 uses the same approach in setting quotas, but, at the end of the year, requires an analysis where actual fishing mortality (FM) is computed for each groundfish species being managed, then summed for all species and areas to produce a total groundfish fishing mortality (TGFM). The TGFM is then compared to the OY range. The average TGFM for each three-year period (the three-year periods would be 1987-89, 1990-92, etc.) shall not exceed the upper end of the OY range, and the measures that are established to control TGFM shall permit TGFM to at least reach the lower end of the OY range.

With Alternative 1, TACs are estimated before the season starts, and with Alternative 2, all fishing mortality is counted once it has occurred. Since the final accounting is at the end of the fishing year with Alternative 2, the comparison to OY must be for a period longer than one year.

The Framework Procedure for Alternative 1 and Alternative 2.

The timing of actions to be taken under Alternative 1 and Alternative 2 in establishing total allowable catch (TAC) and an overall harvest guideline for comparison with the OY range is as follows:

(1) September. The plan team prepares a draft Resource Assessment Document (RAD) which establishes preliminary TACs for all managed groundfish species. TACs will be specified for DAP, JVP, and TALFF. Each TAC may be apportioned among the regulatory areas and districts of the Gulf of Alaska.

(2) September Council meeting. Council will approve preliminary TACs and release RAD for 30-day public review.

Table 3.1 Historical annual groundfish catch, weight and value, in the Gulf of Alaska (in metric tons), 1965-1985.

| | SPECIES Landings, mt | | | | | | | Exvessel Value[1/] ($1,000,000s) |
|---|---|---|---|---|---|---|---|---|
| Year | Pollock | Cod | Sablefish | Rockfish | Flatfish | Atka mackerel | TOTAL | |
| 1965 | 2,746 | 583 | 3,458 | 382,481 | 4,697 | 0 | 393,965 | 282.0 |
| 1966 | 8,940 | 459 | 5,178 | 148,439 | 4,928 | 0 | 167,944 | 116.4 |
| 1967 | 6,432 | 2,154 | 6,143 | 112,741 | 4,506 | 0 | 131,976 | 92.0 |
| 1968 | 6,168 | 1,046 | 15,049 | 108,594 | 3,468 | 0 | 134,325 | 100.2 |
| 1969 | 17,914 | 1,357 | 19,375 | 79,238 | 2,676 | 0 | 120,560 | 86.2 |
| 1970 | 15,970 | 1,830 | 25,694 | 63,674 | 3,859 | 7,281 | 118,308 | 83.5 |
| 1971 | 9,458 | 703 | 25,542 | 77,985 | 2,365 | 0 | 116,053 | 92.1 |
| 1972 | 34,166 | 3,572 | 36,453 | 77,564 | 8,942 | 6,282 | 166,979 | 111.9 |
| 1973 | 36,989 | 5,548 | 27,487 | 61,414 | 19,566 | 9,494 | 160,498 | 91.9 |
| 1974 | 61,474 | 5,353 | 28,006 | 61,193 | 9,733 | 17,531 | 183,290 | 93.2 |
| 1975 | 53,568 | 5,985 | 26,094 | 58,908 | 5,487 | 27,776 | 177,818 | 87.1 |
| 1976 | 79,526 | 7,089 | 27,733 | 56,983 | 6,092 | 15,539 | 192,962 | 91.8 |
| 1977 | 118,062 | 2,261 | 17,135 | 23,729 | 16,724 | 19,455 | 197,366 | 60.1 |
| 1978 | 97,405 | 12,167 | 8,875 | 10,198 | 15,180 | 19,586 | 163,411 | 39.0 |
| 1979 | 105,783 | 14,872 | 10,352 | 11,489 | 13,922 | 10,959 | 167,377 | 43.4 |
| 1980 | 115,037 | 35,327 | 8,509 | 16,088 | 15,889 | 13,166 | 204,016 | 51.6 |
| 1981 | 147,743 | 36,086 | 9,917 | 18,214 | 12,532 | 18,727 | 243,219 | 58.6 |
| 1982 | 168,746 | 29,380 | 8,557 | 10,731 | 7,729 | 6,760 | 231,903 | 51.2 |
| 1983 | 215,608 | 36,401 | 9,002 | 10,557 | 12,661 | 12,260 | 296,489 | 61.0 |
| 1984 | 306,610 | 22,848 | 10,057 | 6,153 | 6,683 | 1,152 | 353,503 | 66.1 |
| 1985 | 291,489 | 14,442 | 11,887 | 3,221 | 3,369 | 1,848 | 326,256 | 61.3 |

| SUMMARY: | Catch Range | | | | | | Value Range: | |
|---|---|---|---|---|---|---|---|---|
| Min. (1965-1985) | 2,746 | 459 | 3,458 | 3,221 | 2,365 | 0 | 116,053 | 39.0 |
| Max. (1965-1985) | 306,610 | 36,401 | 36,453 | 382,481 | 19,566 | 27,776 | 393,965 | 282.0 |
| Mean (1965-1985) | 90,468 | 11,403 | 16,214 | 66,647 | 8,619 | 8,944 | 202,296 | 87.2 |
| (1976-1985) | 164,601 | 21,087 | 12,202 | 16,736 | 11,078 | 11,945 | 237,650 | 58.2 |
| (1981-1985) | 226,039 | 27,831 | 9,884 | 9,775 | 8,595 | 8,149 | 290,274 | 59.6 |

Total of annual minimums: 12,249 Total of annual maximums: 809,296

1/ Computed using 1986 exvessel domestic prices (PacFIN).

Source: Lynde, Marcel. 1986. The historical annotated landings database documentation of annual harvest of groundfish from the Northeast Pacific and E. Bering Sea, 1956-1980. NOAA Technical Mem., NMFS F/NWC-103.

(3) October 1. As soon as practicable after October 1 the Secretary, after consultation with the Council, will publish a rule-related notice in the FEDERAL REGISTER specifying the proposed TACs for DAP, JVP, and TALFF. Public comments on the proposed TAC will be accepted by the Secretary for 30 days after the notice is published.

(4) November. Plan team prepares final RAD.

(5) December Council meeting. Council reviews public comments, takes public testimony and makes final decisions on annual TAC limits.

(6) December 15. Secretary will publish rule-related notice of final TAC limits in FEDERAL REGISTER.

(7) January 1. Annual TAC limits take effect for the current fishing year.

The Resource Assessment Document (RAD) will contain the following information:

(1) Current status of Gulf of Alaska Groundfish resources, by major species or species group.

(2) Estimates of equilibrium yield (EY), constant exploitation yield (CEY), and maximum sustainable yield (MSY).

(3) Estimates of groundfish species mortality from nongroundfish fisheries, subsistence fisheries, and recreational fisheries.

(4) Catch statistics (landings and value) for the current year.

(5) The projected responses of stocks and the fisheries to alternative levels of fishing mortality.

(6) Any relevant information relating to changes in groundfish markets.

(7) Plan team recommendations for fishery mortality guidelines (FMG) and total allowable catch (TAC) by species or species group.

(8) Any other biological or economic information which is useful in determining FMGs and TACs.

The process is initiated by the PT and Scientific and Statistical Committee (SSC) making recommendations with respect to the FMGs and the quota measures that will tend to prevent the FMGs from being exceeded and keep the sum of retainable catch within the OY range.

The FMGs are, therefore, similar to single species OYs in that their development is not assumed to be based on only biological information and are not comparable to the ABCs developed under the current FMP.

The Council will use:

(1) recommendations of the plan team and SSC and information presented by the PT and SSC in support of these recommendations;

(2) information presented by the AP and the public; and

(3) other relevant information,

to develop its own preliminary recommendations.

It should be noted that with Alternative 1 and Alternative 2 the attainment of a TAC for a species is intended to close the target fishery for a species. Under the status quo further harvest of the species would be prohibited; although, under the status quo, the Regional Director may choose to close certain fisheries in certain areas.

With the exception of the "other species" management category, the framework procedure described above is used to determine TACs for every groundfish species and species group managed by the plan. Groundfish that support their own fishery, and for which a sufficient data base exists that allows each to be managed on the basis of its own biological, social, economic, and ecological merits, are called "target species". Groundfish species that are not specified as a target species are collectively grouped in the "other species" category. These species currently are of slight economic value and are generally not targeted upon. This category, however, contains species with economic potential or which have importance to the ecosystem, but which lack sufficient data to allow separate management. Accordingly, a single TAC, equal to 5% of the combined TACs for target species shall apply to this category. Records of catch of this category must be maintained.

All other species of fish and invertebrates taken incidentally that are not managed by other FMPs and are associated with groundfish fisheries, are designated as "nonspecified species" and catch records need not be kept.

