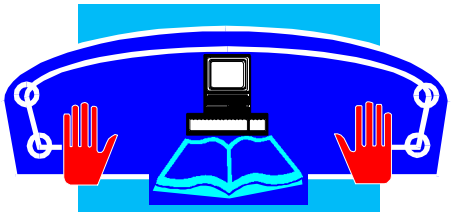

Char Market Penetration Analysis
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CHAR MARKET PENETRATION ANALYSIS

Sector: Fisheries

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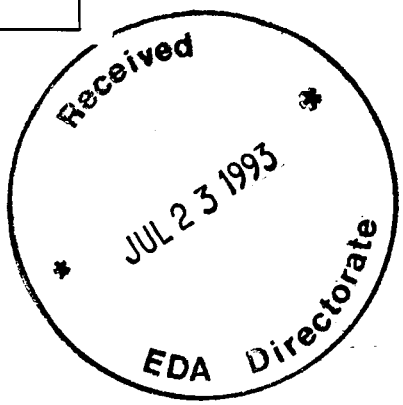

CHAR MARKET PENETRATION **ANALYSIS**

prepared by: Natural Resources Section
Economic Development and Tourism

Introduction

In the spring of 1992, the Freshwater Fish Marketing Corporation offered a reduced price for a limited amount of arctic char from the Northwest Territories. The FFMC, which had sold artic char for over a decade, indicated that increased competition from salmon had forced down demand. The GNWT proposed that the FFMC exempt char from its marketing monopoly. The Corporation agreed and the Northwest Territories Development Corporation took this opportunity to sell arctic char beyond the borders of the NWT.

The commercial char fishery offers a limited but important economic opportunity for eastern Arctic communities which face high rates of unemployment and few income earning alternatives. While the volume of catch is relatively quite small, the proportionate value of this resource to Arctic communities is much greater than other species such as whitefish and lake trout.

This report examines the market in which the NWT Development Corporation has sold char over the last nine months. An estimate of the Canadian market size for whole char has been attempted, and the impact of competing products described. The market for value added products has not been addressed.

Methods

This report was written based primarily on a review of existing studies, reports and statistical information from the following sources: Industry, Science and Technology Canada, the Canadian Association of Fish Exporters, Fisheries and Oceans Canada, Statistics Canada, and Economic Development and Tourism, Government of the Northwest Territories.

Previously reported information was supplemented with selected interviews with industry representatives and government officials.

Background

Government investment in arctic char fisheries has been significant over the last 30 years. Early efforts to establish commercial fisheries focused in the NWT focused on providing a year round supply of arctic foods for Inuit newly settled into communities. This intent quickly broadened to include export (beyond the NWT) sales.

Attempts to penetrate southern markets have constantly been hindered by the high cost of production relative to competing goods produced in the south. These higher costs have been subsidized by government in every aspect of the fisheries sector including price subsidies, contributions toward gear and vessels, and investment in processing capacity.

Both the federal and territorial governments have made significant investments in the char fisheries. Beside devoting staff to the development of these fisheries, direct financial support has been provided through several finding programs. One of the most important has been the Economic Development Agreements between Canada and the Northwest Territories. This series of EDA's has contributed especially to char fisheries in the Baffin.

Historically, the two largest char producing centers in the NWT were Cambridge Bay and Rankin Inlet. The two fisheries were developed quite differently. The Cambridge Bay model developed local control and management and focused on innovative harvest technology. The product line was kept simple, whole frozen char. The Rankin Inlet model was directed toward secondary processing, primarily canning and smoking. Control and management remained in the hands of government, and little innovation was directed toward harvest technology.

More recently, several communities in the Baffin region have contributed to export arctic char production. Except in Pangnirtung, where a federally approved freezing plant is located, these communities must conduct winter fisheries and freeze fish on the ice for southern export because existing freezer plants do not meet federal Fisheries and Oceans requirements.

The Freshwater Fish Marketing Corporation (FFMC)

The FFMC is, by federal legislation, the single desk seller of most of the commercial freshwater production in Alberta, Saskatchewan, Manitoba, parts of Northwestern Ontario, and the Northwest Territories. A crown corporation, the FFMC must fulfill a mandate to provide the best possible price to fishermen, and to purchase all production offered at that price. While in theory the FFMC has no control overproduction, in practice the Corporation has been successful in negotiating production agreements with fishermen and its pricing schedule is used to encourage or discourage production.

