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Correcting the Whimsies of U.S. Fisheries Policy

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There can be little doubt that economists have made profound contributions to the development of coherent public policy in a wide range of areas—pollution control, wetland protection, conservation reserves, wildlife protection, off-shore oil leasing, timber management, agricultural markets, cooperatives in several sectors (agriculture, marketing, food retailing, health care, childcare), land trusts, and the control of urban sprawl. In each case, conceptual and theoretical innovations, coupled with creative empirical insights, continue to offer helpful guidance to a variety of legislative bodies and judicial proceedings. An important part of this creative intellectual history is the fruitful and uniquely American organizational structure that links research at Land Grant Universities with the excellent research programs of several federal agencies—the U.S. Forest Service, the National Oceanographic and Atmospheric Administration, and the U.S. Department of Agriculture's Economic Research Service. The fact that current policies do not always reflect the settled insights from this impressive community of science does not diminish the importance of the empirical findings offered. Politics requires time to catch up with the latest science. And scientific research must evolve so that it reflects pressing social issues.

Against this hopeful picture stands a perverse exception—U.S. fisheries policy. Commercial fishing is an important economic sector. Despite this, fish landed and delivered to restaurants and retail outlets—all $5.5 billion of it in 2014—is given away free to the commercial fishing industry. Imagine if offshore oil were given away free to BP, Royal Dutch Shell, ExxonMobil and a number of smaller companies. Some of those royalties, amounting to approximately $2.5 million per day coming into the U.S. Treasury, provide matching financial support for the Land and Water Conservation Fund. Imagine if logging companies were given access to public timber for no charge. But the larger irony, in light of my earlier comments about the beneficial relationship between public policy and the community of science, is that a small coterie of fisheries economists are the architects of this bizarre give away of the nation's wealth of ocean fisheries. As if this were not odd enough, the nation's major environmental organizations and their benefactors—the Environmental Defense Fund, the Gordon and Betty Moore Foundation, the David and Lucile Packard Foundation, and the Natural Resources Defense Council—are avid cheerleaders for this free gift. The obvious question is how fisheries policy ended up in this muddle. (Bromley, 2009). The more important question is how can this bizarre policy be put right?

How Did Fisheries Policy Go Wrong?

The incoherence started with a rather simple paper by H. Scott Gordon in 1954 entitled "The Economic Theory of a Common Property Resource: The Fishery (Gordon, 1954)." Despite its many flaws, this ancient paper continues to be the first exposure that many aspiring economists—and many fisheries biologists—have to fishery economics. Here, Gordon relied on a simple Ricardian account of how two

parcels of unowned land, one of very high quality, the other quite indifferent, would lead to a situation in which the superior land would be overexploited until its value at the margin (its marginal value product) would be driven down to equal that from the poor parcel. His first mistake was to refer to this as a situation of "common property"—rather than as the absence of property. But of course Gordon was not interested in land—Ricardo had already developed that argument 150 years earlier. So Gordon wrote of the misnamed "common property" fishery. Unfortunately for Gordon's model, most fish move a great deal, and some even move from fresh-water streams to saline oceans and then back again to spawn and die. Only demersal fish—bottom dwellers—tend to stay put on the ocean floor. So Gordon created an underwater version of Ricardian rent for a very special fishery. According to Gordon's naïve story, fishing firms overexploit the better fishing ground until the economic returns from doing so are brought into equality with economic returns from the poorer fishing ground. That was Gordon's second mistake—few fish, even the demersal ones—stick that close to such a defined space. Gordon warned that his model did not apply to most fisheries. Few fisheries economists bothered to notice.

