

The Effects of Buy-Back Programs in the British Columbia Salmon Fishery

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Abstract

Policymakers have implemented five distinct buybacks of either vessels or salmon licenses over the past three decades in the British Columbia (BC) salmon fishery. The earliest buyback was one of the first of its kind in any fishery and the most recent buyback is one of the largest ever in terms of reducing vessel numbers and the funds used. This paper reviews the circumstances under which these buybacks were conducted with an emphasis on their impact on reducing fishing capacity and effort. The focus is on the two most recent buybacks that took place in 1996 and 1998-2000, what has been learned and what they have achieved.

Of the three factors that can solve the [salmon] fleet's financial problems - volume, prices, and fleet size - only the third can be realistically influenced by government. The other two factors are largely at the whim of Mother Nature or world markets.

Gislason et. al. (1998), *Fishing for Money*

1. Introduction

The British Columbia (BC) salmon fishery has implemented five distinct buybacks of either vessels or salmon licenses over three decades. This paper reviews the history, motivation and outcomes of these buybacks with an emphasis on their impact on reducing fishing capacity and effort.

The paper is structured as follows. In the following section we provide an historical review of the salmon fishery, separated into two distinct periods. Section three provides an overview of all the buybacks, but gives a more detailed analysis of the two most recent buybacks that took place in 1996 and 1998-2000. Section four discusses what the buybacks have achieved and what was learned in the design of the programs. The concluding remarks provide an overview of the experiences in the salmon fisheries and what they imply about the ultimate effectiveness of buyback programs.

2. History of the Commercial BC Salmon Fisheries

Commercial exploitation of the fisheries began in earnest in 1870 with the establishment of the first salmon cannery on the BC coast. At about this time various forms of fisheries

regulations were introduced to ensure sustainability of salmon stocks. The goal was to ensure adequate escapement and spawning numbers while providing access for native, commercial and recreational fishers. The management controls at this time included weekly fishing closures for some salmon species and rivers to allow sufficient fish to spawn upstream, and the issuing of licenses to limit the number of vessels (Healey 1993). In one scheme the number of boats allowed to fish for salmon on the Fraser River was capped to the canning capacity, but the control on vessel numbers was ultimately unsuccessful because canneries were able acquire more boats by increasing their canning capacity.

In general, the early efforts at regulation proved ineffective in terms of controlling fishing effort such that by 1917 a Royal Commission found that the same quantity of fish could be caught with less labor and capital (Sinclair 1978). By 1927 a management system had evolved along the coast to limit fishing effort via openings and closures along with the collection of data on landings and salmon escapement.

1946-1979 Period

Modern fisheries management can be dated to 1946 and the establishment of the International Salmon Fisheries Commission (IPSC) to manage sockeye escapement. As in the early years, the focus was to ensure adequate escapement, supplemented with hatcheries and habitat protection. Calculating sufficient escapement, traditionally based on ratio of spawning area up stream occupied by one spawning pair, has proved an inexact science, but still remains a keystone of fisheries management.

By the 1960s fishers and managers were concerned that the size of the fishing fleet was too large and that this would have a negative consequences for both the sustainability and financial viability of the industry. A key study released in 1960 (Sinclair 1960) argued for the halt in any further increase in the salmon fleet, a gradual reduction in the number of vessels, and area regulations that would limit as to where certain vessels could fish. By 1968, the findings of the report had become official fisheries policy and a system of provincial-wide vessel licensing was introduced in 1969, known as the *Davis Plan* after the then Minister of Fisheries. The licensing created two types of licenses: Class A licenses for fishers, whose principal form of livelihood was from fishing, and a Class B license for persons where fishing was a part-time activity. The splitting of the licenses was designed to ensure the gradual exit of part-time fishers as the Class B licenses were originally set to expire after 10 years, although this was subsequently extended to 15 years. Fishers were assigned the more desirable Class A licenses if they could provide evidence that they caught any fish species with a value in excess of \$1,250 in either 1967 or 1968 and were, initially, unrestricted as to what fishing gear they could use: seine, troll or gillnet. To assist Native fishers, a third category, Class AI licenses, were established in 1971 that allowed natives to hold an A license, but with a much reduced annual license fee of \$10 instead of \$200.

