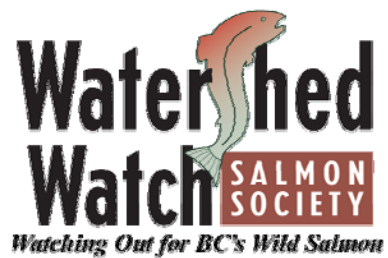


# TRANSFERABLE SHARES IN BRITISH COLUMBIA'S COMMERCIAL SALMON FISHERY



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## **EXECUTIVE SUMMARY**

For several years, conservationists have tried their best to identify the fundamental, structural problems that make the British Columbia salmon fishery "unsustainable." The conservationist focus has been on habitat protection, and on the need for a shift away from mixed-stock fisheries that tend to pose serious and persistent threats to biological and spatial diversity in salmon populations.

We are usually most vocal, and most adamant, when we find ourselves forced to demand fisheries closures. Watershed Watch is of the view that while these demands are justified by circumstance, fisheries closures are never environmental victories. They are tragic and necessary acknowledgements of defeat.

We are also of the view that a solemn responsibility comes with the enhanced role conservationists have taken on lately in fisheries-management decisions. We see a constructive "third-party" role for ourselves in addressing the deeply-entrenched structural problems that beset the salmon fishery.

It is in this spirit that we prepared this discussion paper.

We see a way forward to sustainability in the West Coast salmon fishery. We believe the way forward lies in the experience of other commercial fisheries on Canada's West Coast that have made the transition to "transferable shares" management.

The purpose of this paper is to encourage debate in industry, in fisheries-management circles, and most importantly, among members of the concerned public, in the hopes of encouraging the West Coast salmon fishery to make that transition.

## **ACKNOWLEDGEMENTS**

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## INTRODUCTION

After decades of controversy, "missing fish" scandals, salmon-run declines and the near-collapse of the British Columbia's commercial salmon-fishing industry, a new and enlightened approach to salmon conservation is finally emerging on Canada's West Coast.

A new leadership is also emerging, especially among aboriginal communities and the commercial sector, holding out the hope that deep divisions of long standing may soon be behind us.

The federal and provincial governments are at long last nearing the conclusion of several treaties with First Nations that are expected to contain robust fisheries components.

Fisheries and Oceans Canada has begun to demonstrate progressive and dynamic leadership at the regional and federal levels: In July, 2007, Fisheries Minister Loyola Hearn announced an ambitious, \$175 million initiative to support "environmentally and economically sustainable integrated Pacific commercial fisheries."<sup>1</sup>

For the first time, conservation organizations are participating directly in fisheries-management processes alongside industry stakeholders.

While dozens of British Columbia's salmon runs are at their lowest levels since the industrial fishery began in the 19th century—indeed, dozens of runs are already extinct, and many more are in danger of extinction—the public commitment to conservation, and institutional goodwill, are abundant.<sup>2</sup>

Canada has signed the United Nations Convention on Biodiversity, and has adopted national standards drawn straight from the UN Code of Conduct for Responsible Fishing. The Committee on the Status of Endangered Wildlife in Canada is busy with assessments of marine species, and the Species At Risk Act has been passed into law.

But there is a problem.

The commercial salmon fishery itself is trapped in the past, fatally encumbered by inflexible and outmoded management methods and industry practices. The world has changed, but the salmon fishery has not changed with it.

The West Coast salmon fishery's allocation arrangements, gear-type rules and licencing system remain largely unchanged from the "limited entry" scheme introduced by Fisheries Minister Jack Davis in 1969. The industry's primary fishing methods, its most prominent management features, and its persistent concentration of fishing effort in "mixed stock" areas, are a relic of the late 19th century.

Two years ago, the federal government formally adopted its Policy for the Conservation of Wild Pacific Salmon. The "Wild Salmon Policy" sets out an approach that is intended to incorporate public values with scientific advances in our understanding

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<sup>1</sup> Fisheries and Oceans Canada announcement NR-HQ-07-38E, "One Fishery For All Of Us," July 16, 2007.

<sup>2</sup> Glavin, 2003.

of salmon, and goes some distance in taking into account the important role salmon play in terrestrial and marine ecosystems.

Most importantly, the Wild Salmon Policy places a proper focus on conserving the biological and spatial diversity of British Columbia's salmon species and not just the abundance of certain large, commercially-important salmon runs. Management decisions are now expected to comply with a precautionary approach to decision-making, and to conform with the primary objective of protecting the biological, genetic and spatial architecture in salmon, expressed as "conservation units".<sup>3</sup>

This presents wholly new and daunting challenges to fisheries managers and to fishermen, and demands an unprecedented degree of management flexibility and industry innovation.

The problem is not just that the fisheries-management regime has not kept pace with advances in science, public values, or federal policy. And it's not just that salmon fisheries management is based on an antiquated system that has been abandoned by almost all other B.C. fisheries. It's that the management regime in B.C.'s salmon fishery is inherently inflexible.

Indeed, in many ways, the management regime was explicitly designed to enforce rigidity upon a fishery that has been in a constant state of evolution in technology and catching power. Just one result is a system of hard-and-fast rules that govern allocations not just between the aboriginal, commercial, and recreational fisheries, but within the various licence-area and gear-type sectors of the commercial fishery.

This inflexibility poses particularly daunting challenges in light of emerging ecological disruptions, widely believed to be associated with climate change, that are producing unprecedented variation in salmon run-timing and distribution, ocean-mortality rates and freshwater-mortality rates.

More importantly, the old regime cannot be reconciled with the new conservation paradigm - not without resorting to massive restraints on the commercial fishery, or imposing complete season-long closures.

Fisheries managers, no matter how scrupulous, continue to be overwhelmed by the challenges they now confront every year just to ensure that minimum spawning-escapement goals are met.

Fishermen, too, no matter how conscientious, are locked into long-entrenched practices that leave them incapable of pursuing a profitable fishery without defying public expectations and violating public policy.

In recent years, the once-great Fraser River sockeye runs have three times been closed to all commercial fishing, for the entire season. The closures were not simply due to low sockeye returns. They were due to entrenched industry practices that could not accommodate necessary precautionary measures to conserve endangered and small salmon runs co-migrating in stock aggregates with otherwise harvestable salmon runs.

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<sup>3</sup> Fisheries and Oceans Canada, 2005

Because of the concentration of commercial-industry fishing effort in "mixed-stock" areas, where run strengths are notoriously difficult to predict pre-season and assess in-season, fisheries managers are often forced to place small salmon runs at great risk when they authorize openings.

