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spotlight

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Catch Shares

A Potential Tool to Undo a Tragedy of the Commons in NC Fisheries

KEY FACTS: **• North Carolina currently is experiencing a tragedy of the commons with respect to its offshore fish stocks.**

• Declining fish stocks are affecting N.C. fishermen and fishing communities. Several stocks are either highly limited or prohibited to fishermen.

• Fisheries management has traditionally followed a command-and-control model, with managers applying controls over inputs and outputs.

• Unfortunately, these controls have incentivized winning the "race to fish" and outmaneuvering the planners, so fisheries have continued to decline. The U.S. government has been spending $70 million a year to bail out failing federally managed fisheries under traditional management systems.

• Catch shares are a transformative approach to fisheries management. Injecting property rights into the fisheries via catch shares produces a sea change in incentives. It eliminates race to fish, encourages a more discriminating harvest, and reduces bycatch, and in so doing also allows for longer fishing seasons, reduces investment in fishing vessels, and allows fishers discretion to harvest in safe weather conditions, when market prices are higher, or when there is a need to generate income.

• The federal National Oceanic and Atmospheric Administration (NOAA) actively encourages Regional Fishery Management Councils to consider and adopt well-designed catch share programs. NOAA pledges to offer technical and administrative support for councils and stakeholders in considering, designing and possibly implementing and monitoring catch share programs.

• Not all fisheries are appropriate for catch shares. Successful programs are carefully designed around local stakeholders' concerns and are scientifically based with reliable, real-time catch data and proper monitoring and enforcement.

• Research finds strong links between catch shares and improved economic and biological performance of fisheries and that switching fisheries to catch share systems not only slows their decline but possibly stops (or even reverses) it.

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When a scarce resource that people want has no ownership but instead "belongs to all," it will tend to depletion. That's because the economic incentives in a commons are essentially first come, first served, prompting a rush to consume with no countervailing incentive to conserve. It wouldn't matter if most consumers were sensitive to the need for some conservation to ensure the continuation of the resource; just a few greedy consumers would be enough to force depletion, and in fact their threat prompts the others to overconsumption.

Such a problem is termed a "tragedy of the commons," first named by ecologist Garrett Hardin in a 1968 article in Science.[1] Hardin used the idea of cattle herding on a "pasture open to all," in which each herdsman's desire to maximize his own personal wealth by expanding his herd — while the pasture remains a limited resource — ushers in "ruin to all."

A prominent example (one that Hardin himself discussed[2]) of a tragedy of the commons is fisheries. Dr. Roy Cordato described the difference between a commons approach to a fishery and private ownership (using the example of a catfish pond):

> Common ownership fosters a use it or lose it mentality. A classic example is fish in the ocean. If fishing trawlers come across a large school of fish, their incentive will be to capture as many of those fish as possible. If they don't take them someone else will. This can be contrasted, for example, with the owner of a commercial catfish pond. The incentives in this case are to cultivate the stock; take the largest fish and leave the smaller ones to grow to a more valuable size; to make sure that the fish are well fed and the water is kept clean and well oxygenated, etc. There is no concern that if you don't take the fish today someone else will. And if the resource, in this case catfish, is misused, then it is the owner that will have to bear the costs.[3]

North Carolina currently is experiencing a tragedy of the commons with respect to its offshore fish stocks. The N.C. Division of Marine Fisheries' 2011 Stock Status Report lists 12 groups of fish as viable or recovering, 13 groups as stocks for which there are concerns, and seven that are depleted. Statuses for another seven stocks are unknown. While red drum and monkfish are considered to be recovering stocks, overfished stocks include southern flounder, snowy grouper, red porgy, red snapper, red grouper, spotted seatrout, and several species of shark. Landings of shad, spot, and weakfish were at very low levels. Harvest of river herring in the Albemarle Sound was prohibited, the bay scallion season wasn't opened in 2011, and possession of Atlantic sturgeon was banned.[4]

Furthermore, according to the CapLog Group, the number of days available to North Carolina fishermen for commercial harvest of golden tilefish has decreased by almost 80 percent over the past five years.[5] The days available for vermillion snapper have fallen by 45 percent since 2008.[6] A new endorsement program approved in December 2011 by the South Atlantic Fishery Management Council for commercial harvest of black sea bass with traps would significantly hamper North Carolina fishermen; only 18 of the 60 vessels that landed black sea bass from 1999-2010 would be eligible to do so now, including only seven vessels in Onslow County, five vessels in Carteret County, three in Pender County, two in New Hanover County, one in Brunswick County, and no vessels at all in Dare and Hyde counties.[7]

