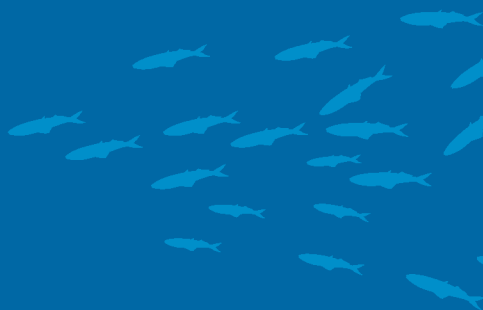
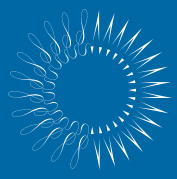
DESIGN MATTERS

Making Catch Shares Work





THE PEW ENVIRONMENT GROUP

DESIGN MATTERS

Making Catch Shares Work

Contents

Executive Summary

Catch shares are fishery management programs that allocate fishing privileges in the form of a specific portion of the total annual catch quota. These programs range from individual transferable quotas to community-based management systems such as sectors. While catch shares take many forms, in general they allocate the quota to allow fishing entities—individuals, communities, cooperatives, etc.— exclusive access to a portion of the quota, but require that fishing cease once that entity's share of the quota is met.

Science-based annual catch limits are essential if catch shares are to be effective and if requirements to end overfishing and rebuild depleted fish populations are to be met. These limits ensure that the amount of fish taken each year remains at levels that allow fish populations to reproduce and maintain an adequate biomass to support maximum sustainable catch. After science-based catch limits have been determined, the quota can be allocated to participants in the fishery. This allocation must be done with careful consideration of the socioeconomic changes that may result.

The critical decisions about how a catch share program is designed and implemented, and who receives an allocation, must be given careful analysis. A properly designed program must include:

- **science-based annual catch limits** that include all fish killed as a result of fishing (target fish landed and non-target fish—or bycatch—discarded at sea)
- **adequate monitoring** of the target fish catch and bycatch
- **identification of explicit conservation, social and economic goals** that the program intends to achieve and metrics for measuring attainment of those goals
- **permits issued for no more than 10 years** and regular review and evaluation of program performance with opportunities to modify and improve the program, as required by section 303A of the Magnuson-Stevens Fishery Conservation and Management Act

- **adequate enforcement**, including validation of catch and discard reporting and, to the extent possible, real-time management with the authority to close the fishery as soon as the quota is reached

- **fair and equitable allocation** through a transparent and open process, including mechanisms to accommodate recreational anglers, working fishermen and coastal communities; ownership caps so that one entity does not hold an excessive share of the quota; and opportunities for new fishermen.

Ocean fish are public resources. Catch shares, therefore, grant privileges to only a portion of the total catch and do not convey exclusive property rights to the resource. These programs can improve fisheries performance, management and ecosystem health, but only if properly designed and monitored. Correctly applied, catch shares are viable management options along with other measures such as adjusting the length of the fishing season, refining areas that are opened or closed to fishing, restricting gear to protect fish habitat and limiting catch size. Catch shares are not, however, a panacea. They should be part of a comprehensive approach that strengthens conservation and supports communities by providing access for recreational anglers and diverse fleets and crew, qualities regarded by many as the heart and soul of a working waterfront.

Science-based catch limits that don't result in overfishing are critical to ensuring long-term sustainability; properly designed catch shares are a way to allocate those limits.

Design Matters: Making Catch Shares Work

Catch shares have been widely lauded for their economic and ecological benefits. Indeed, recent studies in the journals *Science and Nature* describe catch share programs as a solution to fishery collapse, and some conservation groups have proposed that each sector of U.S. fisheries be required to consider catch shares or explain why the management system being used instead is superior. Like other management tools—such as limits on fishing seasons, gear restrictions, area closures and size requirements—catch shares can be a viable tool if correctly designed and applied. However, there are significant questions regarding the actual impact of these programs (as opposed to other management tools) on the ecological health of the fisheries in which they have been implemented, as well as on their economic impacts—the latter of which is the specific focus of this paper.

The current discussion on catch shares too often focuses on the economic benefits that have accrued to the fishermen and fishing communities that are able to participate in these programs, without adequate consideration given to the economic downsides of these programs for those who have been left out. This paper does not seek to provide a detailed, thorough analysis of catch share programs. Rather, its purpose is to highlight some of the economic downsides of these programs, while simultaneously acknowledging their benefits, in order to provide a broader context for discussion. We believe that catch shares, like many management tools, are not a cure-all for the various problems facing fisheries in the United States and elsewhere in the world. To be effective, they need to be implemented as part of a comprehensive approach that includes measures aimed at reducing the scope and severity of negative fishing impacts on the marine environment, while also taking into account the economic needs of fishermen and fishing communities. What follows is a discussion of catch shares: examining problems created by this tool and indicating possible ways to minimize those problems through effective program design.

