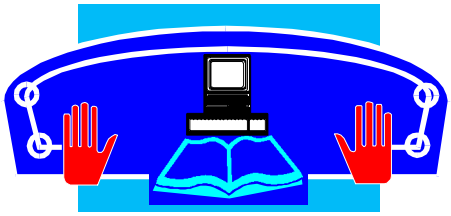

Keewatin Region Commercial Fishing Strategy
Type of Study: Planning / Strategy Author: Symbion Consultants
Catalogue Number: 3-7-16

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Part A:

Objectives, Principles & Issues

1.0 Introduction

In February, 1989, RT & Associates in cooperation with Symbion Consultants were contracted by the Department of Economic Development & Tourism, Government of the Northwest Territories, to prepare a fishing strategy for the Keewatin Region. The objective of the strategy is to develop a five-year plan for the management and development of Keewatin fisheries.

In undertaking this assignment the consultant has identified three phases to the work program: Phase 1 – Strategy Development; Phase 2 – Business Plan Preparation; and Phase 3 – Operational Plan Preparation.

During the strategy development phase, objectives, principles and issues are identified and problems, options and opportunities are examined on an industry sector basis.

During the second phase of the work program, business plan preparation, capital and operating cost requirements, financing options and cash flow projections associated with program implementation are examined to provide a basis for private and public sector investment decisions.

The third phase of the planning process involves the preparation of an operational plan which identifies program implementation scheduling, priorities, responsibilities and critical time horizons. The operational plan is intended as a working document or blueprint to guide the implementation phase of the fishing strategy.

This report addresses the strategy development phase of the work program.

2.0 Background

Fish resources of the Keewatin Region include inland freshwater species such as whitefish, trout and grayling, marine species such as shrimp and Arctic cod, and , anadromous (searun) Arctic char. Fish are harvested for domestic, commercial and sport purposes. In terms of importance to residents of the Region, the domestic fishery is considered to have the highest value from both an economic and a social perspective.

Domestic Harvest: Reliable data is lacking on the current subsistence or domestic harvest of fish in the Region. Possibly the most reliable recent estimates of domestic harvest have been developed through a harvest study conducted jointly by the Keewatin Wildlife Federation and the Department of Renewable Resources, GNWT. Domestic harvest estimates by species for 1984/85 are summarized in Table A-1. A report summarizing the most recent harvest study data is currently being prepared and preliminary indications are that the reported harvest has increased over that reported for 1984/85.

Commercial Harvest: Commercial fishing in the Keewatin, including the harvest of marine mammals, began during the early 1960s when a cannery/processing facility was established at Daly Bay north of Chesterfield Inlet (Carder and Peet, 1983). This operation was subsequently relocated to Rankin Inlet.

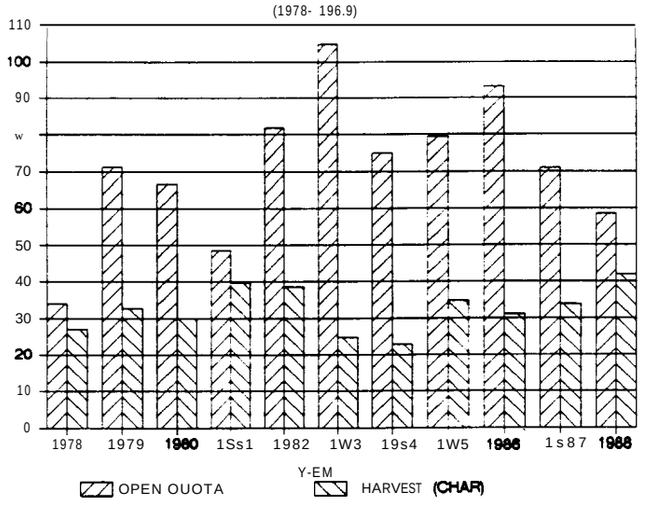
Table A-1
Subsistence Harvest Estimated Edible Weight Values
by Species by Community, 1984/85 (Kgs.)

Community	Char	Whitefish	Trout	Grayiing	Other	Total
Baker Lake	501	1,353	4,879	81		6,814
Chesterfield Inlet	19		398			417
Coral Harbour	12,969		16			12,985
Eskimo Point	8,467	7	2,043	356	5	10,878
Rankin Inlet	17,911	23	1,079	44		19,057
Repulse Bay	10,510		757			11,267
Whale Cove	2,512		286	5		2,803
Total	52,889	1,383	9,458	486	5	64,221

Since its inception, the extent of the Rankin Inlet operation has declined. In 1970 the processing of marine mammal products was discontinued in response to a decrease in demand and the discovery of high levels of mercury in the flesh of marine mamrnals. In 1976 the canning of Arctic char, whitefish and lake trout was discontinued because of high transportation and operating costs (Carder and Peet, 1983). Since then, the operation has concentrated on supplying Arctic char as a frozen product to the Freshwater Fish Marketing Corporation in Winnipeg for resale to southern markets. Small-scale projects directed toward product diversification (steaks, fillets, smoked product) have been attempted since canning operations were discontinued but these initiatives have met with limited success.

In recent years, commercial fishing has focused exclusively on harvesting anadromous Arctic char in the estuaries or mouths of coastal river systems. With the exception of two freezer/packer operations, fishermen set 50 to 100 yards of gill net (5.5" mesh) from 22 foot canoes. Fishing occurs during August and September when char are moving upstream to winter in freshwater lakes. Fishermen sell their catch in dressed form either directly or through a holding

Figure A-1
KEEWATIN COMMERCIAL CHAR HARVEST

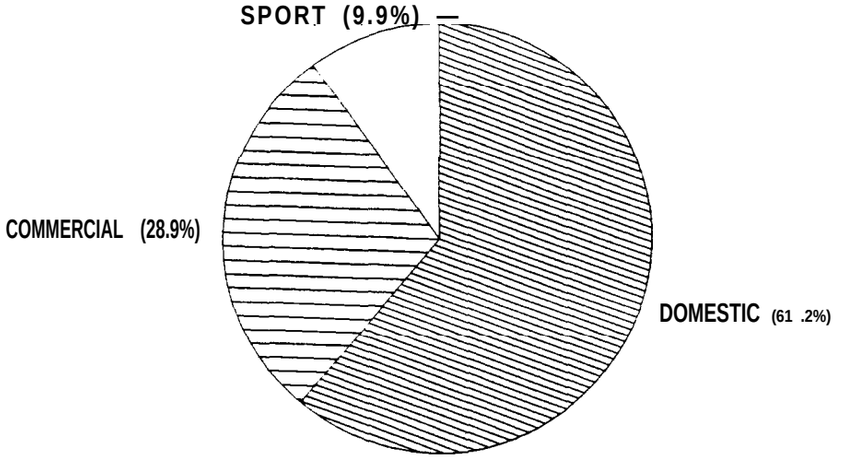


station operation to the Rankin Inlet plant and more recently to a plant that was constructed in Chesterfield Inlet.

Commercial production levels, as reported by the Department of Fisheries and Oceans, have been sporadic ranging from 22721 kgs. (round weight) in 1984 to 42011 kgs. in 1988 (see Figure A-l). Commercial production data for the period 1978/1988 are summarized by community in Appendix 1. With the exception of the harvest reported for Baker Lake, Arctic char accounts for 100% of the commercial production reported for the period.

Sport Harvest: A modest sport fishing utilization exists in the Region. GNWT records show 272 beds available through 20 sport fishing lodge operations. As well, sport angling by community residents occurs during the summer months. Species of primary importance to sport fishing are lake trout, Arctic grayling and Arctic char. In total, the amual sport fishing harvest is modest and is estimated to comprise approximately 10% of the annual harvest for domestic and commercial purposes (see Figure A-2).

FIGURE A-2: Annual Harvest - Keewatin
(1964/66 harvest, all species)



3.0 Approach

Fishery development and management requires an appropriate balance of biological, social and economic factors. Arriving at a common understanding of , development and management objectives, principles, and issues is an essential step in striking this balance. A management and development strategy allows diverse interests to assess the appropriateness of alternative actions from a common perspective.

Although objectives, principles and issues are common elements in any strategy, their content is specific to a particular situation.

Objectives are statements of a broad aim or ideal to be achieved over time. Objectives provide a bask for establishing more specific short-term goals.

Principles are general rules or codes of conduct that direct strategy development and implementation.

Issues provide a basis for identifying problems and assessing options and opportunities available to resolve those problems.

The process of strategy development is an iterative one and consultation is an integral component of the process. The discussion of objectives, principles, issues and options and opportunities that follows is the product of a consultation process which involved fishermen and interested individuals from each of the communities, local Hunters & Trappers Associations (HTAs), fishermen's associations, private trader interests and representatives from federal and territorial governmentlregulatory agencies having an interest in the fishery. The subject areas upon which the consultation process focused included resource use and availability, resource allocation, marketing, and the harvesting, infrastructure and management and organization sectors of the fishery.

4.0 Objectives & Principles

The objectives for managing and developing Keewatin Region fish resources are:

- l. Tomanage anddevelop fish resources onasustainable basis for the benefit of present and future residents of the Region; and

- 2. To manage and develop fish resources to generate, distribute and maximize income and income-in-kind benefits to residents of the Region.

To guide the development and implementation of a strategic plan in a realistic and achievable manner, a set of principles are required. The Keewatin Region Fishing Strategy presented here is premised on the following principles:

1. Consensus on Goals & Objectives: Goals and objectives are the basis for option and opportunity identification, selection, and subsequent evaluation. Objectives and goals should be defined through a coordinated, consensus seeking consultation process.

2. Consultation: Consultation is an integral component of the strategic planning process as it is the means through which various interests are accommodated.

3. Sustainable Development & Viability: Developmental programs and initiatives must be sustainable over the long term within the limitations **imposed by physical, biological, economic and social environments.**

4. Staged Development & Sector Integration: The development of a fishery should proceed in a reamer that is consistent with the aspirations, financial and management capabilities, and initiative of users and interests including government/regulatory agencies. A fishery includes harvesting, holding, handling, transportation, service and supply sectors. These industry sectors are interdependent and it is necessary for each sector to achieve a given **scale of activity before the next developmental stage can occur.**

5. Local Control & Responsibility: Local control and responsibility should be encouraged through the progressive transfer of authority and responsibility in

matters of resource management and development to persons and organizations directly involved in the fishery.

6. **Flexibility: The long-term success of a strategic plan will depend to some extent on the degree of flexibility inherent within the plan. A strategic plan must reeognize the uncertainties associated with a dynamic system such as a fishery and have the inherent flexibility to adapt and take advantage of changing conditions and circumstances caused by either internal or external factors.**

7. Monitoring & Evaluation: The development, implementation and operation of a strategic plan requires an ongoing monitoring and evaluation component to keep the strategy dynamic and effective. A monitoring and evaluation process is a management tool for assessing performance relative to the achievement of stated objectives.

5.0 Development & Management Strategy Issues

5.1 The Fishery Resource

The extent of knowledge on the size, availability and sustainable harvest of Keewatin fish stocks varies and in most instances is quite limited. The adequacy of existing information constitutes a fundamental limitation to the identification of opportunities for development.

Freshwater Species: Department of Fisheries and Oceans quota listings for freshwater species (whitefish, trout) total in excess of one million lbs. At present, there is only a modest domestic harvest of freshwater fish (see Table A-1) and a relatively low level of utilization for sport fishing purposes. The value of freshwater species for sport fishing is high in relative terms as the resource offers a pristine fishing experience that is not dhninished by concurrent commercial exploitation.

At present, there is no commercial harvest of freshwater species. Further, high harvesting, handling and transportation costs preclude the possibility of developing a viable freshwater commercial fishery. For example, based on current Freshwater Fish Marketing Corporation (FFMC) initial prices (1989 summer, medium loose price, FOB Winnipeg) of $.49/lb. for export whitefish and $.59/lb. for lake trout, the costs associated with supporting 10 commercial fishermen on Dubawnt Lake (quota 471,000 lbs.) at a net income level of $6,500 per fishermen ($0.14/lb. of harvest with a total harvest of 47,000 lbs.) are roughly estimated at $42,800 per fisherman per year ($.91/lb.). Of this amount, approximately 90% would be allocated to transportation costs which offer little net benefit to the Region.

Marine Species: At present, quotas have not been established for marine fish species in Hudson Bay. Local knowledge indicates that marine fish species such as Arctic cod, mollusks, crustaceans and others may be found. There is a small local use of certain of these resources (e.g. mussel picking by Rankin Inlet residents) and markets exist for species such as shrimp, scallop and turbot. However, until the size and extent of the resource is adequately defined through exploratory fishing, the existence of an opportunity for development cannot be determined.

Anadromous Species : Department of Fisheries and Oceans commercial quota listings for Keewatin Region anadromous Arctic char stocks total in excess of 260,000 Ibs. (round weight). Arctic char are harvested for domestic, commercial and sport purposes. Current commercial harvests fall far short of the potential indicated by quota listings (see Appendix 1). Based on current harvest levels, a potential for an increase in the level of harvest, current FFMC initial prices ($4.00/lb. for fresh and $3.00/lb. for whole frozen, FOB Winnipeg) and indications of a strong local demand, anadromous Arctic char stocks represent an existing opportunity worthy of priority consideration. However, because many of the Regions' Arctic char stocks have never been fished, the extent of this potential needs to be confirmed within the context of biological sustainability. For development purposes, information on the extent of resource availability is inadequate. This lack of information increases the degree of risk associated with the pursuit of developmental opportunities.

In summary:

- Anadromous Arctic char stocks represent the best opportunity for development in the immediate term but information on the extent of resource availability for development purposes is inadequate;

- Because of the lack of information on the size, extent and availability of marine fish resources in Hudson Bay, opportunities related to the development of marine fish resources cannot be determined; and

- Opportunities for development of the Region's freshwater fish resources for purposes other than sport fishing are severely limited by economic considerations.

5.2 Resource Allocation

Resource allocation becomes an issue when there is a potential or actual conflict over resource use and availability between uses and users. Based on current patterns of use and development priorities, allocation issues relate almost exclusively to anadromous Arctic char stocks. Freshwater and marine species are either inaccessible or underutilized and therefore, the potential for conflict is limited.

Domestic, domestic/commercial, recreational, and commercial are all viewed by community residents and resource managers as legitimate uses of Arctic char stocks. The challenge confronting resource managers is one of accommodating the range of legitimate uses.

At present, resource use conflicts between competing interests for Arctic char do not appear to be a major problem. However, there is evidence in some locations that competing demands may be approaching the biological limits of the resource to sustain utilization. The most prominent local example of this involves the Dianna River where domestic, commercial and recreational fishing pressures impacted stocks to the point where rehabilitation measures were required. This system has been closed to commercial fishing and catch limits have been set for angling.

The importance of the domestic fishery to residents of the Keewatin is recognized. Allocating limited resources between uses and users to accommodate the growing demand of an increasing population maybe required.

5.3 Regulatory Environment

The management and development of fisheries in the Keewatin Region occur under the jurisdiction of federal and territorial governments and agencies whose mandates include conservation and management, quality control, marketing, and economic development.

The Federal Department of Fisheries and Oceans (DFO) by virtue of the Fisheries Act controls quotas, seasons, gear, allocation, licensing, monitoring and enforcement. DFO, through the Fish Inspection Act, also controls the quality of products destined for inter-provincial or inter-national trade by regulating standards for processing. There is no formal arrangement in place to control the quality of fish consumed by fishermen or destined for intra-provincial trade.

The Freshwater Fish Marketing Corporation by virtue of the Freshwater Fish Marketing Act controls the sale of fish destined for markets outside of the NWT. The Corporation exercises this control by entering into “agency style” agreements with individuals or organizations within the NWT. The Corporation agrees to purchase fish at a guaranteed price from a designated buyer. The buyer

then sets a price to fishermen based upon the costs associated with collecting, processing, handling and transporting fish to FFMC in Winnipeg. Fish are purchased from fishermen and then sold to FFMC at the previously agreed price. Buyers areexpected torecord individual fisherman production levelsto allow for distribution of final payments to fishermen.

FFMC also exercises some control over sales within the NWT. Individuals, other than fishermen, wishing to sell fish within the NWT are issued a Special Dealers License. There are no special criteria that must be met to qualify for a license and anyone requesting a license normally receives one.

Fishery development funds from federal sources are administered jointly by the GNWT and agencies of the federal government. These funds are allocated from the Economic Development Agreement (EDA), Special ARDA (S/ARDA), Industry, Science & Technology (ISTC), and Indian& Northern Affairs (INAC) programs. DFO is involved in the regulatory/bureaucratic process associated with the approval of project development funds and overall program funding. DFO development guidelines influence specific project funding initiatives from a stock assessment and licensing perspective. DFO also reviews requests to funding agencies for financial assistance respecting fisheries development programs from a broader fisheries development policy perspective.

The broad issue associated with the regulatory environment is the responsiveness of the regulations and the regulators to the needs of the fishery.

This issue has resulted, in part, from the fact that the needs of the fishery have never been adequately defined. The fisheries of the Keewatin are, from a commercial perspective, in the early stages of development. The productive capability of the resource base is not well defined, local allocation systems and customs are not well understood and formal regulatory based allocation mechanisms and processes are in a state of transition and hence not well developed.

Regulations aimed at conserving and managing developed fisheries may not always be appropriate to the needs of fisheries that are in the initial stages of development. The process of discovering and defining the biological, economic, and social boundaries within which fishery development can occur is one which requires knowledge of the fishery at a working level. Developed fisheries

provide practical knowledge to complement established regulatory theory. Regulating from a theoretical perspective only, in cases where there is little practical knowledge available, may not be conducive to achieving management and development objectives. The integration of conservation and management regulatory theory with the development process and activities may be a more effective regulatory approach for the Keewatin.

Confusion exists regarding the role of fish buyers in securing markets for fish and setting prices paid to fishermen as compared to prices paid by FFMC for fish landed in Winnipeg.

The arms length regulatory relationship between FFMC and "authorized buyers" creates an uncertain environment with respect to markets and prices for fish. Fish buyers although authorized by FFMC are not identified as agents of the Corporation. The marketing regulations that apply in the NWT allow any individual to purchase fish for resale to FFMC. This situation can create instances where individuals purchase fish from fishermen in competition with "designated buyers" resulting in an undermining of efforts to develop a stable handling, packing, and transportation infrastructure sector capable of paying fishermen the price necessary to encourage development of a viable commercial fishery.

Clarification and co-ordination of the roles of the various regulatory agencies, especially from a development perspective, is an issue.

The GNWT plays a part in adrninistering and delivering federal fishery development funding. This is in contrast to Atlantic Canada and Northern Quebec where DFO administers federal fishery development funds. However, economic development guidelines are developed by DFO and the approval of fishery development proposals is assessed according to these guidelines. If the federal and territorial government agencies responsible for program delivery are not aware of or in agreement with DFO development guidelines, conflicts may occur.

In summary, the regulatory issues are:

- The responsiveness of regulations and regulators to the needs of the fishery;

- The regulation of fish buyers by FFMC and other regulatory authority; and

- The co-ordination of responsibility and authority for fishery development funding policy and guidelines.

5.4 Primary Production

Primary production issues relate to the ability of fishermen to harvest fish within the physical, biological, economic and regulatory constraints that exist.

Level and type of activity pursued by Keewatin fishermen ranges from the modest subsistence harvester to large commercially oriented freezer/packer operations and some fishermen harvest for both domestic and commercial purposes.

Based on current prices and scale of operations, commercial fishing is not viable in the long term.

Discussions with commercial fishermen indicate that the economic incentive required to encourage increased production and have a viable fishing operation is in the range of $1.60 to $1.75/lb. of harvest (delivered weight). The current price offered to commercial Arctic char fishermen ranges between $1.00 and $1.40/lb. depending on delivery point. By comparison, Cambridge Bay char fkhermen received payments totaling $2.20/lb. of harvest in 1988. The ability of fkhermen to finance the purchase, operation, maintenance and replacement of basic equipment (boats, motors, nets) better suited to the conditions within which fishing activities occur is constrained because fishing operations are not viable in the long term.

The maintenance of a high quality product is essential to commercial harvesting sector viability.

Fish harvested for commercial purposes must meet certain quality standards as dictated by the marketplace and regulatory authorities. As well, marketplace demand and acceptability are influenced by the quality of the product produced. To achieve an acceptable level of product quality, fish must be handled properly and iced sufficiently to prevent spoilage prior to delivery. Supplying an adequate

supply and quality of ice to fishing locations is a problem. Ice machines located at receiving stations in the Region are often of insufficient capacity to supply the fishermen's needs. As well, loss of ice quantity and quality while traveling to and from fishing locations results in the delivery of a lower quality product.

The fishermen of the Keewatin Region operate within a hostile physical environment where adverse weather conditions and distance to fishing areas constrain harvesting activities. Currently, the majority of the fishermen utilize basic equipment that is poorly suited to conditions on Hudson Bay. As a result, the fishermen have difficulty accessing remote quotas and as well, they are often stranded by weather which results in product quality deterioration. Further, the wood and canvas construction of most of the vessels currently employed in the fishexy is a problem from a quality standpoint as material porosity allows for the buildup of bacteria which can affect product quality.

In summary, primary production issues are:

- Current prices paid to fishermen are often too low to encourage production;

- Low prices paid to fishermen do not produce a cash flow adequate to finance the purchase of equipment (boats, motors, nets) better suited to the physical demands under which fishing activities occur; and

- Product quality does not always conform to marketplace and regulatory authority standards and this diminishes economic returns to fishermen.

5.5 Secondary Production

Secondary production involves the handling, processing, transport and distribution of primary product so that returns to fishermen are maximized. The level and type of secondary production support required depends on the form and quality of the final product that must be delivered to obtain the highest price in the marketplace.

Current secondary production operations do not provide for harvesting sector viability.

In the Keewatin, essential secondary production activities include packing, freezing and transporting fish. Both the Rankin Inlet and Chesterfield Inlet fish plants consistently lose money for reasons including poor management and insufficient product volumes to justify operating costs. As a result, returns to fishermen cannot be maximized. In the case of the Chesterfield Inlet operation, the price to fishermen has actually decreased since the fish plant was constructed. This situation becomes a vicious circle where fishermen are offered an increasingly lower incentive to harvest fish and in turn, the plant operation becomes more and more dependent on outside funding to maintain operations.

The ability of the transportation sector to service the needs of the fishery is an issue.

Transportation cost and reliability factors contribute to the poor financial performance associated with secondary production activities. High air freight and local cartage costs constitute a significant drain on the financial resources available. Instances of fish being bumped off an aircraft to accommodate passengers are not unusual and product quality deterioration results.

The age and condition of infrastructure facilities is such that their ability to service the fishery is suspect.

The Rankin Inlet fish plant and the receiving station in Eskimo Point require a major upgrading or replacement to conform to DFO standards. As well, receiving station facilities in Whale Cove and Eskimo Point are not built to export standards. Since operators from both of these locations have expressed an interest in delivering product directly to FFMC in Winnipeg, the status of these facilities is an issue.

The role of the private trader in secondary production activities is not well regulated and as a result price security for fishermen in lacking.

Char fishermen in the NWT are the only fishermen in the FFMC area of jurisdiction that do not receive a guaranteed initial price for their product. Further, Keewatin char fishermen typically have not benefited from final

payments issued by FFMC. Rather, these payments have accrued to secondary production interests.

Currently, all of the secondary production related facilities in the Region are operated to some degree by private trader interests. These interests, middlemen between fishermen and the market, require that revenues not only cover costs but generate a reasonable profit for their efforts.