Char is included in the list of species over which the FFMC has a marketing monopoly. Because of the relatively low volumes of char compared to other fish received by the FFMC, the Corporation has expended relatively little effort in marketing this species. In the last few years, most of the char production has been sold through one broker in Ontario, with the remainder sold into Alberta. When the large increase in salmon production in the last few years forced salmon prices down, the Corporation could not justify the marketing effort required to keep char prices up. Of course, this lack of effort resulted in a decline in the market price for char, which further discouraged the FFMC's interest in this fish. When the GNWT requested a market exemption for char from the FFMC in 1992, the Corporation was therefore quite willing to concede.

The NWT Development Corporation

The NWT Development Corporation was created by the GNWT to invest in sectors of the economy where risk had discouraged private investment. The primary mandate of the Corporation is job creation. Toward this goal, the Corporation can subsidize operational costs up to $10,000 per job created.

The fisheries sector has long been one economic area with good potential for job creation. However, requirements for large capital investment in the face of uncertain returns have deterred private investment in the processing sector. The Development Corporation had already made a major investment in the marine turbot fishery out of Pangnirtung prior to the FFMC's approval of a market exemption for char. It was logical for the Development Corporation to pickup chin, however, the Cooperative which ran the Cambridge Bay char fishery preferred to market outside of the Corporation. Without summer production in the Baffin, this left production from the Keewatin as the responsibility of the Corporation.

The Corporation had very little in-house experience with char when it assumed responsibility for marketing this fish. This lack of experience combined with an extremely poor fishing season in the Keewatin resulted in an essentially disastrous initial effort. Very little of the Rankin production was sold out of the NWT. Most of the fish was stored in the plant freezer for further processing in the fall. Product could not be produced to the specifications provided by Dev Corp staff in Yellowknife for southern markets. At that point, the Corporation decided to halt its efforts until the Baffin winter char fishery came on stream.

Prior to Baffin production coming on stream in January, 1993, the Corporation contracted two fish brokers to market the production for $40,000 per year for five years. The brokers requested a straight contract rather than the usual volume-based fee because they feared that the Corporation would sell directly to buyers in the next year.

Char Supply

The Canadian char supply comes from three sources: wild caught char from the Northwest Territories, wild caught char from Labrador and a smaller but growing volume of farmed char. This section briefly reviews volumes and characteristics of these sources.

Wild Char - Labrador

The wild char harvest from Labrador peaked in 1981 at 253 tonnes and has declined since that time (see Table 1). This decline is attributed to reduced fishing effort in reaction to decreasing fish size and returns to fishermen. Decrease in fish size is probably a result of over exploitation of the stocks.

Table 1 Wild Char Catch (Exported Out of Region)

Year	Total Catch (tonnes)	
	Labrador	NWT
1981	253	
1982	243	
1983	179	52
1984	148	62
1985	142	63
1986	114	73
1987	108	53
1988	95	89
1989	105	79
1990	106	68
1991	79	56
1992	80	33

Most of the Labrador catch (80%) is processed in Nain; the remaining catch is processed at the Tomgat Cooperative. The flesh color varies from pale pink to red and price is determined by color as well as size.

Labrador char is marketed through distributors in Montreal and Halifax, with Halifax distributors selling into the eastern U.S. Probably over half the Labrador production ends up in the States.

Char from Labrador is generally smaller than char from the NWT and Labrador char is predominantly paler; only about 20% of the catch is red-orange fleshed.

Wild Char - **Northwest Territories**

Char is commercially harvested primarily in three regions of the NWT: the Kitikmeot, the Keewatin and the Baffin. Table 2 presents historical harvest data:

Table 2 Total recorded catch on NWT commercial char licenses (includes fish sold within and outside the NWT)

Year	Total Harvest (kgs)		
	Kitikmeot	Keewatin	Baffin
1975	70702	37920	3 2 1 7 9
1976	46235	40280	21567
1977	94194	41443	40720
1978	68925	27036	32367
1979	86233	35685	27075
1980	71939	34474	12101
1981	65369	46185	19940
1982	57573	53191	43600
1983	76673	25269	28195
1984	74317	23221	56257
1985	64768	35965	26761
1986	64768	28638	28488
1987	47181	29627	3 4 5 2 7
1988	64298	48390	46000
1989	46150	36500	46000
1990	38012	16145	51000
1991	45948	32631	41147

The variation in catch reported for the NWT in tables 1 and 2 reflects the fact that much of the commercial harvest is not exported outside the Territories .

Cambridge Bay has been the most consistent producer of export arctic char. However, adverse environment factors severely limited the catch in 1991, and a failure in marketing strategy reduced sales in 1992. Options to hold live fish until transport overland is possible are being explored. Such alternatives, if feasible, may reduce the transportation costs which currently inhibit expansion of the fishery.

The Keewatin production has fluctuated widely in the last 15 years due to both environmental and organizational problems. Because of distance constraints and the monopoly the FFMC had on char purchases, exports of char from the Baffin has been limited until 1993.

