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 (FCMA). 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 Amendment 12 was adopted initially by the Council at its July and December 1982 meetings but was later rescinded by the Council at its September 1984 meeting without having been submitted formally for Secretarial review.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 It has a number of major deficiencies, the costs of which have increased as the foreign fisheries have been replaced by wholly domestic and joint venture fisheries.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. 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. Pacific ocean perch 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. 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. Removal of fish by fishing operations results in a net loss of nutrients to the ecosystem. At-sea processing returns a portion of those nutrients to the system. However, because of the nature of fish wastes, those nutrients will be available in large part to organisms lower in the food web.

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.

1.1 Council's Preferred Alternatives

At its September 1986 meeting the Council approved Amendment 15 to the Gulf of Alaska Groundfish FMP for Secretarial review and implementation. The Council made its decisions after reviewing written public comments, public testimony, information contained in the draft Environmental Assessment (EA) and Regulatory Impact Review/Initial Regulatory Flexibility Analysis (RIR/IRFA), and the recommendations of the Advisory Panel (AP) and the Scientific and Statistical Committee (SSC). This section identifies those alternatives preferred by the Council and summarizes the rationale and background for their decision.

Two new alternatives were identified and selected as preferred solutions to the stated management problems during the meeting. For problem 1--inability to adjust harvest guidelines--a third framework approach was suggested by the plan team and SSC and adopted by the Council. For problem 3--king crab bycatch by non-pelagic trawlers in the vicinity of Kodiak Island--a variation intermediate between Alternatives 1 and 2 was suggested by the AP and chosen by the Council. The EA and RIR/IRFA have been revised to reflect these changes.

The scope and perspective of the analysis in the version of the documents sent out for public review, however, was sufficiently broad so as to bound the impacts of the new alternatives as well. It follows, therefore, that the analytical documents before the Council provided the information necessary for an informed decision.

Revised Goals and Objectives for Management of Groundfish

With this amendment the Council has adopted a principle management goal whereby the Gulf of Alaska groundfish resources will be managed to maximize economic benefits to the U.S., consistent with its resource stewardship responsibilities. To help meet this goal the Council approved seven objectives which concern the setting of harvest levels while keeping mortality above biological thresholds, the design of management programs to account for all fishery-related removals, the desire to minimize wastage of fishery resources, the intent to manage the groundfish fishery to stimulate development of the domestic industry, the development of effort control measures only when requested by the industry, and the rebuilding of stocks only if the benefits outweigh the costs.

In late-1983 the Council was requested by the fishing industry to stabilize the planning environment of the domestic seafood industry by developing long-range plans for management of the Gulf of Alaska groundfish fisheries. At that time the FMP contained several management goals and objectives which were more or less a restatement of MFCMA National Standards. It was believed that more specific set of goals, pertaining to North Pacific fisheries in general, would provide a clearer sense of direction for the course of fishery management over the next decade. In December 1984 the Council adopted nine Comprehensive Fishery Management Goals. This set of comprehensive goals provided a basic framework for fishery-by-fishery development of specific goals and objectives. The new goal and supporting objectives contained in Amendment 15 is the Council's attempt to synthesize the priorities and

concerns of the groundfish fishing industry and to articulate the current management philosophies and procedures, balancing and blending the two into a form that will guide the management process.

Management Problem 1: Inability to efficiently adjust harvest guidelines.

The Council approved a new alternative, Alternative 3, as recommended by the plan team and SSC. This alternative is a framework approach to setting target quotas for individual species in the Gulf using the same basic procedure that is used in the Bering Sea FMP. Additionally, Alternative 3 includes a procedure for establishing prohibited species catch limits (PSC) for fully U.S.-utilized groundfish species. This alternative, unlike Alternatives 1 and 2, does not provide for a formal accounting of fishery-related mortality.

Alternative 3 is viewed as an administrative amendment which allows the annual setting of harvest quotas without plan amendment. The Council concurred with the advice of the SSC, and a minority of the AP is encouraging the plan team to continue development of a catch/bycatch, accounting/management framework.

Management Problem 2: Inadequate reporting requirements.

The Council approved Alternative 1 which stipulates that each U.S. vessel that processes fish at sea during the fishing year must report its catch on a weekly basis whenever it has fish on board, regardless of how long it holds the fish on board. The revision to existing reporting requirements also includes a definition of fish processing. The Council believed this alternative superior to the status quo since it reduces the possibility of double counting fish and guarantees timely catch reports from this segment of the fleet.

Management Problem 3: King crab bycatch in Kodiak non-pelagic trawl groundfish fisheries.

The Council adopted Alternative 3 which establishes four time/area closures for non-pelagic trawling to protect king crab around Kodiak Island. All three alternatives were identical with the exception of the amount of area to be closed in Marmot Flats. Alternative 3, proposed by the Advisory Panel, closes more of Marmot Flats than Alternative 1 but less than Alternative 2. The small Marmot area of Alternative 1 was based on fishermen observations which showed a concentration of king crab in the area during the summer months. Additional testimony from fishermen at the Council's September meeting indicated that king crab migrate outside the small area at different times of the year. For this reason, the Council favored Alternative 3 since it would provide protection to king crab all year. Alternative 2 was rejected since the additional closed area did not appear to provide any significant benefits to king crab while the costs of closing the entire area to non-pelagic trawling appeared high.

Management Problem 4: Inadequate authority for inseason adjustment.

The Council approved a revised and clarified Alternative 1. This improvement of existing authority allows the Regional Director to use all relevant scientific information in making inseason time/area adjustments of the fishery. Their decision was based on the understanding that this authority

will be used only in the case of true emergency, such as the prevention of overfishing. The Council intends that the least restrictive management response possible will be exercised, but that increasingly restrictive measures would be implemented as necessary. Alternative 2 was rejected by the Council since it allowed inseason adjustments of target quotas and bycatch limits for socioeconomic as well as conservation reasons.

The description of Alternative 1 in the EA and RIR/IRFA has been revised to reflect the Council's intent. The analysis in the earlier draft adequately described the impacts of the revised alternative.

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) 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 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.

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

Objective 3 - The Council will manage the fisheries to minimize waste by:
(a) Developing approaches to treating bycatches other than as a 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.

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

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.

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.

Objective 7 - Population thresholds will be established for economically viable species or species complexes under Council management on the basis of the best scientific information, and ABCs will be established as defined in this document. If population estimates drop below these thresholds, acceptable biological catch (ABC) will be set to reflect necessary rebuilding as determined in Objective 6.

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 management of 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. 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 groundfish 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 both target catch and bycatch. That part of Objective 2 which states that the Council will account for fisheries removals from the sport fishery and from subsistence fisheries will be difficult to implement as estimates of these sources of mortality are currently unavailable.

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 of an economically viable species should fall below its threshold rebuilding must take place (Objective 7), and ABC will be set to facilitate that rebuilding. An economically viable species is one where the benefits of rebuilding outweigh the costs. Note that in any case, National Standard 1 prohibits overfishing.