The issues pertaining to the role of the private trader include: definition of the appropriate role of the private trader in secondary production activities; definition of the type and extent of controls under which private trader interests should operate (e.g. should private traders be required to offer fishermen a minimum price for their product); and clarification of the adrninistrative/regulatory entity (e.g. FFMC, GNWT, other) charged with responsibility for controlling private trader interests.

A related secondary production issue is the GNWT'S current priority to create employment opportunities for regional residents through value added initiatives.

Secondary production activities can satisfy this objective to some extent depending on the criteria employed to evaluate effectiveness. In addition to the employment opportunities associated with supplying a base level of secondary production service, product diversification and additional processing (e.g. smoking, canning, etc.) can be viewed as options to satisfy employment development objectives. However, if secondary production and product diversification initiatives are pursued prior to establishing a viable and energetic harvesting sector, the primary product required to maintain secondary production operations may not be available in sufficient quantity. Further, marketplace demand for the products produced must provide the price necessary to cover production, transportation and marketing costs. Even when a subsidization factor is considered – it is important to note that representatives of the GNWT could not specify the level at which subsidization could be guaranteed over the long term – the product produced must have some value relative to the jobs created or the likelihood of being able to maintain the operation into the future is low.

In summary, secondary production issues are:

- Current secondary production operations do not provide a price to fishermen that is adequate for long-term viability;

- The type and location of basic infrastructure necessary to support harvesting sector activities is not well defined;

- The transportation sector does not adequately service the needs of the fishery;

- The appropriate role of the private trader in secondary production activities requires definition; and

- The GNWT's current priority to create employment opportunities for regional residents 'through value added secondary production initiatives needs to be addressed.

5.6 Management & Organization

An effective management and organizational capability is essential to the development and continued operation of a fishery. Management is required at the local level to oversee and coordinate fishing activities and to ensure that a quality product is delivered to the marketplace. Because of the diversity of regional interests and the physical proximity of various fishing locations, some level of coordination on a regional scale is necessary to establish and maintain appropriate linkages between the various industry sectors.

In the past, the GNWT has participated actively in the management and organization sector of the fishery. However, current priorities suggest that this role should be devolved to other interests. There are many options available to satisfy management and organizational requirements. A variety of local interests and regional organizations are in existence that could be employed to fulfill this function. These interests and organizations include private traders, local HTAs and fishermen's organizations, the Keewatin Wildlife Federation (KWF), the Keewatin Inuit Association (KM), the recently formed Sakku Development Corporation Arctic Cooperatives Ltd. and FFMC. The management and organization issues that must be addressed are:

- The level and type of management expertise required to support the development and continued operation of the fishery;

. The need for an appropriate regional management and , coordination mechanism;

. The role of government in the development and continued operation of the Keewatin Region fishery;

- Authority and responsibility in matters of management and organization for the Keewatin fishery; and

- The appropriate source of financing in support of managementand coordination activities.

5.7 Marketing

Current commercial markets for Arctic char produced in the Keewatin Region fall into two distinct categories, local sales and export sales. Local markets are serviced in a variety of ways depending upon the situation in a particular community. Export sales are handled exclusively by FFMC in Winnipeg.

Marketing sector issues involved in the development of the Keewatin fishery are:

- The ability of the marketplace to sustain a product price sufficient to accommodate harvesting, handling, processing, transportation and distribution costs and viability considerations; and

- The ability of the fishery to supply a consistent quality product to satisfy marketplace expectations and demands.

5.8 Issues Summary

Fish Resources: Anadromous Arctic char stocks represent the best opportunity for development in the immediate term but information on the extent of resource availability for development purposes is inadequate.

Because of the lack of information on the size, extent and availability of marine fish resources in Hudson Bay, opportunities related to the development of marine fish resources cannot be determined.

Opportunities for development of the Region's freshwater fish resources for purposes other than sport fishing are severely limited by economic considerations.

Resource Allocation: The importance of the domestic fishery to residents of the Keewatin is recognized.

Allocating limited resources between uses and users to accommodate the growing demand of an increasing population maybe required.

Regulatory Environment: Regulations and regulators must be responsive to the needs of the fishery.

The regulation of fish buyers by FFMC and other regulatory authorities needs to be clarified.

Responsibility and authority for fishery development funding policy and guidelines need to be clarified and co-ordinated.

Primary Production: Current prices paid to fishermen are often too low to encourage production.

Low prices paid to fishermen do not produce a cash flow adequate to finance the purchase of equipment (boats, motors, nets) better suited to the physical demands under which fishing activities occur.

Product quality does not always conform to marketplace and regulatory authority standards and this diminishes economic returns to fishermen.

Secondary Production: Current secondary production operations do not provide a price to fishermen that is adequate for long-term viability.

The type and location of basic infrastructure necessary to support harvesting sector activities is not well defined.

The transportation sector does not adequately service the needs of the fishery.

The appropriate role of the private trader in secondary production activities requires definition.

The GNWT'S current priority to create employment opportunities for regional residents through value added secondary production initiatives needs to be addressed.

Management & Organization: The level and type of management expertise required to support the development and continued operation of the fishery needs to be defined.

The need for an appropriate regional management and coordination mechanism is required.

The role of government in the development and continued operation of the Keewatin Region fishery needs to be clarified.

Authority and responsibility in matters of management and organization for the Keewatin fishery need to be clarified.

The appropriate source of financing in support of management and coordination activities must be identified.

Marketing: The ability of the marketplace to sustain a product price sufficient to accommodate harvesting, handling, processing, transportation and distribution costs and viability considerations; must be determined and

The ability of the fishery to supply a consistent quality product to satisfy marketplace expectations and demands must be developed.

A Keewatin Region fishing strategy must address the range of issues that exist respecting the various sectors involved in the development and operation of the fishery. From a community perspective, the degree to which each issue applies and the priority afforded a particular issue varies. Current levels of subsistence and commercial harvest, resource availability, numbers of fishermen, the existence of local private traders, the nature of specific problems experienced

and the level of development of the fishery in a particular community are factors which influence priorities at the community level.

Highest priority community issues tend to focus on the harvesting sector of the fishery. This is understandable as this is the sector in which the majority of community residents participate. Thus, returns to fishermen, the ability of fishermen to finance equipment purchases, the type of equipment being used and the availability and accessibility of harvest quotas are important issues at the community level. As well, the adequacy of basic infrastructure support is an important priority from the perspective of the communities. Holding and handling facilities, ice quantity and quality, transportation costs and reliability are predominant infrastructure sector issues.

Government/regulatory issue priorities are influenced by policy directions and agency mandates and are quite different than those stated at the community level. Government/regulatory priorities include employment creation, management and coordination, infrastructure facility locations and costs, resource inventory and conservation, resource allocation and conformity to regulatory requirements. As well, an important consideration is the level and source of financing required to implement programs and initiatives.

Because the priorization of issues by different interests may not always be the same, deriving a consensus on objectives, principles and issues during the consultation process is very important to the ultimate success of strategy development and implementation.

5.9 Perspective Overview

Keewatin commercial fishermen currently produce upwards of 70,000 lbs. (dressed weight) of Arctic char per year which retails for about $8.00 to $9.00/lb. for a total cash flow of from $560,000 to $630,000. Retailers, wholesalers and FFMC take from $280,000 to $350,000 leaving $280,000 to meet the costs of infrastructure, transportation and to pay fishermen. Of this amount ($280,000), Keewatin fishermen receive on average $1.30/lb. (32%) for their efforts which leaves $2.70/lb. (68%) to meet the costs of support infrastructure and transportation.

The resource base, so far as we know, could produce a higher amual harvest. Because current information is inadequate, it is difficult to predict what that level might be. However, it is reasonable to assume that the resource could produce at least 140,000 lbs./year which would produce a total cash flow of from , $1,120,000 ($8.00/lb. retail) to $1,260,000 ($9.00/lb. retail).

The challenges are to increase production and to increase returns to fishermen. The task is to organize the fishery to meet these challenges.

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Part B

Market Analysis And Strategy

6.0 Market Analysis

6.1 Overview

Arctic char is a member of the trout/salmon family. The name Arctic char has associated with it a certain mystique and romance, however it is not a well-known fish among Canadians. It is a point well worth keeping in mind that Canadians consume in excess of 250 million pounds of fish and seafood products annually while total commercial harvest of Arctic char throughout Canada is only 455,580 Ibs., an amount that represents less than one fifth of one percent of fish and seafood products consumed in Canada.

An examination of Arctic char production indicates the following:

Arctic char is commercially harvested by fisheries in Labrador and the Northwest Territories, with a small amount of farmed char produced in New Brunswick, Manitoba, Saskatchewan, British Columbia and the Yukon. The Labrador and aquiculture producers sell Arctic char through independent wholesalers. The NWT producers sell Arctic char either through FFMC when exported outside the NWT or through NWT brokers to NWT retail outlets and institutions.

Based on information obtained from DFO records and a consulting firm (Western Management Consultants) currently completing a study on the impact of aquiculture on the wild char harvest, in 1987/88 the NWT accounted for 64% of all commercially harvested Arctic char in Canada (see Table B-l).

Table B-1
Arctic Char Production By Source, 1987/88

Region	Commercial Harvest	%
NWT	294,580 lbs.	64.5%
Labrador	154,000	34.0
Maritimes (aquiculture)	7,000	1.5 %
Total	455,580 lbs.	100.0%

DFO records also indicate that NWT commercial harvest of Arctic char has increased over the last four years with the highest level of production recorded by the Kitikmeot Region (see Table B-2).

Table B-2
NWT Arctic Char Commercial Harvest
(000 lbs.)

Region	1985/86	1986/87	1987188	1988/89
Mackenzie	22.8		-	
Kitikmeot	175.7	153.5	139.9	143.0
Keewatin	54.1	37.6	72.6	92.6*
Baffin		92.4	82.0	85.**
Total	252.6	283.5	294.5	320.6

*** See Appendix 1**
**** The 1988/89 figure for the Baffin was obtained from ED&T officials in the region and indicated a slightly higher level of production than DFO records.**

Analysis of DFO records also indicates that since 1985/86 the percentage of total NWT production exported and sold through FFMC has averaged above 50% (see Table B-3), the exception being in 1987/88 when the percentage dropped to 4490 of production. The reason for the drop was related to a decision taken by Keewatin fisheries officials to keep 50,000 lbs. of Keewatin Arctic char for production of smoked char and local sales. Although the amount kept from FFMC appears high, as indicated in Table B-3, the overall effect on FFMC sales was only a 20,000 lb. drop over the previous year.

Table B-3
FFMC Sales as % of Total NWT Production
000 lbs.)

	1985/86	1986/87	1987/88	1988/89
Total NWT Harvest	252.6	263.5	294.5	320.6
FFMC Sales	136.4	149.6	129.8	162.3
% of Total	54%	53%	44%	51%

Moreover the drop in Arctic char production sold through FFMC did not have an adverse effect on the price obtained for Arctic char; indeed, as indicated in Table B-4, for the same period in which there was a drop, the overall landed value of production increased from $411,000 to $511,000,

Table B4
Value of FFMC Sales of NWT Arctic Char

	1985/86	1986/87	1987/88	1988/89
FFMC Sales (000 tbs.)	136.4	149.6	129.8	162.3
$Value	$320,000	$411,000	$511,000	N/A

Although a higher percentage of Arctic char has been sold for export through FFMC, there has been a strong and steady NWT demand for Arctic char products. One reason for the trend has been aggressive and successful initiatives in the Kitikmeot and Baffin Regions to promote consumption of Arctic char in local hotels, restaurants and through retail outlets, such as the Bay stores, co-ops and through country food stores; significantly both the Baffin and K.itikmeot Regions have country food outlets that process and distribute country foods. As well, both Regions have sold Arctic char to the Yellowknife market. Another reason has been a GNWT policy promoting purchase of country foods (including Arctic char) by institutions in the NWT such as school residences, correctional centres and hospital transient centres.

A comparison of the three Regions indicates that in 1988/89, both the Baffin and Kitikmeot sold a higher percentage of Arctic char in their respective Regions than did the Keewatin; the percentages were: Keewatin 32%, Kitikmeot 44% and Baffin 81% (see Table B-5).

Table B-5
Percentage of Arctic Char Production Sold in NWT Regions

Region	Production	Export Sales (to FFMC)	NWT Sales	% of Total Sales
Keewatin	92,600 lbs	66,370 lbs	26,230 lbs	28%
Kitikmeot	143,000 lbs	79,930 lbs	63,070 lbs	44%
Baffin	85,000 lbs	16,000 lbs	69,000 lbs	81%

6.2 Role of FFMC

FFMC is a federal crown corporation established to market freshwater fish produced in Northwestern Ontario, Manitoba, Saskatchewan, Alberta, and the Northwest Territories. The objective of the corporation is to maximize the return to fishermen by serving as a central buying, processing and marketing agency. As already indicated in Section A, one of the difficulties with the arrangement is that in the case of the Keewatin FFMC buys fish from the fish plant in Rankin Inlet and not directly from the fishermen, and since the plant is costly and inefficient to operate most of what FFMC pays in first and second payments is absorbed by the plant, not the fishermen.

Federal and provincial legislation licenses FFMC and its agents to sell freshwater fish. In the NWT fishermen are entitled to sell their fish directly or through licensed outlets (cooperatives) or brokers to consumers, however FFMC has complete control over the commercial export of fish out of the NWT. FFMC cannot set production levels, rather the corporation works with each jurisdiction in the NWT' in an attempt to set quotas and season openings in anticipation of market demand. FFMC sets initial payment to fishermen or the fish plant at approximately 85% of the anticipated final price. A second payment is made (after sales) if the final price exceeds the initial payment.

Over the last year the wholesale price that FFMC paid the Rankin Inlet plant for frozen Arctic char varied between $3.50 to $5.00 per lb. with the average being $4.00/lb. The average price for fresh char has been $4.50/lb. Arctic char purchased by FFMC is sold to brokers or wholesalers who then sell to retail outlets. A breakdown of the average markup by FFMC, brokers and retailers indicates that after FFMC has taken its markup there is a further 100% markup – 20% by brokers and 80% by the retail outlets (see Table B-6).

Table B-6
Average Markups on Arctic Char

Rankin Plant	**$4.00**
FFMC Markup	.50
FFMC Selling Price	**4.50**
Broker Markup	**.90**
Retail Outlet Markup	**3.60**
Retail Selling Price	**$9.00**

FFMC sells frozen Arctic char throughout the year in small volumes so there is no sense in the marketplace of a cheap easily available product. Fresh char is sold immediately upon delivery to brokers.

Arctic char represents a small portion of NWT fish production and a very small portion of FFMC sales. Indeed in 1987/88 Arctic char accounted for less than 1% of FFMC sales of $51,941,000. It is therefore reasonable to conclude that FFMC would not put as much time and effort in promoting and marketing char as it would with other species. However, the general consensus by independent consultants (Western Management Consultants, Theme Stevenson & Kellogg) who have assessed FFMC'S marketing initiatives is that the agency is doing an effective job of obtaining good prices for Arctic char.

63 Trends and Potential Markets

The current primary market for Arctic char sold outside the NWT is gourmet restaurants and food suppliers. The primary market within the NWT is retail food stores, hotels and restaurants catering both to visiting tourists and local residents, and institutions such as school residences, correctional centres and hospital transient centres.

Analysis of both markets indicates the following:

Export from the NWT: Diners at fine restaurants are usually upper business class people and expect to be exposed to exotic, unique dishes which includes char. Price is not an important factor as long as it is competitive with that of other similar products, including salmon.

Research to date indicates that executive chefs and purchasing representatives of fine restaurants in Vancouver, Edmonton, Toronto and Montreal have a strong interest in Arctic char, however their major concern is that they have a consistent high quality supply of product year round, and preferably a fresh rather than frozen product. Since fresh salmon is easily available several restaurants are now serving salmon in place of the Arctic char they once served.

Food suppliers include such companies as Modeme Ltee., Canada Packers, Capital Fish, Van Home, St. Lawrence Foods, Billingsgate Fish Company Ltd., and Albion Fisheries Ltd.

Research indicates that most of these suppliers are familiar with char, however like their restaurant counterparts are hesitant about promoting char without assurance of a reliable year-round supply. Also, most prefer a fresh product over a frozen product.

Suppliers also tend to relate the price of char to salmon: when salmon is available at a reasonable price, they are less likely to buy large volumes of char.

Currently there is an oversupply of salmon on the market and the price of salmon has dropped significantly (sockeye salmon currently retails for between $7.00 and $8.00/lb., which compares with char at $9.00/lb.) Although this could affect the price of Arctic char, FFMC believes char will continue to command a high price.

Most Arctic char sold through FFMC has been frozen product; indeed DFO records indicate that of the 1987/88 FFMC sales of NWT Arctic char, about 90% was frozen, 8% was fresh and 2% was processed in the form of vacuum packed steaks and fillets. For the same period, over 90% of Arctic char was sold in Canada with the balance being sold in the United States.

Based on discussions with FFMC officials, it is estimated that the corporation could sell an additional 20% per annum and over a five year period double Arctic char sales. The corporation believes this can be done as long as supplies are reliable and of good quality. It has also indicated that more fresh char could be sold (e.g. 20,000 lbs. could be sold between July 15 and September 15) and that market demand is for fresh product.

FFMC has also indicated that a commercial smoker in Kitchener, Ontario has requested that 100,000 lbs. of Arctic char be "reserved" over the next year to produce and test-market both smoked and camed char. If successful, the demand for Arctic char could be greater than the 209% per annum figure.

6.4 Markets In the NWT

Baffin: Fisheries near Pangnirtung and Igloolik are the main sources of Arctic char production in the Baffin, with two smaller fisheries operating near Pond Inlet and Arctic Bay. The fisheries generally operate on their own selling product either to FFMC or to hotels, restaurants, retail food outlets and the

correctional centre in the Region. Iqaluit is the primary market, not only because the community has the largest population but because there is no local commercial Arctic char quota and little domestichubsistence fishing in the immediate area. Most harvesting in the Region is done during the summer , season, although a winter fishery has started in Igloolik which commercially harvests about 16,000 lbs. per annum.

One advantage that the Baffin has over the Keewatin is that all communities have modem freezer/processing plants (30' X 40') that allow product to be properly processed and stored before delivery. These plants were built three years ago at a cost of $200,000 each. Funding was obtained through Special ARDA.

Economic Development & Tourism (ED&T) officials in the Region believe there is a strong and growing market for Arctic char in the Baffin. They point to the 64,000 lbs. already consumed in the Region, most of it by residents, as well as restaurants and hotels in Iqaluit who use Arctic char to attract both tourists and local residents. There are also the retail stores and the correctional centre where demand exceeds supply. Officials believe that in Iqaluit alone there is an annual demand for 60,000 to 80,000 lbs. of Arctic char. The strong demand has resulted in one of the main suppliers in the Region, Cumberland Sound Fisheries Ltd., raising the wholesale price of Arctic char from below $4.00/lb. to $4.50/lb, which means that in Iqaluit retail outlets, Arctic char will sell for close to $6.00 per pound this season. It is noteworthy that Pangnirtung fishermen operating in Cumberland Sound have received between $1.30 and $1.60 per pound, a price that is being increased to $1.75 per pound.

Another source of sales in the Baffin has involved the production of cold and hot smoked Arctic char by Iqaluit Enterprises Ltd., which last year purchased and processed about 40,000 lbs. of char and sold it in the Region at $12.50/lb. as cold smoked char, a price which has now increased to $16,75/lb. Although the business has been successful in selling product it has not been able to earn a profit because the price charged last year was too low to meet the company's overhead. The company expects the recent price increase will allow it to earn a reasonable profit.

Although demand already appears to be in excess of supply, production in the Region is expected to increase with the harvesting of Arctic char in Nettling Lake this coming season, a lake that has a 50,000 lb. quota.

Officials expect that a wholesale/distribution business will be established this coming year in Iqaluit to improve promotion, marketing and distribution of Arctic char and other seafood products in the Region. As well, the existing country food store in Iqaluit is expected to expand in order to merchandise more country food products, including Arctic char.

Given the strength of demand and the ability of a growing number of consumers to pay higher prices, not only for fresh and frozen product but for value-added product such as smoked char, Baffin ED&T officials believe that within five years there will be no surplus of Arctic char for export outside the Region.

Kitikmeot: Fisheries near Cambridge Bay are the main source of Arctic char production in the Kitikmeot Region and in 1988/89 produced all of the 79,930 lbs. of Arctic char sold to FFMC. The smaller fisheries are spread throughout the Region and account for 63,070 lbs. of production which is sold either to communities in the Region or to Yellowknife.

The co-op in Cambridge Bay owns and operates the Cambridge Bay fish plant which only operates over a three-week period when fish are harvested: one-and-a-half weeks at the end of July and one-and-a-half weeks in August. The rest of the year the plant is closed to minimize the overall cost of operating the plant. The main cost of operating the fisheries is related to air transportation which cost about $100,000 last year.

Based on discussions with ED&T officials in the Region, it appears that the Cambridge Bay fisheries are profitable (the co-op earned an estimated $40,000 last year) and officials attribute their profitability to a highly efficient system which uses a combination of weirs (one-third of production is harvested through weirs) and small chartered aircraft. The profitability of the fisheries has in turn meant a higher return to individual fishermen, indeed for 1988/89, fishermen received an initial payment of $2.20/lb.

A closer examination of markets indicates that Arctic char"sold from Cambridge Bay to FFMC is considered to be an excellent product with good “eye appeal”

and a fine finish. The reason for the char's attractiveness is that harvesting is done using weirs while transportation from the weirs to the Cambridge Bay plant is done with chartered plane. The result is that Arctic char arrives from source to market with minimum delay and minimum handling.

Sales in the regional communities and Yellowknife are about equally divided with 50% of the 63,070 lbs. of Arctic char sold through HTAs and community co-ops, and 50% sold in Yellowknife to restaurants, hotels and two seafood outlets (Northern Fancy Meats and The Seafood Outlet).

Arctic char sells for $2.50/lb.in the Region. The main reason for the low price is that most communities obtain Arctic char through a domestic harvest. The price in Yellowknife is higher and averages $3.25/lb.

The country food processing facility in the Region, Central Arctic Meats, processes about 4,000 lbs. of smoked Arctic char which it sells for $7.00/lb. The product is very popular with both natives and non-natives.

Keewatin: Although the Keewatin sells most of its production to FFMC rather than in the Region itself, this does not mean that there is not a regional market; indeed fish have always been an important food source among native people in the Keewatin and char is by far the preferred species. It is also popular among the growing non-native population and with visitors to the Region.

However, discussions with local store managers and individual operators indicate the opportunity for commercial sales in most communities is limited, with some demand in certain seasons or in one or two communities. The foremost reason for limited demand is that most of the communities in the Keewatin have ready access to char stocks and strong domestic fisheries to supply local needs. It is true that some char is sold to local stores for resale within communities, but the volume is small and limited to 1,000 to 2,000 lbs. a year per community, with retail outlets storing fish until the winter months when availability is low and demand is high. In most communities the retail price for Arctic char averages between $1.50 and $2.00/lb., even during high-demand seasons.

Although the opportunities for local sales are limited one operator in Eskimo Point who owns and operates a small fish plant/store has successfully combined

local and export markets. The owner purchases fish for $1.40/lb., sends some fish to FFMC and Yellowknife and sells the remainder locally for $1.50 to $1.90/lb. throughout the winter. Last year the owner sold 1,000 to 1,500 lbs. in the community and hopes to double the amount this year.