Char production in all areas of the NWT is subject to environmental constraints which cause wide production fluctuations. For example, the Keewatin region experienced a very late spring in 1992 which severely disrupted char runs, resulting in one of the poorest catches of char on record in this area.

Aquacultured Char

In Canada, char captured the interest of aquaculturists in the late 1980's although researchers with Fisheries and Oceans began experiments with culturing char in 1978. Currently, abut 24 operations are raising char, with the majority of producers located in New Brunswick, P.E.I., and Newfoundland, In Manitoba three companies are experimenting with char and one operation in the Yukon has been working to develop commercial production since the late 1980s. A few other operations are located in Saskatchewan, Ontario and British Columbia. However, most of these operations are growing char only as a sideline to trout or salmon; there are only a few serious specialists in char aquaculture in Canada.

Although promoters tout the great potential of farmed arctic char, both market and production have shown slow growth. While some aspects of its biology ideally suit char to aquaculture, other biological characteristics pose problems.

The supply of marketable fish is limited. Producers are still establishing broodstocks in order to provide a self-sustaining supply. In 1991, between 20 and 38 tonnes of Canadian farmed arctic char were sold. As of 1991, there were 2 million eyed char eggs in incubation in Canada which represents a potential supply of 200 tonnes for 1993. Production capacity in Canada presently is about 400 tonnes. Production in 1992 was at about the same level as 1991.

Most production marketed to date has been under 2 lbs. Producers are finding it difficult to grow char in the 2-4 lb range economically. Considering the record of Canadian supply of farmed char to date, the potential predicted for 1993,200 tonnes, is highly optimistic.

Both Iceland and Norway have made significant strides in char aquiculture. The University of Tromso in Norway has been a center for development in this area since the late 1970's. However, no significant volumes of char are being exported from Norway yet, Iceland is now exporting about 1000 kg of farmed a week into Boston, a relatively small volume in terms of the overall fish trade but equivalent, on an annual basis, to the average export production of the Cambridge Bay plant in the Northwest Territories.

Current and Potential North American Supply of Char

The current supply of char in North America has been calculated as follows:

Wild Canadian Chin.

High: the average total NWT production over the past 17 years: 130 tonnes
Low: average NWT export production over the last 10 years: 63 tonnes

Labrador

The average Labrador production over the past 10 years: 115 tonnes

Canadian Farmed Char:
High estimate of 38 tomes
Low estimate of 20 tomes

Total Canadian Supply of Arctic Char
High 283 tonnes
Low: 198 tonnes

Imported Farmed Char: equivalent to volumes imported from Iceland estimated at 52 tonnes

Markets for Arctic Char

Generai

The traditional market for arctic char has been the high priced white table cloth trade in central Canada (supplied by the FFMC), and the eastern US seaboard (supplied by Labrador). It is estimated that 75-80 per cent of arctic char are sold into this market; the balance is marketed into specialty fish stores an retail outlets.[1]

The market for char has experienced downward pressure on price in the past three years primarily because of declining prices for salmon, the main competition for char in it marketplace.

In the remainder of this section, markets for char are considered in light of trends in overall fish consumption patterns in North America, trends in salmon markets, and characteristics of the wholesale, retail and restaurant markets in eastern and central Canada, where the NWT Development Corporation has concentrated its marketing efforts to date. Price regimes are then reviewed in current char markets and compared to salmon prices.

Trends in Fish Consumption, US and Canada

Fish consumption has been increasing in both the US and Canada. The annual Canadian consumption of fish was 7.98 kg per capita in 1988, compared with 5.27 kg in 1970. However, fish represents 3% of food purchases in Canada, a change of only 1% from 20 years ago. While Canadian consumption is slightly higher than the U.S.(7.3 kg per capita in 1989) this value is relatively small compared to other countries such as France (20 kg) or Japan (80 kg).

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[1]Smith, Robin, 1989. Market Interaction of Canadian Farmed and Wild Arctic Char. Department of Fisheries and Oceans.

United States

The U.S. is Canada's major fish export market; Canadian is the world's leading exporter of fish to the United States. In 1990, Canada provided 22 per cent of U.S. imports valued at US$1.174 million. Ground fish products dominate Canadian exports into the U.S.. Canada exports between 86 and 97 per cent of its fresh fish (fillets and whole) and frozen fish (fillets and blocks) to the United States.

Canadian and American fish consumption patterns follow similar patterns. In the United States, fish consumption has increased overall in the last two decades. Fresh and frozen product sales have grown faster than sales for canned fish. Restaurant sales have grown at a faster rate than sales in other sectors. Fish consumption per capita is predicted to reach 9 kilograms by the end of the century.