Identification of the threshold level of a population is critical to the definition of 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 SSC has suggested a definition along these lines for Council consideration.

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 three 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. The 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 allocations to 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.

It is assumed that the adoption of Alternative 1, 2, or 3 reduces the cost of adjusting harvest guidelines but does not effect the setting of the actual harvest guidelines. This means that the target quota for a species in 1987 is expected to be the same as the 1987 OY for that species should the plan not be amended. It follows that the magnitude of the 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.

3.2 The Alternatives

The alternatives to the status quo described in some detail and analyzed below are three 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 changed by emergency rule and formal plan amendment.

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 illustrated in Figure 3.1. The procedure consists of four steps:

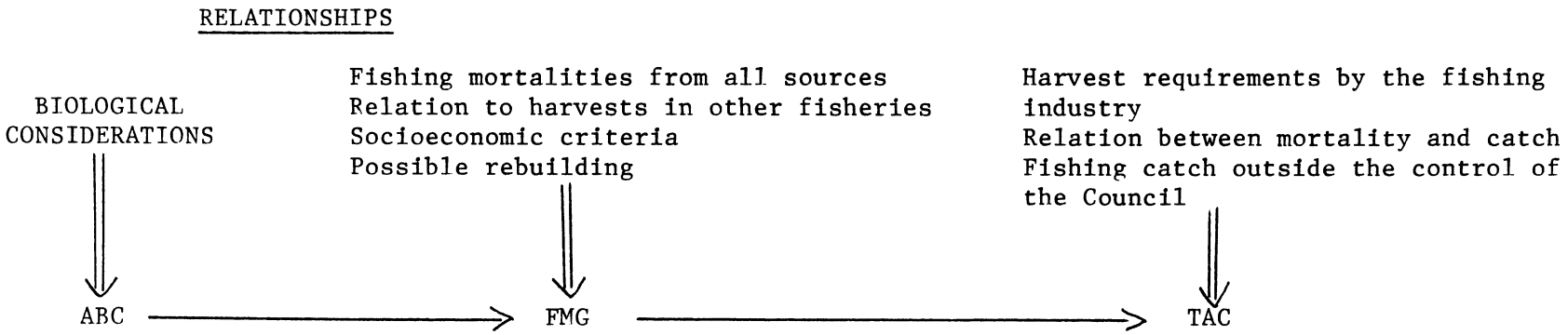
(1) Determining the ABC for each managed species or species group.

(2) 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). The FMG may be lower than the ABC if bycatch considerations or socioeconomic considerations cause the Council to establish a lower harvest. Conversely, the FMG may be higher than ABC if the Council believes that socioeconomic considerations warrant a harvest in excess of ABC in the next fishing year.

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

(4) Summing TAC (Alternative 1) or post season fishing mortality (TGFM, Alternative 2) for all groundfish excluding nonspecified species to assure that the sum is within the OY range specified in the FMP.

Figure 3.1 Working definitions for use in harvest framework for management of groundfish in the Gulf of Alaska.



DEFINITIONS

ABC	Acceptable biological catch	Is a seasonally determined catch that may differ from MSY for biological reasons. It may be lower or higher than MSY in some years for species with fluctuating recruitments. The Council can set the ABLs for individual species anywhere between zero and the maximum possible removal based on the best scientific information presented by the plan team and/or Scientific and Statistical Committee. The ABC may be modified to incorporate safety factors and risk assessment due to uncertainty. Lacking other biological justification, the ABC is defined as the maximum sustainable yield exploitation rate multiplied by the size of the biomass for the relevant time period. The ABC is defined as zero when the stock is at or below its threshold.

Figure 3.1 continued

FMG	Fisheries mortality guideline	A tolerable fishing mortality--an upper limit placed on the sum of target fishing mortality, bycatch fishing mortality, and fishing mortality on the species from recreational, subsistence, and nongroundfish fisheries. In deriving this estimate the team will consider possible rebuilding, all available estimates of the noncommercial fishery mortality, and the extent that the fishery is part of a mixed species fisheries, that is, the relation of the FMG to all other FMGs. Socioeconomic criteria may also be used. All considerations used in establishing FMG will be presented in the RAD.
PSC	Prohibited species catch	A nonretainable catch. It can take the form of a prohibited or nongroundfish species and/or as a fully utilized groundfish species captured incidentally in groundfish fisheries. Such catch must be recorded and returned to the sea with a minimum of injury. A prohibitied species catch limit (PSC) is an apportioned, nonretainable amount of fish provided to a fishery for bycatch purposes. PSC limits of groundfish may be provided to JVP and TALFF when the species is fully utilized by the wholly domestic fishery (i.e., DAP = TQ).
TAC/TQ	Total allowable catch/Target quota	The harvest quota for a species or species group; the retainable catch. TAC will be apportioned to DAP, JVP, and, possibly, TALFF by area.

Figure 3.1 continued

TGFM	Total groundfish fishing mortality	An administrative concept where a predetermined range (116,000- 800,000 mt) is compared with either 1. The sum of the TACs/TQs (Alternatives 1 and 3), or 2. The TGFM (Alternative 2). If (1) or (2) fall in the OY range no plan amendment is necessary and the TACs for the fishing season may be established by rule-related notice.

The range of OY specified in the FMP is 116,000-800,000 mt of groundfish. This range was established by examining for each major groundfish species, historical and recent catches, recent determinations of ABC, and the current and past estimates of MSY (Tables 3.1 and 3.2).

In particular, the end points of the range were derived as described below: For the minimum value, 116,000 mt is approximately equal to the lowest historical groundfish catch during the 21-year period 1965-1985 (116,053 mt in 1971). In that year catches of pollock, Pacific cod and Atka mackerel were all at their minimum value. Given the current status of the groundfish resources and the present management regime, it is considered extremely unlikely that future total harvest will fall below this level. Thus, the TACs/PSCs and FMGs will be established so as to result in a sum of at least 116,000 mt.

The upper end of the OY range, 800,000 mt, was derived from MSY information. The MSY for all species of groundfish (excluding the other species category) has ranged from 804,950 mt in 1983 to 1,000,750 mt for the 1987 fishing year. The average MSY over the five-year period is 845,670 mt. Therefore, the upper end of the range is approximately equal to 95% of the mean MSY for the last recent five-year period. It is possible that in the immediate future, the Council may wish to establish TAC equal to MSY for each species. If this were to occur the Council would be constrained to either keep the sum of TACs at or below 800,000 mt of groundfish, or amend the OY range in the plan.

The ABC summed for all species has ranged from 457,082 mt in 1985 to 720,005 mt in 1984, with an ABC recommended for 1987 of 619,352 mt. The upper end of the OY range is some 29% larger than the 1987 recommended ABC allowing for future expansion in the fishery to that extent.

