

# The B.C. Salmon Fishery: A Consideration of the Effects of Licensing\*

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The British Columbia commercial salmon fishery, since its beginning in the late 1860s as a commercial canning industry, has been the province's single most important fishery. In terms of its economic value, it has always outranked all other fisheries combined, and in the decade from 1968 to 1978 its average earnings accounted for 70 percent of the wholesale value of the total fishery.<sup>1</sup> For this reason, of all the Pacific coast fisheries, salmon has historically received the most attention from legislators, labour organizers, and of course fishermen. This paper briefly outlines some of the historical developments in the industry and then considers the consequences of the federal government's licence limitation program instituted in 1968, after 45 years of open access to the commercial salmon fishery.

Unlike the early Canadian staple industries of trapping, logging and grain production, salmon did not have the commercial potential to become a staple resource industry until the introduction of the canning process. This technique allowed the product to be preserved indefinitely and thus became suitable for export to the markets of Europe. Once the canning process was adopted the growth of this industry burgeoned. From a single cannery on the Fraser River in 1865, which in four years packed some 1,300 cases of salmon, by 1901 the industry was supporting seventy-three canneries along the B.C. coast and canned a million and a quarter cases.<sup>2</sup> It was because of this successful growth that there became established a commercial salmon fishery which could grow beyond the extremely limited local market for fresh salmon at that time.

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<sup>1</sup> *The Salmon Industries in British Columbia*, (Phase III Research Report, for Select Standing Committee on Agriculture, Legislative Assembly, Victoria, March 1979), p. 16.

<sup>2</sup> G. North and H. Griffin, *A Ripple, A Wave* (Vancouver: Fisherman Publishing Society, 1974), p. 2.

A major technological innovation, in the form of the cheap and reliable gas engine, revolutionized the fishing industry between the end of World War I and the beginning of the Depression. Its widespread introduction was a major stimulus to the industry's growth, particularly in the gillnet and troll fleets. This put an end to the two-man sail and oar powered fleet and replaced them with the motor powered "double-ender" style of fishboat, requiring only one operator. The consequence was that the gillnet fleet expanded dramatically as the labour formerly employed as oarsmen/sail handlers now obtained finance and got their own boats and went fishing. After 1923, when the final restrictions on licensing were removed,<sup>3</sup> and after 1924, when motor powered gillnet boats were allowed in the northern district,<sup>4</sup> there were no restrictions on entry and competition in the industry until 1968. The result was that the salmon fishing industry became increasingly competitive as the dynamics of the situation created what Michael Graham identified as "The Great Law Of Fishing.' Fisheries that are unlimited become unprofitable."<sup>5</sup> In other words, fishing investment will continue, in an unregulated fishery, until (or even beyond) the point where the average cost of production equals the market price of the fish. The fishing industry's bargaining position was further weakened during this time due to the increasing corporate strength of the processing industry as it became geographically more concentrated, and developed oligopolistic and oligopsonistic economic characteristics.

Before looking at recent developments in the salmon fishery, with regard to the effects of the licence limitation programme, it might be illuminating to briefly describe its characteristics and the types of products which are marketed. The particular feeding habits of the five varieties of salmon, as well as their various commercial markets, to some extent, contribute to the conditions which support three different fishing gear techniques. Trollers, using lures to catch the fish, concentrate mainly on the coho and spring (chinook) salmon due to their predilection for feeding on smaller fish. The sockeye, chum and pink species' predilection for schooling and for feeding on shrimp and crustaceans enables them to be captured by net techniques. Gillnetters, using nets into which salmon swim and become entrapped by their gills, concen-

<sup>3</sup> *Statutes of Canada*, Section 7 of Special Fisheries Regulations, British Columbia (P.C. 733, vol. I-II, April 25, 1923), p. xlv.

<sup>4</sup> *Statutes of Canada*, Section 1 of the British Columbia Fisheries Regulations (P.C. 645, vol. I-II, April 14, 1923), p. xli.