## 3.3 Environmental Impacts of the Alternatives

A. Do nothing - status quo alternative.

Under the status quo alternative, underharvesting or overharvesting groundfish stocks technically could occur if fisheries were closed only on the basis of quotas specified in the regulations. For instance, a quota may be lower than an amount that would otherwise be acceptable, but current regulations would require the fishery to be closed, which would result in underharvesting a stock. Or a quota may be higher than an amount that a stock would support, but current regulations would allow the fishery to continue, which would result in overharvesting a stock, unless it were closed by some other means. The effects of underharvesting groundfish stocks would result in larger numbers of groundfish species remaining in the ecosystem. More groundfish, therefore, would be in the system to prey on other fish and invertebrates. In turn, more groundfish would be available to be preyed on by marine predators, including marine mammals and birds. Predator/prey relations could change, depending on the importance of the underharvested species as a predator or a prey. Less nutrients in the form of processing wastes would be dumped into the system to be consumed by various marine life as a result of less fishing activity. The effects of overharvesting groundfish stocks would result in smaller numbers of a groundfish species remaining in the ecosystem. Fewer groundfish, therefore, would be in the system to prey on other fish and invertebrates. In turn, fewer groundfish would be available to be preyed on

by marine predators, including marine mammals and birds. Again, predator-prey relations could change, depending on the importance of the overharvested species as a predator or a prey. Initially, more nutrients in the form of processing wastes would be dumped into the system to be consumed by various marine life as a result of fishing activity. Eventually, fishing would cease when fishermen were not able to receive a reasonable economic return from the overexploited species. Actual environmental impacts on the ecosystem are difficult to measure but are believed to be insignificant when compared with natural perturbations in the system.

Under current regulations, species for which the quota has been reached must be treated as prohibited species and discarded at sea while harvesting other groundfish species for which a quota remains. However, such continued fishing would be unlawful should further incidental catches of the fully harvested groundfish species cause that species to be overfished within the meaning of the national standard guidelines. The Secretary must make a finding that overfishing shall not occur before he allows other target fisheries to continue. Because the additional mortality suffered by such prohibited species would not be accounted for, overharvesting of that species with the resulting above environmental impacts on the ecosystem are possible. Again, such impacts are believed to be insignificant when compared with natural perturbations in the system.

B. Alternative 1.

Alternative 1 is superior to the status quo alternative, because quotas may be adjusted efficiently on an annual basis using a rule-related notice procedure rather than a plan amendment. Both retainable and/or nonretainable quotas (TACs, PSCs) may be specified for each species being managed by the plan. Compared to the status quo alternative, the authority to provide "buffer" amounts of all species including sablefish will tend to prevent exceeding the FMG estimates for groundfish, thereby reducing the risk of overharvesting while still providing reasonable amounts of groundfish for bycatch purposes. Environmental impacts will be less, because less oscillation in predator/prey relationships will occur. A balanced number of groundfish species will be left in the system to consume prey, and in turn to be preyed on by other marine life. Amounts of nutrients from fish wastes dumped into the sea from processing operations would be less than would occur due to overharvesting a species. Therefore, less nutrients would be available to marine life. Eventually such marine life would adjust to lower amounts of nutrients as the system tended toward equilibrium. Actual environmental impacts on the ecosystem are difficult to measure but are believed to be insignificant when compared with natural perturbations in the system. The framework also requires that the intended retainable catches (TACs) for the Gulf groundfish complex as a whole be compared to an historical OY range for purposes of management evaluation. To the extent that preventing overharvesting of any species prevents overfishing of that species within the meaning of the national standard guidelines, this alternative is considered superior to the status quo alternative.

Also, this alternative provides the mechanism for an accounting of groundfish mortality and catches. Estimates of mortality attributed to directed and incidental catches of groundfish will be taken into account when evaluating status of stocks information and setting quotas. As a result, managers will be more knowledgeable of the environmental impacts of fisheries in the Gulf of Alaska and will be required to consider mortality estimates when developing management programs. Such management will decrease the probability of overharvesting groundfish resources in the Gulf of Alaska.

C. Alternative 2.

Alternative 2, shares all the environmental benefits described above as well as provide more accurate fishing mortality estimates and TAC/OY evaluations. It is more accurate because in addition to the preseason setting of harvest and bycatch quotas, the framework requires a postseason review of actual harvests and estimated mortality. The postseason estimates of TAC, PSC and FMG lead to a total groundfish fishing mortality estimate (TGFM) for the Gulf groundfish complex as a whole, which is then compared to the specified OY range. Alternative 2 differs from Alternative 1 in that actual mortality, as opposed to predicted catches are formally used in the OY comparison and in preseason adjustments of harvest quotas in subsequent years. Since this framework requires a review after fishing has occurred, should the Council discover that the TGFM exceeded the upper end of the OY range, a three year provision is provided to allow the Council to ensure that the average fishing mortality over the three years does not exceed the OY range. For completeness, this three-year provision is considered important to the framework since it is likely that on occasion actual harvests and mortality will exceed the preseason TACs and FMGs set by the Council. However, with the proposed OY range it is doubtful the the upper end will be exceeded. This alternative is superior to the status quo alternative to the extent that preventing overharvesting of any species prevents overfishing.

## 4.0 DESCRIPTION OF MANAGEMENT PROBLEM 2 AND ENVIRONMENTAL IMPACTS OF THE PROPOSED ALTERNATIVE SOLUTIONS: INADEQUATE REPORTING REQUIREMENTS

### 4.1 The Management Problem

Amendment 14 to the FMP (50 CFR 43193, October 24, 1985) included a reporting requirement that was applicable to any catcher/processor and mothership/processor vessel that freezes or dry-salts any part of its catch on board that vessel and retains that fish at sea for a period of more than 14 days from the time it is caught, or who receives groundfish at sea from a domestic fishing vessel and retains that catch for a period of more than 14 days from the time it is received. Any such vessel must submit to the Regional Director, Alaska Region, NMFS a weekly catch or receipt report for each weekly period, Sunday through Saturday during which groundfish were caught or received at sea. The Secretary had approved this regulation at the Council's recommendation to aid management agencies in the inseason monitoring of groundfish catches. Such reports were needed by these agencies because the large amounts of catches that might be onboard catcher/processor and mothership/processor vessels may not otherwise be reported for weeks or months. Without such reports, management agencies risked closing fisheries based on incomplete and unsatisfactory information that might cause either underharvesting or overharvesting of groundfish stocks. Some of the same vessels, however, have been returning to port to sell or deliver their catches to shorebased processors. The vessel operator, or at his request, the purchaser, must complete and submit a fish ticket to the Alaska Department of Fish and Game (ADF&G) within one week of such sale or delivery.

Because the same catcher/processor or mothership/processor vessels may sometimes submit catch reports to the Regional Director and sometimes fish tickets to the ADF&G, some double accounting has taken place which makes monitoring of the fishery more difficult for management agencies that must spend more time to resolve this problem. Also, when these vessels land their catches within the 14-day period such that reports of landings via the fish ticket system is required, the receipt of the catch information is sometimes late due to delay in the mail system or delay by the vessel operators or purchasers in submitting the tickets. One fishery--the sablefish fishery--is currently prosecuted within a relatively short time period with hook-and-line, trawl, and pot gear. For example, the 1986 hook-and-line fishery for sablefish in the Southeast Outside and West Yakutat Districts was completed in just 17 days. The catching capacity of the efficient catcher/processor vessels engaged in this fishery can harvest large amounts of the quota and remain sea for long periods. Such vessels that remain at sea for more than 14 days fall under the weekly report requirement. That reporting system functioned reasonably well in 1986.

### 4.2 The Alternatives

A. Do nothing - status quo alternative.

Vessels currently are required to report their landings via fish tickets to the Alaska Department of Fish and Game. Catcher/processor and mothership/processor vessels (defined as those vessels that salt or freeze their catch at sea) are required to file weekly reports with NMFS if their trip length exceeds 14 days. Those catcher/processors that land fish in 14 days or less

are not required to submit a report to the Regional Director but must report to the Alaska Department of Fish and Game within seven days.

B. Alternative 1.

Under this alternative, any domestic catcher/processor vessel that freezes or dry-salts any part of its catch on board that vessel, or which delivers any part of its catch to a domestic mothership/processor where it is retained at sea for any time period, would be required to report its catches for each Sunday through Saturday period regardless of how many days it had been fishing. The reports would be required even though that vessel had reported its catch through the State of Alaska's fish ticket system. No double accounting would be possible, because catches would be tabulated from just one source--the weekly report. Ease of monitoring the fishery inseason would increase and management decisions made during the course of the fisheries would be more accurate.

C. Alternative 2.

This is identical to Alternative 1 with an additional stipulation which requires that any vessel which must fill out an Alaska Department of Fish and Game fish ticket shall include the sale price in the appropriate place on the ticket. If the price is not known at that time, the fisherman shall provide NMFS-Juneau Regional Office with that information within two weeks of the sale of the product. If the product is frozen or salted on board, then the price shall be product form specific. For those vessels who are not required to fill out a fish ticket (e.g. catcher/processors who unload their catch outside of three miles) they shall provide price by weight and by product form to NMFS-Juneau Regional Office within two weeks after the product is first sold. U.S. companies representing joint ventures shall provide NMFS-Juneau Regional Office with prices paid to U.S. catcher vessels, by species, before August 1 of the year in which those prices are in effect.

