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PRIVATIZATION IN FISHERIES: LESSONS FROM EXPERIENCES IN THE U.S., CANADA, AND NORWAY[1]

by: Bonnie McCay (Rutgers University), Richard Apostle (Dalhousie University), Carolyn Creed (Dalhousie University), Alan Finlayson (Rutgers University), and Knut Mikalsen (University of Tromso)

I. Introduction

Interest in "rights-based fishing" (Neher et al. 1990) such as "individual transferable quota" (ITQ) systems of allocating fishing rights is expanding very rapidly throughout North America as well as the rest of the world. It is part of more general interest in market-based solutions to environmental problems such as pollution and water scarcity as well as resource depletion. ITQs appeal to fishery managers seeking to prevent the twin tragedies of open access and simple limited entry fisheries: overfishing and overcapitalization. In contrast with a "common property" system where fishers own nothing of the resource -- except perhaps the right not to be excluded (Macpherson 1978) - until they actually capture it, in an ITQ system, participants own shares in rights to capture a resource. They can buy, sell, lease, trade, inherit shares just about as they would any other property. This is very close to what we think of as private property. However, unlike a farming system based on private property rights to land, for example, the government retains the right to determine an overall quota, and perhaps other regulations.

Recent thinking about environmental protection, the conservation of biodiversity, and natural resource management emphasizes both market-based allocation and co-management, or greater responsibility and decision-making power on the part of resource users (Pinkerton 1989). Theoretical work on the kinds of groups and contexts most amenable to co-management is just beginning, although there is a long history of related work on the logic of collective action and in game theory. Similarly, there is work on the reasons for privatization of common resources, but very little on the consequences of privatization including its implications for governance. Comparative case studies are important to the development of such theory. This paper derives from the experience - ongoing- of doing a collaborative, comparative study of the process of creating innovative governance regimes in marine fisheries of the North Atlantic, specifically the surf clam and ocean quahog fishery of the Eastern Seaboard of the U.S.; the cod- haddock-pollock ("groundfish") fishery carried out by small (under 65') draggers in Nova Scotia, Canada; and a variety of fisheries in Norway.

In our research on fisheries management in Canada, Norway, and the United States, and in particular into systems of governance and market-oriented systems of resource allocation, we deal with the politics of conservation in several ways.

The first concerns the politics of deciding for or against major institutional change. In all three countries, attempts to create so-called ITQs, or individual transferable quotas, in major commercial fisheries have been fraught with delay and controversy, largely because of the distributional issues raised by privatization and recourse to market-based regulation. The second concerns the structure of decision-making, and in particular how user groups and their interests and concerns are and are not brought into the decision-making process. The third concerns the distributional effects of changes in fisheries property rights and how people respond to them. In this paper we touch upon aspects of these topics with particular emphasis on the hypothetical intersection of privatization and co-management,

II. ITQs

First, a brief explanation of privatization in the fisheries discussed. ITQs are proportions of a quota, or total allowable catch (TAC) held by private parties, who may buy, sell, lease, and otherwise transfer the ITQs. They are methods of allocating scarce resources that are most often intended to do away with often costly competitive scrambles, or so-called "derby fishing" as well as the "capital stuffing", or spiralling investments in boats and gear, (Copes 1986) prompted by it.

U.S. fisheries have been remarkably resistant to institutional change, such that even limits on the numbers of licenses have been resisted, to the despair of economists and others who have long advocated limited access to counteract tragedies of the open access commons (e.g. Gordon 1954; Scott 1955). Comments by Biliana Cicin-Sain et al. (1979) on the social and cultural underpinnings of such resistance in the U.S. and elsewhere still apply. However, impending crisis in some of the traditional fisheries, such as the groundfish off New England, and new sources of interest and pressure such as the environmentalist community, are forcing the regional councils and other groups to make collective arrangements for fisheries management that involve hard, sometimes tragic, choices (cf. Calabresi and Bobbitt 1978) to limit access and even privatize fishing rights.

The surf clam and ocean quahog (SCOQ) fishery of the U.S. (extending from New England to Virginia) converted to ITQs in 1990; it was the first "rights-based" fishery management system in U.S. federal waters (that is, beyond 3 miles to the edge of extended jurisdiction, 200 miles). It was followed by ITQs for a very small, young fishery for the newly discovered species called wreckfish in the south Atlantic (Gauvin in press). These two will remain the only US ITQ fisheries until the Alaskan halibut and sablefish fisheries IFQ systems are implemented (delayed from original 1994 date) and the Pacific Northwest sablefish ITQ plan is approved.

Both Canada and Norway have had rights-based fishing for a relatively long time, beginning in the late 1970s, soon after the implementation of extended fisheries jurisdiction in the international law of the sea (Moloney and Pearse 1979; Crowley and Palsson 1992; Mikalsen 1993). Portions of quotas were assigned to individual boats or corporations. However, those "individual quotas" or "enterprise allocations" were either tied to particular fishing vessels, making it necessary to buy a boat to buy quota, or were given out anew each year by the government.