An extensive investigation by Watershed Watch and the Fraser River Aboriginal Fisheries Secretariat recently found what minor margins of error in run-size calculations can produce under these conditions: In 2006, the Fraser sockeye runs were overfished by more than a million salmon because of inaccurate forecasts and run-strength estimates. While spawning ground counts later caused in-season run-size estimates to be revised, the event initially appeared to indicate a "missing fish" scenario comparable to the worst such events to befall the Fraser River, in 1994, and 2004.<sup>4</sup>

Another recent investigation, undertaken by Watershed Watch and the North Coast Steelhead Alliance, provides a stark illustration of what happens when fisheries managers fail to exercise precautionary measures and scale back fishing sufficient to minimize the danger of small runs succumbing to catastrophic overfishing events.<sup>5</sup>

The investigation found that in 2006, fisheries managers on the Skeena River simply "caved under pressure," in the words of one Fisheries and Oceans biologist. The managers allowed openings that resulted in severe overfishing of steelhead and other, non-target weak salmon stocks, contributing to dangerously low spawner returns to many Skeena tributaries.

But it would not be fair to simply blame fisheries management or commercial fishermen for these recurring events. Indeed, fisheries managers and some industry leaders have been grappling with ways to break out of these patterns:

1. Early in 2006, a key industry group known as the Commercial Salmon Advisory Board began an examination of industry practices with a view to reckoning how to "renew" the Pacific salmon fishery. At the time of this writing, the options under review by CSAB included a shift to "individual transferable quotas" of the kind that exist in West Coast fisheries that have successfully made the transition to "transferable shares" management.<sup>6</sup>
2. In July, 2007, Fisheries Minister Loyola Hearn announced the \$175 million "Pacific Integrated Commercial Fisheries Initiative." In some respects, the PICFI resembles a conventional licence "buyback" initiative to accommodate greater aboriginal access to the salmon fishery, coupled with improved catch-monitoring and product traceability. More than that, however, the PICFI anticipates the cooperative management of "shares" in the fishery, and a move towards "clear harvest sharing arrangements" within the salmon fleet and between fishery sectors.<sup>7</sup>

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<sup>4</sup> Staley, M. 2007

<sup>5</sup> Watershed Watch; North Coast Steelhead Alliance, 2007

<sup>6</sup> SCORE Newsletter #1, CSAB, December, 2006.

<sup>7</sup> "One Fishery for All of Us." Fisheries and Oceans press release, July 16, 2007.

3. Around the same time, an informal group drawn from First Nations, industry and the conservation sector co-authored a "concept paper" that explicitly confronts the dilemma we address in this document, in the context of the Fraser River. Titled "Beyond the Mixed Stock Fishery," the paper sets out possible remedies in the form of transfers in fishing effort, and the use of "conservation credits," that echo the concept of "transferable shares" proposed here.<sup>8</sup>

The dilemma is that the old-style fisheries are, in effect, all the fishermen are allowed within the existing regime. They are also the only fisheries that managers are given to work with. As runs decline as a result of these circumstances, the dilemma only deepens.

Already, Fisheries and Oceans Canada is finding itself increasingly unable to comply with the court-ordered priority of meeting upriver First Nations' basic constitutional entitlements to fish for food, social and ceremonial purposes.<sup>9</sup>

As it is currently configured, the West Coast's salmon fishery regime is also unlikely to accommodate fair and reasonable aboriginal treaty settlements without causing further significant disruption to the commercial fishery and incurring substantial costs to the public treasury.

The only alternative to that degree of disruption—under the current arrangements—is to incorporate treaty fisheries into a brittle commercial-fisheries management regime that may not last much longer without finally breaking.

Over the past four decades, the federal government has initiated several taxpayer-funded "buy-back" schemes to reduce the number of salmon-fishing boats and reduce the catching power of the fleet. The aim of each of these initiatives was to make the salmon fishery a leaner, more efficient and economically viable undertaking.

Over the past 15 years alone, Canadian taxpayers have spent close to half a billion dollars on a variety of initiatives intended to make the old regime work. These initiatives were each undertaken in good faith, and with the best intentions. But they have not worked. Over the same 15 years, the cost of these public investments—in fleet-reduction programs, "revitalization" subsidies, annual fisheries-management budgets and related costs—actually exceeded the cumulative landed value of B.C. wild salmon.<sup>10</sup>

To make matters worse, there are far fewer public benefits associated with the fishery than there were when the first of the recent "buyback" programs was initiated in 1993. There are now only half the boats and fishermen (about 2,200 vessels, down from roughly 4,400), and the processing sector has been decimated.<sup>11</sup>

Still, British Columbia's commercial salmon fishery remains chronically overcapitalized and economically unviable. It is estimated that the commercial sector needs at least \$120 million in annual landed value just to secure a reasonable return on

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<sup>8</sup> Barrett D., Moore D., Orr C and Wilson K., "Beyond the Mixed Stock Fishery," 2007.

<sup>9</sup> Jones, Shephert, Sterritt, 2004; Personal Communication, Ken Wilson

<sup>10</sup> Glavin, 1996; Nelson & Turris, 2004.

<sup>11</sup> Gislason & Associates Ltd. 2004

investment. Not once since 1999 has the landed value of wild salmon on Canada's West Coast exceeded \$60 million.

While it is commonplace to say this remains a matter of "too many boats chasing too few fish," in fact it is not a simple matter of there not being enough salmon to catch.

Indeed, in some years, up to 25 percent of the commercial catch of Fraser-bound sockeye is estimated to be left "unfished" because of rigid rules governing allocations between commercial gear-type and area. Also, enormous and historically high pink salmon returns to the Fraser River in recent years have gone almost completely unharvested, owing mainly to inflexible gear-type, licencing and area restrictions.

This cannot go on.

There is a way out, however. We believe "transferable shares" are the way.

Transferable shares are not new. Most of British Columbia's commercial fisheries are either already managed under such regimes or are already in transition to these regimes. The salmon fishery is one of the last major commercial fisheries in British Columbia that is not managed by the use of catch shares.

The specific intent of this document is to spark debate, particularly within the commercial fishing industry itself, about how that transition might be accomplished. It is our conviction that the result will be a new kind of fishery, a profitable, sustainable fishery, that will conform to the new paradigm in salmon conservation in British Columbia.

## **WOULD TRANSFERABLE SHARES BE BETTER?**

The pertinent question this document set out to address is whether a transferable-share system would be better for the salmon—and better for the industry, and better for fisheries managers—than the conventional fisheries management approach currently in place.

We now believe that the answer to that question is "yes."

There is now overwhelming evidence that commercial fisheries managed through the use of "transferable shares" are far more likely to be sustainable, and far more likely to meet conservation objectives, than those managed under the kind of management system still in use in British Columbia's commercial salmon fishery.