One year later Anthony Scott published his seminal paper "The Fishery: The Objectives of Sole Ownership (Scott, 1955)." And so the two creation myths of modern fisheries economics not only misidentified the conceptual problem in the fishery (common property), they also insisted that the only way to solve this misidentified problem was to privatize the fishery so that the optimal (economically efficient) fishing effort would be allocated among grounds of different quality. The die was cast. Scott's call for a "sole" owner could be the nation-state, or it could be a private owner. The final blow to conceptual coherence came in 1968 when an unknown biologist conjured a fateful paper published in *Science* magazine entitled "The Tragedy of the Commons (Hardin, 1968)." Like Gordon and Scott before him, Garrett Hardin showed comprehensive ignorance of "common property" regimes throughout history, and he failed to grasp the fundamental difference between common property and an unowned free-for-all (open access) (Ciriacy-Wantrup, and Bishop, 1975; Bromley, 1991). Hardin's flawed account has turned out to be more famous than those of Gordon and Scott. As a result, those working in natural resource policy were left with a false choice—natural resources must be privatized, or they must be managed by governments. Lost in this dichotomized model are the thousands of instances around the world in which jointly managed natural resources are not driven to extinction (Bromley, 1992; Ostrom, 1990). Since governments are alleged to be incompetent in such matters, privatization emerged by default. Surely private owners will be good stewards of nature's bounty. Aldo Leopold is but the first of many observers to put the lie to this particular deceit (Leopold, 1966). In economics we have the "iron law of the discount rate"—if the rate of regeneration of a renewable natural resource is less than the time preference of the private owner, it will be privately "efficient" for the owner to liquidate the resource and consume the proceeds—or invest them elsewhere (Page, 1977).

It was during this time that the oceans came to be thought of as the "common heritage of mankind." This unfortunate phrasing then fed into the emerging confusion over "common property." The U.N.'s Convention on the Law of the Sea was urging protection of oceans and in 1976 the United States created a 200-nautical mile Fishery Conservation Zone (FCZ). In 1982 other coastal nations followed suit and established 200-nautical mile Exclusive Economic Zones (EEZ). Then, in 1983, the United States transformed its FCZ into an EEZ. From this point forward, the old "12-mile limit" on territorial waters would be obscured by extension of dominion over off-shore economic assets. Prior to this extension, our coastal fisheries had been exploited by Russians, Japanese, Norwegians, and various other fishing nations. Suddenly, the United States found itself blessed with a bountiful fishery close at hand, and subsidies began to flow into the creation of a muscular commercial fishing fleet. The U.S. Congress created eight regional fishery management councils to watch over this newly acquired wealth. The rush to exploit these new promising fisheries brought much labor and capital to bear on fragile fish stocks. Politicians had recently come to view the ocean fishery as a promising gold rush—

with no time to waste. As early as 1968, Senator Warren Magnuson, whose name still adorns federal fisheries legislation, declared that:

> "You have no time to form study committees. You have no time for biologically researching the animal…Your time must be devoted to determining how we can get out and catch fish. Every activity… whether by the federal or state governments, should be primarily programmed to that goal. Let us not study our resources to death, let us harvest them" (Magnuson, 1968).

The race was on, and soon there was too much "fishing power" pursuing limited stocks, overfishing became common, and many fish stocks collapsed under the pressure. The availability of free fish was an added temptation to catch too many. The regional fishery management councils were exposed as incapable of resisting pressure from the fishing industry to allow annual harvests that exceeded the recommendations of their scientific and statistical advisors. These management failures were then followed by a range of policies to eliminate that excess capacity. In moves reminiscent of certain agricultural programs, efforts to reduce fishing capacity entailed federal monies being made available to buy fishing vessels—a wet version of dairy-herd buyout programs. The irony is obvious—willful overfishing, and lax regulatory oversight by dysfunctional and co-opted fishery management councils, conspired to create the crisis in over-harvesting that then required correction. Out of this management failure arose the current policy. Fishing firms would be given, for free, a quota of fish based on their historic catch in specific fisheries, and then all participants could either continue to fish, or they could sell their new gift to the highest bidder. The quota share is called an Individual Transferable Quota (ITQ)—or an Individual Fishing Quota (IFQ). This policy was justified on the quite extravagant claims about the good results that would soon emerge—fisheries would be liberated from their excess capacity, and the gifted quota shares would turn firms into "owners" of the fish they wished to harvest. Jane Lubchenco, Administrator of the National Oceanic and Atmospheric Administration, 2009-2013, was an aggressive promoter of ITQs. It was claimed that this gift of "ownership" would turn commercial fishing firms into exemplary stewards of nature's bounty.

