

CHANGING ABORIGINAL POLICY IN CANADA, AND THE EFFECTS ON SCALE AND CAPACITY USE IN THE COMMERCIAL FISHERIES OF QUEBEC

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ABSTRACT

The efficiency analysis literature has long acknowledged the difference between program/policy effects and relative efficiency effects. The use of incentive compatible policy has been an important research agenda for fisheries economists, and Canada uses an array of policies and regulatory tools to fulfill the objectives of their Fisheries Act. One important policy change, beginning in the 90s was aimed at having a more equitable distribution of Aboriginal access to various fisheries. In Canada, these policies came in the wake of two Supreme Court decisions, which aimed to expand the involvement of aboriginal groups in marine fisheries. We use available data provided by Fisheries and Oceans Canada (DFO) to examine localized effects of various programs of the Aboriginal Fisheries Strategy on the performance of fleets on the North Shore of the St. Lawrence Estuary. While there has been a steady growth of the Aboriginal share of the fishery over time, a closer examination reveals that there may still be important differences in technical efficiency between Aboriginal and Non-Aboriginal (NA) operating units, despite important investments in education and other infrastructure. Part of these differences may be due to differences in industrial organization, a relative lack of skilled labor among Aboriginals, and Canadian fisheries policies themselves. In certain cases, license transfer policies to Aboriginals may have led to losses in productive efficiency. In other cases license transfers may have resulted in Aboriginal groups simply hiring back displaced non-Aboriginal workers. The implications of these results are discussed.

INTRODUCTION

The firm, as well as other decision-makers in an economy, can be affected not only by the internal rules of the firm, but also by the policies under which they work. However, the organization of production, sometimes formed over years or even decades of practice, may not be easily overturned or changed by policy. The flexibility of firms' operational methods depends, in part, on the ability of decision-making units to adapt their own practices to new policies. These behaviors may not be as malleable to change as might be supposed and may be seen as a source of inefficiency with respect to new policies. Unresponsive behavior may result in no change at all because the firms or decision-making units circumvent the problem by other means. Alternatively, it could result in a demonstrable decline in technical or allocative efficiency among those who try to adapt by other means.

This paper describes an important case study for Canada. In the wake of two Supreme Court decisions^b aimed at addressing governmental injustices to Canadian Aboriginals, the Government of Canada through the Department of Fisheries and Oceans (DFO), decided to implement a program aimed at re-integrating Aboriginal communities into existing marine fisheries. The policy, which became known as the Aboriginal Fisheries Strategy, became a broad program of technical support, education, and importantly, the transfer of fishing licenses from non-Aboriginal (NA) fishers to Aboriginal recipients through a system of voluntary buybacks and transfers. This system involved government purchases of licenses from NA, so that these licenses with the boat and all equipment could be given to aboriginal fishers. The impact of this buyback-transfer system on the fishing fleet in general, and on the aboriginal fleet in particular, as well as adjustments that occurred, places into perspective a difficulty with standard analyses

of overcapacity and overcapitalization in the fishery; the measures are susceptible to policy changes as well as to the malleability of decision-making units. These phenomena may lead to behavioral responses that are surprising not only to the firms, but also to the regulatory agency, in this case DFO, which is charged with effecting the change.

THE SUPREME COURT DECISIONS AND THE LICENCE TRANSFER PROGRAMS

In 1999, the Supreme Court of Canada reaffirmed the 1760 and 1761 treaties of "Peace and Friendship" between the British Crown and the Mi'kmaq and Maliseet First Nations in the case of *R. v. Marshall* and clarified certain points of the previous *Sparrow* ruling of 1990. As a result, these First Nations peoples retained the right to hunt, fish, and engage in harvest activities and to trade for "necessary" goods. The Court concluded that in today's terms, "the acquisition of necessary goods" is the equivalent of a "moderate livelihood". This includes essentials like food, clothing and housing, supplemented by a few amenities. However, it does not extend to the accumulation of wealth. The Court concluded that to exercise this right and to do business in a meaningful way, the beneficiaries of the Treaty had an implied right to hunt, fish and gather, and to do this in order to obtain goods for trade. Through this ruling, the Court confirmed the authority of the federal government to address treaty rights and limited those rights to traditional sectors used by the affected community. As such, fishing licenses could be transferred to a collective of individuals, such as a First Nations Band Council, rather than to individual aboriginals.