4.3 Environmental Impacts of the Alternatives

A. Do nothing - status quo alternative.

Under the status quo alternative, operators of catcher/processor and mothership/processor vessels would only be required to report if they did not make deliveries within 14 days or less. Accurate inseason management would continue to be jeopardized by double accounting of catches. Management decisions made to open or close fisheries may be erroneous, resulting in possible under- or overharvesting of groundfish stocks. In some fisheries which proceed rapidly, e.g. the hook-and-line fishery for sablefish, real time management would be jeopardized if large quantities of fish that catcher/processor and mothership/processor vessels may have on board are not reported timely. Recent experience has shown that the sablefish hook-and-line fleet can harvest 200 mt or more per day. If only a few hundred tons is left in a quota, then the risk of overharvesting a quota is increased. As a result of overharvesting the quota, the balanced predator/prey relationship in the food web would be more disturbed as a result of increased fishery-related disturbances, because the numbers of sablefish remaining in the system would not be in equilibrium with those removed by fishing mortality. Fewer numbers of other living marine species would be preyed on by the groundfish species

remaining in the system. In turn, fewer numbers of the groundfish species would be preyed on by other predators. Overharvesting groundfish species would initially result in increased amounts of nutrients introduced into the system from processing waste but eventually smaller amounts of nutrients would be introduced as fishing slows when fishermen are no longer able to make a reasonable return from the fishery. These impacts are difficult to quantify but are considered to be insignificant when compared to naturally occurring perturbations that occur in the environment. To avoid overharvesting a stock, managers may close a fishery on the basis of estimates that result in substantial underharvests. Underharvesting the quota would also disturb the balanced predator-prey relationship in the food web because the numbers of groundfish remaining in the system would not be in equilibrium with those removed by fishing mortality. Larger numbers of other living marine species would be preyed on by the groundfish species remaining in the system. In turn, larger numbers of the groundfish species would be preyed on by other predators. Underharvesting groundfish species possibly could result in increased amounts of nutrients being introduced into the system from processing waste as fishing pressure increases to utilize surplus natural groundfish production.

B. Alternative 1.

Under Alternative 1, operators of catcher/processor and mothership/processor vessels would be required to report their catches regardless of the number of days they had fished even though their catches had been reported by fish tickets. This alternative is superior to the status quo alternative, because inseason management would no longer be jeopardized by double accounting of catches. Management decisions to open or close fisheries would be made on the best available data. Risks of underharvesting or overharvesting groundfish stocks and the associated impacts of such actions described above for the status quo alternative could be reduced.

C. Alternative 2.

The environmental benefits of this alternative are identical to Alternative 1. This alternative only differs from Alternative 1 by requiring sale price information which is required by management so as to more fully analyze and consider economic factors in their management of this resource.

## 5.0 DESCRIPTION OF MANAGEMENT PROBLEM 3 AND ENVIRONMENTAL IMPACTS OF THE PROPOSED ALTERNATIVE SOLUTIONS: KING CRAB BYCATCH IN KODIAK BOTTOM TRAWL GROUNDFISH FISHERIES

### 5.1 The Management Problem

The number of red king crab in the waters around Kodiak Island are at historically low levels, with most being old, sexually mature animals. There has been no sign of significant recruitment in seven years. As a result, the Kodiak commercial king crab fishery has been closed since 1983 in an attempt to rebuild the stocks. During this same period a developing domestic groundfish fishery using a variety of gear has displaced most foreign fisheries. While the cause for the decline of king crab is not known, most researchers believe that the decline can be attributed to a variety of environmental factors which independently or in combination led to the depressed condition of the resource. Whether the king crab decline is due in part to commercial fishing, either directed or incidental, is unknown.

King crab are known to concentrate in certain areas around Kodiak Island during the year. In the spring they migrate inshore to molt and mate. Approximately 70% of the female red king crab stocks are estimated to congregate in two areas, known as the Alitak/Towers and Marmot Flats. The Chirikof Island and Barnabus areas also possess concentrations of king crab but in lesser amounts. Past studies have shown that most king crab around Kodiak mate and molt in the March-May period, although some molting crab can be found during late-January through mid-June. Adult female king crabs must molt to mate and extrude eggs. After molting, their exoskeleton (shell) is soft, and crabs in this stage are known as soft-shell crabs. The new exoskeletons take 2-3 months to harden fully. During the soft-shell period, the crabs are particularly susceptible to injury and mortality from handling and from encounters with fishing gear. Because many of the present and potential groundfish trawling grounds overlap with the mating grounds of king crab, the potential exists for substantial king crab mortality.

While it is generally assumed that king crab mortality during the soft-shell phase can be high with any gear type, incidental mortality of hard-shell crab as a result of encounters with fishing gear is not known. Trawl fishing can kill or injure king crab in two ways. First, crabs caught in the net can be crushed during the tow or injured (often fatally) as the catch is unloaded in the fishing vessel. Recent observer studies estimate that about 70% of the crabs caught by bottom trawls in the Bering Sea are killed. Second, crabs might be struck with parts of the gear (e.g., trawl doors, towing cables, groundlines, roller gear) as the trawl is towed along the bottom.

In January 1986, the Council approved an emergency rule to close specified areas around Kodiak Island to bottom trawling while king crab were in their soft-shell condition. This action was believed necessary due to the severely depressed Kodiak king crab stocks. The stocks have experienced little or no recruitment in recent years, and are likely subject to high mortalities to bottom trawls while in the soft shell condition. The emergency rule expired on June 15, 1986, when the soft shell period is believed to end. The Council action was intended to help rebuild the Kodiak king crab resource while still

providing bottom trawl opportunities for groundfish fishermen. The action was to be an interim measure until a longer-term solution could be developed.

In an attempt to allow industry to negotiate a solution to its problems, an industry workgroup was assembled at the request of the Council to review recent actions taken by federal and state management agencies and to develop a long-term solution that would meet the needs of all interested fishing industry groups. Supporting the workgroup were fishery scientists and managers who presented the latest biological and fishery information on the status of the king crab stocks and on areas where commercial fishing operations for groundfish, crab and shrimp are conducted. The workgroup developed a management alternative which is described under Alternative 1.

## 5.2 The Alternatives

A. Do nothing - status quo.

Under this option, there would be no specific control of king crab bycatch in the Gulf of Alaska groundfish fisheries. The PSC framework for halibut established by Amendment 14 remains in effect (50 CFR 672.20e). The retention of halibut, salmon, and king and Tanner crab, are prohibited in all domestic, joint venture, and foreign groundfish fisheries.

B. Alternative 1: Establish a time/area closure scheme for bottom trawling to help rebuild the Kodiak king crab resource as shown in Figure 5.1 and Table 5.1.

This alternative was developed by the industry workgroup and proposes establishing an area designation system with specific time/area closures. The area designations and management actions are as follows:

Table 5.1 Definitions of King Crab Bycatch Areas

| Area Type | Name and Definition |
|---|---|
| 1 | Rebuilding Areas (where crab concentrations are high)<br><br>Closed year round to bottom trawl only. Other gear allowed during open season. |
| 2 | Restricted Fishing Areas (where crab are found, but in less amounts; does not qualify as Type 1 area).<br><br>Closed during soft-shell period (February 15-June 15); limited fisheries allowed (with or without observers; close area or move when bycatch is high). |
| 3 | Unrestricted Fishing Areas (few or no king crab; all gear allowed during open season). |

Areas designated as either Type 1 or 2 are shown in Figure 5.1.

