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THE COMMERCIAL HARVEST OF SALMON IN BRITISH COLUMBIA, 1820-1877[1]

by

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ABSTRACT

Shepard, M.P. and A.W. Argue. (1987). The commercial harvest of salmon in British Columbia, 1820-1877. Can. Tech. Rep. Fish. Aquat. Sci. ....: .. p.

This report reviews archival data on the earliest harvest of Pacific salmon in British Columbia by Europeans, first considering subsistence and export production by the Hudson's Bay Company and then the export production by private entrepreneurs during the first years of the independent commercial fishery. Annual estimates of the live weight of salmon required for production are presented.

Key Words: Pacific salmon, Hudson's Bay Company, historical commercial catch.

THE COMMERCIAL HARVEST OF SALMON IN BRITISH COLUMBIA, 1820-1877

CHAPTER I - BACKGROUND

1.1 INTRODUCTION

The first comprehensive statistics of commercial production of salmon in British Columbia appeared in the Annual Report of the Dominion Department of Marine and Fisheries (DMF) for the year 1877. For that year, data were presented in tabular form similar to that which had been used in other parts of Canada for several years (Argue and Shepard, 1987).

The purpose of the present report is to review data on commercial harvests for years prior to this first year of formal reporting. The report covers the first commercial fishing activities of white men in British Columbia, the operations of the Hudson's Bay Company beginning in the 1820s and the activities of the first independent entrepreneurs who began operations in the lower reaches of the Fraser River in the 1860s. Records of production from these two sources cover only part of the total exploitation of the salmon resource. The report does not cover harvests by native Indians throughout British Columbia which undoubtedly outstripped exploitation by the white man in the early years of the commercial fishery. Nor does it provide coverage of the harvest of salmon directly supplied to or fished by the hoards of prospectors and miners who, following the discovery of gold in the Cariboo in the late 1850s and throughout the 1860s, flocked to the Interior of the newly founded Colony of British Columbia to seek their fortunes. Such a harvest could have been substantial; at its peak in the early 1860s, Barkerville, the centre of gold mining activity, was the largest settlement in Western Canada with a fluctuating population of about 25,000 compared to a total population for the Colony of slightly over 50,000 (Leacy, 1983 and Anon. 1985). Records of the Hudson's Bay Company (Cullen, 1979), show that portions of the Company's production during the 1860s were serving the needs of the mining communities. It is likely, however, that such supplies formed only a part of the total requirement. There were also other commercial uses of salmon not covered in the present report. For example, during the later part of the period covered by this report, there was a growing coal industry on Vancouver Island centered around Nanaimo whose participants undoubtedly used salmon as part of their subsistence.

Even for the Hudson's Bay records coverage was incomplete, being limited to extracts from Company records on file at the headquarters of the Pacific Salmon Commission; other records exist, particularly for HBC posts outside the Fraser drainage. Much more work could and should be done to provide a more complete record. Nevertheless, it was felt appropriate to publish the present preliminary report at this time to set the bounds for estimates of the extent of the white man's use of salmon in the early years of the fishery. It is hoped that further research can be carried out to provide fuller coverage of the harvests of

salmon by the HBC and by non-HBC sources supplying the burgeoning mining populations of the Colonies of British Columbia and Vancouver Island during their early years.

1.2 THE ABORIGINAL CATCH

Whereas the present report is restricted to harvests associated with the white man's trade, it should be remembered that there was very substantial exploitation of the resource by British Columbia's aboriginal population for thousands of years before the white man's arrival. Such exploitation could have represented a significant factor affecting the abundance of the resource even before the white man arrived. Since the indigenous populations of the coastal areas and of the Province's large river systems depended heavily on salmon for their subsistence (in fresh form when the salmon were running and in dried form during the remainder of the year), and since human population levels in pre-contact times were probably considerably higher than in later years, the rates of removal by Indian fisheries were probably very substantial for certain runs. In his Annual Report for 1879 (Anon. 1980), the Inspector of Fisheries for British Columbia, Alex. C. Anderson, estimated that the annual consumption of salmon by the British Columbia aboriginal population was about 17.5 million individual salmon. This is an immense total, more than 10 times the total taken in the white man's commercial fishery of the time and close to levels of removal of the latter fishery at its peak (during the 1920s and 1930s, the fishery took around 20 million salmon annually - Argue and Shepard, 1987).

It is beyond the purview of the present study to assess the accuracy of Anderson's projections. Based on his estimate of the size of the aboriginal population and of average annual consumption rates, his figure would seem to be high. Nevertheless, his projection cannot be discounted out of hand; it would therefore seem worthwhile to subject the facts he presented to closer study. Certainly any serious attempt to assess the effects of man's harvest on the production of the salmon resource has to take into account the very significant removals by the Indians both before and after contact with the white man.

1.3 OUTLINE OF REPORT

With the foregoing background the patterns of exploitation of the white man's fisheries from the 1820s through 1877 can be examined. Chapter 2 deals with the activities of the Hudson's Bay Company; Chapter 3 describes the development of the independent commercial salmon fishery beginning in the 1860s; and Chapter 4 provides estimates of the landed weights of salmon entering the commercial market flow from both sources.

1.4 ACKNOWLEDGEMENTS

The authors are grateful to Mr. I.S. Todd of the Pacific Salmon Commission (PSC) for making available material from the Hudson's Bay Company operations which was provided to the Commission's predecessor, the International Pacific Salmon Fisheries Commission (IPSFC). Historian Gordon Miller, Head of Library Services at the Pacific Biological Station in Nanaimo, provided an in-depth

critique of the original manuscript. His comments were invaluable in preparing the present revised text and in suggesting future pathways for research aimed at developing a fuller account of fishing activities in the early years of the fishery.

CHAPTER II - THE HUDSON'S BAY COMPANY'S TRADE IN SALMON

2.1 THE COMPANY'S HISTORY IN BRITISH COLUMBIA

European exploration of the coast of British Columbia began with the 1774 voyage of the Spaniard Juan Perez Hernandez who traveled as far north as the Queen Charlotte Islands. Explorations by Englishmen James Cook and George Vancouver followed and in the closing years of the century, numerous English and American vessels were carrying out an active trade in furs, obtaining sea otter skins from the Pacific coast of North America and trading them for Oriental goods in China. Approaching from the other direction, the fur trading activities of the Russian American Company spread southeastward along the Alaska coast from the Bering Sea. The maritime fur trade played only a minor role in the development of the white man's habitation of what is now called British Columbia.[1]

The major impetus for the white man's settlement of British Columbia came from the activities of the two British overland trading enterprises, the North West Company and its bitter rival, the Hudson's Bay Company.

In 1793, acting for the North West Company, Alexander MacKenzie made the first overland passage from eastern Canada to the Pacific Ocean. Following his trail, in 1805, North West's John Stuart and Simon Fraser established the first trading post west of the Rockies at McLeod Lake on the Peace River system in northeastern British Columbia. Over the next 15 years, the Company's activities spread throughout the upper reaches of the Fraser River and along the Columbia. By 1821, a chain of 10 trading posts had been established with an ocean terminus at Fort George (Astoria) at the mouth of the Columbia River (Figure 1).

In 1821, the North West and Hudson's Bay companies, which had waged a mercantile war of attrition on the fur trading grounds east of the Rockies, buried their differences and amalgamated under the Hudson's Bay banner. The British Government gave the reconstituted company a 21 year monopoly for the fur trade west of the Rockies.

The 1820s were turbulent years politically. The Russians were pressing hard to extend their trade southward and declared all waters northward from Vancouver Island to be Russian territory. At the same time, the ownership of the land southward of the Russian claim, particularly the Oregon territory, was in doubt. The 1814 Treaty of Ghent, following the War of 1812, established the boundary between Great Britain and the United States east of the Rockies (the 49th parallel) but failed to establish a firm line to the west; the Treaty provided a 10-year period wherein the territory between California and the Russian claim was

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1. A temporary post was established at Clayoquot but this was abandoned by the end of the Century.

left open to subjects of both the United States and Britain. This arrangement cast grave doubts on the future of the newly amalgamated Hudson's Bay Company's operations in the Columbia watershed, especially that of the ocean terminus at Fort George.

Such international problems plus the increasing costs of bringing supplies in and transporting furs out across the vast expanse of Canada, put pressure on the Company to establish a new outlet on the Pacific Ocean and a new pathway from the trading posts in the interior of British Columbia to the coast. One of the results was the establishment of Fort Langley on the lower Fraser in 1827. The Fort was designed to be a new depot and communications hub for passage of goods to and from New Caledonia (the northern portion of what is now British Columbia). This role was never truly realized, however. Through diplomacy and hard-headed bargaining, the Russian threat to the north evaporated. Negotiation over the position of the southern border dragged on for years (it was not until 1846 that the Treaty of Washington established the 49th parallel as the boundary between the British Territory and the United States west of the Rockies). The slow pace decreased the urgency of establishing a new Pacific terminal. Thus, it was more than two decades after Fort Langley had been built that the Company was finally forced to relinquish its holdings in the lower reaches of the Columbia and establish a more northerly headquarters. It was not Fort Langley that was chosen, however. In 1843 Fort Victoria was established as the Regional Headquarters. Nevertheless, Fort Langley did assume a more active role in the late 1840s. In 1848, the fur brigades made their first trips down the Fraser along an all British route ending in Fort Langley where the furs were placed aboard ships.

The choice of Fort Victoria as headquarters reflected the Company's growing interest in coastal trade. The improvement in relations with Russia offered an opportunity for the Company to extend its operations northward along the coast. The Anglo-Russian Convention of 1825 limited Russian activity to the approximate area now occupied by Alaska. This opened the northern mainland coast of British Columbia to the Hudson's Bay Company. As part of a strategy to compete effectively with United States coastal trading vessels, the Company established trading posts at Milbanke Sound (at Fort McLoughlin in 1833), at Fort Simpson in 1831 and on the Stikine and Taku rivers in 1840 (see Figure 2).

The 1820s through the 1870s (the period covered by the present report) saw the fortunes of the Hudson's Bay Company on the Pacific coast rise to their peak and gradually begin to fall away; the establishment of the colonies of Vancouver Island (1849) and British Columbia (1858) opened the Company's lands west of the Rockies to outsiders. These outsiders soon took the initiative and provided the impetus for further economic development of British North American lands on the Pacific coast. The two colonies amalgamated into the single Colony of British Columbia in 1866. In 1871, the unified Colony became a Province of the Dominion of Canada.

2.2 THE IMPORTANCE OF SALMON

The Hudson's Bay Company had a two-fold interest in the British Columbia salmon resource. The first was the northern British Columbia trading posts' great dependence on salmon for subsistence purposes. Without any agriculture, the traders and their staffs depended on their Indian clients for food and, in particular, on the salmon the Indians dried for their winter existence.[2]

The second interest developed with the establishment of near-coastal posts with access to ocean shipping routes and the abundant fresh salmon runs migrating into the Columbia and Fraser Rivers. In the 1830s, the availability of salmon and the identification of overseas markets (mainly Hawaii where American whaling fleets operated, orient-bound vessels stopped, and where natives developed a taste for exotic goods), led to development of an active trade in pickled salmon packed in barrels. This market became a raison d'etre for Fort Langley when other factors militated against its continued existence. The development of this market also led to the Company's initiation of a fishery in the San Juan Islands in the 1850s which apparently continued until the Islands were awarded to the United States by the boundary award of 1872.

