

Common Property Institutions in the Alaskan Groundfish Fisheries

by

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Abstract: This paper describes the process by which the groundfish resources off Alaska are being transformed from essentially open access to more manageable common property resources. Selected common property institutions that were created or developed in these fisheries are described in terms of the problems they were designed to solve, their success or lack of success in doing so, and the factors that influenced both emergence and success of these institutions. The institutions discussed include the North Pacific Fishery Management Council, the Community Development Quota system, the Pollock Conservation Cooperative, and the cooperative bycatch control system known as Sea State used by the factory trawler fleets. Conclusions applicable to other fisheries and other common property resources are then drawn from the analysis of these common property institutions in the Alaskan groundfish fisheries.

Key Words: Common property, fisheries, cooperatives, institutions

I. Introduction

Theory and observation support the conclusion that open-access marine fisheries inevitably suffer from overexploitation and dissipation of resource rents, but the fate of common property fisheries is less certain. Examples of successful self-management and co-management of fisheries can be found (e.g., Jentoft 1989, Bromley 1992), but they appear to be the exception rather than the rule. The extension of territorial waters to 200 miles by most nations over the last few decades allowed for the transformation of most important fisheries from open access to common property resources in the sense that the user groups and their rights to use of the resource could be limited and defined. However, this opportunity for common property institutions to emerge and facilitate rational use of these resources has, for the most part, not been grasped.

As Feeny, Hanna, and McEnvoy (1996) note, while fisheries within the 200-mile limit are state property, they are often *de facto* open access to citizens of that state. Overfishing and collapse of fisheries has continued. Even in cases such as the Alaskan groundfish fisheries where stocks and harvests have been maintained, resource rents have been dissipated through overcapitalization. The creation of private property rights through individual fishing quota systems (e.g., individual transferable quota (ITQ) and individual vessel quota (IFQ)) has been suggested as a solution to this “tragedy of the commons,” and individual quota have indeed been quite effective in improving economic performance in many fisheries (OECD 1997). However, effective common property institutions have emerged in some fisheries, and provide an alternative to IFQ systems which in many cases are not politically viable, logically feasible or socially acceptable.

This paper describes the ongoing process by which the groundfish resources off Alaska are being transformed from essentially open access to (potentially) more manageable common property resources. Selected common property institutions that developed in these fisheries are described in terms of the problems they were designed to solve, their success or lack of success in doing so, and the factors that influenced both emergence and success of these institutions. The institutions discussed include the North Pacific Fishery Management Council (NPFMC), the Community Development Quota program, the harvest cooperative formed by the pollock factory trawlers known as the Pollock Conservation Cooperative (PCC), and the cooperative bycatch control system known as Sea State used by the non-pollock factory trawler fleet. Conclusions applicable to other fisheries and other common property resources are then drawn from the analysis of these common property institutions in the Alaskan groundfish fisheries.

II. Analytical Framework

The literature provides considerable insights into why common property institutions do or do not emerge, how effective they are at increasing or maintaining the benefits the users derive from the common property resource, and the factors that determine whether the institutions endure. This literature provides a framework for analyzing the development of common property institutions in the Alaskan groundfish fisheries. We review this literature below before proceeding with a discussion of selected common property institutions in the Alaskan groundfish fisheries. We then draw upon this literature to identify key factors that have aided or hindered common property management.

Defined boundaries of the group of appropriators and the resource itself are a necessary (Ciriacy-Wantrup and Bishop 1975), but clearly not a sufficient condition for effective common property management. Ostrom (1992) hypothesizes that resource users will fail to develop

cooperative solutions unless “they share a common understanding and perception of the nature of the problem, the alternatives for coordination available to them, the likelihood of mutual trust and reciprocity, and expected decision-making costs as being less than the benefits to be derived.” Ostrom (1990) notes that “the total number of participants, the minimal number needed to achieve collective benefit, the discount rates of individuals, similarity of interests, and presence of participants with leadership or other assets, are consistently shown to influence outcomes,” but these too are insufficient to explain outcomes in many cases.

In analyzing the success of co-management in fisheries, Jentoft (1989) notes that the development of trust between fishers is critical: “Important for a successful result, therefore, are the factors which produce trust in organizations and whether or not these factors are prevalent in the existing organizations.” Jentoft goes on to say that “trust is not only a product of formal organization, but also of informal organization. Informal organization develops through long-term interaction among members inside and/or outside the organization. This leads to the proposition that the more long lasting and multifaceted relations among fishermen, the more likely is the success of co-management.”

Unless they are organized and funded by the government, common property institutions can not be expected to emerge or survive if their benefits do not substantially outweigh their costs including the costs of intragroup enforcement, extragroup exclusion, decision making, and coordination (Feeney 1992). Further, even when benefits exceed costs, sacrificing behavior may inhibit the development of new institutions. When systems are imperfect but adequate, insufficient motivation tends to prevent the costly process of better systems (Ostrom 1992). A crisis is sometimes needed to provide the necessary motivation. Samuelson and Messick (1986) found that the subjects were more willing to vote for controls on the harvesting of the resource in situations characterized by overuse than in situations characterized by optimal rate of exploitation. Paradoxically, it may follow that sound management of fisheries from a biological perspective may actually inhibit the cooperation necessary to improve the economic management of the fishery.

The role of the government in fostering the development of common property institutions can be quite important. While it may be sufficient for the government to provide an institutional environment that is supportive of resource users devising their own governing institutions, the appropriate role of government may extend to providing information or even devising rules of operation (Schlager, Blomquist, and Tang 1994). Subsidizing the costs of development and maintenance of common property institutions, and providing assistance with enforcement and monitoring activities is not uncommon.

Government can also provide significant impediments to development of common property institutions. Hanna (1997) characterizes fishery governance in the US as being dominated by frontier incentives which reward the individualistic pursuit of self interest as opposed to a cooperative approach. She writes that, while these incentives and the culture they engender may be appropriate for stimulating the conquering of a new frontier, they are counterproductive when it comes time to devising strategies for cooperative use of a limited and oversubscribed resource. Hanna (1997) notes also that ‘some management has proceeded in an ‘us versus them’ mode which places user groups outside the sphere of responsibility for fishery health and sustainability and provides little incentive for user groups to develop unified positions or to develop the managerial skills necessary for full participation in the system.’

Common property institutions that do emerge often do not survive. A key factor to both emergence and survival is whether the group can sustain legal claims as common property

resource (CPR) owners (Ostrom 1992). Ostrom notes that it is often critical that the institution be nested in a larger organization in which it is perceived as legitimate. Dahl (1970) suggests that “a broader association (which may be that peculiarly important association known as the state) may be necessary to regulate conflict among smaller, more homogenous associations.”