The Aboriginal Fisheries Strategy (AFS) programs, started in 1992, developed as a consequence of the *Sparrow* and *Marshall* decisions. While the *Sparrow* decision called for a more equitable division of fishing privileges to indigenous peoples for food, social and ceremonial purposes, the *Marshall* decision called for broadening the definition of subsistence to include commercial fishing. This broadening of the subsistence definition has ultimately given aboriginals access to fisheries resources through a series of acquisitions and transfers or through sales using government guaranteed loans.

DFO's policies following the *Sparrow* and *Marshall* decisions had the following objectives:

1. Provide a regulatory framework for the management of aboriginal fishing for food, social or ceremonial purposes;
2. Offer the possibility of aboriginal participation in fisheries management, which will have a positive effect on the conservation, management and enhancement of the resource;
3. Promote economic independence for aboriginal communities;
4. Provide a solid foundation for the conclusion of treaties and agreements on self-government;
5. Improve skills and capabilities of indigenous groups.

The mechanisms of this strategy are diverse and consist of incentives, training and financing business activities in aboriginal communities. These objectives are aimed at ensuring effective management through Comprehensive Fisheries Agreements made between the Canadian government and Aboriginal groups. To do this, DFO maintains negotiations and attempts to achieve mutually acceptable limited term agreements with aboriginal groups. In cases where the parties failed to agree, DFO reviewed previous consultations with aboriginal groups and maintained their fishing rights for subsistence. However, in the case of an agreement, DFO would award the group commercial fishing permits as part of the agreement. This agreement may contain information on allowed tonnage and on the joint management of fishing for food, social and ceremonial purposes by aboriginal communities. The communal fishing license may have set conditions, such as the allowed tonnage, defined fishing areas, the gear to be used and its dimensions, size regulations regarding the catch and access to data collection.

The AFS program was developed because of perceived inequities in the allocation of fishing privileges between aboriginals and NAs. However, some of these inequities may be because of differences between the structure of governance among indigenous groups in Canada and the broader economy. Aboriginal

society is organized around the concept of band councils and tribes. Private property, although present, is less common; collective ownership of enterprises is more prevalent.

Agreements negotiated under the AFS are summarized in the Comprehensive Fishing Agreements (CFA), which are among the first co-management arrangements between DFO and private entities. These agreements include stock assessment tasks, enhancement, management of fisheries and habitat management projects. Communal licenses provide opportunities for aboriginal communities to fish for food, social and ceremonial purposes. These licenses incorporate the management of aboriginal fishing and the public management of fisheries in a wider context.

The Allocation Transfer Program (ATP) was added to the AFS in 1994 as a means of encouraging self-sufficiency within communities through participation in commercial fishing. The ATP was based on the voluntary retirement of NA fishers' commercial licenses through buybacks, which were then issued as new licenses to aboriginal organizations. One issue in this analysis is the impact of remittances on the level of effective effort in the fishery and the division of profits between aboriginals and NAs as a result of these transfers.

Depending on the priorities and capacities of local aboriginal groups, program funding also allowed them to obtain full-time professional services such as a fisheries coordinator, manager, biologist or technician and administrative staff. Funds were available to cover the cost of office rental and buying computers, as well as expenses related to coordination. The program is thus designed to support the creation of new organizations or to consolidate existing programs. DFO policy on Aboriginal fishing in Canada has developed since the Sparrow decision. Following this decision, a policy and regulatory structure was implemented by DFO that enabled co-management process of a variety of activities ranging from subsistence to commercial fishing. The subsequent Marshall decision was another step towards increasing aboriginal participation in commercial fishing. DFO policy in response to these decisions has been mainly oriented towards increasing productive efficiency of aboriginal groups, while at the same time maintaining the condition that licenses that were transferred be held in common.

LOCALIZED EVIDENCE ON THE PROGRAMS

The study area is the North Shore of Québec, and more specifically the Innu tribes of the area from roughly Essipit out to the frontier with Labrador (Figure 1).