Despite the triumphal declarations from advocates of ITQs (Costello, Gaines, and Lynham, 2008), recent evidence suggests that many fish stocks continue to be threatened, or they have "collapsed" (Worm et al., 2009). Chu (2009) conducted a survey of 18 countries using ITQs to manage over 100 fish stocks encompassing at least 249 species. Her results are certainly discouraging for ITQ advocates. Specifically, ITQs do not

> "…translate into consistent changes in stock biomass. Improvements in 12 of 20 stocks after ITQs were introduced suggest that ITQs can be an effective component of fisheries management strategies, but eight of the stocks continued to decline after ITQs were introduced. This suggests that alternative or complementary measures are needed to sustain those fisheries, such as combining ITQs with more effective total allowable catches, better enforcement and monitoring, and implementing aspects of ecosystem-based fisheries management" (Chu, 2009).

A more recent assessment of the conservation effects of ITQs reaches similar unflattering conclusions (Acheson, Appolonio, and Wilson, 2015). Notice the irony here. ITQs are claimed to make fishing firms exemplars of stewardship, and yet as Chu (2009) notes, fisheries managers must devote even greater financial resources and staff time to set total allowable catches, to undertake strict monitoring and enforcement, and to insist on various aspects of ecosystem-based fisheries management. At the same time, many fisheries economists continue to believe that none of this is necessary since fishing firms with ITQs will be good stewards of fish stocks. We see this cognitive dissonance on display in a glowing account of ITQs in the British Columbia ground fish trawl fishery

where we are told that individual transferable quotas and “100% observer coverage” produced “optimal” results (Branch and Hilborn, 2008). The obvious question, of course, is why government observers are necessary if fishing firms with ITQs “act like owners”? Perhaps “owners” are not to be trusted with their behavior toward nature? After all, how can a fishing firm that leaves some fish in the water—in the interest of rebuilding depleted fish stocks—have any assurance that those fish will be available for harvesting next season? Fish are not like a stand of timber allowed to remain in place for a future harvest.

In addition to the flawed record of rescuing fisheries from collapse, ITQ programs have brought striking degrees of consolidation in fishing fleets with attendant concerns for economic concentration. The Bering Sea Pollock fishery now consists of five to six very large firms organized as a single “cooperative.” Economists familiar with cooperatives would regard this arrangement in the Pollock fishery as a cartel. In fact, it is getting quite close to Anthony Scott’s desired “sole owner.” The record of ITQs in Iceland has been particularly devastating for traditional fishing communities (Eythórsson, 2000). The extreme economic concentration in Iceland’s commercial fishery has also been implicated in the severe fiscal crisis in Iceland (Einarsson, 2011).

For some reason, fisheries economists failed to notice that in 1976, with the creation of the Fishery Conservation Zone, and then the 1983 creation of the EEZ, the U.S. government—indeed, all coastal nations—confirmed that fish in the EEZ were the legal responsibility of the federal government that would henceforth manage those fish for the public good. Today, fisheries legislation is abundantly clear that a permit or license—even an ITQ—is simply a legally recognized capacity to attempt to catch a specific quantity of a particular species of fish. It was no longer possible to believe that no-one owns a fish in the water until it is captured. Fish in the EEZ are already owned by the public. Despite this clarity, fisheries economists seem to be alone in their confusion (Anderson and Holliday, 2007; Arnason, 2000). Curiously, the U.S. government agency responsible for administering national fisheries policy appears to be confused on this matter. The Anderson-Holliday publication cited above was issued by the National Marine Fisheries Service in 2007—30 years after the creation of the EEZ.