Hence, the T" part of ITQs is as new -and controversial- in Canada and Norway as IQs of any kind (indeed, limits to entry) are in the United States. Exclusive use is only one of the "sticks" in the bundles that lawyers say make up property rights; transferability is another, critical one. And there are degrees of transferability. In the U.S. SCOQ ITQ system, just about anyone, including banks, can buy, sell, trade in, speculate in shares of the surf clam and ocean quahog quotas. The Canadian system we are studying is for the under-65' groundfish dragger fishery of Canadian waters surrounding Nova Scotia and the Bay of Fundy part of the province of New Brunswick. It converted to "IQ"s in 1990, and has only just begun to have ITQs that can be permanently traded. However, only bona fide fishers -as opposed to fish plant owners[1] -- can own the quotas and there is a 2% cap on how much any one individual can own. In Norway there are both group and individual vessel quotas for a wide variety of fisheries (IQs, IVQs, EAs), but proposals for ITQs have been withdrawn in response to vociferous grass roots political protest, most recently in 1991 (Mikalsen 1993).

[1] The Scotia-Fundy region has a "Fleet Separation Policy" against processorship ownership of licensed fishing vessels; however, there is no rule against bona fide fishers investing in processing plants. Accordingly, during the 1980s a number of vertically-integrated operations appeared this way.

Transferability is a major concern in both Norway and Canada because of the possibility that quota shares will become not only economically concentrated, the monopoly fear, but also geographically concentrated, robbing small coastal communities and remoter regions of their essential economic base - the fishing fleets and the fish processing plants. In Norway, this became a rapidly escalating political issue, compounded by fears of similar effects from joining the EEC, leading the Labor Party to shelve ITQs (Mikalsen). In Atlantic Canada, the ITQ issue seemed remarkably insulated from politics. One possible reason is that in Canada it came during at the outset of a period of resource crisis, whereas in Norway it came after such a period (Mikalsen 1993). Another is that it better "fit" the dominant philosophy about a market-based political economy in Canada, where the dominant party was the Progressive Conservatives, just as ITQs in the U.S. rose in favor within the administration in the peak of the Bush years in the wake of Reagan-Thatcherism. How the advent of the Canadian Liberal Party following the fall 1993 elections will affect fisheries policy is as yet anyone's guess although there are rumors that ITQs will not be expanded in Atlantic Canada because of concerns about coastal communities and the rural economy, particularly when groundfish stocks are at an all time low. However, even "leftish" political parties in all three countries espouse the benefits of free markets and market-based environmental regulation.

III. Comparison between ITQs in the US Surf Clam and Ocean Quahog Fishery and the Canadian Small Dragger Fishery

This part of the paper reports on socio-economic aspects of two ITQ fishery management systems, both first implemented in 1990 and thus as yet in early stages of development:[2] Surf Clam and Ocean Quahog ITQs in the U.S. EEZ, 1990- ("SCOQ" below); and the Under 65' Mobile Gear (Dragger) Fleet Cod /Haddock/ Pollock ITQs in the Scotia-Fundy region of Eastern Canada, 1990- ("<65' Nova" below). We note profound differences in the two fisheries and important differences in factors that precipitated the decision to switch to ITQs, the process itself, the two ITQ systems.

As was the case for most of New Zealand's fisheries (Boyd and Dewees 1992) and those of Iceland (Arnason 1993; Palsson 1994), both the American and the Canadian fisheries studied had already been under limited access and quota management when they were moved into ITQ management. ITQs were not imposed on an open access system. The surf clam fishery was regulated through a moratorium on new boats, quarterly quotas, and time restrictions (to help spread the quota out over the year) beginning in 1977. The Canadian dragger fishery was regulated through restrictions on the size of vessels, areal and seasonal quotas, and other measures since the late 1970s and early 1980s.

Common-sense and an appreciation of the importance of transactions costs (Libecap 1989) would lead one to predict that making the decision to accept major changes in property rights would be far easier in the SCOQ case than in the <65' Nova case. The fewer the number of actors, the easier it is to come to a decision. At the time of initial allocation, the SCOQ fishery was smaller, involving about 120 active boats, as opposed to about 455 licenses in the Nova Scotia fishery; the number of actual owners, or firms, was considerably smaller in both cases. There were 61 owners or firms in the SCOQ fishery; we do not have an accurate count for the Nova Scotia fishery. The SCOQ fishery also had fewer landing places and market outlets, the market begin almost entirely one for clams that would have to be processed, as opposed to both fresh fish and processed fish opportunities (and a larger number of potential buyers) in the Nova Scotia groundfish fishery.

On the other hand, at least on the surface, there was far more economic heterogeneity in the SCOQ case than the Nova Scotia dragger caase: Heterogeneity makes it more difficult to come to collective agreements because of strong differences of interest and power. In 1989, 3 firms controlled 33% of the surf clam vessels (and probably a much higher percentage of the landings). Moreover, some of those firms, as well as smaller ones, were vertically-integrated, having both processing plants and fleets of boats.

Independent owner-operated vessels were only 21% of the total.[2]

In the Canadian dragger fishery, the image presented is one of large numbers of independent owner-operators. A long-established regional policy forbids processors from purchasing fishing vessels and licenses. However, there is nothing to prevent fishers from buying processing plants, which many did in the 1980s, and thus vertical integration is evident. Moreover, there are informal arrangements between processors and owner-operators, which in some cases make independent ownership a fiction. Accordingly, economic homogeneity may be a mask for a more skewed distribution of property and wealth in Nova Scotia; however, there also appears to be less concentration in the processing/ marketing side in Nova Scotia than in the SCOQ fishery (see Apostle and Barrett 1992).