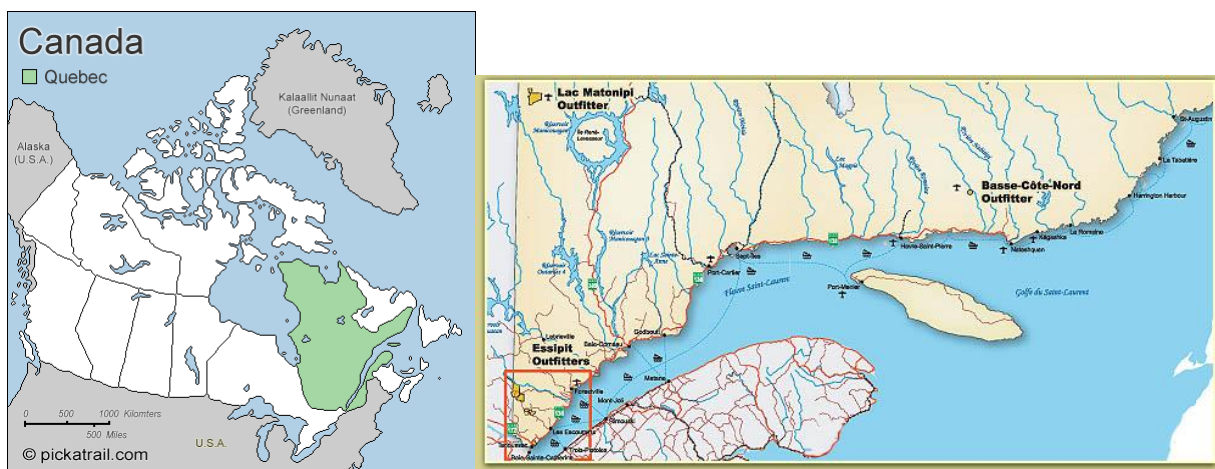


Figure 1. Map of Quebec and detail of the North Shore (Source: Quebec North Shore Outfitters; Pickatrail.com.)

As an indication of the size of the investments per year, the last available information on AFS in 2005-2006 for Québec had the total budget at 3.373M \$, 2.476M \$ of which was the Aboriginal Transfer Program, which was the program which transferred licenses from NAs to Aboriginals. Keeping these figures in mind, we found data compiled by DFO which shows the evolution of the catch statistics for selected fisheries on the North Shore and Quebec from 2000-2009 (Figure 2).