The potential conservation benefits of a transferable-shares system as an alternative to the current management regime in the salmon fishery become clearly evident to us in light of:

- the challenges the Wild Pacific Salmon Policy poses to the existing management system;
- the management flexibility required in coming to terms with broad-scale, climate-related changes in salmon behaviour and salmon productivity;
- the public demand for the restoration of weakened and endangered salmon runs;

- the public expectation that conflicts between the health of the resource and the immediate needs of the fishing industry must be resolved in favor of the resource.<sup>12</sup>

Under old-style management systems, fisheries are competitive. Fishermen compete with one another for greater portions of the allowable catch, and fisheries managers attempt to control fishing effort by restrictions on the number of vessels, fishing time, fishing area, and gear-type. In other words, fisheries are managed by trying to control the “inputs” to fishing.

In contrast, commercial fisheries managed through transferable shares control the “outputs” of fishing, or the catch. Fisheries do not compete against one another for catch—each licence holder is granted a defined share of the target catch before the fishing begins. Each individual fisherman is then held accountable to keep his or her catch within each defined share.

It is the competitive aspect of British Columbia's salmon fishery that has tended to most seriously confound management efforts.

With the rise of the industrial fishery, fishermen sought to gain advantage over one another by moving farther from the rivermouths, into mixed-stock areas, in order to be the first in line on the migratory path of salmon. Fishermen also invested heavily to make their vessels more catch-effective. This has produced a vicious cycle, leaving British Columbia fishermen locked in an economically unviable fishery, saddled with rising fishing costs and diminishing catches. It has got to the point that many “successful” fishermen are saddled with million-dollar vessels that may fish only a few days of the year for a product that comes nowhere near to matching the costs of investment in harvesting.

Salmon prices are falling as well, owing to the ubiquity of cheap farmed salmon in world markets—the aquaculture industry's production costs are a fraction of the harvesting costs associated with the wild-salmon industry.

Despite much larger catch volumes than the British Columbia fishery, even the Alaskan commercial salmon industry appears to be struggling. The value of the Alaskan salmon fishery fell by more than 63% from the late 1980s to the 2000-2004 period.<sup>13</sup> In British Columbia, the situation is much worse. The landed value of B.C. salmon is now only about 20 percent of what it was in the early 1990s.<sup>14</sup>

No foreseeable increase in the available catch is likely to change this situation. A recent financial analysis of B.C.’s commercial salmon fleet found that “the salmon fleet, with its present configuration, cost structure and market prices, is not economically viable under any reasonable catch scenarios.”<sup>15</sup>

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<sup>12</sup> Nelson and Turriss (2004)

<sup>13</sup> For 1996-2000, the total Alaskan salmon catch averaged more than 350,000 mt per year. In contrast, over the same period British Columbia catches totalled slightly less than 30,000 mt. (Knapp et al. 2007).

<sup>14</sup> Gislason & Associates Ltd. 2004, BC MAL 2005, BC MAL 2006, Gislason 2007

<sup>15</sup> Gislason & Associates Ltd., 2006, Page 16.

The gear-type and fishing-area characteristics produced by the industry's long history on the competitive treadmill have left Fisheries and Oceans Canada especially vulnerable to miscalculations that can produce catastrophic results. Not only is the fleet's salmon catch notoriously difficult to anticipate, the impact of the catch on individual salmon runs within migration aggregates is also often nearly impossible to predict.

While it would seem logical that by now, the B.C. industry would have engaged in a serious discussion of the prospects for a transition to a non-competitive salmon fishery managed by transferable shares, it has been the subject of only occasional discussion and debate, and some minor, though promising, experimentation.<sup>16</sup>

The routine uproars over stock collapses, the persistent conflict between aboriginal, recreational and commercial interests, coupled with the almost constant crisis mode that besets the fishery, have left little opportunity to consider long-term solutions.

The Pearse-McRae report of 2004, which proposed management reforms that anticipated transferable shares in the form of individual quotas, was well-received in some government and industry circles. However, after extensive consultations in aboriginal communities, B.C.'s First Nations leaders responded with a parallel report that cautioned against moving to individual quotas prior to progress in settling the fisheries components of treaties.

The First Nations' report proposed a federal commitment to reallocate at least 50 percent of the fisheries catch for treaty settlements, and a moratorium on any further "individual property rights regimes" in the fisheries until the broader allocation issues had been addressed.<sup>17</sup>

Another stumbling block is the considerable anxiety that exists among many commercial fishermen. There is a common perception that any serious consideration of alternatives to deeply entrenched salmon-fishing practices contains a "hidden agenda" to bring to an end the very existence of the commercial, saltwater salmon fishery.

Consequently, two points need to be made up front.

The first is that a "transferable shares" regime need not imply the establishment of any "property rights" in the fishery, and may actually provide the opportunity for more equitable, transparent and cost-effective reallocations of the kind anticipated by the First Nations' parallel report.

The second is that the abandonment of the old-style fisheries management regime, which this discussion document advocates, does not require the elimination of the ocean fishery or mixed-stock salmon fishing. Indeed, given the new conservation paradigm, a non-competitive fishery based on transferable shares may be the only guarantee that smaller-scale mixed-stock fishing has a future.

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<sup>16</sup> The analysis by Dr. Peter Pearse and Don McRae, "Treaties in Transition: Towards a Sustainable Fishery on Canada's Pacific Coast (2004)", is the most ambitious recent attempt to provoke debate about a transition from conventional fisheries management. Experiments in quota-fishing and "pooling" licences are discussed later in this paper.

<sup>17</sup> Jones, Shephert, Sterritt, 2004.

On both points, however, we should be clear that the emerging precautionary and conservative approach to managing the salmon fishery is here to stay, and exploitation rates in mixed-stock fisheries, commercial or aboriginal, should not be expected to return to the levels they had reached by the late 1980s and early 1990s.

Those days are gone. They're gone because of the new conservation paradigm that is beginning to determine the priorities for salmon in British Columbia, and which has already been adopted, in large measure, by the federal government.<sup>18</sup>

What follows is a synopsis of the new approach, as set out in the federal government's new "Wild Salmon Policy."

## **CANADA'S POLICY FOR CONSERVATION OF WILD PACIFIC SALMON**

In May 2005, Fisheries and Oceans Canada, after intense public pressure and broad consultations, released its Wild Salmon Policy (WSP). Its key features are as follows:<sup>19</sup>

- The goal of the Wild Salmon Policy is to restore and maintain healthy and diverse salmon populations and their habitats for the benefit and enjoyment of the people of Canada in perpetuity.
- This policy goal will be advanced by safeguarding the genetic diversity of wild salmon populations, maintaining habitat and ecosystem integrity, and managing fisheries for sustainable benefits.
- Conservation of wild salmon and their habitat is the highest priority for resource management decision-making.
- Resource management processes and decisions will honour Canada's obligations to First Nations.
- Implementation of this policy will involve an open and inclusive process aimed at making decisions about salmon stewardship that consider social, economic, and biological consequences. People throughout British Columbia and the Yukon will contribute to decisions that reflect society's values for wild salmon.
- Wild salmon will be maintained by identifying and managing "Conservation Units" (CUs) that reflect their geographic and genetic diversity. A CU is a group of wild salmon sufficiently isolated from other groups that, if lost, is very unlikely to recolonize naturally within an acceptable timeframe (e.g., a human lifetime or a specified number of salmon generations).
- The status of CUs will be monitored, assessed against selected benchmarks, and reported publicly. Where monitoring indicates low levels of abundance, or deterioration in the distribution of the spawning components of a CU, a full range of management actions to reverse

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<sup>18</sup> Nelson and Turriss 2004

<sup>19</sup> DFO (2005)

declines—including habitat, enhancement, and harvest measures—will be considered and an appropriate response implemented.