Group size and homogeneity are often cited as critical factors for the survival and success as well as the emergence of common property institutions. These two factors are likely to be correlated since smaller groups tend to form from larger ones on the basis of shared ideas, goals, etc. As Jentoft (1989) explains “Organizations with a relatively homogenous socioeconomic membership will have less internal conflicts of interest and this will make decision making easier. Jentoft also notes that “the success of co-management is contingent on fair and equal distribution of resource benefits. When the membership is homogenous, equal distribution will also be fair distribution.” Similarly, Scott (1993) states that though homogeneity is not typically listed in the literature as a prerequisite for self government, heterogeneity embeds two important factors that do make self-government difficult. These are inadequate or asymmetric information and distributional issues. These issues are not independent since solving the information problem may require agreement on distribution of costs and benefits. All of these problems increase to the extent that the group is heterogeneous.

By their very nature, the success of common property institutions relies on the forbearance of individuals from activities that would be profitable for them if others abstain. Thus achieving compliance is critical to the survival of institutions. Typically, the honor system provides an insufficient compliance strategy. A naïve view of compliance might suggest that compliance will be achieved if the penalty for an infraction multiplied by the probability of detection is greater than or equal to the benefit from breaking the rule. However, the literature provides a richer theory of what makes a compliance system effective and efficient. Perceived fairness of rules and penalties and consistent enforcement are shown to be critical to achieving compliance. Peer pressure also can be a major factor; being ostracized by ones peers can provide incentives every bit as important as a fine. Ostrom (1992) suggests that compliance is more likely when enforcement is shared by all members and supplemented by “official” observers with graduated sanctions for non compliance and only minimal sanctions for occasional or accidental noncompliance.

Common property institutions may offer some significant advantages over externally imposed rules. As Sutinen and Kuperan (1999) note, compliance is greater when the rules and the enforcement of them are viewed as legitimate by the user group. A key factor in creating this legitimacy is that rules are devised and enforced fairly and justly. It seems likely that self-imposed rules agreed upon by a group are more likely to be viewed as legitimate. However, while a strong role of resource users in determining rules and perhaps penalties may increase compliance, one should not necessarily assume that enforcement can be effectively carried out by the users themselves. Jentoft (1989) notes that conducting enforcement activities is difficult for fishermen because they usually find it difficult to carry out the role of informer and will rarely report other fishermen. Jentoft writes, “If there is one general lesson to be learned from this it is that enforcement is one of the regulatory functions which seems better handled by government than by fishermen’s organizations.”

A final point made by Ostrom (1992) raises an issue of particular concern for fisheries. She notes that the survival of common property regimes is less likely if they are subjected to rapid exogenous change. This could clearly be a problem for marine fisheries which are often subject to large fluctuations in resource abundance resulting from environmental stimuli and

management failures. Commercial fisheries selling into international markets may also be subject to price shocks due to shifts in international demand. This suggests that effective mechanisms for adaptation and conflict resolution will be critical to the survival of common property institutions in fisheries.

III. Common Property Institutions in the Alaskan groundfish fisheries

The Federally-managed groundfish fisheries off Alaska are some of the Nation's most important in terms of quantity of fish caught and value of products produced. These fisheries account for nearly half of the total volume of US landings of finfish (NMFS 1999 and Hiatt and Terry 1999). The fisheries are managed in two distinct areas, the Bering Sea and Aleutian Islands area (BSAI) and the Gulf of Alaska (GOA) pursuant to two fishery management plans (FMPs), one for each area. In 1998, the total groundfish catch for both areas exceeded 4 billion pounds, which produced over 1.2 billion pounds of fishery products that sold for roughly \$1 billion at first wholesale (Hiatt and Terry 1999). Walleye pollock, from which surimi, fillets, roe, and fish meal are produced, is the most abundant species in the fishery. In 1998 pollock comprised 60 percent of the total Alaskan groundfish catch and 46 percent of the ex-vessel value. Pacific cod, flatfish, rockfish, Atka mackerel, and sablefish make up the rest of the fishery's total catch¹.

In 1976, the Fishery Conservation and Management Act established the exclusive management authority of the United States over fishery resources within 200 miles of its coast (the Exclusive Economic Zone (EEZ)). This act, as amended and currently known as the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), brought about the possibility, if not yet the reality, of transforming massive stocks of groundfish off the coast of Alaska from open access to manageable common property resources. Despite subsequent elimination, first of foreign, and then of joint-venture fishing of these stocks, a community of resource users capable of coordinating utilization of the resource in an economically efficient manner failed to emerge. While the NPFMC and Federal fishery managers focused on limiting catches to sustainable levels, various user groups focused on securing shares of the total allowable catch (TAC). This was accomplished both by competition on the fishing grounds (i.e., the race-for-fish) and through amendments to the FMPs and FMP implementing regulations that directly or indirectly led to allocations to specific user groups as delineated by target species, gear, vessel size, and other characteristics such as whether fish are processed at sea or on shore. Most recently, Congress has become directly involved through the American Fisheries Act which, in 1998, effectively re-apportioned the TAC for BSAI pollock among specified groups of fishers and processors.

Although the use of in-season closures triggered by pre-determined TACs and bycatch limits largely prevented depletion of fish stocks, resource rents were dissipated through excess harvesting and processing capacity. Increasing fishing capacity combined with fixed total catches led to a “race-for-fish” with a variety of negative consequences that increased the social and financial costs of prosecuting the fishery and reduced product quality and value. Progressively shorter seasons and limited alternative uses leave fishing vessels and processing equipment idle much of the year resulting in excessive fixed costs. The “race-for-fish” also

¹ Halibut is also an important fishery in these waters, but from a regulatory standpoint it is not considered part of the groundfish fishery. Authority for its management is held jointly by the International Pacific Halibut Commission, the NMFS and the NPFMC.

contributes to increased accident and bycatch rates. Product mix and quality control decisions by processors have been dominated by a need to maximize throughput and profits per operating day rather than maximizing profit per ton of fish.

Developing cooperative solutions to avoid these problems in the BSAI and GOA groundfish fisheries has been difficult due to the physical size of the fishery, the large number and heterogeneity of the participants and the political resistance to inaugurate institutions to support CPR-based solutions. Nevertheless, as TAC allocations have become more finely divided over the years, relatively small and distinct user groups with common interests have emerged. This has lead to an environment more conducive to cooperative solutions to problems that result from failures to coordinate use of the CPR. Technological changes also have contributed to the implementation and success of some of these solutions. The following describes several institutional arrangements that have evolved since the Magnuson-Stevens Act was originally implemented nearly 25 years ago.

The North Pacific Fisheries Management Council

The Magnuson-Stevens Act established the NPFMC (along with seven other regional fishery management councils) and gave it authority to recommend to the Secretary of Commerce fishery management policies by which the Alaskan groundfish fisheries are prosecuted. Approved policies are implemented by Federal regulations. The NPFMC provides a forum in which stakeholders in the fisheries can cooperate to improve management of the fisheries. By law, the NPFMC is composed of eleven voting members: six from Alaska, three from Washington, one from Oregon and one representing the Secretary of Commerce (National Marine Fisheries Service). The Magnuson-Stevens Act also mandates the creation of a Scientific and Statistical Committee (SSC) and an Industry Advisory Panel (AP) to provide advice to the Council, although the Council is not required to adhere to the advice of either.