Most of the variation in the ABC, catch, and MSY over the five-year interval results from changes in the status of two species: pollock and flounder. Pollock ABC has ranged from 113,600 mt in 1987 to 516,600 mt in 1984, a greater than 400,000 mt deviation. Likewise, flounder ABC was 33,500 mt in 1985 and 340,000 mt for 1987, while MSY has gone from 67,000 mt in 1983 to 340,000 mt in 1987. The variation in flounder ABC is therefore approximately 300,000 mt. Therefore, the 800,000 mt upper end of the OY range was selected in consideration of the volatility in pollock and flounder ABC, the potential for harvesting at MSY, and the desire to allow for some moderate expansion in the future flounder fisheries.

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 and compared against the OY range.

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 total allowable catches (TAC) will be set for the fishing year to prevent the FMGs from being exceeded. The DAP, JVP, and TALFF apportionments are also defined for the Gulf as a whole with specific allocations to each user group by species and area.

Table 3.1 Historical annual groundfish catch in the Gulf of Alaska (in metric tons), 1965-1982.

	SPECIES Landings, mt						
Year	Pollock	Cod	Sablefish	Rockfish	Flatfish	Atka mackerel	TOTAL
1965	2,746	583	3,458	382,481	4,697	0	393,965
1966	8,940	459	5,178	148,439	4,928	0	167,944
1967	6,432	2,154	6,143	112,741	4,506	0	131,976
1968	6,168	1,046	15,049	108,594	3,468	0	134,325
1969	17,914	1,357	19,375	79,238	2,676	0	120,560
1970	15,970	1,830	25,694	63,674	3,859	7,281	118,308
1971	9,458	703	25,542	77,985	2,365	0	116,053
1972	34,166	3,572	36,453	77,564	8,942	6,282	166,979
1973	36,989	5,548	27,487	61,414	19,566	9,494	160,498
1974	61,474	5,353	28,006	61,193	9,733	17,531	183,290
1975	53,568	5,985	26,094	58,908	5,487	27,776	177,818
1976	79,526	7,089	27,733	56,983	6,092	15,539	192,962
1977	118,062	2,261	17,135	23,729	16,724	19,455	197,366
1978	97,405	12,167	8,875	10,198	15,180	19,586	163,411
1979	105,783	14,872	10,352	11,489	13,922	10,959	167,377
1980	115,037	35,327	8,509	16,088	15,889	13,166	204,016
1981	147,743	36,086	9,917	18,214	12,532	18,727	243,219
1982	168,746	29,380	8,557	10,731	7,729	6,760	231,903

Sources: Lynde, Marcelle. 1986. The historical annotated landings database documentation of annual harvest of groundfish from the Northeast Pacific and E. Bering Sea, 1957-1980. NOAA Technical Mem., NMFS F/NWC-103.

PacFIN final annual reports, 1981-1982.

Table 3.2 Gulf of Alaska MSYs, ABCs, and catches for the period 1983-87.

YEAR		Pollock	Pacific Cod	Flounders	Pacific Ocean Perch	Sablefish	Atka Mackerel	Rockfish	Thornyhead	Squid	Totals, All species
1983	MSY	334,000	177,000	67,000	150,000	25,000	33,000	10,200	3,750	5,000	804,950
	ABC	256,000	60,000	67,000	25,000	13,000	28,700	7,600	3,750	5,000	466,050
	Catch	215,608	36,401	12,260	7,406	9,002	12,260	2,001	730	271	295,939
1984	MSY	334,000	177,000	67,000	150,000	25,000	33,000	10,200	3,750	5,000	804,950
	ABC	516,600	60,000	67,000	21,875	9,480	28,700	7,600	3,750	5,000	720,005
	Catch	306,610	22,848	6,112	4,325	10,057	1,152	1,278	183	95	352,660
1985	MSY	334,000	177,000	67,000	150,000	25,000	33,000	10,200	3,750	5,000	804,950
	ABC	321,600	60,000	33,500	11,474	9,480	4,678	7,600	3,750	5,000	457,082
	Catch	291,489	14,442	2,157	925	11,887	1,848	442	38	12	323,240
1986	MSY	334,000	136,000	141,000	150,000	25,000	7,800	10,200	3,750	5,000	812,750
	ABC	116,600	136,000	141,000	10,500	18,800	4,700	n/a	n/a	n/a	n/a
	Catch(to date)	57,039	19,117	1,329	538	17,346	0	1,388	346	8	97,111
1987	MSY	334,000	125,000	340,000	150,000	25,000	7,800	10,200	3,750	5,000	1,000,750
	ABC/FMG	113,600	125,000	340,000	3,702	25,000	600	2,700	3,750	5,000	619,352
STATISTICS											
Range	MSY, min.	334,000	125,000	67,000	150,000	25,000	7,800	10,200	3,750	5,000	804,950
	MSY, max.	334,000	177,000	340,000	150,000	25,000	33,000	10,200	3,750	5,000	1,000,750
	ABC, min.	113,600	60,000	33,500	3,702	9,480	600	2,700	3,750	5,000	457,082
	ABC, max.	516,600	136,000	340,000	25,000	25,000	28,700	7,600	3,750	5,000	720,005
	Catch, min.	215,608	14,442	2,157	925	9,002	1,152	442	38	12	295,939
	Catch, max.	306,610	36,401	12,260	7,406	17,346	12,260	2,001	730	271	352,660
Mean	MSY	334,000	158,400	136,400	150,000	25,000	22,920	10,200	3,750	5,000	845,670
	ABC	264,880	88,200	129,700	14,510	15,152	13,476	6,375	3,750	5,000	565,622
	Catch(83-85)	271,236	24,564	5,465	3,299	12,073	3,815	1,277	324	97	267,238
Std. error	MSY	0	10,306	47,296	0	0	5,521	0	0	0	34,703
	ABC	66,793	15,524	49,587	3,501	2,678	5,599	1,061	0	0	55,009
	Catch(83-85)	22,988	5,223	2,400	1,528	688	2,933	368	172	62	13,372

Source: PacFIN and Gulf of Alaska plan team reports, 1982-86.

Alternative 2 differs from Alternative 1 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 116,000-800,000 mt OY range. Alternative 2 uses the same approach in setting quotas, but, at the end of the year 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. Should in a single year the TGFM exceed the upper end of the OY range, this alternative allows up to two years to subsequently predict future groundfish mortality so that the three-year average remains within the range. If the TGFM falls below the lower end of the range or if the three-year average exceeds the range, the range will require a plan amendment to revise.

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 ABCs, FMGs, and TACs for all managed groundfish species. TACs will be specified for DAP, JVP, and TALFF. For fully utilized species the harvest amounts specified for JVP and TALFF may be retainable bycatch amounts (TAC) or prohibited species catch limits (PSC). Each TAC or PSC 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.

(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) By January 1 the Secretary will publish rule-related notice of final TAC limits in FEDERAL REGISTER.