What Is a Catch Share?

Catch share is an umbrella term that includes a number of fisheries management strategies. Catch share programs allocate fishing privileges as a share of allowable catch to individuals, cooperatives, communities or groups of fishermen.[1] Figure 1 represents the hierarchy of programs. They are incentive-based tools that bestow privileges to access a public resource (not a property right) and that are thought to enhance fishermen's flexibility and efficiency by allowing them to choose how and when to catch their portion of the quota.[2] Studies of catch shares have found that they can improve economic and environmental health and eliminate the "race to fish," thus enhancing safety and minimizing bycatch and other ecosystem impacts.[3]

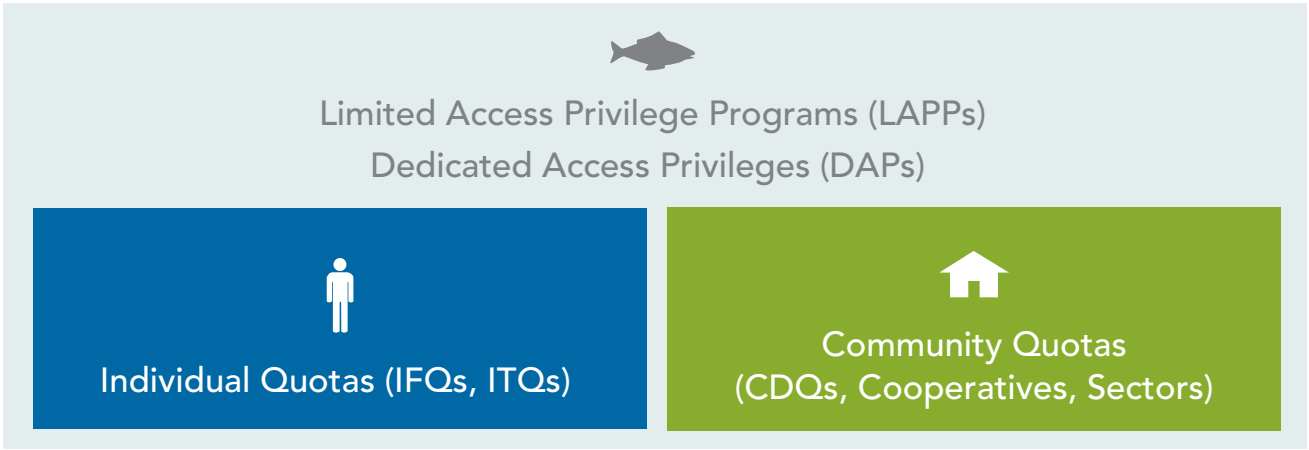
In theory, fishing privileges and exclusive access to a portion of the catch give fishermen an incentive for economic efficiency and prudent stewardship of the resource. Economic theory also suggests, however, that for market forces to work effectively, the privileges need to be permanent, secure, restricted and transferable.[4] Since fishermen have little control over fish populations, exclusivity is reduced and the "tragedy of the commons" problem occurs—that is, all fishermen suffer when individual fishermen maximally use public resources for their personal benefit.

Granting permanent rights to a public resource runs counter to the public trust doctrine that holds that certain lands and their natural resources belong to the public and that, although the government is the legitimate administrator of those lands, resources must be managed for the public good rather than for the exclusive benefit of private individuals.[5] Additionally, the Magnuson-Stevens Fishery Conservation and Management Act (MSA) states that quota shares are not property rights, but privileges to fish.

The MSA further defines catch shares as Limited Access Privilege Programs (LAPPs). While catch shares are often equated only with individual transferable quotas (ITQs) or individual fishing quotas (IFQs), the system also includes other quota share arrangements, among them community development quotas (CDQs), sector allocation, and community and regional fishing associations. Typically, various forms of catch shares have been used in commercial fisheries, where participants are readily identifiable. However, there is increasing interest in employing catch share programs in recreational fisheries, which face significant challenges, including the absence of real-time data, insufficient monitoring and untested methods of assigning quotas to individual anglers.

FIGURE 1

Some Types of Catch Shares



Individual Fishing Quotas (IFQs) are allocated to eligible fishermen, allowing them a specific portion of the total allowable catch (TAC). The MSA defines IFQs as a federal permit to catch a certain quantity of fish (a percentage of TAC); the permit is held for the exclusive use by a person; thus, it is distinct from a community development quota.[6]

Individual Transferable Quotas (ITQs) can be bought, sold or transferred to other fishermen.[7] While ITQs are sometimes construed as a property right, U.S. law states that there is no creation of right, title or interest and that the quota can be revoked, limited or modified at any time without compensation.[8]

Limited Access Privilege Programs (LAPPs) are defined by the MSA as a federal permit held for exclusive use by an individual to catch a portion of the total quota. IFQs are a form of LAPP, but LAPPs include more than IFQs. LAPPs allow flexibility for allocating the total quota, whereas IFQs are always a percentage of the total quota.[9]

Community Development Quotas (CDQs) allocate portions of the annual TAC to coalitions of villages with limited economic opportunities (e.g., rural coastal communities in western Alaska).[10]

Sector Allocation gives a portion of a quota, in accordance with an approved plan, to a self-selecting group of fishermen bound by a contractual agreement. The participants allocate the quota to those in the sector. These allocations are a form of harvesting cooperative, but the MSA does not consider them to be LAPPs because allocations are granted to the whole sector rather than to individuals.