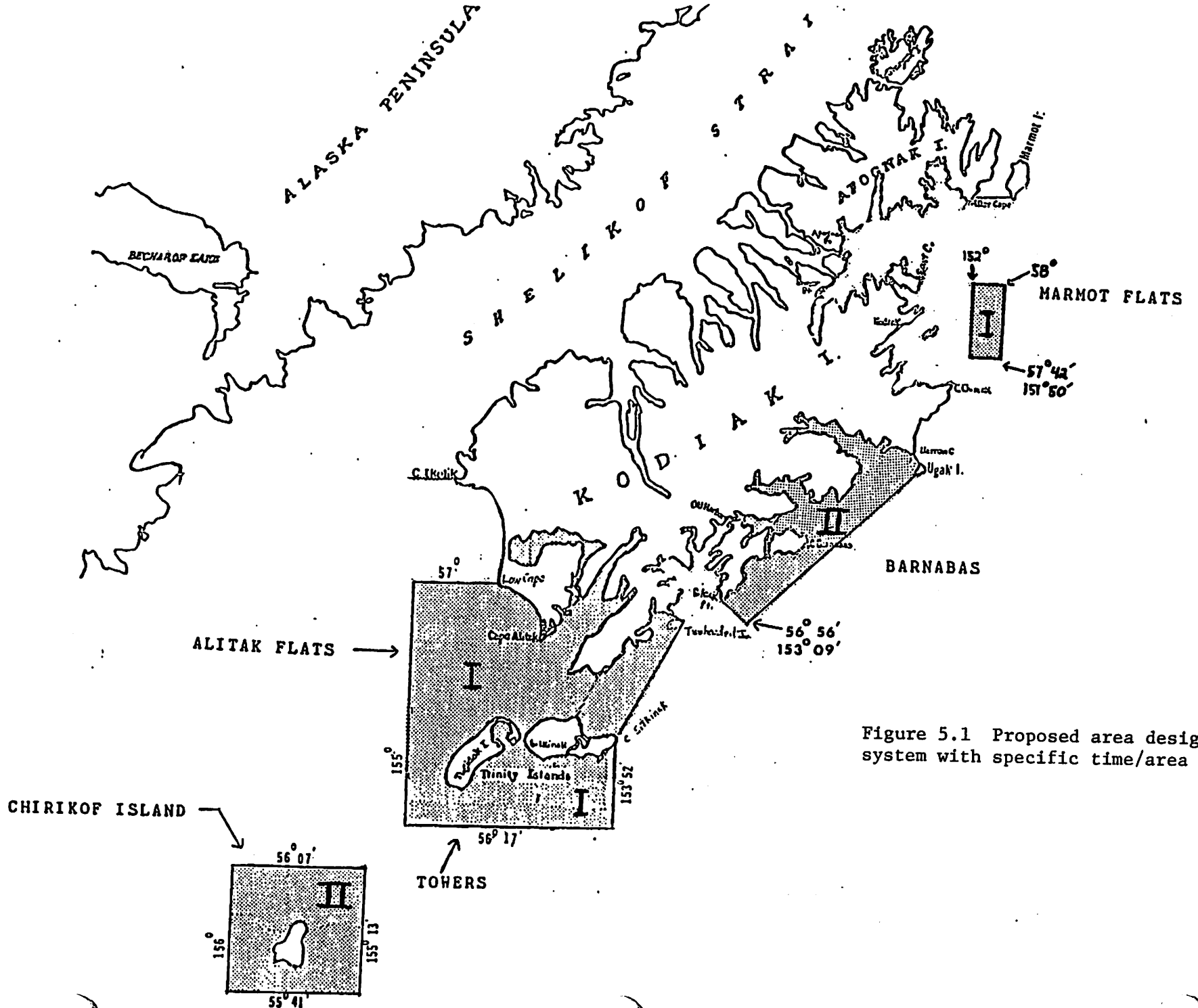


Figure 5.1 Proposed area designation system with specific time/area closures.

In developing this alternative, the industry workgroup recognized that the future of the king crab resource is dependent on the ability of existing brood stock to successfully produce crab. Scientific data shows that Alternative 1 provides protection to 85% of the Kodiak red king crab stocks, protects the most highly concentrated crab areas all year round, yet provides for groundfish fishing opportunities necessary to support the economic base of Kodiak communities. The workgroup also recognizes that once areas have been closed to fishing, there is often a reluctance to open those areas even when circumstances may have changed. Therefore, the time/area closure scheme presented in Alternative 1 will be in effect for three years from the year of implementation. At that time the Council will review the situation, the status of the king crab resource, the apparent effectiveness of the time/area closures, etc. to determine whether this approach to the king crab bycatch problem should be continued, abandoned, or replaced with a new alternative.

## 5.3 Environmental Impacts of the Alternatives

A. Do nothing - status quo alternative.

With this option, no specific management measure would be implemented in this plan for the control of king crab bycatch in the bottom trawl groundfish fisheries. Incidental catches and subsequent mortalities would continue wherever concentrations of king crab occur, and at all times of the year when bottom trawling is conducted. This alternative does not afford any protection to the king crab resource nor does it address the needs described in the problem statement. The condition of king crab likely would remain depressed. Fewer king crab in the system would be present as a prey species for predators. Known predators include halibut, Pacific cod, and sculpins that feed on juvenile king crab; herring and capelin feed on larval king crab.

Predators also include marine mammals. Interaction between king crab and marine mammals is generally minimal. Exceptions are interactions with bearded seals and sea otters. Unlike most seals that are pelagic feeders, the bearded seal is a benthic feeder consuming king crab which are generally smaller than commercial size. Although direct competition with the commercial fishery is avoided, future commercial harvests might be smaller as a result of juvenile king crab being consumed by the bearded seal. The sea otter feeds on any size of king crab, including commercial sized crab. The sea otter is also a benthic feeder and regularly dive to 30 fathoms in search of food and have been recorded at depths as great as 50 fathoms. A potential exists for conflict between crab fishermen and sea otters when crab pots are set in relatively shallow water near shore, because sea otters may enter crab pots and drown. The occurrence of such sea otter mortality is believed to be rare. No documentation exists on the importance of king crab in the sea otter diet.

Also under this alternative, fewer king crab would be in the system to feed on other marine life. King crab are bottom foragers, feeding on a wide range of food items, including dead organisms. Crab larvae feed on sponges, hydroids, and algae during the transition to their demersal mode of life. Brittle stars are an important food item for newly molted king crab. King crab also feed on mollusks, polychaete worms, isopods, young Tanner crab, other star fish, and sea urchins. With fewer king crab, more of these organisms would be available for consumption by other organisms.

Commercial fishing for groundfish would be conducted in the areas proposed to be closed or restricted described above for Alternative 1. Groundfish will thus be removed from the system, which otherwise would have contributed to the current food web in these areas. The predator/prey relationships that exist in local areas and the food web that have adjusted to the low abundance of king crab and current level of groundfish fishing would remain the same. The overall environmental impacts of this alternative compared with the Alternative 1 are not well understood but are believed to be insignificant compared to natural perturbations in the environment.

B. Alternative 1: Establish a time/area closure scheme for bottom trawling to help rebuild the Kodiak king crab resource as shown in Figure 5.1 and Table 5.1.

Adoption of this alternative would provide the positive benefits of protecting the majority (85%) of Kodiak Island king crab resource from bottom trawls during their soft-shell period (February 15-June 15), protect the most concentrated king crab areas, or 70% of the existing resource year round, while still providing bottom trawl fishing opportunities close to established processing and support facilities. Injury or mortality as a result of bottom trawling would be reduced.

Compared to the status quo alternative, Alternative 1 would increase the probability of a king crab population recovery while minimizing the impacts on the groundfish bottom trawl industry. A review of 1985 bottom trawl groundfish harvests indicate that only 1% of the harvest would have been lost if the time/area closures had been in effect. It is likely that the foregone groundfish catch consisting of sablefish, Pacific cod, and flounder would have been taken from other areas around Kodiak Island. More king crab would be in the system as the stocks recover. The balanced predator/prey relationship in the closed or restricted areas would change. More king crab would consume prey species that otherwise may have been consumed by other species. In turn, more king crab will be available to be preyed on by other predators, including marine mammals. Local fishing mortality would be reduced as groundfish fishing is closed or restricted. Fewer or no groundfish would thus be removed from the system, which would then contribute to the current food web in these areas. The balanced predator/prey relationships that exist in local areas and the food web that has adjusted to the low abundance of king crab and current level of groundfish fishing would change. The overall environmental impacts of this alternative compared with the status quo alternative are not well understood but are believed to be insignificant compared to natural perturbations in the environment.

## 6.0 DESCRIPTION OF MANAGEMENT PROBLEM 3 AND ENVIRONMENTAL IMPACTS OF THE PROPOSED ALTERNATIVE SOLUTIONS: INADEQUATE INSEASON MANAGEMENT AUTHORITY

### 6.1 The Management Problem

The Regional Director is currently authorized by the FMP to make inseason time/area adjustments in the Gulf of Alaska groundfish fishery. These adjustments are accomplished by field orders, which are regulations published in the FEDERAL REGISTER. The FMP states that the Regional Director may issue such field orders for conservation reasons only. His adjustments are to be based on the following considerations:

(1) The effect of overall fishing effort within the area in comparison with preseason expectations.

(2) Catch per unit of effort and rate of harvest.

(3) Relative abundance of stocks within the area in comparison with preseason expectations.

(4) The proportion of halibut or crab being handled.

(5) General information on the condition of stocks within the area.

(6) Information pertaining to the optimum yield for stocks within the the statistical area.

(7) Any other factors necessary for the conservation and management of the groundfish resource.

Except for 4 above, the implementing regulations at 50 CFR Part 672.22 roughly follow the language contained in the FMP. Concerning item 4, the implementing regulation only provides for consideration of the amount of halibut, not the amount of crab. This difference may simply be an oversight when the regulations were first drafted during 1978. The implementing regulations require the Regional Director to make adjustments on the basis of a determination that: (1) the condition of any groundfish or halibut stock in any portion of the Gulf of Alaska is substantially different from the condition anticipated at the beginning of the year; and (2) such differences reasonably support the need for inseason conservation measures to protect groundfish or halibut stocks.

The FMP requires the Regional Director to compare the effect of overall fishing effort and the relative abundance of stocks with preseason expectations. Hence, the implementing regulation also requires the Regional Director to make his determination on the basis of preseason expectations of groundfish conditions. Except for the April 1 starting date for the hook-and-line and pot fishery for sablefish, the fishing year starts on January 1. Hence, preseason expectations are those that must be made during the prior fishing year.

Such limited comparisons prevent the Regional Director from using newly obtained information, which can, and often does, give him reason to make time/area adjustments. For example, results of scientific surveys often

become available during the current fishing season. The overall effects of fishing effort, when compared against the survey results, may justify continuing or stopping fishing for a certain groundfish species in a management area. Under the FMP's current regime, the Regional Director is not technically allowed to compare the effects of fishing effort against the survey results, because such results were not derived preseason.