Traditional Fisheries Management and Unintentional Consequences

Fisheries management has traditionally followed a command-and-control model, with managers applying controls over inputs and outputs. Input controls have included blocking access to fisheries though limiting permits, limiting gear to certain kinds and amounts, specifying fishing methods, limiting areas available to fish, and limiting fishing seasons. Output controls have included setting total allowable catch for the entire fleet each season, limiting bycatch (i.e., species that aren't the target of the fishing expedition but are caught, for example, in trawling nets), and placing trip or bag limits on individual fishermen.[8]

The incentives under traditional management have been those of winning the seasonal race to fish, which annu-

ally overshadows the long-term health of the fishery and, consequentially, the local fishing industry. Entrepreneurial ingenuity has continued to stay a step ahead of the regulators. As described by the U.S. Commission on Ocean Policy,

> In response to each new measure designed to limit fishing effort, fishermen developed new fishing methods that, although legal, undermined the goal of reaching sustainable harvest levels. This prompted managers to promulgate more restrictive measures and fishermen to develop more ingenious methods to work around them. For example, if managers limited the length of the boat, fishermen increased its width to hold more catch. If managers then limited the width, fishermen installed bigger motors to allow them to get back and forth from fishing grounds faster. If managers limited engine horsepower, fishermen used secondary boats to offload their catch while they kept on fishing.[9]

Continually shrinking the number of fishing days also gives fishermen less opportunity to coordinate fishing days with market conditions as well as weather conditions. The urgency of race to fish in limited days to fish causes fishermen to take risks such as overloading their boats and fishing during dangerous weather conditions. For an extreme example, in the Alaskan halibut and king crab fisheries prior to the introduction of Individual Transferable Quotas (ITQs), the fishing season had fallen to just two to three days and the king crab fishery was so marked with injury and death that it hatched a television series, "The Deadliest Catch." And all those risks taken resulted in a market glut that depressed prices.[10]

Injecting Property Rights into Fisheries

Given the declining state of fisheries, the need for new ideas for fisheries management has been evident for some time. In 2007 Congress passed the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 (MSA), including within the federal government's marine fisheries management law an allowance for Limited Access Privilege (LAP) and Individual Fishing Quotas (IFQ) programs, also known as "catch shares."[11]

Catch shares are a transformative approach to fisheries management. Rather than a command-and-control environment with its incentives of race to fish, catch shares inject property rights into the commons. This alternative produces a sea change in incentives, as fishing shareholders assured of a secure portion of the allowable catch have ownership in the long-term success of the fishery. It eliminates race to fish, encourages a more discriminating harvest (leaving younger and smaller fish to mature as well as reproduce), and reduces bycatch, and in so doing also allows for longer fishing seasons, reduces investment in fishing vessels, and allows fishers discretion to harvest in safe weather conditions, when market prices are higher, or when there is a greater need to generate income.

Furthermore, in some IFQ programs, the privileges are treated as tradable commodities. Under an ITQ program, if a fisherman exceeds his allowable catch, he can purchase shares from another fisherman; conversely, a fisherman can sell shares to others and remain solvent in times when he is unable to fish. Through the introduction of property rights comes a market process that allocates resources more effectively. It also provides a powerful incentive to fishermen to make sure the fishery is sustainable, including voluntary actions to avoid overfishing and act with ecologic and environmental responsibility in mind.

A study of catch shares by the Property and Environment Research Center found that

> Experience with [catch share] regimes has been positive; enhanced fishery projects are directly evident in positive prices for quota allocations and indirectly evident in higher unit values for fishery products, longer and safer fishing seasons, and improved catch per vessel. Many studies indicate that markets for catch shares are both competitive and efficient in regimes where they are tradable. Additionally, fishers vested with secure harvest rights have incentives for stewardship of the resource and more efficient management, neither of which exists in the traditional race to fish.[12]