More striking is the different in the socio-cultural contexts of the two fisheries. The SCOQ fishery is based primarily in ports like Atlantic City and Cape May, that are economically diversified and socially stratified, as opposed to more rural and fishery-dependent ports, such as Oyster, Virginia (the home of one of the SCOQ fleets). In contrast, the Nova Scotia dragger fishery is based in small, rural, fisheries-dependent, and more-or-less egalitarian communities throughout Nova Scotia. Among other things, this has meant that employment and the landing offish in particular communities have mattered a great deal in Nova Scotia but not, at a public scale, in the Mid-Atlantic and New England ports of the SCOQ fishery. In the decade of debates about changing the SCOQ management system, there were virtually no public discussions about the concerns of crew or the question of employment (McCay et al. 1992).

In both cases, the major problem identified was overcapacity. Some of the more extreme statements about the surf clam fishery claimed that the entire TAC could be taken by a small handful of vessels; a NMFS simulation suggested that this number could be as low as 13, under a stock certificate option (similar to the ITQ concept) (Surf Clam Task Force 1986). Capacity in the Nova Scotia dragger fishery was estimated as four times that needed to harvest groundfish at the target $F_{0.1}$ level (O'Boyle et al. in press; Anon. 1988).

The precipitating problem and the process of response differed. For the SCOQ fishery, the problem ironically came about because of biological abundance, whereas in Nova Scotia the problem was resource decline. Surf clam resources declined sharply in the 1970s, but during the 1980s successful year-classes from the late 1970s began to enter the fishery, resulting in rising catch per unit effort rates. Given the existence of a strict quota and other limits, the result was restricted fishing time. A limited access fleet became an overcapitalized fleet (on top of prior overcapitalization in open-access conditions). In a sense the precipitating cause was widespread recognition of how ludicrous it was to allow clam boats to work for only 6 hours every two or three weeks, without the ability to combine allowable hours from several licenses only one boat. The rallying cry was "consolidation," allowing people to combine their licenses and hence the amount of time they were allotted onto fewer boats.

The response process was one of a high level of "co-management," or industry involvement in decision-making, up to a point (sometime around 1987,1988) when the regional fishery management council and NMFS took a stronger stance, redefining "consolidation" to ITQs. The time between general agreement that some kind of individualized quota or boat quota would be a good way to manage the fishery to agreement on ITQs was 11 years, largely because of disputes over the basis for making the original allocation, disputes grounded in the heterogeneity of the industry (McCay and Creed 1989, 1990). From the outset people in the industry agreed (a) that something should be done; and (b) that some kind of "stock certificate" or "boat quota" would be appropriate. They were hung up on two questions: the method of making an initial allocation (whether on basis of past history of catches or other criteria) and the rate at

[2] In the surf clam and ocean quahog fisheries, "independents" (as opposed to vertically-integrated firms) also had developed small fleets; 30% of the vessels were in small fleets of 2 to 4 boats.

which vessel owners would be allowed to "consolidate" their operations, i.e. to reduce a four boat fleet to a one or two boat fleet working the same quota. Until the last year, most people in the industry had no idea that quotas would be separable from the vessels and that they might be transferable.

For Nova Scotia's draggers, the precipitating problem was resource decline (O'Boyle et al. in press). Following the rapid development of this fleet in the optimistic years of the 1980s, the imposition of limited licensing and quotas were necessary. Further stock decline resulted in early season closures, particularly in 1989; the closures galvanized action. The decision-making process was short-cut by the federal Minister of Fisheries, responding to what he and others in his ministry perceived as a crisis. In Canada the minister of fisheries enjoys unusual "discretion." After a government task force brought up individual quotas as an alternative management system for this fleet (which had grown rapidly during the 1980s), and despite promises to bring the question to a vote by the industry, the federal Minister of Fisheries [then Tom Siddon] declared that the fishery would be managed with IQs. Period. All that the fishermen and processors could vote on was whether or not they wanted to be part of the new IQ system or would go with two alternatives that required them to stop using otter trawl dragging fishing gear and, for the most part, to withdraw from heavy exploitation of three major stocks: cod, haddock, and pollock. The messages they received made it clear that IQs were there to stay, and those who did not respond were defaulted into the IQ system (Apostle et al. 1993). The question of initial allocation was set aside; Minister and DFO staff set up "IQ Group" to let industry and DFO staff work on questions such as that, the framework for "co-management."

Design of ITQs:

The <65' Dragger system in Canada began with IQs, not ITQs; the co-management group decided to make the individual quotas fully transferable beginning in 1993-4. In the interim, only temporary (within fishing year) transfers could be made. The SCOQ system began with ITQs, although only a short while before the decision was made most industry members thought they were dealing with "vessel allocations" or boat quotas (McCay 1990). Communication and education are critical to the success of ITQ programs (Boyd and Dewees 1993); for a while the SCOQ program was jeopardized by mis-communication and faulty representation.

The scope of the ITQ system varies. In the Canadian case, ITQs are only one of the management regimes used for the groundfish fisheries of the Scotian shelf, and hence the ITQ sector competes with other sectors for quota and is thus frequently embroiled in conflict. In 1989 participants in the <65' dragger fishery had to choose whether to go with IQs or to enter one of two competitive quota fisheries. Ultimately 325 (71%) of the original 455 chose to receive ITQ licenses. 74 chose to received fixed gear licenses and another 50 chose to be "generalists" in limited entry fisheries managed through competitive quotas. (6 licenses were cancelled before implementation of the ITQ system). (R. Barbara, pers. comm. to C. Creed 3/27/94). During 1992 only about 326 vessels were under IQ out of 2724 vessels in the entire groundfish fleet of the Scotia-Fundy region; however, the IQ program targets the core groundfish fisheries of the region (O'Boyle et al. in press).