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2. In the February 5, 1826 entry for the Journal of the New Caledonia District Supervisor William Connolly emphasized the dependence of the posts on salmon. He reported on a letter he had written to the trader at Babine Lake regarding wastage of salmon: "The principal purport of my letter to Mr. McLeod is to require that a sufficiency of Salmon be provided for thirty men proportioned to the time we may be supposed to depend upon his post for subsistence. For Salmon we are often reduced to the necessity of giving such articles as the Indians think proper to demand as we cannot subsist without it. But with regard to meat this necessity does not exist and it would therefore be inexcusable, if for the gratification of our palates any expenditure of valuable property was incurred ..."(Hudson's Bay Company Archive B. 188/a/8).

The December 23 entry in the Fort Langley Journal stated: "Hitherto in serving out our salted salmon each man had a piece: but this appearing not sufficiently exact with all parties we got up a kind of beam by which we now contrive to serve each with 4 lbs. and as much potatoes as he can possibly make use of. Every Second day they have per man 3 ps. dried salmon, which is exactly a whole." (HBC Arch. B. 113/a/2).

In a rather poignant note, Factor Peter Skene Ogden in his entry in the Stuart's Lake Journal for Christmas day 1840 stated: "Christmas and ... the Men ... did not labour and issued a glass of the staff of life and rations of Turnips. Salmon however was as usual our fare and thankful are we this year to have it and I only wish the quantity was greater and of better quality, but in both unfortunately we are deficient."

2.3 ESTIMATES OF HARVESTS

2.3.1 Data Sources

Information on the utilization of salmon by the Hudson's Bay Company's posts comes mainly from daily journals kept by Traders at individual posts or by District Supervisors. Since the emphasis of the present report is on the statistics of the private enterprise commercial fishery which hit its stride about the time British Columbia joined Confederation (1871), it was not feasible for the authors to conduct a thorough study of the salmon trade by the Company in earlier years. This would have involved conducting an intensive search of the Company's archival records which are now held in the Provincial Archives of the Province of Manitoba.

Under these circumstances, the authors limited their coverage to reviews of material available in British Columbia. This consisted of archival records held in the British Columbia Provincial Archives in Victoria, and a collection of extracts from Company Records obtained by the International Pacific Salmon Fisheries Commission (IPSFC) in the early 1950s.

Among the records available to the authors, the best information on utilization is provided by journals of supervisors of the New Caledonia District (all posts in British Columbia north of Kamloops). The supervisors were much concerned with the supplies of salmon obtained at individual posts and with the transfer of salmon between posts. Although the supervisors did not prepare formal statistical reports, their notes were often sufficient to determine the total quantities of salmon procured for storage at individual posts or shipped out from certain posts to supply others. For 1820 through 1831, these supervisors' reports, supplemented by daily journal records from individual posts, were sufficient to provide estimates of numbers of dried salmon stocked at Fort St. James (1820, 1823-1827 and 1829-1831) and at Fort Alexandria (1825, 1826, 1828 and 1829) and the number of salmon procured at Babine and Fraser's Lakes. A record of the number of salmon stocked at Fort Kamloops (in the Columbia District) in 1827 was also included.

An entry in the "New Caledonia District Accounts - Outfit 1836-37" provided records of the "expenditure of provisions at the different Posts in New Caledonia District O. 1836", detailing usage of salmon in all six posts in the District.

With the exception of the foregoing record for 1836, although some post journals are available, supervisor's summaries for 1831 onward are lacking. Records of harvests or of numbers of salmon stocked are fragmentary. It was therefore not possible, with the records available, to estimate total usage at posts for most years after 1830. Undoubtedly other useful records exist in the Hudson's Bay Archives, particularly those for Babine and Bear (Connolly's) Lakes and for Fort McLeod. Records for these non-Fraser River drainage posts were not extracted by the IPSFC-commissioned 1951 study. Further research would seem warranted.

Fortunately, Cullen (1979) has prepared an excellent monograph including many extracted records describing the development of the salmon fishery for the pioneering pickled salmon trade at Fort Langley. Regrettably, similar published coverage of the commercial fishery which the company developed in the San Juan Islands in the 1850s is not available; the only material the authors found was in the form of some anecdotal references in books by Lyons (1969) and Howay (1914).

Despite the fragmentary coverage, information gathered from the foregoing sources is believed to be sufficient to establish the order of magnitude of harvests associated with the activities of the Hudson's Bay Company in the days preceding the development of the independent commercial fisheries on the banks of the Fraser River in the 1860s.

2.3.2 Subsistence Usage by the Northern Posts

As outlined above,[3] salmon was the main source of protein for the Traders and their staffs in the northern posts during the first half of the 19th century. Although the staff obtained some fish through their own fishing efforts, by far the greatest part of their supplies was obtained through trade with the Indians. Salmon were procured in fresh form or as partly or fully dried product.

Fort St. James on Stuart Lake was one of the principal fur trading posts in the north. Its own supply of salmon was not usually adequate to provide for over-winter subsistence of its personnel. Substantial portions of the Post's salmon supplies came from Fraser's and Babine Lakes. The shipment of salmon between posts involved prodigious labour.[4] Fish from Babine were transported to the south end of the lake and portaged to Stuart Lake. The supervisor of the New Caledonia District frequently stayed at Fort St. James and it became a base for transshipment of salmon to Fort McLeod in the Peace River Area and to Fort Alexandria to the south.

Estimates of quantities of salmon traded and stocked for 1820-1836 are presented in Tables 1 and 2. The data suggest procurements of up to 50,000 salmon at Babine and up to 36,000 at Fraser's Lake with annual usage of up to 34,000 at Fort St. James and about 25,500 at Fort Alexandria. In a single year the post at Kamloops in the Columbia District was recorded as stocking 18,000 salmon. It is impossible from these mixed figures of harvest and stocking to determine the annual numbers of salmon actually used to support the Hudson's Bay operation.

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3. Section 2.2.

4. The Western Caledonia Journal for February 18 noted that: "The Men arrived [from the Babine Portage] with the remainder of the salmon forming a Total of 17,750 received here out of 23,000 which were sent to the Portage. This work has occupied almost the whole of our men for nigh a Month & I am really happy that it is now got over _." (HBC Arch. B. 188/a/3).

Nevertheless, on the basis of the available records, the total numbers utilized would not appear to have been very large; they were certainly in the tens of thousands rather than in the hundreds of thousands. In the one year (1836) for which summary records of dried salmon for the entire New Caledonia District exist, the total take was only in the order of 67,000-69,000 fish (Table 2). As such, the harvests would have formed an inconsequential proportion of the large runs of salmon returning to the Fraser and Skeena drainages in those early years.

From the records examined it would appear that in the New Caledonia district, the Babine operation was the largest. In a note prepared in 1889 by a company officer at Fort St. James (Anon., 1889), citing evidence presented to a Senate Committee in 1888 concerning the level of the Company's take of salmon, it was stated that: "The Hudson's Bay Company now annually trade from ten to fifteen and rarely as many as twenty thousand dried salmon at Babine. I believe they largely exceeded those quantities in former years ... but they never even approached fifty thousand, let alone '4 or 5 million' in any one year." This statement, made over 65 years after the Babine operation began, tends to support the view that the Company's usage of salmon there had always been at a modest level.

The foregoing rather sketchy account permits at least a general assessment of the order of magnitude of the Company's subsistence usage of salmon. Much more could undoubtedly be learned from company records, not only about the Company's use of salmon but also regarding the harvests by their clients, the local Indian tribes with whom they traded. In this paper no attempt has been made to assess the species composition of the catch. It is obvious (by the 4-year periodicity of abundance and the seasonal timing of the harvests) that most of the fish taken had been sockeye, but references to "large" and "small" salmon and the fact that they were taken both very early and very late in the season (when sockeye would not have been the dominant species), indicate that chinook and coho salmon were probably used as well. Further assessments of the records as background for providing a general picture of species breakdowns would seem useful.

2.3.3 The Pickled Salmon Trade

2.3.3.1 The Fort Langley operation

In its early days, Fort Langley, located on the south bank of the Fraser River about 50 km upstream from the entrance of the north arm of the Fraser into the Pacific Ocean, became an active supplier of agricultural trade goods (mainly for sale under contract to the Russian American Company) and of pickled salmon bound for markets in Hawaii and the United Kingdom. Trade in these products reached its peak in the 1840s and 1850s.

Established in 1827, the Fort began pickling salmon in 1828 for use by the Trader and his staff. A total of 85 tierces containing over 7,500 salmon

were put up in 1829. Major problems were encountered with the construction of barrels for the pickled salmon, but nevertheless, on September 21, 1830, the first 185 barrels of salmon were put aboard ship for sale overseas.[5] Cullen (1979) describes the problems that were faced:

> "[Trader McDonald] had managed to put up 220 barrels of salmon in 1830 in casks so bad that practically all the pickle was lost and nine barrels sent for trial in Monterey found no purchasers. Still, McDonald was encouraged to go on salting, if only for home consumption. About 300 barrels were produced in 1831, 100 of which sold at ten dollars a barrel to a Hawaiian Islands wholesaler for resale in Lima. In 1831-32, Duncan Finlayson reported from Oahu that Columbia River salmon were most popular in the island market, but the Fraser River fish would probably command a better price. In August 1832, he forwarded 380 bushels of salt to McDonald to cure 300 barrels of salmon for exportation."

Cullen's article provides a lively description of the development of the trade over the next 40 years. Available data on production, summarized in Table 3, indicate that production peaked in the 1840s and early 1850s with a maximum production of 2,610 barrels in 1849. The trade deteriorated in the late 1850s as the quality of the Fort Langley product apparently dropped causing prices to fall.

By the 1850s, the Hudson's Bay Company had lost its monopoly on trade in mainland British Columbia (the Colony of British Columbia was founded in 1858) and private entrepreneurs began to enter the market, spelling the death knell of the Company's participation. A letter from Mr. O. Allard of Fort Langley to the Board of Management, dated March 8, 1870, reflected the transition in the industry from a Hudson's Bay Company operation based on the purchase of fish from the Indians to a business operated by independent buyers and fishermen, both Indian and white. Mr. Allard's letter stated:

> "I find from Experience lately that we cannot cure fish at Langley to so good advantage as when we were supplied to the wharf by Indians ... In my humble opinion the most economical way for the Company to get salmon cured now, is to supply the barrels & salt to some trusty Fisherman: and have him to fill up the barrels for so much, I think I can get Ewen a Scotch Man to take the contract ..."[6]

Presumably the "Scotch Man" was Alexander Ewen who, as will be shown in the next Chapter, was one of the prime movers in the development of the modern British Columbia industry. In the 1860s, private fishermen and entrepreneurs rapidly took over the Hudson's Bay Company markets and developed new ones; the Company's role diminished rapidly and by the 1870s,

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5. For more detail see Fort Langley Journal entries for August 24, 1829 and September 21, 1830 (HBC Arch. B. 113/a/2).

