

Before you Begin – Identify Goals, Sectors and Stakeholders

Before you begin designing a catch share system there are a few things to consider. The most important of these is to identify the goals for the fishery. These may be any number and combination of biological, economic or social goals. In addition to goals, you must also know what all the fishing sectors are and which will be included in the catch share, as well as the stakeholders and how they will be included in the design process.

WHAT ARE YOUR GOALS?

The most important step in designing a catch share is to articulate goals. As with any management system, knowing the goals from the beginning is vital to making good decisions about program design and evaluating success.

A clear articulation of your fishery's goals will also help you put in place a customized program that is most likely to succeed. Without specific goals, it is difficult to achieve consensus among stakeholders about how best to proceed. Knowing the goals of a fishery and their relative importance will dictate decisions about catch share design.

Catch shares are infinitely malleable and can be designed to meet a wide variety of goals. However, it may not be possible to optimize all goals at all times and there are often trade-offs between various design options. For example, transferability will help achieve biological and economic goals, but unfettered trading may have undesired impacts on social goals. Catch shares alone may not be sufficient to achieve all the goals outlined below but they are a necessary component.

Catch shares, like all management practices, require stated goals and priorities as a starting point. Then, thoughtful design will ensure that the catch share system achieves and enhances the identified goals. Below is a discussion of common goals for fisheries management accompanied by short explanations for how catch shares help achieve these different goals, an understanding of which lays the groundwork for being able to make effective goal-driven design decisions. The rest of the manual will discuss design options in terms of how well different options meet various goals.

Rule of Thumb – You should design the catch share system based on clearly-articulated goals with measures of success.

Ensuring effective stewardship

Ensuring effective stewardship of marine resources is often the legislative or regulatory goal of fisheries management. This can be measured in different ways, but generally focuses on accountable and responsible management of resources for future generations, such as maintaining populations of target species and non-target species, including ocean wildlife. Stewardship can also be expressed as ending overfishing of target or non-target stocks, protecting wildlife, rebuilding depleted stocks or conserving certain key habitats and strengthening ecosystem resilience for future generations.

End overfishing

Overfishing occurs when the rate of fishing mortality exceeds the ability for the stock to reproduce at the maximum biological level on a continuing basis (Public Law 94-265.16 U.S.C. 1853 et seq.). Many fisheries worldwide are experiencing overfishing. The key to ending overfishing is setting catch limits at the appropriate level and holding fishermen accountable for staying within the limits. While many conventionally managed fisheries worldwide are suffering, catch share fisheries rarely exceed limits. The Alaska halibut and sablefish fishery demonstrates the success of catch shares in preventing catch limit overages. Prior to implementing an Individual Fishing Quotas the fleet routinely exceeded catch limits, whereas under catch shares fleet compliance with catch limits is very high (NMFS Alaska Regional Office, 2009a).

Setting appropriate caps is discussed in more detail in Step 1 – Define and Quantify the Available Resource and complying with caps is discussed in Step 1 – Define and Quantify the Available Resource and Step 5 – Administer the Program.

Rebuild stocks

A fishery is defined as “overfished” when a fishery’s biomass has been reduced below the level that can produce the maximum biological yield (Public Law 94-265.16 U.S.C. 1853 et seq.). Many countries, including the United States, require that overfished fisheries take steps to rebuild and restore the stocks to healthier levels. Again, the key component to achieve rebuilding is to set the catch limit at a level that allows stocks to grow, and put in place accountability measures that ensure those limits are not exceeded. For overfished stocks, this means reducing catch in the short term until stocks have recovered to a level that will support additional catch. While ecosystems are certainly complex and influenced by more than just fishing effort, a reduction in catch and mortality will be key to rebuilding stocks.

If your fishery’s goal is to rebuild the stock, it will be vital to focus on Step 1 – Define and Quantify the Available Resource.

Reduce waste and bycatch

Many fisheries encounter non-targeted catch – either marketable fish that fishermen are not allowed to keep due to regulations (e.g. regulatory discards), non-marketable fish that fishermen choose not to keep because it is not economically valuable (economic discards), or incidental take of ocean wildlife (often prohibited species) (Sanchirico et al., 2003).