The exceptions to the above pattern of limited local demand are in Baker Lake and Coral Harbour, where the great distances to fish quotas makes it difficult and expensive for fishermen to get enough fish to meet local needs. The result is that in both communities demand is high throughout the year. The co-op managers at Baker Lake and Coral Harbour estimated that annual demand for Arctic char is 30,000 Ibs. in each community and said that whenever possible the co-ops bought char from local fishermen for $1.50/lb., which sold in their stores for $2.00/lb. The managers also said that when local supplies were depleted, they bought from other regional communities or Pangnirtung. When fish was flown in, the retail price increased to $3.00/lb. to cover the cost of transportation, with no apparent drop in demand.

Rankin Inlet is another community where demand has often outstripped supply because commercial char quotas near the community have been closed to allow stocks to recover from overfishing. For example, char is sold at the local Bay store whenever it is available (both as frozen whole fish and as unfrozen steaks) and last year 1,000 Ibs. of frozen fish was purchased from the Rankin Inlet fish plant during the summer season for $4.50/lb,, stored in the Bay's freezer, and retailed for $5.00/lb., with all of the fish sold by January, after which there were no further locally available supplies. The manager at the store has said the store could easily sell at least double that amount each year.

Another market in Rankin Inlet involves the local hotel and school dining room which are operated by one business. Based on discussions with the business operator, it appears that last year although the company purchased 1,000 lbs. of Arctic char from communities in the Region at a price of $1.75 to $2.25/lb. (plus freight), the company had to import an additional 4,000 to 5,000 lbs. of alternate seafood product from Winnipeg (this included a mixture of fish product from cod to whitefish) because it could not obtain Arctic char in the Region. The operator also indicated that given high food delivery costs, Arctic char would have to be priced below $3.00/lb. before he purchased; in the case of the school dining room a price above $3.00/lb. would mean he would have to renegotiate his contract. It was also pointed out that the hotel provides an outlet for sales of

Arctic char to customers, and again because of a lack of adequate supply, demand could not be met. The operator felt that the hotel could possibly sell 5,000 lbs. a year at a retail value of $4.50 to $5.00 a pound.

The hostel at the Churchill Hospital, which currently purchases 1,200 Ibs. of char a year for Inuit patients, provides another market for Keewatin char. This amount is expected to increase because char has just recently been added to the menu. Previously it was only available on request. The hostel is paying $2.25/lb. plus freight to have char shipped from Whale Cove with the price apparently determined by the broker in Whale Cove.

The general pattern in the Region consists of small seasonal markets in most of the smaller communities when local domestic supplies run out and a larger year-round market in Baker Lake and Coral Harbour. The wholesale price in the smaller communities ranges from $1.50 to $2.00 a pound, with retail prices of $1.50 to $3.00 a pound. The annual demand in Rankin Inlet is approximately 12,000 lbs. with prices slightly higher than in the other communities, ranging at the wholesale level between $2.50 and $4.50 a lb. and at the retail level between $4.50 and $5.00 a lb.

Most outlets in the Region said they preferred to receive fish whole frozen, either round or gutted, and most were interested in buying both summer and winter fishery products. The most important factor in satisfying the regional market was the availability of supply. The quality of the char that was available was acceptable to most customers.

Smoked char was very popular and almost every outlet said they would like to handle more of it. Retailers purchased smoked char from the Rankin Inlet fish plant for between $5.00 and $7.00 a pound and sold it for between $9.00 and $13.00 a pound. The total demand for smoked char in the Region was estimated at between 8,000 and 9,000 pounds a year. Most outlets reported numerous requests for the product from both local residents and other communities,

Yellowknife: Analysis of the Yellowknife market indicates the following:

All three Regions sell Arctic char to Yellowknife (Keewatin sold 3,000 to 4,000 Ibs. last year), however discussions with local buyers indicate there is still considerable room for increased sales. For example, the Seafood Outlet said it

would be interested in purchasing approximately 14,000 pounds of fresh or frozen char from the Keewatin throughout the year provided that the product is of consistently high quality. It was pointed out that poor appearance of fish from the Keewatin Region had caused problems in the past and that more care should be taken to ensure char are properly cleaned and gutted, and that they are handled gently to prevent bruising. There had also been problems with consistency of supply; supplies were promised but not always delivered.

The preferred products for sale in Yellowknife are vacuum-packed frozen fillets or steaks and smoked char for retail sales, and whole frozen (gutted) fish for hotel use. The wholesale price for fresh and frozen char ranges between $2.75 and $3.25 a pound plus freight costs, depending on supply and quality. Retail prices in Yellowknife vary between $5.28 and $6.28 a pound for frozen char, and from $10.00 to $12.00 a pound for smoked char, with smoked char from Iqaluit receiving much higher retail prices (hot smoked, $16.75/lb., and cold smoked, $22.50 per lb., at Northern Country Foods Ltd.).

Summer is the peak season for sales in Yellowknife because of the high tourist interest and the greater number of banquets and conventions. The present demand for fresh and frozen char among hotels and retail outlets is approximately 17,000 pounds a year and some of this is now being met by char from Cambridge Bay. In order to compete with this source, char from Keewatin will have to be of a consistently high quality and good appearance, and will have to be available on a reliable basis. As well, since Yellowknife retailers are only prepared to handle fish in 1,000 pound lots, char would have to be stored in volume in the Region and shipped to Yellowknife as orders were placed.

The market for smoked Arctic char in Yellowknife was also confirmed by the chef at the Yellowknife Inn who already smokes his own char to meet the needs of his customers. He said customer requests indicate that a lot more smoked char could be sold. The chef also believed that camed Arctic char would sell.

6.4 Market Size (Arctic Char Frozen and Fresh)

As indicated above, there are strong markets for fresh and frozen Arctic char through FFMC and in Yellowknife, Rankin Inlet, Baker Lake, Coral Harbour and the hostel in Churchill. The total potential size of these markets over a five-year period can be calculated as follows:

FFMC: Assuming Keewatin sales to FFMC increased over the next five years by 20% per annum, which the corporation has said it could absorb, this would translate into an amual increase of 20% of existing production of 66,370, or 13,274 lbs. per annum.

Assuming the Baffin Region implements plans to stop selling to FFMC over the next five years to meet growing regional needs, this would add an annual increase of 20% over existing Baffin sales to FFMC of 15,000 or 3,200 lbs. per annum. Total sales to FFMC in Year I would be:

Existing levels:	66,370 lbs.
20% increase:	13,274 lbs.
Baffin gap:	3,200 lbs.
Total:	82,844 lbs.

If there were a similar annual increase over the next five years, potential sales to FFMC in Year 5 would be 148,740 lbs.

Yellowknife: Assuming Keewatin were to obtain 50% of current Kitikmeot sales in Yellowknife, this would translate into 50% of 17,000 Ibs. or 8,500 Ibs. in Year I. If this amount were to increase by 10% per annum, sales in Year 5 would be 12,444 lbs. Note: Keewatin has a price advantage over Kitikmeot since transportation costs are lower: Rankin to Yellowknife is 33¢/lb. whereas Cambridge Bay to Yellowknife is 50¢/lb.

Keewatin Communities: Since most communities are able to obtain Arctic char locally, it is assumed that demand for product would come mainly from Baker Lake, Coral Harbour, Rankin Inlet and the hostel in Churchill. Based on estimates obtained total market size is:

Baker Lake	30,000 lbs.
Coral Harbour	30,000 lbs.
Rankin Inlet	12,000 lbs.
Churchill	2,000 lbs.
Total	72,000 lbs.

Assuming a 10% per annum increase, potential sales in Year 5 could be 105,175 lbs.

Including both export and NWT sales, the total potential market is therefore:

	Year I	Year 5
FFMC	82,844	148,740
Yellowknife	8,500	12,444
Region	72,000	105,175
Total Market	163,344 lbs.	266,359 lbs.

6.5 Pricing - Frozen Arctic Char

The schedule of prices for frozen Arctic char by market are presented in Table B-7. As indicated, after deducting the cost of transportation from the Rankin fish plant to market and adding the GNWT transportation subsidy, the best available price for Arctic char is from FFMC.

FFMC has in the past been responsible for increasing the price for Arctic char and the corporation continues to test for market acceptance for further

Table B-7
Comparison of Arctic Char Prices Paid to Keewatin Brokers or Rankin Inlet Fish Plant

Market	Price	Transportation cost	Subsidy	Net price
FFMC	4.00'	.33	.17	3.87
Yellowknife	3.25	.33	.17	3.08
Rankin	2.25-3.00	nil	nil	2.25-3.00
Baker Lake	2.00-3.00	.40	.20	1.80-2.80
Coral Harbour	2.00-3.00	.55	.28	1.72-2.72
Churchill	2.70	.45	.28	2.25
Other Communities	1.50-2.00	.34**	.17	1.33-1.83

- FFMC price represents blended first and second payments.
- * Average transportation cost (Rankin to communities) used.

increases. However this must be done carefully: if prices are increased too much or too rapidly product will stop selling. Indeed, in 1984 when the corporation increased the price to over $5.00/lb. the market for char became smaller and more exclusive – in fact, according to a Theme Stevenson & Kellogg report on the industry, there was a danger of the market disappearing altogether.

6.6 Target Market - Frozen and Fresh Arctic Char

As indicated in Table B-8, FFMC is ranked as the best market since it offers the highest price, guaranteed sales, and volume purchase. It can also be added that the corporation provides promotion and marketing assistance and management advice.

The Yellowknife market is ranked second because with the exception of FFMC it offers a higher price than other markets.

The remaining communities have lower prices than Yellowknife and are ranked in descending order as follows: Rankin Inlet, Churchill, Baker Lake, Coral Harbour and the remaining regional communities.

Note: the potential for Repulse selling Arctic char to Coral was considered, however there are no scheduled flights from Repulse to Coral and in winter open water prevents transportation by snowmobile.

Table B-8
Arctic Char Market Ranking

				Criteria	
Market	Rank	Market Size (lbs.)	Sales Price	Guaranteed Sales	Volume Purchase
FFMC	1	82,644	$3.87	Yes	Yes
Yellowknife	2	8,500	$3.08	No	No
Rankin	3	12,000	$2.25-3.00	No	No
Churchill	4	2,000	$2.25	No	No
Baker Lake	5	30,000	$1.80-2.80	No	No
Coral Harbour	6	30,000	$1.72-2.72	No	No
Other Communities	7	8,000	$1.50	No	No

6.7 Competition

Territorial Competitors: The Kitikrneot and to a lesser extent Baffin Regions sell Arctic char in Yellowknife, however the overall demand for Arctic char in Yellowknife is not being met and there is room for expansion. As such, ‘ Keewatin fisheries could sell Arctic char in Yellowknife.

As already indicated, Pangnirtung is selling some product in the Keewatin, which suggests that if the Keewatin had more effective and consistent marketing throughout the year, more Arctic char could be sold.

Export Competitors: The competition for Arctic char appears to be from Labrador char and farmed char. However Labrador has declined in importance as a serious competitor. Labrador char is lighter in colour and does not have the same appeal as the red-fleshed NWT Arctic char. Moreover Labrador production has dropped from a high of 552,200 Ibs. in 1981/82 to a low of 154,000 lbs. in 1988/89 which suggests overfkhing. Another indication of overfkhing is that the majority of Labrador Arctic char are small, ranging between 2 lbs. and 5 lbs., which compares with NWT Arctic char which usually range in size between 4 lbs. and 7 Ibs.

Farmed char also does not appear to be a serious threat to NWT Arctic char. Last year only 7,000 pounds of farmed char was sold and although it is difficult to predict if production will increase dramatically it appears this will not occur in the short term. In addition, farmed char can only be grown profitably to “pan size” (8-12 ounces) whereas wild char can be grown to banquet size or sold as steaks. The markets for both products, although appearing to be the same, are different and restaurants will continue to demand wild char regardless of increased farmed char production.

The real competition for char is from salmon and there is now an oversupply of farmed salmon on the market, most of it from British Columbia and Norway. However, since char is only being produced in relatively small quantity and since it is distinct from salmon, it can be argued that there will always be a market niche for Arctic char in the south, especially if properly promoted. The real difficulty rests in ensuring continuous and reliable supply of good quality, preferably fresh, product.

6.8 Value-Added Products

Smoked Arctic Char: The potential for selling value-added product such as smoked fish in the NWT has already been demonstrated in the Baffii Kitikrneot and in 1987/88 in the Keewatin when Arctic char was smoked and sold in the Region.

A review of each Region's experience indicates the following:

Kitikmeot has been able to sell about 4,000 lbs. of smoked char in the Region at a price of $7.00/lb., with good consumer acceptance, however information was not available on the profitability of sales.

Baffin: As already mentioned Iqaluit Enterprises Ltd. smoked about 40,000 Ibs. of Arctic char last year, which translated into sales of some 20,000 lbs. of cold and hot smoked product, however the price charged did not meet overhead costs and the company recently had to increase prices by about $4.00/lb. Currently cold smoked Arctic char sells for $16.75 and hot smoked Arctic char sells for $22.50. The hot product sells for a higher price because of the higher shrinkage involved in processing.

Both products are vacuum-packed and have received strong consumer acceptance, in particular the cold smoked product which slices and does not crumble like conventional hot smoked product.

Company officials have said that last year it sold about 30% (6,000 Ibs.) of smoked product in Iqaluit, 35% (7,000 lbs.) in Yellowknife hotels and restaurants (Our Place), and the remaining 35% throughout the NWT'.

The company is now attempting to penetrate southern markets (Montreal). It believes there is a very good southern gourmet market for its product, particularly the cold smoked char.

It is important to note that the company was unable to market outside the NWT until such time as DFO inspection regulations were met and approval obtained, which it has only now received. The company is also in the process of establishing a laboratory in its facility to measure for contaminants such as PCBS and mercury.

The company is prepared to undertake a joint initiative with the Keewatin to promote and market smoked product, believing a cooperative approach would be to evexyone's advantage.

Keewatin: In 1987/88 Keewatin fisheries decided to keep a percentage of production for processing into smoked Arctic char. Initially it kept 50,000 lbs. but in fact only processed 30,000 lbs., with the balance of production either shipped to FFMC or sold in the Region as fillets.

Although the experience with smoking Arctic char in the Keewatin proved to be inconclusive (no records of the project's overall costs were kept), it appears that there was strong product acceptance, with about 25% (5,000 lbs.) sold in Yellowknife (Seafood Outlet) and 75% in the Region, both to natives and non-natives. The smoked char sold for between $7.00 and $9.00 per lb.

It is worth repeating that during the market research undertaken by the consultants, most retail outlets in the Region said they would purchase Keewatin produced Arctic char if it were available and cost between $9.00 and $13.00. The total demand for smoked char in the Region was estimated at between 8,000 to 9,000 pounds a year. Most outlets reported they had received numerous requests, from local residents and other communities, for smoked product.

Canned Arctic Char: During the 1960s and 70s a cannery operated in Rankin Inlet, processing char, some whitefish and lake trout, and muktuk. According to FFMC, the final product was excellent, with an attractive label and good, consistent quality. In the case of char, product was packed in flat 3-3/4 ounce cans (similar to sardine cans) at a cost of $4.00-5.00 a can, however with the cost of production so high, it was extremely difficult to sell the cans at a price high enough to be profitable.

The high costs of running a cannery in the Region are largely due to the high cost of transportation and utilities. With a realizable quota of only 260,000 pounds, the economies of scale work against a regional canning operation, Indeed, products from a regional cannery would have to compete with canned sockeye salmon that is processed in canneries handling 12 million pounds a season.

There is also a great deal of trim lost in canning. When salmon are canned, the smaller fish are used, making it easy to cut fish into chunks for canning. However Keewatin char is a premium fish; cutting large fish to put into cans would destroy a lot of their value.

If fish were processed in the Region it would have to be done in a plant that meets DFO standards and passes amual inspection. Requirements include stainless steel counter tops, and sealed floors, ceilings and walls.

In 1986 smoked and camed char was produced for sale at Expo. It was packed in 7-1/2 oz. unlabeled cans and put into labeled boxes. Cost of production was $3.50/can, which sold for $5.99 to $6.99/can. A total of 7,500 cans were produced and about half of them sold during the event. The rest were sold through outlets catering to tourists in Yellowknife and through Don Anderson in Vancouver. The product was well received and generated numerous requests from all over Canada, however, because of the limited amount of product and the unusual nature of a World Exhibition it is impossible to gauge the strength of the market from this experience.

The present cost of canning is approximately $4.80 a can if the product is shipped to a processor in Vancouver. Therefore, if there is a market for canned char, it is as a low-volume, high-priced specialty gourmet item, or as a unique souvenir item aimed at tourists. The size of this market is unknown and ED&T is conducting a study to determine whether this specialty market exists and how it can best be served.

Competition: As indicated earlier, over the next Year a Kitchener- based smoker will be producing and test-marketing 100,000 lbs. of smoked and canned Arctic char. FFMC believes that because the Kitchener smoker is a large operator, it will have economies of scale advantage over any NWT'-based producer.

6.9 Winter Fisheries

In discussions with FFMC and buyers in NWT markets there was good indication that product harvested through winter fisheries would have strong demand.

6.10 Other **Species**

Whitefish and Trout: Commercial quotas in the Keewatin are available for trout and whitefish, however the price obtainable in southern markets for trout and whitefish does not justify the cost of harvesting either fish. For example, looking at whitefish, the price obtainable from FFMC is currently 49¢ per lb. for medium-size export loose whitefish, while the cost of transportation is 33¢/lb. from Rankin to Winnipeg. Assuming a 50% transportation subsidy was obtained through the GNWT'S fisheries assistance policy, fishermen would receive 17¢/lb., leaving a balance of 32¢/lb., which would drop even lower when transportation, handling and processing costs were added. The reason for the low whitefish price is an oversupply of whitefish on the market. Indeed FFMC has instituted a whitefish "reduction" program to discourage production. The opportunity for selling trout is not much better since FFMC currently pays only .59¢/lb. for the fish.

The potential for regional and territorial sales of trout and whitefish also appears to be poor. As indicated in Table B-9, in 1984/85, the last year for which records are available, consumption of fish by species in the Keewatin consisted of 1,383 lbs. of whitefish, 9,458 lbs. of lake trout and 486 lbs. of grayling, which compared with 52,889 lbs. of Arctic char. The regional survey undertaken by the consultants also indicated that in the opinions of retail store managers in the Region consumer preference was for Arctic char and there would be very little demand for other fish in the Keewatin.

Table B-9
Subsistence Harvest Estimated Edible Weight Values
by Species by Community, 1984/85 (Kgs.)

Community	Char	Whitefish	Trout	Grayling	Other	Total
Baker Lake	501	1,353	4,879	81		6,814
Chesterfield Inlet	19		398			417
Coral Harbour	12,969		16			12,985
Eskimo Point	8,467	7	2,043	356	5	10,878
Rankin Inlet	17,911	23	1,079	44		19,057
Repulse Bay	10,510		757			11,267
Whale Cove	2,512		286	5		2,8413
Total	52,889	1,383	9,458	486	5	64,221

Source: Gamble, R.L. 1987.

Shrimp, Scallops, Cod and Turbot: Markets for shrimp, scallops, cod and turbot are as follows:

Shrimp vary in size from Jumbo to Crevettes. In 1988/89 Canadian production was 29,000 metric tones, up 16% over the previous year. The primary markets for Canadian shrimp are in Canada, United States and Japan. There are projections for higher levels of production on the United States west coast which could result in a drop in price over the next year. The current prices for shrimp are $4.80-5.00 for cooked shrimp packed 100/lb.; $5.00-5.20 for peeled shrimp packed 125-175 per lb.; and $2.00-2.20 for raw whole frozen shrimp packed 90-105/lb.

Scallops: In 1988/89 Canadian production of scallops was 75,000 metric tones, up 4% over the previous year. The primary markets for scallops are in the United States, however the markets for scallops harvested in the NWT (Icelandic scallops) are not as strong as for scallops harvested in the Atlantic (Atlantic scallops). Currently Atlantic scallops receive $1.00 to $1.20 more per pound than do Icelandic scallops. The price for Atlantic scallops is $5.80-6.00 for fresh and $4.50-5.50 for frozen. Last year the Pangnirtung fisheries obtained $7.SO/lb. locally for 3,000 lbs. of scallops harvested.

Cod: In 1988/89 Canadian production was 470,000 metric tones, with the primary markets in Canada and the united States both for fresh and frozen fillets. The markets for Atlantic cod are stronger than those for Arctic cod because the former is not as abundant. The price for cod is between $5.00 and $6.00f1b.

Turbot: Turbot or "Greenland Halibut" is harvested as a by-product of shrimp fishing. In 1988/89 Canadian production of turbot was 20,300 metric tones, a 3170 increase over the previous year. The primary markets for turbot are in the United States, where demand is very high in winter. Last year the Pangnirtung fisheries harvested 281,600 lbs. and after gutting and filleting (about 5070 of fish product is lost) obtained $3.60 per lb. or a total of 140,800x $3.60 = $506,880 from buyers in Montreal.

It is noteworthy that for cod and halibut DFO'S Atlantic group have responsibility for assigning quotas.

6.11 Marketing Strategy

6.12 Harvest All Available Quotas

Based on market information obtained, all available Arctic char quotas in the Region (260,000 lbs.) could be sold. An attempt should therefore be made to harvest all potential quotas in the Region. This includes developing winter fisheries.

6.13 Sell Most Keewatin Production to FFMC by Year 5

The best return for Keewatin production comes from FFMC in terms of offering the highest price, guaranteed sales, and by purchasing all production over a short season, keeping storage costs for the fisheries to a minimum. FFMC also assists in promotion and marketing of Arctic char in a manner that keeps prices high. Analysis indicates that no other market offers the same advantages.

To realize the greatest advantage, the strategy should therefore increase sales to FFMC and in Year 5 sell most regional production to the corporation. Production targeted at FFMC should be negotiated annually. Targets and commitments to FFMC should be established in advance and all attempts should be made to adhere to them.

6.14 Sell More Fresh Char to FFMC

Since higher prices can be obtained by selling fresh as opposed to frozen char to FFMC, attempts should also be made to overcome logistical problems wherever practical in order to sell fresh char to FFMC.

6.15 In the Interim, Sell Some Production to Other Markets

If there is surplus production that cannot be sold to FFMC then it should be sold primarily in Yellowknife and Rankin, and depending on price, to secondary markets in other communities. However, since these markets do not buy in large volumes like FFMC, a distribution centre will be required to store and sell fish as orders are placed. This could be undertaken by FFMC, with product shipped from Winnipeg, or alternatively this could be accomplished by a country food/processing facility in the Region that would process and market both

seafood and country food products for greater economies of scale. Such facilities have been established in both the Baffin and Kitikmeot (both are marginal break-even operations). In order to determine the economic feasibility of establishing such a feasibility in the Keewatin, it is recommended that a separate study be initiated.

An attempt should also be made to obtain a price for Arctic char sold in the Region that is equal to what FFMC pays. This is particularly true for such government-funded institutions as the Rankin Inlet school residence dining room and the Churchill hospital transient centre.

6.16 Initiate **Two-Year Pilot Project to Develop and Sell Smoked Arctic Char**

In order to confirm overall market acceptance (including price acceptance) and profitability of selling smoked Arctic char, a two-year pilot project should be initiated on a small scale to produce both cold and hot smoked Arctic char similar to that being produced by Iqaluit Enterprises Ltd. Consideration should be given to a joint venture with Iqaluit Enterprises in order to economize on joint promotion and marketing initiatives. It is expected that if a regional country food/processing facility were established, the facility could undertake the processing, storing and marketing of product produced. If over the two-year pilot project phase it was determined that product could be produced and sold more profitability than through FFMC, then more production could be allocated for processing and sale through the Keewatin facility.

Caution should be exercised in undertaking this project since strong competition may be forthcoming from a Kitchener-based smoker.

6.17 Undertake **Test Fisheries for Shrimp, Scallops, Cod and Turbot**

Given existing market demand for shrimp, scallops, cod and turbot, test fisheries should be undertaken to confirm potential quotas that could be harvested in the Region.