Canada

The Canadian domestic market for fish products was valued at C$1,216 million in 1988. While Canada is a leading world exporter of fish, 61 percent of the Canadian demand was filled by imports. This fact suggests that the Canadian market is under supplied by domestic producers, a situation which is explained by the greater attraction of the American market for Canadian suppliers.

Using Statistics Canada 1990 data for food expenditures per household in 17 metropolitan areas, we have calculated and estimate for expenditures (in 1990 dollars) per household on fish assuming that fish purchases comprise 3% of all food purchases.

Fish purchased from stores: $155/year/household
Fish purchased from restaurants, etc.: $58/year/household
Total fish purchases: $213/year/household

These statistics are based on an estimate of 2,003,800 households which allows an estimate of total expenditure of $426,809,400 for fish in major urban centers in Canada.

Sales of canned fish have declined as a result of increased consumer consciousness regarding health (decreased consumption of salt, fats and preservatives). In 1989, consumption of canned fish in Canada was estimated at 1.55 kg per capita, a decline from 1.89 kg per capital estimated for 1988.

Statistics Canada data for 1989 indicate that consumption of fresh and frozen fish in Canada was 6.32 kg per capita. Sales of fresh fish grew throughout the 80's and into 1990 largely as a result of the appearance of fresh fish counters in supermarkets. This growth has slowed in the early nineties, primarily because of the recession.

Sales of frozen fish are currently declining in Canada but the rate has slowed as the relatively cheaper cost of frozen product becomes more attractive in a recessionary

economy. Prospects for the frozen market are good over the medium term; frozen product is attractive to low and middle income earners, and frozen fish is more practical due to ease of storage.

The demand for frozen prepared fish dishes is growing. This growth is largely a result of changes in the workforce which has seen a dramatic rise in the number of two income families and correspondingly less time for meal preparation.

Consumer Profiles

Trends in seafood consumption are more easily defined when examined according to consumer type: ethnic, upscale, conservative, and non-consumers.

Ethnic Consumers

Non-anglophone and non-francophone ethnic groups eat fish frequently. This group generally are

- interested in a wide range of species, especially more exotic species from warmer seas
- brought up eating fish
- conscious of using all parts of the fish
- purchasing in small fish stores where presentation and cleanliness are not of primary concern

Up-scale Consumers

Up-scale consumers are largely responsible for the increased demand in fresh fish and exotic species. This group is characterized by

- higher education
- higher income
- professional status
- 24-44 age category
- greater social mobility
- widely traveled
- more cosmopolitan
- more open to new experiences

Conservative Consumers

These consumers eat traditional fish products such as salmon, trout, cod, sole, haddock and halibut. Growth in demand has been slow in this category.

Non-Consumers

This category represents a significant but shrinking proportion of the Canadian population. While taste is factor in their decision not to eat fish, the non-consumption of the group also stems from the relative expense of fish, cultural barriers, previous negative experience, fear of choking on bones, and fear of poisoning.

Other Factors Affecting Fish Consumption

Important externalities affecting demand for fish in North America are availability and supply. Shortages in traditional species since the mid- 1980s has allowed imported species to capture significant share of the North American market. Non-traditional species such as Alaskan pollock, grouper, orange roughy, whiting and catfish are important species in the market today. Alaskan pollock is now a price setter in the low end of the market. Other protein substitutes, meat and poultry, compete strongly for the same market. Sales of chicken have grown faster than fish primarily because of price. While the price of fish has increased by 50 % in the last ten years, the price of chicken has increased by only 20% during this dine.

As more fresh whole fish and fillets enter the market, quality and appearance assume greater importance relative to canned and frozen product.

Disposable income is also an important influence on fish consumption in North America, especially since the restaurant trade accounts for a proportionately high volume of sales. In the last three years, fish sales have slowed in response to the recessionary economic climate.

Market for Fish: Eastern/Central Canada

The geographic focus of marketing efforts at the retail level by the NWT Development Corporation for char has been eastern and central Canada, primarily Montreal. A recent study completed for ISTC examined the characteristics of the seafood markets in Toronto and Montreal, with reference to Quebec City for comparison. The following discussion is based on this report, supplemented by information from Statistics Canada.

The data in Table 3 suggest that households in Ottawa eat much less fish than households in other central and eastern Canadian cities. Households in Toronto and Montreal reported the highest levels of fish consumption in the five cities surveyed. This trend would suggest that these two cities would be preferred locations for fish marketing.