A key component of the *Davis Plan* was a buyback of fishing vessels that began in 1970 and ended in 1973 funded from vessel license fees and sales of retired vessels. In total, 361 vessels were purchased and removed from the salmon fishery over this period. At the time, this was the first ever buyback conducted in a Canadian fishery, and government officials developed the program without any models from which they could

draw examples. One lesson learned from this buyback was that purchasing vessels along with licenses was costly; although proceeds from vessel sales helped raise some funds, many of the vessels purchased could not be sold quickly, and the government incurred maintenance costs as well as losses from vessels both sinking and depreciating in value.

From 1971 onwards fishers wishing to replace an existing vessel with a larger vessel were also required to purchase another licensed vessel such that the gross tonnage of the two existing vessels was equal to or greater than the replacement vessel. By 1977, the number of vessels in the salmon fisheries had declined some 17% to just over 5,000, but an increase in the average size of vessels, improved fishing gear, and a shift to more effective methods of fishing (such as seining) led one observer to conclude that the capital value of the fleet had increased by about a half over the decade 1968-1978 (Fraser 1979). In response to this concern, a cap was placed on the total number of Class A licenses that could be used on seine vessels in 1977, and in 1982 the salmon fleet was split into those vessels that could use all three gear types and those that could only fish using gillnet or troll gear.

1980-2000 Period

Worries about the state of the fishery led to the establishment of a Royal Commission in 1980 to devise ways forward to ensure the sustainability of the fisheries and improve economic performance. The Commission concluded that fishing capacity had doubled or even trebled in the previous decade despite the earlier buyback and recommended that the total fleet size be reduced by half (Pearse 1982). The Commission called for a buyback, as well as a number of other changes in the salmon fishery, including area licensing and a

transition period in which the existing annual, perpetually renewable licenses would be replaced by licenses with ten year terms along with a system of royalties on landing. These royalties would then be used to fund a vessel buyback. Opposition by fishers to the Commission's proposals ensured that none of the key recommendations were ever implemented other than a buyback that took place in 1981. Unlike the previous buyback under the *Davis Plan*, the purchase was funded out of general revenues and involved the purchase of salmon licenses rather than vessels. Under the buyback, only 26 licenses were removed from the fishery representing less than one percent of the total number of vessels at that time.

The failure to implement the recommendations of the Royal Commission maintained the status quo in the salmon fisheries over the 1980s. Beginning in 1992, however, another initiative was introduced to transfer capacity from the commercial fishery so as to give greater opportunities to aboriginal fishers. This was accomplished with a program called the Aboriginal Fishing Strategy designed to encourage economic opportunities for aboriginals and as a means to start addressing treaty obligations.¹ Using funds from general revenue, all Class A license holders were allowed to submit to the regulator an offer for the price they would be prepared to accept for the purchase of their license. Beginning with the lowest cost offers and working upwards the regulator spent CDN\$ 6 million in 1992-1993 and removed approximately 11, 31 and 33 of the seine, gillnet and troll licenses from the fishery through three multiple rounds (Mylchreest 1993).

Despite the 1981 buyback many fishers and biologists continued to be concerned that the salmon fleet was too big and that it compromised the long-standing escapement

policy for salmon. By the 1990s the problem became critical as both quantity and the value of fish landed within the industry fell dramatically, as shown in Figure 1. The Federal government responded to this crisis and introduced in 1996 a number of far-reaching reforms under the *Mifflin Plan* named after the then Minister of Fisheries. Under the reforms CDN\$ 80 million was allocated out of general revenues for the buyback of licenses. License fees were also increased at the same time, but there was no direct link between the funds raised through the fee increase and amount allocated to the buyback. Using a reverse auction and over two rounds a total of 797 salmon licenses representing about 20% of the total fleet totaling 48 seine licenses, 444 gillnet licenses and 305 troll licenses were removed from the fishery. Area licensing was also introduced under the plan for the three gear types (two areas for purse seiners and three areas each for gillnet and troll vessels) to reduce congestion externalities and the amount of effective harvesting capacity that could be used within a region (by reducing the number of vessels).