<sup>5</sup> M. Graham, *The Fish Gate* (London: Faber & Faber, 1943), p. 155.

trate mainly on sockeye and chum species as they congregate in inlets and river estuaries. Seiners, using large nets with which they circle the salmon school and then close off the bottom to trap all the salmon within, concentrate more on the pink species and tend to fish offshore more than the gillnetters. These distinctions and demarcations are by no means rigid, as can be seen by the troll fleet's success in recent years in catching sockeye salmon on lures.

Because troll-caught fish are of top quality, are unmarked by nets, and are cleaned and iced down almost immediately after being caught, they attract the top fish prices and are generally unaffected by Union or Native Brotherhood negotiated minimum prices. These salmon are usually for the fresh or the frozen domestic and export market. Net-caught fish are predominantly canned, though top quality fish will be frozen or even sold on the fresh market. The frozen export market has been growing in recent years, in large part due to Japanese demand which developed after the 200-mile Canadian territorial ocean limit was established in 1977. The foreign market for frozen salmon has been growing over the past twenty-five years, even before the growth of the Japanese markets, such that canned salmon has declined from 67 to 48 percent of the market value of the catch.<sup>6</sup> One consequence of this development has been the growth in the number of small processors who are freezing salmon for these export markets. This seems to have contributed to some instability in the industry, especially in regard to the fish prices paid to fishermen.

However distinctive and/or valuable the B.C. salmon fishery might be, surely its most contentious aspect is the licence limitation program initiated in 1968 and implemented at the beginning of the 1969 season. Licence limitation schemes were not new to the industry, though it had been forty-five years since any form of entry restriction had been in force. As early as 1889 the federal government had imposed a limit of 500 boats allowed to gillnet on the Fraser River.<sup>7</sup> Most of the licences on these boats were reserved for the canneries, but by 1894 most of the fishermen fishing the Fraser were "free fishermen" — i.e., their licence was not attached to a cannery.<sup>8</sup> However, in the northern district it was

<sup>6</sup> *The Salmon Industries in British Columbia*, p. 67.

<sup>7</sup> G. Alex Fraser, *License Limitation in the British Columbia Fishery* (Technical Report Series No. PAC/T-77-13, Economics and Special Industry Services Directorate Pacific Region, June 1977), p. 2.

<sup>8</sup> D. Stacey, *Technical Change in the Fraser River Canning Industry 1871-1912* (unpublished M.A. thesis, University of British Columbia, 1970), p. 38.

not until 1923 that licensing, and the connection of licences to canneries, was abolished.

In 1968 the licence limitation program now in effect was first introduced. Like its forerunners, the 1968 act sought to establish a biological control on the salmon harvest, but unlike the earlier attempts, it was an explicit attempt to bring about a measure of economic viability and stability for those in the salmon industry. The objectives stated by the Minister at the time clearly indicate this: "... to increase the earning power of British Columbia fishermen and to permit more effective management of the salmon resource."<sup>9</sup>

The underlying rationale for the plan was the need to control the entry to and the harvesting capacity of the increasingly valuable salmon fishery. In a market economy the common property status of the fishery is expected to bring with it a state of competition of effort to lay claim to the greatest number of fish. As with any common property resource, as its value (and eventually its scarcity) increases, so too does the intensity of competition and, concomitantly, the degree to which the so-called "tragedy of the commons" has its effect. The tragedy, of course, is that each fishing unit, in pursuing its own rational self-interest, will not restrict its own fishing effort. To do so would simply mean that the fish it could have caught would then be caught by competitors. The assumption behind the licence limitation program was that the competition to harvest the salmon resource would become less intense with a limitation on vessel numbers. Eleven years of the program's operation has demonstrated that this assumption was ill-founded. The plan has failed, not because it had "loopholes" (as claimed in *The Salmon Industries Report*<sup>10</sup>), but because of the error in making the operating assumption that fishboat numbers in themselves could govern the intensity of use or harvest of "the commons."