6. See HBC Arch. B. 113/a/3.

had become a virtually forgotten footnote in the history books.

2.3.3.2 The San Juan Island operation

The Hudson's Bay salmon export operations were not limited to Fort Langley. Fort Victoria was founded in 1843 and from its base there, in 1851, the Company initiated a fishery along the shores of San Juan Island 20 miles away. The fishery expanded and over the next few years was reported to have produced 2,000-3,000 barrels of salted salmon annually (Howay, 1914). Unfortunately, the authors have been unable to unearth firm records of the annual catches in the San Juan operation; further search of Hudson's Bay Company records would be worthwhile. It is evident, however, that the San Juan and Fort Langley operations were coincidental.

2.3.4 Summary

If, as suggested by Howay, the San Juan operation at its peak took between 2,000 and 3,000 barrels and if the take at Fort Langley continued at about the same level as it was in the early 1850s (around 2,000 barrels), the total annual trade could have amounted to 4,000 to 5,000 barrels (about 1.2 to 1.5 million pounds of raw fish equivalent, if mainly sockeye, or around 200,000-250,000 individual fish). Combined with subsistence usage in the interior posts, the total annual take by Hudson's Bay Company operations in what is now British Columbia would probably not have exceeded 300,000 salmon, a very modest figure considering that before the end of the century, commercial removals of Fraser-bound salmon in some years exceeded 10 million). Even the 300,000 figure may be high since it is not entirely clear if Howay's reference to "2,000-3,000 barrels" referred exclusively to salmon processed in the San Juan Islands.

CHAPTER III - THE INDEPENDENT COMMERCIAL FISHERY

3.1 EARLY HISTORY

As indicated in the last Chapter, the termination of the Hudson's Bay Company's exclusive trade charter in 1858 presaged the entry of independent free enterprise into the British Columbia salmon industry. The early development of this segment of the industry is poorly documented. As will be discussed below, Colonial records reveal the existence of a non-Hudson's Bay commercial trade in pickled fish at least as early as 1860. Howay (1914) noted that in 1863, Capt. William Spring began salting and curing salmon at Beechey Bay. The exact location of "Beechey Bay" is not clear; no such location is known on the Fraser River and so it might be assumed that the operation took place in the vicinity of Beechey Head on Vancouver Island near Sooke, the future site of the famous Sooke traps. In any event, in the following year, a Mr. Annandale established a saltery that was definitely on the Fraser river. According to Howay, the operation was not successful; Mr. Annandale's vessels, using Scottish-style trap-nets, were unable to catch sufficient fish to supply his operation. Shortly after, an associate of Annandale's, Alexander Ewen who had had earlier dealings with the Hudson's Bay Company,[1] successfully introduced drift-nets and used them to build up an active trade in pickled fish over the next few years. Following the pattern established by the Hudson's Bay Company, much of the pickled fish was exported to the Hawaiian Islands.

The first canning of salmon on the Fraser was carried out in 1867 by Alexander Syme who conducted experimental tests and successfully demonstrated his product at the October 1867 Agricultural Exhibition held in New Westminster. The first commercial canneries were not built until 1870, however. In that year, Alexander Loggie & Co. constructed a primitive canning plant at Annieville, about 3 miles downstream from New Westminster. The cannery was an adjunct to an existing salting operation. Loggie had had experience in fish canning in New Brunswick. In the canning venture he was associated with Alexander Ewen. In the same year, Capt. Stamp built a small cannery at Sapperton in New Westminster.

3.2 RECORDS OF HARVEST

3.2.1 Statistics in Colonial Days

Records of economic life in the colonies were maintained in annual reports prepared by colonial officials for submission to London. These annual reports (referred to as "Bluebooks") were handwritten accounts made out on forms presumably prescribed by the British Government. Bluebooks for the colony of British Columbia are available from 1860 through 1870, and for Vancouver Island

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1. See quotation by Mr. Allard in Section 2.3.3.1.

from 1863 through 1865. The Bluebooks contained a section for statistics on "Manufactures, Mines and Fishing". For fisheries, columns were provided for numbers of boats and ships employed, and quantities and values of fish caught. With the exception of the 1861 report for British Columbia, none of the Bluebooks examined contained quantitative catch records; the recorders generally provided only narrative accounts. For example, the Bluebook for British Columbia for 1867 contained the following notes:

> "There are no established fisheries in B. Columbia nor are any statistics available as to the number of boats &c. employed in fishing. The waters, both salt & fresh abound in fish. The Fraser River is celebrated for its Salmon, Sturgeon and Oulachon, all of which are caught --- in considerable quantities & a considerable trade is now carried on in salted, cured, smoked, tinned & pickled fish.
>
> The coasts abound with herring, rock cod,--- sardines. Whale fishing is about being established ..."

Unlike those of other years, the Bluebook for 1861 provided firm figures, noting that 6 boats were fishing and that "1,085 barrels of Salmon of 200 lbs. each cured" and "420 barrels of Sturgeon, 200 lbs. each " had been processed. These were the first official records of actual quantities processed commercially on the West Coast. The completeness and accuracy of this record is impossible to check.

3.2.2 Export Statistics

Whereas for the most part the Bluebooks lack quantitative data on catches, they do contain annual records of the quantities and values of commodities exported including fish, and for some years, quantity of salmon specifically. The entries are quite rudimentary but nevertheless, since the salmon trade was developed mainly to meet export market needs, these records provide a useful reflection of the relative volumes of commercial production in the early days.

For the Colony of British Columbia, export data for 1860 through 1864 mainly comprised information on shipments to the neighbouring Colony of Vancouver Island. For most years, the exports were listed only as "fish" (i.e., not broken down by species). Quantities varied between 33 and 122 barrels of fish per annum (except in 1862 when no exports of fish were recorded). The data are summarized in Table 4. It is likely that most of these exports were salmon; indeed, in 1861, the only year in which the species of fish exported were specified, all the

exports consisted of salmon. It is interesting to note that in that year, 8 barrels of salmon were exported to New South Wales (now a State of Australia), the forerunner of an active trade with that continent later in the century.

Exports (all to Vancouver Island) jumped to 628 and 559 barrels in 1865 and 1866 respectively. In 1864 and 1865, Vancouver Island itself exported $124 and $4,100 worth of unspecified fish products (mainly to the United States) plus $400 worth of salmon in the latter year. The relatively large quantity of exports from Vancouver Island in 1865 (mainly to the United States) is in contrast to the relatively small quantities of fish exported in 1863 and 1864. From 1866 through 1870, quantities of fish exported from the unified Colony of British Columbia (which included Vancouver Island from 1866 onward) were much smaller. As illustrated by Ward and Larkin (1964), 1865 was one of the "big" cycle years on the Fraser which consistently produced large runs and correspondingly high catches every four years until the Hells Gate slide of 1913 put an end to the "dominance" of the cycle in 1917. It is tempting to conclude that the exports recorded for 1865 consisted of sockeye salmon caught on the Fraser River and transshipped through Victoria on Vancouver Island.

From 1866 through 1870, exports from the Colony of British Columbia slowly rose above the pre-1865 level, exceeding 2,000 barrels for the first time in 1870. In that year, the main beneficiary of the exports was Hawaii (then known as the Sandwich Islands), reflecting a revival of the trade that had been established earlier in the century by the Hudson's Bay Company (see preceding chapter). Since salmon had always dominated the trade with Hawaii, it is probably safe to assume that the bulk of the exports consisted of salmon.

3.2.3 Other Records of Production in the Colonial Era

The development of canning techniques led to the rapid expansion of the salmon industry during the final three decades of the Nineteenth Century. Commercial salmon canning in British Columbia began in 1870. The event was very poorly documented and the only quantitative record the authors could find was in Cicely Lyons' book (Lyons, 1969) which noted that, in 1870 "... Alexander Loggie & Company was able to export to England three hundred cases of one-pound squats." The advent of canning, which transformed the industry, was followed closely by another event of major importance; on July 20, 1871, the colonial era ended and British Columbia joined the Canadian Confederation as a province.

3.2.4 Production Records in the Early Dominion Era, 1871-1877

In 1872, the Dominion Department of Marine and Fisheries was five years old. Its report for that fiscal year provided the Department's first coverage of fisheries of the newly-founded Province of British Columbia. The account consisted mainly of an extract from an official report on British Columbia by the Dominion Minister of Public Works, the Hon. H.L. Langevin. Mr. Langevin concluded that "... there are really only two large fishing establishments; one a

salmon fishery, under the management of Captain Stamp, who, for the first time, exports salmon in tin boxes; the other a whale fishery in the Gulf of Georgia." The brief section of his report on the salmon fishery concludes with the sanguine statement that, "There would appear to be no limit to the catch of salmon." (Anon., 1873).

In time for the 1873 salmon season, the Dominion Department of Marine and Fisheries had appointed an agent in Victoria. His first report, for the Fiscal Year ending June 1873, actually covered the entire 1873 salmon season. The account contained quantitative data on the volume of salmon processed noting that:

> "Canning salmon is now developing every year. One large firm, Messrs. Findlay, Durham and Brodie, are engaged extensively in this business. There are some others in a smaller way.
>
> "There were cured and preserved for export last year as follows:-
> Canned salmon, by Findlay & Co..... 115 tons
> 14 doz. 1 lb. tins in case, 22 cases to 1 ton,
> other parties 80
> 4000 barrels of salt salmon."
>
> "The canned salmon is sent principally to Great Britain, while the salt fish is shipped to the Sandwich Islands and the Australian Markets." (Anon., 1874).

In the Annual Report for the following year (Anon., 1875), in a statement dated October 1874 (presumably dealing with the 1874 season), the Department's Agent reported that four combined cannery/pickling operations processed 18,718 "cases fresh salmon" on the Fraser River; the report notes that "each case contains 48 tins of 1 lb. each". On the basis of this statement, it is concluded that the cases of so-called "fresh salmon" were actually canned salmon. The plants (plus a pickling plant and a group of unspecified "other parties" who processed an estimated 500 barrels of salmon) also put up an estimated 2,474 full barrels of pickled salmon, 100 half barrels and 100 barrels of salmon bellies.

There were no records of production for the 1875 season. Sometime during the year the decision was taken to extend the provisions of the Dominion Fisheries Act to British Columbia and to appoint a Dominion Inspector of Fisheries in the province of British Columbia. The man chosen was Alexander Caulfield Anderson, a famous Hudson's Bay Company trader and explorer (he conducted the exploration which led to the establishment of commercial trading and supply routes connecting the British Columbia interior with the lower mainland). Anderson held that position until his death at age 70 in 1884. Although in narrative form, his first report as Inspector, for 1876 (Anon., 1877), was quite detailed.