Among other things, the NPFMC is given the authority to determine who, or which vessels, may take part in the federally managed groundfish fisheries off Alaska. Initially, the NPFMC, like other regional fishery management councils, began implementing a policy of “Americanization” which eventually led to the exclusion first of foreign fishing vessels and then foreign at-sea processors from the fisheries within the US EEZ (Megrey and Wespestad 1990). By 1988, participation the North Pacific groundfish fishery in the EEZ was limited to domestic fishing vessels and plants and foreign processor vessels in joint-venture operations with American owned catcher vessels. Joint venture operations were subsequently phased out leaving the fishery fully “Americanized” by 1991 (NMFS 1993). Despite the removal of the foreign and joint venture fleets, however, by 1988, domestic capacity was already sufficient to harvest the groundfish TAC and was still expanding rapidly (Megrey and Wespestad 1990).

In 1992 the NPFMC took action to limit participation in these fisheries. A moratorium on entry of additional fishing vessels into BSAI and GOA groundfish fisheries and the BSAI crab fishery was adopted by the Council in 1992. In 1996, the Council acted to replace the moratorium in the groundfish and crab fisheries with a license limitation program, a more restrictive form of limited access; however, the program was not actually implemented until 2000. Although the moratorium and the limited license program put a theoretical cap on the size of the fishing fleet, they allowed in far more vessels than were necessary to prosecute the fisheries.

This group of vessels competed against each other for a limited catch both on the fishing grounds and increasingly in the NPFMC arena. A series of amendments to the BSAI and GOA

groundfish FMPs have effectively divided the fisheries among various user groups. These FMP amendments have included direct allocations of quotas for particular species or species groups to groups of vessels as delineated by gear type, vessel size, mode of operation, etc. The National Marine Fisheries Service estimated that in the early 1990s, the NPFMC spent about 24 percent of its time in setting TAC levels while the remainder of the meeting time was spent on allocation issues (NMFS 1996). Tables 1 and 2 provide a brief history of the FMP amendments of which the NPFMC now has adopted about 65.

One of the major sectoral divisions in these fisheries is based on where the fish are processed. Inshore-offshore allocation amendments, Amendment 18 to the BSAI groundfish FMP and Amendment 23 to the GOA groundfish FMP, were adopted in 1992 and allocated specific proportions of the pollock TAC (and Pacific cod TAC in the GOA) between fishing for delivery to offshore (factory vessel) processors and for delivery to onshore processors. Amendment 18 also created the Community Development Quota (CDQ) program which allocated 7.5 percent of the BSAI Pollock TAC to Western Alaska coastal communities. The remaining Pollock TAC was allocated 35 percent to vessels delivering to shoreside plants and floating processors at a fixed location in state waters and 65 percent to the catcher-processor fleet and vessels delivering to offshore processor vessels known as motherships. In June 1998, the NPFMC acted to change the inshore-offshore allocation of Pollock in the BSAI to 39 percent to inshore and 61 percent to offshore producers.

This allocation was superceded by Congress later in 1998, however, when it passed the American Fisheries Act (AFA). The AFA identified the plants and vessels eligible to participate in the BSAI pollock fishery and changed the allocation between the sectors in a negotiated deal between the AFA's sponsors and fishing industry representatives. The AFA increased the CDQ allocation to 10 percent of the Pollock TAC and, after allowance for bycatch of pollock in other fisheries, allocated the remaining TAC 50 percent for processing by inshore processors, 40 percent for processing by offshore catcher-processors, and 10 percent processing by offshore motherships. The AFA also authorized the formation of fishery cooperatives for catcher-processors in 1999, and for the mothership and inshore sectors in 2000, and provided for the buyout of nine catcher-processors. The Council has also acted to protect groups that may be indirectly influenced by the AFA. To prevent redundant pollock capacity from flowing into other fisheries which are already fully subscribed, a series of so called "sideboard" measures are being put in place that dictate maximum levels by species of non-pollock catches of particular segments of the pollock fleet.

The inshore-offshore allocations in the GOA pertain to pollock and Pacific cod and have not changed since 1992. These allocations provide for 90 percent of the GOA cod TAC and 100 percent of the GOA pollock TAC to vessels delivering to onshore plants, effectively excluding catcher-processors from the GOA pollock fishery and most of the GOA cod fishery.

Allocations have also been made among gear groups in the Pacific cod fishery in the Bering Sea. Amendment 24 split up the Bering Sea cod TAC between trawl, fixed gear and jig gears in 1994. The relative shares were changed by Amendment 46 in 1997, and a pending amendment will likely further break down the fixed gear TAC between pot and longline gears.

Until October 1996, when the most recent amendments to the Magnuson-Stevens Act were enacted, the NPFMC had the ability to implement IFQ systems as a means of resolving rent dissipating dilemmas, among other things. An IFQ program was recommended by the NPFMC for the halibut and sablefish fixed-gear fisheries in 1991, and was fully implemented in 1995. Although the NPFMC briefly considered IFQ programs for other fisheries also, a five-year

moratorium on IFQ systems included in the 1996 reauthorization of the Magnuson-Stevens Act suspended any future plans for additional IFQ programs.

While IFQs were at least temporarily prohibited, some other forms of property and quasi property rights were not. The CDQ program has been allocating shares of the groundfish quotas to specific community development groups annually since 1992 (Ginter 1995). More recently, shares of the BSAI pollock TAC have been allocated to fishery cooperatives to divide among themselves. Other groups with less secure rights to catch allocations have nonetheless formed cooperative ventures to rationalize their group's activities.

The CDQ Program for the BSAI Groundfish Fishery

The purpose of the Alaska CDQ program is to promote the economic development of the communities by giving them a means to benefit from the high-value fisheries of the BSAI. The program allocates shares of the TACs for all species of groundfish and crab in the BSAI to six community development groups in Western Alaska. A National Research Council (1999) committee produced a thorough report on the Alaska CDQ program from which we draw much of the descriptive material about the structure of the program. The community development groups are made up of regional alliances of Alaska Native villages on or near the Bering Sea. The current CDQ program was recommended by the NPFMC in 1992, as part of the inshore-offshore Pollock allocation. The Council had previously adopted (in 1991) a CDQ allocation for the Pacific halibut and sablefish fixed gear fisheries as part of the IFQ program for these fisheries but this was not implemented until 1995. The first CDQ Pollock harvests were made in December 1992. Initially 7.5 percent of the BSAI pollock TAC was allocated to the CDQ program. The overall allocations are divided among the communities based on recommendations of the State of Alaska. In 1995, the program was expanded by the NPFMC to include allocations for king crab, tanner crab, and other groundfish species. The expanded multi-species CDQ program was authorized by Congress in 1996, and fully implemented in 1998. In 1999, the share of the pollock TAC allocated to the CDQ program was increased to 10 percent by the AFA.

