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## Tomorrow's Catch: A Proposal to Strengthen the Economic Sustainability of U.S. Fisheries

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# Tomorrow's Catch: A Proposal to Strengthen the Economic Sustainability of U.S. Fisheries

*Wild fisheries in U.S. waters* make an important contribution to the nation's economy, our coastal heritage, and to consumers. But their economic sustainability is not guaranteed and current practices do not capitalize on their full economic potential. Fortunately, in contrast to many contemporary environmental challenges, economic and environmental objectives in fisheries can, in principle, go hand in hand. Effective stewardship of wild fisheries can leverage their renewable nature and lead to both a more prosperous U.S. fishing industry and a healthier marine ecosystem.

Although federal U.S. policy has long recognized the economic and recreational value of fisheries, management practices in the United States and in much of the world remain focused on heavy-handed, top-down command-and-control approaches that implicitly prioritize short-run inefficient exploitation of fisheries over their long-term sustainability. These outdated management approaches can encourage short, highly competitive fishing seasons known as the race to fish, an economically wasteful situation in which each licensed fisherman overinvests in fishing technology, gear, crew, and other inputs to maximize his take of fish, given the prescribed season length. These accelerated seasons often lead to stock depletion and economic waste, threatening the prosperity of fisheries, fishing communities, and marine ecosystems.

Wild fisheries play a particularly significant role in many local economies. In 2011, almost 10 billion pounds of fish were caught and brought to U.S. shores, supporting 1.3 million jobs and generating revenue of about \$5 billion. The economic impact of fisheries goes far beyond this initial harvest, however, with notable activity in the processing and distribution of fish, retail sales, and recreational fishing.

Advances in fishery management in the United States over the past two decades have led to improved economic efficiency and sustainability, but more remains to be done. Rebuilding our nation's fish stocks can increase sales by billions of dollars and lead to hundreds of thousands of new jobs for American workers. In addition, improved management would lower public disaster payments to fisheries, reduce fishermen fatalities, and raise the quality of fish for American consumers.

In a new Hamilton Project discussion paper, Christopher Costello of the University of California, Santa Barbara proposes an amendment to the Magnuson-Stevens Fishery Conservation and Management Act (MSA), the federal law guiding the management of U.S. fisheries. This proposal would require

that fisheries meeting certain criteria undertake a transparent comparison of the economic, social, and ecological trade-offs between status quo management and alternative management structures—in particular, property-rights structures that fall into the broad class referred to as catch shares. Costello expects that this comparison will lead many fisheries to adopt a catch share management approach.

Catch shares are a customizable family of fishery management policies that assign fishing rights to various entities, including fishermen, cooperatives, and communities. Costello asserts that catch shares will give fishing communities a greater stake in the sustainability of fisheries, thereby preventing their depletion and building long-term economic prosperity. Drawing on a growing body of empirical evidence, Costello observes that catch shares eliminate the economically wasteful race to fish that threatens other fishery management approaches. By dramatically lengthening the fishing season, catch shares can lead to gains in long-term employment, significant improvements in safety for fishermen, and improved availability of fresh fish for consumers. Finally, by allowing fishermen to trade their catch share rights among themselves, this property-rights approach would encourage the most efficient fishermen to participate in the market, leading to lower costs and higher profits for fishing communities.

## The Challenge

### Overview of Fisheries Management in the United States

Most industrial high-value fisheries in the United States are located in federal waters (from three to two hundred nautical miles off shore), and are thus under the purview of the U.S. Department of Commerce through the National Oceanic and Atmospheric Administration (NOAA). Under NOAA, eight regional fishery management councils oversee the conservation and management of U.S. fisheries, with each council including representatives from the commercial and recreational fishing sectors in addition to environmental, academic, and government organizations.

States do not have jurisdiction beyond three nautical miles from shore, where most commercial fishing takes place, and until the MSA was passed in 1976, there was no concerted federal effort to regulate fishing. After fish stocks continued to decline over the 1970s and 1980s, exacerbating economic hardships for workers in the fishing industry, the MSA was amended in 1996 and again in 2006 in attempts to protect essential fish habitat, restore fish stocks, and reduce bycatch—non-targeted species harvested accidentally.