Recently, community-based fisheries management (CBFM) has attracted considerable interest; the U.S. Government Accountability Office (GAO) found that "the easiest and most direct way to help protect communities under an IFQ program is to allow the communities themselves to hold quota."[11] CBFM encompasses programs such as CDQs, cooperatives and sectors. In CBFM programs, communities play a large role in managing their fisheries and protecting the resource. These programs have been established in Alaska, Maine, Massachusetts, Nova Scotia and Mexico.

Each type of catch share program has its strengths and weaknesses, and the diversity of U.S. fisheries and fishing communities necessitates a variety of approaches. Because each fishery is unique, catch share programs must be tailored to its needs and challenges and the communities that depend on it.

The Magnuson-Stevens Act

The MSA[12] describes catch share programs such as IFQs as limited access privilege programs (LAPPs), while the U.S. Commission on Ocean Policy describes them as dedicated access privileges (DAPs) to emphasize that they are not a property right (Box 1).

The MSA details discretionary provisions that could be included in fishery management plans, including the establishment of a LAPP. The law stipulates that in developing such management programs, regional fishery management councils shall consider historical and present-day fishing in the fishery, the communities and economies that would be affected, and the "fair and equitable distribution of access privileges."[13] In addition, under the MSA, a LAPP must include regular monitoring and review, a system for enforcement and monitoring, and a mechanism to prevent an entity from acquiring an excessive share. More importantly, the MSA requires that a permit issued under a LAPP cannot exceed 10 years but that it will be "renewed before the end of that period, unless it has been revoked, limited, or modified."[14] In addition, the MSA requires that catch share holders pay the costs of the program's implementation.[15]

BOX 1

The U.S. Commission on Ocean Policy

The U.S. Commission on Ocean Policy supported use of the term dedicated access privilege to underscore that shares of a quota grant access for fishing, but not a right to the fish. The Commission's Recommendation 19-15 proposed that the National Marine Fisheries Service be responsible for issuing national guidelines for such programs, and it outlined several key features:[16]

- **specifying goals (biological, social and economic)**
- **providing for periodic review**
- **limiting the duration of quota shares**
- **establishing user fees to fund the program and support ecosystem-based management**
- **allowing for public participation by and consultation with all stakeholders.**

15 Active Catch Share Programs in U.S.

In addition, several more catch shares are in active development, including the West Coast Groundfish Trawl Individual Quotas and 17 sectors proposed in New England under an amendment to the Northeast Multispecies Fishery Management Plan.[17]

No Single Solution

Catch shares are not a cure-all for fisheries management problems and should not be considered an end unto themselves; rather, they should be evaluated as one of a number of possible tools that councils can employ when developing management plans.

Catch shares function as an allocation tool to achieve management objectives for fisheries and to obtain a continuing optimum yield of fish catch. To prevent overfishing, fishing must remain within science-based annual limits through improved accountability and enhanced monitoring.

Catch share systems can be effective and lead to substantial benefits from economic efficiency and capacity reductions. However, it is unrealistic to assume a catch share program will guarantee desired change and provide a single, simple remedy. Overfishing and other fisheries problems require a package of measures, including catch shares (where appropriate), gear and effort controls, and spatial management.[18] In addition, poorly designed catch share programs may encourage compensatory behavior such as increased discarding and misreporting or underreporting of catch. They can also induce fishermen to upgrade their vessels and gear when the number of vessels in the fishery falls, thus increasing fishing effort.

In addition, catch share programs may not be appropriate for some fisheries and may lead to unintended consequences. Among these fisheries are:

- recreational fisheries where managers lack real-time data or the ability to effectively manage an allocation of quota (for-hire and charter segments may be an exception)
- fisheries where the size of the population fluctuates widely (resulting in significant variations in the value of quota shares)
- fisheries with poor or unreliable catch data
- fisheries that lack monitoring, enforcement or a hard TAC.[19]

In addition to these fisheries, there may be others where such programs may be ineffective. For example, the slow growth and late maturity of a species can create an economic incentive for fishermen to catch and sell fish now rather than conserve them because the economic payback for conservation is so far in the future, thus minimizing the economic-efficiency gains sought through catch shares. To counter such negative incentives, positive ones must be established—for example, the management of orange roughy requires a program that offsets incentives to catch and sell fish now and instead focuses on conserving the population for the future.[20] Catch shares are also of limited use in British Columbia, where five species of salmon spawn in more than 1,500 streams. Therefore, these wide fluctuations in salmon population size and distribution make it impractical to implement IFQs.[21]

Additionally, the performance of catch shares depends upon when and where quotas are used. Catch shares may not be fully effective for fish populations found in various locations at different densities and times. Under these conditions, fishermen will target highly abundant fish populations and compete for the higher-valued species.[22]

Catch shares are not a panacea for all fisheries management problems and should not be an exclusive goal; rather, they are one of a number of possible management tools regional fisheries management councils can employ.