- Measures for habitat protection and salmon enhancement will focus on sustaining wild salmon. An integrated approach to habitat management—including assessment of habitat condition, identification of indicators and benchmarks, and monitoring of status—will be adopted that links fish production with watershed and coastal planning and stewardship initiatives.
- Ecosystem considerations will be incorporated into salmon management. Indicators will be developed to assess the status of freshwater ecosystems. Information from ocean climate studies of marine survival and of the biological condition of salmon will be integrated into the annual assessments of salmon abundance that guide salmon harvest planning.
- The policy aims to maintain CUs but recognizes there will be exceptional circumstances where it is not feasible or reasonable to fully address all risks. Where an assessment concludes that conservation measures will be ineffective or the social or economic costs to rebuild a CU are extreme, the Minister of Fisheries and Oceans may decide to limit the range of measures taken. Such a decision will be made openly and transparently.
- This policy will foster a healthy, diverse, and abundant salmon resource for future generations of Canadians. It will support sustainable fisheries to meet the needs of First Nations and contribute to the current and future prosperity of Canadians.

From a commercial-industry perspective, the Wild Salmon Policy is only less onerous in its potential impact than Canada's new Species At Risk Act, but the WSP is in itself a means by which SARA-type conservation actions can be taken in advance, so to speak, to avoid the legal listing of a "conservation unit" of salmon under SARA. In any case, the WSP will have profound impacts upon B.C.'s commercial salmon fishery.<sup>20</sup>

The most relevant objective of the WSP, in assessing its implications for conventional salmon-fishery management, is the emphasis it places on safeguarding the genetic and spatial diversity of wild Pacific salmon.

The policy explicitly acknowledges that conventional management of large fisheries has failed to protect genetic diversity. Consequently, not only is the commercial salmon fishery now expected to adhere to reduced harvest levels, but fisheries management is expected to ensure that individual conservation units of salmon are not overharvested.

This will mean the imposition of new and severe limits on the fishery's impact on small runs where conservation concerns exist, and reductions in the fishery's impact on non-target conservation units and non-target salmon species. As we have seen, the current

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<sup>20</sup> Gislason & Associates Ltd. 2004

management system is logistically incapable of adequately addressing these issues except by dramatic fishing restraints and outright closures.

The WSP does allow for trade-offs between conservation and social and economic considerations where recovery costs are deemed extreme. But these are political decisions, and voters now have little tolerance for politicians who make trade-offs to the detriment of any renewable resource, especially salmon.<sup>21</sup>

For these reasons, it is in the interests of the commercial industry to find a way out of the constant tug-of-war between conservation objectives and socio-economic objectives. It's in the industry's interest to focus on resource-management and fishery-practice alternatives that will protect the genetic and spatial diversity of salmon while still permitting an economically viable salmon fishery.

## **WHY TRANSFERABLE SHARES WORK**

Under transferable share management, each fisherman is assigned a percentage share of the fishery's target catch. Fishermen know how much fish they can take before the fishing begins. The competitive nature of the fishery is removed. Fishermen no longer focus on catching as much fish as possible in the time permitted; with a share of the catch assured, fishermen no longer need to race for the fish.

Importantly, the economic incentive shifts from volume to value. The focus shifts to maximizing profits through increasing the value of the catch and keeping costs low.<sup>22</sup>

Environmental Defence, a highly-respected American conservation organization, recently undertook a comprehensive study of transferable-share management that documents how these fisheries in the United States and British Columbia have performed against key environmental, economic and social goals since their transition from conventional fisheries management.<sup>23</sup>

The 14-month project assembled a team of 30 specialists who examined 150 studies and academic papers and collected data on nearly 100 U.S. fisheries. They analyzed 10 existing American and U.S.-Canada share fisheries, and undertook direct fieldwork in three existing share fisheries and in two fisheries contemplating a transition. The results are impressive.

### **1. Complying With Catch Limits**

Under conventional management, catch targets were exceeded nearly 65% of the time for the fisheries studied. However, once these fisheries converted to catch shares, compliance with catch limits rose from 35% to 75% and combined landings averaged 5% below the total allowable catch.

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<sup>21</sup> Nelson and Turriss 2004

<sup>22</sup> Environmental Defence 2007; Jones 2003

<sup>23</sup> Environmental Defence 2007

The B.C. Experience: In the ten years preceding the introduction of catch shares in British Columbia’s commercial halibut fishery, catches consistently exceeded target levels. In the year before the transition to catch shares, the allowable harvest level was exceeded by 22 percent. Since catch shares were introduced in 1991, harvests have been below target levels, with the exception of three years—in 1993 and 1999, catches exceeded target levels by just over one percent, and in 2000, the allowable catch was exceeded by 0.2 percent.<sup>24</sup>

According to Environmental Defence, the turnaround in compliance was due to the fact that instead of indirectly controlling catch through effort controls, regulators are now directly controlling the catch: Each fisherman is responsible and held accountable for his or her catch, which in turn results in collective responsibility.

The B.C. Experience: Gislason (2007) and Staley (2007) note that all conventionally managed southern B.C. salmon fleets that targeted Fraser River sockeye in 2006 exceeded their total allowable catch. But there were no penalties—no relinquishments of overages, and no sanctions or fines imposed.

In contrast, there was a small transferable-share pilot program in one of the salmon troll fisheries for sockeye in the same year. A mandatory dockside monitoring program was in place. The troll transferable-share program was the only salmon fishery that managed to stay within its catch limit for Fraser sockeye in 2006.<sup>25</sup>

## **2. Better Science and Monitoring**

Scientists can collect more accurate and timely data with better monitoring in place. Of the fisheries studied, by Environmental Defence, 72 percent of those managed under catch shares had monitoring programs, compared to only 26 percent for conventional management regimes.

Further, the precision of biomass and fish abundance estimates improved under catch share management, dropping from a dangerously wide margin of +/-50 percent, five years before implementation to +/-25 percent, five years after implementation.