There is a small set of broad approaches to fishery management in the United States. One common approach, used in the management of many state-level fisheries and a few federal fisheries, is that of regulated open access. Under such a system, fisheries allow fishermen free entry and exit, but regulate factors

such as gear type, fishable area, and season length. At first glance, this approach makes some intuitive sense: for a fixed amount of effort by fishermen, fishery managers can maintain safe harvest levels, for example by controlling the size of nets fishermen use. But this logic turns out to be flawed once economic behavior is considered: as soon as any economic value is generated by the regulations, new entrants will flock to the fishery.

New entrants produce two important consequences. First, the increase in the number of fishermen will lead to an excessive harvest, and possibly to collapse in the fish stocks, because the regulations (fishing nets, in this example) were designed under the old amount of fishing effort. Second, the increased entry dissipates the economic value of fishing and may produce an economic outcome no better than that achieved under a complete lack of regulation.

Another management approach is a system of limited entry, which restricts the entry of fishermen into the industry. This is typically accomplished by issuing a fixed number of permits to fishermen. Entry and exit are controlled either by allowing trade in the permits themselves or by prohibiting trade but distributing new permits as active permits are retired. Harvest restrictions are achieved by regulating other factors, typically the season length. This may at first appear to solve the problems of the regulated open access system. Indeed, this is the most common form of management of U.S. fisheries. If designed and implemented properly, this approach can lead to reasonably robust conservation of fish stocks, but the same cannot be said for its economic effects. Limited entry provides very strong incentives for a race to fish, often leading to depletion of stocks and economic waste.

When a fishery manager restricts the season length to protect the fish stocks, fishermen invest heavily in their fishing capacity to maximize their catch before the season ends. This overinvestment squanders resources and further depletes the fish stocks, prompting the fishery manager to again cut the season length. In many U.S. fisheries, the season lasts just a few days. The problem with limited entry is that solving the ecological challenge by protecting the fish stocks will not necessarily solve the economic challenge. Regulations that achieve ecological goals may nonetheless promote substantial economic waste. While U.S. fishery managers have been among the best in the world at measuring, monitoring, and protecting the fish stocks, they have paid less attention to designing fishery management institutions to generate economic prosperity.

Increasingly, fisheries around the globe are adopting catch share management systems. But three main barriers have impeded the widespread adoption of catch share systems in the United States. First, until recently, catch shares were perceived to be a one-size-fits-all solution with little flexibility in design. Second, while the aggregate gains from catch share adoption can be large, the distributional effects may also be significant. If some politically powerful players stand to lose from the transition, they may wield sufficient influence to block adoption. Finally, as is common with new institutional regimes, there has been

a general lack of information about catch shares with which to make sound decisions. Costello contends that all three of these challenges can be overcome with information, a view that shapes his policy proposal, described below.

## Inefficiencies in the Fishing Sector

Costello asserts that the inefficiency of fishery management systems that are not property-rights driven arises from two basic sources. First, fisheries are overexploited when fishermen have little stake in the future productivity of the resource. For example, a recent study found that the unassessed fisheries of the world, which are largely managed with input controls, are drastically overharvested compared to other fisheries. Overharvesting, of course, has negative consequences for conservation. But even if one cares only about the economic prosperity of the fishing industry, conventional management often leads to inefficiently small resource stocks, and thus to lower profits. Regulating inputs also induces the race to fish, leading to inefficient labor and capital use, increased costs, and often lower quality and price.

The sector most obviously affected by the inefficient management of U.S. fisheries is the commercial fishing sector where, on average, individuals are harmed by the market inefficiencies. Recreational fishermen are also harmed by overexploitation of fish, however, because it leads to lower fish stocks for them to catch. In addition, this inefficiency can affect actors in the supply chain in diverse ways. On the one hand, restaurants specializing in local, fresh seafood or large chains with a long-term stake in sustainability will benefit from improved fishery management. On the other hand, many fish processors, who wield immense market power under the current regime and who may lose that power under a reform, may prefer the status quo.