The licence limitation program was directed to licensing vessels and limiting their number. It did not encompass direct control on the number of fishermen, limit the effort they individually applied to fishing, or in fact limit the productive fishing capacity of the total fleet. It is this last factor which is at the heart of the whole licensing issue. Neither the licensing of vessels nor the degree to which their numbers were limited was enough to reduce and control the productive capacity of the fleet

<sup>9</sup> B. Mitchell, "Hindsight Reviews: The British Columbia Licence Programme," in D. V. Ellis, *Pacific Salmon — Management for People* (Victoria: University of Victoria, 1977), p. 151.

<sup>10</sup> *The Salmon Industries in British Columbia*, pp. 41-42.

such that the Minister's objectives would be realized. Implicit in the intention "to increase the earning power of British Columbia fishermen" is the necessity to increase the availability of the finite resource, or to decrease the productive capacity of the fleet as a whole so that each unit left has access to a greater portion of the resource. The former option was not the purpose of the scheme (though an enhancement program has been adopted since). The failure of the Fisheries officials to appreciate the complexity of the latter option allowed two developments to occur which critically undermined the effectiveness of the program.

The first was that licence limitation, when first introduced, linked the length of the boat to its registered or estimated net tonnage, but did not link the boat's tonnage to its size upon replacement. Thus, with the licence limitation program's introduction, fishermen became aware of the value of net tonnage (i.e., the displacement weight of the boat) in its link to the size of boat any given tonnage permits. For example, a forty-foot boat requires a ten-ton licence (that being the arbitrary tonnage figure the Fisheries department set for a forty-foot boat), while a fifty-foot boat requires a fifteen-ton licence or more. (The discrepancy at the fifty-foot level is that a boat of this size or greater must be registered under Canadian Registry, at which time its particular tonnage displacement is calculated.) The investment in a larger boat obviously requires the acquisition of additional tonnage licence — in the case of the example, another five tons. During the first two years of the program the relationship of tonnage of the replaced boat to the tonnage required by the length of the replacement boat was non-existent. To refer again to the example, if the forty-foot boat was replaced by the fifty-foot boat the licence covering the smaller boat could be redefined to cover whatever the larger boat required — fifteen tons or more. Thus there was no impediment to increasing the productive capacity of the fleet through investment in larger, more productive units. Until this practice was halted by what was known as the "replacement rule" (which in effect froze the definition of the tonnage licence to the size of boat from which it had come), in June of 1970 "the capacity of vessels withdrawn and replaced . . . increased from 186 tons to 596 tons."<sup>11</sup>

The second development which occurred took place after the 1970 replacement rule was imposed. This was the practice of "pyramiding" tonnage licence, whereby the tonnage licence from a smaller boat or boats could be combined to cover the necessary tonnage licence capacity

<sup>11</sup> *Ibid.*

of a large boat. Thus, if the fisherman who disposed of his forty-foot boat acquired a fifty-foot boat, the necessary extra tonnage licence could be purchased on the open market from someone disposed to retiring his small boat and capitalizing on the market for the licence tonnage it held. While this scavenging of tonnage licences did not actually increase the total tonnage licence capacity (as had happened prior to the replacement rule), the productive capacity formerly localized in the small-boat fleet became partially redistributed into the larger, more efficient, and thus more productive, seine boat fleet.