In the SCOQ case, ITQ management was designed to be the only regime for the management of surf clams and ocean quahogs throughout their range (in federal waters). But this did not absolve it from conflict. A small, distinct fishery for inshore ocean quahogs ("mahoganies") in federal waters in the Gulf of Maine emerged as a possible exception; it is being treated as an experimental fishery until decisions are made.

The initial allocation was free to existing license holders in both cases. Apart from nominal administrative fees, there have been no attempts to collect resource rent from quota holders. Hence both systems are vulnerable to the criticism that ITQs represent a giveaway of a public resource, even a "public trust" to private owners for mostly private benefits.

Probably the most difficult and contentious issue with ITQs is how to determine who gets how much in the initial allocation. In Nova Scotia historic participation was the criterion for the allocation, using the best two of the four years between 1986 and 1989. This was computed for each species (cod, haddock, pollock) and each fishing area (Canada uses subdivisions of NAFO areas, esp. 4Vn, 4VsW, 4X, 5Y, 4WVX, 5Z). The IQ group made this decision, having discussed and debated numerous alternatives, but, unlike the various committees involved with SCOQ management, the IQ Group was able to come to a conclusion within a short period of time. In the SCOQ case, using "history" was hotly debated for a decade because of claims that this was unfair because of alleged cheating done by some of the larger firms that increased their levels of participation. The final and complicated compromise used history together with a measure of vessel size (as a proxy for capital investment) plus heavier weighting of more recent years (to prevent newcomers from severe disadvantage). The result in the SCOQ case was an allocation that came close to the status quo, although some of the smaller holders found themselves with unviable levels of quota. The result in the Nova Scotia case seems to be a large percentage of quota holders with unviable levels of quota (O'Boyle et al. in press).

Another important issue concerns the potential for concentration of ownership and monopoly in a fishery, once rights to quota are established. The SCOQ system began with no cap on the amount any one firm or person could hold, under the argument that the U.S. anti-trust laws could be invoked to constrain would-be monopolies. There is also no proscription on non-fishermen holding shares. In contrast, and as might be expected given the higher level of dependency of the communities of the Scotia-Fundy region on fisheries, the <65' Nova system required both that ITQ holders be bona-fide fishermen (which in fact included a sizeable number of processors who were also fishermen) and that no person could hold more than 2% of the ITQ for a species.

Critical to the success of ITQ fisheries in meeting their economic and conservation objectives is finding a way to monitor behavior and enforce the rules of the system. ITQs make monitoring more difficult because individual vessel catches must be accurately recorded against their quotas. In addition, ITQs appear to increase incentives to discard lesser-valued species or sizes of fish, "high grading," raising the ante for enforcement (Copes 1986; Boyd and DeWees 1993). These are serious problems in the Scotia-Fundy groundfish fisheries, problems anticipated by DFO personnel prior to initiating IQs in Nova Scotia. Accordingly, the IQ Group also had to cooperate with DFO in setting up adequate monitoring and enforcement capabilities and to find a way to implement a "user pays" policy; the system is described below.

In the SCOQ case, monitoring and enforcement are made easier by the technology and organization of the fishery: clams are put into large steel-mesh cages when on board the boat; these cages are moved to the processing plants; the ITQs take the form of cage tags that stay with the cages from start to finish. In addition, clamming is a relatively "clean" fishery, in terms of by-catch of other species; there may be some "high grading" going on to get clams of the size desired by processors, but most ciam beds are made up of clams of the same year class and hence similar sizes. A black market in over-quota clams is harder to establish because there are relatively few buyers and each is responsible for keeping accurate records.

IV. Consequences of ITQs

Both systems had a very rapid decline in the numbers of vessels actually involved in the fishery, showing the effectiveness of the ITQ systems in reducing this aspect of overcapitalization. There were a total of 73 vessels fishing for surf clams or ocean quahogs or both (almost all both) in 1992, 53% of the number fishing in 1990. For the Nova Scotia dragger fishery, the decline is similar in scale, from 455 licensed vessels at the outset to between 120 and 170 actively fishing vessels in 1993, plus another 30 or so that caught less than 5 tons of fish apiece.

Decline in labor and employment is also expected in the early phase of an ITQ system. We have estimated a 1/3rd decline in labor in the SCOQ fishery 1990-1992 (McCay and Creed 1994). Comparable estimates are not yet available for <65' Nova but are expected to be larger because the dragger fishery of Nova Scotia (and to a lesser extent neighboring New Brunswick) had not gone through a period of rotating labor among boats comparable to what had been done in the SCOQ fishery when fishing times declined as CPUE increased with limited quotas and rising abundance of clams.

Increased efficiency is found among the SCOQ vessels, in terms of amount of effort per vessel (Keifer n.d.; Hoff 1993) and for firm (McCay and Creed 1994). Comparable data are not yet available for the <65' Nova vessels; declining numbers of vessels have been accompanied by declining catches and quotas so a major increase in catch per vessel, the crude measure of efficiency used for SCOQ, is not expected.