Unintended Consequences

Catch shares, as well as other types of fisheries management programs, can unintentionally create incentives for unsustainable fishing practices, such as: high grading—discarding low-market-value fish in favor of those with higher value to maximize quota returns; underreporting catch; overfishing non-quota species in multispecies fisheries; and poaching.[23]

Further empirical research is necessary to determine whether catch share programs can address and manage broader ecosystem concerns, such as the unintentional catching of non-target species, habitat destruction and changes to the food web.

Catch share programs may also cause adverse social and economic consequences, including consolidation (concentration of quota in just a few large operations), loss of jobs, reduced income, unemployment and displacement of small-scale fishermen.[24] Consolidation was apparent in the Mid-Atlantic Surf Clam/Ocean Quahog fishery when the fleet shrank from 128 vessels to 59 in just two years. By 1995, the largest quota holders were outside investors (a bank and an accounting firm).[25] In contrast, the Alaskan halibut/sablefish fishery IFQ program was designed to minimize socioeconomic impacts by capping the quota share that a single fisherman or entity could have, prohibiting absentee ownership and creating categories of quota based on vessel size with rules against transferring quota to another category. Because they are data-intensive, catch share programs may also result in increased administrative costs (to train staff, hire observers, enforce quotas and collect data for accurate stock assessments) as well as in prohibitive costs for fishermen trying to enter the fishery as lease and quota prices escalate.[26] Once established, such programs may be difficult to adjust as conditions or management change because of vested interests in the fishery and potential difficulty in modifying or revoking shares.

Socioeconomic inequities that catch shares create or magnify are a critical concern. These inequities may arise from initial allocation of quota shares or from the ability of some quota holders to acquire more shares and dominate a fishery.[27] For instance, in the IFQ programs implemented in various British Columbia fisheries, reducing the number of available licenses through buybacks and policy reform also reduced the size of the fishing fleet and led to escalating license and quota prices.[28] As a result, the costs of licenses and quotas are now prohibitively high. Rural, small-scale and aboriginal fishermen can no longer afford to participate in the fisheries; consequently, the number of rural licenses has dropped roughly 45 percent.[29] A GAO report underscored this point, concluding that IFQ programs have "raised concerns about the fairness of initial quota allocations, the increased costs for fishermen to gain entry, and the loss of employment and revenues in communities that have historically depended on fishing."[30]

Single-factor solutions are not always sufficient: overfishing and other fisheries problems require a package of measures, including catch shares (where appropriate), gear and effort controls, and spatial management.

Mixed Results

The use of a catch share program does not necessarily result in consistent, positive changes in the size and health of a population. For example, IFQs have been widely used in a variety of fisheries and illustrate a range of effects.

An analysis of 20 fish populations managed under IFQs in many countries found that 12 populations improved after IFQ implementation, while eight continued to decline.[31] Although IFQs played a role in helping some fisheries reduce capacity, end the race to fish and improve compliance with quotas, it is unclear to what extent these changes were due to IFQs or the larger management plan of which IFQs were a part. In some fisheries, improvements were more likely the result of hard TAC limits than an IFQ system. This was demonstrated by declines in populations in fisheries where limits were set too high or compliance was lacking even with an IFQ system in place.[32] Moreover, some IFQ fisheries may require additional, complementary measures for effective management, such as seasonal or area closures and gear restrictions to protect juvenile fish.[33]

In addition, management of multispecies fisheries can be challenging because both target and non-target fish are generally caught together, causing the quota of one species to constrain the catch of relatively healthy species. However, if all species caught together are included in a properly designed and monitored catch share system with appropriately set catch limits for all, the number of discards (low-value, non-target species thrown back) can decrease. For instance, in British Columbia's groundfish trawl fishery, an IFQ system and at-sea observer coverage have successfully discouraged discarding and led to matching catches for individual species to their quotas in this multispecies fishery. This is due to the fishermen's ability to adjust their fishing practices and target species to match changes in catch limits. These fishermen avoided rougheye, shortraker and yelloweye rockfish when limits were reduced for these species. The system, which includes annual catch limits for individual species, dockside monitoring, mortality limits (instead of landing limits) and accounting for catch in subsequent years (i.e., carry-forward of up to 37.5 percent for overruns and underruns), has resulted in fewer discards (a 51 percent decrease after IFQ introduction) than in similar U.S. fisheries.[34]

In some fisheries, improvements are more likely to result from hard total allowable catch limits than because of an ITQ system. This was demonstrated by declines in fish populations for fisheries where limits were set too high or compliance was lacking even when an ITQ system was in place.