And so the ominous shadow of Scott Gordon, Anthony Scott, and Garrett Hardin continues to contaminate fisheries policy with conceptual confusion, false claims of the stewardship commitments of private resource users, and dubious empirical research motivated by an apparent desire to reach pre-determined conclusions. Current fisheries policy is a tragedy for the thousands of small family firms excluded from the fishery by ITQ programs. Fisheries policy is also a tragedy for the thousands of small coastal communities now bereft of local economic activity. This devastation of small firms and coastal communities is matched by a similar fate of thousands of towns and villages throughout rural America. It need not be this way. The term "tragedy" also reminds us of the conceptual mischief and incoherence still in play from Garrett Hardin’s deeply flawed allegorical tale about population growth that was then turned into a morality tale for natural resource management (Locher, 2013).

Of immediate pertinence here, fisheries policy is an embarrassment to applied economists who generally view the crafting of economic advice as a sacred trust, whose very purpose is to serve the larger public good. It is an embarrassment for the free gifting of fish to the private sector, compounded by the bizarre policy goal of maximizing quasi-monopoly rents to an industry, and justified by the intellectually fraudulent claim of achieving “economic efficiency.” This intellectual charade would leave even an average undergraduate economics major incredulous.

Correcting the Tragedy

The most difficult aspect of crafting public policy is not the search for what various individuals say they want. Rather, public policy is vexing because it requires an artful escape from a familiar

situation that is pushing us in an unwanted direction. The unavoidable challenge in public policy is, therefore, helping decision makers to imagine a world different from the one they think they understand. It is a modernist conceit to believe that we can know—objectively describe—future outcomes of specific policy choices, and that we can then "rationally" pick the best outcome by selecting the policy that will deliver that desired outcome. The happy stories of introductory economics textbooks do not apply to the real world. The British economist G.L.S. Shackle offers this insight:

> "Outcomes of available actions are not ascertained but created. We are not speaking…of the objective recorded outcomes of actions which have been performed. Those actions are not "available." An action which can still be chosen or rejected has no objective outcome. The only kind of outcome which it can have exists in the imagination of the decision-maker" (Shackle, 1961).

The task before us, therefore, is to show decision makers what is possible. This demonstration will not be a promise of specific outcomes in the future—outcomes that no scientist can possibly predict. However, our policy guidance can offer help in escaping settings and circumstances that no longer seem reasonable. And this brings us to the second flaw in public policy—the conceit that policy problems get fixed and remain that way. The most urgent need in the design of public policy is the creation of "off ramps"—purposeful escape routes when unexpected and unintended effects begin to emerge. They always will, and we need ways to help policymakers understand this fact, and be prepared to craft remedial action. The old adage of "don't let the best be the enemy of the better" is apt here. Public policy is a quest for the better, and the better can always be improved upon as the world out there delivers its inevitable feedback. An economy is always in the process of becoming. Public policy concerns dealing with that inexorable "becoming."

Rescuing fisheries from its flawed state requires a clear specification of a top-level policy goal. This goal must be strict assurance of the sustainable management of valued fish stocks. Once the top-level goal has been set, the second consideration must be to derive a plausible "resource rent" from the commercial exploitation of our wealth of ocean fisheries. How might this be accomplished?
The economically appropriate means is to ask fishing firms how much they would be willing to pay for the opportunity to hunt for—and bring to shore—a specific share of a scientifically based on total allowable catch (TAC). The appropriate mechanism for this new policy would be a bidding procedure in which aspiring firms indicate what fraction (the royalty bid) of annual gross landings receipts they are willing to pay the government in order to gain income and wealth from catching our fish (Bromley, 2005, 2008, 2009, and Bromley and Macinko). Shares of TAC would be offered in "lots" and bidders would be constrained as to how many lots of quota shares they could acquire. In this way, economic concentration could be controlled. Acquired permits would be for a fixed periods—say five or ten years—thereby allowing fisheries managers to control the number of vessels participating in a particular fishery. These fixed-term permits assure everyone that at frequent intervals, some portion of the existing permits in a fishery will come open for acquisition by new entrants. Those firms currently holding permits could bid once again to retain them, but new entrants would also have an opportunity to enter the fishery through submitting a winning bid.