NOAA's Policy on Catch Shares

Catch share programs have been used in federal fisheries in the United States since 1990. The U.S. Commission on Ocean Policy recommended that every federal, interstate, and state fishery management entity consider the potential benefits of adopting catch share programs.[13] With catch shares having been included in the 2006 amendments to Magnuson-Stevens, the federal National Oceanic and Atmospheric Administration (NOAA) actively encourages Regional Fishery Management Councils to consider and adopt well-designed catch share programs. NOAA pledges to offer technical and administrative support for councils and stakeholders in considering, designing and possibly implementing and monitoring catch share programs.[14]

NOAA's policy does not, however, require or advocate that every fishery include a catch share program and notes that catch shares are not appropriate for every fishery. The NOAA policy lists several characteristics of fisheries for which catch shares "could be particularly beneficial."[15] They include fisheries that are overcapitalized (e.g., that have too large a fleet size for the total allowable catch, owing to race to fish); whose stakeholders are receptive to the idea (which includes education and outreach efforts on behalf of catch share programs); whose stock is overfished (leading to the imposition of many regulations and controls under traditional management); where the infrastructure exists for data collection, administration, and enforcement and can be flexible enough to suit various conditions; and that have excessive bycatch.[16]

Groundfish Program in New England

Stakeholder receptiveness is no small part of the equation, however.[17] In 2009, the New England Fishery Management Council overwhelmingly approved a catch share program for groundfish that went into effect May 1, 2010.[18] The initial process was quite controversial.[19] Amid the turmoil, North Carolina Congressman Walter Jones proposed an amendment in 2011 that would have blocked NOAA from spending funds to promote and expand catch share systems along the Atlantic coast and the Gulf coast. The amendment passed the U.S. House with a solid bipartisan majority but was stymied in the Senate.[20]

Nearly a year later, Cape Cod Times recounted the controversy and the growing support among fishermen for catch shares:

> within weeks of implementation last spring, complaints surfaced that the allocation of quota to individual fishermen was flawed, that the sector system favors those with money, and that the net result this year was many fewer fishermen catching fish. Others charged that the allocation process was an inside job that benefitted those with connections to regulators, and that the National Marine Fisheries Service fumbled the ball with poor scientific analysis of fish stock sizes that led some fishermen to make poor business decisions.
>
> In the first few months, U.S. Rep. Barney Frank, D-Mass., called for Lubchenco's resignation, Gov. Deval Patrick filed for emergency aid to fishermen, and New Bedford and Gloucester sued the federal government.
>
> Yet even the sector system's harshest critics agree it's better than the previous fishery management system, and most believe the next fishing year, which begins May 1, could be much better.[21]

As one fisherman with several years' experience in catch share programs put it, "The first year is the worst."[22] On May 1, 2011, NOAA raised the catch limits on 12 groundfish stocks in New England.[23]

Designed Around Stakeholder Concerns and Solid Data

A consistent feature in the research literature on catch shares is the importance of carefully designing the programs to address the concerns of the local stakeholders. The Alaska halibut/sablefish IFQ program, for example, was customized with stakeholder concerns over the program's socioeconomic effects on the communities: quota share per individual or entity was capped at one percent, absentee ownership was prohibited, vessel size and type were taken into account.[24] A cautionary example to the contrary was offered by the Mid-Atlantic surf clam/quahog ITQ, with so many fishermen selling their shares to outside investors that the fleet size shrunk by more than half and a bank and an accounting firm were the largest holders of fishing quotas. (The memories of this experience factored in the controversy over the New England groundfish catch shares.)[25]

Furthermore, reliable, real-time catch data and proper monitoring and enforcement are crucial elements for a catch share program. Lack of those elements would put the programs at risk for unintended negative consequences. The programs need to be scientifically based with the ability to adjust catch quotas with confidence. Not all fisheries are appropriate for catch shares.[26]

Effects of Catch-Share Programs Worldwide

Research backs up the greater effectiveness of catch shares in addressing the tragedy of the commons problem with respect to fisheries. A study published in 2005 in the Journal of Environmental Economics and Management of New Zealand's robust catch shares system (it is the largest such system in the world), covering 15 years' of data for 33 species and over 150 markets for fishing quotas, found a "substantial increase in quota prices since the ITQ system was established, consistent with an increase in the profitability of the fisheries" and importantly, "these quota price increases have been significantly greater for stocks that faced significant reductions in allowable catch levels;" i.e., stocks that had been overfished and overcapitalized.[27] A study published in 2009 in Fish and Fisheries looked at catch shares' effect on 20 fish stocks around the world for which biomass data were available before and after implementation of ITQ systems; it found positive changes in 12 out of the 20 stocks, and a reduction in the rate of decline by 62 percent after implementation of the ITQs.[28]