Participation in the CDQ program is limited to communities within 50 miles of the Bering Sea coast but not on the Gulf of Alaska coast. Eligible communities are required to be certified as Native villages under the Alaska Native Claims Settlement Act and must not have already developed the capabilities for "substantial" participation in the commercial groundfish fisheries. Fifty-six communities were initially certified as eligible for the CDQ program and these communities formed themselves into six CDQ groups. To receive an allocation of quota, each group is required to set up a management structure and develop a detailed business plan. What has emerged are non-profit CDQ corporations with a board of directors made up of representatives from the communities, executive officers and professional staff. To facilitate interaction with industry partners and government oversight agencies, most of the CDQ groups established headquarters in Juneau, Anchorage or Seattle.

The allowable uses of the profits made by the communities have been quite strictly controlled. The communities are required to invest profits in fishery related industries such as fishing vessels, processing plants, port facilities, etc. To extract value from their shares of the resource, CDQ holders may harvest their fishery allocations themselves or lease them to other parties. With the exception of halibut allocations, CDQ holders have mainly chosen to lease quota to outside parties in return for compensation in a variety of forms. Contractual arrangements are not typically limited to payment of royalties per ton of quota but also include

provisions for training and employment of residents of CDQ villages, scholarship programs, and a variety of other considerations. Some of the groups have used revenue sharing agreements that allow the royalty to vary with the first wholesale product mix and prices. Increasingly CDQ groups are taking equity positions in existing commercial harvesting and processing operations which then use their CDQ allocations².

In practice the allocations themselves are used much like IFQs. Because there are few limitations on when or where the allocations can be used, and the harvesting privileges are secure, they are highly valuable to CDQ partners who also participate in the non-CDQ fisheries. Allocations can be used to prospect for fish before season openings as well as to prolong fishing after the regular non-CDQ season. The high value of these allocations in the pollock fishery is evidenced by the fact that lease rates for harvesting privileges have been quite close to, and have even exceeded, ex-vessel prices for delivered fish³. In 1999, when regulations were implemented to protect endangered Steller sea lions by limiting catches in areas close to port and splitting the winter season into two periods separated by a five-day stand-down period, vessels that had leased CDQ allocations were able to continue operations during this period. They also were able to avoid some spatial restrictions imposed on the fleet's non-CDQ operations. The passage of the AFA, discussed in more detail in the following section, offered similar benefits to non-CDQ participants in the Pollock fishery and the possibility of ending the race for fish in that fishery by creating quasi property rights. Some CDQ groups and their advocates expressed concern that this would result in lowering the rental value of the CDQ allocations. This did not occur in 1999. In fact, the average price per pound paid for pollock catch rights reached record high levels that year. The usefulness of the CDQ allocations for avoiding spatial and temporal restrictions may have contributed to these high rates, as did the increase in product prices in international markets. These lease rates may remain high. Due to significant excess harvest and processing capacity, additional fish allocations are valued at their marginal contribution to profit. In contrast, the average ex-vessel price paid for fish deliveries reflects the need for plants to cover more than variable costs. Also, the value of a pound of fish for processors no longer facing a race-for-fish has risen due to the processors' increased ability to maximize the value produced from a pound of fish in the slowed down fishery.

Cooperatives for BSAI Pollock Catcher Processors

The BSAI pollock fishery is the largest and most valuable fishery in Alaska with a catch of close to 2.5 billion pounds in 1998. The ex-vessel value of the fishery in 1998 was around \$240 million, and the value of production at first wholesale exceeded \$600 million (Hiatt and Terry 1999). The net value of the fishery has been reduced substantially by excess capacity which increased the capital costs incurred by the harvesting and processing sectors and has reduced the quality and value of product. In the early 1990s, after adopting the initial inshore-offshore measures and a moratorium on new entry, the NPFMC began to work on a "comprehensive rationalization" plan which included the option of an IFQ system. What has resulted to date from this plan, some would argue is neither "comprehensive" nor "rational." Insufficient support for a multi-species (or even a pollock-only) IFQ system stemmed primarily

² These arrangements and investments are discussed in the annual reports provided by the CDQ groups to NMFS and the State of Alaska.

³ Information on royalties is derived from confidential reports provided to the State of Alaska and NMFS by the CDQ organizations.

from on-shore processors' concern that they would be adversely affected by such a system and from social equity concerns. Fishing capacity continued to increase and seasons continued to shorten in the mid 1990s. Regulatory actions continued to focus on allocation issues between the in-shore and at-sea processing sectors.

In October 1998, Congress enacted the AFA which has had a profound affect on the management of groundfish fisheries in the BSAI and to a lesser extent the groundfish fisheries in the GOA. Among other things, the AFA identified an exclusive group of catcher vessels, factory trawlers, motherships and in-shore processors that were eligible to participate in the pollock fishery. The AFA also subsumed the NPFMC action, in June 1998, to change the inshore-offshore allocation. After increasing the CDQ allocation of BSAI pollock to 10 percent of the TAC and providing for bycatch amounts in other fisheries, the AFA shifted just over 10 percent of the BSAI pollock TAC from factory trawlers to in-shore processors, which include processing plants on land and floating processors anchored near shore. The Act also permanently removed (with compensation to the owners) nine factory trawlers from the offshore fleet. A profound change brought by the AFA was the creation of a pollock factory trawlers cooperative called the Pollock Conservation Cooperative (PCC). A group of catcher vessels that delivered fish to these factory trawlers also was able to form a separate cooperative. The formation of these cooperatives allowed the factory trawlers, and catcher vessels that deliver to them, to allocate among themselves the offshore factory trawler sector's share of the pollock TAC each year until December 31, 2004.

In practice, the cooperative system is very similar to an IFQ system for this sector of the fishery. However, the distribution of fishing privileges and the system for trading, selling or enforcing them was developed internally by the members of the cooperative. Each factory trawler and catcher vessel is allocated a proportion of that cooperative's overall quota based on a negotiated agreement by cooperative members. Individual vessels thereby are allowed to fish at a slower pace because they no longer compete against one another for catch. Stiff penalties are applied internally to an individual vessel that exceeds its allocation. The race-for-fish between the offshore sectors (motherships and catcher vessels delivering to them -- factory trawlers and catcher vessels delivering to factory trawlers) ceases because the full amount of the offshore allocation of the pollock TAC is distributed to the cooperatives as prescribed in the AFA.

Both leasing and sale of harvesting privileges among members of the cooperative are allowed. The leasing and sale of harvesting privileges to an outside party is allowed only if the buyer agrees to abide by the rules set forth in the cooperative's contract. They must also harvest and process the quota with one of the vessels already permitted or a replacement vessel that meets specified criteria. Although quotas are not held in perpetuity (allocations and cooperative provisions of the AFA sunset at end of 2004), an expectation exists that the system will continue after that date or be replaced by an IFQ system. In the first year of the new system significant leasing and sale of catch rights took place, including the sale of two of the largest companies, each with several vessels and large catch histories that can be converted to harvesting privileges within the fishery cooperatives.