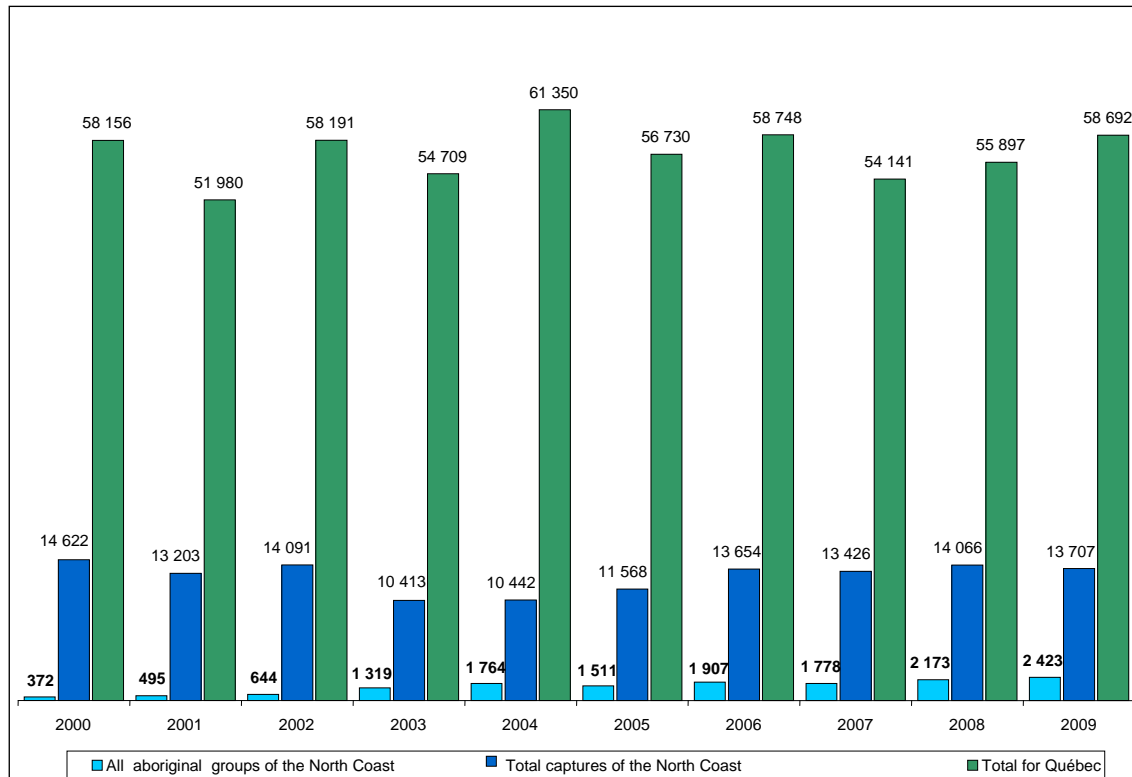


Figure 2. Evolution from 2000 to 2009 of aboriginal landings, total North Coast landings, and Quebec landings. (Source: DFO)

This series shows that, while the overall productivity of the North Shore has held relatively steady except for declines in 2003-2005, the share of Aboriginal activity has risen from about 2% of the North Coast landings in 2000, to about 18% in 2009. This might be taken as an indication that the AFS, and particularly the ATP program, has on the whole been successful.

However, when we look more closely at some comparative performance indicators in the Aboriginal fleet, the story becomes more complex.

PROGRAM CHANGES AND COMPARATIVE PERFORMANCE OF FIRMS

We studied more detailed data from DFO, in an effort to understand what was behind the broad results. One set of summary data shows aggregated costs and earnings statistics of different fisheries in Zone 16 on the North Coast. Different production indices through time, organized by whether or not the vessels are Aboriginal-owned, are included in the data. We also reviewed discussion documents of DFO analysts, in the wake of their refusal of a season extension for the 2010 season made by Aboriginal fishing firms. The reasons for this discussion and analysis were that certain fishers of high valued species such as snow crab were finding it difficult to exploit their individual quota over the season set by DFO. Those fishers made a request to extend the fishing season to provide more flexibility. These are the first

indications that there were effectively variations in productive capacity and technical efficiency between the respective fleets.

However, when analyzing the comparative performance of Aboriginal and NA operators, it is important to keep several ideas in mind. First, the organizational structure of Aboriginal producers in the fishing fleet is different from the organizational structure of NA producers, especially under an ITQ or IQ system. Permits are collectively held in the Aboriginal context, whereas they are privately held in NA contexts. This difference may have an effect on the distribution of costs and earnings of actual operations, as well as on organizational costs. There are many examples of community quotas throughout the world (Ginter, 1997 ; Langdon 2008), and the relative merits of Community based approaches compared to ITQ policy has been explored as well (Copes and Charles, 2004). The arguments of those who study community management use important concepts in institutional economics such as the "Optimal commons" (Field 1985). This idea argues that the relative efficiency of certain types of decision-making structures depends critically upon the internal organization costs of the unit compared to the organizational costs external to the unit, in comparison to the likely benefits to be derived from organizations of different size. The point of these arguments is that "one size does not fit all" when it comes to fisheries policy. Community based management using community licenses may be, under certain circumstances, "optimal". However, this does not mean that the costs and benefits and therefore the relative efficiencies, are directly comparable to the case of the private competitive firm, as though that case is the standard.

Second, the existence of a program managed by DFO, aimed at Aboriginal groups, may have both positive as well as negative effects on performance indices. While skill levels have appeared to improve for some workers, and access to capital is better assured, there may be negative effects on productivity brought on by the economic effects of subsidies. The most direct example is that we know that various subsidy programs tend to raise the opportunity costs of Aboriginal workers, which may result in high turnover and unemployment. Part of the AFS subsidies aimed at growing the Aboriginal part of the sector may be dissipated through countervailing subsidies.