The Environmental Defence report notes: “Setting a catch limit based on uncertain science can result in dramatic negative impacts...better monitoring lead[s] to better science, better science leads to reduced uncertainty and reduced uncertainty leads to more appropriate catch limits. The result is healthier fisheries.”<sup>26</sup>

The B.C. Experience: A recent report on catch monitoring in the B.C. commercial fishing sector illustrates that those fisheries managed under transferable shares have effective monitoring programs in place while the salmon fishery relies on self-reporting hail, logbook and sales-slip systems that have been found inadequate by a number of studies.<sup>27</sup>

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<sup>24</sup> Jones 2003

<sup>25</sup> Gislason 2007

<sup>26</sup> Environmental Defence, 2007, Page 14

<sup>27</sup> Gislason 2007.

### 3. Reducing Bycatch

In the fisheries studied by Environmental Defence (2007) bycatch was reduced by more than 40% following the implementation of transferable share management. As fishermen no longer have to race for the fish, they gain the flexibility to try to fish more selectively by targeting their fishing effort and experimenting with new techniques and gear.

The B.C. Experience: After the implementation of transferable shares in the groundfish trawl fishery, the ratio of discards to landed weight declined as fishermen learned to fish more selectively (Grafton et al. 2004). For some species the drop in discards to retained catch has been dramatic—in 2003/04 the ratio of discards to retained catch for spiny dogfish was just 5% of 1997/98 levels (Grafton et al. 2004).

According to Grafton et al. (2004) this change can be directly attributable to adjustments fishermen made in fishing time, area and length of tow to ensure that bycatches of non-target species did not prevent them from fishing.

### 4. Limiting Fishing Impacts on Habitats

The Environmental Defence study found improved gear design and a reduction of gear in the water allowed by the transition to transferable shares resulted in an overall reduction of 20 percent in fishing effort, time fished and gear deployed.

The B.C. Experience: Prior to the transition to catch shares, the frantic pace of British Columbia's commercial sablefish fishery resulted in fishing gear being lost or left on the grounds where it continued to fish. Since the introduction of transferable shares this problem has been largely eliminated.<sup>28</sup>

### 5. Making Fishing Safer

Commercial fishing is a dangerous profession due to the combination of the power and isolation of the ocean, the heavy machinery involved and the often-frantic pace of the fishery. Under conventional fisheries management, fishermen compete against each other and race to catch the fish. Fishermen are often compelled to risk their lives in order to make a living. Vessels end up operating in inclement weather often far from potential assistance and crews exist on little or no sleep.

Based on the fisheries they reviewed, Environmental Defence reports that in the five year period prior to the implementation of share-based management, safety deteriorated on average by 20 percent from previous levels. In the five years following the introduction of transferable shares, safety increased 2.5-fold.<sup>29</sup>

The B.C. Experience: In the geoduck clam fishery, prior to the implementation of share management, openings were short and the pace was frantic. A defined share of the available harvest meant that divers no longer had to race, the season was longer,

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<sup>28</sup> Jones, 2003

<sup>29</sup> Safety was measured by decreases in fatalities, vessels lost, search and rescue missions and safety violations issues.

and harvesting activities took place under safer, more stable conditions. The number of accidents involving divers dropped, and a survey of the fleet revealed that many of the fishermen felt that the improvement in safety was one of the best things about moving to a share system.<sup>30</sup>

## 6. Improving Economic Performance

In the fisheries Environmental Defence studied, a common rationale for moving to transferable shares was poor economic performance and, in every case studied, financial viability improved dramatically. In the five years leading up to transferable share management, revenue per vessel had declined by an average of 10 percent; in the five years following the transition to transferable shares, revenues rose by 80 percent, on average.<sup>31</sup>

Environmental Defence also notes that fishing seasons were extended on average by the equivalent of 35 work weeks per year. A longer season means fishermen can land product more consistently, provide fresh fish for a longer period of time, and produce higher quality seafood—thus creating more value from the fishery.

The B.C. Experience: The roe herring, groundfish trawl and halibut longline fisheries are all managed under forms of transferable share regimes. Except for minor pilot projects, the salmon fishery is managed in the conventional manner. In a recent report card for B.C. fishing fleets, Gislason (2007) concludes that the roe herring, groundfish and halibut fleet are all economically viable, while the salmon fleets are not. The competitive fishery management system does not promote the hallmarks necessary to operate successfully in the global seafood industry.<sup>32</sup>

One important conclusion of the Environmental Defence report is that the Marine Stewardship Council's independent eco-labeling process is *seven times more likely* to rate a catch share fishery as "well managed" than a fishery under a conventional management system.

Also, a conservationist report card on the Strait of Georgia roe herring fishery—which operates under a catch-share regime—was completed after an extensive analysis by the Sierra Club of Canada's B.C. Chapter in 2003. The report card resulted in an overall grade of "B".<sup>33</sup>

Although the B.C. salmon fisheries are currently working their way through the Marine Stewardship Council certification process, a major retailer in the United Kingdom has informed the industry that 2007 will be the last year they will purchase non-MSC certified salmon from Canada. All indications are that other UK retailers, and many European retailers, will soon follow suit.

A loss of this market would represent a significant financial blow to British Columbia's commercial salmon fishery.

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<sup>30</sup> Jones, 2003

<sup>31</sup> Environmental Defence, 2007.

<sup>32</sup> Gislason & Associates Ltd., 2004.

<sup>33</sup> Wallace, Glavin, 2003.

Whether or not the Marine Stewardship Council intends to grant approval to any of British Columbia's salmon fisheries was an open question at the time this discussion paper was being written. While some sectors of the salmon fishery should be expected to win tentative MSC approval, it should also be expected that the stipulated conditions will pose further, extreme challenges to the conventional management regime.

## **TRANSFERABLE-SHARE EXPERIMENTS IN BRITISH COLUMBIA'S COMMERCIAL SALMON FISHERIES**

Motivated by the need to curtail excess fishing effort and to move the focus of fishing from maximizing volume to maximizing value, a number of catch-share salmon fisheries have been quietly underway in British Columbia, on an experimental basis (Barkley Sound, San Juan, Johnstone Strait, Area F troll).

These pilot programs provide a glimpse of what catch share fisheries could mean for the commercial salmon fishery in general. The results from the pilot programs tend to be similar, and they conform to the patterns Environmental Defence observed in its studies. Specifically:<sup>34</sup>

- fisheries tended to be slower-paced;
- fisheries were generally open for a longer period of time;
- share fleets fished to their designated catch levels and in the case where an overage occurred it was limited to three percent of the allowable harvest;
- catch of non-target species still occurs, and there is room for improvement, but in some instances "bycatch" appears to have been minimized;
- better catch monitoring produced more timely and accurate catch data, which in turn gave managers greater confidence in the catch and rate of harvest, which in turn allowed DFO to provide the fleet greater flexibility to harvest their catch;
- improved product quality in some cases;
- few increases in landed prices—but this has been attributed to the fact the pilot programs tend to be single-year projects and it takes time to build markets.

While it is not feasible to discuss each pilot project in detail, Gislason & Associates Ltd. (2004) provides a concise summary of the 2002 Barkley Sound seine fleet catch share fishery that could serve as a useful example of how transferable shares could be applied to the salmon fishery generally.

