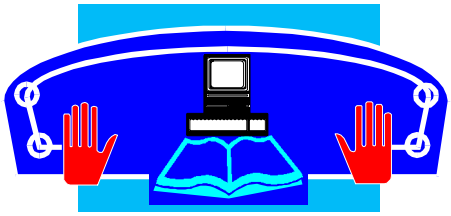

An Economic Analysis Of The 1987 Whale Cove Commercial Char Fishery

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FISHERIES

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AN ECONOMIC ANALYSIS OF THE 1987 WHALE COVE COMMERCIAL CHAR FISHERY

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AN ECONOMIC ANALYSIS OF THE 1987 WHALE COVE COMMERCIAL CHAR FISHERY

Lynda Yonge
March 1988

WHALE COVE FISHERY

During the summer of 1987 the community of Whale Cove ran a successful commercial char fishery. Twenty-two men and women harvested a total of 20,155 pounds of fish between the last week of July and the second week in September. The fish was all purchased by a local fish dealer and then sold to the Issatik Food Plant in Rankin Inlet. This report summarizes the economic performance of both the individual fishermen of Whale Cove and the local fish dealer, and examines the potential for future expansion of the commercial fishery in this community.

INDIVIDUAL FISHING OPERATIONS

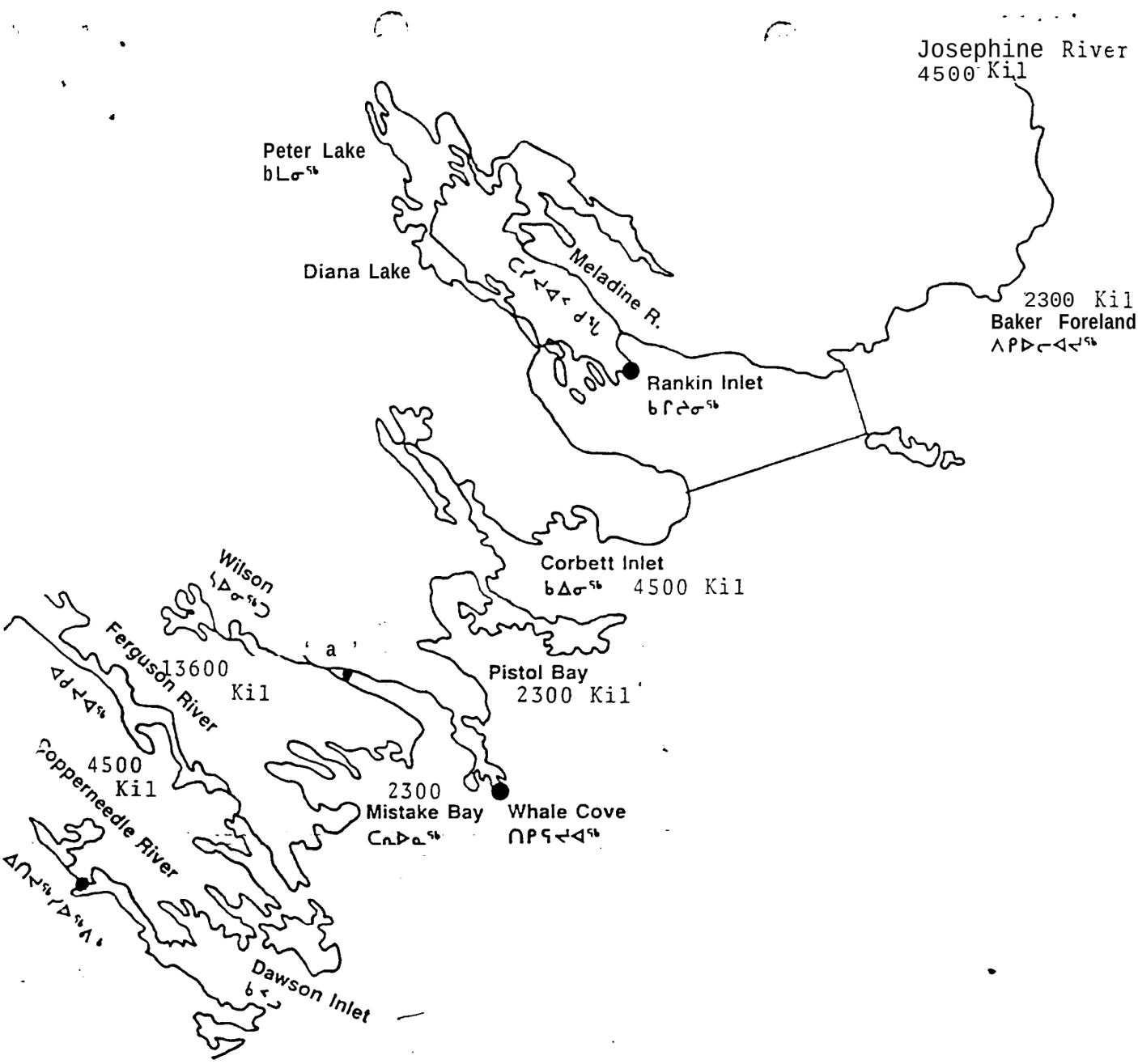
A wide variety of community members fished commercially in 1987. Young men and women, grandmothers, retired people, employed and unemployed workers, all participated to varying degrees. Fish were caught by setting gillnets and checking them at low tide, usually twice a day. Nets were left in place as long as sufficient amounts of fish were caught. When catches were small, they were moved to a more productive site.