A third issue is related to the effects of permit transfers. The way in which a permit is used or not used may be related to the way in which the permit was acquired. If the owner of an asset (a permit) does not acquire it with scarce resources, the use of that asset may not be efficient. The owner may not be aware of the true value of the asset, or alternatively, he may not have the skills to use the asset. A third possibility may be that the terms defined by existing regulation, or constraints imposed by the market, may make it difficult or impossible to use the asset. For example, permit transfers to Aboriginals are one way; they cannot be sold to a third party. Permits and quotas are for specific zones and quantities which might not be useable because of distance or size of quota.

All of these reasons, which may affect competitiveness, may be the reason for the statistically significant differences we see in indices of productivity between NAs and Aboriginals. Table 1 presents the results of a series of simple statistical estimations of different productivity estimates. Since this is based upon a small sample, we used a linear estimation with only two explanatory variables. One is a trend line and the other is a binary variable where the intercept term is the effect of NA production. The variable "Aboriginal" is a dummy variable that shifts the intercept value of the productivity index in question.

Table 1. Results of regressions of three indexes of productivity (2006-2010) with a binary variable "Aboriginal" (* 90%; ** 95%; * 99%).**

	Traps raised per boat	Soak time per boat	Landings per boat
R²	0.65428	0.5237	0.9023
R² Adjusted	0.55551	0.3876	0.8744
F (Sig)	6.624 (0.024)**	3.849 (0.075)*	32.3477(0.0003)***
Intercept	5987.75***	7401.437***	77912.15***
Aboriginal	-2610.25**	-2778.981**	-20542.81***
Trend	476.03	836.48	7541.98***

The three regressions of productivity indices we use is the number of traps raised by boat, the hours of trap immersion by boat, and catch by boat. In these three estimations, the first and the last are the most significant, with F values and t statistics above the 95% level, even considering the small sample size. The overall trend in the indices is positive in all three estimates over time, which is to be expected given the evolution of real effort over time. Capital investments, learning, and other improvements in operations will usually result in increasing marginal changes in these indices over time, even if natural stocks decline. Productivity indices that reflect the productive factors of a real economy, especially different forms of capital and labor, environmental productivity, and natural capital, stand a greater chance of providing policy relevant information than do more simplistic notions of effort. Catch per boat over the period covered showed a marginal increase per boat of about 7,500 kg per year. However, it is also true that despite these increases, the marginal productivity per boat among Aboriginal producers is negative, and significant. That is, NA vessels in this sample caught an average of 77,912 kg of crab in Zone 16, whereas Aboriginal vessels captured an average of 57,370 (77,912 - 20,542) kilograms. Further, these estimates are statistically significant despite the low degrees of freedom.

This may be evidence that permit and quota usage among Aboriginals is less intensive, at least in recent years, compared to NA firms. This may have prompted some Aboriginals to request season extensions in Zone 16. DFO resisted this request for two reasons. First, it was felt that Aboriginal producers should simply fish “earlier and harder,” like NA fishers. Second, they offered the argument that it was always good to leave some quota in the water for conserving the resource.

Within the structure of the quota system, each vessel receives a part of the global quota established for the zone. They therefore have the equivalent of an individual vessel quota that is tied directly to a TAC. In these cases, and knowing that collective use of an asset might be relatively less productive, especially in the context where it is generally acknowledged that Aboriginal groups are learning, then it does seem reasonable in this case to allow for longer seasons. The reason for individual quota management in the first place is to provide flexibility to producers while assuring that the resource will not be over-exploited. The benefits and costs of individual quotas have been extensively discussed in the fishery management literature^c, but the general consensus is that they can permit more flexibility among producers. Among the benefits of longer seasons are: reduced incidence of death and accidents of mariners; a more even product delivery to the dock throughout the season, thereby avoiding gluts, price declines and wastage; reduced at-sea mortality of incidental catch; higher quality of delivered product; and more efficient use of both human and physical capital (National Academy of Sciences, 1999).