Bering Sea and Aleutian Islands Crab Rationalization

In 2005, to improve conservation efficacy and address social and economic concerns, the Bering Sea and Aleutian Islands crab fishery was restructured and downsized through IFQs and individual processing quotas (IPQs).

The IPQ program was intended to achieve equity between the harvesting and processing sectors by assigning processor quota shares to processors based on the amount of fish that each had processed over a period of time.[35] In an IPQ program, fishermen with IFQs in the fishery may sell fish only to processors with processor quotas in the fishery. In the Bering Sea and Aleutian Islands crab fishery IPQ program, 90 percent of the market is limited to processors with quotas.[36] The North Pacific Fishery Management Council (NPFMC) struggled with instituting the crab rationalization plan—to match fishing capacity to the amount of crab that could sustainably be caught each year—in large part because of controversy over establishing processor quotas. The program did not take effect until Congress mandated it when the MSA was amended through the Consolidated Appropriations Act of 2004.

IPQs like the one established in the Alaska crab fishery are highly controversial due to their potential for discouraging competition in the marketplace. The U.S. Department of Justice advised the National Oceanic and Atmospheric Administration to oppose IPQs on the grounds that they would inhibit efficient use of resources and thwart beneficial competition, leading to distortions in the market by giving companies excessive control over price and product.[37] As a result, language in the MSA requires IPQs to comply with antitrust laws. Also, in the face of much criticism of the crab rationalization plan, the NPFMC decided to require the collection of extensive socioeconomic data and to review progress at 18 months, three years and five years.[38]

Consolidation became a significant issue in the crab rationalization system because only a few companies stood to gain from the redistribution of capital. In the Bristol Bay red king crab fishery, the number of boats fell from 251 in 2004 to 89 in 2005-6 after IFQ implementation; likewise in the Bering Sea snow crab fishery, the number of boats dropped from 189 in 2004 to 80 in 2005-6.[39] These declines resulted in an estimated loss of 1,200 jobs from 2004 to 2006.[40] Other estimates of the economic impact were seen in small Alaskan fishing communities such as King Cove, where there was a 75 percent reduction in income for local businesses,[41] and in Kodiak, where Bristol Bay red king crab fishermen's earnings declined between $1 million and $1.6 million following rationalization.[42] For those left in the Bristol Bay king crab and the Bering Sea snow crab fisheries, however, fleet-wide crew member pay increased from an average of $24,314 in 2004 to an average of $53,585 in 2007.[43] Remaining vessel owners in the Bristol Bay red king crab fishery saw their average harvest increase from 56,000 pounds per vessel in 2004 to 185,000 pounds in 2005-6, and the average value of their catch increase from $262,000 in 2004 to $792,000 in 2005-6.[44]

In addition, processor shares have been highly consolidated, leaving only a few corporations in control of the industry and raising antitrust concerns. Trident Seafoods, for example, was allocated 23.3 percent of the red king crab quota and 25.8 percent of the snow crab quota.[45] High-grading also became a problem in the fishery. An estimated 677,000 legal male crabs were discarded in the first year of rationalization, compared to the six years prior to rationalization, when the highest estimate for total discarded

legal males was 80,000 crabs in the 2002 season.[46] In response, the Alaska Department of Fish and Game adjusted the quota down for the 2006-7 season to account for the high number of discards, and the crab industry agreed to implement measures to remove the incentive to high-grade. Discarding of legal males has not occurred on a similar scale since the initial season.[47]

Absentee ownership is also a problem, and some quota holders lease their shares at rates substantially higher than the actual value. Managers therefore are considering alternatives to require that shares be held by active participants in the fishery.

Alaskan Halibut and Sablefish

In the late 1980s, the open access Alaskan halibut and sablefish fisheries were prime examples of a race to fish, and overcapitalization led to seasons as short as a day and fishing in hazardous weather.

By 1991, despite no overfishing, the effects of a drastically short season prompted the North Pacific Fishery Management Council to take steps to rationalize the fisheries and in 1995, after many years of debate, an IFQ program was implemented. Under this program, quota holders can sell their fishing privileges as long as there is no excessive consolidation or change in the character of the fishing fleet. If an overage occurs, up to 10 percent will be reduced from the subsequent year's quota and additional overage is subject to a penalty.[48]

The initial allocation of quota was defined by several objectives, including preserving the character of the fishing fleets, discouraging corporate ownership and rewarding longtime and active participants.[49] As such, quotas were given only to vessel owners or fishermen leasing vessels, with a portion of the quota going to local communities under a CDQ program. To preserve the character of the fleet, vessel classes were created within each fishery (three in sablefish and four in halibut). Initially, quota holders were restricted to their initial vessel class to maintain the quota distribution among vessel classes. Flexibility was later introduced by allowing unused large-vessel quotas to be reallocated to smaller vessels in the fishery.[50]

The Alaskan halibut and sablefish IFQ program is considered successful in many respects: increased economic efficiency, decreased operating costs, higher prices at the dock, decreases in lost gear and higher values for quota shares.[51] There have also been improvements in vessel safety (measured by a decrease in the number of search-and-rescue operations), longer seasons, and greater availability and quality of fish for consumers. In addition, the fishery resource continues to be sustainably managed.