Two observations are clear. First, the inefficient management approach has important effects on all sectors of the fishing industry. Second, the MSA does not provide for the comparison of alternative management options, which can bolster the economic efficiency of the fishery. There is no one-size-fits-all solution to the diverse economic, social, and ecological conditions of U.S. fisheries, but with the right management institutions and careful implementation, fishing communities can increase revenue and reduce costs, protect the marine ecosystem, and produce a higher-quality product for consumers.

## A New Approach

Costello proposes amending the MSA to require certain fisheries to conduct a comparative analysis of alternative fishery management approaches, including catch shares. Specifically, Costello's proposal would call on fisheries to evaluate the expected ecological and economic outcomes of at least two versions of catch share management approaches, and to compare these results to the performance of the status quo management system.

By conducting and disseminating such an analysis, fishermen, policymakers, and other stakeholders could make fishery management decisions based on a transparent comparison of potential outcomes under different management systems. They could then choose whichever approach meets the unique goals of the particular fishing community.

One of three triggers would require a fishery to conduct such an analysis: (1) any fishery considering a major management change, (2) any fishery demonstrated to be on a risky economic or ecological trajectory, and (3) any fishery in which a significant fraction of participating fishermen (Costello suggests one-third) requests the analysis.

Rather than a one-size-fits-all solution, catch shares can be customized to the particular circumstances of a community. Catch shares can be designed in many different ways, but there are three common models:

1. The individual transferable quota (ITQ) model assigns tradable fishing rights to individuals, giving each fisherman a share of the total allowable catch. This model aims to encourage fishermen with low costs to purchase shares from those with high costs, while compensating those who choose to sell their shares.
2. The cooperative model allows a group of fishermen to explicitly cooperate on harvest strategies, co-management, and marketing.
3. The spatial use rights or territorial user rights fishery (TURF) model gives a fishing community an exclusive privilege to harvest a designated area of the ocean or other body of water.

Under Costello's proposal, the fishery management councils would evaluate the status quo management system against up to three alternative approaches, including two versions of catch shares, such as the ITQ and cooperative models. The analysis would pay close attention to the risk of fishery collapse—ecological and economic—under each management approach. Importantly, the proposal does not require the adoption or even explicit design of a catch share system. Rather, it requires only that the anticipated outcomes of catch shares be compared to those of the status quo management so that stakeholders can make an informed decision given their specific goals.

Costello proposes that the analysis be undertaken by the eight regional fishery management councils, comprising representatives from the commercial and recreational fishing sectors, as well as from environmental, academic, and government organizations. The councils would draw on research universities and the fishing community, and would tailor each analysis to the specific fishery in question. The methods and results of the analysis, including an explicit write-up of all model assumptions and data sources, would be subject to public scrutiny. The public would have an opportunity to comment before analyses are finalized.

## Roadmap

- Congress will amend the Magnuson-Stevens Fishery Conservation and Management Act (MSA) to direct the appropriate fishery management council to conduct a comparative analysis of alternative fishery management approaches, including catch shares, for fisheries that meet select criteria. Under the amendment, fishery management councils would evaluate the expected economic, social, and ecological outcomes of at least two versions of catch share management approaches, and would compare these results to the performance of the status quo management system. Fisheries meeting at least one of three triggers would be required to conduct such an analysis: (1) any fishery considering a major management change, (2) any fishery demonstrated to be on a risky economic or ecological trajectory, and (3) any fishery in which a significant fraction of participating fishermen (such as 33 percent) requests the analysis.
- During an initial phase-in period, Congress will appropriate new funds to the National Oceanic and Atmospheric Administration (NOAA) to support fisheries in their analyses of alternative management structures.
- NOAA will expand its support for the design, implementation, and monitoring of catch shares, consistent with its Catch Share Policy of 2010.

During an initial phase-in period, Congress would appropriate new funds to NOAA to support fisheries in their analysis of alternative management structures. In addition, NOAA would expand its support for the design, implementation, and monitoring of catch shares, and continue to allow fisheries to share in the economic upside of catch shares, consistent with its Catch Share Policy of 2010. While the combination of funding for catch share adoption and policies to distribute economic benefits to fisheries has not been successful in incentivizing catch share adoption to date, Costello's hope is that the implementation of triggers requiring further analysis of fishery management structures combined with additional NOAA support will be sufficient to lead to markedly higher adoption of catch shares in U.S. fisheries.