The results of this new management approach are in sharp contrast to those of the recent past when each company attempted to put as much catching and processing capacity on the fishing grounds as it could muster. The pace of fishing was slowed down considerably by reducing the number of vessels fishing and by slowing down operations of those that are fishing. During the 1999 pollock winter season (A season) from late January, to late March, four of 20 eligible pollock factory trawlers were voluntarily left at their moorings in Seattle, and six factory

trawlers were idled in the fall season. Some of the catcher vessels that had delivered to this fleet simply rented their quota (receiving as much or more per pound for leased quota as they had for delivered fish the previous year). One factory trawler sold its catch history to the cooperative and exited the fishery completely (Richardson, 2000).

The pollock fishery under the AFA changed not only by reducing the fishing capital. Elimination of the need to race for fish allowed the fleet to dramatically change the way it operates on the grounds. In prior years, skippers had one primary goal – catch as much fish as fast as possible. Under the cooperative, the processing plant manager takes the leading role and dictates the pace of fishing to optimize flow through the plant. The average haul size for pollock factory trawlers dropped by roughly 30 percent between the A seasons in 1998 and 1999⁴. The daily catch rate for the group of factory trawlers that fished in 1998 and 1999 declined by over 60 percent. With smaller haul sizes, more careful processing and the ability to search out fish of optimal size the offshore fleet is able to improve its product mix and product quality and increase product recovery rates. In particular, the quality of the roe increased and the fleet was able to produce more high valued products such as deep skin fillets in place of less valuable products such as mince or regular fillets (APA 1999, NMFS data).

The AFA also provided for the motherships and inshore sectors to form cooperatives starting in 2000. Fishery cooperatives in these sectors have been implemented in 2000, effectively ending the race for fish in the inshore sector. A distinct difference between the inshore and offshore cooperatives, however, is that more cooperatives (up to eight) exist in the inshore sector. Allocation of the inshore Pollock TAC among the cooperatives depends on the catch histories of their member vessels. Also, the inshore sector of the BSAI pollock fishery was given a more restrictive set of ground rules dictating the structure of cooperatives. For example, to remain in a cooperative one year, a vessel must deliver at least some of its pollock harvest to the inshore processor to which the cooperative is tied during the previous year. Transfers of pollock TAC allocations between cooperatives, and hence plants, also is limited. Transfers of catcher vessels from one cooperative to another is discouraged by a requirement to operate in the “open access” mode for one year before joining a new cooperative. Due to these restrictions, whether the efficiency gains from inshore cooperatives will be as great as in the offshore sector is not clear. These restrictions likely will be the subject for NPFMC debate for years to come.

Sea State: a Bycatch Reduction Initiative

For several groundfish species harvested off Alaska, landings are not limited by the TAC, but by bycatch limits. To regulate the incidental take⁵ of certain “prohibited” species, limits on the annual incidental total take in specific fisheries (as delineated by primary target species) are set and the fishery is closed once these limits are reached. Prohibited species catch (PSC) limits are set for Pacific halibut, Pacific herring, salmon, king crab and tanner crab. Most of the flatfish fisheries are closed by PSC limits before the TACs are taken, and the cost in foregone harvest of groundfish is considerable.

While some reduction in incidental catch has been achieved with gear modifications and closed areas, the potential for reductions is inherently limited. The size and shape of halibut are

⁴ Calculations of vessel production rates and mixes are derived from observer data and data submitted by processors to NMFS.

⁵ Incidental take is not the same as catch. Take refers to mortality and is a function of catch since a percentage of incidental catch returned to the sea is assumed to survive.

similar to the target flatfish, and crab and flatfish habitats overlap. Another strategy for reducing incidental catch is to avoid fishing in areas with concentrations of the prohibited species. Such avoidance is greatly facilitated if vessel operators are aware of concentrations of prohibited species and the bycatch rates of other vessels fishing in other areas.

In 1995, a group of bottom trawlers formed a cooperative venture with a private company called Sea State, Inc. to facilitate this strategy. The basic information necessary to calculate bycatch rates on a tow-by-tow basis with a fine spatial scale was already available from the National Marine Fisheries Service (NMFS) observer program. Most of the participating vessels had observers onboard recording the quantities of catch and bycatch taken on a haul-by-haul basis for approximately half the vessel's tows. However, there was no mechanism in place to consolidate this information in real time and return it to the fleet. In fact, because doing so would reveal the fishing locations of individual vessels, the information was confidential. A general clearance agreement between Sea State, NMFS and participating companies allows Sea State to access observer data, calculate bycatch rates per ton of target catch on a one-minute-by-one-minute spatial grid, and disseminate this information by satellite communication to the participating vessels. The participating vessels are then expected to move away from high bycatch areas, and peer pressure is exerted on those who are reluctant to move.

While the concept is appealing, the performance of Sea State in achieving its tasks is unclear. The most dramatic declines in bycatch coincident with the implementation of Sea State were in crab bycatch (especially red king crab) in the rock sole fishery; however, these reductions may have been due primarily to the closure in 1995, and thereafter, of a large area where crab bycatch had been high in prior years. Halibut bycatch has not declined (in fact it has risen somewhat in the yellowfin and rock sole fisheries). Several factors may partially explain this. A strong year class of halibut recruited to the fishery in the mid to late 1990s, thus there may be more halibut to avoid. In the rock sole fishery, the crab area closures may have forced the fleet to reallocate effort in areas with higher halibut concentrations, and efforts to avoid crab in remaining areas may also lead to increased halibut bycatch. In the yellowfin fishery, low prices for yellowfin may have contributed to the problem. Because yellowfin is a relatively low value fish, fishers will typically try to target a certain amount of a more valuable species on the same trip. This targeting behavior may have been at odds with attempts to reduce halibut bycatch (Hendershadt 2000). In sum, it is entirely possible that bycatch rates would have been considerably higher in the absence of Sea State, but it is difficult to determine to what extent.⁶

Gauvin, Haflinger and Nerini (1996), developers of the program, claim the program has been quite successful, particularly at reducing crab bycatch in the rock sole fishery, but they note that a lack of full participation in the program has hindered efforts. One company with about a fourth of the active vessels in the fleet does not participate in the program. This company's boats have at times had higher bycatch rates than the rest of the fleet, before and after the implementation of Sea State. However, for the last few years, their bycatch rates for the most critical species, halibut, have actually been lower than that of the Sea State participants.

Individual bycatch caps might eliminate free rider behavior and increase incentives to participate in data sharing; however, monitoring and enforcement problems may be prohibitive. An alternative might be to form a cooperatives similar to those in the pollock fisheries that would internally allocate and enforce bycatch quotas of prohibited species.