Table 3 Fish Consumption in Selected Eastern Canadian Cities, kilograms perhousehold per week
(source: **Statistics Canada,** Detailed Weekly Food Quantities by City)

PRODUCT TYPE	CITY (KG/HSLD/WEEK)					
	Halifax	**Quebec**	**Montreal**	**Ottawa**	**Toronto**	
Fresh/frozen F h						
Cod						
Flounder and Sole		.057	.029		.025	
Haddock	.043					
Salmon			.04			
Other Fish		.039	.05		.132	
Pre-cooked Frozen Fish Portions	.041		.028		.054	
Canned Fish						
Salmon			.022	.027	.039	
Tuna	.06	.032	.033	.077	.021	

Market for Fish in Montreal and Toronto

A 1991 study **reviewed** the state of the retail food industry in Montreal, Quebec City and **Toronto.**[2] The study included a survey of a sample of supermarkets, fish stores and restaurant in Montreal, Quebec **City** and Toronto to **determine** the quality and variety of fish sold in those establishments. The following discussion summarizes the **results** of that study which are relevant to this consideration of char markets.

[2]Stratem. 1991. Situation of Seafood Products on the Montreal and Toronto Retail and Institutional Markets. Industry, Science and Technology **Canada.**

Supermarkets (based on a survey of 54 supermarkets in Montreal, Quebec and Toronto)

. Whole Fresh Fish and Steaks

In supermarkets surveys, of thirty two species carried in stores, Pacific salmon, rainbow trout, smelt and Atlantic salmon were the most common fish found in fresh fish food counters. Only 2% of the stores carried fresh arctic char.
supermarkets

. Whole Frozen Fish and Steaks

In stores surveyed in Montreal, Quebec and Toronto, the majority of stores offered Pacific salmon and Smelt. Frozen arctic char was carried in Quebec and Montreal in 11% and 5%, respectively, of stores surveyed.

Fish Stores *(20* stores in Quebec City, Montreal and Toronto)

Whole Fresh Fish and Steaks

Fish stores generally offer a wide range of fresh whole fish. The majority of stores surveyed in Montreal offered Atlantic and Pacific salmon, mackerel, sole, shark, blue fish, tilefish, rainbow trout, grouper, pickerel, skate, hake, smelt ,swordfish, sea bream, and monkfish.

Stores in Toronto offered Atlantic salmon, tileflish, red snapper, mackerel, hake and sea bream.

Fresh arctic char was offered by 7.7% of stores sampled, presumably only in Montreal.

Frozen Whole Fish and Steaks

Fish stores generally care much less frozen inventory for sale than supermarkets. The emphasis is on sales of fresh whole fish.

Hotel, Restaurant and Institutional Market

The white table cloth trade has been the traditional market for char. An examination of trends in the restaurant market are important for char markets.

Growth in the restaurant trade was negative between 1990 and 1992. This decline is attributed to the current recession; the general trend over the last three decades is an increase in the number of times Canadians eat meals outside the home. Food consumed

outside the home accounted for 39% of all food eaten in Canada in 1990, compared@ 18% in 1%3.

Recovery of sales in the restaurant trade was slow over 1992 and this growth, though slow, is expected over 1993, although significant impact on sales may not be seen until 1994.

The restaurant sector experiences a high rate of bankruptcies; yet the rate of new openings is higher than business c1osws. The supply is greater than demand even with the trend toward a greater number of meals being consumed away from home.

- ***Food Preferences of Restaurant Customers***

According to a survey conducted by the Canadian Restaurant and Food Service Association, among restaurant customers, chicken is the most popular main dish (22% of respondents), followed by hamburger (10%) and steak (8%).

Fish is ordered by 7% of survey respondents (not including shellfish) as a main dish.

For 91% of the respondents, price is considered important or very important when deciding on a main dish. Menu description was selected by 86% of the survey sample as important or very important.

- ***Growth in Seafood Sales***

According to a 1991 survey of restaurant and hotel buyers, seafood sales in restaurants are growing for the following reasons:

- people cook fish less at home than meat or poultry, therefore they are looking for something different in their restaurant experience
- people are becoming more health conscious and choosing fish as a healthy alternative
- restaurants are offering a greater number and variety of fish products
- fish appeals to the more adventurous palate of the 25-55 age group, which is a strong customer group

Over the past five years, restaurants have been increasing the menu space given to fish dishes, especially in medium and high price restaurants. Generally, 20% of a restaurant menu is devoted to fish dishes; this figure expands to 50% in high class restaurants.

People eat more fish at night than at lunch time, except in medium class restaurants which serve less expensive fish dishes (tuna or salmon salad, etc.).

Fish most often requested by buyers for high class restaurants are

Salmon	Striped Bass
Perch	Ocean Perch
shrimp	Turbot
Shark	Pickerel
Red snapper	Grouper
Swordfish	Sea bream
Squid	Spiny dogfish
Mackerel	

. ***Buyer Purchasing Patterns***

The purchasing patterns of medium price and high priced restaurants are considered here; low price restaurants are considered outside the market for char.