(7) January 1. Annual TAC limits (and PSC limits if specified) 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 maximum sustainable yield (MSY) and allowable biological catch (ABC).

(3) Estimates of groundfish species mortality from nongroundfish fisheries, subsistence fisheries, and recreational fisheries, and the difference between groundfish mortality and catch, if data are available.

(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 and area.

(8) Any other biological, economic, or biological information which may be useful in establishing FMGs, TACs, and PSCs.

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.

D. Alternative 3: Establish an overall harvest framework procedure which establishes an OY range and provides a procedure for adjusting individual target quotas (TQ) and prohibited species catch limits (PSC) on an annual basis.

A framework procedure has been developed whereby the Council can set harvest levels by specifying a target quota (TQ) for each groundfish fishery on an annual basis. The procedure consists of four steps:

(1) Determining the ABC for each managed species or species group.

(2) Determining a TQ based on biological and socioeconomic information. The TQ may be lower than the ABC if bycatch considerations or socioeconomic considerations cause the Council to establish a lower harvest. Conversely, the TQ may be higher than ABC if the Council believes that socioeconomic considerations warrant a harvest in excess of ABC.

(3) Identify what groundfish species will be fully utilized by the wholly domestic fishery. Determine a PSC limit in these fully utilized fisheries based on biological and socioeconomic information for joint venture and foreign fisheries. The sum of TQ and PSC for any groundfish species cannot result in overfishing.

(4) Sum TQ for all groundfish species excluding nonspecified species to assure that the sum is within the OY range specified in the FMP. If the sum falls outside this range the TQs must be adjusted or the plan amended.

The timing of actions and procedure to be taken in establishing target quotas (TQs) is very similar to the schedule described under Alternatives 1 and 2:

(1) September. The plan team prepares a draft Resource Assessment Document (RAD) which establishes preliminary ABCs, and initial TQs for all managed groundfish species. TQ will be specified for DAP, JVP, and TALFF. For fully utilized species (where DAP = TQ), there will be no retainable catch available for JVP and TALFF. Each TQ may be apportioned among the regulatory areas and districts of the Gulf of Alaska.

(2) September Council meeting. Council will approve preliminary TQs 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 TQs for DAP, JVP, and TALFF. Public comments on the proposed TQs 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 TQ limits. Final TQs are added to assure that the sum is within the OY range.

(6) By January 1 the Secretary will publish a rule-related notice of final TQ limits in FEDERAL REGISTER.

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

The OY range specified under Alternative 3 is the same as described previously under the other alternatives; or 116,000-800,000 mt of groundfish. The TQs will be summed with the total compared to the OY range. If the sum falls

within the range, the Regional Director will implement the TQs. Should the sum fall outside the OY range, the Council must either adjust the TQs or amend the range in the FMP.

This alternative provides a specific procedure for the setting of bycatch limits of fully utilized groundfish species (i.e., DAP = TQ). Incidental catches of these species will be treated as "prohibited species", where such catch is nonretainable, must be recorded and returned to the sea with a minimum of injury. The timing of actions and procedure to be taken in establishing prohibited species catch limits (PSCs) of fully utilized species is as follows:

(1) September. Following the initial determination of TQs for all managed groundfish species as described in Section 6.1, the plan team will identify those groundfish species that are fully utilized by the wholly domestic fishery. For those species, initial PSC limits will be calculated for joint venture and foreign fisheries using the best available bycatch rates obtained by NMFS observers from the respective fisheries and applying it to initial joint venture (JVP) and foreign (TALFF) TQ apportionments. Each PSC may be apportioned among the regulatory areas and districts of the Gulf of Alaska.

(2) September Council meeting. Council will review and approve preliminary PSCs and 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 PSCs for JVP and TALFF. Public comments on the proposed PSCs 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 PSC limits.

(6) By January 1 the Secretary will publish a rule-related of final PSC limits in the FEDERAL REGISTER.

(7) January 1. Annual PSC Limits take effect for the current fishing year.

For purposes of supplying scientific information to the Council for use in utilizing the above procedure, a RAD will be prepared annually as similarly described for Alternatives 1 and 2.

As with the status quo, a reserve system is used whereby 20% of each species or species group TQ is initially set aside for purposes of accommodating expanding DAP and JVP fisheries. The Regional Director may access DAP or JVP and apportion to them any amounts of reserves that he finds will be harvested by U.S. vessels. The Regional Director may apportion to TALFF any portion of the reserves that he determines will not be harvested by U.S. vessels.

It should be noted that with Alternatives 1, 2 and 3 the attainment of a TAC/TQ for a species is intended to close the target fishery for a species. That is, once the quota is taken further retention of that species would be prohibited. Other fisheries targeting on other species would be allowed to continue as long as the nonretainable bycatch of the closed species is found to be nondetrimental to that stock (status quo). Similarly, when a groundfish PSC limit is reached the applicable fishery must close, regardless if its target quota has been harvested.

With the exception of the "other species" management category, the framework procedure described above is used to determine TACs or TQs 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/TQ, equal to 5% of the combined TACs/TQs for target species shall apply to this category. Records of catch of this category must be maintained.

All remaining 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 is 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. Amounts of nutrients from fish wastes dumped into the sea from processing operations would be less than would occur due to overharvesting a 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. Environmental impacts as a result of commercial harvests will be the same as the status quo. Fishermen will continue their attempts to achieve quotas. However, this alternative requires that an accounting of all fishery related mortality upon groundfish species be conducted annually and that this information be used in decision making. Managers will now have a better overall view of the ecosystem which will lead to better management decisions. 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.

D. Alternative 3.

Alternative 3 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. Retainable quotas (TQs) may be specified for each species being managed by the plan. In addition, nonretainable quotas (PSCs) may be specified for joint venture and foreign fisheries for those fisheries that are fully utilized by wholly domestic fisheries (DAP). This more efficient procedure could lessen chances of over or underharvesting.

Actual environmental impacts on the ecosystem are difficult to measure but are believed to be insignificant when compared with natural perturbations in the system. Environmental impacts as a result of commercial harvests will be the same as the status quo. Fishermen will continue their attempts to achieve quotas. The framework also requires that the intended retainable catches (TQs) 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.

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

4.1 The Management Problem

Current reporting requirements are of two types. First, operators of any fishing vessel are responsible for the submission to the Alaska Department of Fish and Game of an accurately completed State of Alaska fish ticket for each sale or delivery of groundfish caught in any regulatory area. Second, operators of any catcher/processor and mothership 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 which 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, 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.

This latter requirement was necessary to aid management agencies in the inseason monitoring of groundfish catches. More timely catch and effort information was needed because large catches onboard catcher/processor and mothership vessels were not being reported for weeks or months through the normal fish ticket submission process. Without timely reporting, management agencies risked closing fisheries based on incomplete and unsatisfactory information that might cause either under- or over-harvesting of groundfish stocks.