[Insert Figure 1 here]

The Mifflin Plan is also noteworthy for introducing single gear licensing, whereby each license holder was obligated to permanently designate which fishing gear would be used. To help offset the concerns of fishers over the shift to single gear licensing, and also to encourage exit of vessels from the fishery, a stacking provision was also introduced whereby a vessel could acquire multiple licenses so that the vessel could fish

¹ It should be noted that there was already a significant aboriginal presence in the

with more than one gear, or in more than one area, if the license-holder had the appropriate set of licenses. After the licenses were stacked on a vessel, however, the licenses became “married” and could not be sold separately.²

The government also responded to concerns about the requirement for the license holder to permanently choose an area by announcing that the choice would be temporary for a four-year period, at which point the license holder would have to make a permanent selection.³ For those fishers that elected not to fish in 1996, they could also wait to the following year to make their area selection. This also coincided with a ‘tie-up’ program under which a license holder could elect not to fish and have the license fees waived for the season.

Continuing poor returns and prices, complaints over the effects of the Mifflin plan, and concerns over certain salmon stocks led to further attempts starting in 1998 to rationalize the salmon fishery. Out of government funding worth a total of CDN\$400 million, half was allocated to license buybacks while the remainder went to habitat restoration, community assistance, and retraining initiatives. Again using a reverse auction process, this time spread over three separate auction periods, a total of 1,409 licenses were removed from the salmon fisheries representing 216 seine licenses, 731 gillnet licenses and 462 troll licenses. Thus, by 2001 the total number of BC licensed salmon vessels was 1,881 that included 197 seine vessels, 1,202 gillnet vessels and 482 troll vessels (Schwindt *et al.* 2003). As a result, the 1998-2000 buyback finally succeeded

commercial fishery prior to the introduction of this new strategy.

² This followed a general practice in the fishery where any limited entry license, even in different fisheries, would become married with others as soon as it was bundled onto the same vessel.

in reducing the salmon fleet by over half, and for every gear type and became, in terms of expenditures and number of vessels removed, one of the world's largest ever fishery buybacks.

3. Effects of Vessel and License Buybacks

A summary of the five different buybacks is provided in Table 1. The 1996 and 1998-2000 buybacks were the largest in terms of expenditures, the number of vessels that they removed from the salmon fisheries, and the proportion of the total fleet retired. With the exception of the 1970-73 buyback, all buybacks have been funded out of general revenues.

The outcome of the buybacks and license stacking is that less than a third of the number of vessels that fished 35 years ago operate in the fishery today. Figure 2 illustrates the reduction in number of vessels reporting salmon landings over the period 1990-2003. However, the actual capacity reduction over this period is much smaller than the reduction in the total number of vessels implies because of upgrades in gear and vessels over the period. Indeed, it is quite possible that capacity utilization (Kirkley and Squires 1999), or the ratio of actual to potential output, may even be less today than it was in 1970 given the large, but fluctuating, decline in the total catch salmon over the past three decades. This does not imply that the recent buybacks have been unsuccessful at reducing capacity and increasing capacity utilization, but rather that the degree of

³ This decision was subsequently rolled over into another temporary four-year period with the permanent decision deferred to 2005.

overcapacity may be little better today than it was in 1969 and before the expenditures of hundreds of million of dollars over five successive buybacks.