Structural changes in the fishing industry have been observed for both fisheries, in the direction of concentration of ownership of this new capital, ITQs, with complex, and still unfolding, implications for buyers and sellers in the market. In the US SCOQ system, it is clearer that there is a strong trend to build upon the pre-existing structure of dominance by a few firms. In the Canadian <65' Nova system such a trend is reputed to exist but is less apparent in the data. Informal "pooling" of quota has emerged as a substitute for one firm buying up a large amount of quota; members of the industry are petitioning through the IQ Group for formal acceptance of pooling of quota among designated groups. This would reduce the government's role in monitoring transfers of quota and provide more flexibility to some participants in the industry.

We turn to the SCOQ fishery itself, which has been the focus of a detailed study of the consequences of ITQs in the period 1990-92. McCay and Creed conducted surveys of crewmen and vessel owners who had been in the Atlantic surf clam and ocean quahog fishery in October, 1990, when the ITQ system began. The surveys were supplemented by analyses of National Marine Fisheries Service (NMFS) and Council data on permits, ITQ allocations, transfers, and landings.

V. Questions and Approaches of the Study

Before the ITQ system began, we generated a set of hypotheses about what would happen in the early phases and a set of guiding questions. Although generated primarily from our observations of the industry and discussions with members of the industry, the hypotheses are consistent with projected effects of an ITQ system made by economists and professional managers with industry members' public statements and the predictions found in the hearing document for the plan amendment that brought about ITQs. For the most part, the hypotheses were borne out by events and processes of the period 1990-1992.

Following are our hypotheses (as written in a 1990 proposal to Sea Grant) with summary findings (McCay and Creed 1994):

"I. Patterns of ownership of ITQs: (1) Consolidation of ownership will occur in both fisheries as

marginal operators sell out to more efficient operators; (2) Because of the relative utility of having control over supply and predictability about and some control over demand, the percentage of vertically integrated owners will increase; (3) As large fleet and vertically-integrated operators consolidate their fleets, they will reduce their operating costs enabling them to cut the ex-vessel price of their clams. (4) In response, small independents who choose not to leave the fishery will form cooperatives or partnerships and/or hand-shuck surf clams at sea in order to gain economies and bargaining power viz-a-viz vertically-integrated firms.

Findings:

- those who sold out were the smaller, more marginal firms, but not all of them sold out; many remained in the game, leasing their ITQ to others or acquiring more in order to clam.
- the number of vertically integrated owners did not increase; there were buy-outs, on the one hand, and the entry of some processors into ITQ ownership on the other.
– the ex-vessel price of the clams did not significantly decrease during this period, but some large firms tried to reduce the amount they paid to independent harvesters and their own boats.
- there were attempts to both form cooperatives and to handshuck clams at sea; they came to nought.

"II. Patterns of ownership and employment in the Mid-Atlantic surf clam fleet: (1) The number of vessels in this fleet will be reduced by about 30% in the first year; (2) The patterns of vessel consolidation will reflect the patterns of ownership- large fleet owners will be able to consolidate without any further capital investment and will reduce their surf clam vessels by 3/4 in the first year; (3) Although owners have already consolidated their crews, labor will be sharply reduced, perhaps by 1/3; (4) Displaced workers will choose work related to fishing, either crewing on other types of vessels or doing dock work; (5) Those who remain on surf clam vessels will work longer hours and have higher incomes than during the period from late 1986 to present; (6) Vessel owners will adjust the share system so they can capture a higher percentage of the profits from their more efficient vessels. They will be able to do so because of the scarcity of employment in the fishery and the relatively high income it offers, and may be motivated to do so because of pressure to purchase more ITQs to maintain market share. In addition, crew shares may decline because crew sizes may increase as vessel owners try to avoid firing long-term crewmen.

Findings:

- The number of vessels in the surf clam fleet was reduced by over half by 1992
- Large fleet owners were able to consolidate, reducing the size of their fleets by 1/2 to 3/4 within the first two years; however, this was accompanied by investment in ITQs, either through purchase or through leasing, for most of the large firms. (Note that "capital stuffing" in quotas may be happening here as in New Zealand; Boyd and Dewees 1993).
- Labor on the boats was reduced by about 1/3, as predicted.
- Displaced workers generally tried to stay in fishing-related work but found this work to be very scarce
~ Clammers who continued to work in the SCOQ fishery worked longer hours, but many did not have higher incomes than before ITQs
~ Vessel owners generally reduced the crews' share or "lay." They justified this in terms of having to take the cost of buying or leasing ITQ off the top of the lay. Larger firms were more likely to do this; among those not doing it were firms run by people who are concerned about the social ramifications of ITQs.

"III. Accounting for Exceptions: We foresee the potential for owners to resist consolidation of ownership of fishing vessels. Marginal operators might choose to remain in the fishery by either leasing their quota or by forming cooperatives. Owners may choose to sell to their sons and daughters (or sons-in-law) rather than to the highest bidder. Displaced crewmen may take shore jobs because they dislike fishery work that takes them from their home ports for long periods of time, especially scalloping and longlining. These and other outcomes would indicate that institutional and psychological factors need to be incorporated in social impact assessments predicated on assumptions from micro-economics.

Findings:

- Many marginal operators stayed in the SCOQ'fishery by leasing out quota and by engaging in long-term contracts with buyers; none were able to form cooperatives although this was discussed.
- Several important transactions involved sales of ITQ, with or without vessels, to kin or partners
- Displaced crewmen were not found on the offshore fishing vessels engaged in scalloping and longlining; they tended to be on inshore boats if at all.