The reaction of DFO to the variability in productivity between Aboriginals and NAs is a demonstration of how difficult it can be for public managers to coherently accommodate producers that operate under different types of industrial organization, even when their own intuition and policies tells them that accommodation is necessary. It may not be in the interests of DFO or the industry to advise Aboriginal fishers to try to increase the intensity of their fishing activity. In addition, “leaving quota in the water for

the good of the resource” may not be compatible with the management structure in place or the economic incentives of producers. If individual quotas are left in the water, the stock will indeed benefit, since part of the stock will help increase the populations in following years, but part of the stock will die of natural causes. There is no guarantee that the contributor of left-over stock will ever benefit from this act, for many reasons. In many systems involving individual quota management, the issue of season length becomes less important, because output is effectively constrained by the TAC and individual quota.

The differences in productivity between Aboriginal and NAs will likely exist for some time. However these differences are neither surprising nor are they particularly undesirable. In addition, they are easily accommodated with an IQ or ITQ system. They arise from different productive organizations with different objectives for the decision-making unit. Some of these constraints are even legally mandated in Canada.

EDUCATIONAL SUBSIDIES

Under AFS, DFO has maintained an active, technical educational program for Aboriginals that is mainly at the post-secondary and junior college level^d. In the Innu community 205 people have taken 1 or more courses from the inception of the SRAPA program up to 2009. A high turnover rate occurs in fishing operations and in most sectors in the Aboriginal communities.

The success rates for these courses are perhaps an indication that for those who do take them, mostly younger crew-members, they are motivated to complete courses, but they are not necessarily motivated to complete the entire program. DFO pays for tuition and travel of those who stay in the courses. They also provide subsidies for trainees during their coursework for up to two years, and some of these costs are shared with the Band administration. However, no one has actually completed the entire professional program to date. Some Band members feel that there is an over-production of technical jobs and some have confirmed that the turn-over among young people in the fishery tends to be high.

Innu communities on the North Coast deal with seasonal unemployment, which presents problems for smaller communities. Consequently, these communities hire NAs to fill positions. In communities with a sufficient population and demonstrate an openness to hiring specialized labor that is NA, then filling management positions is less problematic. However, employment related problems may also extend to the higher ranks of professional activities, like managers and boat captains. This is partly due to the fact that many Aboriginals with higher education tend to be attracted by higher paying opportunities outside the community. Perhaps because of this, there are indications that almost all Innu communities on the North Shore have a shortage of Aboriginal human resources at the professional levels. In some communities, fisheries coordinators seemed unprepared to take on the management of fisheries operations. This may partially explain why, for example, quota for even high-valued species such as snow crab might go unused in some communities.

GOVERNANCE AND MANAGEMENT

Governance plays a role when analyzing the effectiveness of the AFS Program in different communities. Although all Innu communities have autonomous band councils, not all of the governance structures are similar and ownership patterns of different assets in the community vary greatly. In some communities, economic activity is structured so that most businesses are community owned. Sometimes, this model also extends to living quarters, where rent is paid to the band council. Not surprisingly, common property problems (usually over-use of capital infrastructure) occur. However, the fisheries related enterprises are communally held, as they must be by law. This may explain differences in operational efficiency between Aboriginal and NA fisheries operations. Communal management of fisheries activities might lead to vessels that are older than usual, with possibly not enough revenue set aside for maintenance and

replacement of capital stock. This may lead to in-season break-downs which ultimately lead to under-use of quota.

Management practices at DFO may affect the development of fisheries related activities. Two examples warrant discussion. In reviewing permit usage, it was found that some communities have a high rate of non-use or incomplete use of some permits of lower-valued species. Interviews with one band administrator revealed that the market prices would not support their exploitation. The recipients of these permits opted not to use them, because they felt that they would have operated at a loss. As one fisheries coordinator said, some permits were offered as “gifts” that were ancillary to the allocation of a higher valued species, such as crab quota. Some permits, like an ancillary herring permit given with a crab quota, seemed reasonable. But when these opportunities were more thoroughly explored, it was found that regulatory restrictions on the transfer of permits and quotas (the collective permit to Aboriginals cannot be sold or permanently transferred to NAs), coupled with the fact that returns on exploitation of these permits may be modest, made it relatively difficult to benefit from the permits. Some managers have opted to hold these permits until such time that they might become profitable.