The effect of this failure to control the productive capacity of salmon fishery is reflected in the dramatic change in the composition of the fleet between 1968 and 1977. Whereas in 1968 there were 397 licensed seine vessels, by 1977 the fleet had increased by 29.5 percent to 514 vessels. Average net tonnage had increased by 2.9 tons, and the proportion of seine boats adopting combination gear, enabling them to more intensively utilize their capital equipment, rose by 26.8 percent. During this same period the gillnet fleet shrank from 3,760 vessels to 2,832 vessels: a 24.7 percent decline in fleet numbers. Average net tonnage increased by 1.2 tons, and the proportion of gillnetters adopting combination gear rose slightly by 3.2 percent. In the troll fleet the decline was dramatic — from 2,349 vessels in 1968 to 1,770 in 1975 — but recently it has increased by 260 vessels, representing an overall decline of 13.6 percent. Their average net tonnage also increased by 1.2 tons and the proportion putting on combination gear rose by 10.25 percent. Thus the seine boat fleet has had the most significant change over this period. Their fleet numbers increased by nearly 30 percent and their average net tonnage by nearly three tons, thus intensifying their capacity for fishing flexibility by nearly 27 percent. The gillnet fleet, on the other hand, declined by nearly 25 percent while hardly changing its capacity for flexibility.<sup>12</sup> This change in fleet size and structure has precipitated considerable impacts upon the economies of salmon fishing and upon employment in the industry.

When the licence limitation program was introduced it did more than limit entry to the fishery. It created what C. B. Macpherson called “state property”: “a right of a corporate entity — the state or the government or one of its agencies — to exclude others, not (as *common property* is

<sup>12</sup> These figures were taken from or calculated from G. Alex Fraser, “Limited Entry: Experience of the British Columbia Salmon Fishery,” in *Journal of the Fisheries Research Board of Canada* (vol. 36, no. 7, July 1979), pp. 761, 762.

... ) an individual right not to be excluded."<sup>13</sup> The licence thus came to have a property right allowing access to the fishery resource, and the right to use equipment of a certain size and tonnage in the exploitation of this resource. In that it was marketable, it took on a commodity value relative to the scarcity of these licence "rights" for sale, and relative to the value of these rights as perceived by non-holders. In traditional economic terms tonnage licences became a "scarce commodity." Because no more licences were to be created (ignoring the anomaly of the creation of tonnage prior to the replacement rule) all that had to occur was for conditions in the salmon fishery to appear lucrative and the demand for the scarce commodity would rapidly inflate its value. The salmon fishery is notorious for its fluctuations, and it was only a matter of time before a good salmon run coupled with high prices would make the fishery seem an attractive investment. This happened in 1973, and in the latter part of that year licences were selling for \$4,000 and \$5,000 a ton. Since that time the cost of buying licence tonnage has been a major portion of the cost of investing in the industry.

The dramatic increase in the investment cost of licence tonnage was a stimulus for increasing efficiency through the introduction of more sophisticated equipment. Because of the cost of servicing the financial commitment incurred in buying tonnage, investors had to be sure of competing favourably in the scramble for salmon and thus were motivated to improve their technological sophistication. Other fishermen, while perhaps being able to avoid the financial commitments, were driven to match the technological sophistication, or "the commons" would have little to yield to the least efficient pursuers of this fugacious resource. Thus the productive capacity of the fishery was on a treadmill of expansion.

The effect of this economic dynamic on fleet capitalization has been profound. Fraser notes that the estimated market value of the salmon fleet has increased from \$73.8 million in 1968 to \$273 million in 1977, a 270 percent increase in 10 years.<sup>14</sup> Sinclair cites an even greater increase totalling 294 percent.<sup>15</sup> Fraser feels that the figures he quotes are deceptive due to the inclusion of the capitalized licence values, and that

<sup>13</sup> C. B. Macpherson, *Democratic Theory: Essays in Retrieval* (London, Oxford Univ. Press, 1973), p. 123.

<sup>14</sup> G. Alex Fraser, "Limited Entry: Experience of the British Columbia Salmon Fishery," p. 757.