VI. Co-Management and User Participation

People who support ITQs and those who support co-management seem to come from different (armed?) camps. However, it is well worth considering co-management and related issues when investigating ITQ systems.

The term "co-management" is often used in a very general sense as a call for more public or user participation in resource management. It also can be seen as but one of a variety of forms of interaction between a government and its public. The wider domain of citizen involvement in environmental and social issues (Hance et al. 1988; Arnstein 1969) provides a schema that may be useful for our purposes. The extremes of fisher (/user/public) participation in public policy would be, at one end, Government Power, and at the other end. Fisher Power. Either the government acts unilaterally, as it seems to do from time to time, e.g., the State Department's relations with foreign countries that affect fish markets, or closures of fisheries due to public health concerns, or the fishers completely ignore government, create their own systems of resource allocation and management or subvert government programs.

More common, at least in democratic polities, is the vast "in between" arena, whereby the fishers (or other users) and the government (or whatever agencies are involved) are interacting. Co-Management is properly within that arena. It entails power-sharing in a partnership between government agencies and citizens with a stake in the common pool resource. Examples of co-management would be situations in which meetings are called jointly by fisher organizations and government officials; where fishers have oversight and monitoring powers in relation to a specific fishery management system; and where fishers are funded to hire technical consultants (see Hance et al. 1988 for parallels in environmental protection matters). American Indian tribes in the west have formal co-management powers in fisheries that often include those features (see Pinkerton 1989 for specific cases and a thorough introduction to co-management). Successfully co-managed fisheries that are now well documented include some with historical depth, like the inshore fisheries of Japan, managed by cooperatives (Ruddle 1989) and the Lofoten winter cod fisheries of Norway, managed and enforced by groups of fishers (Jentoft and Kristoffersen 1989). Newer examples include the user of European Community producer organizations as vehicles for allocating IQs among fishers in the UK (Jentoft and Kristoffersen 1989; see also Meltzoff and Broad 1992) as well as a variety of arrangements between state agencies and tribal groups in North America, where courts have upheld the sovereignty of the tribes (Cohen 1986).

Co-management is close to self-governance. This is particularly true for allocation questions. An

important trend in fisheries management in North America is to separate biological conservation issues from allocation questions in the decision-making structure. Little has actually happened on this front in the United States, despite expert advice (Calio's Blue Ribbon Committee; other reports); in Canada, the Fisheries Ministry (of the late Progressive Conservative government, not the new Liberal government) began to create a system that would clearly separate the two. "Industry" and other representatives of resource users might be given fuller rein to make decisions about allocation decisions (how many licenses, granted to whom, in what area, with what gear) than they have been to make decisions about total allowable catches. In Norway a similar structural separation of conservation and allocation is evident in the division of labor between the government bureau engaged in fisheries science and data collection, and the fishing industry's huge, all-encompassing organization, which has some power in making allocative decisions (Hoel, Jentoft, and Mikalsen 1992).

ITQs and Co-Management or Self-Governance

The economist Anthony Scott recently suggested the possibility that ITQs might help build a bridge from an open, essentially un-governed fishery to "ciosed self government," and that this might be one of the heretofore underappreciated values of privatization in the fisheries (Scott 1993:187; Scott 1988). ITQs might serve the role of a "building-block," among others, in the construction of a "joint fishermen-ownership structure" (Scott 1993: 188). We understand his concept of "self-governance" to be close to that of "co-management," in most realistic situations, but that it could also be close to "fisher power" in extremis.

His argument focuses on reasons for the failure of fishery groups to develop lasting self-regulation for direct fish stock conservation purposes. The reasons are two-fold and inter-connected: problems with information and with distribution. It is very difficult and costly to get reliable information on the size and behavior of fish populations, on the one hand, and on the behavior, including catches, of other fishers, on the other. The resultant suspicion and lack of trust leads to defection from cooperative agreements. In addition, social and economic heterogeneity makes the distribution of costs and benefits a major issue, and poses obstacles to cooperative agreements. To the extent that it is technically feasible to get information about wild fishes and other people's catches (an important "if), ITQs, Scott argues, might help encourage people to agree on rules and set up systems of monitoring and enforcement. This is because ITQs make it clear, and relatively public, what the current distribution (of rights, and potential wealth) is. They thus can serve as the basis for allocating decision-making power and responsibilities including taxation (e.g. to pay for scientific research or enforcement) (Scott 1993: 193-196).

Scott did not mention other possible benefits of ITQ systems in this regard: to the extent that they encourage some concentration of wealth, capital, and labor, they reduce the size of the interested group, which reduces transaction costs. Group size has long been seen as a critical variable in collective action (Olson 1965). Moreover, the boundaries of the group become clear (this is true with limited licensing, as well). Clear definition of boundaries is one of the criteria known to make a difference to the success of local-level or communal systems of common pool management (McKean 1992). Another is heterogeneity (Ibid). It is harder to predict changes in heterogeneity; in ITQ systems the potentials for concentration and accentuation of differences in wealth can be immense, depending on how the system is designed and how it evolves. On the other hand, for ITQs brought into an over-capitalized fishery, there will most certainly be attrition, as some of the owners find that the ITQs they have been alloted are insufficient to allow them to carry on the business, and they either sell out, lease out, or form new partnerships. The process may "shake out" the so-called "marginal fishermen," the smaller-scale operations as well as older people who had stayed in just for the hope of getting an allocation that could be sold, and in that way reduce the socio-economic spread.