Medium Price Restaurants

Product quality and price rank as equally important, however these restaurants tend to stay away from very expensive species. Most of these restaurants buy a combination of fresh and frozen fish, but the proportion varies widely. Often, fresh fish will be offered as a special to supplement a permanent menu offering supplied by frozen product.

High Price Restaurants

Most of these establishments buy almost all fresh fish. The buyers are extremely demanding and want personalized service. Price is not a great consideration compared to quality, variety and prompt, accurate service. Filleted fish is in most demand, although French chefs tend to buy whole fish. These restaurants generally have daily delivery and expect to order 24 hours in advance.

Market Placement of Arctic Char in Montreal and Toronto

In eastern and central Canada, Montreal and Toronto offer the best opportunities for char sales. Halifax, which is presently served by Labrador char, offers another good metropolitan market although the lower level of fish consumption in that city and the less cosmopolitan nature of its populace makes it a less attractive market than Montreal or Toronto.

The best markets for arctic char in metropolitan Montreal and Toronto are ranked in order of importance as follows:

Seafood specialty restaurants
High class restaurants
Seafood stores

While high class restaurants generally prefer to purchase fresh fish, the trade is willing to carry frozen char for the standard menu offering and use fresh char when in season or for specials.[3]

Competing Products for Wild Char

Salmon and AquaCultured char are the two most important competing products for wild caught arctic char.

Salmon

Salmon is the most popular finfish species sold in Canada and the US. It is most frequently cited as the major competitor for char. Trends in the salmon market impact on the market for char. Awareness of these trends is important in predicting market directions for char.

The Canadian salmon industry is concentrate on the east and west coasts. The Pacific salmon harvest is primarily wild, averaging 90,000 tonnes for all species, with aquacultured species becoming increasingly important. The Atlantic industry is based on farmed fish (70% of production). The market for Atlantic salmon is mainly for fresh, whole fish sold into central Canada and increasingly into the U.S. In contrast, the West Coast industry sells only about 14% of its production of whole fish domestically.

The three most important markets for Canadian salmon are Japan, the EC, and the U.S. In 1989, Canadian salmon exports were valued at $479 million which represents 16% of the world market share. Of this volume, 48% were frozen, whole or dressed and 28% were canned.

Aquacultured salmon has become an important contributor to world production. In 1984, farmed salmon contributed almost 4 per cent to world salmon production; by 1991, this share had increased to 26 per cent (see table 4).

The world's largest exporter of farmed salmon, Norway, was unable to control production, leading to a decline in world salmon prices in the late '80's. As a result, in November 1990 the Norwegian Fish Farmers Sales Organization declared bankruptcy, leaving US$11O million owing to many of the 750 Norwegian fish farming companies. The FOS was a single huge sales organization setup by the Norwegian industry and given a monopoly by law to control sales of Norwegian farmed salmon.

[3]Smith, Robin. 1989. Market Interaction of Canadian Farmed and Wild Arctic Char. Department of Fisheries and Oceans.

The Canadian aquaculture industry is moving toward rearing Atlantic salmon as the fish of choice on both coasts. BC production is expected to remain at 19,000 tonnes thorough 1993, when for the first time there will be a greater tonnage of Atlantic salmon harvested. West Coast will probably stabilize production in short term at 18,000 tonnes in BC and 3,000 tomes from Washington. The most noteworthy trend is the switch from Pacific (chinook) to Atlantic salmon.

Maine and New Brunswick are both increasing in production of Atlantic salmon. The forecast for '92-'93 is 16,000 tomes, 10,000 from New Brunswick and 6,000 tonnes from Maine. Production on east coast is growing at a much faster rate than the west coast.

Table 4 World Production of Farmed Salmon (metric tomes)

	1990	1991	1992	1993*
Norway	158,000	155,000	125,000	105,000
Scotland	33,000	40,600	35,000	30,000
Chile	19,400	26,600	33,500	35,000
Japan	25,900	27,000	27,000	27,000
Canada	20,750	27,500	28,700	31,000
Faroes	12,000	15,600	15,000	12,000
Ireland	7,500	8,300	9,000	8,000
us	3,900	6,200	10,500	12,000
Others	6,100	7,500	5,500	6,000
TOTAL	286,550	314,300	289,200	266,000

*estimate

Table 5 World Salmon Production (metric tonnes)

YEAR	FARMED	WILD	%OF TOTAL
1984	33,000	836,000	3.9
1985	45,000	1,088,773	4.1
1986	68,000	934,773	7.3
1987	87.000	845.227	10.2
1988	134,000	852,682	15.7
1989	196,000	1,140,909	17.2
1990	286,550	1,076,409	26.6
1991	314,300	1,189,273	26.4

With salmon supply increasing from both the wild harvest and farmed production, salmon prices have been dropping in recent years. This price drop has been exacerbated in the last

two years by the recession in Japan, the world's largest consumer of salmon, which has resulted in a decline in demand

In the marketplace, char is associated with salmon and pricing follows the same pattern both in the long term and over short term seasonal movements. The price received for char will therefore fluctuate during the year according to the price of salmon. The annual price fluctuation for Atlantic salmon, a species popular with the upscale market, is shown in Figure 1.