Along with these improvements, however, are downsides: lost jobs, high cost of entry into the fishery, consolidation of quota holdings and increased administration costs (in 2005, administration and enforcement of these IFQ programs cost the federal government $1.3 million and $2.4 million, respectively).[52] Small coastal communities in western Alaska were especially affected by the program, and a CDQ was implemented through Community Quota Entities (whose small-boat, community-based fishermen with limited financial opportunity struggle to raise sufficient capital to enter the quota fisheries) to address these concerns. More recently, fishermen can lease their quota share in every halibut/sablefish area except southeastern Alaska. This has changed the character of the fishing fleet because about half the quota for each species is leased to and caught by hired skippers rather than owner-operators.[53] Leasing drives up the price of quota shares and pushes out those with limited capital and other resources. Absentee ownership and high entry costs threaten one of the program's goals of protecting small-scale, community-based fishermen.

Gulf of Mexico Red Snapper

A commercial IFQ program for the red snapper fishery was implemented in the Gulf of Mexico in January 2007. This population is categorized as overfished and subject to overfishing because fishing levels remain too high.

Due to tightened regulations and lowered quotas—required for ending overfishing and rebuilding this depleted population—the commercial red snapper fishery became highly overcapitalized; the number and fishing capacity of the vessels in the fishery exceeded the amount of allowable quota. In the late 1990s, the quota was divided into two separate seasons open for only the first 15 days of the month. To further constrain catch, these seasons were reduced in 1999 to the first 10 days of the month. This small window resulted in derby fishing with a rush to fit as many trips in and catch as many fish as possible in the available time. This in turn led to instability in the supply of fresh red snapper to markets, high levels of bycatch and unsafe conditions for fishermen, all of which lowered prices.

A red snapper IFQ program, developed as Amendment 26 to the Reef Fish Fishery Management Plan,[54] was implemented to reduce overcapacity in the fishery and discourage derby fishing.[55] The overall intent of the program is to help end overfishing and rebuild the red snapper population. Specific anticipated benefits include:

- increased market stability
- replacing fishing seasons with year-round fishing
- increased flexibility to modify fishing operations
- cost-effective and enforceable management of the fishery
- improved safety at sea
- optimized social, economic and biological benefits from the fishery.

Also, the program is intended to provide direct and indirect biological benefits to red snapper and other marine resources by reducing bycatch and discard mortality and eliminating quota overages.

Since implementation, after a further reduction of the quota in 2008, the price paid to fishermen has increased 17 percent, while average landings, number of trips and days at sea have declined. Coupled with the reduction in minimum size, the ratio of landed to discarded fish has improved threefold to fourfold, reducing overall mortality by lowering the amount of discarded fish. Between 1996 and 2003, the red snapper fleet concentrated its fishing effort in an average of just 77 days to catch its quota. In the past two years, however, that same effort has been spread across an entire year. The IFQ program also provides a better system of accounting for fishing activity. In the past two years, annual landings have been just shy of the allowed commercial quota—a sharp improvement over the previous 17 years, when the quota was exceeded nine times.

The IFQ program has resulted in fewer entities in the commercial red snapper fishery.[56] Before the program was implemented, there were 764 permitted participants in the Gulf commercial red snapper fishery. After implementation, 546 entities qualified for quota shares; now, after two years of operation, the number of individuals holding IFQs has dropped to 466, a 14.6 percent reduction since the start of the program and a 39 percent reduction from pre-IFQ levels. In addition to the consolidation that followed the IFQ program's implementation, other issues have arisen. For example, catch reports have mislabeled species and underreported landings. Bycatch also remains a problem, particularly of other reef fish encountered as the red snapper population expands and returns to its historical range.