"Messrs. Findlay, Durham & Brodie, Victoria.

4,122 cases, ea. 4 doz., 1 lb. cans		$24,800.00
400 do. do 2 lb. cans		2,300.00
38 half-barrels salted salmon		190.00
37 barrels do. do.		260.00
		$27,550.00

"Messrs. Holbrook & Cunningham, New Westminster.

2,600 cases canned salmon, 4 doz., ea. 1 lb.	$15,600.00
250 half-barrels salted salmon	1,250.00
	$16,850.00

"Messrs. Ewen & Wise, New Westminster.

3,125 cases, 4 oz. ea., 1 lb.	$18,750.00
300 half-barrels salted salmon	1,500.00
150 barrels do. do.	1,050.00
	$21,300.00

"Total as per notes supplied ..... $65,700.00"

The DMF Annual Report covering 1877 provided a more formal record of British Columbia salmon production. The 1877 report was the tenth published by the Department. For other parts of Canada, earlier reports had contained statistical information in a more or less standardized format. For 1877, use of that format was extended to statistics for the British Columbia fishery including information on the quantities of salmon processed, by product and by enterprise, throughout the province.

The data for 1877 reveal a major expansion in salmon processing activity. The number of canneries had increased from three or four in 1876 to seven in 1877, including the first canning operation outside the Fraser at Inverness on the Skeena River. The canned pack rose from just over 500,000 lbs. in 1876 to over 3,000,000 lbs. in 1877, a six-fold increase, while the pack of pickled salmon showed an even greater proportional increase, from the equivalent of just under 500 barrels in 1876 to over 3,500 barrels in 1877. However, as outlined above, pickled salmon production in the thousands of barrels had often been achieved in earlier years, including the days of the Hudson's Bay Company trade.

Records of production for 1876 and 1877 from the DMF reports, along with data from earlier years, are summarized in Table 5.

3.2.5 Exports from 1871-1877

Export data for 1871-1877 (the first years in the post-Confederation period) are contained in Dominion Government official documents entitled "Tables of the Trade and Navigation of the Dominion of Canada" (Anon., 1873-1899).

see bottom page 17

in Section 3.2.2 above that, in colonial days, most of the fish products exported consisted of salmon. Overall, the data in Table 6 indicate a major growth in the export of canned salmon (from a few thousand pounds in 1872 to over 3 million pounds in 1877).

The tables contain data covering exports during the previous fiscal year (ending June 30). Thus, the table published in 1876 covered the fiscal year ending June 30, 1875, which in turn covered exports of salmon caught mainly during the 1874 fishing season (the salmon season occurred primarily during July through September). Table 6 lists the quantities of fish exported from British Columbia from 1871 through 1877. Unlike most of the colonial records, the Dominion records segregate salmon from other fisheries products. The data indicate that salmon formed the bulk of the products exported, reinforcing the view expressed

CHAPTER IV - ESTIMATION OF LANDED WEIGHTS

4.1 LANDED WEIGHTS FROM PRODUCT DATA

The data arrayed in the foregoing sections provide information on the quantities of salmon products either processed or exported. As background for studies of biological production, it is useful to be able to interpret such data in terms of weight of raw fish required to prepare the products and of the species composition of the catch. The present section deals with the estimation of landed weights.

To make estimates, it is first necessary to determine the actual product weights and then to develop conversion factors to transform the data into estimated landed weights.

4.1.1 Dried Salmon

Records of transactions involving trade between the Hudson's Bay Company and Indians for dried salmon involved tallies in numbers of fish. Occasionally, however, reference was made to numbers of pieces of fish. Post records for the 1820s indicate that dried salmon were frequently divided into thirds ("_ our whole trade this season is only 5000 pieces dry, each the third of a salmon..."; "... 3 ps. dried salmon, which is exactly a whole fish"[1]. Knowing either the number of fish or the number of pieces of fish does not however provide an estimate of the weight of product actually handled; in addition, information on the average weight of individual fish would be necessary. This requires knowledge of the species composition of the fish being preserved. As outlined in Chapter II, there is information in the Hudson's Bay archives which would be useful for making at least gross assessments of species composition; it was not possible within the scope of the present study to review these data.

4.1.2 Pickled Salmon

The Hudson's Bay Company began wet salting salmon at Fort Langley in the late 1820s (Cullen, 1979). In the first two years (1828 and 1829), production was recorded in tierces. The Fort Langley Journal entry for October 25, 1828, noted that: "To day our friends brought us no less than 550 fish, which in all for the last four days is equal to 16 tierces..." The Journal indicated that in the previous three days, 600 had been collected for a four day total of 1150, giving an average of about 72 salmon per tierce. The entry in the post journal for August 24, 1829 provided the following record for pickled salmon:

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1. See footnote 2 in Chapter II.

"Salted in various sized casks, pipes &c = 50
Tierces avging. 90 = 4500 ..."

Thus, the tierces in 1829 contained 12 more fish than those described in 1828. The difference between the two years in the number of salmon per tierce may be due to a difference in species composition. In October 1828, it is probable that the salmon taken would not have been sockeye - they would more likely have been coho with perhaps some chinook included; the Journal entry for October 21 of that year noted that an Indian "... and his followers had brought about 100 small fresh salmon, & 10 or 12 Large ones such as we see on the Columbia, but both far from being in their prime now." In all probability, the salmon taken in August 1829 would have been sockeye.

At 90 sockeye per tierce, using modern conversion factors for pickled fish (1.5 lbs. live weight per 1 lb. pickled fish), assuming the live weight of each was around 6 lbs., a tierce of product would have contained about 360 lbs. of processed salmon. This is considerably less than the contents of a tierce in the Twentieth Century salmon fishery; Argue and Shepard (1987) used figures of 750-760 lbs. of product for the early 1900s.

For purposes of the present report 360 lbs. of product or 540 lbs. of live weight were used as conversion factors for tierces of salmon produced in 1828 and 1829 at Fort Langley.

These first two years of the operation at Fort Langley were experimental; the real export trade began in 1830. By that time, attempts were being made to produce a standard product. In 1830, handmade barrels of "25 Galls" were constructed. This size was deemed to be "...the best adapted for land carriage over the southern settlements."[2] The Company also developed trade in barreled cranberries; records for the Fort Langley post for 1855 through 1857 referred to production of the foregoing commodity in terms of full barrels of 24 gallons and part barrels of 12 and 8 gallons. These records suggest a more or less standard barrel size of 24-25 gallons had been adopted. Such barrels would have been slightly smaller than those used in the salmon trade in the early part of the Twentieth Century; the Canadian Fisheries Inspection Act of 1914 specified that fisheries products when packed in a barrel containing 26 imperial gallons would weigh two hundred pounds. A Hudson's Bay company communication in 1841 spoke of salmon selling well in Hawaii in "... barrels of 180 lb.", supporting the conclusion that the Hudson's Bay Company barrels were smaller than those used for pickled fish in the early part of the Twentieth Century.

As outlined in Chapter III, the first non-Hudson's Bay Company record of salted salmon production is found in the Colonial Office Bluebook of Statistics for the Colony of British Columbia for 1861 which noted that 6 boats

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2. Fort Langley Journal, 1829-1830. HBC Arch. 113/a/3. Entry for February 15, 1830.

had fished with a production of "... 1,085 barrels of Salmon of 200 lbs. each", and "... 420 barrels of Sturgeon of 200 lbs. each" the same weight as specified in the Canadian Inspection Act a half century later.

On the basis of the foregoing, it is assumed that in the Hudson's Bay Company's operations (which terminated in the 1870s), each barrel of pickled salmon contained 180 lbs. of raw salmon product whereas from the beginning of the non-H.B.C. fishery on the Fraser in the 1860s, barrels of pickled salmon universally contained 200 lbs. of product each.

Argue and Shepard (1987) assumed that 300 lbs. of raw salmon was required to process 200 lbs. of pickled product. Lacking other information on the extent of utilization, this conversion factor was used to estimate the live weight of pickled salmon in the pre-1878 era.

4.1.3 Canned Salmon

As outlined above, canning of salmon in British Columbia on a commercial scale began in 1870. For that year, Lyons (1969) has provided an estimate of the weight of the pack - 30,000 net lbs. of product, packed in 300 cases containing one-pound flats (tins). Lyons stated that: "Unlike the standard cases of today, the heavy wooden cases of 1870 each contained 100 tins, which explains why in the first few seasons of canning the British Columbia salmon pack was shown in hundredweight; "twenty-two of these cases weighed one long ton." There is however some doubt regarding the final statement; in the English weight system in use at the time, a long ton (2,240 lbs.) was divided into twenty long hundredweights (or quintals), all of 112 lbs. Nevertheless, Lyons may have been right; the first published production record was that provided in the Annual Report of the Dominion Department of Marine and Fisheries covering the 1873 fishing season. The report gave the pack as:

> "14 doz. 1-lb tins in case, 22 cases to 1 ton,
> other parties ..... 80 [tons]"

The arithmetic in the table does not make sense; 14 dozen one-pound cans "in case" would weigh 168 lbs. and 22 of these would weigh 3,696 lbs., a great deal more than a ton. Nevertheless, the notation of "22 cases to 1 ton" (close to 2200 lbs.), accords with Lyons' formulation, suggesting that the Department Annual Report figure of "14 doz. 1 lb. tins in case" was in error and that Lyons' estimate of 100 cans per case was more likely. It appeared that there was a major change in 1874; the Department of Marine and Fisheries' report for that year specified that each case of salmon contained 48 one-pound tins, indicating that the 48 lb/case industry-wide standard measurement of canned fish production in existence today was first adopted in that year. Departmental records for all succeeding years (except for 1875 for which no data were given) confirm this conclusion. As Lyons noted, even though the "quantity in a case varied" during 1874-1876, by 1876 "... the salmon canners had adopted the custom of computing their pack at 48 pounds of salmon to the case ..."

Argue and Shepard (1987) assumed that, during the 19th Century, 7 lbs. of raw salmon were required for each 4 lbs. of canned product. Data are lacking for the earliest days of the fishery but it would not be surprising to find that there had been substantial wastage of raw fish in the canning process which at the time was carried out on a largely experimental basis. However, even in the early days, there was obvious concern regarding efficiency. Salmon were not easily caught in a number of years and the processors were hard pressed to make an economic go of their businesses. According to Lyons, "...it was said of Alexander Ewen that he never wasted fish."

4.2 LANDED WEIGHTS FROM EXPORT DATA

4.2.1 Segregation of Salmon from Other Export Products

Except for 1861, export data for the colonial days (Table 4) do not segregate salmon products from those of other species. Nevertheless, as outlined in the preceding section, it is apparent that the majority of fisheries exports during the early period of the fishery consisted of salmon. The chief evidence for this comes from information on exports for years immediately following British Columbia's entry into confederation (1871-1877). Records for these years did segregate salmon products from those of other species. As shown in Table 6, it would appear that, except for exports to the United States, virtually all exports of fish in cases, boxes, barrels or cans, consisted of salmon. On this basis and for purposes of the present analysis, during 1860-1870 all fish in cases, boxes or barrels, except those exported to the United States, were considered to have consisted of salmon.