The FMP allows the Regional Director to make time/area adjustments for conservation purposes only. NOAA has consistently interpreted conservation of groundfish resources to mean protection of those resources rather than the more classical definition of wise use. Consequently, extended fishing time to more fully utilize a certain groundfish species, perhaps as a result of reopening an area after it had been closed, is done usually with much bureaucratic difficulty. Other new information obtained inseason, which is socioeconomic in nature and important to the fishermen and the processors, should also be considered by the Regional Director when making his determination in making time/area adjustments.

6.2 The Alternatives

A. Do nothing - status quo alternative.

Under the status quo alternative, time/area adjustments would be made inseason by comparing commercial fishery data with information known at the beginning of the fishing year. These adjustments would be made for conservation reasons only.

B. Alternative 1: Authorize the Regional Director to close fisheries on the basis of all relevant information to promote fishery conservation.

Under this alternative, the Regional Director would not be constrained by the current requirement that he compare information obtained from the fishery only with information available at the beginning of the fishing year. Instead, he would be authorized to consider any relevant information. On the basis of such information, he shall close fisheries in any or part of a regulatory area, or restrict the use of any type of fishing vessel or gear, or change any previously specified TAC or PSC limit as a means of conserving the resource. Such closures must be necessary to prevent one of the following occurrences:

(1) The overfishing of any species or stock of fish.

(2) The harvest of a TAC for any groundfish, or the taking of a PSC limit for any prohibited species, the previous specification of which is plainly erroneous.

C. Alternative 2: Authorize the Regional Director to make time/area adjustments to promote fishery conservation and/or promote socioeconomic interests in the fishery on the basis of all relevant information.

This alternative is similar to Alternative 1, except that the Regional Director would be authorized to open fisheries after consultation with the Council for socioeconomic reasons, as well as close fisheries for conservation reasons. Socioeconomic factors that he may consider are (4) and (5), listed below. Using all available information, he shall open or close fisheries in

any or part of a regulatory area, or authorize the use of any type of fishing vessel or gear, or change any previously specified TAC or PSC limit as a means of conserving the resource. Such actions must be necessary to prevent one of the following occurrences:

(1) The overfishing of any species or stock of fish.

(2) The harvest of a TAC for any groundfish, or the taking of a PSC limit for any prohibited species, the previous specification of which is plainly erroneous.

(3) The closure of any fishing for groundfish based upon the harvest of a TAC or the taking of a PSC limit, the previous specification of which is plainly erroneous.

(4) The failure to harvest a TAC for any groundfish as a result of weather conditions or the availability of facilities for the processing of the groundfish.

(5) The failure to maximize the quantity or quality of roe extracted from any groundfish of which roe is a principal product.

## 6.3 Environmental Impacts of the Alternatives

### A. Status Quo Alternative.

Under the status quo alternative, managers can close fisheries for conservation reasons, by comparing information obtained from the fishery with information available at the beginning of the fishing year. If this is the best available information, then the decision to close a fishery would likely be the most rational decision. Such a closure would be made to prevent overharvesting a groundfish species, and perhaps even overfishing of that species within the meaning of the national standard guidelines. However, information may be obtained which is more recent than that available at the beginning of the fishing year. The current inseason authority prevents managers from using the new information, thus forcing an irrational decision to not close a fishery. For example, newly obtained survey information may indicate that a certain species of groundfish is depressed and that further fishing to achieve a quota might harm that species. Overharvesting a groundfish species could result. The balanced predator-prey relationship in the food web would be disturbed as a result of increased fishery-related disturbances, because the numbers of groundfish remaining in the system would not be in equilibrium with those removed by fishing mortality. Other living marine species would be preyed on by fewer numbers of groundfish remaining in the system, and predators would find fewer numbers of those groundfish to prey on. Initially, more nutrients in the form of fish wastes from the overharvested species would be discarded at sea and consumned by various marine life, but eventually the species could be reduced in abundance to a point that fishermen would not be able to make a reasonable economic return by fishing for them, and a reduced or no amount of nutrients would be discarded. These impacts are difficult to quantify but are considered to be insignificant when compared to naturally occurring perturbations that occur in the environment. As a practical matter, managers could implement an emergency rule, thus obviating the above scenario.

Thus, the impacts attributed to the status quo alternative are only theoretically true.

Because Alternative 1 differs from Alternative 2 only by the inclusion of socioeconomic factors in Alternative 2, the environmental impacts are the same for both alternatives. Under either of them managers would be authorized to consider all relevant information when making a decision to open or close a fishery for conservation or socioeconomic reasons. Accordingly, rational decisions would be made. The risk of overharvesting or underharvesting groundfish species would be reduced. The balanced predator-prey relationship in the food web would be less disturbed as a result of fishery-related disturbances, because the numbers of groundfish remaining in the system would be in equilibrium with those removed by fishing mortality. Other living marine species would be preyed on by numbers of groundfish that are in equilibrium with the system, and predators would find those numbers to prey on. No changes in the amounts of nutrients in the form of fish wastes would be discarded at sea and, therefore numbers of marine life that feed on fish wastes should reach equilibrium. These impacts are difficult to quantify but are considered to be insignificant when compared to naturally occurring perturbations that occur in the environment.

## 7.0 EFFECTS ON ENDANGERED SPECIES AND ON THE ALASKA COASTAL ZONE

None of the alternatives would constitute actions that "may affect" endangered species or their habitat within the meaning of the regulations implementing Section 7 of the Endangered Species Act of 1973. Thus, consultation procedures under Section 7 on the final actions and their alternatives will not be necessary.

Also, for the reasons discussed above, each of the alternatives would be conducted in a manner consistent, to the maximum extent practicable, with the Alaska Coastal Zone Management Program within the meaning of Section 307(c)(1) of the Coastal Zone Management Act of 1972 and its implementing regulations.

## 8.0 FINDINGS OF NO SIGNIFICANT ENVIRONMENTAL IMPACT

For the reasons discussed above, implementation of any of the alternatives would not significantly affect the quality of the human environment, and the preparation of an environmental impact statement on the final action is not required by Section 102(2)(C) of the National Environmental Policy Act or its implementing regulations.

Assistant Administrator for Fisheries, NOAA

Date

## 9. COORDINATION WITH OTHERS

The Gulf of Alaska Groundfish Plan Team consulted extensively with representatives of the Alaska Department of Fish and Game, National Marine Fisheries Service, members of the Scientific and Statistical Committee and Advisory Panel of the Council, and members of the academic and industrial community.

## 10.0 LIST OF PREPARERS

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TO: NORTH PACIFIC FISHERIES MANAGEMENT COUNCIL.

The Kodiak Longline Association is not satisfied with the conclusions of the NPFMC Trawl/Crab Workgroup. The unanimous decision which it came to regarding trawl closures reflects the make-up of the workgroup and not the industry in Kodiak. Not a single resident Kodiak Crabber, or a crabber who wasn't also involved in trawling was on this workgroup; yet half of the local trawl fleet was on the group.

Two years ago the draggers and the council killed the observer program that the Kodiak Advisory Board and ADF&G proposed to gather data on this problem. As a consequence, there is still no good data. The observer trip on DAP trawlers this last fall clearly show that J-V by-catch figures are not always similar to DAP operations. Even the basic tallying of by-catch by the Council & NMFS system is faulty. Two years ago the Council pledged in the March joint meeting with the Board of Fish to co-ordinate incidental and targeted catch statistics with ADF & G and gather more information on this problem. At this spring shellfish meeting the Council staff was presenting incidental catch statistics to the Board of Fish that were demonstrably inadequate and inaccurate. The tanner crab DAP figures given for the whole year of 1985 were nearly equaled in only two ADF & G observed trips. The halibut cap passed by the Council is worthless without a monitoring program in the DAP fisheries.

Since no program is in the offering, we need time and area closures to protect the stocks. In Kodiak the Advisory Board trawl closures protect the most important halibut nursery areas along with king crab and tanner crab, dungeness. and herring. The workgroup focused on a long term reccomendation concerning trawl closures but yet there was NO discussions on the effect these trawl closures (by the Board of Fish and NPFMC) would have on protection of other stocks, habitat, juvenile and nursery areas.

The flounder stocks in these Kodiak bays are not currently protected by any management plan. The whole Central Gulf OY of flatfish could be taken as starry flounder. There is no reason to expect a lasting shoreside industry to develope on this stock given the current management regime.

Cod fish stocks are widely distributed outside the closure areas and an increasing longline catch will insure that the fish in the closure areas will be available to shoreside processors. The potential effect on the bottom fish industry is being exaggerated. Pete Jackson of ADF & G clearly states in the attached paper that the effect of the closed areas by both the Board of Fish and NPFMC would have minimal impact upon the developing groundfish fishery.

Once again the average fishermen is seeing the Council catering to a small group of trawl fishermen while ignoring the interests of the majority and ignoring conservation concerns.