Georges Bank Atlantic Cod Sectors

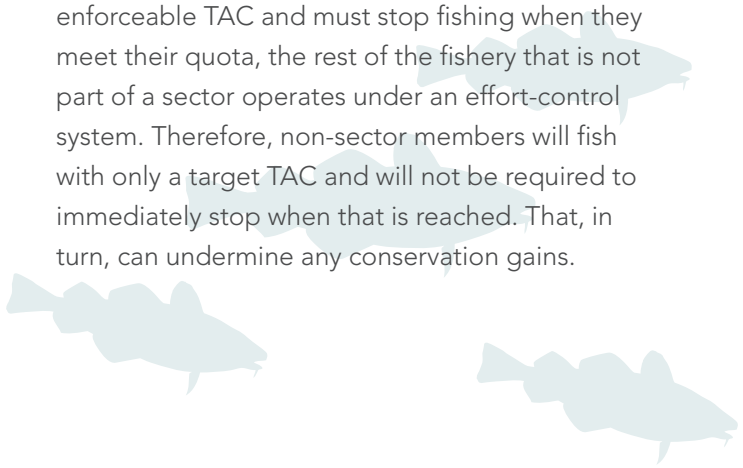
The Cape Cod Commercial Hook Fishermen's Association (CCCHFA) has developed a form of community-based fisheries management that fosters a highly adaptive means of local decision-making, self-monitoring and enforcement known as sectors.

A sector is a community of fishermen who voluntarily work together to manage an annual allocation of fish. In exchange for operating under higher standards of monitoring and reporting, sector fishermen are given more flexibility in how they fish and are offered exemptions from various federal regulations. Sector members agree to stop fishing once their allocation (enforceable TAC) has been met.

In 2004, CCCHFA worked with local codfish hook-and-line fishermen to develop the Georges Bank Cod Hook Sector. By operating under their own annual enforceable TAC of Georges Bank cod, hook sector members are exempt from limits on daily trips and the number of hooks they can use. Furthermore, the fishermen of this sector are allowed to determine how to divide this allocation among members. The hook sector operates by allocating monthly quota targets of 8.33 percent of the sector's total annual quota.[57] Quota that is not landed in a particular month is rolled over to a subsequent month, and all cod fishing stops when the annual quota is reached. The agreement among these fishermen is codified in federal regulations and in the form of a binding annual contract. To prevent excessive consolidation and unfair market control, the hook sector cannot be allocated more than 20 percent of the overall Georges Bank cod TAC. One problem remains, however: fishermen are still bound by regulations for days-at-sea and trip limits for all other groundfish they catch.[58]

A second sector was developed by CCCHFA in 2006—the Georges Bank Cod Fixed Gear Sector. This allowed local gillnet fishermen the opportunity to join. Support for the sector concept has spread throughout New England, and Amendment 16 to the Groundfish Fishery Management Plan would authorize an additional 17 sectors to be implemented in 2010. Sector members would receive additional benefits, including allocations of nearly all groundfish species, transferability of quotas among sectors and additional regulatory exemptions. The 20 percent cap on sector ownership would be eliminated, and yearly overages would be deducted from subsequent years. A minimum of 30 percent observer coverage would be required, as would weekly catch reports. Fishing still would have to stop when a sector caught its allocation.

The main benefit to fishermen is that they can run their businesses more profitably and efficiently by spending less time on the water and by fishing when market prices are high. However, the costs involved in producing environmental assessments, operations plans and increased monitoring must be borne by the fishermen. These costs are shared by all sector participants and can reach $80,000 to $100,000 a year for the sector.[59] One of the biggest concerns to sector members is that while they operate under a enforceable TAC and must stop fishing when they meet their quota, the rest of the fishery that is not part of a sector operates under an effort-control system. Therefore, non-sector members will fish with only a target TAC and will not be required to immediately stop when that is reached. That, in turn, can undermine any conservation gains.



Conclusion

If properly designed, catch share programs can lead to substantial gains in fisheries by reducing capacity, increasing economic efficiency and ensuring sustainable catches. Poorly designed programs, however, may induce unintended behavior such as increased discarding, underreporting catch, misreporting catch or overfishing of non-quota species.

While traditionally employed in commercial fisheries, catch share programs are gaining advocates for use in some recreational fisheries. The application of catch shares needs careful design and review, and ultimately may not be feasible in many recreational fisheries as they currently are managed. A key challenge is the lack of real-time monitoring of recreational catch, which allows managers to take action before quotas are exceeded. Certain segments of recreational fisheries, such as the for-hire industry or charter boats, may be more willing to explore a catch share program because of existing licensing and reporting requirements, which would serve as the basis for such a program.

Lessons can be learned from the many IFQ programs implemented to date. In the red king crab fishery of the Bering Sea and Aleutian Islands, consolidation and reduction in the fleet led to a loss of jobs, and quotas for processors restricted the market. Elsewhere in the North Pacific, the Alaskan halibut and sablefish fishery included clear objectives that guided the design of the program, including the establishment of vessel classes to preserve the character of the initial fishing fleet. The halibut and sablefish IFQ program succeeded in ending derby fishing and extending the season, improving fishermen's safety and enhancing product quality. However, recent developments, including the trend for quota holders to hire captains to catch their portion, are driving up leasing costs and making it difficult for rural residents to enter or stay in the fishery. In the Gulf of Mexico, the red snapper IFQ program has shown initial benefits, increasing the length of the season and the price paid to fishermen, and reducing overcapacity in the fishery. And in New England, sectors appear to be a promising alternative to the historical status quo. While there have been beneficial outcomes across the country in the fisheries that employ catch share programs, important issues remain to be addressed in many of them.