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Robin Smith, Western Management Consultants, Vancouver.

Part C:

Strategy Elements, Programs & Initiatives

7.0 Harvesting Sector

The harvesting sector of a commercial fishery consists of the individuals and equipment involved in catching, handling and delivering fish to a facility that , arranges for the sale and transport of fish to market. The harvesting sector of the Arctic char fishery in the Keewatin is largely undeveloped from a commercial perspective. The fishermen are not well organized, prices are low and the majority are using equipment that is poorly suited to fishing conditions.

There is an opportunity for the harvesting sector to become an economically viable industry harvesting more fish and employing more people without causing unnecessary disruptions to traditional economies and lifestyles.

In the immediate term, the best opportunities for viable commercial development appear to be in the Ferguson River, Whale Cove and Chesterfield Inlet areas. Approximately 82,100 lbs. (dsd. wt.) of Arctic char could be harvested from these areas and this level of harvest could provide long-term viability for up to 26 fishermen operating out of 13 outfits. There also appears to be potential for a viable winter commercial harvest in the Repulse Bay area.

In the following sections, participation, production, and gross economic returns in each community are reviewed, the economic viability of individual harvesting enterprises is analyzed, harvesting sector objectives are identified, and problems, options and opportunities are discussed.

7.1 Commercial Arctic Char Production - 1988

In 1988, there were 123 fishermen, many of whom combined commercial with domestic fishing activities, involved in the Keewatin open water char fishery. In total 81,731 lbs. (dsd.wt.) of char were harvested worth a landed value of $104,159.70. Most of the fishermen used 20'-22' canoes and set an average of four fifty-yard 5.5" gillnets. The two freezer/packer vessels located in the Region did not operate in 1988.

Prices paid to fishermen varied between $1.00/lb. and $1.40/lb. Eskimo Point and Rankin Inlet fishermen were paid the highest price and Chesterfield Inlet fishermen the lowest. Whale Cove fishermen received $1.30/lb. Repulse Bay fishermen received $1.25/lb. (rnd.wt.) for winter-caught lake frozen char. Price

discrepancies between the 29 communities area function of transportation costs and operating costs for local holding and handling facilities.

Production volumes of Arctic char for 1988 (81,731 lbs. dsd. wt.) represent the highest level of production that has been obtained over the last 10 years. It is difficult to determine if this increase represents the beginning of an increasing production trend or simply another peak in the highly variable production pattern that has characterized this fishery (see Appendix 1).

Eskimo Point 1988 production (20,522 lbs. dsd. wt.) was lower than 1987 (21,561 lbs.), but represented the second highest production from the Eskimo Point area during the 1978/1988 period. Eskimo Point had the highest participation in the commercial fishery with 54 licensees.

Whale Cove produced 22,209 lbs. (dsd. wt.) in 1988 as compared to the highest production recorded during the 1978/1988 period which was 31,746 lbs. in 1981. Whale Cove had 26 people participate in the fishery.

Rankin Inlet production was higher than in recent years because of a quota increase for 1988. The 1988 harvest (18,893 lbs.) is still well below the peak production levels experienced prior to the closure of the Diama River. Rankin Inlet had 15 people participate in the fishery.

Chesterfield Inlet 1988 production was the highest recorded (20,107 lbs. dsd. wt.) during the 1978/1988 period. Only in 1985 when production reached 19,583 lbs. was there a comparable level of haxvest. There were 28 people who fished commercially in Chesterfield Inlet.

Repulse Bay has a history of low commercial char production. Ice conditions in the Repulse Bay area can make gillnet fishing from open canoes hazardous. Also, Repulse Bay fishermen indicated that char caught in gillnets are frequently attacked by shrimp and consequently rendered unsuitable for commercial purposes. A small-scale (1,500 lbs. were delivered to FFMC) winter export char fishery was attempted this past winter in Repulse Bay.

Coral **Harbour** also has a history of low commercial production. Coral Harbour fishermen, owner/operators of a freezer/packer vessel, experienced equipment problems in 1988 that prevented them from pursuing a commercial char harvest.

Commercial quotas in the Coral Harbour area are limited to the Duke of York Bay area where distance and ice conditions make access difficult.

Baker Lake residents harvest whitefish, lake trout and some char from Baker Lake mainly for subsistence purposes. A number of community residents expressed an interest in becoming involved in commercial char fishing in Baker Lake and the Chesterfield Inlet area.

Open water commercial char production data for 1988 are summarized in Table c-1.

Table C-1
1988 Commercial Arctic Char Harvest - Keewatin Region

Licensed Fishermen		Open Quota Areas	Quota lbs. rnd. wt.	Production lbs. dad. wt.	Price $/lb.	Gross $Value
Eskimo Point	54	Eskimo Point Area	9,920	8,754	$1.40	12,256
		Maguse River	9,920	5,794		8,112
		Sandy Point	1,985	1,726		2,416
		Ferguson River	29,980	467		654
		Coppemeedle River	9,920	3,781		5,293
		Subtotals:	61,725	20,522		28,731
Whale Cove	26	Wilson Bay	15,430	9,927	$1.30	12,905
		Pistol Bay	5,070	3,274		4,256
		Ferguson River	29,960	9,008		11,710
		Subtotals:	50,480	22,209		28,872
Rankin Inlet	15	Corbett Inlet	9,920	10,432	$1.40	14,605
		Baker Foreland	10,140	8,461		11,845
		Subtotals:	20,060	18,893		26,450
Chesterfield Inlet	28	Chesterfield Inlet (Fish Bay)	10,140	9,680	$1.00	9,680
		Robinhood Bay	14,990	2,950		2,950
		Steepbank Bay	9,920			
		Stony Point	14,990	6,243		6,243
		Kangiqsukjuak	Test	1,234		1,234
		Sagvaqjuak	Test			
		Subtotals:	39,900	20,107		20,107
		Total:	137,115	81,731		104,160

Repulse Bay: No open water commercial fishing in 1988.
Coral Harbour: No open water commercial fishing in 1988.
Baker lake: Provisional quota test fishery conducted in 1968.

7.2 Harvesting Sector Economic Viability

The well-being of a fisheries harvesting sector is determined by the individual and collective ability of fishermen to earn a financial profit. Although other , considerations, such as lifestyle may be involved, failure to earn a profit over a number of years will result in fishermen being unable to continue fishing.

Economic viability may be viewed in both a short- and a long-run timeframe. A commercial fisherman is considered to be economically viable in the short run if revenues earned are at least equal to annual operating costs. Long-run viability requires an amount of revenue that meets not only operating costs but also the fixed costs of capital invested in boats, motors and gear. A fisherman must also be receiving or have the expectation of receiving sufficient fishing income to provide an incentive to continue fishing.

The Domestic/Commercial Fisherman: An economic analysis of the commercial char fishery in the Keewatin is complicated by the incorporation of commercial fishing into the traditional subsistence economy. In many instances, an individual fishing mainly for domestic purposes will sell fish commercially to obtain a cash income sufficient to underwrite the cost of pursuing domestic hunting and fishing activities.

Some minimum level of viability is necessary for these fishermen to be able to continue pursuing domestic hunting and fishing activities in conjunction with commercial harvesting. If cash incomes obtained from the sale of char decline, the domestic component of the fishery maybe impacted negatively.

The Yonge Reports: Cost and revenue data surveys for char harvesting operations were conducted in Whale Cove in 1987 and Eskimo Point in 1988 (Yonge 1988 and Yonge 1989). These reports provide cost estimates for fuel, supplies, maintenance and repair, net replacement and capital equipment (canoes and outboards). Measures of the number of trips per season, volume of fish caught per trip and the volume of fish caught per net lift were also included in the reports. Data from the Yonge reports were used to estimate current economic performance and future economic potential for open water char harvesting operations.

Viability Analysis: An average of the costs and revenues reported by Yonge was calculated as a basis to estimate the economic performance of an average domestic/commercial fisherman in the Eskimo Point/Maguse River area, the Coppemeedle River area, and the Whale Cove area. The data were then extrapolated to estimate the potential economic performance of a fisherman operating on a "commercial scale" in each of these areas.

Cost and revenue data are summarized in the form of an income statement which includes average revenues from fish sales, expenditures as reported and estimated by fishermen and a capital recovery factor (CRF). The CRF incorporates capital asset depreciation and financing costs into the income statement so that the long-term viability of an enterprise can be assessed.

The following analysis is based on income statements presented in Appendix 2. The statements are are one-year assessments of economic performance which allow informed judgments to be made on future performance under varying circumstances. Short- and long-term viability is projected for a domestic/commercial and commercial-scale fisherman operating in the Eskimo Point, Coppemeedle River, and Whale Cove areas. A description of the conditions underlying each income statement is also presented in Appendix 2.

Viability Analysis Results - Domestic/Commercial Fishing: Based on the application of rigid economic criteria, domestic/commercial fishing operations are not viable in the long run at current landed prices. The analysis of short-run viability indicates that a domestic/commercial fisherman in Copperneedle River and Whale Cove can earn a small cash income ($160.64 and $373.25 respectively) from char fishing. A domestic/commercial Eskimo Point/Maguse River fisherman was not viable in the short run.

Although the economic performance, in a strict sense, of a domestic/commercial fisherman was poor in all three fisheries analyzed, this assessment should be reconsidered from the perspective of an integrated domestic/commercial harvest. For many fishermen the purpose of selling fish commercially is simply to obtain enough cash to operate the equipment used in traditional domestic hunting and fishing activities. The fishery in Whale Cove and Copperneedle River was "viable enough" in the short run to meet these needs. The fishery in the Eskimo Point/Maguse River area was not.

For a domestic/commercial fishery to be viable in the long run, income earned from commercial fishing must be high enough to underwrite the long-term costs (capital costs) of a combined domestic/commercial harvest. If it is not, fishermen will be unable to purchase new canoes, outboards, and nets and the existence of both the domestic and commercial fisheries and the benefits the communities derive from them will be threatened.

The current levels of income earned by domestic/commercial fishermen through fish sales are insufficient to pay for the long-term capital costs of an integrated harvest. Based on the analysis conducted for an average fisherman, capital costs represent between 60% and 80 % of the total costs of fish harvesting. For purposes of analysis, the total capital recovery cost for equipment has been assigned to the commercial fishery even though capital equipment is actually used for other domestic fishing and hunting activities; Yonge (1989) estimated that equipment was used for commercial fishing only 30% of the time. If other domestic hunting and fishing activities do not provide a cash income, alternate sources to finance the purchase of replacement capital equipment would be required. Without alternate sources of financing, a domestic/commercial fisherman could not continue fishing in the long run.

Viability Analysis Results - Commercial-Scale Fishing: The analysis of short- and long-inn viability for a commercial-scale fisherman in all three fishing areas indicates that there may be a significant opportunity for a limited number of fishermen to pursue char fishing on a commercial scale and be economically viable at current landed prices. If landed prices can be increased, the extent of viability or number of fishermen that could be accommodated at a viable level would also increase.

The commercial analysis allowed for the use of Lake Winnipeg style fibreglass yawls and larger outboard motors. The use of this type of equipment would allow fishermen to travel longer distances, set more nets and operate with a greater degree of safety under adverse weather conditions. Although the capital cost of these items is higher than the cost of canoes and smaller outboards ($12,500 vs $7,000), the increased volumes and associated revenues projected for a fisherman using this equipment would appear to justify the additional cost.

The Coppemeedle River displayed the highest economic potential of the three fisheries analyzed. After meeting all operating and long run capital costs it is

estimated that a fisherman would receive a net return to his labor of $4,761.00. Hired labor would probably be required to harvest the entire 8,500 lb. (dsd. wt.) quota and this added expense would reduce the fisherman's net return. On a commercial scale, the Eskimo Point and Whale Cove fisheries were not viable in the long run but provided fishermen with cash returns of $3039.63 and $2912.13 respectively in the short run. If the price to fishermen could be increased or fishermen were willing to accept a lower return in the short run, these fisheries could display long-run viability.

A full-scale commercial fishery in the Eskimo Point/Maguse River area could theoretically support 5 commercial fishermen. Approximately 18,700 lbs. (dsd. wt.) of quota are available in the area and a commercial scale fisherman harvesting 3,300 lbs. (dsd. wt.) could, by accepting a lower return in the short run, display long-term viability at current landed prices. The Whale Cove area quotas (Mistake Bay, Wilson Bay, Pistol Bay) could support approximately six full-scale commercial fishermen, each requiring a 3,700 lb. (dsd. wt.) harvest from a potentially harvestable area quota of 22,200 lbs. (dsd. wt.)

Winter Fishing Viability: Detailed cost and revenue information respecting a winter char fishery is lacking. However, discussions with Repulse Bay fishermen who participated in the 1988 winter fishery indicate that revenues (based on $1.25/lb. rnd. wt.) were approximately high enough to cover operating expenses. This indicates that a higher price may be required if a winter fishery out of Repulse Bay is to achieve long-run viability.

In summary, the results of the viability analysis conducted indicate that at current landed prices;

- Income earned from fish sales is not high enough to underwrite domestic/cornrnercial harvesting activities over the long run. The purchase of replacement canoes and outboards may have to be financed with income from other sources;

- There may be an opportunity for a limited number of fishermen to pursue char fishing on a larger commercial scale and be economically viable. Larger boats and outboards and more nets would assist fishermen in obtaining the volumes necessary to achieve viability; and

- A winter fishery in the Repulse Bay area does not appear to be viable (basis $1.2S/lb. md. wt.).

73 Harvesting Sector Objectives

Based on consultations with fishermen and other interested parties in each of the communities in the Keewatin Region the objectives for the harvesting sector are:

- 1. To achieve and maintain a level of cash income from the char fishery that allows community residents to continue traditional domestic harvesting activities; and

- 2. To allow individuals to develop the char fishery by pursuing the opportunity to harvest char on a commercial scale.

7.4 Harvesting Sector Problems

At current prices the average domestic/commercial fisherman is unviable in the long run and the likelihood of obtaining prices high enough to achieve viability is low.

At the current average volume harvested by a domestic/commercial fisherman, the price to fishermen would have to increase to $2.67/lb. for Whale Cove, $4.44/lb. for Copperneedle River, and $11.21/lb. for Eskimo Point to provide for replacement of canoes, outboards, and nets with income earned through fish sales alone. It should be noted that estimates of long-run break even prices are based upon average cost and revenue conditions. The circumstances of individual fishermen vary considerably about the averages, many fishermen could be viable at a lower price while some may require an even higher price.

The opportunity for domestic/commercial fishermen to improve viability by catching more fish is limited by the availability of quota close to communities.

The dilemma facing the domestic/commercial fishery is that under current conditions the majority of fishermen are not viable. The possibility of prices increasing to the levels required for viability is low and if fisherman had the

equipment needed to catch enough fish to become viable there would only be quota available for 5 or 6 individuals in each community to be viable.

The allocation of the char resource between commercial-scale fishermen and ' domestic/commercial fishermen within and between fishing areas is a potential problem.

Despite the results of the viability analysis, domestic/commercial fishermen have managed to survive over the years. Fisherman have managed to acquire the funds necessary to purchase canoes, nets and outboards and they probably will continue to do so in the future. More problems could be created than are solved by assisting domestic/commercial fishermen with capital purchases and promoting higher volume fishing in areas where domestic/commercial fishing is concentrated.

The ability of fishermen to finance the capital investment required for commercial-scale operations in more remote fishing areas is a problem.

Notwithstanding the potential allocation problem previously identified, the objective of allowing individuals to develop the char fishery by pursuing the opportunity to harvest char on a larger commercial scale is achievable but limited in scope and subject to the resolution of certain financial and logistical problems.

The development of a commercial-scale char fishery focusing on more remote quotas not utilized for domestic purposes requires an investment in larger boats and outboards and an increase in the number of nets per fisherman. The estimated total capital cost for a commercial-scale operation is $13,700. Fisherman will have difficulty obtaining financing from conventional sources because many will be unable to provide an equity contribution. Also, a commercial-scale char fishery is an unproven venture and ability to service debt will be a concern to conventional lending institutions.

A logistical problem facing the development of a commercial-scale char fishery relates to obtaining an adequate supply of quality ice for remote commercial fishing areas.

When fishing grounds are not located near an ice source such as a receiving station ice machine, fishermen have to travel long distances to replenish ice supplies. This is costly in terms of increased fuel consumption and lost fishing time. Also, ice quality and quantity is lost during travel because of melting and evaporation.

The infrastructure sector of the commercial fishery is not developed to adequately sexvice the needs of a developing commercial harvesting sector.

Abetter coordinated and more efficient infrastructure sector will be required to service a developing commercial-scale hamesting sector.

At current prices to fishermen, a winter fishing operation in the Repulse Bay area may not be viable.

As mentioned previously, Repulse Bay fishermen indicate that current prices are approximately adequate to cover operating expenses. Obtaining a higher price for winter-caught char is a problem.

Requests and the need for resource inventory work may increase as commercial development occurs and a developing commercial hamesting sector will need a response to these requests in a timely reamer.

Should a commercial-scale fishery develop, there will be a need to monitor and evaluate the biological response of char stocks to increased levels of harvest. With the exception of systems close to the communities, very few Arctic char quotas in the Keewatin have been subjected to continued harvests at or near allowable levels. Also, as the commercial fishery develops the process of establishing sustainable quotas in previously under-exploited systems may require refinement.

In summary, problems confronting the harvesting sector of the fishery include:

- The ability of domestic/commercial fishermen to continue to finance equipment replacement;

- The allocation of char stocks between commercial-scale and domestic/commercial uses and users;

- The ability of fishermen to finance the capital investment required to pursue char fishing on a commercial scale;

- Providing a reliable supply of quality ice to remote fishing areas;

- The ability of the infrastructure sector of the fishexy to effectively and efficiently service a developing commercial-scale harvesting sector;

- The price obtained for winter-caught char harvested in the Repulse Bay area; and

- The increased monitoring and resource inventory efforts that may be required to evaluate the response of char stocks to increased levels of harvest and the ability of regulators to respond, in a timely manner, to requests for quotas or quota adjustments in previously under-exploited systems.

7.5 Harvesting Sector Options & Opportunities

The recognition of the potential for commercial-scale char harvesting operations prior to significant commercial-scale development occurring represents an opportunity.

There is an opportunity to avoid the negative consequences of encouraging commercial-scale development without a prior assessment of the trade-offs between commercial and domestic benefits. There is an unique opportunity to develop and implement allocation criteria and programs in conjunction with, rather than in response to, the development of a commercial fishery. The responsibility for realizing this opportunity is one which is best met by the management and organization sector of the fishery in conjunction with resource management and regulatory agencies. A discussion of how the management and organization sector might address this responsibility is found in Section 9.0 of this report.

The extent of the open water commercial-scale development opportunity could approach or exceed 82,100 lbs. (dsd. wt.) of quota harvested by up to 13 outfits employing 26 men.

Table C-2 summarizes the river systems, quotas, and number of outfits that each system could possibly support at a viable economic level. The locations identified do not appear to be used currently for domestic or domestic/commercial purposes, and would be accessible by fishermen using larger boats and outboards similar to those identified in the viability analysis. Fishermen from Eskimo Point, Whale Cove and Chesterfield Inlet would likely be involved and fishermen from Baker Lake and Rankin Inlet could possibly be involved in pursuing these opportunities. A reasonable time frame over which development could occur is five years.

There may be a significant opportunity to harvest char commercially using weirs.

Weirs are a very efficient capture mechanism having potential application for river systems exhibiting appropriate depth, width and rate of flow characteristics. Conduit weirs have been operated experimentally in the Ferguson River (1988) and the Thomsen River (1986 and 1987). Data respecting the commercial viability of these experimental operations are lacking. Investigations to assess the suitability of weirs in certain river systems should be undertaken on a pilot project basis. Discussions with fiihermen indicate that the Coppemeedle River, Stony Point and Ranger Seal Bay systems offer potential for using weirs.

Table C-2
Commercial-Scale Development Opportunities

System	Listed Quots (dad. wt.)	Harvesting Units
Coppemeedle River	8,500 lbs.	1
Mistake Bay	4,40Q	1
Ferguson River	26,000	2-3
Metie Harbour	4,400	1
Ranger Seal Bay*	13,000	2
Robin Hood Bay*	9,700	2
Steep Bank Bay*	6,400	1
Stony Point*	9,700	2
Total:	82,100 lbs.	12-13

Note: Because of the limited fishing history associated with these locations, potential harvest is estimated at 75% of DFO quota listings.

A winter fishery for char out of Repulse Bay would appear to have commercial potential.

Repulse Bay fishermen indicated that at the 1989 price of $1.25/lb. they were close to "breaking even". Given that little infrastructure is required in support of a lake frozen product, the combined FFMC initial and average final payment price FOB Winnipeg is approximately $4.00/lb., air freight Repulse Bay to Winnipeg is $.96/lb. and handling and boxing costs would be approximately $.12/lb., there should be an opportunity to increase the price to fishermen; e.g. $4.00/lb. FFMC price – ($.96 + $.12 shipping and handling costs) = $2.92 available.

In Table C-3, quotas, although largely unconfirmed through an actual harvest, that could be accessed by Repulse Bay fishermen are identified.

There is an opportunity to acquire the economic and biological data needed to verify viability estimates in conjunction with an equipment assistance program for fishermen.

The open water commercial opportunities identified in Table C-2 are estimated and their accuracy has not been validated under actual operating conditions. The estimates are dependent upon the response of char stocks to harvest pressures, price levels and the conditions (operating expenses, catch rates, etc.) and assumptions developed for the viability analysis (Appendix 2). Testing for

Table C-3
Quotas Available to Repulse Bay Fishermen

System	Quota (rnd. wt.)
Curtis River	9,900 lbs.
Core Bay Area	7,900
Piksirnak River	5,000
Snowbank River	5,000
Ross Inlet*	5,500
Tasirjuac River*	5,500
Total	38,800 lbs.

Note: These systems were opened on a test fishery basis.

viability could occur through a program which provides capital assistance to a limited number of eligible fishermen in exchange for the information required to validate viability estimates. There are several options available to provide capital assistance; grants, loans, etc. The concept of a revolving fund as a basis for a loan program has advantages as it could be administered by the management and organization sector of the fishery in a manner that accommodates the circumstances and financial capabilities of fishermen.

A wage component or minimum wage guarantee to underwrite the possibility of a fisherman not covering operating expenses through fish sales could also be included as part of this type of program. Criteria to determine eligible fishermen and the exact nature of the information requirements should be determined by the management and organization sector of the fishery in conjunction with government and regulatory agency personnel.

Research and development funding may be required to obtain the biological information necessary to confirm quotas within the context of biological sustainability.

Discussions with DFO personnel indicated that current budgets and department priorities may not be able to accommodate an intensification of resource inventory work in the Keewatin. Initially, resource inventory work should be concentrated in the Chesterfield Inlet area as these stocks have not been subjected to harvesting pressures. Should Repulse Bay fishermen intensify winter fishing efforts, resource inventory and monitoring work should be undertaken. A process to monitor the response of char stocks to harvesting pressures is recommended for all systems. Additionally, residents of Coral Harbour indicated that technical and financial assistance is needed to conduct test fishing programs to determine the potential of stocks on Southampton Island.

A pilot project to test the feasibility of harvesting and holding natural ice near fishing locations should be conducted.

Putting up natural ice may offer a practical and economic solution to the problems experienced in attempting to haul machine ice to remote fishing locations. Many community residents have identified this as an alternative worth

investigating and several people mentioned the idea of a traditional cooler where permafrost is utilized as a natural refrigerant.