One year's experience with the catcher/processor and mothership reporting system has revealed certain problems that reduce the effectiveness of the weekly reporting system. The most critical problem is the exemption from the weekly reporting requirement granted any vessel that lands its catch within 14 days. When a vessel which has been reporting weekly stops reporting or omits a report during one or more weekly periods because it was landed within a 14-day period, three problems are created. First, the absence of weekly catch reports for certain periods and vessels results in an incomplete accounting of catches for that segment of the fleet, which has led to inaccurate forecasts of quota achievement. The catch data submitted on fish tickets by catcher/processors and motherships often enter the management system too late to be useful for filling these data gaps in real time. Second, the reconciliation of fish tickets with weekly catch reports, where reporting periods often overlap, has resulted in significant delays in compiling catch information due to the time spent resolving discrepancies in the data. The most common and serious discrepancy experienced to date has been double counting of catch, which has resulted in premature forecasts of quota achievement. Finally, inseason enforcement of the weekly reporting requirements has been rendered nearly impossible. When a vessel which has been reporting weekly stops reporting or skips one or more periods, enforcement agents are unable to act because of the possibility that the vessel lawfully reported by fish ticket.

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 vessel that prepares fish to render it suitable for human consumption for use on board that vessel would be required to report its catches regardless of how many days there are between landings. Any vessel that receives fish from a catcher vessel and retains it at sea for any time period, would be required to report amounts of fish received from each catcher vessel. Reports would be required for each Sunday through Saturday period. The reports would be required even though that vessel had reported its catch through the State of Alaska's fish ticket system. This alternative would make inseason management of the fisheries more effective by: (1) eliminating time needed to resolve fish ticket discrepancies resulting from double counting, and (2) eliminating time lost due to delays in receiving fish ticket data. Inseason catches by catcher/processor vessels and catches received by mothership/processor vessels 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.

4.3 Environmental Impacts of the Alternatives

A. Do nothing - status quo alternative.

Under the status quo alternative, operators of at-sea processing vessels would only be required to report if they did not make deliveries within 14 days or less. Inseason management would continue to be jeopardized by double accounting of catches. Management decisions made to open or close fisheries may be made erroneously, 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 at-sea 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 are left in a quota, then the risk of overharvesting a quota is increased. As a result of overharvesting the quota, the predator/prey relationship in the food web might be more disturbed as a result of increased fishery-related disturbances on the environment, because the numbers of sablefish remaining in the system would be farther from an equilibrium (assuming it was) with those other predator and prey species remaining in the ecosystem. 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 greater net loss of nutrients from the system although increased amounts of nutrients from processing waste would be locally introduced. 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 predator/prey relationship in the food web because the numbers of groundfish remaining in the system would be further from equilibrium (assuming it was) with other elements of the ecosystem. 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.

B. Alternative 1.

Under Alternative 1, operators of catcher/processor vessels would be required to report their catches regardless of the number of days they had fished. Operators of other at-sea processing vessels would be required to report amounts of fish received from each catcher vessel. Reports would be for each Sunday through Saturday period. 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 under or overharvesting groundfish stocks and the associated impacts of such actions described above for the status quo alternative could be reduced.

5.0 DESCRIPTION OF MANAGEMENT PROBLEM 3 AND ENVIRONMENTAL IMPACTS OF THE PROPOSED ALTERNATIVE SOLUTIONS: KING CRAB BYCATCH IN KODIAK NONPELAGIC 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 Barnabas 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 could kill or injure king crab in two ways. First, crabs caught in the net can be crushed during the tow or injured as the catch is unloaded in the fishing vessel. Recent observer studies estimate that about 70% of the crabs caught by non-pelagic (or 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 non-pelagic 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 non-pelagic 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 non-pelagic trawling to help rebuild the Kodiak king crab resource for a period of three years from the year of implementation (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
I	Type I 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 non-pelagic trawling. Fishing with other gear would be allowed.
II	Type II areas are those areas sensitive for king crab populations and in which bottom trawling will be prohibited during the soft-shell season, Feb 15 - Jun 15. Fishing with other gear would be allowed and fishing with non-pelagic trawl gear would be allowed from Jan 1 - Feb 14 and Jun 16 - Dec 31.

Areas designated as either Type I or II are shown in Figures 5.1 and 5.2.