## Learn More about This Proposal

This policy brief is based on The Hamilton Project discussion paper, “Tomorrow’s Catch: A Proposal to Strengthen the Economic Sustainability of U.S. Fisheries,” which was authored by:

**CHRISTOPHER COSTELLO**  
University of California, Santa Barbara  
and National Bureau of Economic Research

## Benefits and Costs

### Benefits

The transparent comparison of status quo management to several alternatives will provide fishermen and other stakeholders with the necessary information to better advocate for management approaches that reflect their economic, social, and ecological goals. One significant benefit of such a comparative analysis is that providing information on the outcomes of different management schemes will level the playing field, ensuring that asymmetric information is not used for political or special-interest gain. Additionally, requiring the comparison across a number of alternatives will encourage stakeholders to avoid getting stuck in marginal thinking about any one design. Importantly, Costello does not propose mandating the adoption of any particular approach.

Costello maintains that a transparent comparison will prompt many fisheries to adopt catch shares. Catch shares produce three mechanisms that drive economic prosperity. First, they promote the efficient use of economic inputs, lowering the cost of fishing, often by 30 to 50 percent. Second, they improve the quality and value of the product by dramatically extending the season length, which typically raises prices by 10 to 40 percent because fish are sold on the fresh, not frozen, market. Third, they encourage the efficient management of fish stocks, increasing harvest over time and reducing fishery collapse.

Catch shares have increased economic efficiency in the British Columbia halibut fishery and have improved long-run conservation measures in New Zealand through increased asset prices. In the Gulf of Mexico’s red snapper fishery, the aggregate economic benefits of catch shares ranged from a two-fold increase in economic surplus to a ten-fold increase in market capitalization. In a recent Organisation for Economic Co-operation and Development report, each of eighteen fisheries

examined showed an increase in value from catch share adoption ranging from 8 percent to over 400 percent. On average, fisheries doubled in value. Increases arose from price increases or cost decreases, and from optimization of the yield.

Catch shares may also have important effects on consumer welfare. Typically, the slower pace of fishing allows a higher fraction of catch to be sold fresh rather than frozen, improving quality for consumers. While this almost always entails a price increase, the price change arises from a higher-quality product, so overall consumer welfare may actually increase. If overall fish catch increases as stocks rebuild, this may also benefit consumers in the long run.

### Costs

The direct costs of conducting comparative analyses of management would primarily fall on the fishery management councils, but under the full scope of the proposal, those expenses would be offset with some amount of funding from NOAA. To allow the councils to further offset the costs of analysis, Costello suggests that a small fraction of the efficiency gains produced from reform be captured by the councils. Even if the fishery itself does not explicitly pay back the costs, NOAA can expect to save money in the long run. As fisheries adopt management approaches with lower risks of fishery collapse, the federal government will need to pay less in disaster aid. Costello argues that the first few fisheries to undertake the analysis are likely to bear the greatest cost as methods, data, and processes are worked out, but subsequent analyses would become progressively less expensive as councils make use of preexisting methodologies.

Costello notes that while the anticipated costs of implementing the proposed amendment to the MSA are small, there may be larger costs associated with actually reforming the management of a fishery. For example, an ITQ model allocated at the individual level may require onboard observers or cameras to prevent low-value catch from being wastefully discarded at sea. If privileges are transferable, those trades must be tracked by the relevant agencies. In addition, different kinds of catch shares may require different kinds of scientific information for their implementation: catch shares that allocate fractions of the allowable catch require the determination of the total allowable catch, which usually requires an estimate of fish biomass. The costs of implementing different forms of catch shares are becoming better known, and this information can be used in the design phase. Importantly, many of these costs are not additional: they are costs that would need to be borne by any fishery management system that wished to achieve similar goals. The increase in value that accrues from catch shares can also be tapped to cover any additional management costs that may be incurred. This second point arises because short-term costs of management reform are more than overcome by long-term increases in fishery value from improved management.