⁶ Eventually the authors hope to undertake a more involved analysis of individual vessel responses to information generated by Sea State and resulting changes in individual bycatch rates which may shed more light on this, particularly on whether vessels are actively cooperating.

IV. Factors affecting emergence and success of common property institutions

The extensive size of the Alaskan groundfish fisheries and the high degree of heterogeneity in the user groups initially inhibited the formation of effective common property institutions capable of implementing cooperative efforts to solve problems such as overcapitalization and excessive bycatch. The failure of stakeholders to agree on many measures that would have substantially increased the overall net value of the fishery or curtailed the dissipation of resource rents is unsurprising because few management policies implemented in the fishery have equal impacts on all groups. Although all of the stakeholders in the Alaskan groundfish fisheries can not be said to share a common understanding and perception of the problems they face or the solutions to those problems, there are natural subgroups which do share common interests to varying degrees. For better or worse, these groups have become increasingly distinct over time as they have joined together in the Council arena to support regulations which have created official or de facto quota allocations for them.

Clearly defined and legally supported user rights for relatively small and homogeneous groups appear to be a necessary condition for the development of effective common property institutions capable of implementing cooperative solutions to the groups' problems. For example, only after the fleet of eligible pollock factory trawlers was defined and given a specific allocation of the TAC, good for six years, and Congressional sanction to form a fishery cooperative, were they able to do so. Prior to the AFA, the grouping of the mothership and factory trawler allocations and the relatively large factory trawler fleet proved to be a prohibitive factor. This was partly due to the fact that the owners of the motherships could not legally form or be part of a cooperative due to antitrust laws. But another factor was the structural differences between these sector groups which created significant differences between benefits of cooperation and the consequences of not cooperating for the two sectors. Also worth noting is the fact that brokering of the AFA in October 1998, with its framework for cooperatives, occurred when the offshore fleet was facing further reallocations of their catch share toward inshore processors and possible loss of fishing permits for some vessels held by the largest of the offshore companies. In June 1998, the offshore fleet attempted to broker a similar fishery cooperative provision with the NPFMC during its third consideration of inshore-offshore allocations. Only after concerns of the CDQ groups were addressed (by increasing the CDQ allocation), concerns of the inshore processors were addressed (by providing for inshore cooperatives tied to processing companies and limiting entry to the inshore processing sector), and concerns of Congress were addressed (by eliminating the foreign rebuilt factory trawl vessels) did the user rights become clearly defined and legally supported.

The success of the offshore pollock sector has stimulated other groups to try and emulate them. The crab fleet is exploring the idea of forming a similar type of cooperative that would allow for rationalization of the fishery while distributing benefits among the user group. The impetus to form cooperatives is strengthened by an impending crisis for the crab fleet which currently is faced with depleted stocks and substantial excess capacity. A consensus among vessel owners is a necessary, but likely not a sufficient, condition for formation of such a cooperative in the crab fisheries or in others despite opportunities for substantial economic gains. A crab fishery cooperative must rely on the NPFMC to ensure protection of the group's communal property, and may require legislative assistance by amendment of the Magnuson-Stevens Act and assistance from NMFS for monitoring and enforcement of cooperative rules.

The cooperatives must be perceived as legitimate by these organizations in which they are nested. To acquire support at the Council level, other stakeholders must be satisfied. As was true in the pollock fishery, a potential road block comes from processors whose income and existence may be threatened by a unified crab fleet capable of slowing production to a level that can be handled by fewer plants or less processing capacity than currently exists. Similarly cooperatives pose threats to small processors and communities that may become redundant as fisheries are rationalized.

Experience working together in the political arena of the NPFMC and state legislatures to support group objectives may have been quite helpful in developing trust among members of the groups that formed the Sea State bycatch reduction program and cooperatives in the pollock fisheries. The need of particular user groups to cooperate in influencing the actions of the NPFMC and other regulatory institutions led to the development of an institutional infrastructure in the form of industry associations with permanent staff. These organizations, supported by member dues, provide both a forum for discussion of cooperative institutions and a resource to carry out the logistical and political work necessary to implement them. Experience working together internally may be even more important. Some members of the initial offshore pollock cooperative had already formed a similar cooperative in the West Coast whiting fishery which had been very successful and provided a model for the PCC in the Bering Sea.

Technology and infrastructure have played an important role in the emergence and success of common property institutions in the Bering Sea. The catch and bycatch monitoring and reporting system already in place for the NMFS observer program was a critical component of the CDQ program, the pollock cooperatives and the Sea State program. Vessels using CDQ allocations and vessels in the PCC even agreed to double observer coverage (for which they pay) to facilitate accurate catch monitoring. In the flatfish fisheries, proposals to allocate bycatch shares on a vessel-by-vessel basis have met with the criticism that observer monitoring of bycatch was not sufficiently accurate at current coverage levels. In both cases, self monitoring appeared to be an insufficient means of assuring that individual vessels would not exceed catch limits.

V. Conclusions

Much of the common property literature, particularly on fisheries, focuses on resources utilized by artisanal groups. But the basic conclusions of this literature appear to be applicable in the highly industrial and corporatized fisheries off Alaska. The Alaskan experience provides a validation of much of the theory addressing the factors that effect the emergence and survival of common property institutions.

A critical factor for the emergence of common property institutions capable of assuring efficient use of fishery resources in the Alaskan groundfish fisheries appears to be the creation of reasonably secure property rights or quasi property rights to allocations of overall TACs. Furthermore, the allocation must be made to relatively small and homogeneous groups as delineated by gear, mode of operation, and target species or species group. However, even when these user groups can agree internally to institute cooperative solutions to their problems, they may still rely on the blessing of a larger institution, the NPFMC. Because increasing the overall profitability of many fisheries requires reductions in the number of participants in both harvesting and processing sectors, there are likely to be losers as well as winners. powerful groups, who perceive they will lose, may be able to block other groups from achieving gains

through internal cooperation, or may demand prohibitively high compensation from the perceived winners.

Furthermore, while the allocation of catches to small user groups may lead to efficiency gains, it may also limit the potential gains in the overall fishery. Because there is no real currency of exchange for allocations of catch or bycatch across groups, their values, particularly for bycatch, can be extremely disparate. Allowing sale or trading of catch allocations between groups would alleviate this, but is also likely to meet with substantial opposition from companies, communities and individuals that might be indirectly affected by the exchanges.

Most fisheries naturally are subject to rapid and substantial exogenous change. Environmental variables and management limitations can lead to large fluctuations in fish stocks and the value of catches can change dramatically in response to international markets. Effective mechanisms for adaptation and conflict resolution will be critical to the survival of common property institutions in such fisheries.

The ongoing experimentation with private and common property institutions in the Alaskan groundfish fisheries also provides fertile ground for further research on relative benefits of private and common property regimes for fisheries. Questions for future research include: When does common property have advantages over private property? Are fishery cooperatives better than IFQs? Do they provide more or less protection to all stakeholders? Which of these systems can more easily accommodate conflicts between competing user groups? Are either more suited to ecosystem management?