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

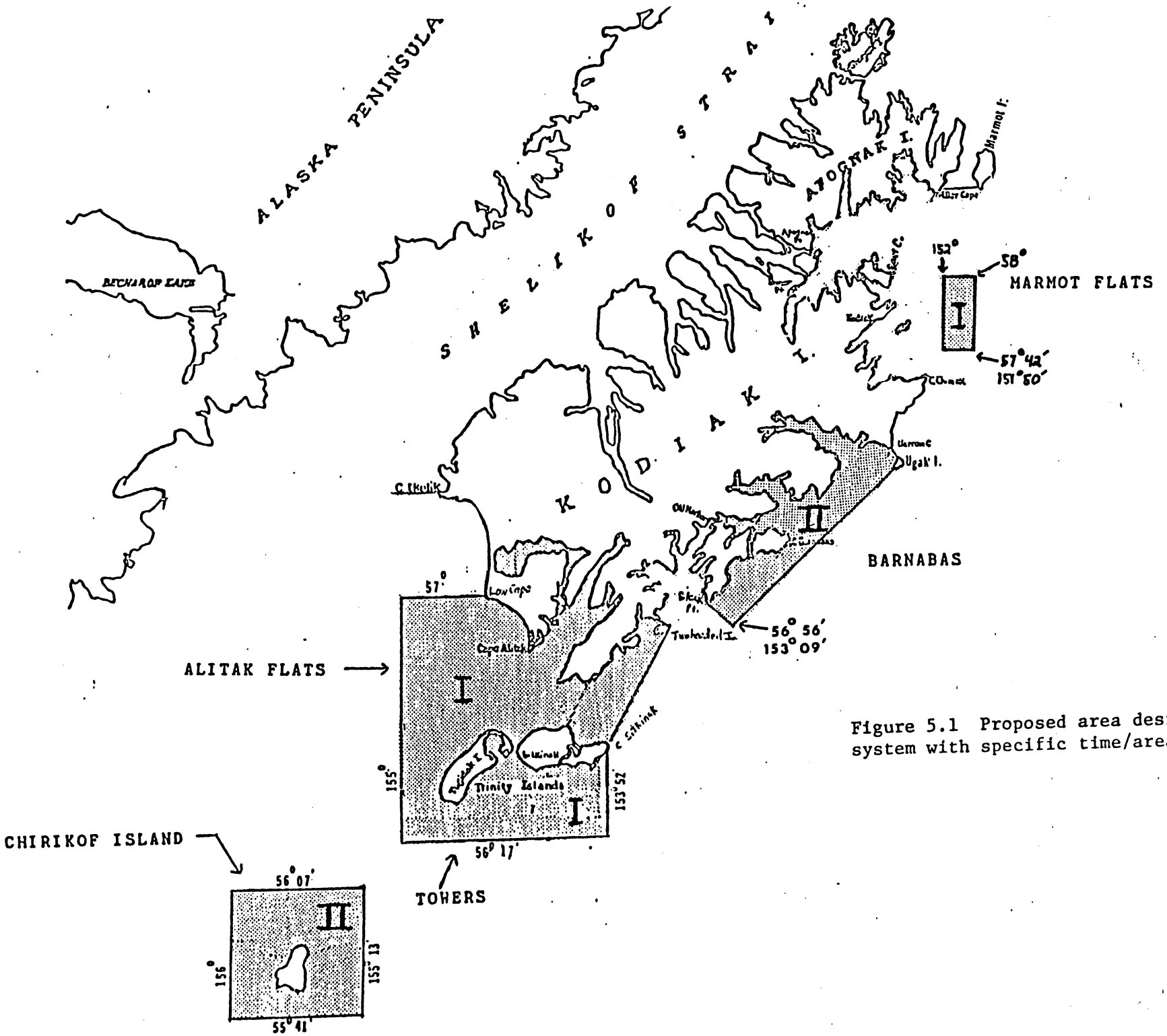


Figure 5.1 Proposed area designation system with specific time/area closures.

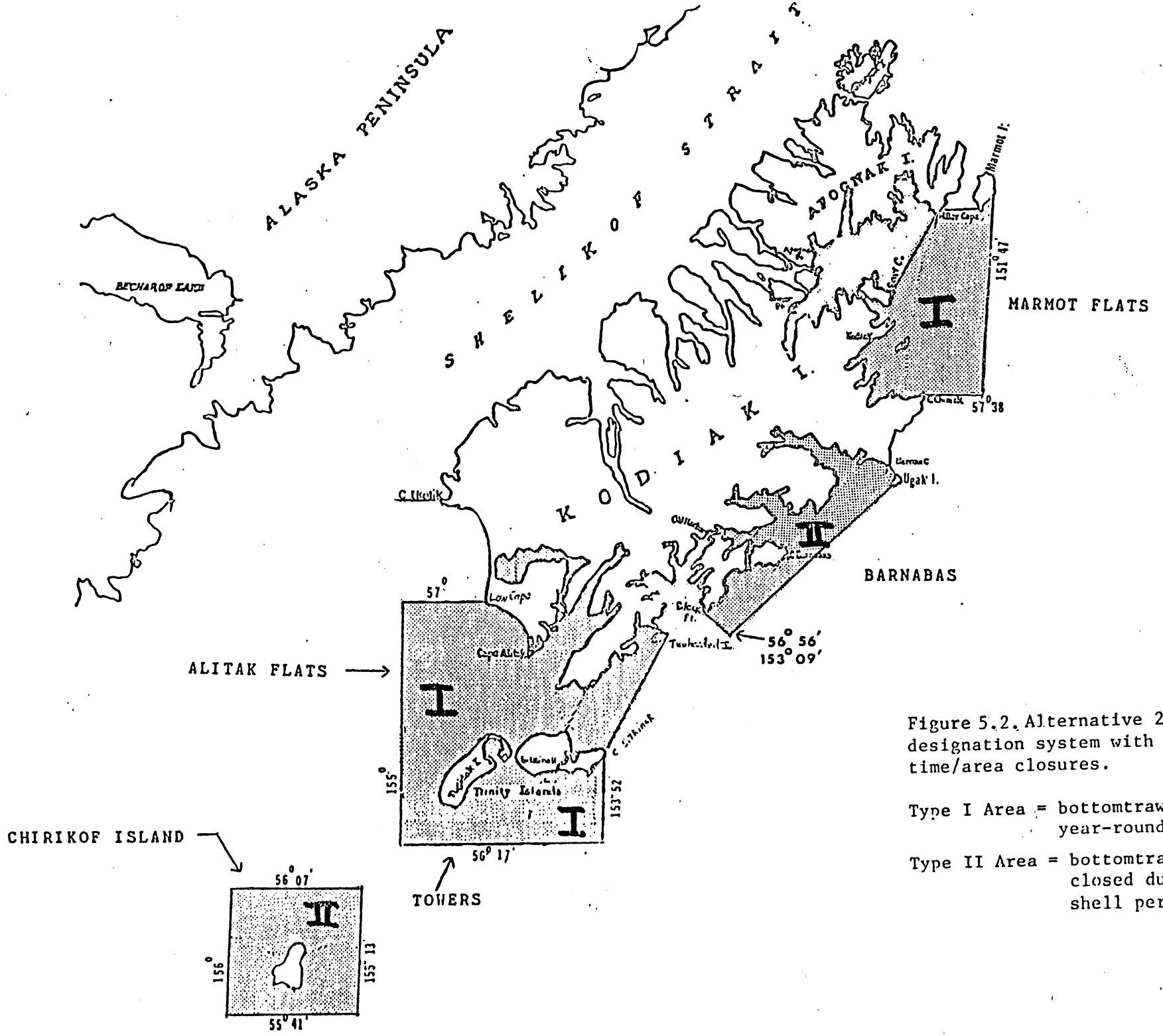


Figure 5.2. Alternative 2 area designation system with specific time/area closures.

Type I Area = bottomtrawling closed year-round

Type II Area = bottomtrawling closed during soft-shell period

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.

It should be noted that if the state of Alaska finds reason to open a shrimp fishery within the designated areas, these alternatives are not intended to prohibit such a shrimp opening.

C. Alternative 2: Establish a time/area closure scheme for non-pelagic trawling similar to Alternative 1 except that a larger area of Marmot Flats is designated a Type I area. This scheme is designed to help rebuild the king crab resource and would be in effect for three years from the year of implementation (Figure 5.2).

This alternative is identical to Alternative 1 with the exception that the Marmot Flats area is expanded to match the boundaries defined by the Council's 1986 emergency rule (Figure 5.2). As with Alternative 1, the Marmot Flats, Alitak Flats, and Towers areas would be designated Type I areas and closed year-round to non-pelagic trawling for groundfish. Similarly, the Chirikof and Barnabas areas are designated as Type II areas with non-pelagic trawling prohibited during the February 15 - June 15 king crab soft-shell period. Fishing with other gear would be allowed and fishing with bottom trawl gear would be allowed from January 1 - February 14 and June 16 - December 31. This alternative was developed for public review by the Advisory Panel.

D. Alternative 3: Establish a time/area closure scheme for non-pelagic trawling similar to Alternative 2 except that a smaller part of the Marmot Flats area is designated a Type I area, as shown in Figure 5.3 and Table 5.1, for a period of three years from the year of implementation.