[Insert Figure 2 here]

The problem in the BC salmon fisheries is that the same incentives remain for fishers to upgrade vessels and gear so as to compete for the limited number of salmon that can be caught in salmon openings (Grafton and Nelson 1997). Thus although the recent buybacks are beneficial to fishers who remain, it is by no means clear whether there have been sufficient to maintain a financially viable industry. The possibility also remains that further buybacks may be required in the future if fishers continue in ‘capital stuffing’ to out compete their fellow harvesters, or if currently inactive license holders return to the salmon fishery.

The 1996 and 1998-2000 Buybacks

The effect on vessel numbers, by gear type, of the two recent buybacks is provided in Table 2. The almost CDN\$ 200 million spent in the 1998-2000 program is noteworthy for its impact on the number of seine vessels which have the greatest capacity to catch per unit of fishing time. Overall, the two buybacks reduced the total fleet by over 50% from 1996 to 2000 such that by the year 2000 the seine, gillnet and troll vessels were 50%, 48% and 41% of their number in 1996.

The goal of the buybacks under the Mifflin Plan was to reduce the size of the fleet to ensure the economic viability of the remaining boats, make the fishing effort more

manageable, and reduce the pressure on salmon stocks. For those license holders exiting, the buyback offered an opportunity to sell their licenses at a time when license values were higher than they otherwise would have been (due to the demand from the government as well as from other license holders interested in stacking). For those license holders that elected to remain, they expected to benefit through improvements in fishing opportunities promised under the Mifflin Plan and the long-term certainty promised in terms of reaching a long-term agreement on intersectoral and intergear allocations of the salmon harvest.

Under the Mifflin Plan there was some debate among the different gear types as to whether or not the government should seek to retire licenses for the different types in proportion to the capacity (measured by historical catches) of that type, or whether the buyback program should be unrestricted. The net effect of the 1996 buyback was that a higher proportion of trollers had exited the industry relative to the other gear types.⁴ Prior to the 1998-2000 buybacks, then, the trollers argued for the program to operate in a fairly unrestricted way (the criteria already permitted the board responsible for setting the rules about the buyback to favor different gear types when choosing bids), but that the benefits should then accrue to the remaining fishers (so if a higher proportion of trollers retired the remaining trollers would thereby benefit more than other gear types through a greater average catch per license). Other groups argued that the benefits of fleet reduction should be shared equally. The government announced that the share of the harvest per license

⁴ The government had hoped to retire equal proportions of the different gear types at this time, but relatively few seiners applied, and as fishers using mixed troll and gillnet gear were electing to use single gear types it was unknown at the time how many would elect one or the other. As well, the panel reviewing the bids felt that the trollers' bids were more reasonable (James 1996).

would increase in proportion to the number of licenses retired within that gear type, but the government would actively seek to retire 50% of licenses in each gear type.

Not everyone benefited from the buyback. Neither crewmembers nor other participants in the fishery (including shore workers as well as more specialized fishers such as packers or seine-net owners) were eligible for payments under the buyback program. A higher proportion of smaller boats and independent operators exited the fleet and the employment impact was particularly severe in the very small and northern communities (where many of these vessels were based) and the loss of even a few vessels has large economic implications. Indeed, a report commissioned in 1998 by the BC government found that about 3,000 seasonal jobs were lost due to restructuring that took place in the Mifflin Plan (Gislason 1998).

Both of the recent buybacks also excluded communal licenses and licenses held by native fishing corporations. In the 1996 buyback, there were also efforts made to ensure that the proportion of Class AI licenses to the fleet as a whole was maintained so that a disproportionate number of licenses held by aboriginals were not retired.

4. Lessons Learnt from the Buybacks

Perhaps the most important lesson of the buybacks in the BC salmon fisheries is that it is much cheaper to prevent excess capacity occurring than it is to 'fix' the problems after the fact. If fishery regulators had followed the recommendations of Sinclair in 1960 and the 1982 Royal Commission, a significant amount of resources, time, and effort could have been saved.