### ***Issue***

During the early 1990s, sockeye salmon stocks declined dramatically in Barkley Sound on the west coast of Vancouver Island. After peaking at almost two million fish in 1991, sockeye returns fell by ten times to only 200,000 returning fish in 1995. There was no commercial seine fishery in the Sound

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<sup>34</sup> This section draws from a number of reports, Archipelago Marine Research Ltd. (2003), GSGislason & Associates Ltd. (2004), GSGislason & Associates Ltd (2006b), Christopher Sporer Consultants Ltd. (2006).

between 1994 and 2001. Then in 2002 DFO identified the opportunity to have a limited sockeye seine fishery in Barkley Sound Area 23. However, the Department was not willing to accept a competitive fishery for all 159 southern licensed seine vessels, as such a large fleet was considered unmanageable.

***Response***

A seine fishermen’s association suggested a way to match fleet size to size of the fishing opportunity. The pilot initiative for 2002 entailed:

- designating weekly catch targets or total allowable catches (TACs) for the total commercial sector;
- consulting with the three commercial sectors (seine, gillnet, and troll) on splitting the weekly TAC;
- segmenting 159 seine licences into eight working groups;
- designating approximately one seine vessel to catch each 2,000 to 3,000 TAC component;
- validating all catches through a dockside monitoring program (DMP); and
- implementing “catch-up/make-up” for underages/overages from one week to the next.

***Results***

As a result of the industry plan, there was a commercial seine fishery in Barkley Sound for the first time since 1993. The aggregate TAC of 205,000 sockeye was met exactly. The bycatch of 110 Chinook and coho salmon was minimal and all were released live. Other benefits included: (1) lower costs; (2) higher quality/shorter trips; (3) no visible gear conflicts; (4) co-management and cooperation fostered among the gear sectors; and (5) the opportunity to test selective fishing gear/techniques.

<b>Fishing Week (2002)</b>	<b>No. of Days Fished</b>	<b>No. of Vessels Fishing</b>	<b>Total Allowable Catch (fish)</b>	<b>Catch (fish)</b>
June 16 – 22	1	2	4,000	3,721
June 23 – 29	2	5	20,000	14,624
June 30 – July 6	2	13	40,000	45,954
July 7 – July 13	2	14	40,000	38,915
July 14 – July 20	4	18	60,000	60,915
July 21 – July 27	2	13	41,000	41,000

***Lessons Learned***

The Barkley Sound pilot showed that effective solutions are fisherman-driven. DFO is willing to accept creative approaches as long as the fishery is sustainable, that is: (1) industry can demonstrate its ability to fish to a TAC; (2) an industry-funded catch monitoring program is in place; and (3) the bycatch is controlled. Slowing down the harvest can increase fish quality, but

this higher quality fish needs to be handled, processed, and marketed differently.<sup>35</sup>

By using transferable shares, the competitive aspect of the fishery was removed. Not all vessels fished, but *transferable shares allowed all licence holders to benefit*.

The conservation benefits are apparent. The fishery was not conducted in one short intense burst, but rather in small scale “bites” taken over a six-week period. Slowing down the fishery in this way reduces the risk of overharvesting errors and offers greater opportunities to more closely monitor the bycatch of non-target species.

## CONCERNS AND CONTROVERSIES

No fisheries management regime is perfect. Despite the demonstrated conservation benefits of transferable-share management, there are still matters of concern and potential drawbacks to consider. In addition, as in the restructuring of any business, the transition to transferable shares involves change where people, communities and fishing-related businesses can be affected, positively or negatively.

This tends to generate a fair amount of “heat and light” in any discussion of transferable shares. This is particularly true for salmon, due to the unique status they occupy in British Columbia’s culture and sense of place (Glavin 2003).

This section looks at some of the concerns generally associated with transferable share management.

### *Practicality*

Due to the highly migratory nature of the salmon resource, it can be difficult to set a total allowable catch prior to the fishing season, and harvesting can only occur for a limited time during the year. These reasons are often cited by people who raise doubts about whether it is feasible to implement a transferable-share regime in British Columbia’s commercial salmon fishery.

But these reasons do not always apply. Chinook and coho can be harvested over a longer period of time and, due to their biology and their capacity for assessment, ocean fisheries for these species lend themselves more readily to sustainable catch targets and in-season adjustments to catch limits.

For other salmon species, however, specific challenges do arise from the migratory and spawning behaviour unique to them. Nevertheless, the transferable share pilot projects that have been attempted provide direct evidence that such a management regime is possible for these species.

Examples such as the 2002 Barkley Sound pilot program illustrate how even for a highly migratory species such as sockeye, which is only available for harvest for a limited time, transferable share management can work. The important point to remember

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<sup>35</sup> G.S. Gislason & Associates Ltd. (2007)

is that in every salmon opening the fleet is fishing to a target, and that target will form the basis for a transferable share program.

The B.C. groundfish trawl transferable-share fishery is enormously complex. The fishery includes over 55 distinct quotas, individual species caps, total holdings caps, rules for fish released at sea, 100% at-sea monitoring and 100% port monitoring and validation. The fishery is far better at meeting conservation (and economic viability) objectives as a result. A transferable share program for the salmon fishery may prove similarly complex.

But that shouldn't be a reason to not move forward.

### ***Privatizing a Public Resource***

There is much concern that transferable shares, particularly "individual quota" regimes, will unavoidably result in the privatization of fisheries resources. This is a myth.

In Canada, fish are a distinct kind of "common property" resource. Wild fish are Crown-owned, which is to say they are owned by the people of Canada. This fact has been reiterated by the courts on several occasions, most recently in 2006 by the Federal Court of Canada and the Federal Court of Appeal.<sup>36</sup>

Similarly, in Canada, there is no "public right to fish" as the phrase is routinely used.

When Canada limits entry into a commercial fishery, the Minister of Fisheries and Oceans is at liberty to issue licences to certain Canadians, granting permission to catch a particular species of fish or marine plant for the purposes of economic gain. In doing so, the government excludes other Canadians from engaging in that same activity for the species in question.

A commercial fishing licence is subject to conditions attached to the licence, and a licence is precisely that. It is a limited fishing privilege. It is not an absolute or permanent right. It is not property.

Transferable shares, in the form of quotas, or any such arrangement, are a condition attached to the licence that sets out how much fish (in percentage, pounds or pieces) that may be retained by the licensee. While one might use the term "property right" as shorthand to describe the nature of access to an allowable catch, that "share" in the fishery does not establish any property rights to the resource itself.

A transition from a conventional limited entry fishery to a catch-share fishery causes no change to the legal status of the licence. The licence—along with the transferable catch shares attached to it—remains a limited fishing privilege, and not a property right.