4.2.2 Weight of Products Expressed in Terms of Values, Packages and boxes

As shown in Tables 4 and 6, export data were sometimes expressed in terms of total value, packages, boxes or cases rather than in terms of barrels, pounds or tins for which standard unit weights have been estimated earlier in this report. To estimate the total weights of products exported, it is therefore necessary to determine the amount of product associated with particular values or with various types of containers.

Lacking data to provide such estimates for containers, information on prices of products of various types was examined as a means of assessing alternative hypotheses regarding the weights of exported products (Tables 7 and 8). During the colonial era, all exports recorded for British Columbia in 1863 and exports to the Sandwich Islands in 1868, 1869 and 1870 were recorded in terms of "packages". For Vancouver Island, the only fish exports other than fish oil or products sent to the United States consisted $2,702 worth of unspecified fish in 1865.

Examining each of these instances in turn, in 1863, the Colony of British Columbia exported 28 "packages" of fish to Vancouver Island with a value of one pound sterling per package. Between 1860 and 1868, except for exports

to the United States, all fisheries products exported were expressed in terms of barrels. It is therefore likely that the "packages" referred to in the 1863 statistics were actually barrels. The price of each package was one pound sterling, the same as that for a barrel of fish in 1860 (see Table 7). Prices per barrel in later years (1864-1868) fluctuated between 1.03 and 2.48 pounds sterling, suggesting that a price of one pound sterling per barrel in 1863 was not unreasonable. On this basis, it is considered that the "packages" referred to in the 1863 record were actually 200-lb. barrels of pickled salmon.

During 1868 through 1870, exports to the Sandwich Islands were recorded in terms of "packages" which in 1868 were worth 0.95 pounds sterling (about $5.00) per package and $4.36 and $5.36 per package in 1868 and 1869 respectively. These prices were not dissimilar to prices per barrel for pickled salmon shipped to the Sandwich Islands (Honolulu) during the early years of association with the Dominion of Canada (between $4.94 and $6.75 from 1871 through 1875). In this regard, it is worthy of note that both in the colonial era and in the early years of association with the Dominion, the prices of exports of pickled salmon to other destinations (Australia and England) were significantly higher ($5.60-$15.94) than the price for products being sent to the Sandwich Islands. Whether this represented variations in market situations or in types of fish used for processing is not known. In any event, it would seem reasonable to assume for estimation purposes, that the "packages" of pickled fish exported to the Sandwich Islands between 1868 and 1870 were equivalent to 200-lb. barrels of pickled salmon.

In 1865, the Colony of Vancouver Island exported $2,702 worth of "fish" to the United Kingdom. In 1865, the price of barreled fish exported from British Columbia was 1.03 pounds sterling per barrel (about $5.00). A figure of five dollars per barrel applied to the Vancouver Island exports would indicate shipments of about 540 barrels. However, it is noted that the exports from the Colony of British Columbia (379 barrels) in 1865 were destined for the Colony of Vancouver Island. Thus, the $2,702 worth of fish shipped from Vancouver Island could simply have been re-exports with a markup. On the basis of available records, it is assumed that most of the fishing for salmon in the area would have been prosecuted on the Fraser River in the Colony of British Columbia rather than on Vancouver Island. From this perspective, the authors have concluded that it is most likely the exports from Vancouver Island in 1865 actually represented re-exports of fish caught in the Colony of British Columbia and should be ignored in compilation of the total volume of exports from the two Colonies.

The package designation problem extended into the Dominion era with reports of 200 and 846 "boxes" of salmon (product unspecified) having been exported in 1871 to New South Wales and the United Kingdom respectively and 779 and 139 "packages" of canned salmon having been exported in 1872 to the United Kingdom and Honolulu respectively (Table 6).

As outlined in Chapter III, commercial canning had begun on the Fraser River in 1870 and was well established by 1872. Lyons (1969) stated that

the bulk of the product was exported and yet the official Dominion export data for 1871 and 1872 do not contain entries specifically designated as canned fish. In this light, the segregation of "boxes" of unspecified salmon product from barreled salmon in 1872 and the fact that other forms of processing (e.g., dry-salting, smoking or mild-curing) had not yet been employed at the commercial level, suggests that the so-called boxed salmon were actually cases of canned salmon.

In this welter of varying quantities, how can one interpret information on the weight of production in the "boxes" and "packages" listed in the 1871 export reports? One is tempted to accept Lyons' observation that, at least until 1873, each container of canned salmon contained 100 lbs. of product. There are, however, some nagging reservations about the use of this conversion factor. These include the fact that from the time canned products first appeared in the export record (1872), the poundage of every individual entry except one (i.e., each record of poundage of canned salmon exported to a given country in a given year) was divisible by 48, not by 100 nor by 168. The one exception was an export to Australia in 1873 of 26,416 lbs., a quantity not divisible by 100, 168 nor by 48. Another consideration casting doubt on the likelihood of the "boxes" being 100-lb. cases is the fact that the price per box was $4.80. At 100 1-lb. cans per case, the price per pound would have been 4.8 cents, a very low value. During 1873-1877, the declared price of exported canned salmon varied between 11.3 and 25.1 cents per pound (Table 8)[3]. If the boxes had each contained 48 pounds instead of 100 pounds, the price per pound would have been 10 cents, closer to the going price in later years. On this basis, it is tentatively assumed that the 1,046 boxes of salmon included in export records for 1871 were in fact 48-lb. cases of canned salmon.

As shown in Tables 6 and 8, for 1872, the records included entries of 779 "packages" of canned salmon exported to the United Kingdom and 139 exported to Honolulu. The average price per case of the Honolulu shipment was $8.00 per package. If the packages had contained 48 pounds of product, the average price per pound would have been about 16.7 cents, similar to the unit price of canned fish in later years (see previous paragraph). Canned salmon exports to the United Kingdom in 1872 were divided between "packages" (779) and pounds (4,320). Values were not given separately for the two classes of goods but combined, they were assigned an aggregate value of $6,360. If it is assumed that each of the packages contained 48 pounds of product, then the total weight of product exported to the United Kingdom would have been 41,712 pounds and the average price per pound, 15.2 cents, a reasonable figure considering the average price prevailing during the 1870s. On the basis of the foregoing, it is assumed that the "packages" listed in the 1872 export table consisted of 48-lb. cases.

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3. In quoting the range of prices per pound during 1873-1877, the price per pound in the 1872 record was ignored since the price calculated from the export data for that year was extremely high (42 cents per pound) in comparison to data for all other years.

4.2.3 Estimation of Total Product Weights Exported

On the basis of the analyses presented in the foregoing sections, the estimated live weights of salmon required for the products exported from British Columbia (and Vancouver Island) during 1860-1877 are derived in Table 9, assuming that 300 lbs. of raw fish were required to produce each barrel of pickled fish and that 7 lbs. of raw fish were required to produce each four pounds of canned product (Argue and Shepard, 1987).

In general, the annual production and export of pickled salmon was highly variable between 1860 and 1877 (Table 10). In one year (1873), the estimated quantity of exports exceeded the estimated amount of production. This could have been due to the fact that the periods covered by the production records (calendar year) and export records (fiscal year ending June 30) differed. The volume of canned production also varied from year to year; 1874 and 1877 were "big years" with 1876, the first year of comprehensive records, being one of low production.

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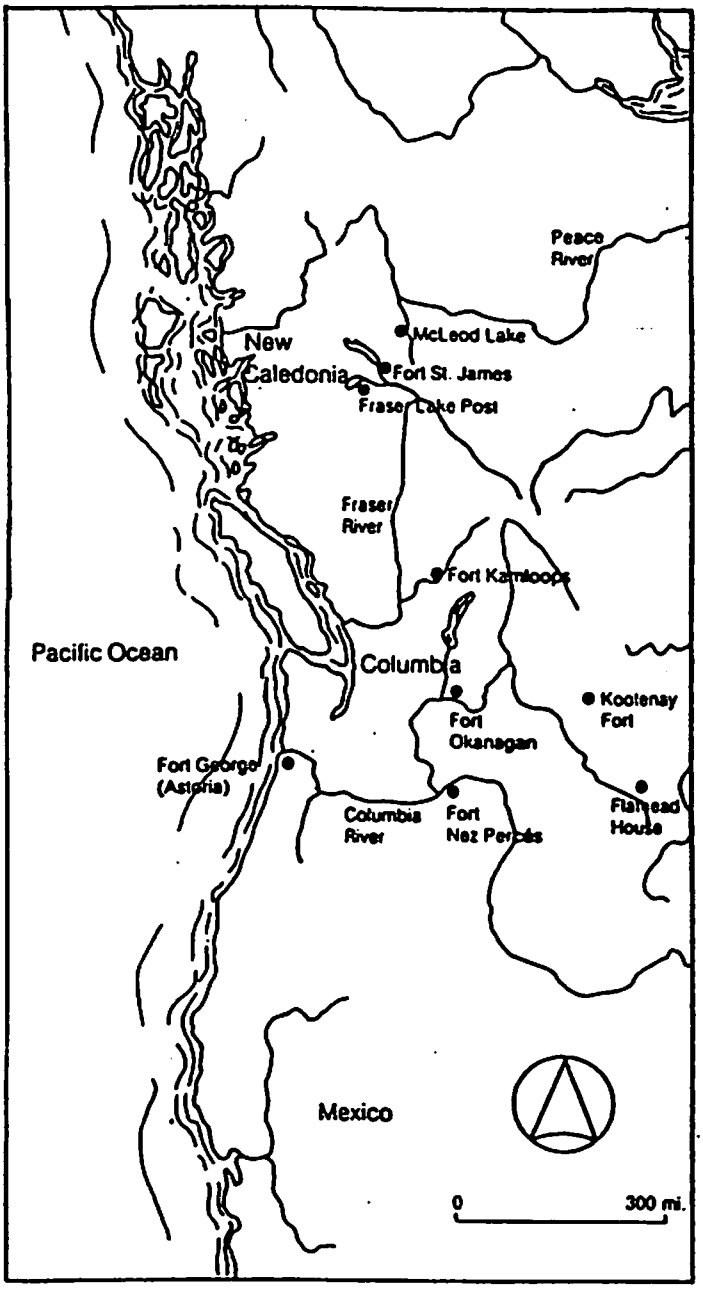

Figure 1. North West Company posts on the Pacific Slope. (from Cullen, 1979).