The need to do this may be in part related to the inflexibility of the quota and permit programs presently in place. These restrictions make it difficult for anyone, even Aboriginal communities, to treat the permit as an exchangeable asset rather than as a privilege, in the sense of the Fisheries Act. This is the case even though the customary practice, even at DFO, is to treat them in this way. However, the ability to trade, allows market forces to take over part of the role of resource allocation. This is thought by many fisheries management specialists to result in some efficiency gains. Related to this is the second complaint: some current quota regulations are unnecessarily restrictive. These restrictions prevent operators from achieving appropriate economies of scale, because they cannot combine quotas from different communities fishing in the same region on one boat, nor can they fish later in the season.

EFFECTS OF BUY-BACKS IN REMOTE AREAS

Economists are generally unfriendly towards the use of subsidies, and cautious with regards to buy-backs. Those selling out of the fishery through a buy-back program, who know that the government has allocated funds for buying businesses, as happened in the ATP program, will bid up the prices of these businesses, usually beyond the price necessary to entice them out of the fishery. In the case of some communities of the north Shore, sellers of a permit and boat were sometimes hired back as boat captains, with a crew that was subsidized. The captain who was a former owner gains a windfall, but in the case of the North Shore, because the market for specialized labor is thin, much of that labor may find its way back to the fishery anyway, under new ownership. The issue of buybacks has been explored by Hannesson (2007), as well as others. One lesson from these studies is that buyback programs are difficult to efficiently execute. We expect that they would be especially difficult to do in thin labor markets like we see in Northern Québec.

Transfers of ownership of licenses and boats may involve some loss of information on actual fishing practices and some loss of expertise, which have to be re-learned by those who have received licenses. In the case of Quebec, this has been offset by public investment in training. Although these programs have had some effect on the development of the fishing sector, this leads to questions about the way in which transfers are made. A review of DFO data on indigenous designated masters and designated crew (in terms of positions held) in 2011, reveals that Aboriginal boat captains in that year occupied 11% of positions whereas Aboriginal crew members occupied about 80% of positions on Aboriginal owned vessels. These limited data suggest that the ATP programs, while transferring ownership of firms, did not necessarily lead to rapid changes in management of these firms. However, the training programs aimed at deckhands does appear to have had a positive effect on the structure of Aboriginal employment, although the turn-over in these jobs is still high.

Each year, as DFO obtains additional funds for ATP, a substantial amount is added to subsidize the purchase of fishing enterprises. Over the last 4 years, DFO has gradually shifted towards contributing a portion of the costs of acquisition, generally 80-90%, with the band completing the purchase with their own money (Wilkins, Pers. Comm.). In the future, this amount may be reduced. Reducing dependency on subsidies is tending in the right direction, and may contribute to improvements in performance.

CONCLUSIONS:

The response of DFO to the Canadian Supreme Court decisions resulted in the institution of the AFS and the ATP programs. Now after over a decade, it may be time to take stock and to ask what changes have occurred in the structure and function of the industry, and to ask what might be some recommendations for the future.

We note a similar pattern to the transfer problem to Aboriginals recently cited in Australia by Pascoe (2012). The opportunity costs of Aboriginals may be such that their implication in the fishery may be slowed. There is a difference in the technical efficiency of firms, but this might be due to a number of things, in particular, the fact that permits to Aboriginals are held communally whereas they are held privately among NA firms. It also might be because of the effects of subsidies on firm behavior, and also public management rigidities. Whatever the reasons, the image that we get is that the AFS and the transfer programs, in place since 1992 and 1994, seem to be having a relatively modest impact on the growth of Aboriginal involvement in the fishery, at least in the North Coast of Quebec. Some of this growth might be due to the fact that some NA resources are hired back after transfers are made, but simply change who they work for. Certainly some of the growth is due to subsidy effects and not due to gains in efficiency at all. This can be guessed by looking at Figure 1. In periods where the gains of the Aboriginal catches are the most pronounced, the declines in the total North Shore catches are even larger.