High numbers of regulatory discards are often reported under conventional management, whereas they are often greatly reduced under catch shares. When managers control the fishery through effort regulations such as trip limits, significant discards are often an unintended consequence. In moving to catch shares, many of these regulations are reduced, resulting in lower discards. Instead fishermen have flexibility in deciding how to best meet their specified share of the catch limit. In the Gulf of Mexico, a catch share program for the red snapper fishery implemented in 2007 put an end to management that encouraged derby-style fishing, including short seasons and high minimum size limits. After 2 years operating under these changes, the fishery reduced discards (when compared to landings) by nearly 70 percent (NFMS Southeast Regional Office, 2009).

If your fishery's goal is to reduce waste and bycatch, it will be vital to focus on Step 1 – Define and Quantify the Available Resource, with particular attention to how to design multi-species catch shares.

Maximizing fleet-wide economic benefit

Promoting economic stability and increasing economic benefit is often another goal of fisheries management. The economic health of a fishery is generally signaled by asset prices (either permits or catch shares) on the open market. The asset value represents the current and expected future economic value of the fishery. Three main drivers determine this price: expected long-term sustainability of the stock as indicated by a sustainable harvest level, product value and economic efficiency of the fleet. It may be a goal of a fishery to increase or enhance any of these economic signals (Grafton et al., 2005b). Maximizing overall economic value has led many fisheries to implement catch shares. For example, New Zealand's goal of increasing the export value of its fisheries resources weighed strongly in their implementation of catch share systems in 1986 (Bess and Harte, 2000).

Today, many fisheries are economically inefficient because of the twin challenges of regulatory costs and overcapacity. For example, effort in many fisheries is managed through seasonal closures, trip limits, restrictions on gear and other input controls. These will often constrain fishing effort in one way but lead to an increase in effort somewhere else as fishermen seek to run a successful business. The result has generally been an increase in fishermen with dwindling profit margins as they compete for fewer fish (World Bank, 2008).

Catch share systems go straight to the core of this challenge by expressly managing how much fish can be caught rather than the specific methods of how fishermen choose to run their businesses. Furthermore, many catch share design options play a role in determining the magnitude of fleet-wide economic benefits and the distribution of benefits among participants.

Increase asset value due to long-term sustainability

As noted above, asset value is an important indicator of the economic and biological health of a fishery. Long-term secure access to a portion of the fishery creates an incentive to ensure sustainability of the fishery. A fishery believed to be sustainable in the long-term attracts more participants, raising the demand for shares. Therefore, ensuring effective stewardship, as outlined above, will positively increase the economic value of a catch share fishery. Furthermore, as stocks grow, science improves and fisheries stay within their catch limits, these limits may ultimately increase, leading to higher share value.

If your fishery's goal is to increase value due to long-term sustainability, then focusing on Step 1 - Define and Quantify the Available Resource is important.

Address overcapitalization

Many fisheries are significantly overcapitalized with far more capital and labor on the water than is needed to effectively capture the available catch. Input regulations often exacerbate this problem by creating an incentive for participants to direct capital investments towards winning the race for fish rather than investing in innovations related to harvesting efficiency or reducing the habitat impacts of fishing. Overcapitalization is commonly recognized as a challenge for open access and limited access fisheries. Reducing overcapacity is often the main motivation for implementing a catch share program.

Conventional management, particularly input-based regulations, can also lead to higher operating costs. For example, regulations that limit per trip landings may raise the costs of fishing if participants have to make multiple trips over several days to land the same amount of fish they could have caught in one trip. These additional trips increase the costs of harvesting and reduce the fleet's profits.

When there is a shift from managing effort under a race for fish scenario to managing output by allocating secure shares, fleet composition may change as participants focus on improving harvesting efficiency rather than increasing vessel capacities. The change in the way capital is used in a fishery may lead to technological innovations that increase profits, reduce bycatch and discards and allow for increased habitat protection.

If your fishery's goal is to reduce overcapitalization, then it will be vital to focus on Step 2 – Define the Privilege.