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Table 1. History of amendments to the fishery management plan (FMP) for the groundfish fisheries of the Bering Sea and Aleutian Islands.

Year	Amendment	Action
1982	Am. 1a	Established PSC limit of 55,250 chinook salmon for foreign trawl fisheries.
	Am. 2	Modified catch limits for domestic fisheries for Pacific cod, yellowfin sole, and other flatfish.
1983	Am. 1	Established optimum yield (OY) of groundfish complex; framework procedure for TAC and reserves, opened pot sanctuary and winter halibut savings area to domestic trawling. SAFE required.
	Am. 3	Established PSC policy for domestic fisheries and bycatch reduction schedule for foreign trawl fisheries.
	Am. 4	Modified catch limits for JV groundfish fisheries; allowed foreign fishing along Aleutian Islands west of 170°W.
	Am. 5	Withdrawn.
	Am. 6	Disapproved. Would have established a fishery development zone exclusively for U.S. fishing vessels.
	Am. 7	Modified restrictions for foreign longlining in winter halibut savings area.
	Am. 8	Reduced salmon PSC limits for foreign trawl fisheries.
1985	Am. 9	Established catch reporting system and check in-check out requirements for catcher-processors; incorporated habitat protection policy; established directed fishing standards (20% rule).
1987	Am. 10	Established bycatch limitation zones and PSC limits; Area 516 closed to all trawling year-round; established in-season management authority.
	Am. 11	Defined overfishing and ABC; established seasonal release of JV pollock apportionment; revised PSC definition.
1988	Am. 11a	Modified reporting requirements for catcher-processors and motherships.
1989	Am. 12	Revised federal permit requirements; established PSC limit procedure for fully utilized groundfish species in JVP and foreign fisheries.
	Am. 12a	Extended PSC limits for <i>C. bairdi</i> crab, red king crab, and halibut to all trawl fisheries.
	Am. 13	Established a new observer program and data reporting system; framework target species definition and seasons; established walrus islands closure areas, allocated sablefish by gear type.
	Am. 14	Prohibited pollock roe-stripping; seasonally allocated pollock TAC.
	Am. 16	Allowed seasonal apportionment of PSC limits; established vessel incentive program (VIP) to reduce bycatch rates; refined overfishing, specification process, and fishing gear definitions.
1992	Am. 16a	Established hotspot authority; allowed pollock TAC to be limited for non-pelagic gear; established herring PSC limits and herring savings areas.
	Am. 17	Permanently established the Walrus Islands buffer zones; authorized experimental fishing permits; established Bogoslof District for pollock specification.
	Am. 18	Allocated pollock TAC to inshore and offshore components (35% inshore, 65% offshore); established catcher vessel operational area (CVOA); allocated 7.5% of pollock TAC as CDQ.
	Am. 19	Revised hotspot authority; expanded VIP to all trawl fisheries; delayed opening of trawl fisheries until January 20; modified PSC limits; established new fishery definitions and directed fishing standards.
	Am. 20	Established buffer zones around Steller sea lion rookeries.
1993	Am. 22	Established trawl test areas for fishermen to test their gear prior to opening of fishing seasons.
	Am. 15	Established IFQ program for sablefish; established Western Alaska CDQ program.
1994	Am. 21	Allowed halibut bycatch mortality limits to be set by regulatory amendment.
	Am. 24	Allocated Pacific cod by gear type (54% trawl, 44% fixed gear, 2% jig gear); authorized seasonal apportionment of Pacific cod allocated to gears.
1995	Am. 25	Eliminated the primary halibut bycatch mortality limits; allowed release of vessel-specific observer data on PSC bycatch; prohibited discard of salmon until counted by certified observer.
	Am. 27	Implemented observer requirements based on Fisheries Research Plan.
	Am. 28	Established three districts in the Aleutian Islands for TAC specifications.
	Am. 30	Raised the CDQ allocation limit to 33%.
	Am. 31	Implemented the modified block plan to prevent excessive consolidation of IFQs in halibut and sablefish fisheries; clarifies IFQ transfer process.
1996	Am. 21a	Established the Pribilof Islands Habitat Conservation Area, a year-round closure to all trawling.
	Am. 26	Authorized voluntary retention of salmon bycatch for donation to foodbanks.
	Am. 29	BLANK. Amendment number assigned to proposed salmon VIP program that was put on hold.
	Am. 32	Established a one-time transfer of halibut and sablefish IFQ to CDQ.
	Am. 33	Allowed freezing of non-IFQ species when fishing sablefish IFQ.
1997	Am. 23	Established a moratorium on new vessels.
	Am. 35	Established chum salmon PSC limit and chum salmon savings area.
	Am. 38	Extended provisions of Amendment 18, inshore/offshore allocation; modified CVOA area.
	Am. 42	Allowed halibut and sablefish IFQ assigned to larger vessels to be used on smaller vessels.
	Am. 47	Modified observer program.
1998	Am. 37	Modified red king crab PSC limits; established trawl closure areas in nearshore Bristol Bay and the red king crab savings area.
	Am. 39	Established a licence limitation system; allocated 7.5% of groundfish TACs to CDQ programs.
	Am. 41	Modified <i>C. bairdi</i> PSC limits to be based on crab abundance.
	Am. 43	Established sweep-up provisions to consolidate small quota share blocks for halibut and sablefish.
	Am. 44	Established more conservative definition for overfishing.
1999	Am. 46	Modified allocation of Pacific cod by gear type (47% trawl, 51% fixed gear, 2% jig gear).
	Am. 34	Allocated 2% of the Atka mackerel TAC to vessels using jig gear.
	Am. 36	Established plan to protect forage fish species from exploitation.
	Am. 40	Established PSC limits for <i>C. opilio</i> crab in trawl fisheries and a bycatch limitation zone.

	Am. 49	Established mandatory retention program for pollock, cod, yellowfin sole and rock sole.
	Am. 50	Allowed for donation of halibut to foodbanks for distribution to needy.
	Am. 51	Modified inshore/offshore allocations of pollock.
	Am. 52	Established pre-registration and stand-down requirements for trawl fisheries.
	Am. 53	Allocated shortraker and rougheye rockfish TAC among trawl and fixed gear vessels.
	Am. 54	Established indirect ownership and use caps for halibut and sablefish IFQ holders.
	Am. 56	Revised overfishing definitions.
1999	Am. 45	Reauthorized the pollock CDQ program.
	Am. 48	Proposed establishment of a streamlined TAC setting process (on hold; never implemented).
	Am. 55	Established essential fish habitat.
	Am. 59	Extended the vessel moratorium for another year.
	Am. 60	Modified the licence limitation program.
2000	Am. 57	Prohibited pollock fishing with bottom trawl gear (pending).
	Am. 58	Modified chinook salmon bycatch limits and areas (pending).
	Am. 61	Established sideboard measures for harvest vessels per the American Fisheries Act (pending).
	Am. 62	Established sideboard measures for processors per the American Fisheries Act (pending).
	Am. 63	Established conservation program for sharks (pending).
	Am. 64	Further allocated Pacific cod TAC among fixed gear sectors (pending).
	Am. 65	Established habitat areas of particular concern and protection measures (pending).
	Am. 66	Removed squid from CDQ catch limits (pending).