What are some of the recommendations that could be made to improve the performance of the AFS?

Awarding funds for the acquisition of new enterprises to band councils might be done competitively, based upon an independent evaluation of the business plans of band councils who wish to acquire new enterprises. We believe also that there needs to be a tightening of the requirements that band councils make financial or in-kind contributions to the projects.

DFO should eliminate subsidies for at sea training and instead, initiate a share system for new crew-members, as on other vessels in the fleet. The bands should be able to finance a crew, especially with higher value permits. Usually, high turn-over is an indication that workers are not being paid their opportunity wage, i.e., the wage that compensates them sufficiently to make them stay.

While helping the Aboriginal communities become part of the fishing industry is an important goal, placing them on a technical par with NAs may not be feasible or desirable, since differences in productivity may have little to do with structural factors that DFO can control through the allocation of funds and organizational activities. However, some changes that would be useful might include:

1. Further experiments with zonal management groups composed of Aboriginals and NAs with access to a zone, in order to address the year to year management issues such as catch overages or shortfalls, season length and capacity monitoring and management. This may be possible using joint planning agreements. In particular, one of the first activities of a zonal management group for Zone 16 would be to negotiate for a longer season length.
2. Review and adjust subsidy policies and programs towards a more cost-sharing approach, in order to reduce the negative effects of subsidies on productivity.

Because the transfer of licenses under AFS was to communities and not to individuals, this has led to a renewed emphasis on collective governance structures, which may not be taken sufficiently into account in the management of the fishery by DFO. Collective management or commons management is thought by many economists today to be no better or worse than complete privatization, and efficiency considerations should be made taking into account the relevant industrial organization that the public manager is facing. However, when a fishery does have different industrial organizations, say, community quotas and privately held ITQs, then accommodations will need to be made. Happily, ITQ policy generally is very flexible, and can accommodate different structures with some planning. That in fact is the summary message of a number of authors who have studied the application of ITQ programs world-wide (Shotton 2001a ; Shotton 2001b).

There is little evidence that the management capacity of individual band organizations guided DFO in their decision to transfer permits and other assets, when one might expect this to possibly be a prime consideration when transferring an asset. It is possible that the AFS program could transfer too many licenses for the management capabilities of a band council, forcing it to choose which permits to exploit, or placing some councils in a situation where they could not completely exploit a permit. This realization might argue for a more measured and market based approach to distributing permits and also to permit/quota use and transfer. Permit and quotas cannot pass permanently into the hands of others, but maybe there are rule changes that can be made to make the temporary use of permits and quota shares of Aboriginals easier and less costly.

The history of AFS suggests that fisheries managed collectively in collaboration with the band council can make public management more effective, because part of the management responsibility can be transferred to the concerned community through Comprehensive Fisheries Agreements. This is an attractive extension of much of the literature of fisheries self-governance of which Townsend et al (2008) is an example. However, doing this in the context of the AFS may require more capacity building, but this time in the important areas of resource management, public management, finance, and law. These considerations will likely give a new direction to the programs that are already in place.

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ENDNOTES

^a Disclaimer: The views expressed by the authors do not reflect the views of the Department of Fisheries and Oceans or the Government of Canada.

^b **R. v. Sparrow, 1990**, which found that where an Aboriginal group has a right to fish for food, social, and ceremonial purposes, it takes priority, after conservation, over all other uses of the fishery. **R. v. Marshall, 1999**, affirmed a treaty right to hunt, fish and gather in pursuit of a “moderate livelihood” arising out of Peace and Friendship Treaties of 1760 and 1761. <http://www.dfo-mpo.gc.ca/fm-gp/aboriginal-autochtones/marshall/afs-srapa-eng.htm>

^c This same document talks about catch overages by Aboriginals earlier in this series. In the Canadian system, catch overages from one year are deducted from quota in the following year, or are subject to fines.

^d The EPAQ in Grande-Rivière and other course providers in CEGEPs for courses dealing with mechanical abilities are examples. Completion of courses leads to a certification of aide-pêcheur professionnel (deck-hand) or class IV master (captain). More information is available on <http://www.epaq.qc.ca/index.php/peche>