Opportunities, programs and initiatives associated with the development of the , harvesting sector are summarized as follows:

- There is an opportunity to avoid the negative consequences of encouraging commercial-scale development without a prior assessment of the trade-offs between commercial and domestic benefits.

- There is an unique opportunity to develop and implement allocation criteria and programs in conjunction with, rather than in response to, the development of a commercial **fishery.**

- The extent of the open water commercial-scale development opportunity could approach or exceed 82,100 lbs. (dsd. wt.) of quota harvested by up to 13 outfits employing 26 men.

- Weir fishing may represent a viable commercial alternative in addition to gill net fishing.

- A winter fishery for char out of Repulse Bay would appear to have commercial potential.

- A program approach to testing the viability of commercial scale fishing could assist in fulfilling regulatory and development agencies economic and biological data requirements and assist fishermen with capital investment needs.

- An intensification of resource inventory and monitoring work is recommended and research and development funding to support this work may be required.

- Putting up natural ice may offer a practical and economic solution to the problems experienced in attempting to haul machine ice to remote fishing locations.

8.0 Infrastructure Sector

The infrastructure sector of a commercial fishery consists of the capital assets (buildings and equipment) and transportation mechanisms required to handle and deliver fish to market. The level and type of infrastructure required depends on the volume and timing of fish produced and marketplace quality criteria.

Ultimately, fishermen pay for infrastructure services. Therefore, the role of the infrastructure sector is to support harvesting sector activities at the lowest possible cost.

In the sections that follow, the current status of the infrastructure sector of the Keewatin commercial fishery is reviewed from a physical and financial perspective. Infrastructure objectives are identified and problems, options and opportunities discussed.

8.1 Infrastructure Physical Status

Existing infrastructure supporting the Keewatin Arctic char commercial fishery includes facilities in Rankin Inlet and Chesterfield Inlet registered to freeze fish for export markets and receiving/holding facilities in Whale Cove and Eskimo Point that pack fish on ice for transfer to a registered export plant. In addition, two freezer/packer vessels (Arctic Tern & Natsiak) are located in the Region and although not currently employed in the infrastructure sector, these vessels are registered to process fish for export outside the NWT. It is important to note that even though a freezing capability exists in both Whale Cove and Eskimo Point, these facilities are not registered to export a frozen product outside of the NWT.

Transportation between communities and to FFMC in Winnipeg is handled by licensed regional and territorial air carriers (Calm Air, Nunasi Air and NWT Air) using Twin Otter, Hawker 748, C-46 and Lockheed Electra aircraft. Table C-4 provides a description and ranking of the physical characteristics of existing infrastructure facilities based on facility ownership (private, Government, etc.), type (packing station or export rated to freeze fish), age, capacity, condition and the existence of freezing and ice production capabilities.

Table C-4
Keewatin Region Fishery Physical Infrastructure

Location	Ownership	Type	Age	Export Rated	Capacity*	condition	Freezing	Ice
Eskimo Point	private	receiving + IOyr		no	3000 lbs	poor***	yes	yes
Whale Cove	HTA	receiving	9yr	no	5000 lbs	good	yes	yes
Rankin Inlet	GNWT	processing	+20yr	yes	+m lbs	poor***	yes	yes
Chesterfield Inlet	Fish Assoc.	processing	4yr	yes	10000 lbs	good	yes	yes
Arctic Tern**	private	processing	9yr	yes	13000 lbs	fair	yes	no
Natsiuk**	private	processing	2yr	yes	25000 lbs	good	yes	no

* Capacity rating is based on holding capacity not throughput capacity.
** Freezer/packer vessels.
*** Both the Eskimo Point and Rankin Inlet facilities require upgrading or replacement to remain functional.

Table C-5
Relative Distribution of Revenues Available ($/lb.)
basis 1988 prices & $4.00/lb. combined initial& final payment)

Community	Fish Purchase (1988 Prices)		Freight		Balance to Packing/Processing	
Eskimo Point	$1.40	35%	$1.08	27%	$1.52	38%
Whale Cove	$1.30	32%	$.78	20%	$1.92	48%

8.2 Infrastructure Financial Status

The infrastructure sector of the Keewatin commercial fishery earns revenues through the purchase of fish from fishermen and subsequent resale of fish to FFMC. Currently, the FFMC initial price for whole frozen Arctic char is $3.00/lb. FOB Winnipeg and $4.00/lb. for fresh Arctic char FOB Winnipeg. In addition, the Corporation issues a final payment in December of each year which corresponds to profits earned from production volumes from the preceding years haxvest. Thus, a final payment issued in December of 1988 corresponds to 1987/88 production and profits for the fiscal year ending April 30,1988.

Based on past production and average final payment values, combined initial and final payments for Keewatin Arctic char are estimated at $4.00/lb. This is the amount available on average to cover the costs of infrastructure, transportation and payments to fishermen. The relative distribution of this amount between fishermen, freight services and packing/processing services is presented in Table C-5 based on 1988 prices to fishermen.

Packin@rocessing Costs: There are two categories of infrastructure currently operating in the Region: registered fish plants and receiving/holding stations. In Tables C-6 and C-7 that follow, packing/processing costs, excluding freight costs,

Table C-6
Operating Costs
Chesterfield Inlet Fish Plant

Expenses	($/lb.)
Wages	$1.18
Supplies& Repairs	.65
Power	.27
Gasdine (boat operation)	.25
Telephone	.03
License Fees	.01
Interest& Bank Charges	.02
	$2.41/lb.

Source: March, 1989. Report of Mr. Donald Rosa, CESO Project Reference t-55039

Table C-7
Operating Costs
Whale Cove Receiving Station

Expenses	($/lb)
Wages	$.12*
Supplies & repairs	.045
Power	.06
Gasoline (boat operation)	
Telephone	.003
License Fees	.001
Interest & Bank Charges	$.23

Note: The cost ofwages has been estimated at $2,500.
Source: Adapted from Yonge, 1988.

payments to fishermen and capital cost depreciation, for the Chesterfield Inlet fish plant and the Whale Cove receiving/holding operation are presented. Cost information for the operation of the Chesterfield Inlet fish plant including the operation ofacollector boatwas obtained from 1988 financial statements and is , based on handling 20,100 lbs. of fish. Cost information for the Whale Cove operation was adapted from work conducted by Yonge (1988) and is based on handling 20,155 lbs. of fish.

At $2.41/lb., the operating costs for the Chesterfield Inlet fish plant exceed the $2.31/lb. available for processing, as identified in Table C-5, by $.10/lb. based on current prices to fishermen and transportation costs for a frozen product. The losses incurred would increase proportionately if the price paid to fishermen were increased. From the cost information available, it must be concluded that the Chesterfield Inlet operation is not viable based on current product volumes and operational/management conditions. The cost of wages for plant workers and a collector boat operator represent the greatest cost incurred by the operation, a cost that exceeds the cost of fish purchases.

At $.23/lb. the costs identified for the operation of the Whale Cove receiving/packing operation represent 12% of the amount available for processing/packing ($1.92/lb. see Table C-5) based on current prices to fishermen and transportation costs for an iced product. At this operating volume, it is concluded that a receiving/holding operation could be supported within the financial resources available to accommodate this function.

Operating costs for the Rankin Inlet fish plant and the Eskimo Point receiving/holding station could not be obtained at the time of preparing this report. Further, the Rankin Inlet plant by all accounts is oversized and the age and condition of plant equipment results in excessively high operating expenses in relation to the volume of Arctic char handled at present or potentially available as throughput in future.

Freezer/Packer Operating Costs: Existing freezer/packer vessels represent a third category of infrastructure potentially operable in the Region. Operating cost estimates for using a freezer/packer vessel in an infrastructure capacity are

presented in Table C-8 based on discussions with the owner/operator of the Arctic Tern. Costs, include direct delivery to Rankin Inlet but exclude payments to fishermen and capital cost depreciation. Costs are based on a volume of 13,000 lbs, one full load, obtained from a single location such as the Ferguson River.

The estimated cost of $.70/lb. for operating a freezer/packer vessel in an infrastructure capacity would leave a balance of $3.30/lb. to cover freight and transfer costs and payments to fishermen. In comparison to a shore-based facility such as Chesterfield Inlet, the freezer/packer alternative has significant cost advantages.

Table C-8
Operating Costs - Freezer/Packer Vessel

Expenses	($/lb)
Wages	$.24
Supplies & repairs	.25
Power	
Gasoline (boat fuel)	.20
Telephone	
License Fees	
Interest & Bank Charges	.01
	$.70ilb.

Source: Personal communication, owner/operator Arctic Tern Fishing

83 Transportation Financial Status

In Table C-9, current local cartage and air freight rates (excluding GNWT freight subsidy) are compared. To estimate agross weight rate for delivery of a fresh product, the dressed weight of fish has been increased by a factor of 25% to account for the weight of containers and ice.

8.4 Objectives

The primary objective of the infrastructure sector of the Keewatin commercial fishery is:

. To provide an integrated handling, packing/processing and transport capability, at the lowest possible cost, to service current harvesting sector volumes with consideration to handling additional throughput as maybe obtained in future.

Table C-9
Air Freight & Cartage Rates by Destination ($/lb)

	Air Freight Rates Destination			Air + Cartage + Ice Rate Cartage	Destination		
	Rankin	Eskimo Pt	Wpg	Rates	Rankin	Eskimo Pt	Wpg
Eskimo Pt	0.34	-	0.76	0.10	0.55		1.08
Whale Cove	0.24	0.34	-	0.08	0.40	0.53	-
Rankin		0.34	0.33	0.05	-	0.49	0.48
Chesterfield	0.27	0.87	-	0.04	0.39	1.14	-
Repulse Bay	0.57	0,91	-	-	0.71	1.14	-
Coral Harbour	0.55	0.87	-	0.15	0.88	1.28	-
Baker lake	0.39	0.54	-	0.10	0.61	0.60	-

Notes:
All rates are expressed in $0.00/lb
Air freight rates are tariff rates for Calm Air/Nunasi.
Special Commodity Ratas maybe obtainable for guaranteed volumes.
Rankin/Winnipeg is NWT Aifs Special Commodity Rate.
A factor of .25 has been applied to calculate gross weight rates including containers and ice.
Cartage rates for Coral Harbour and Baker lake are estimated values.

A secondaxy and longer term infrastructure objective is:

- To diversify infrastructure related business activities and promote the vertical integration of the fishery to provide additional employment and income opportunities for residents of the Region.

8.5 Problems - Infrastructure Sector

Existing infrastructure facilities and capabilities are not functioning in a coordinated and cost effective manner.

The costs associated with operating existing registered fish plants are excessive. Poor financial performance results when facilities are operated during periods when product volumes are too low to justify operating costs. The relationship between weekly harvest volumes and operating costs must be reconciled. Effective management and organization is key to the operation of a financially accountable infrastructure sector.

The receiving/holding facility in Eskimo Point and the fish plant in Rardcin Inlet require a major upgrading and/or replacement to continue servicing the harvesting sector of the fishery.

Problems with the physical status of infrastructure facilities affect financial performance. Inappropriately designed and sized or inadequately maintained facilities tend to drain financial resources to the ultimate detriment of the harvesting sector; e.g. prices to Chesterfield Inlet fishermen have actually declined since the fish plant became operable.

Transportation scheduling and reliability between communities is a problem.

Both Calm Air and Nunasi Air have opted to utilize smaller passenger aircraft (King Air) on the majority of their scheduled inter-community routes. Freighter services are offered separately with frequency dependent on volume. The ability of existing regional air carriers to service the needs of the fishery is questionable.

8.6 Options and Opportunities - A Perspective

In the discussion that follows, the options and opportunities available to resolve infrastructure sector problems and increase payments to fishermen are presented. Considered options that have advantages include:

- Maximizing supply of a fresh product to the extent possible and a whole frozen product for the balance;
- heating a modest central processing capability in Rankin Inlet (either upgrade existing plant or construct new facility);
- Maintaining receiving/holding capabilities in Eskimo Point, Whale Cove and Chesterfield Inlet;
- Deploying freezer/packer vessels in Chesterfield Inlet and Ferguson River area;
- Operating facilities on a packing or processing fee basis for a maximum of five weeks from the first week in August through the first week in September; and
- Utilizing a dedicated aircraft to move fish from receiving stations to the central plant in Rankin Inlet.

Target Production Volumes: Any discussion of infrastructure options and opportunities must relate to anticipated volume throughputs. In Table C-10, based on current harvest volumes and harvest opportunities identified in Section 7.0, target product volumes are presented by river system and delivery point ,

Table C-10
Target Production Volumes by Location
(conversion factor round to dressed is .85)

Source	Quota Harvest (Dsd. Wt. Equiv.) Iced Delivery	Frozen Delivery
Eskimo Point Receiving Station		
Area	8,500 lbs.	
Maguse	8,500 lbs.	
Sandy point	1,700 lbs.	
Coppemeedle	4,200 lbs.	
Arctic Tern Freezer/Packer		
Copperneedle		4,300 Lbs.
Ferguson		26,000 lbs.
Whale Cove Receiving Station		
Wilson Bay	13,400 lbs.	
Pistol Bay	4,400 lbs.	
Mistake Bay	4,400 lbs.	
Rankin Inlet Processing Facility		
Baker Foreland	8,800 lbs.	
Corbett Inlet	8,500 lbs.	
Chesterfield Inlet Receiving Station		
Area	8,600 lbs.	
Merle Harbour	4,400 lbs.	
Natsisk Freezer/Packer •		
Stony point		9,700 lbs.
Steep Bank Bay		6,400 lbs.
Robin Hood Bay		9,700 tbs.
Ranger Seal Bay		13,000 lbs.
Total (144,700 lbs.)	75,600 lbs.	69,100 lbs.

*Because of the limited fishing history associated with these locations, harvest is estimated at 75% of DFO quota listings.
Note: See Appendix 3 for discussion of infrastructure cost scenarios.

based on dressed weight equivalent quota harvests and form of delivery to a central processing facility.

8.7 Options and Opportunities - Discussion

The identification of options and opportunities for infrastructure development depends on the relationship between the harvesting and infrastructure sectors of the fishery. A proposed relationship upon which option and opportunity identification can be premised is:

- 1. In the short term, infrastructure facilities and associated management and organizational functions should be directed toward providing support necessary to the management and development of the harvesting sector.

- 2. Only when a viable and energetic harvesting sector is established at an operating level consistent-with sustainable resource potential should opportunities for diversification of infrastructure sector business activities be assessed and pursued.

Current physical infrastructure problems may actually represent an opportunity for the future development of the fishery. The need to upgrade or replace facilities in Rankin Inlet and Eskimo Point should be viewed as on opportunity to review the type and location of these facilities from a logistical and financial viability perspective.

Central or Community Based Processing Capabilities: Delivery of a fresh product to market realizes the best price. However, because of logistical and climatic considerations, a freezing capability is required to minimize cullage. To service export market product form and quality criteria, options range from registered facilities in each community capable of handling both a fresh and frozen product to a single central processing capability with community receiving/holding stations feeding the central plant.

Based on capital and operating cost considerations, a central processing capability has advantages. The capital cost of a fully equipped (ice, freezers, etc.) registered processing facility is roughly estimated at $250,000 ($165/sq. ft.). The construction of this type of facility in each of the communities would not be

viable based on current nor projected product volumes. If the current Chesterfield Inlet operation is indicative of operational viability, community based registered processing facilities would consistently lose money and returns to fishermen could decline.

Options for locating a central processing facility include Rankin Inlet and Eskimo Point. Eskimo Point, because it is the southern most community in the Region has a geographical advantage and would be a logical location for a central processing facility. However, air service to this community does not compare to that provided to Rankin Inlet in terms of regularity, reliability and price. Shipments from Eskimo Point to FFMC would have to transfer aircraft in either Churchill or Thompson resulting in a loss of control and potential spoilage problems. The price of moving product from Eskimo Point to Winnipeg is currently 1.08/lb (there is no Special Commodity Rate in place for this route) versus Rankin Inlet to Winnipeg on a direct carrier flight at $.48/lb. In fact, when shipping from Eskimo Point, it is less expensive to ship through Rankin Inlet ($1.03) than through Churchill or Thompson (see Table C-9). Lower transportation costs and reliability considerations make Rankin Inlet a more attractive option.

The option of locating a central plant in Rankin Inlet would require that receiving/holding stations be maintained in Eskimo Point, Whale Cove and Chesterfield Inlet. The existing Whale Cove facility functions well in this capacity. The Chesterfield Inlet facility if employed as a receiving station only rather than a processing facility would be underutilized. However, current and anticipated product volumes cannot justify a processing operation and plant relocation is considered unfeasible from a physical and political perspective. The existing facility in Eskimo Point requires upgrading or replacement to continue functioning as a receiving station.

Role of Freezer/Packer Vessels: The existence of two freezer/packer vessels in the Region represents a significant infrastructure sector opportunity. These vessels offer a processing capability combined with mobility. By deploying these vessels in strategic remote locations, fishermen could harvest distant quotas without incurring the time, cost and risk to product quality involved in transporting product to a community based facility. By deploying the Natsiak in Chesterfield Inlet and the Arctic Tern in the Ferguson River Area, an estimated

69,100 lbs. (dsd.wt.) of Arctic char could be handled by these two operations (see C-10).

Ultimately, these operators couldbe employed on a contract processing basis where revenues are tied to the volume of product handled. However, initially these operators would require a guarantee sufficient to cover expenses because the ability of the harvesting sector to mobilize in these areas is suspect based on historical levels of production (see Appendix 1). Once established in the infrastructure sector, cost information would be evaluated to determine an appropriate processing fee. Initial discussions with the operator of the Arctic Tern indicate that volumetric costs would be approximately $.70/lb (see Table C-8). However, this does not provide for capital cost depreciation nor major repairs that may arise during intensive vessel service.

Facility Size and Volume Throughput Ratings: If the option to locate a central processing facility in Rankin Inlet is pursued, the facility should be constructed to handle a throughput of up to 150,000 lbs. Consideration should be given to operating the facility on a five-week seasonal basis only (month of August and first week of September). A decision to construct a new facility or to downsize and upgrade the existing Rankin Inlet facility will require some design, engineering and cost comparisons. Should a new facility be required, consideration should be given to an airport location over a shore-based location because of the relative volume of fish delivered by aircraft from the other communities.

Based on a projected maximum product volume throughput of 144,700 lbs. (dsd. wt.) a central processing facility in Rankin Inlet should be equipped to handle:

- Up to 69,100 lbs. of previously frozen product delivered from freezer/packer vessels operating in the Chesterfield Inlet and Ferguson River areas; and

- Up to 75,600 lbs. of fresh fish delivered on ice from receiving stations and direct delivery fishermen. As a basis for projecting a future infrastructure sector operating cost environrnent, the following broad assumptions have been adopted:

Of the 75,600 lbs. delivered fresh to Rankin Inlet, it is realistic to expect that up to 50% of this volume (37,800 lbs.) could be repacked for delivery in fresh form to Winnipeg.

Based on anticipated volumes, timing of delivery, logistical considerations and the provision of some backup freezing capacity for the freezer/packer operations, a central processing facility should have a drawdown or flash freeze capacity of 5,000 lbs. per 24 hour period and a bulk cold storage capacity of 30 to 40,000 lbs.

Receiving stations should be of a size sufficient to handle upwards of 20,000 lbs of dressed product with an anticipated daily maximum throughput of 3,000 lbs. Both the Whale Cove and Chesterfield Inlet facilities are capable of handling projected volumes but a replacement facility would be required for Eskimo Point. Provision of adequate quantities of ice to supply fishermen and meet plant requirements may be a problem at anticipated throughput levels. Ice capabilities at receiving stations are important to the maintenance of a quality product. Augmenting current capabilities by putting up natural ice maybe a cost effective option worthy of investigation.

Facility Operation: Community based receiving stations could be operated by a single individual. However, during periods of peak activity, additional assistance may be required. For a central processing facility a staff compliment of four persons is anticipated during periods of peak activity. Freezer/packer operations would require a minimum crew of three.

As with the proposed operation of the freezer/packer vessels, there are advantages to operating community based receiving facilities and a central processing facility on a packing or processing fee basis where revenues are tied to the volume of product handled. The advantage of this type of operating system is that costs for various handling and transportation functions can be better controlled.

Transportation Infrastructure: Existing inter-regional transportation services are expensive and inadequate from the perspective of moving a fresh product. In Table C-II the costs of moving projected harvest volumes from receiving stations and freezer/packer operations to a central processing facility located in Rank.in Inlet are presented for existing regional carriers as compared to the costs, inclusive of maintenance and pilot costs, associated with the option of basing a dedicated aircraft (Cessna 207) in Rankin Inlet for 31 days.

Table C-1 1
Costs of Scheduled Carriers vs Dedicated Aircraft

Source	Volume (Dsd. Wt.) (ice + containers)	Scheduled	Dedicated
Eskimo Point	28,625 lbs.	$13,382	$11,230
Whale Cove	27,750	9,157	10,890
Arctic Tern	20,000	5,260	7,870
Rankin Inlet	nla	.	
Chesterfield Inlet	16,500	6,125	6,480
Natsiak	20,000	5,940	7,860
Total	112,875 lbs.	$39,884	$44,330

Notes:

Dedicated aircraft costs are estimated at $1430/day inclusive of fuel, maintenance and pilot accommodation at a rate of $150/day. Accommodation costs could be reduced by constructing living quarters for a piIot within the Rankin Inlet facility.

The daily rate for a dedicated aircraft was obtained from Skyward Aviation in Thompson, Manitoba. The rate quoted assumes one trip each day to Eskimo Point, Whale Cove and Chesterfield Inlet or 500 round trip miles with an aggregate payload of 3650 lbs. Based on 31 days of operation or the equivalent miles, the product volume that could be moved is approximately 113,150 lbs. inclusive of ice and containers or 84,862 lbs. of fish (dsd. wt).

The shipment of containers/supplies to receiving stations from Rankin Inlet has been estimated at 10% of scheduled carrier rates.

8.8 Summary

In summary, infrastructure sector options and opportunities that have advantages worthy of consideration include:

- Maximizing supply of a fresh product to the extent possible and a whole frozen product for the balance;
- Locating a modest central processing capability in Rankin Inlet (either upgrade existing plant or construct new facility);
- Maintaining receiving/holding capabilities in Eskimo Point, Whale Cove and Chesterfield Inlet;
- Deploying freezer/packer vessels in Chesterfield Inlet and Ferguson River area;
- Operating facilities on a packing or processing fee basis for a maximum of five weeks from the first week in August through the first week in September; and
- Utilizing a dedicated aircraft to move fish from receiving stations to the central plant in Rankin Inlet.