The contrast with existing ITQ fisheries warrants elaboration. Now, quota shares are controlled by a closed class of vessel owners who are able to block new entrants by trading shares among themselves, but not selling to new entrants. With the entire TAC obligated in perpetual gifts to the industry, the National Marine Fisheries Service (NMFS) has lost the ability to offer fishing opportunities to new entrants. Moreover, in an ITQ fishery, entry requires the up-front purchase of quota from those who now hold it. This cost represents an entry barrier that can be overcome only through a contractual arrangement with the current holder of the ITQ—paying for the quota shares at the end of the season—

or through entering the credit market in search of liquidity. Either route exposes aspiring entrants to virtually all of the stochastic variation in future TAC, as well as to the endemic risks in a highly variable economic activity.

The approach advocated here requires no such ex-ante financial commitment. If the aspiring fishing firm submits a winning royalty bid, there is no prior financial obligation required. The royalty is simply deducted from the proceeds due the fishing firm upon sale of the product at dockside; no fish, no fee.

The above approach is pertinent to fisheries that currently do not have an ITQ program. For fisheries now managed under ITQs, it will be necessary for the NMFS to recover control of outstanding ITQ shares. This requires the establishment of a transition plan. Current ITQ holders would have a two-year *accreditation phase* during which the mix of gifted and purchased ITQs would be determined. Those ITQs previously purchased from other fishing firms would be eligible for compensation. There would be no compensation for ITQs initially received free from the government. During the *transition phase*, the royalty auction for new (replacement) permits would generate royalty revenue that would provide funding to amortize a loan from the National Marine Fisheries Service. That loan would provide a pool of funds to compensate those fishing firms that had previously purchased ITQs from other fishing firms. The transition from an ITQ fishery to a royalty permit fishery would be phased in so that during each year over a five-year period (for example), 20% of the outstanding ITQs would be reclaimed by the NMFS. These reclaimed shares of the TAC could then be re-issued as fixed-term permits under the royalty-bid program. At the end of five years, all ITQ fisheries would be converted into royalty permit fisheries.

It is likely that some ITQ holders will decide not to continue fishing under the new royalty program. In this case, their catch history would go into a *reversion pool* that could then be available for royalty bids by other firms remaining in the fishery, as well as by new entrants—skippers, crew, processors, even conservation organizations intent on "banking" some fish to promote sustainability. The acquisition of new royalty shares from the reversion pool would be conducted in the same way as the royalty bidding for the annual tranche of "regular" royalty shares. In addition, annual shares of the TAC that are not fished, or not acquired through bidding, would go into the reversion pool for allocation by future royalty bids.

Rethinking the Iron Triangle

The venerable *iron triangle* of policy—special interests, their allies in the legislative branch, and their enablers in the executive branch—must be reconfigured. Fisheries policy is the product of an *artful rectangle*. Fisheries economists deserve recognition for the whimsical policy incoherence in commercial fisheries.

For More Information

Acheson, J., S. Apollonio and J. Wilson. 2015. "Individual Transferable Quotas and Conservation: A Critical Assessment." *Ecology and Society*. 20(4):7.

Anderson, L. G., and M. C. Holliday (eds). 2007. "The Design and Use of Limited Access Privilege Programs." NOAA /NMFS, Washington, D.C.

Arnason, R. 2000. "Property Rights as a Means of Economic Organization." In Ross Shotton, ed. "Use of Property Rights in Fisheries Management: proceedings of the FishRights99 Conference." Freemantle, Western Australia,. FAO Fisheries Technical Paper 404/1.

Branch, T. A., and R. Hilborn. 2008. "Matching Catches to Quotas in a Multi-Species Trawl Fishery: Targeting and Avoidance Behavior Under Individual Transferable Quotas." *Canadian Journal of Fisheries and Aquatic Sciences*. 65:1435-46.