<sup>15</sup> S. Sinclair, *A Licensing and Fee System for the Coastal Fisheries of British Columbia*, vol. I (Vancouver: Dept. of Fisheries and Oceans, 1978), p. 276, Tbl. IX-2.

when everything is taken into account the "real capital employed has increased by 36 million, or 49 percent."<sup>16</sup> In terms of market value, however, which is what affects the purchaser of the licence, gear and boat (and the value which must be amortized), it is the estimated market value which is most relevant. The fact that of the 270 percent increase in market value of the fleet, 221 percent is over and above the value of real capital employed, gives credence to Sinclair's cautious statement that "the assignment of a value to licenced tonnage, real or assumed, has been an important factor in the increased market value since 1972."<sup>17</sup> While Pearse and Wilen suggest that there was in fact a decline from 5.7 percent to 3.7 percent in the rate of capital growth after 1969, they also note that "more important, however, is the clear evidence that the growth in redundant capital has not been halted."<sup>18</sup> Though Sinclair is not inclined to identify this capital growth as "redundant," his analysis comes to a similar conclusion:

part of the increase represents capitalization of the value of the license and part represents resource rents captured by the fishermen and which in many instances was spent in higher costs spent in construction, upgrading or upbidding the price of fishing vessels. This in turn resulted in maintaining the same fishing pressure on available stocks that limited entry and licensing was intended to correct.<sup>19</sup>

The productive capacity was maintained and the efficiency of the fishery had to be even more strictly curtailed.

The level of capital investment and the soaring market value of the fleet indicate a growth in harvesting capacity which is excessive, and contrary to the aim of the licence limitation program. The "earning power of British Columbia fishermen" has been decreased. An analysis of the annual rates of return on the value of the total salmon fishing fleet, before and after licensing, clearly shows these rates of return are declining.<sup>20</sup>

<sup>16</sup> Figures presented by P. H. Pearse and J. E. Wilen, "Impact of Canada's Pacific Salmon Fleet Control Program," in *Journal of the Fisheries Research Board of Canada* (vol. 36, no. 7, July 1979), p. 767, Tbl. 2 suggest that Fraser's estimates may be rather conservative.

<sup>17</sup> S. Sinclair, *A Licensing and Fee System for the Coastal Fisheries of British Columbia*, p. 277.

<sup>18</sup> P. H. Pearse and J. E. Wilen, "Impact of Canada's Pacific Salmon Fleet Control Program," p. 768.

<sup>19</sup> S. Sinclair, *A Licensing and Fee System for the Coastal Fisheries of British Columbia*, p. 279.

<sup>20</sup> Figures for landings, total fleet revenue, reported value of vessels, gear and licences

TABLE 1

<i>year</i>	<i>landings (millions lbs.)</i>	<i>total fleet revenues, including bonuses (millions \$)</i>	<i>reported value of vessels, gear &amp; licences (millions \$)</i>	<i>% rate of return on investment</i>	<i>% rate of return on investment exclusive of estimated value of licences</i>	<i>the portion of % rate of return which has been taken up by the cost of licences</i>
1960	75.15	18.50	37.08	49.89		
1961	121.63	26.92	38.86	69.27		
1962	163.91	31.07	40.93	75.91		
1963	119.32	23.30	53.82	43.29		
1964	124.20	31.10	51.15	60.80		
1965	90.19	26.85	55.80	48.11		
1966	162.85	40.43	60.64	66.67		
1967	133.17	37.88	68.07	55.64		
1968	176.36	47.78	73.47	65.03		
1969	79.04	29.95	80.70	37.11		
1970	154.49	49.13	89.18	55.09		
1971	132.37	48.48	82.84	58.52		
1972	164.39	54.87	93.71	58.55	61.23	2.68
1973	185.20	125.99	133.30	94.51	104.99	10.48
1974	134.25	80.20	219.26	36.57	60.61	24.04
1975	76.17	51.80	204.24	25.36	41.07	15.36
1976	121.80	103.60	214.65	48.26	56.61	8.35
1977	138.35	122.10	277.65	43.97	61.19	17.22

At first glance these figures indicate a general tendency for lowering rates of return on total investment.<sup>21</sup> Even when the estimated value of

are taken from P. H. Pearse and J. E. Wilen, "Impact of Canada's Pacific Salmon Fleet Control Program," pp. 766, 767, Tbls. 1 and 2. The three sets of figures on percentage rates of return on investment were calculated from their figures. (The figures for estimated value of vessels and gear, minus licences, have not been included.)