This alternative is identical to Alternative 2 with the exception that the Marmot Flats area is reduced to match the boundaries specified by the Council's Advisory Panel at their meeting on September 23, 1986 (Figure 5.3). As in Alternative 1, the Marmot Flats, Alitak Flats and Towers areas would be designated Type I areas and the Cherikof and Barnabas areas designated as Type II areas.

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 non-pelagic trawl groundfish fisheries. Incidental catches and subsequent mortalities would continue wherever concentrations of king crab occur, and at all times of the year when non-pelagic 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

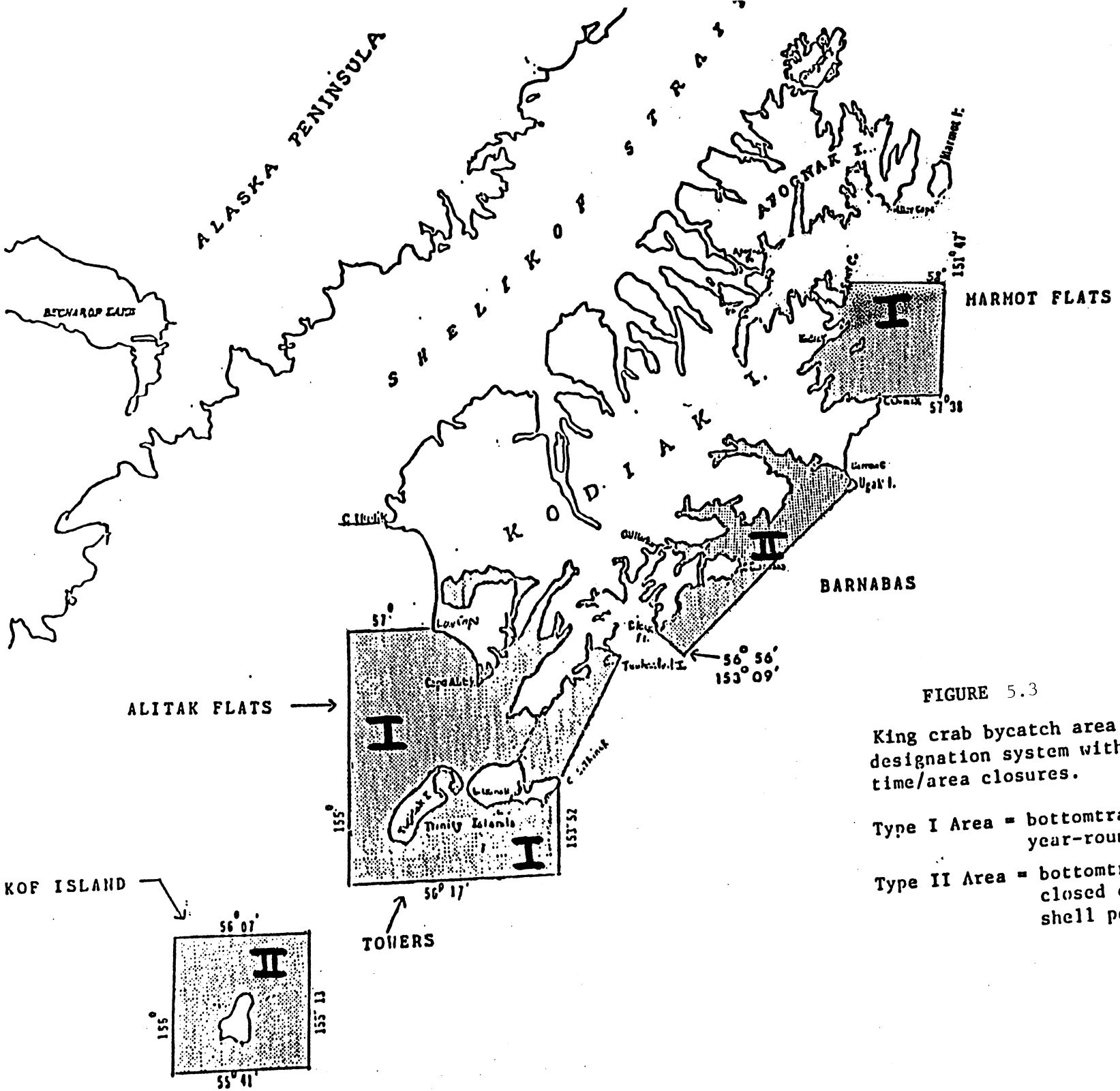


FIGURE 5.3

King crab bycatch area designation system with specific time/area closures.

Type I Area = bottomtrawling closed year-round

Type II Area = bottomtrawling closed during soft-shell period

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 sea otters. 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.

With the status quo, commercial fishing for groundfish would be conducted in the areas proposed to be closed or restricted in Alternatives 1 and 2. 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 Alternatives 1 and 2 are not well understood but are believed to be insignificant. The Gulf of Alaska ecosystem is so complex, that the environmental impacts as a result of this amendment are undetectable given the background availability of the system.

B. Alternative 1: Establish a time/area closure scheme for non-pelagic trawling to help rebuild the Kodiak king crab resource for a period of three years from the year of implementation.

Adoption of this alternative would provide the positive benefits of protecting the majority (85%) of Kodiak Island king crab resource from non-pelagic trawls during their soft-shell period (February 15-June 15), protect the most concentrated king crab areas (Alitak Flats and Towers), or 70% of the existing resource year round, while still providing non-pelagic trawl fishing opportunities close to established processing and support facilities (Dana Schmidt, ADF&G, personal communication). Injury or mortality as a result of non-pelagic 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 non-pelagic trawl industry. A review of 1985 non-pelagic trawl groundfish harvests indicate that only 1% of the harvest would have been lost if the time/area closures had been in effect during that year. 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. Therefore, the impacts of this alternative on groundfish stocks is insignificant.

As king crab stocks recover more king crab will enter the ecosystem. The 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.

C. Alternative 2: Establish a time/area closure scheme for non-pelagic trawling similar to Alternative 1 except that a larger area of Marmot Flats is designated a Type I area. This scheme is designed to help rebuild the king crab resource and would be in effect for three years from the year of implementation (Figure 5.2).

Adoption of this alternative would intuitively afford more protection for king crab because a larger area of Marmot Flats is included in the time/area closure scheme. However, what additional protection is provided is unknown. A review of king crab population survey data does not statistically allow a comparison of the degree of king crab protection between Alternatives 1 and 2. As with Alternative 1, Alternative 2 protects the majority (85%) of Kodiak Island king crab resource from non-pelagic trawls during their soft-shell period (February 15 - June 15), and protects the most concentrated king crab areas (Alitak Flats and Towers), or 70% of the existing resource year-round (Dana Schmidt, ADF&G, personal communication).

As with Alternative 1, this alternative would increase the probability of a king crab population recovery while minimizing the impacts on the groundfish non-pelagic 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 during that year. 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. Therefore, the impacts of this alternative on groundfish stocks is insignificant.