Bromley, D. W. 1991. "Environment and Economy: Property Rights and Public Policy." Oxford: Blackwell.

Bromley, D. W. (ed.). 1992. "Making the Commons Work: Theory, Practice, and Policy." San Francisco: ICS Press.

Bromley, D. W. 2005. "Purging the Frontier From Our Mind: Crafting a New Fisheries Policy." *Reviews in Fish Biology and Fisheries*. 15:217-29.

Bromley, D. W. 2008. "The Crisis in Ocean Governance: Conceptual Confusion, Spurious Economics, Political Indifference." *MAST: Maritime Studies*. 6(2):7-22, and Rejoinder, pp. 39-54.

Bromley, D. W. 2009. "Abdicating Responsibility: The Deceits of Fisheries Policy (and other comments)." *Fisheries*. 34(6):280-90, 2009.

Bromley, D. W. and S. Macinko. 2007. "Rethinking Fisheries Policy in Alaska: Options for the Future." Alaska Department of Fish and Game.

Chu, C. 2009. "Thirty Years Later: The Global Growth of ITQs and Their Influence on Stock Status in Marine Fisheries." *Fish and Fisheries* 10:217-230.

Ciriacy-Wantrup, S. V. and R. C. Bishop. 1975. "Common Property as a Concept in Natural Resources Policy." *Natural Resources Journal*. 15(4):713-27.

Costello, C., S. D. Gaines, and J. Lynham. 2008. "Can Catch Shares Prevent Fisheries Collapse?" *Science* 321:1678-1681.

Einarsson, N. 2011. "Fisheries Governance and Social Discourse in Post-Crisis Iceland: Responses to the UN Human Rights Committee's Views in Case 1306/2004." *The Yearbook of Polar Law*. 3:479-515.

Eythórsson, E. 2000. "A Decade of ITQ-Management in Icelandic Fisheries: Consolidation Without Consensus." *Marine Policy*, 24:483-492

Gordon, H. S. 1954. "The Economic Theory of a Common Property Resource: The Fishery." *Journal of Political Economy*, 62:124-42.

Hardin, G. 1968. "The Tragedy of the Commons." *Science*. 162:1243-48.

Leopold, A. 1966. "A Sand County Almanac." Oxford: Oxford University Press.

Locher, F. 2013. "Cold War Pastures: Garret Hardin and 'The Tragedy of the Commons.'" *Revu d'Histoire Moderne et Contemporaine*. 60(1):7-36.

Magnuson, W.G. 1968. "The Opportunity is Waiting…Make the Most of It." The Future of the Fishing Industry in the United States. Publications in Fisheries, Vol. 4. Seattle: University of Washington Press, pp 7-8.

National Oceanographic and Atmospheric Administration (NOAA). 2015. "Commercial Fisheries Statistics." National Marine Fisheries Service. Available online: http://www.st.nmfs.noaa.gov/commercial-fisheries/index

Ostrom, E. 1990. "Governing the Commons: The Evolution of Institutions for Collective Action." Cambridge University Press.

Page, T. 1977. "Conservation and Economic Efficiency Baltimore." Johns Hopkins University Press.

Scott, A. 1955. "The Fishery: The Objectives of Sole Ownership." *Journal of Political Economy*, 63:116-24.

Shackle, G.L.S. 1961. "Decision, Order and Time in Human Affairs, Cambridge." Cambridge University Press.

Worm, B,, R, Hilborn, J, K. Baum, T, A. Branch, J, S. Collie, C, Costello, M, J. Fogarty, E, A. Fulton, J, A. Hutchings, S, Jennings, O, P. Jensen, H, K. Lotze, P, M. Mace, T, R. McClanahan, C, Minto, S, R. Palumbi, A, M. Parma, D, Ricard, A, A. Rosenberg, R, Watson, and D, Zeller. 2009. "Rebuilding Global Fisheries." *Science.* NS 325(5940):578-85, July 31.

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