Table 2. History of amendments to the fishery management plan (FMP) for the Gulf of Alaska groundfish fisheries.

Year	Amendment	Action
1978	Am. 1	Extended OYs, DAHs, & TALFFs to October 31, 1979; changed fishing year to November 1 - October 31.
1979	Am. 2	Allowed directed foreign longline fishery for Pacific cod west of 157° W outside of 12 miles year-round.
1978	Am. 3	Established special joint venture reserve wherein TALFF = 0.8 OY - DAH - JVP.
1979	Am. 4	Modified foreign fishing regulations; increased squid & Atka mackerel OY; reduced number of management areas; removed tow restriction on off-bottom; required annual review of domestic permits & catch reporting .
	Am. 5	Established separate rattail OY.
	Am. 6	Released unused DAH to TALFF and reapportioned DAH by regulatory areas.
	Am. 7	Extended plan year through October 31, 1980; modified foreign fishing regulations; increased Pacific cod & Atka mackerel OY; created separate OY for <u>Sebastolobus</u> spp.; reporting requirements.
1980	Am. 8	Changed to calendar year & eliminated expiration date; distributed OYs Gulfwide for squid, other species, <u>Sebastolobus</u> spp., & other rockfish; established four species categories; divided Eastern Area into subareas for sablefish only; set a reserve release schedule; required biodegradable panels in sablefish pots.
1981	Am. 9	Established king crab closed area.
1982	Am. 10	Modified foreign fishing regulations; limited POP fishery in Eastern Area.
1983	Am. 11	Increased pollock OY in Central area; added management objective; divided Yakutat district into 2 sablefish districts; set sablefish OY =ABC : gave RA authority to adjust time/area restrictions on foreign fisheries; modified reporting requirements.
1982	Am. 12	Prohibited pots for sablefish off Southeast; trawls only for sablefish bycatch (<u>withdrawn September 1984</u>).
1984	Am. 13	Combined Western and Central areas for pollock and set a combined OY.
1985	Am. 14	Modified OY apportionments; implemented framework for setting prohibited species caps; set sablefish seasons by gear.
1987	Am. 15	Modified goals & objectives; established single OY range; set framework for annual species harvest levels; established PSC framework for foreign fisheries; revised reporting requirements; established time/area restrictions on non-pelagic trawling around Kodiak to protect king crab until December 31, 1989; authorized RA to make in-season adjustments.
1988	Am. 16	Revised definition of prohibited species; updated the plan; revised recordkeeping & reporting requirements.
1989	Am. 17	Modified reporting requirements.
	Am. 18	Established a new observer program & reporting system; framework target species definition and seasons; established Shelikof District in Central Area; added Type III crab trawl closure zone; revised PSC procedure & established 2,750 mt halibut PSC; revised recordkeeping & reporting; clarified framework procedure to split or combine species groups.
1990	Am. 19	Prohibited pollock roe-stripping; divided the pollock TAC into equal quarterly allowances in the Western & Central Gulf.
1994	Am. 20	Implemented Halibut and Sablefish IFQ Program.
1991	Am. 21	Amended overfishing definition; established interim harvest levels specifications; provided limited authority to the State of Alaska to manage DSR; allowed legal fishing gear to be defined by regulatory amendment; revised existing framework for managing halibut bycatch (vessel incentive program (VIP)).
1992	Am. 22	Authorized RA to approve experimental fishing permits; combined Area 68 (East Yakutat) with Area 65 (Southeast Outside); require identification of groundfish pots (regulatory amendment).
1992	Am. 23	Allocated 90% of P. cod & 100% of pollock to onshore sectors; 10% of P. cod TAC and bycatch pollock to offshore sector.
	Am. 24	Established hot spot authority; establish time/area closures fort bycatch reduction; expanded VIP to trawl ;

		delayed rockfish opening July 1 (regulatory amendment); redefined VIP & PSC allowance limits.
Am. 25		Established 3 new districts in Western/Central Area for pollock; limited maximum amount of quarterly pollock TAC to carry over to 150% of the initial quarterly allowance; trawl closures around Steller sea lion rookeries.
Am. 26		Reinstated King Crab Protective Zones around Kodiak Island permanently.
Am. 27		Established legal trawl testing zones when fishing is otherwise prohibited.
Am. 28		Approved vessel moratorium for groundfish, crab, and halibut fisheries.
Am. 29		Established exclusive area registration for vessels engaging in directed fishing for pollock.
Am. 30		Established fee-based Research Plan for groundfish and crab Observer Programs (<u>later withdrawn</u>).
Am. 31		Set separate ABC and TAC for Atka mackerel.
1995	Am. 32	Defined POP rebuilding schedule.
	Am. 34	Raised CDQ allocation limit to 33%.
	Am. 35	Implemented modified block plan in halibut and sablefish IFQ program; clarified IFQ transfer process.
1996	Am. 36	Established a one-time transfer of halibut and sablefish IFQ & CDQ.
	Am. 37	Allowed freezing of non-IFQ species when fishing sablefish IFQ.
	Am. 38	Modified POP rebuilding plan.
	Am. 39	Established plan to protect forage fish species from exploitation (<u>pending</u>).
	Am. 40	Extended provisions of Amendment 18, inshore/offshore allocation.
	Am. 41	Established a licence limitation system for groundfish fisheries.
1997	Am. 42	Allowed halibut and sablefish IFQ assigned to larger vessel categories to be used on smaller vessels.
	Am. 43	Modified sweep-up provisions in halibut and sablefish IFQ program.
	Am. 44	Established more conservative definition for overfishing.
1996	Am. 45	Established pollock trimester apportionments in Western and Central GOA.
	Am. 46	Removed black and blue rockfishes from the plan.
	Am. 47	Approved modified observer program.
	Am. 48	Revised specification process (<u>draft</u>).
	Am. 50	Allow donations of trawl-caught halibut to food banks.
1998	Am. 51	Inshore/Offshore pollock and P. Cod allocation (III) (<u>draft</u>).
	Am. 52	Pollock and P. Cod Registration and Stand-down (<u>pending</u>).
	Am. 53	Rockfish retention rates (<u>draft</u>).
	Am. 54	IFQ indirect ownership, 10% leasing, and sablefish use caps (<u>draft</u>).
	Am. 55	Essential Fish Habitat (<u>draft</u>).
	Am. 56	Redefine overfishing (<u>draft</u>).