As king crab stocks recover more king crab will enter the ecosystem. The 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.

D. Alternative 3: Establish a time/area closure scheme for non-pelagic trawling similar to Alternative 2 except that a smaller part of the Marmot Flats area is designated a Type I area, as shown in Figure 5.3 and Table 5.1, for a period of three years from the year of implementation.

Intuitively, adoption of this alternative provide more protection for king crab then Alternative 1. However, the level of protection this alternative provides relative to the other alternatives is unknown. King crab survey data is not of adequate spatial resolution to address these differences. As in Alternatives 1 and 2, Alternative 3 protects the areas of highest concentrations of king crab (Alitak Flats and Towers), or 70% of the existing resource year-round (Dana Schmidt, ADF&G, personal communication).

As with Alternative 1 and 2, this alternative would increase the probability of a king crab population recovery while minimizing the impacts on the groundfish non-pelagic 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 during that year. 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. Therefore, the impacts of this alternative on groundfish stocks is insignificant.

As king crab stocks recover more king crab will enter the ecosystem. The 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 4 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. It should be noted that the proportion of salmon being handled is not mentioned in either the plan or the implementing regulations. 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 season begins on January 1 and ends on December 31, or until the quota is reached. 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 (i.e., prior to January 1).

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 modify gear, close, extend or open fisheries, and adjust TQ and PSC limits.

Inseason authorization for the Secretary, by means of his delegation to the Director, Alaska Region, NMFS, is provided to adjust gear restrictions, season opening and closing dates, and TQs and PSC limits. Such adjustments must be necessary to prevent overfishing or to change TQs or PSC limits which the Regional Director finds, as a result of the best available stock status information, to have been incorrectly specified.

The Regional Director is constrained, however, in his choice of management responses to prevent potential overfishing by having to first consider the least restrictive adjustments to conserve the resource. The order in which the Regional Director must consider inseason adjustments to prevent overfishing are specified as: (1): Any gear modification that would protect the species in need of conservation protection, but which would still allow fisheries to continue for other species; (2) a time/area closure which would allow fisheries for other species to continue in non-critical areas and time periods; and, (3) total closure of the management area and season.

An example of a potential gear restriction would be the closure of an area to non-pelagic trawling to prevent overfishing of a bottom dwelling species. The exercise of the Secretary's authority to adjust TQs or PSC limits requires

that adjustments be made only as a function of the best available scientific information that the biological status or condition of a stock is different from that on which the currently specified TQ or PSC limits is based. Any adjustments to the specified TQ or PSC limit must be reasonably related to the change in stock status. The Secretary may not make inseason adjustments based on any rationale other than a change in biological stock status.

For example, a PSC limit for a crab stock derived from a specific level of the crab biomass, could be adjusted upwards or downwards if the new stock status information showed that the crab biomass had changed.

If the TQ or PSC limit was based on factors other than the biological stock status of that species, however, the Regional Director would not be able to make the determination that the TQ or PSC limit was incorrectly specified. In the Gulf of Alaska, for example, the Council has routinely based the optimum yields for Pacific cod and flounders to control the halibut bycatch. In this instance, any change in the stock status of Pacific cod or flounders could not result in exercise of this authority since the TQs were not based on the stock status of these species.

The types of information which the Regional Director must consider in determining whether stock conditions exist that require an inseason management response are described, as follows, although he is not precluded from using information not described but determined to be relevant to the issue.

(1) The effect of overall fishing effort within a regulatory area.
(2) Catch per unit of effort and rate of harvest.
(3) Relative abundance of stocks within the area.
(4) The condition of the stock within all or part of a regulatory area.
(5) Any other factors relevant to the conservation and management of groundfish species or any incidentally caught species which are designated as a prohibited species or for which a PSC limit has been specified.

Finally, the procedure which the Secretary must follow requires that the Secretary publish a notice of proposed adjustments in the Federal Register before they are made final, unless the Secretary finds for good cause that such notice is impracticable or contrary to the public interest. If the Secretary determines that the prior comment period should be waived, he is still required to request comments for 15 days after the notice is made effective, and respond to any comments by publishing in the Federal Register either notice of continued effectiveness or a notice modifying or rescinding the adjustment.

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 in the interest of furthering the fishing economy, as well as close fisheries for conservation reasons. Socioeconomic factors that he may consider are (4) and (5), listed below. Factors (1), (2), and (3) are conservation factors and ask the same as under Alternative 1, where again,

conservation is taken to mean wise use. 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, 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, 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 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 obtained which is more recent than that available at the beginning of the fishing year may be available which managers could not use according to current inseason authority. 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. As a result, 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. Other impacts might include the influx of nutrients in the form of fish wastes from the overharvested species, discarded at sea, and consumed by various marine life. 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.

B. Alternative 1.

Under Alternative 1, the Secretary, through the Regional Director, would be authorized to make inseason adjustments to harvest levels, gear restrictions and season opening and closing dates by rule-related notice. Such adjustments

must be necessary to prevent overfishing or to change harvest quotas or bycatch limits which the Regional Director finds, as a result of the best available stock status information, to have been incorrectly specified.

The Regional Director is constrained, however, in his choice of management responses to prevent potential overfishing by having to first consider the least restrictive adjustments to conserve the resource. The order in which the Regional Director must consider inseason adjustments to prevent overfishing are specified as: (1) any gear modification that would protect the species in need of conservation protection, but which would still allow fisheries to continue for other species, (2) a time/area closure which would still allow fisheries for other species to continue in non-critical areas and time periods, and (3) total closure of the regulatory area or season.

An example of potential gear restriction would be the closure of an area to non-pelagic trawling to prevent overfishing of a bottom dwelling species. Any adjustments to the specific harvest quota or bycatch limits must be reasonably related to the change in stock status, and the Secretary may not make inseason adjustments based on any rationale other than a change in stock status.

The inseason adjustment authority provided by this alternative would allow the Regional Director to respond in a timely manner to changing environmental circumstances or stock conditions. He would thus be better able to prevent overfishing groundfish species, thus reducing the likelihood of the fishery-related impacts on the resource. No changes in the amounts of nutrients in the form of fish wastes discarded at sea are expected to occur. No changes in the effects on endangered species or the coastal zone are expected.

C. Alternative 2.

This alternative would allow the Regional Director to open and close fisheries for either conservation or socioeconomic reasons. The environmental impacts of Alternative 2 would be no less than with the previous alternative, but they could be perceived to be greater if fishing seasons were reopened for socioeconomic reasons. However, greater environmental impacts are unlikely since the socioeconomic factors are very specific and authorize inseason adjustments only for failure to achieve a harvest quota due to weather, or to maximize the roe quality in a roe fishery. In both cases the number of groundfish removed from the ecosystem would be the same. Regardless, the environmental impacts associated with inseason management adjustments would be undetectable and most likely insignificant within the range of natural dynamics of the ecosystem.

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

9.0 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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