Farmed Char

To date, char farmers have not been successful in growing char economically to the 4-7 lb size. Char under 2 lbs, the most common farmed size, do not compete directly against char in the 4-7 lb category. Current market reports indicate that farmed char on the market is inferior to wild-char in terms of taste, flesh color, and texture.

Pricing

In the marketplace, the price for char is affected by the following factors: size, color of the flesh, fresh or frozen state, and the current price for salmon.

Labrador char prices, shown in Table 6, reflect the size and color variation prevalent in production from that area.

Table 6 Labrador Inuit Development Corporation Arctic Char Prices, 1991 (frozen, head on):

Size (lb)	Color	Price($/lb)
2-4	Red	3.50
4-6	Red	3.70
+6	Red	3.90
2-4	Pink	3.25
4-6	Pink	3.50
+6	Pink	3.70
2-4	Pale	2.70
4-6	Pale	2.95
+6	Pale	3.20

NWT wild production is generally more consistent in color and size. Fish in the 4-7 lb range dominate the supply.

Western Management Consultants (1989) compared the price regime for frozen and fresh char by size and market segment:

Table 7

	Brokers/ Wholesalers		Retailers		Restaurants
	Buy	sell	Buy	sell	Buy
FROZEN	Cdn$/lb				
2-4 lb	2.50	3.40 -.			
4-7 lb	4.75	5.38	4.65	8.01	5.47
7 lb	4.50	5.38			
FRESH					
8-10 oz	4.50	5.95			5.95
2-7 lb			5.00	8.01	

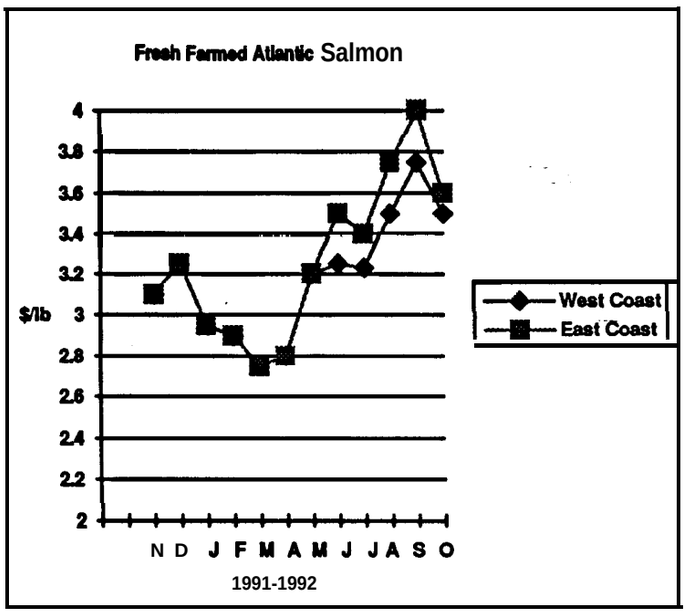
In the late 1980's, the FFMC offered a 25% price bonus for fresh arctic char. The program was discontinued because lack of reliable supply created customer dissatisfaction and the increasing supply of fresh farmed salmon was putting downward pressure on price.

For NWT production the FFMC provided the following information on markups on frozen char circa 1990 (prices Cdn$/lb):

Plant	$3.00
FFMC Markup	$.50
Broker Markup	$.90
Retail Markup	$3.60
Total (Retail Price)	$8.00

Char prices follow prices for salmon from year to year and seasonally. The following chart presents price trends by month for fresh farmed Atlantic salmon grown on the east and west coasts of Canada.

Figure 1 Wholesale Prices (US $) Fresh Farmed Atlantic Salmon (8-10 lb), 1991/92 **(source: Canadian** Association of Fish Exporters)



In 1992, prices for **aquacultured** char averaged Cdn$4.00 to $5.00/lb to the **processor;** who tend to market directly. Polar Seas Ltd. estimates that prices of **Cdn$6-7/lb** can be obtained marketing directly to restaurants.