<sup>21</sup> In analyzing this data, three points must be kept in mind. Firstly, while the percentage rates of return on investment may seem very lucrative, the returns are not evenly distributed throughout the fleet. The median point in the income distribution is nearly always skewed down to the low income end of the distribution curve. Secondly, 1973 must be considered one of those anomalies which periodically occur when salmon are plentiful and prices remain high. In this table it may be noted that it appears once in seventeen years. Finally, while separating costs of licensing from the costs of vessels and gear enables measurement of the real excess

licensed tonnage is excluded in the calculation of the percentage rate of return on investment (Table I, column 6), the massive increase in investment has not generated any better returns than were earned prior to licensing.

It is interesting to compare the rate of return on investment (including the cost of purchasing the licensed tonnage) to the rate of return minus the licensing cost. It can be seen, in the last column, that the effect of speculation on licence tonnage has cost the fishermen as much as 24 percent of their rate of return on investment.

The most illuminating indication of the fishermen's situation, however, is seen in the comparison of landings with the rates of return those landings accounted for. If one takes the year of the lowest landings in the pre-licence period and compares it to the year of the most similar lowest landings in the post-licence period, one finds that in 1960, while landings were one million pounds less than in 1975, the rate of return on total investment was 24.23 percent higher. Looking at the most similar years of highest landings, pre- and post-licence periods, one finds that in 1962 landings were one half million pounds less than in 1972, and yet the rate of return on total investment in 1962 was higher by 17.36 percent. In short, the rate of return on investment has fallen very significantly in both instances of comparable quantities of salmon being landed.

The findings of the 1978 Sinclair Report<sup>22</sup> corroborate the detailed statistics of Pearse and Wilen. Sinclair's figures enable the average rates of return on overall market value of capital invested to be calculated for each fishing gear type. One finds that the rates of return on the market value of the capital investment declined by 9.7 percent in the seine fishery, 4.4 percent in the gillnet fishery, and 28.5 percent in the troll fishery.<sup>23</sup>

Given these rates of return, Fraser's observations of the consequences of the program for the new entrants are well grounded.<sup>24</sup>

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in fishing capacity, the real cost of investing in the salmon fishery still includes the cost of licensed tonnage. Thus it is a cost which must be included in the calculation of a return on investment.

<sup>22</sup> S. Sinclair, *A Licensing and Fee System for the Coastal Fisheries of British Columbia*, pp. 273, 275.

<sup>23</sup> While it is acknowledged that the average rate of return on estimated market value is not necessarily the same as the return on the actual amount invested, the estimated market value is the figure which must go into a determination of opportunity cost if the value of the investment was to be realized and invested elsewhere.

<sup>24</sup> G. Alex Fraser, "Limited Entry: Experience of the British Columbia Salmon Fishery," p. 759.

On net, it appears that new entrants [post-licence limitation program introduction] have gained little from the program. Indeed, in 1973, due to a large run and rapid price increases for salmon, some new entrants clearly paid excessive prices for licenses. These individuals may actually be worse off than in a situation of free entry.

The effect of the change in fleet size and structure upon employment would seem to be no less profound. As outlined above, between 1968 and 1977 the seine fleet grew by 117 boats, the gillnet fleet was reduced by 928 vessels, and the troll fleet reduced by 319 vessels. Using the Fisheries department 1970 estimate of the average employment on seine vessels of 5.5 men, and 1.2 men on gillnetters and trollers,<sup>25</sup> the increase in employment in the seine fleet totalled 644 persons while the decrease in employment in the gillnet and troll fishery totalled 1,497, a net decrease in employment of at least 853 persons. This 8.96 percent estimate of the loss of jobs in the salmon fishery is quite conservative compared to the 15.8 percent figure one can calculate from Fraser's Fishery Service figures for the same time span but two years earlier.<sup>26</sup> Furthermore, these statistics do not reveal the loss, with the reduction of the gillnet and troll fleets, of self-employment for small independent (or semi-independent) fishermen, very often decentralized, and returning income to small coastal communities. The figures also fail to describe the loss of opportunity to earn a living in a traditionally individualistic lifestyle.