In a recent analysis of the industry immediately prior to the 1996 buyback Schwindt *et al.* (2000, p. 39) estimate that the fishery generated a negative net present value (NPV) of almost CDN\$ 1 billion, but if it operated at the productivity and gear mix used by the Southeastern Alaska fleet it could have generated a NPV of over CDN\$ 1.4 billion. Using data from 1982, Dupont (1990, p. 40) finds that the economic loss from redundant vessels at that time with the existing fleet structure was over CDN\$ 50 million/year. The implication, therefore, is that BC salmon fishers need to face appropriate economic incentives to limit their fishing effort. Various alternatives to control ‘effort creep’ have been proposed including royalties on landings, exclusive river specific ownership rights, individual transferable quotas and bidding rights to participate in salmon openings (Grafton and Nelson 1997, Schwindt *et al.* 2003). Such management alternatives require careful consideration by the regulator before there is yet another ‘capacity crisis’ in the industry.

The specifics of the more recent buybacks also provide a number of important insights. First, fishers support the use of *voluntary* buybacks funded from general revenues. In particular, many fishers agreed with the use of a reverse auction that allowed *all* eligible fishers to enter bids to exit the fishery by selling their licenses (Muse 1999).

Second, buybacks that have a differential effect on different gear types are viewed with concern by fishers. For example, the 1996 buyback removed very few seine vessels and led to concern by some gillnet and troll vessels over future allocations of fish between the three gears and the increased ‘corporatization’ of the fishery because seiners are predominantly owned by fishing corporations while the small boat fleet is made up of independent fishers (Pacific Salmon Revitalization Plan Review Panel 1996). These

political concerns also affected the operation of the 1998-2000 program, where efforts were made in the latter rounds of the buyback program to focus on the retirement of seine licenses. In both these cases, maintaining ‘equity’, or the allocation of harvests between different gear types, was required to ensure political support for the buyback programs.

Thirdly, in the 1996 program, many fishers supported the idea of buybacks on the expectation that they would benefit all remaining fishers. After the 1996 buyback program was concluded, however, concerns were raised that the buyback had little effect in improving the economic returns in the salmon fishery. Some fishers felt that the buybacks had only taken ‘marginal’ or sub-economic boats out of the fishery so that the actual reduction in effective capacity was insignificant, and that the exercise was more of a political maneuver designed to reduce the number of licenses, not capacity (KPMG 1997). In some cases, concerns expressed were due to other changes that had taken place in the licensing program at the same time. Although the ‘stacking’ of licenses allowed fishers to acquire licenses in different areas, fishers disliked the fact that it reduced their flexibility and fishing opportunities.⁵ Further, once stacked, licenses cannot be ‘divorced’ and sold separately, other than to the government. Thus the only alternative to fishers wishing to sell their ‘married’ salmon fishing licenses or readjust their mix of licenses is to go through intermediaries and incur very substantial transactions costs.

Finally, many fishers felt that they had not gained the full benefits from a reduction in vessel numbers as their share of the harvest had been reduced in response to a number of government initiatives over the period to allocate salmon to aboriginals to address treaty

⁵ While there was much resentment expressed to the dire straits affecting the salmon fishing industry, attributed to the changes created under the Mifflin plan, several fishers

commitments and improve economic opportunities. These initiatives included a retirement program in which licenses in selected areas were purchased and then transferred to aboriginal groups as part of the treaty settlement process. Fishers have also voiced their preference that buybacks should take place over a longer period and at times when the rules regarding the fisheries are not also being changed so that they may make a reasonable assessment of the benefits of remaining or retiring (Government of Canada 1998).

An aspect of the three most recent buybacks worth emphasizing is that they were instituted over multiple rounds. The number of vessels removed and the price paid by gear type per round for each license is provided in Table 3. Multiple rounds increases administration costs, but has the benefit of reducing the strategic behavior in terms of the offers provided by fishers. More importantly, it also allows the regulator running the auction to adjust payments to target particular groups of fishers by adjusting the criteria for what bids are accepted and allows fishers the chance to reformulate their bids. Such flexibility allowed the license retirement advisory committee to retire a much greater number of seine vessels in the 1998-2000 buyback and at a lower cost than would have been possible in a single round (James 2004).