This has happened in the U.S. surf clam and ocean quahog ITQ fishery. In the first half of 1990,

before ITQs came into effect, there were 128 boats working; in October 1992 there were 57. The small "independents" (as opposed to large fleets and vessels integrated with processing) virtually disappeared except in the New England region. The number of people working on boats reduced from about 460 to about 150 in that period of time. The social costs of such streamlining and consolidation are self-evident. But here we turn again to the question of implications for governance. If there are fewer "actors," and their interests are much more alike than before, and if they hold more or less secure property rights[3] that give them a specific, exclusive interest in the future well-being of a common pool resource, then will they be more likely than before to cooperate in developing and modifying rules? to monitor each other's behavior? to help enforce the rules? to be good stewards, as well as good citizens?

The Nova Scotia Case for Co-Manaaement

The questions are genuine ones. We do not know yet but are trying to find out. The Nova Scotia case suggests a "yes", however, and thus is worth a brief report, as the conclusion of this paper.

To repeat Scott's (1993) argument: Self-governance has, in the past, stopped short of regulation for purposes of fish population management, largely because of the inabilities of fishery groups to handle problems getting and sharing the information they need and problems allocating benefits and responsibilities. ITQs may help overcome these obstacles. The Under-65' Groundfish Dragger I(T)Q system of the Nova Scotia region of Canada may be a budding case in point where privatization of rights to natural resources also promotes self-governance or co-management.

One of the biggest obstacles to privatization is getting agreement on (a) privatization itself; and (b) how the newly minted exclusive rights will be allocated (Libecap 1989). As noted, the surf clam and ocean quahog case in the U.S. was one that took over 11 years because of those issues (McCay and Creed 1992) and because the decision-making system under the Magnuson Act, and the specific policy of the Mid-Atlantic Fishery Management Council, encouraged intensive industry participation for surf clam management, but required near unanimity, which was almost impossible.

The Under'65' Dragger case of Canada was strikingly different. The fishing industry had virtually no input into the key question of whether to accept individual quotas for the fishery but was given the opportunity to virtually Co-Manage the fishery after that decision had been made and implemented.

The Minister and officials of the regional office of the Department of Fisheries and Oceans (DFO) also decided that the important and difficult decisions about just how the system would be implemented would be done through the "consultative process," in which the fishing industry would play an unusually strong role. The region had already set up an elaborate consultative process, with myriads of "advisory committees" reflecting the complexity of the regulatory process, whereby fishing licenses and quotas were divided in terms of gear, vessel size, area fished, species, etc., a system that had arguably helped destroy potentials for community-based resource management (MacInnes and Davis 1992) but also had spawned new communities of interest and interaction. A DFO-led Implementation Committee did much of the early work; it was made up of DFO and industry personnel who deliberated on key questions such as the mode of initial allocation and the appeals process. This committee was followed by a committee that has come closer than any in the region to co-management: the "IQ Group."

[3] In the U.S. system, these are not called "rights;" they are "privileges," meaning that they are not assignable in perpetuity. The government may revoke the system at any time (but is not likely to because they are quickly becoming de facto rights). In Atlantic Canada, the IQ system was intended as a 5 year experiment, but again there are strong expectations that the IQ "rights" (also described legally as "privileges" for the same reason) will endure.

The "IQ Group" is comprised of representatives of areal blocs of IQ holders plus DFO personnel, and must deal with both day-to-day issues and more general policy. Among the key questions have been (a) transferability; and (b) monitoring and enforcement.

In his article, Anthony Scott sketches an imaginary scenario for the evolution of self-governance once ITQs are introduced. Because it is closely reflected in this Canadian case (which may have influenced Scott's thinking), it is worth recounting. First there will be temporary quota rights; every year the government might redistribute them or auction them off, or whatever. But to increase the value of their holdings, fishermen would get together to try to get the rules modified, particularly to get more permanent quotas and transferability (Scott 1993: 188). Just so. In the Under 65 case, they were not redistributed or auctioned but any quota transferred to others was returned to the original holder at the end of the year. This created nuisances and expensive reliance on bookeepers and lawyers, and it exacerbated the underground economy of fishing. Accordingly, members of the industry, through the IQ Group, urged DFO to consider making permanent transfers possible-i.e., to bring the T into ITQ.

As noted earlier, transferability itself is extremely important in bringing market forces more squarely into the workings of the system and also in restructuring access not only for fishers but also for communities. However, this stage has another importance: This stage is important because this concerted action by quota-holders marks the end of the period in which fishermen have instinctively acted individually, even toward government. Now beginning to regard the system as their own, they find it possible to cooperate." (Scott 1993: 188).

Again, just so, and in relation to a matter that few would have guessed could be handled by fishery groups only a short time before: monitoring of catches. In an sleight-of-hand, DFO brought people into the IQ system by suggesting they had few good alternatives, and then insisted that if they wished to stay in the IQ system they would have to find a way to create virtually 100% monitoring of catches, and to finance that. The context is important to understanding why fishers would want or agree to those provisions. The major alternative was to return to an old quota system, which led to a quick race for the quarterly or semi-annual quota and then industry shutdown. In 1989, just before IQs were created, the Under 65' Dragger fleet was tied up after June. Accordingly, the IQ Group had to work out a system of financing and managing catch monitoring. Arguably, because they had learned to cooperate and to trust each other, and had come to see the system as their own through the various implications of holding ITQs, they were able to do this, too. It was extremely difficult, but the outcome was a tax on all landings, paid up front on the basis of allotted quota, and an independent monitoring corporation, the board of directors of which includes members of industry. It is closely supervised and coordinated with government inspection, monitoring, enforcement, and data collection.