9.0 Management & Organization – Infrastructure Component

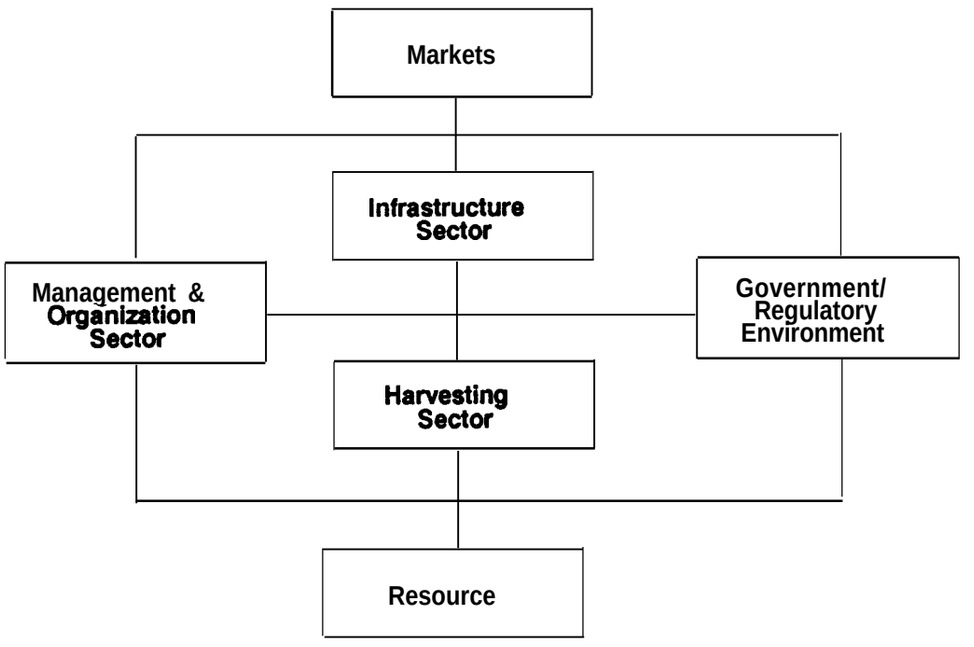
Effective management and organization is essential for the development and operation of a commercial fishery. The roles of management and organization mechanisms and structures are:

- To function as a link between the harvesting and infrastructure sectors of the fishery; and

. To act as a bridge between the operational components of a fishery and marketing and government/regulatory activities, requirements and interests.

The inter-relationships between the various sectors and interests involved in a commercial fishery are portrayed in Figure C-1

Figure C-1
Commercial Fishery Management & Organization



Effective management and organization involves the allocation of scarce resources, human, material and financial, to maximize productivity directed toward the achievement of organizational goals and objectives. Components of an effective approach to management include:

- **1.** A process for defining, evolving organizational goals and objectives;

- **2. An accountable management authority** having a mandate to **direct activities and initiatives toward** the achievement of **organizational goals and objectives; and**

- 3. An ongoing, dynamic process of monitoring, evaluation and adjustment to achieve desired and evolving objectives in an efficient and cost effective manner.

Management and organization occurs at two levels. One level is involved in coordinating the handling and delivery of fish between fishermen and the marketplace. This level is concerned with managing infrastructure facilities to meet the needs of fishermen, the marketplace and the regulatory environment. The other level involves mechanisms, structures and authorities required to allocate the fish resource between uses and users in a manner that maintains the resource base at acceptable levels and allows for development of the fishery.

In the sections that follow, the infrastructure component of management and organization is discussed. The resource allocation component of the managemerit and organization sector is discussed in Section 10.0.

9.1 Current Status - Infrastructure Management

Infrastructure management and organization functions occur at both a community and regional level. In 1988, responsibility for regional management functions was assumed by the Rankin Inlet HTA and the KWF. Activities included operating the Rankin Inlet fish plant, administering payments for the Whale Cove operation and coordinating transportation within the Region and to FFMC in Winnipeg.

Historically, the Rankin Inlet operation has been a focal point for the coordination of activities on a regional scale. Recently, there has been a trend away from this central focus. Chesterfield Inlet currently operates independently and both Whale Cove and Eskimo Point have expressed a desire to relinquish ties with the Rankin Inlet operation.

At a community level, management and organization functions include facility operation, maintaining records of deliveries from fishermen, coordinating local transportation and administering payments to fishermen. In 1988, the HTAs in Rankin Inlet, Whale Cove, Baker Lake and Repulse Bay assumed responsibility for coordinating local activities. In Chesterfield Inlet, the local fisherman's association has coordinated activities since the construction of the fish plant was completed in 1985. In Eskimo Point, a local private trader, Kakivak Fisher Foods, fulfills the local management and organization function. In Coral Harbour, commercial fishing activities have been limited to an existing freezer/packer operation and as a result, a community based management entity has not emerged.

9.2 Objectives - Infrastructure Management

Based on a recognition that a more effective management and organization capability is required to ensure continuity in and between the harvesting and infrastructure sectors of the fishery, objectives for the management and organization sector are:

- 1. To develop a clear and progressive management framework organized toward the pursuit of opportunities and options respecting current operations and future expansion alternatives;

- 2. To effect a progressive management capability at a reasonable cost by defining management and organization roles and responsibilities at a regional and community level based on specific areas of responsibility such as transportation% personnel, facility management, operations, planning, financing, and program implementation; and

- 3. To develop the human resources within the Keewatin to provide the expertise and continuity necessary to progressively define and develop management and coordination capabilities.

93 Problems - Infrastructure Management

Management and organization objectives for the Keewatin commercial fishery are directed toward the development of a progressive management position displaying vision, flexibility and continuity.

The current management structure in the Region is not well defined and as a result, the fishery lacks the level of organizational capability needed to effectively pursue expansion and growth opportunities.

Management continuity is a problem as the individual or organization involved from year to year tends to change in an unpredictable reamer. Consequently, no individual or organization within the Region has been in a management role long enough to gain the experience and expertise necessary to meet the needs of the fishery.

Within the present management framework, policy and managerial functions are not clearly identified and specific areas of authority, responsibility and accountability at a regional and community level are not well defined. Without a refinement of organizational structure it will be difficult to actively pursue developmental opportunities while continuing to efficiently manage current operations.

9.4 Options and Opportunities - Infrastructure Management

A possible option for organizing the management and organization sector would be to separate policy making and objective setting functions from day to day management and coordination functions. Selection of this option would require clarification of areas of responsibility and accountability for these functions between community level and regional management entities.

From a policy perspective, the management and organization sector should be concerned with the general tasks of ensuring that all fishermen in the Keewatin are treated fairly and equitably with respect to:

- Prices received for fish; and
- access to developmental opportunities and programs.

If all fishermen are to receive fair and equitable treatment, authority and responsibility for policy decisions relating to fish prices and access to developmental programs must lie with a central decision-making body capable of representing the collective interest of the Region.

A policy that attempts to rationalize prices received by fishermen throughout the Region requires that a central decision-making body have the authority to influence the pricing practices of local fish buyers. Local buyers will be reluctant to relinquish pricing control. A centralized processingheceiving facility located in Rankin Inlet and operating under the conditions proposed in Section 8.0 could provide for increased prices to fishermen. A decision to organize the fishery along these lines and realize the benefits associated with higher prices to fishermen can only be effected by a regional management and organization entity.

A central decision-making body capable of representing the regional interest would also be required to develop policies and objectives regarding access to developmental programs for fishermen. Decentralized control of program objectives and policies could result in the development of programs that have conflicting objectives or an inequitable treatment of fishermen from different communities with respect to access to program finds.

There are several existing organizations within the Region that could assume responsibility for developing fish pricing and developmental program policy; the KWF or the recently formed Sakku Development Corporation are possible candidates. Alternately, a new organization, with community representation from fish packers, buyers and local fishermen could be established.

The specific day to day tasks facing the infrastructure management and organization sector of the fishery are:

- The operation, maintenance, and staffing of community infrastructure facilities;

- Coordinating the purchase and delivery of consumables (boxes, etc.) and fishing supplies to community facilities;

- Negotiating air transport and local cartage freight rates;

- Coordinating transportation activities during the fishing season (dispatching planes and ensuring delivery to Winnipeg); and

- Information recording and accounting functions.

There are advantages to having some of these tasks undertaken by a centrally located regional management entity. The cost advantages of central warehouse and distribution facilities are widely recognized. Bulk purchases of consumables and fishing supplies could be made by a regional entity with volume discounts and distribution cost savings passed on to community infrastructure operations. Also, negotiating air transport freight rates and the coordination of transportation activities during the fishing season could be done more effectively by a centrally located regional entity.

Tasks which are appropriate for community level management and organization could include: receiving facility and personnel management; implementing a maintenance and repair schedule for local facilities and equipment; coordinating day to day operations; product quality control; information collection and recording; maintaining financial records and accounts; and local developmental program delivery and administration and the general coordination of harvesting sector activities. It is important to recognize that decentralization of program management and administration can be accommodated provided that umecessary duplication of administrative duties associated with program delivery, monitoring and evaluation do not occur.

Proficiency in the day to day management and planning tasks requires a level of expertise that can only be developed with experience. A mechanism to build expertise within the local population is desirable. FFMC is an experienced management entity that could assist in the process of building regional expertise. A five-year management agreement with FFMC is viewed as an option to fulfill this need. Under this agreement, FFMC could offer support services and persomel on a seasonal basis. Further, the Corporation could assist in training

and establishing criteria for information collection and analysis to assist in evaluating performance relative to industry sector goals and objectives.

In summary, infrastructure management and organization options and , opportunities include:

- The separation of policy making and objective setting functions from the day to day management and coordination functions;

- A regional decision-making authority responsible for policy making and objective setting with respect to development of the fishery and prices to fishermen;

. The KWF, Sakku Development Corporation, or a new entity comprised of community representatives from the harvesting and infrastructure sectors as possible candidates to assume authority for policy making and objective setting functions;

- A centrally located management entity responsible for operating a central warehouse, processing and distribution facility, negotiating air transport freight rates, and coordinating transportation activities during the fishing season; and

- A management agreement with FFMC to assist in the development of local expertise related to the day to day management and coordination functions.

10.0 Management & Organization – Resource Allocation Component

The operational elements of the Keewatin fishing strategy are primarily directed toward an increased commercial use of the anadromous Arctic char resource. As , strategy implementation occurs and the level of commercial harvest increases, so does the possibility of conflict over resource use and availability between legitimate resource uses and users. This potential for future resource use conflict could be minimized by developing an improved regional resource allocation management capability.

Domestic, domestic/commercial, recreational and commercial uses are all legitimate uses of the resource. In order of priority, domestic or subsistence use must be accorded priority because of the value of the resource for food and income-in-kind within the economic, social and cultural context of people living in the Region. A resource allocation mechanism maybe required to protect this use of the resource.

10.1 Current Status - Resource Allocation

Currently, the allocation of anadromous fishery resources is controlled by setting commercial quotas at a level that provides for estimated domestic harvest needs. Based on the concept of a TAC (total allowable catch) and an estimate of the level of harvest of a particular stock for domestic purposes, a commercial quota is established. Ideally, the combined domestic, recreational and commercial harvests would not exceed the TAC.

The process of allocating anadromous fishery resources is currently in a state of transition. DFO is involved in a process directed toward the devolution of responsibility for resource allocation. Consultation with local interest groups, resource harvesters and community organizations is an integral component of this process. Ideally, once a TAC is established for a particular system, allocation decisions would be made by the various user groups having an interest in the fishery. Current initiatives in the area of land claim negotiations suggest that local authority and responsibility in areas of resource allocation will be formalized through the establishment of local and regional resource management boards (1989, Yaremchuk & Wong).

DFO resource managers use the best information available to set TACS and commercial quotas. Their job is complicated by the fact that existing policy does not provide for placing an annual limit on the level of domestic harvest by native fishermen and there is no existing requirement for domestic fishermen to report the level of harvest that is occurring. Without this information, and in many ‘ cases without good information on the potential TAC that a particular stock can sustain, resource managers are often in the position of having to react to problems that arise. This was the case for the Dianna River situation and indications are that there may be a problem with the Maguse River stocks at Eskimo Point.

Allocation decisions respecting the number of commercial fishermen on a particular system are currently made informally among the fishermen themselves. DFO licensing requirements do not limit the number of fishermen. However, informal policies and traditional practice limits opportunities to fishermen from particular communities. The concept of a community resource use area exists and in practice, this constitutes an informal allocation decision.

10.2 Objectives - Resource Allocation

Resource allocation objectives are:

- 1. To allocate resources in a reamer that does not adversely impact the ability of community residents to obtain income-in-kind through the harvest of fishery resources for domestic purposes while attempting to accommodate the range of alternative use opportunities and interests that exist.

. 2. To establish a workable allocation mechanism to facilitate allocation decisions within and between legitimate resource use interests.

10.3 Problems - Resource Allocation

As evidenced by the Diama River situation and possibly a similar situation respecting the Maguse River, the ability of anadromous Arctic char stocks to sustain concurrent levels of subsistence and commercial use is limited. Potential problems are most prominent for river systems in close proximity to the

communities. Systems close to communities are easily accessible and offer the greatest opportunity for economic return and thus, harvest activities for both domestic and commercial purposes tend to concentrate in these areas. This situation could be intensified by encouraging increased commercial fishing , activity.

A problem confronting resource managers is that the information available for many systems is inadequate for purposes of establishing a reliable TAC. Information on stocks and harvest levels is a management tool to assist in making informed allocation decisions. DFO'S survey research and stock assessment efforts have tended to concentrate on stocks utilized for commercial purposes (1989, Yaremchuk & Wong). Current information respecting the native domestic fishery is inadequate.

10.4 Options and Opportunities - Resource Allocation

By making appropriate resource allocation decisions, resource use conflicts can be avoided and the possibility of harvest levels exceeding the biological sustainability of the resource can be reduced. The recognition of conflict potential before a conflict actually occurs represents an opportunity.

Community input in matters of resource allocation is imperative if an improved regional resource allocation management capability is to be developed. Current initiatives associated with land claims negotiations have identified local and regional fishery management boards as appropriate entities to make allocation decisions. Locally the HTAs and regionally the KWF, have a degree of legitimacy and a mandate to participate in the process of allocating Keewatin Region wildlife and fishery resources. The participation of these existing organizations should be encouraged and ultimately formalized.

The entity or entities ultimately given responsibility and authority to make allocation decisions will have an opportunity to establish the principles upon which allocation decisions would be premised. A set of coherent principles can form a foundation and rationale for allocation decisions. Principles to guide decisions may be required as a basis for:

- Determining the relative values of commercial and domestic uses;

- Promoting long-term economic viability for the commercial harvesting sector;

- Establishing criteria for allocating a limited number of commercial opportunities among potential users; and

. Recognition of exclusive community resource use areas.

Once an allocation decision has been made, there are many options available to control or encourage residents of the Region to comply with the decision. For example, if a decision is made to protect domestic fishing opportunities, zoning areas or specific river systems for domestic use only could be used as a tool to effect that decision. Alternately, a licensing system could be established that assigns individual quotas for domestic, domestic/commercial and commercial fishermen.

Resource allocation is an evolutionary process. To be effective, a resource allocation decision-making body must have authority and be accountable to the collective interest of the Region. There is an opportunity to allocate Keewatin fish resources in a reamer that incorporates regional perspectives, traditions and values while avoiding the negative aspects of resource use conflict. The process of realizing this opportunity will require extensive consultation between an entity representing local interests and various government/regulatory authorities.

11.0 Industry Sector Monitoring & Evaluation

Monitoring and evaluation involves the collection, analysis and interpretation of revenue and cost information. Monitoring and evaluation is considered an integral component of strategy implementation as it is a process that identifies information requirements and collection mechanisms necessary to assess the relative performance of industry sectors. By establishing and maintaining an ongoing monitoring and evaluation function, sector performance can be assessed in relation to stated objectives. The process provides a base for identifying problems, revising objectives and altering or adjusting program elements and initiatives to meet the changing needs of the fishery as it progresses through various stages of development.

The monitoring and evaluation function is best performed by the management and organization sector of the fishery. Specifically, information collection would be performed by receiving station, processing plant and freezer/packer vessel operators. The regional management and coordination entity in conjunction with FFMC would be responsible for establishing information criteria and data collection and analysis systems.

Monitoring and evaluation should include:

- Assessing the economic performance of the harvesting sector on an individual fishermen basis by fishing location. Information requirements would include revenues from initial and final payments, operating costs and capital costs and expenses;

- Assessing the economic performance of receiving stations, processing facilities and freezer/packer operations by developing annual profit/loss statements;

- Assessing the economic and physical performance of the transportation sector;

- Assessing the type and appropriateness of linkages between the various industry sectors of the fishery; and

- Assessing the progress of the fishery as a whole as a basis for identifying additional employment and income opportunities for residents of the Keewatin Region.

12.0 Strategy Opportunities Summary

There is an opportunity to increase the level of harvest and to organize the commercial Arctic char fishery in the Keewatin Region in a manner that provides higher prices to fishermen.

Harvesting Sector Opportunities: There is an opportunity to avoid the negative consequences of encouraging commercial-scale development without a prior assessment of the trade-offs between commercial and domestic benefits.

There is an unique opportunity to develop and implement allocation criteria and programs in conjunction with, rather than in response to, the development of a commercial fishery. The extent of the open water commercial-scale development opportunity could approach or exceed 82,100 lbs. (dsd. wt.) of quota harvested by up to 13 outfits employing 26 men.

Weir fishing may represent a viable commercial alternative in addition to gill net fishing.

A winter fishery for char out of Repulse Bay would appear to have commercial potential.

A program approach to testing the viability of commercial-scale fishing could assist in fulfilling regulatory and development agencies economic and biological data requirements and assist fishermen with capital investment needs.

An intensification of resource inventory and monitoring work is recommended and research and development funding to support this work maybe required.

Putting up natural ice may offer a practical and economic solution to the problems experienced in attempting to haul machine ice to remote fishing locations.

Infrastructure Sector Opportunities: Options and opportunities available to organize the infrastructure sector to better meet the needs of the harvesting sector and increase payments to fishermen include:

Maximize supplying a fresh product to the extent possible and a whole frozen product for the balance;

Locating a modest central processing capability in Rankin Inlet (either upgrade existing plant or construct new facility);

Maintaining receiving/holding capabilities in Eskimo Point, Whale Cove and Chesterfield Inlet;

Deploying freezer/packer vessels in Chesterfield Inlet and Ferguson River area;

Operating facilities on a packing or processing fee basis for a maximum of five weeks from the first week in August through the first week in September; and

Utilizing a dedicated aircraft to move fish from receiving stations to the central plant in Rankin Inlet.

Management & Organization Opportunities - Infrastructure: Options and opportunities directed toward a more effective infrastructure management and organization capability include:

The separation of policy making and objective setting functions from the day to day management and coordination functions;

A regional decision-making authority responsible for policy making and objective setting with respect to development of the fishery and prices to fishermen;

The KWF, Sakku Development Corporation, or a new entity comprised of community representatives from the harvesting and infrastructure sectors as possible candidates to assume authority for policy making and objective setting functions;

A centrally located management entity responsible for operating a central warehouse, processing and distribution facility, negotiating air transport freight rates, and coordinating transportation activities during the fishing season; and

A management agreement with FFMC to assist in the development of local expertise related to the day to day management and coordination functions.

Management & Organization Opportunities - Resource Allocation: By making , appropriate resource allocation decisions, resource use conflicts can be avoided and the possibility of harvest levels exceeding the biological sustainability of the resource can be reduced.

Resource allocation is an evolutionary process. To be effective, a resource allocation decision-making body must have authority and be accountable to the collective interest of the Region.

There is an opportunity to allocate Keewatin fish resources in a reamer that incorporates regional perspectives, traditions and values while avoiding the negative aspects of resource use conflict. Locally the HTAs and regionally the KWF, have a degree of legitimacy and a mandate to participate in the process of allocating wildlife and fishery resources.

The Keewatin Fishing Strategy presented in this report is organized on an industry sector basis. There are important interrelationships and linkages between the various industry sectors and these linkages must be considered integral to the achievement of strategy goals and objectives. An omission or lack of commitment to one sector over another may preclude the realization of opportunities associated with any given sector. A management and development strategy must be an integrated plan where the various industry sectors are addressed on a comprehensive basis.

A process of monitoring and evaluation is proposed to assess the relative success of the strategy on an ongoing basis. Program implementation must relate to intended objectives and be pursued within the context of strategy development principles. Monitoring and evaluation is a management tool for assessing performance relative to intended goals and objectives. The results obtained allow informed judgments to be made on the adequacy and reasonableness of goals, objectives and initiatives. Adjustments or alterations of various initiatives may be required to keep the strategy meaningful and dynamic.

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Appendix 1

Commercial Fish Harvest Data

1978/1988

KEEWATIN HARVEST DATA

ROUND WEIGHT (KGS)	1978	1979	1980	1981	1982	1983	1984	1983	1986	1987	1988	TOTAL
BAKER LAKE												
Baker Lake												
Quota		22680		226a0	22700	22700	22700					113460
Harvest 1		91		226	305	273	3&O					12s5
Whitehills Lake												
Ouota												
Harvest		114										114
BAKER LAKE TOTAL												
QUOTA		22680		226a0	22700	22700	22700					113460
HARVEST		20s		226	30s	273	360					1369
CHESTERFIELD INLET												
Chester. Inlet (Fish Bay)												
Ouota			22ba	22ba		2300	2300	2300	2300	4bO0	4600	22936
Harvest			136	454		545	2591	4100	2566	2900	5050	18430
Josephine River												
Quota		4536	4536		4500	4500	4500	4500	4300			31572
Harvest		1650	195		909	591	141	5270	118			0074
CHESTERFIELD INLET TOTAL												
QUOTA	0	4536	6804	2260	4S00	6800	6800	6800	6800	4600	4600	54S00
HARVEST	o	16s0	331	454	909	1136	2732	94S0	2604	2900	50S0	27304
CHESTER. IN. & BAKER LAKE												
Barbour Bay												
Quota												
Harvest							409					409
Big River '												
Quota										Closed	Closed	
Harvest												
East Point												
Quota												
Harvest												
Daly Bay												
Quota												
Harvest												
Hanway River												
Ruota						2300		Clossd	Closed	Closed	Closed	2300
Harvest						409						409
Ranger Seal Bay												
Quota						9100			closed			9100
Harvest						113			416			529
Robinhood Bay												
Quota								baoo	baoo		6800	20400
Harvest								133	2300		1540	3973
Steep Bank Bay												
Ouota										4500	4s00	4s00 13s00
Harvest										1108	707	16 1831
Stony Point												
Quota								Closed	6800	6800		6800 20400
Harvest								3600	625	2723		3257 1020S
CHESTER. & BAKER TOTAL												
QUOTA	0	0	0	0	0	11400	0	13600	18100	4500	18100	b5700
HARVEST	0	0	0	0	0	522	4009	73a	b547	707	481:	17356

KEEWATIN HARVEST DATA

ROUND WEIGHT (KGS)	1978	1979	1980	1991	1982	1983	1994	19S5	1986	1987	1988	TOTAL
CORAL HARBOUR												
Cleveland River												
Quota		9072	9072		9100	9100	9100	9100	7600			62144
Harwst		1814	88s		1240	682	2237	1746	650			9254
Gordon River												
Ouota											Closed	'
Harvest												
Thomsen River												
Quota					2300	1300			Closed	4200		8800
Harvest 2					1376	454			453	2300		4583
CORAL HARBOUR TOTAL												
QUOTA	0	9072	9072	0	11400	11400	9100	9100	7600	4200	0	70944
HARVEST	o	1814	885	0	2616	1136	2237	1746	1103	2300	0	13837
ESKIHO POINT												
Eskimo Point												
Quota	4536	4536	4136	4100	4500	4500	4300	4300	4100	4500	4500	49608
Harvest 3	2129	1366	340	2796	1332	1340	1363	1076			4361	17709
Maguse River												
Ruota	4536	453b			4500	4500	Closed	4500	4500	4500	4500	36072
Harvest 4	083	3353		318	154	2004	2000		5129	10347	3022	27210
Unnamed River												
Quota												
Harvest												
Unnamed River												
Quota												
Harvest												
Sandy Point												
Ruota		907	907	907	900	900	900	900	900	900	900	9021
Harvest		408	272	31a	318	68	900	900	900	900	900	5884
ESKIHO POINT TOTAL												
QUOTA	9072	9979	5443	5407	9900	9900	5400	9900	9900	9900	9900	94701
HARVEST	3612	5127	612	3432	1004	3412	42b3	2776	b029	11247	8409	S0003
RANKIN INLET												
Baker Foreland												
Quota		22b0	2268	2268	2300	2300	2300	2300	2300	4600	4600	27S04
Harvest		2740	2029	3475	300a	2200	332	1075	2524	1641	4414	23430
Corbett Inlet												
Ouota		4536	4536		4500	4500	4500	4500	4000	4500	4300	40072
Harvest		3243	2200		1305	545	353	4620	305	2145	5440	20164
Curtis River												
Quota					Closed			Closed	Closed			
Harvest 2					Soo			517	852			lbb9
Diana Lake												
Quota												
Harvest												
Rankin Inlet Bay												
Quota	11340	11340	11340	11340	11400	11400	6800					749b0
Harwst	10903	11340	10783	15574	14464	6053	5412					74529
RANKIN INLET TOTAL												
QUOTA	11340	16144	18144	13608	18200	18200	13600	6800	6300	9100	9100	142536
HARVEST	10903	17323	15012	19049	19077	8798	6097	6220	3681	3786	9854	119600