An outcome of the recent buybacks is that the nominal price of salmon licenses more than doubled for seine licenses and tripled for gillnet and troll licenses between the first rounds of buybacks in 1993 and the most recent rounds in 1998-2000 despite large

recognized that much of the problem was due to the generally poor economics created by the poor returns and prices, each down over 70% compared to the beginning of the 1990s.

declines in salmon prices and landings.⁶ It is unlikely that this increase is directly due to any increase in earnings associated with the buybacks as the reduction in harvests and prices has been proportionately greater than the number of licenses. Some observers have attributed the increased value to expectations of the introduction of a system of individual harvesting rights into the BC salmon fishery. In other words, the buybacks have implicitly acknowledged that fishers have some recognizable right in the resource thereby conferring additional value on existing licenses and catch histories.⁷

Regardless of the reason, a rise in license values should be considered when evaluating the use of buybacks. Whether the increase in the license is directly through improved fishing values, the increased possibility of a more profitable fishery, or even an acknowledgment that these licenses are recognized as granting some kind of right, policy-makers should consider the implications of such changes in terms of its costs and the implications for barriers to entry into the fishery.

5. Concluding Remarks

The British Columbia salmon fisheries have suffered from overcapacity in some form or another for many decades. To address this problem and to help ensure sufficient escapement of salmon to spawn, five different vessel or license buybacks were instituted over the period 1970-2000. The two most recent and largest buybacks in terms of expenditures and the number of vessels retired took place in 1996 and 1998-2000.

⁶ Interviews with fishers suggest that troll and gillnet licenses are currently worth 20% more than they were during the last buyback.

Combined, these buybacks have reduced the number of vessels in the fishery by more than half from 1996-2000. In addition, the government is moving towards the use of selective buybacks as a way of achieving other policy objectives. These include recognizing aboriginal treaty rights and settlements through an allocation of a share of the salmon harvest in specific fisheries and the use of more selective fishing techniques. Within this new policy framework, license buybacks provide the means to accommodate new entrants and a way in which to shift capacity between geographic fisheries while recognizing existing fishing rights.

Despite the apparent success of the recent buybacks in reducing vessel numbers and inducing other structural changes, the incentive of individual fishers to out compete their fellow harvesters in a short fishing season still remains. Although the number of licenses fell by a half over the period 1998, the average catch has also fallen dramatically over the past decade. Further, many of the fishers that still hold licenses have pursued economic opportunities elsewhere in other fisheries, and could potentially return to the fishery if either salmon prices or returns recover.

The history of the BC salmon fisheries suggests that the benefits associated with buybacks, without a change in the economic incentives faced by fishers, will be short-lived as capacity and fishing effort creep back up over time. Indeed, one of the surprises of the buyback program to the regulators was that they discovered that much of the funds expended during the buyback were reinvested either in new equipment or purchasing new quotas because of the tax implications, offsetting some of the benefit from fleet reduction

⁷ It should be noted that during the buybacks the federal government characterized them as license retirement schemes and that the payments were *ex gratia* and not in consideration of any rights the fishers had.

(James 2004). While buybacks may have reduced the severity of the problem facing salmon fishers in BC salmon, and may have created an opportunity for change, they have not necessarily provided a lasting solution.