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<sup>36</sup> Federal Court docket A-775-05; Federal Court of Appeal docket A-152-05 ;

### ***First Nations Interests***

As previously noted, in 2004, leaders of the First Nations Summit and the B.C. Aboriginal Fisheries Commission appointed a panel to articulate a vision for future fisheries management and allocation, as well as outline the principles that would help achieve that vision. The panel produced a report with recommendations aimed at ensuring the conservation of fisheries resources while bringing a high degree of certainty to aboriginal and non-aboriginal interests alike.

The "Our Place At The Table" report's proposed moratorium on the introduction of any new quota fisheries specifically objected to "individual property rights regimes" prior to the resolution of aboriginal concerns. Importantly, the report called for steps to ensure that First Nations have access to adequate fish for food, social and ceremonial purposes—a reflection of the increasing inability of the current regime to meet court-ordered obligations to provide First Nations with adequate access to salmon.

While transferable-share fisheries do not confer "property rights" to the resource, they do hold out the promise of better controlling commercial harvests and enabling managers to better meet their constitutional obligations.

Importantly, transferable shares might also be used as the means by which either licences, or shares of the total-allowable catch (which varies from year to year, from species to species, and also varies between conservation units) might be transferred, by lease or sale, by a government-funded independent board or trust of the kind proposed by First Nations organizations and some industry groups.<sup>37</sup>

The flexibility built into transferable-share fisheries is well-suited to accommodate variations in the abundance of salmon runs. Those variations provide both opportunities and obstacles to both in-river aboriginal fisheries—which tend to be more selective and stock-specific—and to saltwater commercial fisheries, which tend to be concentrated in mixed-stock areas where fisheries often present threats to small and endangered runs.

A transition to transferable shares opens up the possibility of upriver aboriginal fisheries and saltwater commercial fisheries engaging in share-trading and lease arrangements on an annual basis, determined by the abundance or scarcity of specific salmon runs, and by fluctuations in the level of conservation concern associated with small or weakened stocks.

At a minimum, transferable shares are well suited to serve the terms of interim agreements, providing economic benefits to First Nations until such time as comprehensive treaty agreements are settled. Ultimately, for the purpose of treaty settlement, transferable shares provide a greater range of options, and a greater degree of fairness and certainty, to commercial licence shareholders.

### ***Increased Costs to Enter the Fishery***

One of the common criticisms levelled at transferable share management is that they make it prohibitively expensive to enter the fishery. Indeed, Gislason & Associates

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<sup>37</sup> Turning Point, 2004 *Our Future Harvest: A New Approach to Coastal First Nations' Commercial Fisheries*.

Ltd. (2004) notes that British Columbia fisheries managed under transferable shares have shown the greatest growth in licence values.

However, the same report also illustrates that the licence values of fisheries managed by conventional means can also be high (e.g., roe herring in 1994, prawn trap in 2002). What's key here is that the value of access privileges to the fishery—whether by licence or by transferable shares—is a reflection of the profitability and the long-term sustainability of the fishery. Licence values are determined by the anticipated stream of future rents.

Those fisheries that are economically viable will tend to have higher access-privilege values, which means it will cost more to enter. Fisheries that are generally not economically viable—which also usually means unsustainable—will have lower values. Therefore, they will be less expensive to enter. Fisheries managed by catch shares are generally economically viable, which will be reflected in a higher licence and catch share values.

In any industry, it costs more to buy the profitable businesses, while companies that are losing money can generally be acquired for substantially less money.

The real issue is that traditional financial institutions do not recognize commercial fishing licences and catch shares as secure assets – after all, licences and quotas are not property, as such—and do not make loans for their purchase.

In other industries, entrepreneurs can use the assets of the company as collateral to secure financing for its purchase. Unfortunately, fishermen generally do not have this option. This is problematic as licence and transferable shares make up the largest component investment in commercial fishing.<sup>38</sup>

Fishermen must often rely on non-traditional financing sources for debt financing of licence and share purchases. Processing companies will often provide loans at favourable terms but, in return, require some form of contract on the licence or share, and access to the licence's production. The result is processor control over the licence and its production, at least during the term of the loan.<sup>39</sup>

Relatively high commercial-licence and transferable-share values would tend to indicate that the fishery is economically viable, so what is needed is a way to resolve the problem of access to capital. Just one option is some type of licence registry that would allow commercial fishing licences and transferable shares to be treated as intangible personal property for business purposes, while maintaining the common-property nature of the salmon resource.

New entrants would benefit from having greater access to capital. The more assets a fisherman has, the greater opportunity they have to leverage access to capital. The more security they can offer, the lower their interests rates will be on borrowed capital.

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<sup>38</sup> Gislason & Associates Ltd, 2004.

<sup>39</sup> Gislason & Associates Ltd, 2004.

### ***Ownership Concentration***

Another concern associated with catch share management is that it will lead to excessive concentration of fishing privileges in the hands of just a few owners.

It is likely that there would be some initial consolidation. However, in its recent study, Environmental Defence observed no significant change in concentration after transferable catch shares were introduced.

In addition, many catch share programs set specific limits on the total percentage of the allowable catch that one owner can hold. For example, to ensure fishing privileges remain dispersed, commercial halibut vessels in British Columbia are limited to fishing a maximum of one percent of the allowable harvest.

Environmental Defence also notes that, due to economies of scale, fisheries requiring capital intensive ships and processing will have a high concentration of ownership regardless of the management regime in place. One such example is the groundfish trawl fishery in British Columbia, which already had a high concentration of ownership before it moved to a transferable share management.

It's important to note that British Columbia's commercial salmon fishery, in comparison with other B.C. fisheries, exhibits a generally higher degree of corporate concentration than B.C.'s existing "quota" fisheries. The salmon fishery is characterized by vertical integration—processing companies own or control a large number of fishing licences. In addition, the processing sector is dominated by a handful of firms, most notably the Canadian Fishing Company, which accounts for perhaps half of the commercial fishery's salmon production.<sup>40</sup>

Transferable-share fisheries actually provide opportunities for a variety of interests to be represented in share ownership and control.

For example, as part of the negotiations over the initial allocation of shares in the B.C. groundfish trawl fishery, a range of interests were included—crew, shoreworkers, processors, fishing communities and licence holders. Only 80 percent of the species' total-allowable-catch was allocated to licence holders; the remaining 20 percent were placed under the purview of the Groundfish Development Authority. The GDA was charged with promoting regional development, market and employment objectives, sustainable fishing practices and fair and safe treatment of fishing crews.<sup>41</sup>

In Alaska, commercial halibut fishery crew members are permitted to buy sell and hold shares.

In B.C., meanwhile, the conservation group Ecotrust has set out a series of recommendations to ameliorate corporate concentration in the fisheries and head off the potential loss of groundfish quota held in coastal communities. Ecotrust's proposed approach is easily adaptable to the potential for transferable shares in the salmon fishery.<sup>42</sup>

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<sup>40</sup> Glavin, 2003; Gislason & Associates Ltd., 2004

<sup>41</sup> Grafton et al., 2004

<sup>42</sup> Ecotrust, 2004.