According to the preceding data, a 10% premium can be expected for fresh char over the price received for frozen char. The price **received** for fresh farmed char (under 4 **lbs)** follows very closely the price received for fresh farmed Atlantic salmon in the 8-10 lb range. This relationship suggests a premium can be obtained for char in the same size class as salmon. The wholesalers marketing **NWT** Development Corporation char suggest that the upper limit of this premium is 20% and at certain times of the year, when the salmon supply is high, this premium disappears.

In the winter of 1993, the **NWT** Development Corporation offered char at the following wholesale prices:

Size **(lbs)**	Price/lb
2-4	$3.50
4-6	$4.05
6-8	$4.50
8-10	$4.65
>10	$4.65

The prices offered in the winter of 1993 by the Development Corporation for frozen arctic char were approximately 25% higher than fresh farmed Atlantic salmon. However, the prices for char do not reflect any broker fees.

Market Size for Arctic Char

In estimating the market size for arctic char in Canada, the following assumptions were used:

. the char will be sold in whole, dressed frozen form, 4-7 lbs
• farmed salmon and farmed char will not directly compete since these are sold fresh
• currently, the whole frozen salmon supply to the Canadian market represents 14% of the average wild harvest on the west coast, 12,600 thousand metric tonnes
. half of the production of fresh farmed Atlantic salmon, 5,000 tonnes, from eastern Canada will enter the eastern and central Canadian market,

Using these assumptions, we can calculate an estimate for whole salmon consumption in Canada as 18,100 tomes. Based on this estimate, a market size for char can be estimated for various market penetration rates: 2%, 5%, 10% and 15%.

Penetration Rate	Market Size (tonnes)
2%	362
5%	905
10%	1,810
15%	2,715

We can reasonably expect that at current char prices, a market penetration rate of 5% could be achieved without forcing prices down. We base this expectation on the assumption that most of this production would end up in the restaurant and specialty seafood stem market. This figure is very close to the estimate for market size for char provided by Western Management Consultants.

To achieve penetration rates above 5%, char would have to sold into the supermarket retail trade for lower returns. At prices equal to salmon, the maximum market share which char could reasonably be expected to capture would be 15%.

Marketina Performance of the NWT Development Corporation

By March 31,1993, the NWT Development Corporation had purchased slightly over 32 tonnes of arctic char from the Baffin region. The community of Pangnirtung provided half of that supply, followed closely by Igloolik, with theremaining 10% coming from Broughton Island and Clyde River.

The primary market for the char was chain of seafood stores in Quebec with remaining supplies sold into the white table cloth trade. This focus is consistent with the recommendations for target markets made earlier in this report.

The Corporation originally set a sales target of 2,500 lbs per week of whole, dressed frozen char. Some value-added processing would be conducted in Montreal to develop marketable smoked, marinated and fillet products. However, the program of frozen sales was terminated in February after the incidence of returns of poor quality fish reached 15%. At this point, 7.7 tonnes of frozen char had been sold. The decision to terminate sales was made in order to avoid damaging the market.

Since the termination of frozen sales, all production has been earmarked for the value added program. To date, no significant sales have been made.

In discussions with the Corporation, Air Canada has indicated that it will purchase 160,0008 ounce portions of char annually at a price of $8.20/lb.

The prices for which the Corporation was selling arctic char were about 30% higher than fresh farmed Atlantic salmon at the beginning of 1992. This places the product in the upper 5% of the market as described above; the potential Canadian market size in the range is estimated at 905 tonnes. This price range is consistent with the market segment into which the Corporation was selling char: seafood stores and white table cloth restaurants but the price was relatively higher than salmon at the beginning of 1993. As the winter progressed, this differential between the Corporation's prices and salmon prices decreased toward the 20% maximum which the market can bear.

No conclusions can be drawn regarding the degree of market penetration achieved by the Corporation because of the premature termination of the frozen product program. If the program had continued and sales realized 2,500 lbs per week, annual sales of 130,000 lbs or 59 tonnes would have been realized. This represents a 6% share of the potential Canadian market for char at the prices for which the Corporation was selling char.

Conclusions

The maximum supply from wild and farmed production in Canada is much smaller than the potential Canadian market. However, to maintain high prices (prices at which the NWT Development Corporation was selling char in the winter of 1993), introduction of new production into the market must be gradual.

To maximize market penetration, char prices cannot be static through the year. As the prices for salmon rise and fall, so must char prices. The Corporation has already this winter experienced situations where, on a week to week basis, buyers would take advantage of lower salmon prices, returning to char when salmon prices rose again.

The best market for char are seafood specialty stores and restaurants, and the white tablecloth trade. The Canadian market in this trade should be able to absorb all of the NWT production without sacrificing price. Again, seasonal price variations must be observed