The IQ system is fragile. Monitoring is critical, as noted above. More recently, with a drop in fish landings in the region as quotas are cut back by the government due to alarming stock assessments for major groundfish species, the IQ Group has had to deal with the problem of maintaining the monitoring system with lower tax income. Their ability to do this – not yet proven- will be a clue to how sustainable this new institution for cooperation and self-governance is. The response of another governing body to the crisis has also jeopardized the system. A new management advisory group, the Fishery Resource Conservation Council (FRCC), that is supposed to elevate decision-making beyond the realms of special industry or agency interest, recommended closure of the IQ groundfish fishery, as well as other fisheries, in the middle of 1993 because of concerns about stock status. IQ industry members were very angry because of the investments they had made based on their expectations about using their quota; the government violated the trust implied in the awarding of IQ property rights. They were also angry because the decisions, and consultations about them, were made by the FRCC without any involvement of the industry, violating the trust that had developed in the co-management process. The status of both ITQs and co-management in 1994 is thus problematic; at the very least, the added uncertainty has resulted in a precipitous decline in the value of quota (B. Giroux, per. comm. to C. Finlayson).

VII. ITQS and Stewardship

Scott (1993) suggests that there is nothing inherently impossible about self-governance for biological conservation. Information about the resource itself, beyond monitoring catches, is of course critical. Groups of fishers can pool resources to hire scientists to do stock assessments, as well as develop their own means of collecting and analyzing data, and make recommendations on total allowable catches, for example. Governments do not have to monopolize this kind of expertise. The Under 65' case is not inclined in that direction, but situations where they might can be imagined, including the loss of legitimacy that government scientists experienced in neighboring Newfoundland when their stock assessments proved tragically wrong for northern cod, the fishery for which is now completely closed (Steele et al. 1992; Neis 1992). The general point about ITQs is that they become easily measurable signs of responsibility for contributing to joint endeavors such as these.

Two major problems loom, however. One concerns the "outsiders," those not in the ITQ system but fishing the same stocks. In the U.S. case there are none for surf clams and ocean quahogs, unless one includes the Maine "mahogany" fishery, but in the Canadian case large numbers of fishers have opted to stay with a quota fishery, using a different kind of fishing gear. On Jan. 2,1990, then Fisheries Minister Tom Siddon announced "boat quotas" for the Under 65' dragger fishery. There were 455 mid-shore draggers in the region, which included Southwest Nova Scotia, Southwest New Brunswick and Eastern Nova Scotia. They were offered choices; as of 1993, 325 had chosen to receive ITQ licenses; 74 to receive fixed gear licenses, for gill-netting and line-fishing; and 50 (vessels 30' in length or less) to become "generalists" involved mostly in flatfish fishing but having by-catch quota access to cod and haddock, [source: C.Creed 3/29/94; R. Barbara DFO]

Boundaries are good and necessary for creating self-governance, but they are also divisive in ways that can threaten the self-governing communities. In response to slashed fish quotas, the non-ITQ fishers in the Nova Scotia region have demanded part of the ITQ quota, and this and related issues have escalated to threats of violence. Supporting the ITQ monitoring system in times of low catches might be possible if the system were extended to monitoring the catches of other fishers, justifying government expenditurs, but controversies such as the above make that difficult to attain. It should be added that another class of "outsiders" is increasingly important: recreationists, environmentalists, animal-rights activists, and others not engaged in commercial fishing.

The other concerns motivation, incentives, and behavior. Poorly defined property rights contribute to "tragedies of the commons," but it is not yet clear what the conditions are for well defined property rights to contribute to self-restraint for the common good (see Mace 1993). The ITQ systems are designed to mimic if not represent capitalist social relations, and capitalism is not the natural incentive structure for self-sacrificing, future-oriented behavior. In interviews with fishers engaged in ITQ fishery we have been told that their own views about their relationships to the fish stocks have changed, now that they see themselves as owners of rights that extend some distance into the future. And although cheating and law-breaking continue, we are also told that people seem more likely than before to report on other fishers. But the other critical ingredient for cooperative restraint in the use of common pool resources, community (Singleton and Taylor 1992), is not necessarily strengthened by market dynamics. It is then ironic that the co-management experience may be one of the few sources of "community" for ITQ-holders, one of the few places where people contest and share definitions and norms and construct new possibilities for the future.

The most hopeful sign is that people involved in ITQ fisheries appear to become more concerned about law enforcement and blatantly anti-conservationist behaviors. For example, when some fishers began bringing in cod and haddock roe, there were near riots at the docks in communities in Nova Scotia (B. Giroux, pers. comm., to C. Finlayson). In addition, the Canadian ITQ fleet has begun to adopt more conservationist policies, including mesh structure and size and closures of critical spawning areas, far in

advance of other fisheries. Some of this effort may be traced to the need to be defensive about the use of dragger technology in the context of a widespread critique of draggers as a cause of the sharp declines in many groundfish stocks, but some of it appears to reflect genuine recognition of the value of being better stewards of one's property.

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