Sincerely,

Oliver N Holm

Oliver Holm, President
Kodiak Longline Association

OH/kk

cc: Ron Dearborn
Board of Fish
James Campbell, Chairman NPFMC
Kodiak Advisory Board

# Spatial and Temporal Distribution of the 1985 Groundfish Trawl Catch in the Kodiak Area

by

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## Introduction:

This report discusses the spatial and temporal distribution of 1985 trawl-caught domestic groundfish catches in the Kodiak area. The Kodiak area, for the purposes of this report, includes all waters surrounding Kodiak Island and its adjoining archipelago including Shelikof Straits. This area is encompassed by 151°00' to 156°00' W. longitude and 55°30' to 59°00' N. latitude (Figure 1). The domestic trawl catches for groundfish within this area will be discussed by species and quarterly (3 month) periods relative to the total area of consideration 1/2° x 1° latitude-longitude blocks, state as opposed to non-state waters, as well as for specified inshore waters in which the North Pacific Fisheries Management Council and the Alaska Board of Fisheries (BOF) recently prohibited on-bottom trawling during all or part of each year.

The configuration of groundfish catch reporting areas used prior to 1985 unfortunately precludes analyses of pre-1985 catches in the degree of detail as are those for 1985. An historical overview of Kodiak area domestic groundfish catches must, therefore, be based on Central Gulf of Alaska (GOA) catches as a unit - the majority of which are taken within the immediate Kodiak area as defined earlier. This overview must also be based on catches for all gear types combined rather than those for the trawl fishery only.

Catch History and Fishery Overview:

Review of Central GOA annual domestic groundfish catches since 1975 shows a progressive increase of over sixtyfold - from 204 mt in 1975 to 12,554 mt in 1985. Pacific cod has been the most intensely fished species followed by pollock, sablefish and flounder. The largest between-year increase, 131%, was seen between 1984 and 1985 (Table 1).

The combined 1985 Kodiak area trawl catch for the four primary groundfish species (pollock, Pacific cod, sablefish and flounder) was 8,245 mt. The majority (73%) of this catch was pollock, followed by Pacific cod and sablefish at 21% and 4%, respectively (Table 2). This catch is 67% of that for the Central GOA management area by all gear types combined.

Study of 1985 Kodiak area groundfish trawl catches for major species groups by 1/2° x 1° latitude/longitude blocks and quarterly time periods shows two factors of note. First, catches of the four major groups (Pacific cod, pollock, sablefish and flounder) are generally concentrated in three blocks off the southcentral portion of Kodiak Island's eastside and in two blocks in the northern portion of Shelikof Straits. Second, catches of cod and pollock, which collectively comprised 94% of the 1985 Kodiak area groundfish trawl catches, were caught during the first (January-March) and last (October-December) quarters of the year. Only minimal fishing effort occurred between April and September (Table 2, Figures 1-4).

Kodiak area trawl catches for groundfish during 1985 were made predominantly (87%) outside State of Alaska waters. The 1,097 mt state waters trawl catch was composed primarily (98%) of Pacific cod and pollock, with the remainder being predominantly sablefish. Flounder comprised only 8 mt (.01%) of the state waters trawl catch. The 1,097 mt trawl-caught groundfish catch made within state waters represents 10% of the total Kodiak area catch made by all gear types combined. Trawl catches in state waters during 1985 occurred almost exclusively during the first and last quarters of the year, while those made outside of state waters occurred primarily during the October-December

quarter, with only 25% being taken between January and the end of September (Table 2).

At issue presently in the GOA groundfish fishery is the degree to which on-bottom trawling can affect king and Tanner crab stocks. In response to testimony concerning the generally depressed condition of Kodiak area king and Tanner crab stocks and their vulnerability to on-bottom trawling, the North Pacific Management Council (NPFMC) and the Alaska Board of Fisheries (BOF) in separate actions identified certain primarily inshore grounds as sensitive to this potential damage and closed them to trawling during all or part of each year.

The first of these closures was made by the NPFMC in January 1986 and affected four areas around Kodiak Island. One of these areas immediately surrounds Cherikof Island approximately 90 nautical miles southeast of Kodiak Island, with the remaining three bordering portions of Kodiak Island's southend and eastside. These areas include southern Sitkalidak Straits, Alitak Bay, as well as the outer Marmot Bay/Marmot Flats area (Figure 5). These areas were closed for a 90 day period through emergency rule effective March 8, 1986. The NPFMC's intent was for a working group to review this closure strategy in May 1986 and recommend a permanent strategy for their action at the June 1986 meeting.

The second of these closures was made by the Alaska BOF in March of 1986. These time-area closures include state water portions of three of the areas closed by the NPFMC (Alitak Bay, Sitkalidak Straits and Outer Marmot Bay/Flats) plus the collective bays on Kodiak Island's westside inside of a line connecting their headlands (Figure 6). The waters surrounding Cherikof Island were not included in this closure. The BOF further stipulated that the westside bays remain closed to on-bottom trawling year around with the remaining three areas closed from February 15 through June 15 of each year.

The 1985 groundfish catch in the four areas closed to trawling by the NPFMC was 128 mt, or 2% of that from the entire Kodiak area. The catch from this area was split fairly even between sablefish, Pacific cod and flounder

with the majority (63%) coming from the Marmot grounds. Fishing effort in these areas was most intense in the second and fourth quarters of the year (Table 3).

The 1985 groundfish catch in four areas closed to trawling by the Alaska BOF was 582 mt, or 7% of that from the immediate Kodiak area. Essentially all of this catch (99%) was Pacific cod and pollock, 99% of which was taken during the first and last quarters of the year (Table 4).

When utilizing 1985 catches from the above closed waters areas to estimate their potential impact on future years catches, one must be aware that their boundaries do not correspond precisely to those used to report catches. These differences, although generally minor, limit the precision to which these comparisons can be made. In actuality, the 1985 catches shown for these closed waters, most notably those on the westside of Kodiak Island, would be less than those shown in Table 4. This is because the catch reporting areas for these inner bays extend three miles offshore, whereas the actual closed areas extend seaward only to a line connecting the headlands of the bays involved.

As was the case with state waters catches as a whole, 1985 catches from those state waters closed by the BOF occurred primarily (81%) during the first quarter (January - March). This period of fishing concentration would, therefore, overlap with the closures on Kodiak's eastside by six weeks (closure begins February 15). Effort in the westside bays would, of course, be completely precluded by the year around closure of these grounds. The fact that only 7% of the 1985 Kodiak area catch came from these areas, however, suggests that the potential impact posed to the continued development of the groundfish fishery would be minimal.

Summary:

Central GOA domestic groundfish catches have increased progressively since 1985 with the greatest between-year fluctuation seen between 1984 and 1985. These catches have historically been dominated by pollock and Pacific cod. Close examination of 1985 trawl catches in the immediate Kodiak area shows

effort to be concentrated in the two primary areas and fishing effort to be concentrated into the first and last quarters of the year.

Trawl effort for groundfish in the immediate Kodiak area in 1985 generally reflects fishing characteristics seen in the remainder of the Central GOA. Catches occurred predominantly (87%) outside of state waters. Trawl catches made within those portions of state waters designated by the Alaska BOF for closure during all or part of each year comprised 7% of those from the immediate Kodiak area. Based on 1985 groundfish catch data for the trawl fishery in the immediate Kodiak area, it would appear that imposition of the closed waters areas as adopted by the BOF would have minimal impact upon the developing groundfish fishery.

Table 1. Annual groundfish catches by species group in the Central Gulf of Alaska management area for all gear types combined, 1975-1985. All catches shown in metric tons.

| Species | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Pacific Cod | 83 | 151 | 170 | 609 | 857 | 461 | 795 | 1,910 | 4,105 | 2,608 | 1,956 |
| Pollock | 0 | 0 | 44 | 492 | 1,465 | 479 | 561 | 2,186 | 117 | 330 | 6,569 |
| Sablefish | 0 | 0 | 0 | 1 | 48 | 19 | 6 | 19 | 251 | 2,786 | 3,670 |
| Flounder | 4 | 25 | 14 | 86 | 32 | 13 | 52 | 18 | 61 | 240 | 120 |
| POP* | 0 | 0 | 0 | 0 | 0 | 2 | 6 | 2 | 0 | 0 | 8 |
| Rockfish | 0 | 2 | 0 | 2 | 5 | 31 | 62 | 10 | 16 | 53 | 174 |
| Thornyhead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 11 |
| Atka Mackerel | 15 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other | 102 | 97 | 96 | 50 | 228 | 364 | 128 | 50 | 44 | 2 | 46 |
| TOTAL | 204 | 275 | 324 | 1,240 | 2,643 | 1,369 | 1,610 | 4,195 | 4,594 | 6,020 | 12,554 |

*Pacific Ocean perch

Table 2. Quarterly 1985 Kodiak area trawl-caught groundfish catch by major species group taken inside and outside state waters. All catches shown in metric tons.[1/]

| | STATE WATERS/QUARTER | | | | | NON-STATE WATERS/QUARTER | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Species | 1 | 2 | 3 | 4 | Total | 1 | 2 | 3 | 4 | Total | TOTALS |
| Flounder | -[2/] | - | - | 8 | 8 | 2 | - | 27 | 144 | 173 | 181 |
| Pacific Cod | 230 | 2 | - | 119 | 351 | 337 | 72 | 68 | 899 | 1,376 | 1,727 |
| Pollock | 718 | - | - | 2 | 720 | 801 | 58 | 114 | 4,312 | 5,285 | 6,005 |
| Sablefish | 1 | 17 | - | - | 18 | 144 | 170 | - | - | 314 | 332 |
| TOTALS | 949 | 19 | - | 129 | 1,097 | 1,284 | 300 | 209 | 5,355 | 7,148 | 8,245 |

[1/] Does not consider catches of minor species groups including Pacific Ocean perch and rockfish.
[2/] Trace amount - <1 mt.