KEEWATIN HARVEST DATA

ROUND WEIGHT (KGS)	1979	1979	1960	1981	1982	1983	1984	1985	1986	1987	1988	TOTAL
REPULSE MY												
Alden River & Lake												
Quota												
Harvest												
Bennett Bay												
Ouota							2300					'2300
Harvest							790					790
Brown River												
Ruota									6000			6800
Harvest									620			620
Gibson Cove												
Quota	2260	2268				Closed						4536
Harvest	1341	454				3b4						2119
Sore Oay												
Ouota					3600	3600	3600	3600	3600	3600		21600
Harvest					200	272	300	436	212	81		1641
Haviland Bay												
Quota					2300	2300	2300		2300	2300		11500
Harvest					1290	364	109		3b2	63		2100
Karnarvik Creek												
9uota												
Harvest												
Lyons Inlet												
Quota												
Harvest		344										344
North Pole River												
Quota				2300	2300	2300	2300					9200
Harvest				318	1272	818	4s					24S3
Piksieak River												
Quota					2300	2300						4b00
Harvest					363	454						817
Repuse Bay qen. area												
Quota												
Harvest												
Snowbank River												
Ruota												
Harvest												
Unnamed River (Wager Bay)												
Quota												
Harveet												
Unnamed liver												
Quota												
Harvest												
REPULSE BAY TOTAL												
QUOTA	2260	2260	0	2300	10500	10500	10500	3600	12700	3900	0	60536
HAWEST	1361	798	0	318	312S	2272	1332	436	1254	144	0	I1040

KEENATIN HARVEST DATA

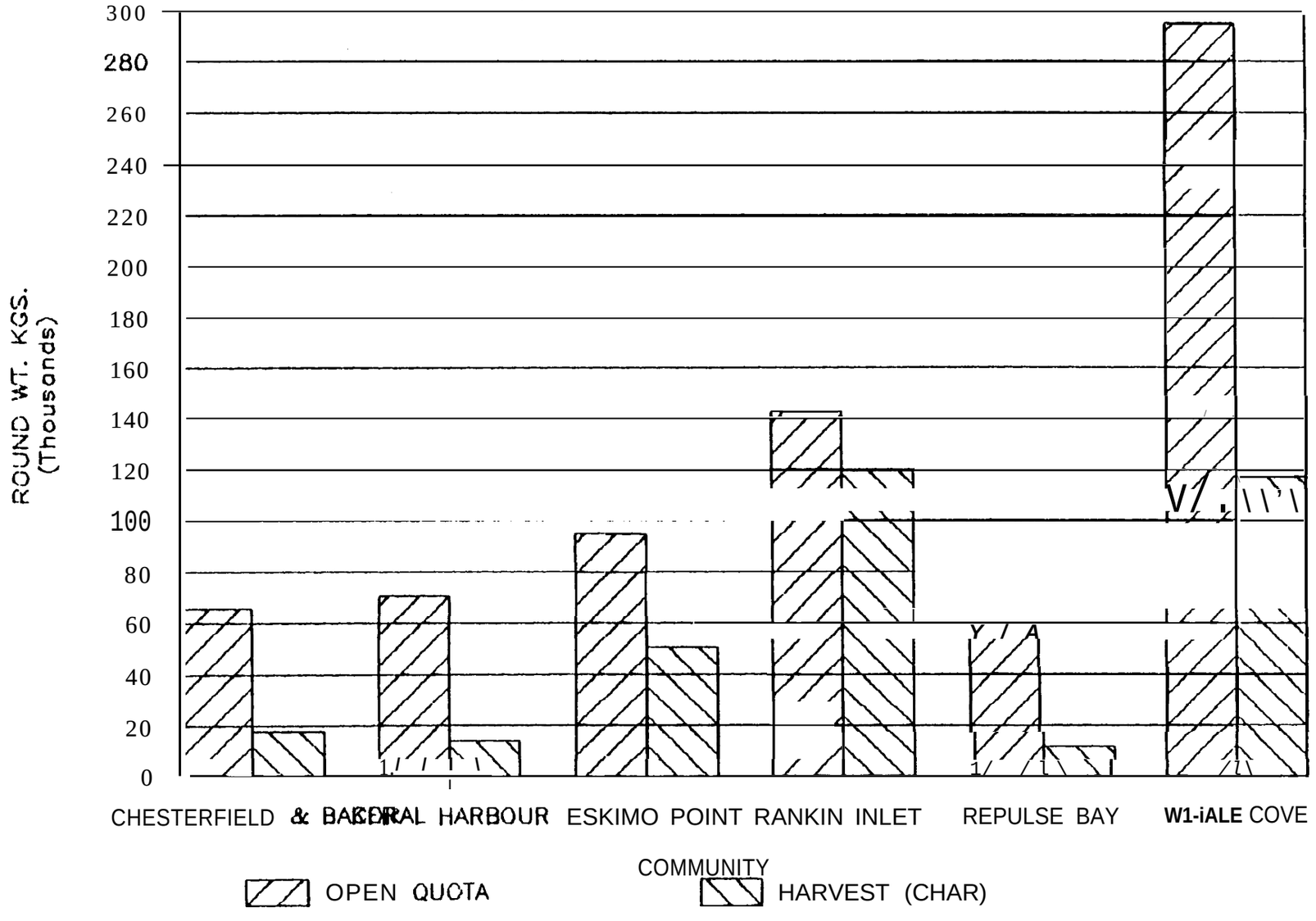
ROUND WEIGHT (KGS)	1978	1979	19S0	1981	1982	1983	1994	1985	1996	19S7	1988	TOTAL
WHALE COVE												
Copperneedle River												
Quota						4s00			4500	4s00	4500	18000
Harvest						544			lb9	325	1970	3ooa
Ferguson River												
Ouota		13608	13608	13bOa	13600	13600	13bO0	13bO0	13b00	13b00		122424
Harvest		22b0	10783	a337	3243	WOO	3b3	boa4	2a	5083	49so	44139
Mistake Bay												
Quota					2300	2300	2300	2300	2300	2300		13800
Harvest					370	454	3b3	23	lab	397		1793
Pistol Bay												
Quota			226a			2300	2300	2300	2300	2300	2300	lbOba
Harvest			310			3b4	3b3	207b	2000	2047	1707	8867
Wallace River												
Quota		2260	22b0			2300						ba3b
Harvest		50	42!			13b						bo7
Whale Covq												
Quota	22b0	2268		2270	2300	2300	2300	2300				lb00b
Harvest	345	581		3657	S1O	545	b02	3149				93a9
Wilson Bay												
Ouota	9072	9072	9072	9072	9100	9100	9100	9100	9100	10000	10000	101788
HarvQst	10815	3141	1s84	4571	b903	421	360	2119	7430	4991	5178	47547
WHALE COVE TOTAL												
QUOTA	11340	2721b	27216	24950	27300	3b400	29b00	29b00	31a00	32700	lba00	294922
HAWEST	11160	b060	13098	16565	l102b	7470	2051	13451	9S21	12843	13805	1173S0
KEENATIN RE610N TOTAL												
QUOTA ARCTIC CHAR	34020	71215	66679	40533	81800	104b00	75000	79400	93200	70900	5a500	783847
HARVEST ARCTIC CHAR	2703&	32772	29930	3901a	3S557	2474b	22721	34845	31119	33927	42011	357490

NOTES:

1 Includes whitefish,lake whitefish
2 Test Fishery conducted in 1986
3 1986/87 see Maguse River
4 1985 see Eskimo Point

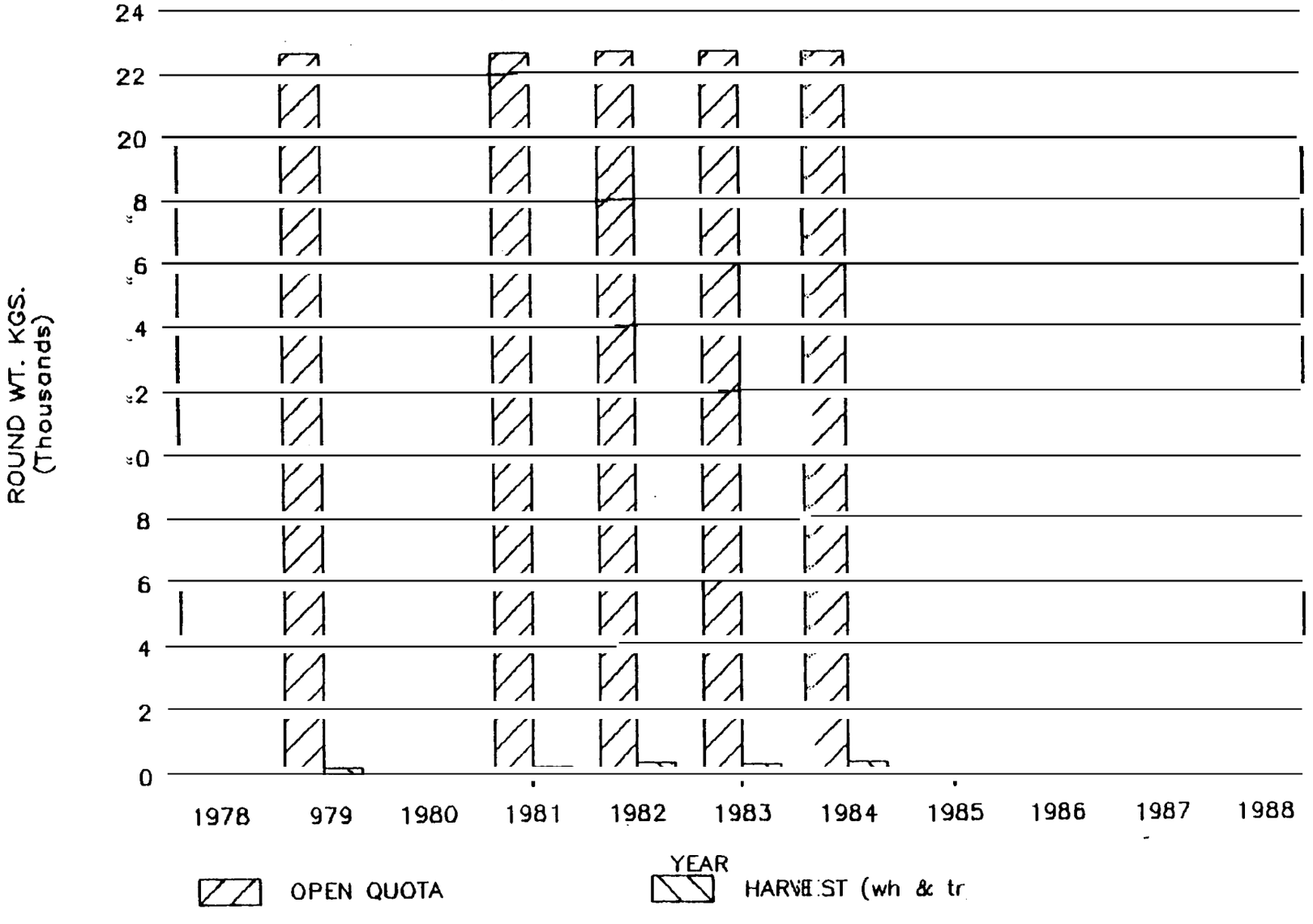
KEEWATIN COMMERCIAL CHAR HARVEST

(1978 - 1988 **by community)**



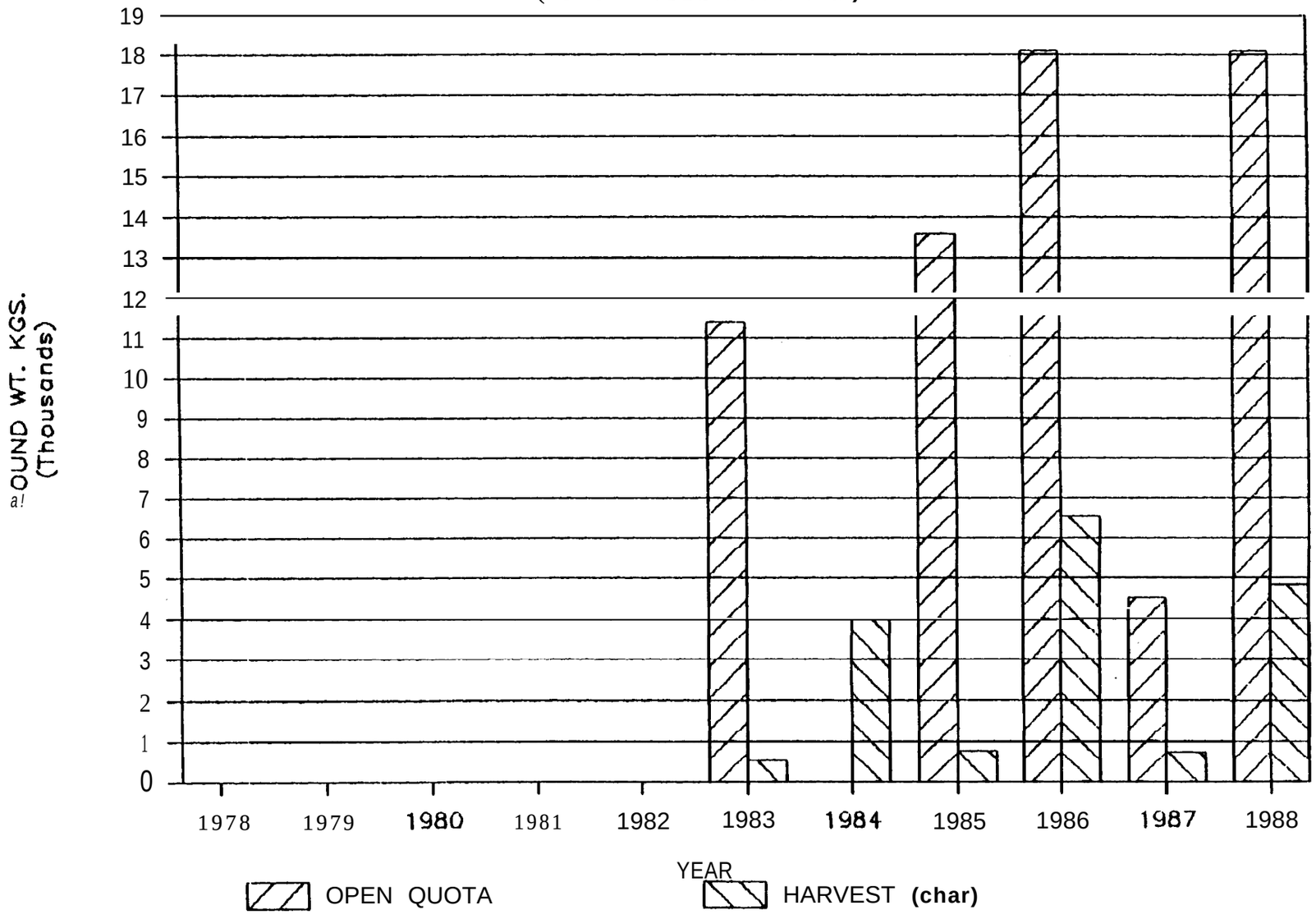
BAKER LAKE COMMERCIAL HARVEST

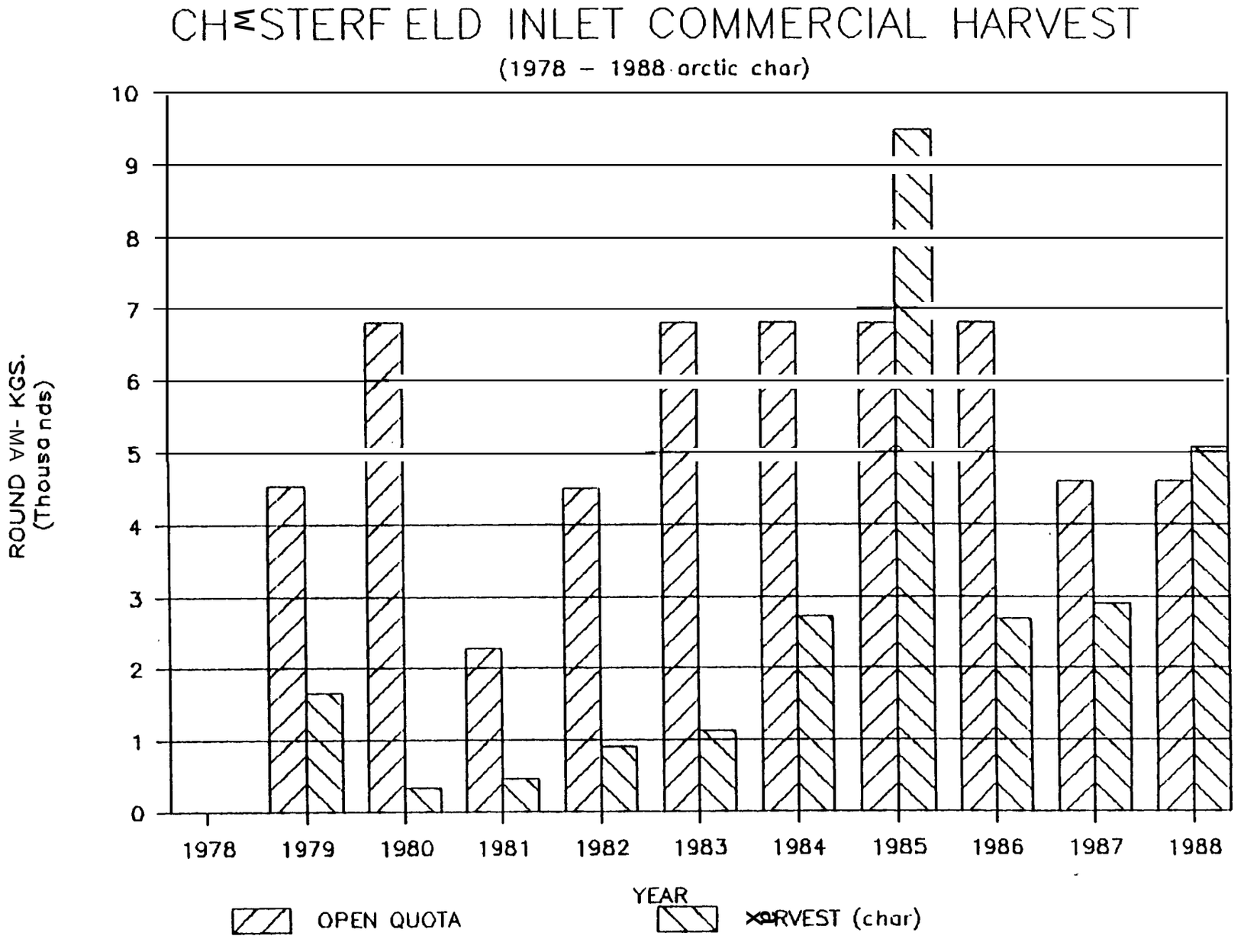
(1978 – 1988 whitefish & trout)

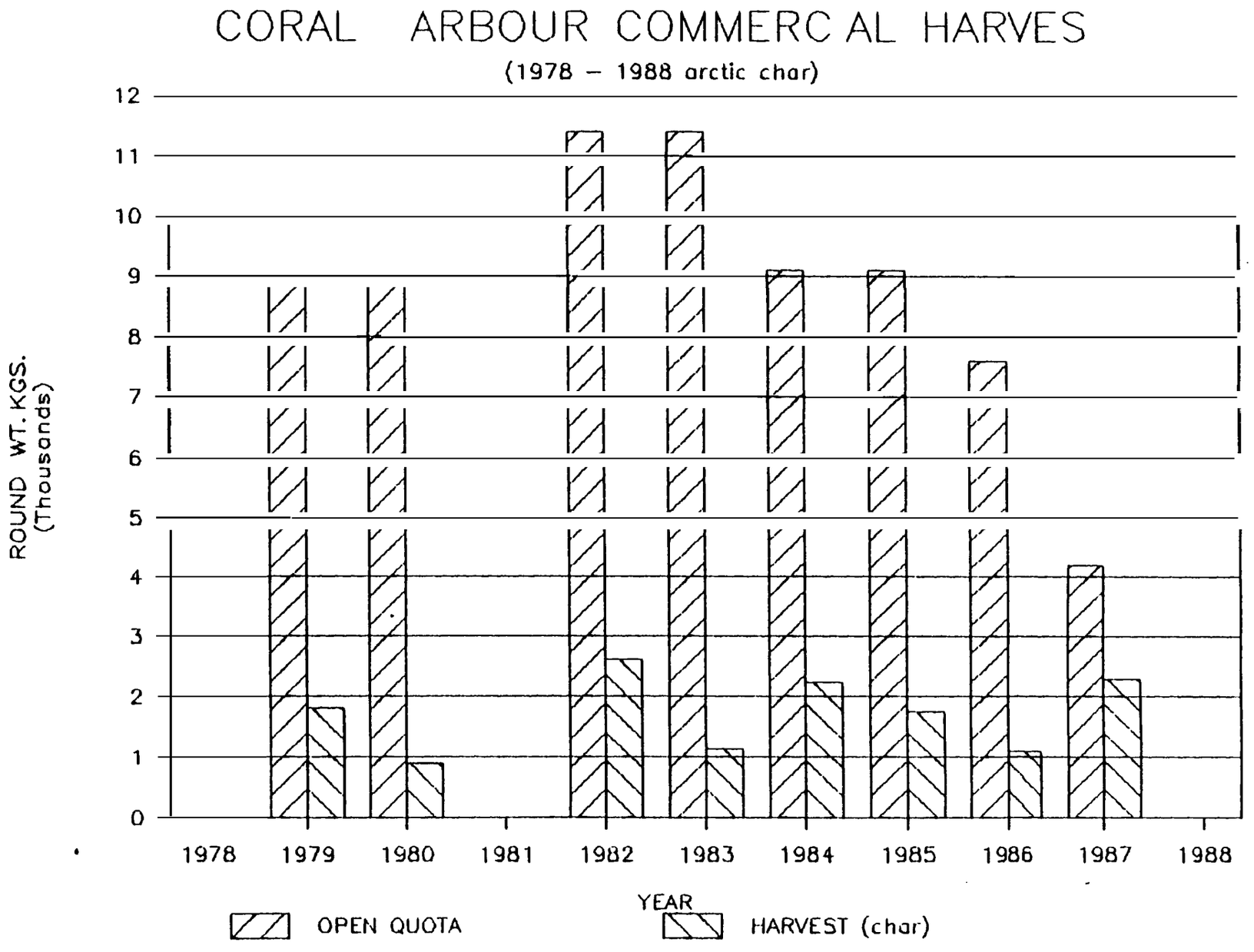


CHESTERFIELD/BAKER COMMERCIAL HARVEST

(1978 - 1988 arctic char)