Leverage the marketplace

In a non-catch share fishery, fishermen often do not have the luxury of choosing when to fish. They must go when the season opens and compete for the available catch. When fishermen deliver fish products to market at the same time, supply outpaces demand and both prices and quality decline (Redstone Strategy Group, LLC, 2006). Furthermore, under a race-to-fish situation, fishermen often do not have the time or incentive to invest

in ways to increase catch value, such as product differentiation, marketing or other value-added efforts.

Catch shares tend to reduce management's focus on effort and input controls that may inhibit fishermen's business opportunities. When these controls are reduced and fishermen are allowed to innovate, they often are empowered to make decisions based on the market, while working within their share of the catch limit.

If your fishery's goal is to leverage the marketplace, then it is important to focus on Step 2 – Define the Privilege.

Promoting and improving fishing-related jobs and communities

Catch shares can be designed to achieve social goals, and examples the world over elucidate options. Social goals generally focus on improving and securing fishing-related jobs and/or increasing benefits to certain communities. For example the Bering Sea Aleutian Island Crab Rationalization program had numerous goals to promote healthy jobs and communities (North Pacific Fishery Management Council, 2008). And recently, Peruvian anchoveta fishermen demonstrated in support of the proposed ITQ program (Chauvin, 2008). Likewise, community-based catch shares (e.g., Community Development Quotas in Alaska, Georges Bank Hook and Fixed Gear Sectors in Cape Cod, and Groundfish Development Quotas in the British Columbia groundfish fishery) have been implemented with the express purpose of promoting local, small-scale fishing communities. Ensuring fairness is also a commonly identified goal-- one which must be clearly defined during the design phase

Improve Jobs

Ensuring or improving fishing-related jobs is often a high priority for fishery stakeholders. As fish stocks dwindle and fishing regulations increase in response, fishing-related jobs are increasingly in jeopardy. The best way to ensure the availability of fishing-related jobs is to ensure resilient and abundant fish stocks. The challenge with depleted fisheries is in getting from the status quo to a rebuilt fishery. In order to end overfishing and rebuild stocks, it is necessary to reduce the amount of catch allowed in an already overfished fishery. Catch shares are often implemented at the same time as reductions in catch limits. Less catch may therefore mean fewer jobs in the short term. Furthermore, there are strong incentives in catch share fisheries to reduce overcapitalization. Both of these are likely to change the nature of jobs in the fishery. In general, catch share fisheries provide stable, high-quality, better-paying jobs, while conventional management often necessitates more sporadic, part-time jobs with limited job security if stocks are declining (Redstone Strategy Group, LLC, 2006). Implementing a catch share does provide the opportunity for participants to evaluate the type of jobs they want moving forward. It also provide the opportunity to compensate fishermen who choose to exit the fishery

For this goal, it is important to focus on both Step 1 – Define and Quantify the Available Resource and Step 2 – Define the Privilege. When moving through both of these steps, design decisions must be made in regards to whether to support fewer higher-quality, better paying jobs or more sporadic part-time jobs.

Support and Promote Fishing Communities

Many fisheries identify supporting and promoting fishing communities as a key goal. For example, you may decide it is important to preserve the historic industry structure of a fishery or limit changes of current fishing patterns. That may mean preserving access for certain types of fishing participants, gear or vessel sizes. Or you may place a premium on promoting a specific local fishing community, as may be the case where fishing has been a staple of the economy and social fabric. It is important to identify this value up front to allow informed decisions about what sort of management system is right for you.

If supporting and promoting fishing communities is important to your fishery, then making careful decisions in Step 2 – Define the Privilege and Step 3 – Identify Eligible Participants and Determine Transferability will be important.

Ensuring fairness:

Ensuring fairness is often a top concern of fishermen and other stakeholders. This often plays out in the design and implementation of fishery regulations. Fairness may mean something different to various stakeholders. Therefore, it is important to articulate early on what fairness means to your particular fishery as you take steps to design a catch share program.

Generally, conversations about fairness come up in the initial share allocation process. Therefore, it will be important to focus on Step 4 – Assign the Privilege and evaluate what is fair to each fishery.

WHAT FISHING SECTORS SHOULD BE INCLUDED?