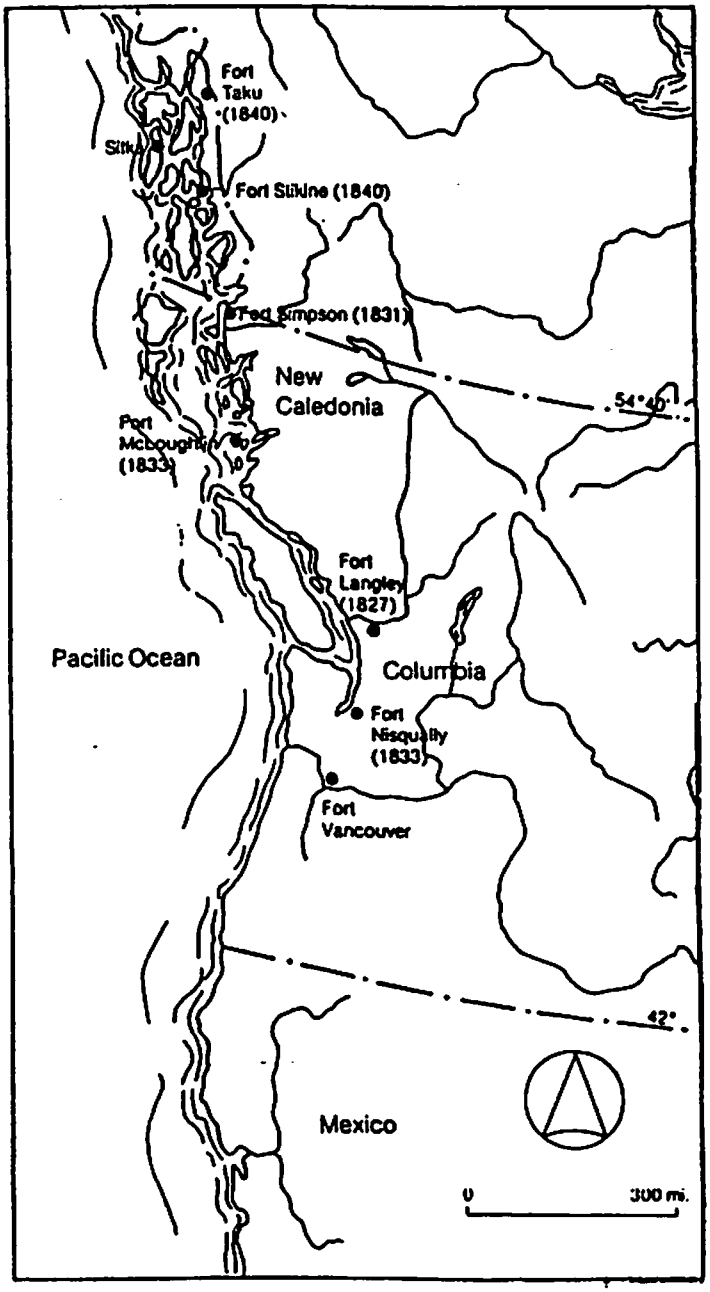

Figure 2. Hudson's Bay Company expansion of Pacific forts, 1827-40. (from Cullen, 1979).

Table 1. Approximate numbers of salmon stocked for subsistence purposes at Fort St. James, Fort Alexandria and Kamloops and numbers of salmon obtained by trade at Babine and Fraser's Lakes in New Caledonia District by North West and Hudson's Bay Companies, 1820-1836.

	FORT ST. JAMES	FRASER'S LAKE	BABINE LAKE	FORT ALEXANDRIA	KAMLOOPS
	No.Stocked	No.Traded	No.Traded	No.Stocked	No.Stocked
1820	4,300+ a	13,000 a			
1823	2,000+ b				
1824	9,600+ c	29-30,000 d	45,000 e		
1825	27,000 f	26-27,000 g	42-44,000 h	17,000+ i	
1826	7,800+ j	20,000 k	3,000?l	4-6,000 m	
1827	3,000? n	1,500?o	15-16,000 p		18,000r
1828		4,000?r	53,000?s	2,400 t	
1829	25,000+ u	3,600 v		23,500-24,448 w	
1830	10,848 x	22,000 x	27,000 x		
1831	34,000 y			21,980 z	
1836	23,455 aa	3,791 aa	9,598 aa	14,903 aa	

FOOTNOTES TO TABLE 1

a. From daily entries in Fort St. James Journal July 2 - December 6, 1820. All but about 255 of the total were obtained from Fraser's Lake; the entry for November 25 notes: "Mr. McDougall of Fraser's Lake writes me he traded upwards of 13,000 Salmon, far short of what he expected." The entries for Fort St. James are incomplete (September 27 - October 12 missing) so the total there is almost certainly incomplete. Hudson's Bay Company Archives (HBC Arch. B.188/a/1).

b. From daily entries Fort St. James Journal, July 13-October 12, 1823 (HBC Arch. B. 188/a/2). Apparently all taken in Stuart Lake; no record of any transferred from Fraser's Lake.

c. From daily entries, Fort St. James Journal, September 21 - December 21, 1824 (HBC Arch. B. 188/a/4). Many of the fish were recorded as coming from Fraser's Lake and Babine.

d. The December 5 entry by William Connolly in the Western Caledonian Journal for 1824 (HBC Arch. B. 188/a/3) noted that: "I am happy to learn that the Salmon trade at the Post [Fraser's Lake] has turned out much better than was expected, say 29,000." The December 5 entry in the Fort St. James Journal (HBC Arch. B. 188/a/4) noted that "This evening Mr. McDonnell arrived from Fraser's Lake He has 30,000 Salmon in Store ..."

e. Ibid. The entry for November 27, 1824 noted that at Fort Kilmaur (Babine), "the trade ... in provisions [amounted to] 45,000 dry salmon, including 12,000 of last years Stock."

f. From daily entries, Fort St. James Journal, July 14 - November 29, 1825 (HBC Arch/ B.188/a/4).

g. William Connolly's Journal of Occurrences New Caledonia District, 1825 - 26 (HBC Arch. 188/a/5). The entry for January 26, 1826, noted that Mr. McDonnell from Fraser's Lake "...informs me that he has at present 37,000 Salmon in Store..."

h. Ibid. The entry for January 29th noted that "... forty two thousand salmon have been procured at the Babines." The November 12 entry for the Journal for 1825-1826 (HBC Arch. B 188/a/8), however, noted that: "Last season 44,000 Salmon were procured here."

i. Ibid. The entry for November 25, 1825, written at Fort Alexandria, noted that "Seventeen thousand Salmon, mostly of good quality are now in Store ... A few thousand more can be procured from the Atnahs below ..."

j. Ibid. For 1826 - 1827 (HBC Arch. 188/a/8) from daily records for September 24. Most fish were taken locally but some also were brought in from Fraser's Lake and Babine.

k. Ibid. The entry for November 21 noted "The Salmon Trade (at Fraser's Lake) has not been very productive, only 20,000 having been procured ..."

l. Ibid. The entry for November 12 (written at the "Fort of the Babines") noted that: "The Salmon Trade has been even less productive than that of Furs, Mr. Ross having been able to add only 3,000 to his old Stock which amounted to 15,000."

m Ibid. The entry for November 5 (written at Fort Alexandria) noted that the fever of the trader, Mr. Yale "... would not admit of his going to trade the Atnah Salmon, from whom I suppose four or six thousand will be procured, which with what remains of last years Stock, 6,800, and the produce of the garden ... will secure the Establishment from want until the Spring."

n. Ibid. For 1827-1828 (HBC Arch. 188/a/11). The entry for September 12, 1827, notes that: "The Quantity of Salmon now received is 1400 including about 500 of last years Stock." Entries for the remainder of the year record only a few local acquisitions plus a shipment of 1400 from Babine.

o. Ibid. The entry for October 20, 1827 notes: "... the distressing intelligence of Salmon having so completely Failed that [the Trader] had not been able to procure from the natives, more than 1200. To which he does not expect to add three hundred more ..."

p. Ibid. The entry for September 12 noted that the trader at Babine "... informs me in his Letter that Salmon are this year very scarce, and that he does not expect to procure above 15 or 16,000 ..."

q. Ibid. The entry for February 14 describing the trade at Kamloops noted that the Trader there had "... procured an unusual quantity of Salmon, which this year was very Abundant in the Lower parts of the River. tis a singular and I believe, unprecedented occurrence, that Salmon should have been so numerous as far as the Bridge in Fraser's River, and that so few have ascended any higher up. Mr. McDonald procured about 18,000 which is a greater quantity than is required for the use of the Columbia ..."

r. Ibid for 1828-1829 (HBC Arch. B 188/a/12). The entry for December 9 indicated that the Trader had "... procured only 4,000 at Stellah."

s. Ibid. The entries for November 17 and December 15 indicate that quantities of salmon accumulated at the Babine-Stuart Lake portage by those dates were 13,400 and 18,600 respectively. Whether or not the December total included any that had been there on November 17 is not known. The entry for March 2, 1829, notes that the stock remaining at Babine at that time was 21,000. Assuming the three totals were independent, the amount of Babine salmon stocked (both at Babine and Stuart Lakes) would have totalled 53,000.

t. Ibid for 1828-1829 (HBC Arch. B 188/a/12). The entry for October 25 notes that a letter from Mr. McDougall of Fort Alexandria indicated that "... the Whole Stock he has been able to secure amounts to no more than 2,400 Salmon."

u. Ibid for 1829-1830 (HBC Arch. B 188/a/19). The entry for November 1 notes that: "... from Tatchi, Mr Douglas procured 25,200 salmon." Other fish were traded with the Indians but quantities were not specified.

v. Ibid. The entry for December 9, 1829, notes that "... the quantity of Salmon ... Mr. McDonnell procured at Stellah is 24,000 and from Indians of Nantlah he obtained 12,000, forming a Total of 36,000."

w. Ibid. The entry for October 25 indicated that "... only 3,000 had been collected at Alexandria." The Fort Alexandria Account Book for 1829-1832 (HBC Arch. B.5/d/1) records the Issue of Provisions from February 13, 1829 to February 13, 1830 to include "Stock and Receipts" of 22,510 "Salmon Dried" and 1,938 "Fresh Salmon" (Total 24,448).

x. Journal of Occurrences at Stuart Lake, November 1830. (HBC Arch. 188/a/16). The entries for November 30 and December 7, 1830 and for January 9, 1831, indicate that stocks of salmon on those respective dates for Stuart, Fraser's and Babine Lakes were 10,848, 22,000 and 27,000 salmon.

y. Ibid. The entry for December 5, 1831, notes that at Babine "Mr. Roussains trade of the season [was] 34,000 exclusive of 11 M of last years trade."

z. The Fort Alexandria Account Book for 1829-32 (HBC Arch. B.5/d/1) records the "Total Stock on Hand of Dried Salmon throughout the period February 15, 1831 - February 6, 1832..." as being 21,980

aa. See Table 2.

Table 2. Extracts from New Caledonia District Accounts - Outfit 1836-37. (HBC Arch. B188/d/15)

A. Extract from page headed:

"Expenditure of Provisions at the different Posts in New Caledonia District O. 1836."