Table 3. Quarterly and annual 1985 Kodiak area trawl caught groundfish catches by major species group in portions of area closed in 1986 by the North Pacific Fisheries Management Council to on-bottom trawling through June 15, 1986. All catches shown in metric tons.

| | SPECIES / QUARTER | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Closure Area | Pacific Cod | | | | Pollock | | | | Sablefish | | | | Flounder | | | | Total | | | |
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Cherikof | - | - | - | - | - | - | - | - | - | 39 | - | - | - | - | - | - | - | 39 | - | - |
| Alitak | 6 | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | 6 | 2 | - | - |
| Sitkalidak | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - |
| Marmot | 8 | 8 | - | 14 | - | - | - | - | - | 9 | - | - | - | - | - | 39 | 8 | 18 | - | 54 |
| TOTALS | 14 | 8 | 1 | 14 | - | - | - | - | - | 50 | - | - | - | - | - | 39 | 14 | 59 | 1 | 54 |

Table 4. Quarterly and annual 1985 Kodiak area trawl caught groundfish catches by major species group in portions of area closed in 1986 by the Alaska Board of Fisheries to on-bottom trawling during all or part of each year. All catches shown in metric tons.

| Closure Area | SPECIES / QUARTER | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pacific Cod | | | | Pollock | | | | Sablefish | | | | Flounder | | | | Total | | | |
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Alitak | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Sitkalidak | - | - | - | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 6 |
| Westside | 229 | 2 | - | 101 | 243 | - | - | - | 1 | - | - | - | - | - | - | - | 473 | 2 | - | 101 |
| Marmot | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TOTALS | 229 | 2 | - | 107 | 243 | - | - | - | 1 | - | - | - | - | - | - | - | 473 | 2 | - | 107 |

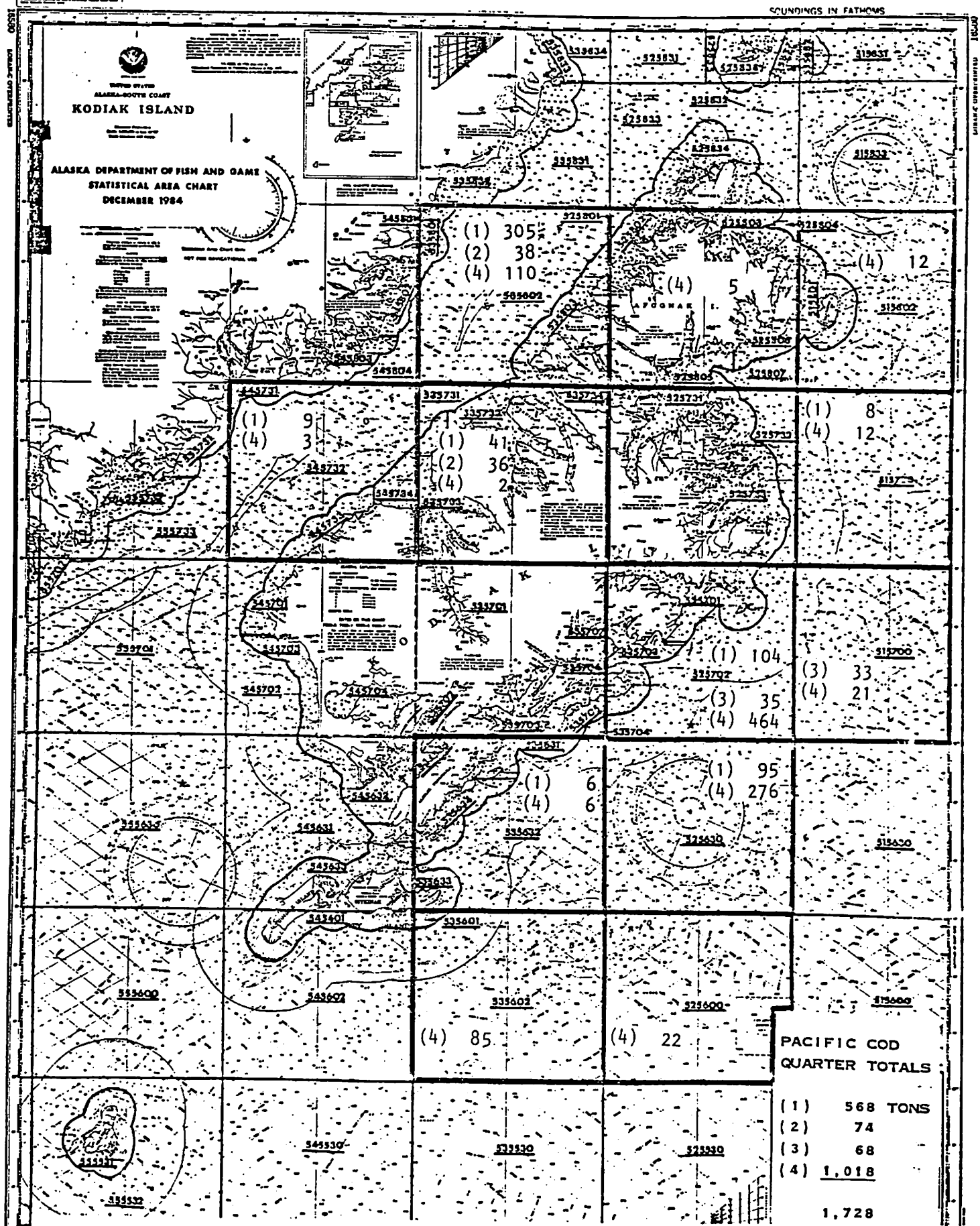


Figure 1. 1985 Kodiak area Pacific cod catch by statistical area and quarter. Quarters shown in parenthesis-catches shown in metric tons.

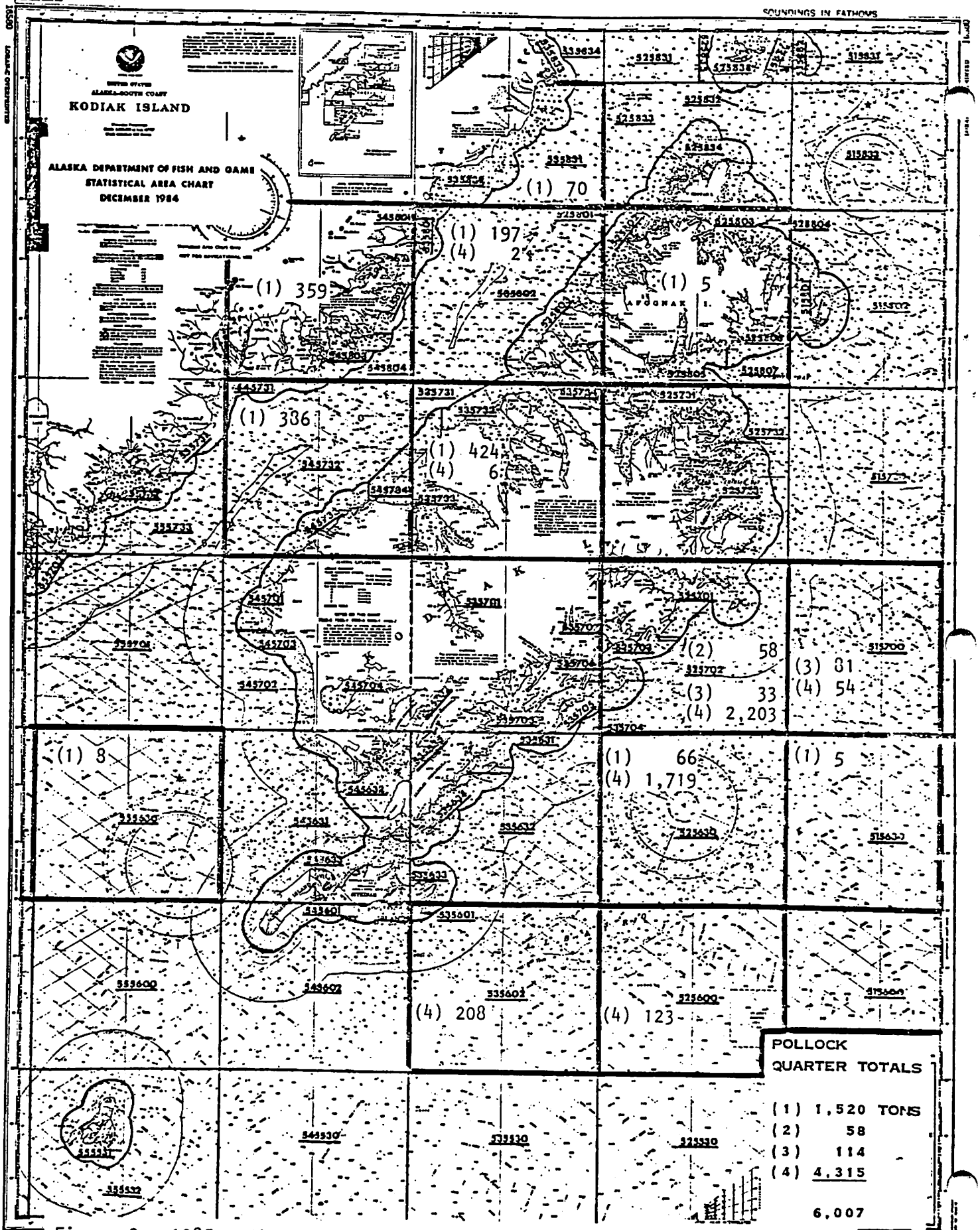


Figure 2. 1985 Kodiak area pollock catch by statistical area and quarter. Quarters shown in parenthesis-catches shown in metric tons.