# Questions and Concerns

## 1. How will catch shares affect fishing communities?

America's port towns have a rich history, and the welfare of those fishing communities features prominently in fishery legislation in the United States. After fisheries were mismanaged through the 1990s and fishery managers had to drastically limit harvest, it is no surprise that fishing communities are often wary of more reform.

The effects of catch shares on fishing communities are complex and highly dependent on design. For example, New Zealand's ITQ catch share model is specifically designed for economic efficiency: in assigning transferable privileges to individual fishermen, the design encourages the most efficient fishermen to buy, through voluntary trade, the privileges of those who have higher costs. This process reduces overcapitalization in fishing fleets and mirrors other natural labor transitions in developed economies. Critics worry that industry consolidation will eliminate the presence of smaller operators, however.

Yet catch shares can be designed to reflect the diverse goals of coastal communities. If a community wishes to prevent consolidation, the catch share model can be designed to limit the ownership of any single entity. Catch shares can be customized in other ways, too. For example, the design could allocate rights to groups—e.g., communities, ports, or cooperatives—and could require that fish harvested under that quota be landed and processed in that port. In addition, the design could limit participation: only fishermen with a history in the port, or in an apprenticeship program, for instance, might be able to acquire privileges.

Some of these provisions have economic trade-offs. A requirement that only local fishermen participate in a fishery may exclude more-efficient fishermen, for example, and a cap on consolidation could reduce economic efficiency. However, when preserving local fishing heritage is a key goal, these trade-offs may be acceptable.

## 2. Are recreational fisheries ever integrated into catch shares?

The commercial and recreational sectors share access to many fish stocks in U.S. fisheries. Under conventional management, the fishery management councils allocate a certain fraction of the available harvest to each of these two sectors. With catch shares, the assignment across sectors depends on the particular characteristics of a given fishery and objectives of a council.

There are several important interactions between commercial and recreational fisheries that should be considered before extending catch shares to cover both sectors. For one, creating a catch share in only one sector while the other remains an open access fishery will dissipate the economic gains made within the catch share system. Creating catch shares across both sectors—such as a cross-sectoral ITQ program—would allow recreational boat captains to extend their season through acquiring more harvest rights, thereby accommodating high recreational demand, and would allow commercial fishermen to acquire more rights when fish prices are high. Alternatively, in a cross-sectoral TURF program, recreational TURFs could be managed more like clubs, with only catch and release or with small bag limits. This spatial separation between sectors could improve the welfare of both sectors.

## Highlights

Christopher Costello of the University of California, Santa Barbara proposes an amendment to the Magnuson-Stevens Fishery Conservation and Management Act (MSA), the federal law guiding the management of U.S. fisheries. The amendment is intended to give fishing communities the information necessary to advocate for management approaches that reflect their economic, social, and ecological goals.

## The Proposal

**Require fisheries meeting certain criteria to undertake a transparent comparison of the economic, social, and ecological trade-offs between status quo management and alternative management structures.** The comparative analysis would include property-rights structures that fall into the broad class referred to as catch shares. Catch shares are designed to give fishing communities a greater stake in the sustainability of fisheries, thereby preventing their depletion and building their long-term economic prosperity.

**Increase funding for the National Oceanic and Atmospheric Administration (NOAA) to support fisheries in their analysis of alternative management structures.** In addition, NOAA would expand its support for the design, implementation, and monitoring of catch shares.

## Benefits

The transparent comparison of status quo management to several alternatives will provide fishermen and other stakeholders with the necessary information to better advocate for management approaches that reflect their diverse goals. Costello maintains that transparent comparison will prompt many fisheries to adopt catch shares. Drawing on a growing body of empirical evidence, Costello contends that catch shares produce three mechanisms that drive economic prosperity. First, they promote the efficient use of economic inputs, lowering the cost of fishing, often by 30 to 50 percent. Second, they improve the quality and value of the product by dramatically extending the season length, which typically raises prices by 10 to 40 percent as fish are sold on the fresh, not frozen, market. Third, they encourage the efficient management of fish stocks, increasing harvest over time and reducing fishery collapse.



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