	Salmon dried. ea.	Salmon Winter fresh ea.
Alexandria	14,903	
Fort George	6,680	
Frasers Lake	3,791	
McLeods Lake	3,457	
Babine lake	9,598	
Connollys Lake	5,434	30
Stuarts Lake	23,455	
	67,318	30

B. Extract from list headed:

"Inventory of Sundry Merchandise, property of the Honble Hudsons Bay Company remaining on hand in New Caledonia District the first day of Feby One Thousand Eight Hundred and Thirty Seven viz:-"

under heading "Country Produce":

"... 69,112 Dried Salmon ..."

Table 3. Commercial production of pickled salmon for sale at Fort Langley, British Columbia 1828-1873.

Year	No.Barrels	Year	No.Barrels
1828	32 a	1851	950
1829	100 a	1852	1,832
1830	200	1852	2,000
1831	300	1854	2,000
1832	NA	1855	NA
1833	270	1856	510
1934	57.5	1857	NA
1835	661 b	1858	NA
1836	200	1859	NA
1837	450	1860	NA
1838	597	1861	NA
1839	400	1862	NA
1840	300	1863	NA
1841	540	1864	NA
1842	NA	1865	NA
1843	NA	1866	NA
1844	890	1867	92
1845	800	1868	0
1846	1,600	1869	130
1847	1,385	1870	118
1848	1,703	1871	7.5
1849	2,610	1872	NA
1850	1,600	1873	0

NA. No records available.
a. Converted from Tierces (see Chapter IV, Section 4.2).
b. Plus 24 tierces and 5 hogsheads.

Table 4. Quantities of fish products exported from the Colonies of British Columbia and Vancouver Island, 1860-1870.

YEAR	Destination	Unspecified Fish						Salmon			Fish Oil		
		Hhg.	Barrels			Money		Barrels	$		Money		Barrels
			Full	Half	Kits	Amount	Currency				Amount	Currency	
Colony of British Columbia													
1860	Vanc. Is.		122										
1861	Vanc. Is.							25					
	New S. Wales							8					
	TOTAL							33					
1862	No Exports Recorded												
1863	Vanc. Is.	28											
1864	Vanc. Is.		98										
1865	Vanc. Is.		628										
1866	Vanc. Is.		309										
	Sandvich Is.		250										
	TOTAL		559										
1867	New Zealand		47										20
	Victoria		34										
	Sandvich Is.		397										
	United States					94	Pound st.				561	Pound st.	
	TOTAL		478			94	Pound st.				561	Pound st.	20
1868	United Kingdom		138										
	Victoria		10										
	Chile		200										
	Sandvich Is.	897											
	United States					350	Pound st.				325	Pound st.	
	TOTAL	897	348			350	Pound st.				325	Pound st.	
1869	New S. Wales		62	26	16								
	New Zealand		64	39									22
	Sandvich Is.	618											
	United States	194											362
	TOTAL	812	126	65	16								384
1870	United Kingdom		25										349
	Sandvich Is.	2,346											
	United States					908	$						225
	TOTAL	2,346	25			908	$						574
Colony of Vancvouver Island													
1863	No Exports Recorded												
1864	United States					124	$						
1865	England								400	300	$		
	U.S. (San Fran.)					2,702	$						
	U.S. (Other)					1,398	$						
	TOTAL					4,100	$		400	300	$		

Source: Bluebooks for the Colonies of British Columbia (1860-1870) and Vancouver Island (1863-1865).

Table 5. Estimated weight of salmon products processed in British Columbia, 1861-1877

Year	I	II	III	IV	V	VI	VII	VIII
	Pickled			Canned			Total Live Wt.	
	Barrels	Prod. Wt. lb.	Green Wt. lb.	Cases	Prod. Wt. lb.	Green Wt. lb.	lb.	Tonnes
1861 a	1,085	217,000	325,500				325,500	147.6
1870 b	NA	NA	NA		30,000	52,500	30,000	13.6 +
1873 c	4,000	800,000	1,200,000		436,800	764,400	1,236,800	560.9
1874 c	2,624	524,800	787,200	18,719	898,512	1,572,396	543,519	246.5
1876 c	481	96,200	144,300	10,647	511,056	894,348	607,256	275.4
1877 c	3,561	712,200	1,068,300		3,234,576	5,660,508	3,946,776 d	1789.9

Column II: Column I X 200 - See Text.
Column III: Column I X 300 - See Text.
Column V: Data as given in source or Column IV X 48.
Column VI: Column V X 7/4.
Column VII: Column III + Column VI.
Column VIII: Column VII / 2,205.
a. From Colony of British Columbia Bluebook for 1861
b. From Lyons (1969).
c. From Annual Reports of the Department of Marine and Fisheries.
d. Does not include $600 worth of smoked salmon (weight unspecified).

Table 6. Quantities of fish products exported from British Columbia, 1871-1877.

YEAR	Destination	Unspecified Fish				Salmon				Fish Oil		Other
						Pickled			Canned			
		Cases	Boxes	Pkg.	Barrels	Barrels	Boxes	Pkg.	lb.	$	Barrels	$
1871	New S. Wales					60	200					
	New Zealand					84						
	Victoria					145						
	Sandwich Is.				109	280						
	United Kingdom						846			16,850		
	United States	95								10,788		
	TOTAL	95	0	0	109	569	1,046	0	0	27,638	0	0
1872	Australia					374			1,200			
	United Kingdom			5		2		779	4,320		62,810	
	United States					2		139			9,988	266
	Honolulu					374						
	TOTAL	0	0	5	0	752	0	918	5,520	0	72,798	266
1873	Great Britain					37			186,432		108,408	
	Australia				10	1,782			26,416			
	New Zealand					20						
	Honolulu					399						
	New Caledonia				10							
	United States				43						12,009	
	TOTAL	0	0	0	63	2,238	0	0	212,848	0	120,417	0
1874	Great Britain				93	50			498,720		46,842	
	Australia				6	845			172,800			
	Peru								4,800			
	Chile								9,504			
	Africa								4,800			
	Mauritius				15	70			3,600			
	United States										19,582	
	Sandwich Islands					422						
	TOTAL	0	0	0	114	1,387	0	0	694,224	0	66,424	0
1875	Great Britain								161,616		30,547	
	Australia					249			126,320			
	South America								18,384			
	Sandwich Islands					658						
	United States				2a				101,664		15,147	
	TOTAL	0	0	0	2a	907	0	0	407,984	0	45,694	0
1876	Great Britain				176	3			312,864		52,500	
	United States				159				11,520		12,714	
	Australia					294			162,432			
	TOTAL	0	0	0	335	297	0	0	486,816	0	65,214	0
1877	Great Britain					10			1,141,528			
	United States					1,079			1,740,408		18,436	
	South America								4,800			
	Australia				2,321	1,805			314,256			
	Sandwich Islands					50						
	TOTAL	0	0	0	2,321	2,944	0	0	3,200,992	0	18,436	0

Source: Tables of the Trade and Navigation of the Dominion of Canada for the Fiscal Years ending 30th June, 1871-1877.

Table 7. Quantities, values and prices of unspecified fish products exported from British Columbia and Vancouver Island, 1860-1870.

YEAR	Destination	Packages				Barrels				Money	
		Pkg.	Value	Price	Curr.	Barrels	Value	Price	Curr.	Amount	Curr.
Colony of British Columbia											
1860	Vanc. Is.					122	122	1.00	pound st.		
1861	All exports consisted of salmon - see Table 4.										
1862	No Exports Recorded										
1863	Vanc. Is.	28	28	1.00	pound st.						
1864	Vanc. Is.					98	243/6/0	2.48	pound st.		
1865	Vanc. Is.					379	391	1.03	pound st.		
1866	Vanc. Is.					309	446	1.44	pound st.		
	Sandwich Is.					250	348	1.39	pound st.		
	TOTAL					559	794	1.42	pound st.		
1867	New Zealand					47	62	1.32	pound st.		
	Victoria					34	25	0.74	pound st.		
	Sandwich Is.					397	460	1.16	pound st.		
	United States									94	pound st.
	TOTAL					478	547	1.14	pound st.	94	pound st.
1868	United Kingdom					138	110	0.80	pound st.		
	Victoria					10	20	2.00	pound st.		
	Chile					200	247	1.24	pound st.		
	Sandwich Is.	897	856	0.95	pounds st.						
	United States									350	pound st.
	TOTAL	897	856	0.95	pounds st	348	377	1.08	pound st.	350	pound st.
1869	New S. Wales					79	741	9.38	$		
	New Zealand					84	604	7.23	$		
	Sandwich Is.	618	2,694	4.36	$						
	United States	194	564	2.91	$						
	TOTAL	812	3,258	4.01	$	163	1,345	8.28			
1870	United Kingdom					25	140	5.60	$		
	Sandwich Is.	2,346	12,346	5.26							
	United States									908	$
	TOTAL	2,346	12,346	5.26		25	140	5.60		908	$
Colony of Vancouver Island											
1863	No Exports Recorded										
1864	United States									124	$
1865	England: Exports consisted only of salmon - See Table 4.										
	U.S. (San Fran.)									2,702	$
	U.S. (Other)									1,398	$
	TOTAL									4,100	$

Source: Bluebooks for the Colony of British Columbia for 1860-1870 and for the Colony of Vancouver Island for 1863-1865.

Table 8. Quantities, values and computed prices of salmon products exported from British Columbia, 1861-1877.

YEAR	Destination	Pickled			Unspecified			Canned					
		Barrels	Value	Price	Boxes	Value	Price	Pkg.	Value	Price	Lb.	Value	Price
Colony of British Columbia													
1861	Vanc. Island	25	37 a	1.48 a									
Colony of Vancouver Island													
1865	England					400							
Province of British Columbia													
1871	New S. Wales	60 b	c	c	200	c	b						
	New Zealand	84 b	588	7.00									
	Victoria	145 b	1,145	7.90									
	Sandwich Is.	280 b	1,420	5.07									
	United Kingdom				846	4,061	4.80						
	d TOTAL	509 b	3,153	6.19	846	4,061	4.80						
1872	Australia	374	3,177	8.49							1,200	500	0.42
	United Kingdom	2	14	7.00				779	e	e	4,320	e	e
	Honolulu	374	1,906	5.10				139	1,112	8.00			
	d TOTAL	750	5,097	6.80				139	1,112	8.00	1,200	500	0.42
1873	Great Britain	37	257	6.95							186,432	33,605	0.180
	Australia	1,782	27,696	15.54							26,416	5,250	0.191
	New Zealand	20	160	8.00									
	Honolulu	399	2,694	6.75									
	TOTAL	2,238	30,807	13.77							212,848	38,655	0.182
1874	Great Britain	50	400	8.00							498,720	73,500	0.147
	Australia	845	5,848	6.92							172,800	26,513	0.153
	Peru										4,800	700	0.146
	Chile										9,504	2,384	0.251
	Africa										4,800	700	0.146
	Mauritius	70	680	9.71							3,600	600	0.167
	Sandwich Is.	422	2,210	5.24									
	TOTAL	1,387	9,138	6.59							694,224	104,397	0.150
1875	Great Britain										161,616	20,445	0.127
	Australia	249	1,080	4.34							126,320	15,242	0.121
	South America										18,384	2,101	0.114
	Sandwich Is.	658	3,250	4.94									
	United States										101,664	12,684	0.119
	TOTAL	907	4,330	4.77							407,984	49,872	0.122
1876	Great Britain	3	21	7.00							312,864	45,626	0.146
	United States										11,520	1,670	0.145
	Australia	294	2,553	8.68							162,432	23,400	0.144
	TOTAL	297	2,574	8.67							486,816	70,696	0.145
1877	Great Britain	10	100	10.00							1,141,528	154,259	0.135
	United States	1,079	8,983	8.33							1,740,408	196,536	0.113
	South America										4,800	650	0.135
	Australia	1,805	13,369	7.41							314,256	41,915	0.133
	Sandwich Is.	50	350	7.00									
	TOTAL	2,944	22,802	7.75							3,200,992	393,380	0.123

a. Pounds sterling
b. Nature of product not specified, barrels assumed to contain pickled salmon.
c. Value not given for individual products, total value of mixed products, $900.
d. Total for quantities for which separate values given.
e. Value not given for individual products, total value of mixed products, $6,360.