### ***Employment and Transition Costs***

In its study, Environmental Defence does caution that the transition to transferable shares changes the business of fishing. They note that job stability improves under transferable share management—a typical crew position provided the equivalent of just one-half day of work per week prior to the implementation of catch shares and more than four days of work per week after the transition. However, the total number of available crew positions decreased by half. Fewer people remain in the fishery but those working have more steady employment, which actually ends up generating a greater amount of total labor, as measured in fishing hours per season.

Jones (2003) reports similar results for the B.C. commercial fisheries that have moved to transferable share management. But transferable shares also create employment opportunities in the various monitoring programs that accompany this management regime.

It has also been noted that the employment problem associated with the transition to transferable shares is not really about the reduction in the number of jobs; rather, the issue is that there were too many people working in the fisheries in the first place. Trying to build excess employment on the back of fisheries resources can be dangerous. Such excess employment puts too much pressure on fish stocks.

The desire to maintain employment was one of the factors that led to decision makers ignoring warning signs in the Atlantic cod fishery; history tells us that it is preferable to undergo some short-term transition adjustments than to allow the collapse of an entire fishery.<sup>43</sup>

## **DISCUSSION**

As previously noted, we do not assert that transferable shares would mean a perfect fisheries management system for salmon. Rather, what is important is whether or not transferable shares would represent an improvement over the current management regime.

To put the question as narrowly as possible: Would transferable shares provide a better chance of achieving the conservation objectives of the Wild Salmon Policy?

We say "yes," for the following reasons.

To safeguard genetic diversity of wild Pacific salmon, commercial fisheries must adhere to the allowable harvest levels for each of scores of conservation units. Similarly, the commercial fisheries must be able to minimize, or eliminate, any impacts on non-target conservation units, and other species of salmon, in the prosecution of the fishery.

The B.C. salmon fishery is clearly trapped in a competitive fishery that is driven by an overwhelming incentive motivating fishermen to fish as hard as possible, to try to catch as many fish as possible, in as short a time as possible. The evidence clearly shows that competitive fisheries are less likely to adhere to allowable catch levels than those managed by transferable shares.

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<sup>43</sup> Environmental Defence, 2007; Jones 2003

Currently, commercial salmon openings are still conducted in short, intense bursts. The impact on the resource takes place in a very short period of time. Given that the fleet still possesses considerable catching power, this can only result in the chronic and unavoidable peril of target conservation units being fished at unsustainably high harvest rates.

In contrast, longer openings have been observed in most of the transferable-share pilot programs for salmon. The pace of the fishery slowed because fishermen didn't need to engage in the "race for the fish."

With the harvest spread throughout the migration, and taken in more manageable, small-scale "bites," taken over a longer period of time, mixed-stock fisheries can be made more manageable, their in-season impacts easier to assess. A slower-paced fishery would open the possibility for genetic analysis of catch composition, in-season, allowing precise targeting on strong run components, and avoidance of weak ones. A slower-paced fishery affords time and opportunity to adjust in-season, if a downgrade in run-size proves necessary.

Under a short, intense fishery, by the time it becomes apparent that a downgrade is required, it may be too late.

Controls placed on individual harvests results in both individual and collective responsibility. Shifting the management focus from "inputs" to "outputs" also frees up the fishermen to innovate, trade, and experiment—either as individuals, or in groups.

When individual catch shares replace the fisherman's capacity to out-fish other fishermen as the determining factor in individual catch limits, a host of new possibilities present themselves. Not the least of these opportunities is the utilization of selective technology (live-capture gear, alternative mesh sizes, escapement grids, barbless hooks, knotless web) and methodology (depths fished, time of day, duration of opening).

Under the current management regime, there is little incentive to experiment with selective fishing gear and techniques. Fishermen who are trying to catch as much fish as possible in as short a time as possible will naturally tend to gravitate to methods and gear designed for volume, rather than selectivity and quality.

Where progress has been made in moving the commercial salmon fishery to more selective fishing methods, it has tended to be because of regulation, rather than by individual innovation and ingenuity. Non-compliance with these regulations—seiners refusing to "brail" for non-target species in their catch, and gillnetters refusing to use "revival boxes" for non-target species in their catch—appears to be commonplace.

DFO has "pushed" fishermen to fish selectively rather than "pulled" the fleet there through the use of proper incentives. Current selective fishing initiatives are nowhere near as effective as they could be at safeguarding genetic diversity.

Transferable share management, by freeing fishermen from the treadmill of competition, will provide incentives for cooperation, the pooling of gear and resources, and the sharing of costs. Fewer active vessels can mean less gear in the water, less risk to conservation-unit integrity, and less risk to non-target conservation units.

Transferable shares would allow the fishery itself to move from opportunity to opportunity, as circumstances demand. By breaking down competition between fishermen and between fish gear-types and areas, more opportunities become available for the relocation of fisheries away from dangerous mixed-stock areas, whenever necessary.

In years when conservation concerns for certain conservation units are particularly acute, fishermen who normally prefer fishing in mixed-stock areas can "sit out" the season without substantial economic loss, by transferring their shares to more efficient or selective operators, or to fishermen in more terminal areas, where conservation units can be harvested more selectively.

Similarly, from time to time, in years of particular abundance, upriver First Nations may choose to transfer some of their economic-opportunity harvests to willing-buyer fishermen in the fishing grounds of the approach areas.

Depending on the conditions in a given year, access to Fraser sockeye could be readily shared among and between seiners in Johnstone Strait, gillnetters fishing just below Mission Bridge, and aboriginal communities upstream of Hell's Gate. The focus of fishing effort for Skeena River sockeye could be similarly transferred from time to time, from sector to sector. Skeena salmon could be taken mainly by trollers and the net fleet at sea, or by First Nations harvesters far upriver, depending on conditions that naturally change from year to year.

The current management system provides no mechanism to move catch between licence areas (e.g., from ocean fisheries to in-river fisheries), and no way to compensate those fishermen who temporarily forego fishing opportunities. A transferable-share system could allow fishing effort to be transferred between licence areas without increasing the number of vessels in an area, and without economic loss to fishermen.

A transferable-share system, in summary, would be better.

## **CONCLUSION**

The answer to the question—Would transferable shares provide a better chance of achieving the conservation objectives of the Wild Salmon Policy—is clear.

The answer is yes.

Compared to B.C. fisheries that are managed by transferable-share regimes, the salmon fishery scores poorly on both sustainability and economic-viability grounds.

The current salmon-fishery management system is outdated and ineffective.

A transferable-share fishery would be a much better way to manage the commercial salmon fishery and meet the conservation objectives of the Wild Salmon Policy.

It may be the only way.

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