Over the past four decades there has been a tendency to create divisions of management. For example, permits or licenses are often delineated by type of gear (trawl, hook and line, pot, etc), focus of effort (nearshore vs. offshore), size of vessel (smaller vs. larger), purpose of activity (recreational vs. commercial) and many other characteristics.

While many permit classes are logical for specific management reasons, these divisions often do not represent the true nature of fishing from either the perspective of fishing businesses or ecology. For example, many fishermen hold multiple permits and fish a variety of species, stocks and aggregations using a multitude of gears. This is especially true for smaller vessels and nearshore fishermen where flexibility is the key to making a living. In addition, various species, stocks and aggregations interact ecologically and the increasing scientific trend towards ecosystem-based management reflects a growing

recognition of the importance of managing these collectively. When fishing is governed by numerous different permits with a variety of different rules, it becomes complicated to effectively manage participants, achieve ecological goals and for participants to run successful businesses.

Considering a transition to a catch share program provides your fishery an opportunity to revisit and rethink these divisions. While catch shares should be designed and implemented taking careful account of existing traditions, there are a number of reasons to look beyond current management practices. Most importantly, from a biological point of view, it is preferable to account for all sources of mortality of a species and stock. There are a number of ways to achieve this. For example, there may be a fishery that currently targets four different species using three different types of gear and two basic vessel class sizes. It is likely that there are specialized license categories for many of these distinctions, each of which has their own rules and regulations. It is possible to implement distinct catch share systems for each of these groups, e.g. there could be a catch share system for one specific vessel class using one particular gear and targeting one specific species. Alternatively, the catch share system could include many or all species, gear types and vessel sizes and allow open interactions among them.

Both approaches are commonly used. For example, the Pacific Whiting fishery on the US west coast has three distinct gear sectors and each has its own approach to management. The amount of fish allocated to each sector is determined by a separate management action than that which determines how each group allocates the catch among the participants (Pacific Fishery Management Council, 2000). Alternatively, the British Columbia groundfish IVQ has implemented an integrated management system for all commercial fishermen targeting groundfish, regardless of gear type or vessel size. Here, all participants are under the same catch share program and shares are traded across gear type and size (Turris, 2008).

Moving towards an integrated system can simplify much of fisheries management. For example, if all fish under a catch share system can be freely traded across different sectors, then managers no longer have to determine yearly allocations of the catch among gear types, vessel types and/or different groups of fishermen. These allocation decisions can be highly contentious and time-consuming. Under an integrated catch share system, the shares will move to where it is most valuable. Of course, there still may be good reasons to incentivize certain gears or practices, particularly to reduce habitat impacts.

On the other hand, there may be a specific goal to promote a certain segment of the fishery. In this case, divisions with strong firewalls would ensure the different segments would retain relatively the same prominence in the fishery moving forward. For example, Iceland has created two vessel categories with rules on trading between the sectors. The goal was to ensure the small boat fleet remained viable in the long run.

When different sectors deliver fish in different forms, creating an integrated system may require additional creativity. For example, some fishermen tend to head and gut fish onboard, while others may deliver it in the round. In this case, managers must develop conversion ratios to create a common currency for the shares to avoid overfishing or other negative effects. If the conversion ratio is incorrect, then shares that are traded from one gear sector to another gear sector may not accurately represent the catch. If significant trading occurs, then the fishery could either underfish or overfish the catch limit. In 1993, New Zealand recalculated a number of conversion factors for their shark fisheries because the previous ones had been insufficient and resulted in inaccurate accounting of catch (Shotton, 1999).

WHO ARE THE STAKEHOLDERS?

Fisheries tend to have a wide variety of stakeholders, from direct participants to those with an indirect connection. Stakeholders often participate in management decisions. Stakeholders are varied but generally include some or all of the following:

- current and historical license holders
- captains
- crew
- fishing-dependent communities
- historical participants such as indigenous communities
- seafood business owners
- conservation non-governmental organizations
- scientists
- public

Knowing the key stakeholders in a fishery and developing a process that includes appropriate stakeholders will help facilitate a smoother design process and a catch share program that meets participants' goals. Including fishermen and other stakeholders in the design process will often lead to greater support for the program from among those who must play by the program's rules. For example, the Gulf of Mexico Commercial Red Snapper IFQ development included innumerable stakeholder meetings and substantial participation. Prior to implementation, all fishery participants voted 87% in approval of the program (NMFS Southeast Regional Office, 2006).