Table 9. Estimated quantities of salmon exported from British Columbia and Vancouver Island, 1860-1877.

Year	I	II	III	IV	V	VI	VII	VIII
	Pickled			Canned			Total Live Wt.	
	Barrels	Prod. Wt. lb.	Green Wt. lb.	Cases	Prod. Wt. lb.	Green Wt. lb.	lb.	Tonnes
1860 a	122	24,400	36,600				36,600	16.6
1861 a	33	6,600	9,900				9,900	4.5 +
1862 a	NA	NA	NA				NA	NA
1863 a	28	5,600	8,400				8,400	3.8
1864 a	98	19,600	29,400				29,400	13.3
1865 a	628	125,600	188,400				188,400	85.4
1866 a	559	111,800	167,700				167,700	76.1
1867 a	478	95,600	143,400				143,400	65.0
1868 a	1,245	249,000	373,500				373,500	169.4
1869 a	975	195,000	292,500				292,500	132.7
1870 a	2,371	474,200	711,300				711,300	322.6
1871 b	569	113,800	170,700	1,046	50,208	87,864	258,564	117.3
1872 b	750	150,000	225,000	918	49,584 c	86,772	311,772	141.4
1873 b	2,238	447,600	671,400		212,848	372,484	1,043,884	473.4
1874 b	1,387	277,400	416,100		694,224	1,214,892	1,630,992	739.7
1875 b	907	181,400	272,100		407,984	713,972	986,072	447.2
1876 b	297	59,400	89,100		486,816	851,928	941,028	426.8
1877 b	2,944	588,800	883,200		3,200,992	5,601,736	6,484,936	2941.0

Column II: Column I X 200 - See Text.
Column III: Column I X 300 - See Text.
Column V: Data as given in source or Column IV X 48.
Column VI: Column V X 7/4.
Column VII: Column III + Column VI.
Column VIII: Column VII / 2,205.
a. From Colony of British Columbia Bluebook for 1861
b. From Tables of the Trade and Navigation of the Dominion of Canada for the fiscal years 1872-1878 (reflecting fishing seasons 1871-1877 - See Text).
c. 918 cases plus 5,520 lb.

Table 10. Estimated total production and total exports (in terms of live weight) of pickled and canned salmon in British Columbia, 1860-1877.

Year	Pickled		Canned		Total Live Wt	
	Prodn. lb.	Exported lb.	Prodn. lb.	Exported lb.	Prodn. lb.	Export lb.
1860	NA	36,600			NA	36,600
1861	325,500	9,900			325,500	9,900
1862	NA	NA			NA	0
1863	NA	8,400			NA	8,400
1864	NA	29,400			NA	29,400
1865	NA	188,400			NA	188,400
1866	NA	167,700			NA	167,700
1867	NA	143,400			NA	143,400
1868	NA	373,500			NA	373,500
1869	NA	292,500			NA	292,500
1870	NA	711,300	52,500		52,500	711,300
1871	NA	170,700		87,864	NA	258,564
1872	NA	225,000		86,772	NA	311,772
1873	120,000	671,400	764,400	372,484	884,400	1,043,884
1874	787,200	416,100	1,572,396	1,214,892	2,359,596	1,630,992
1875	NA	272,100	NA	713,972	NA	986,072
1876	144,300	89,100	894,348	851,928	1,038,648	941,028
1877	1,068,300	883,200	5,660,506	5,601,736	6,728,806	6,484,936

Table 8. Quantities, values and computed prices of salmon products exported from British Columbia, 1861-1877.

		Pickled			Unspecified			Canned					
YEAR	Destination	Barrels	Value	Price	Boxes	Value	Price	Pkg.	Value	Price	lb.	Value	Price
Colony of British Columbia													
1861	Vanc. Island	25	37 a	1.48 a									
Colony of Vancouver Island													
1865	England					400							
Province of British Columbia													
1871	New S. Wales	60 b	c	c	200	c	b						
	New Zealand	84 b	588	7.00									
	Victoria	145 b	1,145	7.90									
	Sandwich Is.	280 b	1,420	5.07									
	United Kingdom				846	4,061	4.80						
	d TOTAL	509 b	3,153	6.19	846	4,061	4.80						
1872	Australia	374	3,177	8.49							1,200	500	0.42
	United Kingdom	2	14	7.00				779	e	e	4,320	e	e
	Honolulu	374	1,906	5.10				139	1,112	8.00			
	d TOTAL	750	5,097	6.80				139	1,112	8.00	1,200	500	0.42
1873	Great Britain	37	257	6.95							186,432	33,605	0.180
	Australia	1,782	27,696	15.54							26,416	5,250	0.191
	New Zealand	20	160	8.00									
	Honolulu	399	2,694	6.75									
	TOTAL	2,238	30,807	13.77							212,848	38,655	0.182
1874	Great Britain	50	400	8.00							498,720	73,500	0.147
	Australia	845	5,848	6.92							172,800	26,513	0.153
	Peru										4,800	700	0.146
	Chile										9,504	2,384	0.251
	Africa										4,800	700	0.146
	Mauritius	70	680	9.71							3,600	600	0.167
	Sandwich Is.	422	2,210	5.24									
	TOTAL	1,387	9,138	6.59							694,224	104,397	0.150
1875	Great Britain										161,616	20,445	0.127
	Australia	249	1,080	4.34							126,320	15,242	0.121
	South America										18,384	2,101	0.114
	Sandwich Is.	658	3,250	4.94									
	United States										101,664	12,084	0.119
	TOTAL	907	4,330	4.77							407,984	49,872	0.122
1876	Great Britain	3	21	7.00							312,864	45,626	0.146
	United States										11,520	1,670	0.145
	Australia	294	2,553	8.68							162,432	23,400	0.144
	TOTAL	297	2,574	8.67							486,816	70,696	0.145
1877	Great Britain	10	100	10.00							1,141,528	154,259	0.135
	United States	1,079	8,983	8.33							1,740,408	196,536	0.113
	South America										4,800	650	0.135
	Australia	1,805	13,369	7.41							314,256	41,935	0.133
	Sandwich Is.	50	350	7.00									
	TOTAL	2,944	22,802	7.75							3,200,992	393,380	0.123

a. Pounds sterling
b. Nature of product not specified, barrels assumed to contain pickled salmon.
c. Value not given for individual products, total value of mixed products, $900.
d. Total for quantities for which separate values given.
e. Value not given for individual products, total value of mixed products, $6,360.

Table 9. Estimated quantities of salmon exported from British Columbia and Vancouver Island, 1860-1877.

Year	I	II	III	IV	V	VI	VII	VIII
	Pickled			Canned			Total Live Wt.	
	Barrels	Prod. Wt. lb.	Green Wt. lb.	Cases	Prod. Wt. lb.	Green Wt. lb.	lb.	Tonnes
1860 a	122	24,400	36,600				36,600	16.6
1861 a	33	6,600	9,900				9,900	4.5 +
1862 a	NA	NA	NA				NA	NA
1863 a	28	5,600	8,400				8,400	3.8
1864 a	98	19,600	29,400				29,400	13.3
1865 a	628	125,600	188,400				188,400	85.4
1866 a	559	111,800	167,700				167,700	76.1
1867 a	478	95,600	143,400				143,400	65.0
1868 a	1,245	249,000	373,500				373,500	169.4
1869 a	975	195,000	292,500				292,500	132.7
1870 a	2,371	474,200	711,300				711,300	322.6
1871 b	569	113,800	170,700	1,046	50,208	87,864	258,564	117.3
1872 b	750	150,000	225,000	918	49,584 c	86,772	311,772	141.4
1873 b	2,238	447,600	671,400		212,848	372,484	1,043,884	473.4
1874 b	1,387	277,400	416,100		694,224	1,214,892	1,630,992	739.7
1875 b	907	181,400	272,100		407,984	713,972	986,072	447.2
1876 b	297	59,400	89,100		486,816	851,928	941,028	426.8
1877 b	2,944	588,800	883,200		3,200,992	5,601,736	6,484,936	2941.0

Column II: Column I X 200 - See Text.
Column III: Column I X 300 - See Text.
Column V: Data as given in source or Column IV X 48.
Column VI: Column V X 7/4.
Column VII: Column III + Column VI.
Column VIII: Column VII / 2,205.
a. From Colony of British Columbia Bluebook for 1861
b. From Tables of the Trade and Navigation of the Dominion of Canada for the fiscal years 1872-1878 (reflecting fishing seasons 1871-1877 - See Text).
c. 918 cases plus 5,520 lb.

Table 10. Estimated total production and total exports (in terms of live weight) of pickled and canned salmon in British Columbia, 1860-1877.

Year	Pickled		Canned		Total Live Wt	
	Prodn. lb.	Exported lb.	Prodn. lb.	Exported lb.	Prodn. lb.	Export lb.
1860	NA	36,600			NA	36,600
1861	325,500	9,900			325,500	9,900
1862	NA	NA			NA	0
1863	NA	8,400			NA	8,400
1864	NA	29,400			NA	29,400
1865	NA	188,400			NA	188,400
1866	NA	167,700			NA	167,700
1867	NA	143,400			NA	143,400
1868	NA	373,500			NA	373,500
1869	NA	292,500			NA	292,500
1870	NA	711,300	52,500		52,500	711,300
1871	NA	170,700		87,864	NA	258,564
1872	NA	225,000		86,772	NA	311,772
1873	120,000	671,400	764,400	372,484	884,400	1,043,884
1874	787,200	416,100	1,572,396	1,214,892	2,359,596	1,630,992
1875	NA	272,100	NA	713,972	NA	986,072
1876	144,300	89,100	894,348	851,928	1,038,648	941,028
1877	1,068,300	883,200	5,660,506	5,601,736	6,728,806	6,484,936