Elements of Successful Catch Share Programs

Catch share programs must include effective and explicit policies that address overfishing, bycatch and habitat protection. They should also contain regulations to protect the health and resilience of the marine ecosystems that sustain productive fisheries. Finally, catch shares should also accommodate recreational anglers and diverse community-based fleets and crew that are the heart and soul of a working waterfront.

For example, fishing businesses and communities could be harmed by the consolidation of quotas or by allocation schemes that favor just a few participants. Consequently, catch shares should be viewed as an allocation tool to be employed only in certain fisheries after being carefully designed to address potential social and economic consequences.

When properly designed and implemented, catch share programs can lead to better-managed fisheries. They should be implemented, however, only if science-based annual catch limits are properly set to ensure that fish populations are not subject to overfishing and that depleted populations are rebuilt.

All fishery management systems, including catch share programs, require an infrastructure for monitoring and accountability measures to ensure that limits are not exceeded. They entail high upfront costs to adequately handle the influx of information and data. Additionally, a well-planned program must include reliable monitoring and enforcement as well as the ability to report verifiable trip and catch information in real time.

These management imperatives, combined with the experiences of established catch share programs, underscore the importance of a carefully designed program to meet both conservation and socially responsible objectives. Positive trends in fisheries are the result not merely of catch share programs, but also of a combination of measures—an enforceable TAC and restrictions on fishing season and gear. Catch shares should be viewed as an allocation tool that is appropriate only with the right combination of other management measures in a comprehensive approach to fisheries management. As a critical step in this approach, fisheries managers should focus on setting science-based annual catch limits that end overfishing and rebuild depleted populations, as well as defining equitable social objectives for fishery management.

More specifically, catch share programs must follow the design principles outlined below if they are to succeed:

- **science-based annual catch limits** that include all fish killed by fishing (target fish landed and non-target fish—or bycatch—discarded at sea)
- **adequate monitoring** of the target fish catch and the incidental catch of non-target species
- **identification of explicit conservation, social and economic goals** and objectives and metrics for measuring progress
- **permits issued for no more than 10 years** and a regular evaluation of program performance, with an opportunity to modify and improve it as required by section 303A of the Magnuson-Stevens Act
- **adequate enforcement**, including validated catch and discard reporting and, to the extent possible, real-time management that has the power to close the fishery as soon as the quota is reached
- **fair and equitable quota allocation** that is conducted through a transparent and open process, including mechanisms to provide access opportunities to recreational anglers, working fishermen and coastal communities; ownership caps so that one entity does not hold an excessive amount of quota; and opportunities for new fishermen to enter the fishery.

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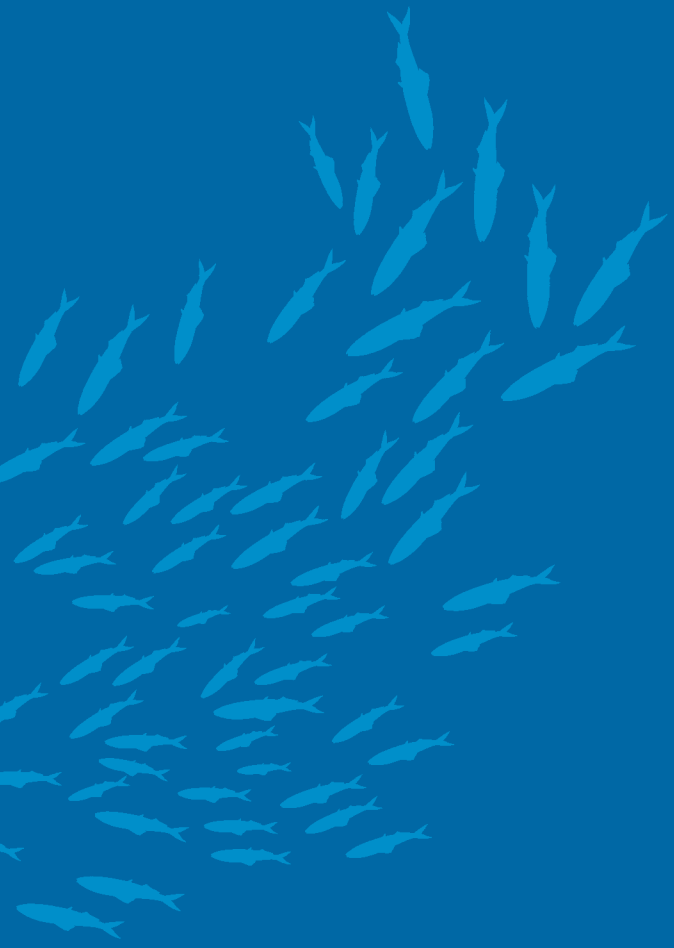

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