Box 3 – Common Drivers for Implementing a Catch Share

While it is possible for many fisheries to benefit from a catch share program – either by changing existing conditions for the better or preventing the pain of future declines – fisheries have generally transitioned to catch shares when they were under duress. Below are commonly cited reasons for implementing a catch share. If your fishery is currently experiencing any of these conditions, it is likely that a catch share will be beneficial:

1. Biological conditions
 - a. Target or non-target species are overfished
 - b. Target or non-target species are undergoing overfishing
 - c. Significant discards or bycatch
 - d. Uncertain science due to lack of fishery information

2. Economic conditions
 - a. Declining revenues
 - b. Derby-style fishing; race for fish
 - c. Overcapitalized fleet
 - d. Excess gear deployment
 - e. Buy-out under consideration
 - f. Management costs exceeding the revenues

3. Social conditions
 - a. Exceedingly complicated regulations
 - b. Desire for increased stability and predictability
 - c. Significant safety concerns
 - d. Conflict between different fishing sectors
 - e. Declining or unstable jobs

Table 1 – Before you Begin Design Options – The table below provides guidance on selecting design options based on your goals. The representative objectives – Ensuring Effective Stewardship, Maximizing Fleet-Wide Economic Benefit and Promoting and Improving Fishing-Related Jobs and Communities – are listed on the left side of the table along with goals within each objective, and all steps are represented across the top of the table. To use the table, review the guidance in the boxes below each step to understand which design options will help you meet your goals.

		Goals	Fishing Sectors	Stakeholders
Outcomes	Ensure Effective Stewardship	End overfishing.	Include all sectors that encounter species and stocks in question.	Include scientists and others with specialized knowledge on species and stocks as stakeholders.
		Rebuild stocks.		
		Reduce waste and bycatch.	Remove input-based controls that focus on limiting effort and include sectors with both directed and in-directed catch on species and stocks in question.	
	Maximize Fleet-Wide Economic Benefit	Increased asset value due to long-term sustainability.	See "Ensure Effective Stewardship" outcome.	
		Leverage the market place and encourage innovation.		
		Address overcapitalization.	Include all sectors that encounter species and stocks in question.	
	Promote and Improve Fishing-Related Jobs and Communities	Improve Jobs.		Include community representatives as stakeholders.
		Support and Promote Fishing Communities.	Consider identifying sectors by community.	
		Ensuring Fairness.		

Design Worksheet Before you Begin

USE THIS SHEET TO RECORD YOUR NOTES AND DESIGN DECISIONS AS
YOU WORK THROUGH THE DESIGN MANUAL

<p>What are your goals?</p>	
<p>What fishing sectors should be included?</p>	
<p>Who are the stakeholders?</p>	

NOTE: You can decide to divide the fishery into various units with different catch share design elements. Keep this in mind as you proceed.

At a Glance - Before you Begin

Before you begin designing a catch share program there are a number of things to consider. Most importantly, you have to know your goals for the fishery. These may be biological, economic, social or some combination of all of these. Additionally, you must also identify all fishing sectors and stakeholders and determine which will be included in the catch share.

1. What are your goals?

Identifying your goals is perhaps the most important step of ensuring a well-designed catch share. Goals will drive design decisions and provide a basis for evaluating success. Clearly articulated biological, economic and/or social goals must be identified prior to catch share design.

2. What fishing sectors should be included?

Considering a transition to catch shares provides your fishery an opportunity to revisit and rethink these divisions. While catch shares should be designed and implemented taking careful account of existing traditions, there are a number of reasons to look beyond current management practices. Most importantly, from a biological point of view, it is preferable to account for all sources of mortality of a species and stock.

3. Who are the stakeholders?

There are often a variety of parties that will be affected by fishery management decisions. Including fishermen and other stakeholders in the design process will often lead to greater support for the program.