In 2008 Science published a comprehensive study of the effects of the implementation or not of ITQs on fisheries around the world, using a database of 11,135 fisheries and their catch statistics from 1950 to 2003. Economist Christopher Costello, marine biologist Steven D. Gaines, and economist John Lynham found a "strong link" between the presence of ITQs and the economic and biological performance of those eleven-thousand-plus fisheries. They found a global trend of increasing collapse in fisheries such that about 27 percent of the world's fisheries were in collapse by 2003.[29] Against this global backdrop they found,

> ITQ fisheries perform far better than non-ITQ fisheries. **Switching to an ITQ not only slows the decline toward widespread collapse, but it actually stops this decline.** Each additional year of being in an ITQ ... offsets the global trend (0.5% increase) of increasing collapse in non-ITQ fisheries. Other estimation techniques suggest even larger benefits. For example, **fishery fixed-effects results suggest that ITQs not only halt the trend in global collapse, but they may actually reverse it.**
>
> Although bioeconomic theory suggests that assigning secure rights to fishermen may align incentives and lead to significantly enhanced biological and economic performance, evidence to date has been only case- or region-specific. By examining 11,135 global fisheries, we found a strong link: **By 2003, the fraction of ITQ-managed fisheries that were collapsed was about half that of non-ITQ fisheries. This result probably underestimates ITQ benefits, because most ITQ fisheries are young.**[30] (Emphasis added.)

The U.S. government has been spending $70 million a year to bail out failing federally managed fisheries under traditional management systems.[31] Catch shares' potential to halt and maybe even reverse this collapse of fisheries would have resounding economic effects. NOAA's expenditures to promote and fund catch shares' expansion would be offset by such gains. Recent research suggests that, in addition to their positive economic effects on fisheries, catch shares would have a net positive effect on the federal deficit, through greater income tax revenue, mandates to recover some costs of management, and smaller staffing needs to manage catch share programs, among other benefits.[32]

Conclusion

Declining fish stocks are affecting North Carolina's fishermen and their communities. Several stocks are either highly limited or prohibited to fishermen or, in the case of black sea bass, essentially prohibited to all but a handful. The situation highlights the need for new management ideas for the state's offshore fisheries. Fishermen and the fishery management councils should make a sober consideration of catch share systems and consider customizing and adopting them to suitable fisheries. Injecting property rights via catch shares could bring North Carolina's fishermen the security of a guaranteed portion of the allowable catch, the freedom of more days at sea, the benefit of an increased harvest stock size, the discretion to harvest in opportune times, as well as, depending upon the design, the opportunity to trade shares as yields and efficiency direct and to work together voluntarily with other fishermen to ensure the sustainability of their calling.

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    [Congressmen Barney] Frank and [John] Tierney voted with Jones last February when his amendment won a 100-vote majority as a budget rider. But catch share forces — spearheaded by the nonprofit giant Environmental Defense Fund, where [Jane] Lubchenco served as board officer before being tapped to head the National Oceanic and Atmospheric Administration — hired a ring of lobbyists and saw the Jones amendment eliminated via parliamentary maneuvering in late November.
    "We all know that catch shares are designed to consolidate the fleet; millions of dollars of slickly produced, sham 'assessments' won't make people forget that," Jones said in an email. "If fishermen come together and decide they want catch shares, fine. But these outside groups should spare us the charade of their 'objectivity'."

    Jones listed several objections to catch shares in a letter to Sam Rauch, Acting Assistant Administrator of NOAA Fisheries, February 17, 2012, jones.house.gov/press-release/jones-speaks-out-against-shark-catch-shares:

    We oppose catch shares because this nation simply can't afford the tens of millions of dollars that this agency is spending on them. We oppose catch shares because their implementation takes precious resources away from far more important uses like stock assessments and cooperative research. We oppose catch shares because of the top down process that the agency and councils have frequently used to force these programs onto unwilling fishermen. But most importantly, we oppose catch shares because they've proven to be thinly veiled efforts to consolidate the fishing fleet and needlessly destroy fishing jobs and communities.
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