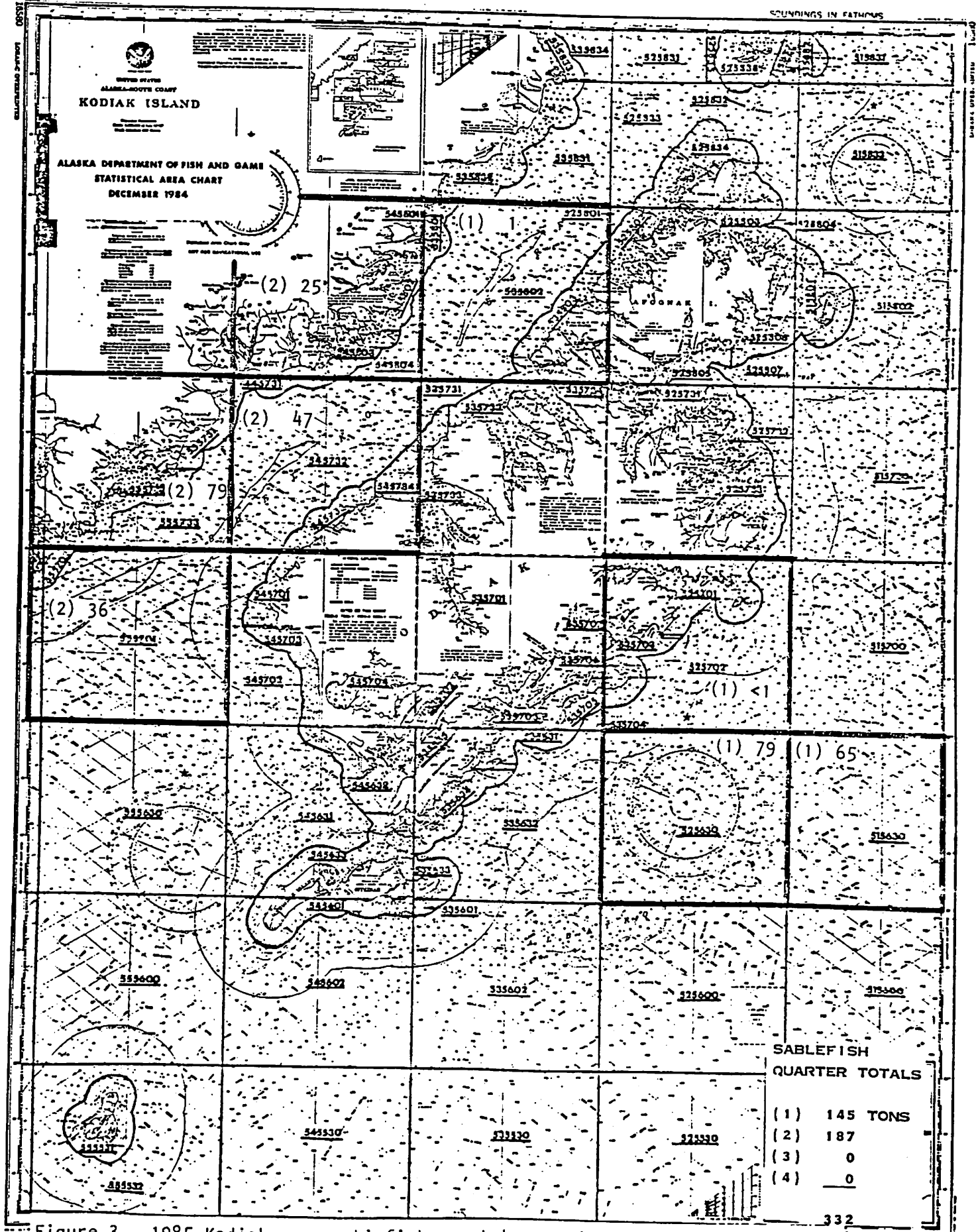


Figure 3. 1985 Kodiak area sablefish catch by statistical area and quarter. Quarters shown in parenthesis-catches shown in metric tons.

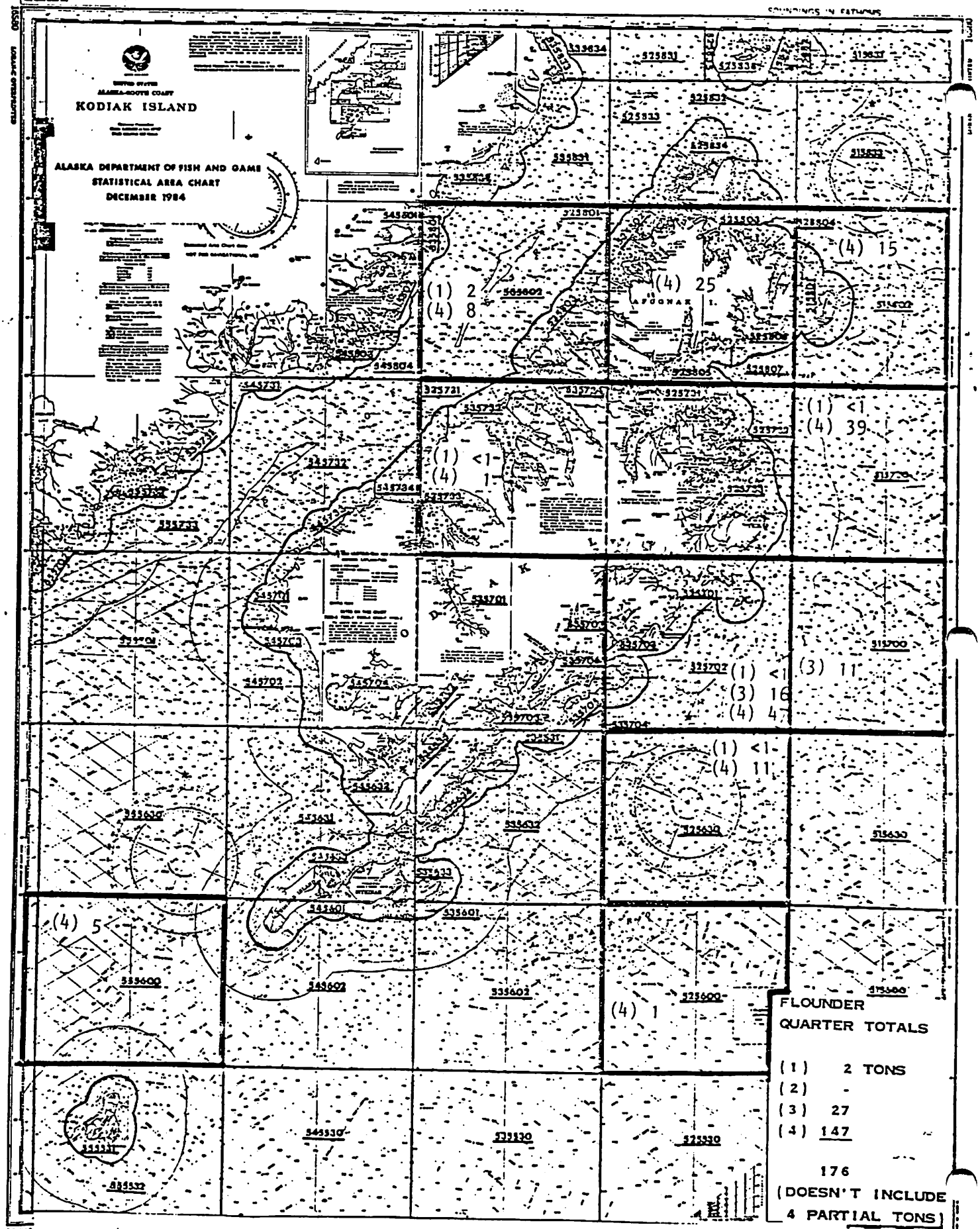


Figure 4. 1985 Kodiak area flounder catch by statistical area and quarter. Quarters shown in parenthesis-catches shown in metric tons.