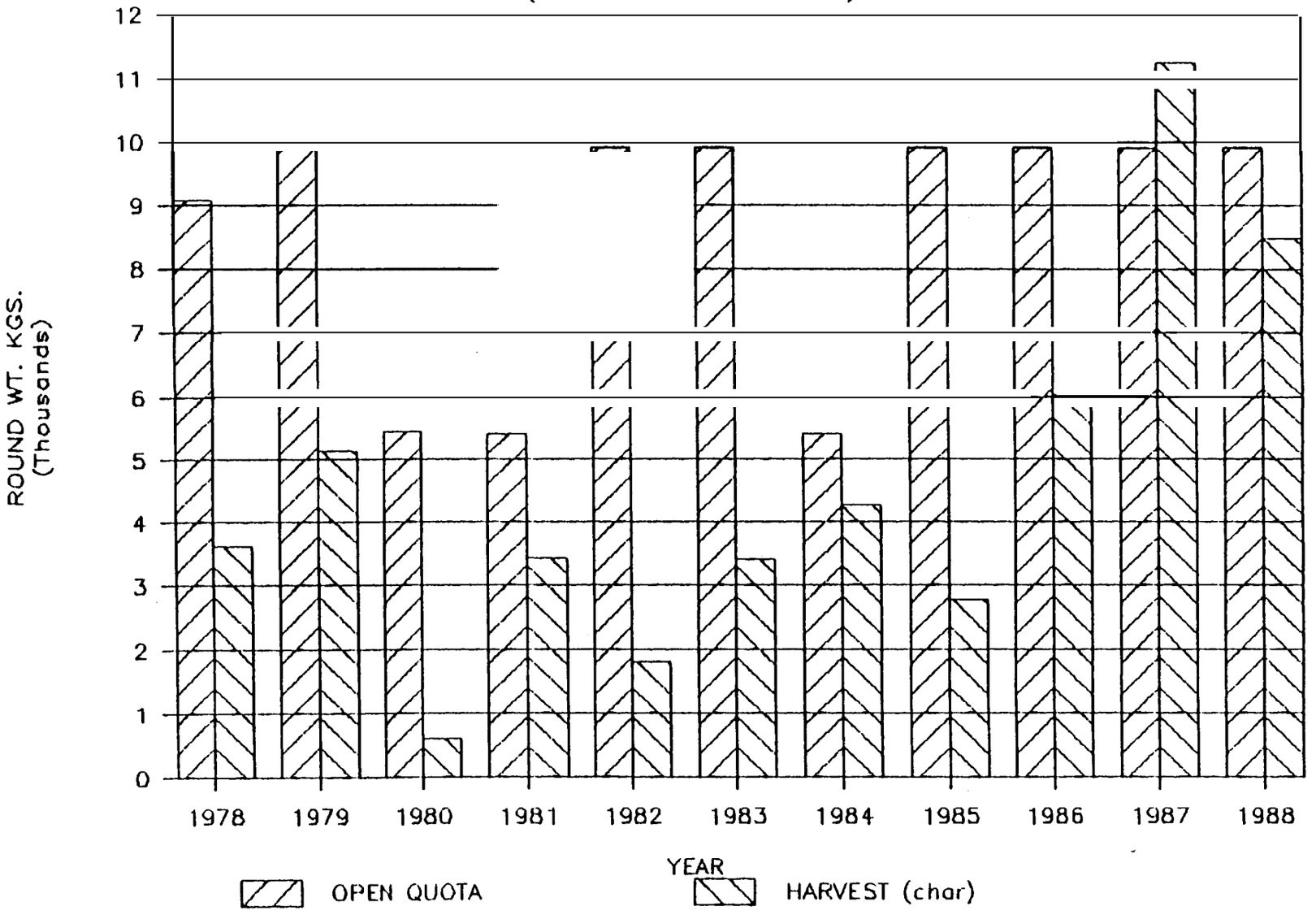


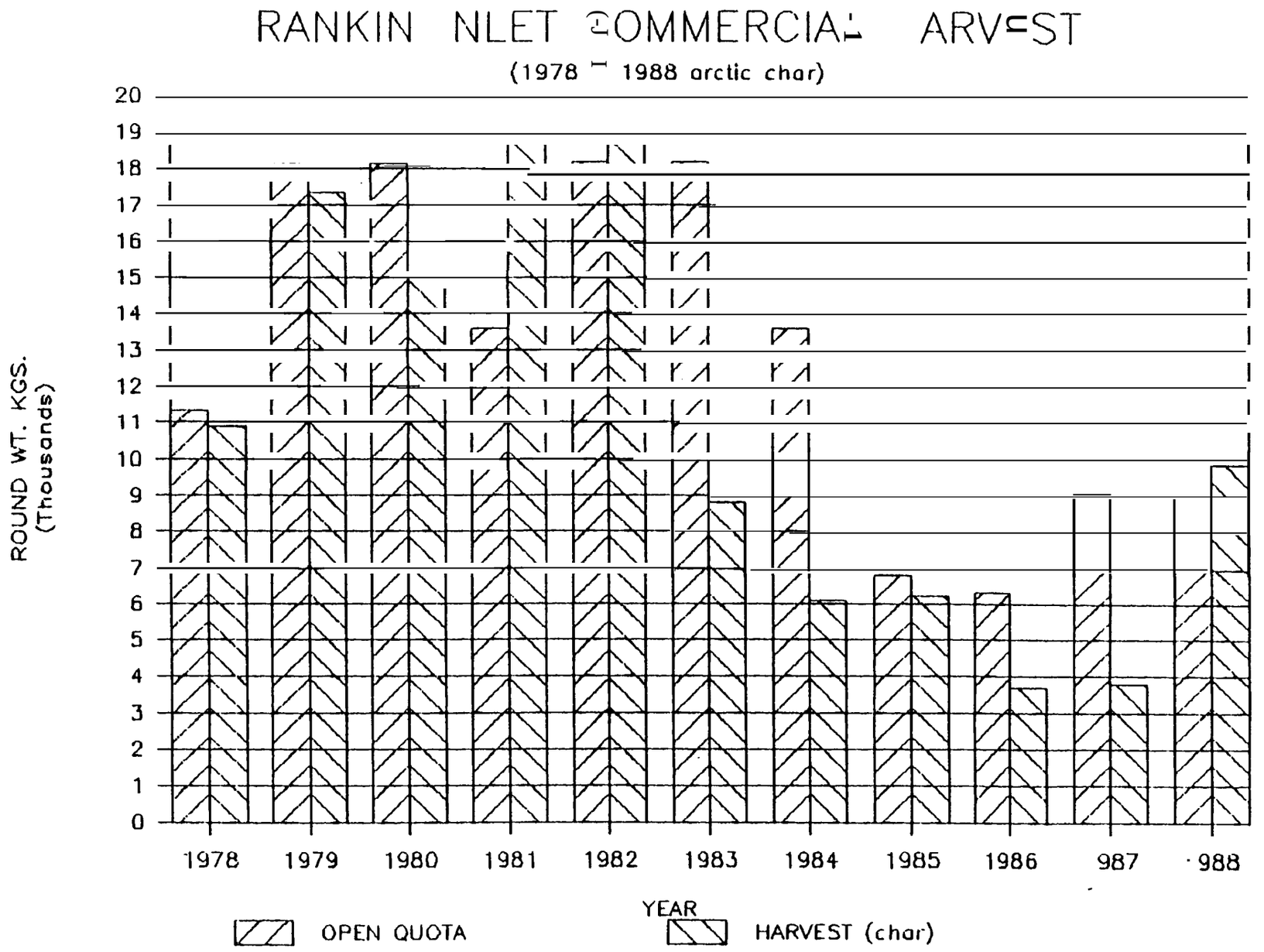

CHESTERFIELD INLET COMMERCIAL HARVEST
(1978 – 1988 arctic char)
ROUND WT- KGS.
(Thousands)
10
9
8
7
6
5
4
3
2
1
0
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
YEAR
OPEN QUOTA
HARVEST (char)

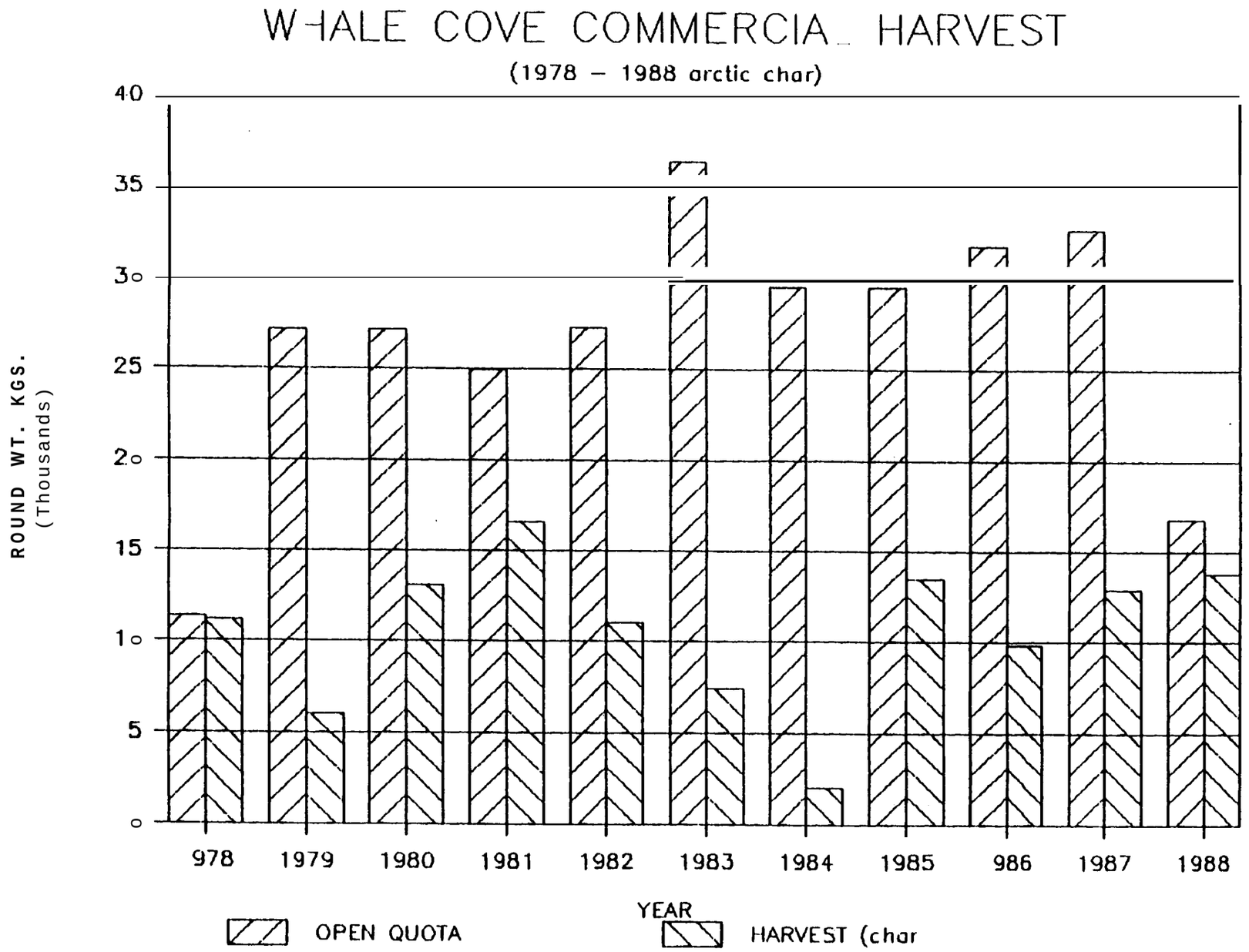

CORAL ARBOUR COMMERC AL HARVES
(1978 – 1988 arctic char)
ROUND WT. KGS.
(Thousands)
12
11
10
9
8
7
6
5
4
3
2
1
0
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
YEAR
OPEN QUOTA
HARVEST (char)

ESKIMO POINT COMMERCIAL HARVEST

(1978 - 1988 arctic char)




RANKIN NLET COMMERCIAL ARVEST
(1978 - 1988 arctic char)
ROUND WT. KGS.
(Thousands)
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
1978
1979
1980
1981
1982
1983
1984
1985
1986
987
988
YEAR
OPEN QUOTA
HARVEST (char)


WHALE COVE COMMERCIAL HARVEST
(1978 – 1988 arctic char)
ROUND WT. KGS.
(Thousands)
40
35
30
25
20
15
10
5
0
978
1979
1980
1981
1982
1983
1984
1985
986
1987
1988
YEAR
OPEN QUOTA
HARVEST (char

Appendix 2

Income Statements

Domestic/commercial Viability Analysis

FISHERY	f19k PROD. (in lbs. }	F19t SALES ($0.00)	GROSS/LB	Costs: Operating + Capital RKovery: SUPPLIES	FUEL	LICENSE FEE	PARTS REPAIRS b	NET REPLACE	CAPITAL RECOVERY	LONG TERM VIABILITY (capital recovery included): TOTAL COSTS	COSTS /LB	NET REVENUES	NET/LB	SHORT TERM VIABILITY (capital recovery excluded): TOTAL COSTS	COSTS /LB	NET REVENJES	NET/LB
Eskimo Point/Maguse	2?11.18	$388.89	$1.40	*$100.00*	$96.00	$10.00	$250.00	$200.00	$2,459.00	$3,115.(KJ	$11.21	($2,726.11)	($9.81)	$656.00	$2.36	($267.11)	($0.96)
Copperneedle River	756.17	$1,058.64	$1.40	$100.00	$338.00	$10.00	$250.00	$200.00	$2,459.00	$3,357.00	44.44	($2,298.36)	($3.04)	4s99.00	$1.19	$160.64	$0.21
Whale Cove	*1525.51*	*$1,90.3.25*	$1.30	$100.00	$1,000.00	$10.00	$300.00	$200.00	$2,459.00	$4,069.00	$2.67	($2,085.75)	($1.37)	$1,610.00	$1.06	$373.25	$0.24

Commercial Scale Viability Analysis

FISHERY	FISH PROD. (in lbs.)	FISH SALES ($0.00)	GROSS/LB	Costs: Operating + Capital Recovery: SUPPLIES	FUEL	LICENSE FEE	PARTS & REPAIRS	NET REPLACE	CAPITAL RECOVERY	LO& TERM VIABILITY (capital recovery included): TOTAL COSTS	COSTS /LB	NET REVENUES	NET/LB	SHORT TERM VIABILITY (Capital recovery excluded): TOTAL COSTS	COSTS /LB	NET REVENUES	NET/LB
Eskimo Point/Maguse	3306.88	$4,629.63	$11.40	$200.00	$480.00	$10.00	$500.00	$400.00	$3,644.00	$5,234.00	$1.58	($604.37)	($0.18)	$1,590.00	$0.48	$3,039. 63	$0.92
Copperneedle River	8500.00	$11,900.00	$1.40	$250.00	$1,885.00	$10.00	$750.00	$600.00	$3, 644.00	$7,139.00	$0.84	$4,761.00	$0.56	$3,495.00	$0.41	$8,405.00	$0.99
Whale cave	3747.80	$4,872.13	$1.30	$150.00	$1,000.00	$10.00	$400.00	$400.00	$3,644.00	$5,604.00	$1.50	($731.87)	($0.20)	$1,960.00	$0.52	$2,912.13	$0.78

Notes to Income Analysis

Average Eskimo Point/Maguse River Fisherman
68.3 Ibs. dsd.wt./trip
27.5 lbs. dsd.wt./net
4 trips/season
$24.00/trip fuel and oil expense
Capital Items and Costs: Canoe ($4000.00); 30 hp. Outboard ($3000.00);
3 Nets ($600.00)
Operating Life: Canoe – 6 years, Outboard – 3 years, Nets – 3 years
Financing Costs: 11.759?0

Average CopperneedIe River Fisherman
290.0 lbs. dsd.wt./trip
99.0 Ibs. dsd.wt./net
2.6 trips/season
$130.00/trip fuel and oil expense
Capital Items and Costs, Operating Life, and Financing costs as above

Average Whale Cove Fisherman
61.0 lbs. dsd.wt./trip
25.0 lbs. dsd.wt./net
25 trips/season
$40.00/trip fuel and oil expense
Capital Items and Costs, Operating Life, and Financing costs as above

Commercial-Scale Eskimo Point/Maguse River Fisherman
165.0 Ibs. dsd.wt./trip
27.5 lbs. dsd.wt./net
20 trips/season
$24.00/trip fuel and oil expense
nets lifted/trip increases from 2.5 to 6
trips/season increase from 4 to 20
supply costs increase from $100.00 to $200.00
parts and repairs costs increase from $250.00 to $500.00
net replacement costs increase from $200.00 to $400.00
Capital Items and Costs: Lake Winnipeg style yawl ($8500.00),
55 hp. motor ($4000.00),6 nets ($1200.00)

Operating Life: yawl – 10 years, outboard – 3 years, nets – 3 years
Financing Costs: 11.75%

Commercial-Scale Copperneedle River Fisherman
594.0 lbs. **dsd.wt./trip**
99.0 lbs. dsd.wt./net
14-15 trips/season
$130.00/trip fuel and oil expense
nets lifted/trip increases from 3 to 6
supply costs increase from $100.00 to $250.00
parts and repairs costs increase from $250.00 to $750.00
net replacement costs increase from $200.00 to $600.00
Capital Costs an Items, Operating Life, and Financing Costs as above

Commercial-Scale Whale Cove Fisherman
149.5 lbs. dsd.wt./trip
25.0 lbs. dsd.wt./net
25 trips/season
$40.00/trip fuel and oil expense
nets lifted/trip increases from 3 to 6
supply costs increase from $100.00 to $150.00
parts and repairs costs increase from $300.00 to $400.00
net replacement costs increase from $200.00 to $400.00
Capital Costs and Items, **Operating** Life, and Financing Costs as above

Appendix 3

Current & Future Infrastructure Cost Scenarios

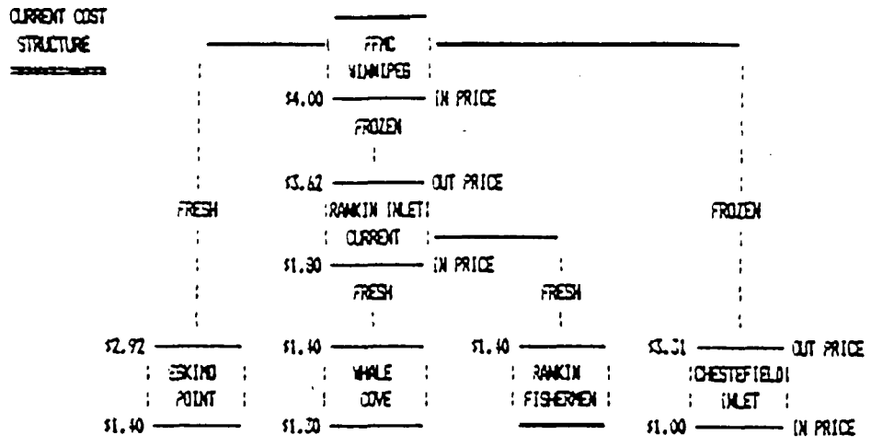
Infrastructure Sector Cost Scenarios: The chart on the following page presents three simplified cost structure scenarios to demonstrate the magnitude and extent of the opportunity that is believed to exist respecting the development of an integrated and cost effective infrastructure sector.

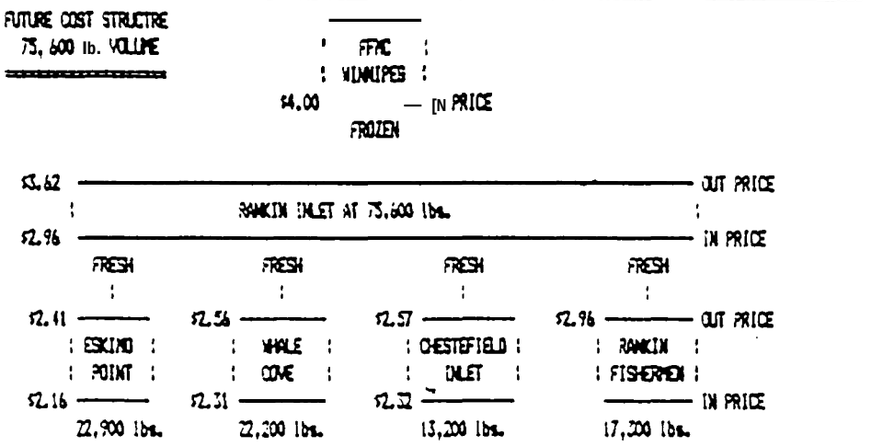
- **Current Cost Scenario:** In this cost structure scenario current in and out prices are identified by delivery point and product form based on 1988 prices to fishermen, a combined initial and final payment of $4.00/lb. FOB Winnipeg and transportation costs as identified in Table C-n (page 71).

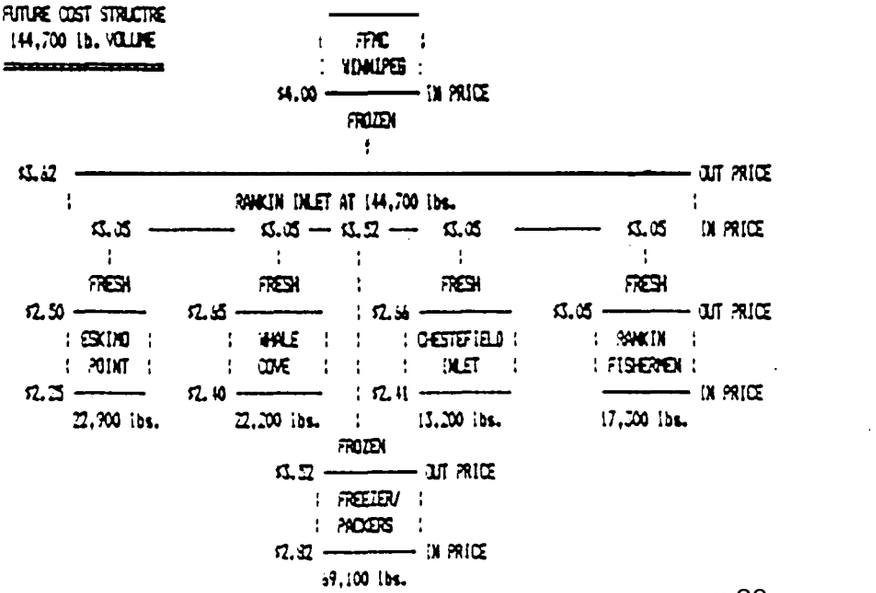
- **Future Cost Scenario, 75,600 lb. Harvest:** In this cost structure scenario projected in and out prices are identified by delivery point and product form based on a hamest volume as obtained through receiving station operations only with no remote Ferguson River and Chesterfield Inlet quota harvest and no participation by freezer/packer vessels; and

- **Future Cost Scenario, 144,700 lb. Hamest:** In this cost structure scenario projected in and out prices are identified by delivery point and product form based on a harvest volume as obtained through receiving station operations and the operation of freezer/packer vessels in the Ferguson River and Chesterfield Inlet areas.

Current & Future Cost Structure Scenarios







As a basis for projecting a future infrastructure sector operating cost environment, the following broad assumptions have been adopted:

A combined initial and final payment of $4.00/lb. FOB Winnipeg and , transportation costs as identified in Table C-n;

A $50,0005-week operating cost for the Rankin Inlet facility;

Operation of the Chesterfield Inlet plant in a receiving capacity only.

A receiving/packing cost of $.25/lb. for receiving stations in Eskimo Point, Whale Cove and Chesterfield Inlet;

A processing cost of $.70/lb. for freezer/packer operations; and

Delivery of a frozen product to FFMC in Winnipeg.