With the growth of employment in the seine fleet there has been an increase in the proportion of fishermen whose relations of production come closest to being employees, or more conventional wage-labourers. There is also a strong likelihood that the ownership of the seine fleet has tended to centralize into corporate or third-party investors' control, and has probably also had the effect of centralizing the labour pool to major home ports from which the seiners sail. As may be appreciated, more knowledge must be gained to understand the full impact of these developments on the composition of the workforce.

In terms of the history of Canada's regulation of the exploitation of natural resources, the management of the salmon resource could at best be described as awkward, at worst incompetent. It is a testimony to the vitality of the renewable resource that salmon are still commercially harvestable after a century of exploitation. The irony is that the characteristics of the resource which facilitate its relatively easy capture are also those which would permit its relatively easy management.

<sup>25</sup> G. Alex Fraser, *License Limitation in the British Columbia Fishery*, p. 45.

<sup>26</sup> *Ibid.*, p. 46.

While the salmon industry shares with other fisheries the distinction of being one of the final resource areas to be exploited under common property/state property legal definition, it is one of the few fisheries which in its early stages could have developed private location rights to allow trapping a major portion of the harvest. This had been practised in earlier times by the native people.<sup>27</sup> Without the establishment of some form of private guarantee to a portion of the yearly harvest, there was no individual inclination to curtail productive capacity with which to lay claim to the greatest portion of the common property resource.

The government's management efforts, in the face of this disinclination, attempted to impose the same effect by reducing efficiency and by establishing overall quotas on the total harvest. Scott provides a cogent analysis of the conundrum this has produced for both the resource managers and the fishermen.

"Overfishing" regulations that reduce one component of fishing effort induce further controls to suppress increases in other components. Also, because it is becoming obvious that the setting of an overall quota encourages private investment to outwit or anticipate competitors, rather than to increase the quality, value, or amount of the catch, administrators are tempted to regulate or forbid these investments as well.<sup>28</sup>

Licence limitation programs have represented a major effort to curtail overfishing. However, as this paper has attempted to explain, the latest program has in itself contributed the dynamics to create even greater pressure on the resource.

At this stage in the fishery it is far too late to consider any private harvesting location forms of resource allocation, despite its theoretical potential impetus for efficient production and good husbandry. The capital and human investment in the existing techniques is too great and too entrenched. The route which may hold greater promise is the creation and allocation of individual quotas allowing fishermen to harvest a certain amount of the resource, and no more, for that year.<sup>29</sup> By this management technique competition to lay claim to the resource

<sup>27</sup> R. Barsh, Associate Professor of Business, Government and Society, University of Washington, gives a brief but illuminating description of the traditional Queets River net fishery of western Washington, prior to European involvement. R. L. Barsh, *The Economics of a Traditional Coastal Indian Salmon Fishery*, (manuscript to be published), pp. 1-2.

<sup>28</sup> A. Scott, "Development of Economic Theory on Fisheries Regulation," in *Journal of the Fisheries Research Board of Canada* (vol. 36, no. 7, July 1979), p. 728.

<sup>29</sup> *Ibid.*, pp. 734-52.

would cease. Instead, the fisherman would be encouraged to harvest his quota of fish in the most efficient manner. Productive capacity would no longer be a question for government management, but for fishermen's individual attention. Overall productivity would be regulated, and achieved directly in the division of the total harvest quota among the individual quota holders. Whether this approach can be accepted or not is a political question to be resolved between the government and the fishermen.