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Table 1. Summary of Buybacks in the BC Salmon Fishery					
	1970-73	1981	1992-1993	1996	1998-2000
Nominal Amount in \$CDN Millions Spent	\$5.97	\$2.5	\$5.95	\$78.6	\$195
Amount adj. for inflation (\$1992)	\$23.1	\$4.2	\$5.9	\$74.3	\$175.8
Licenses or vessels retired	361	26	75	797	1,409
% Reduction in salmon fleet	6%	<1%	2%	19%	43%

Table 2. Effects on Gear Types of 1996 and 1998-2000 Buybacks					
Gear Type	Eligible Licenses, 1996	Licenses Retired, 1996	Eligible Licenses, 1998	Licenses Retired, 1998-2000	Licenses Remaining
Seine	536	48	487	216	271
Gillnet	2,256	444	1,825	730	1,095
Troll	1,291	305	989	460	529
Total	4,112	797	3,302	1,406	1,896

Table 3. Average payments per license retired in 1996 and 1998-2000					
	1996 Retirement		1998-2000 Retirement		
Gear Type	Round 1	Round 2	Round 1	Round 2	Round 3
Seine	\$405,118	\$443,475	\$420,152	\$432,115	\$435,578
Gillnet	\$73,719	\$84,702	\$77,880	\$80,830	\$84,231
Troll	\$70,881	\$82,136	\$77,532	\$82,150	\$85,872
Total licenses retired	396	401	99	645	665

Figure 1. Salmon Landings by Weight and Value, 1990-2003

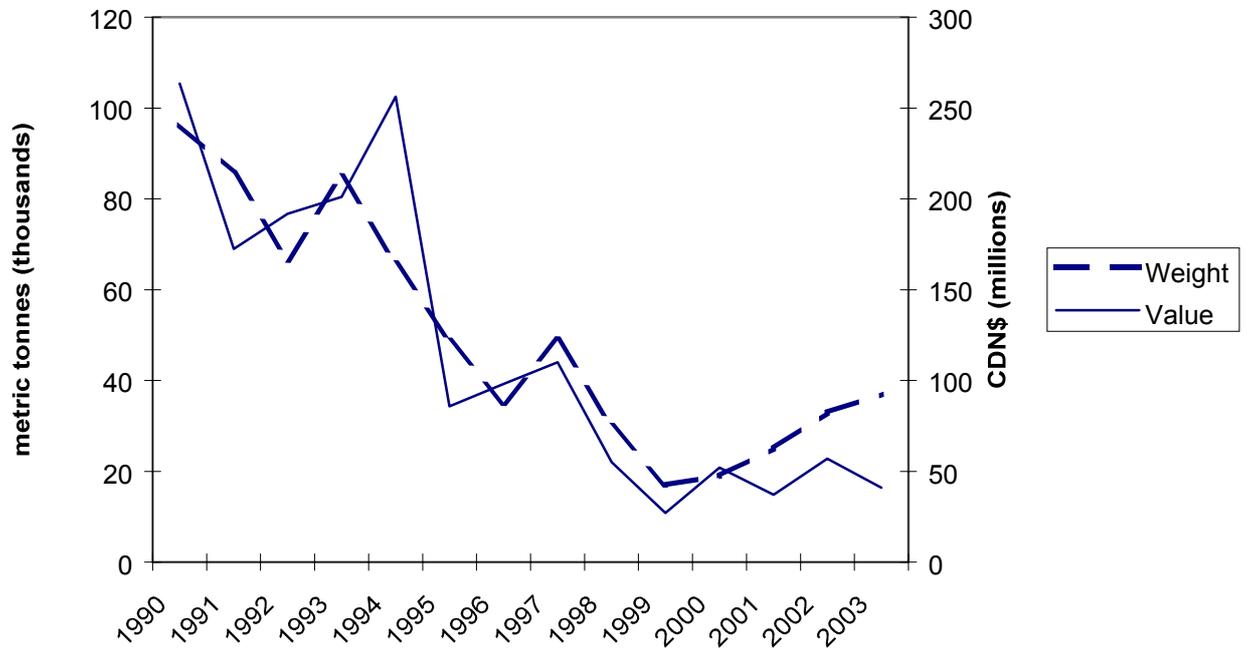


Figure 2. Vessels Reporting Salmon Landings in the BC Salmon Fishery, 1990-2003