Most of the fishermen used canoes equipped with outboard motors. Some of the smaller producers fished close to town, either walking to their nets or using a Honda ATC for transportation. This type of fishing is more or less an extension of the domestic fishery and involves very little capital investment and little or no expenses for fuel and food.

There are five commercial quotas available to the fishermen of Whale Cove. These are shown in Figure 1. Fish were harvested regularly from the Wilson River, Pistol Bay, Mistake Bay and Ferguson River quotas. Only one catch came from the Copper Needle quota. Catches from each quota are summarized in Table 1. Pistol Bay and Wilson River are the most easily accessible quotas and made up 75% of the total catch.

The fishermen of Whale Cove are self-employed and own their own equipment. They either fish alone, or accompanied by friends or relatives. Although the fisherman supplies food for everyone on a fishing trip, none of the fishermen paid hired labour. There are seine husband and wife teams where the wife fishes close to town using a Honda ATC to bring in her catch and the husband uses a beat and motor to set nets farther away. The total catch is recorded under one licence.

Of the 22 active fishermen in Whale Cove, information was gathered from 14 people (including two husband and wife teams fishing on the same licence) through a questionnaire, interviews, and a public meeting. This represents 55% of the licensed fishermen and 80% of the total catch for 1987.



Keewatin Major River Systems
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Rankin Inlet/Whale Cove Areas
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TABLE 1 WHALE COVE FISH HARVESTS - SUMMER 1987

River System	Date	Harvest (lbs)	Total Quota Dressed (lbs)
Wilson River	July 31	738	
	August ?	1076	
	August 14	757	
	August 21	1830	
	August 28	2272	
	Sept 4	3330	
	Sept 11	643	
Total		10646	17409
Copper Needle	July 31	623	8609
Mistake Bay	August 7	355	
	August 14	20	
	August 21	278	
	September	106	
Total		759	4400
Ferguson	August 7	752	
	August 14	209	
	August 21	387	
	August 28	1059	
	September	1215	
Total		3622	26017
Pistol Bay	July 31	252	
	August 7	346	
	August 14	268	
	August 21	590	
	August 28	1655	
	Sept 4	1394	
Total		4505	4400
TOTAL		20155	60834

FISHING COSTS

The major costs incurred by commercial fishermen can be divided into two categories, the fixed capital expenses for boat, motor, and gill nets, and the variable and semi-variable costs associated with each trip - gas and oil for the outboard motor, maintenance and repairs on the boat and motor, and food and supplies. None of the fishermen took a wage or paid out wages for fishing.

CAPITAL INVESTMENT

The major capital investments required to participate in commercial fishing are a boat and meter, and a number of gillnets. The fishermen in Whale Cove use canvas covered wooden canoes ranging in length from 20 to 24 feet, with the most common being 22 feet long. The average cost of a canoe is approximately $3,000.00, although the prices paid ranged from $400.00 for a used canoe, up to $5000.00. The expected operating life of these canoes averaged 6 years.

The motors used range in size from 20 to 65 horse power, the most common falling between 25 - 30 hp. The cost of these motors ranges from $700.00 to $4300.00, with the average cost being approximately S3000.00. Maters are expected to last an average of 5 years, although they may require extensive repairs each season. The average capital investment for a beat and mater was approximately $5500.00.

Fish are caught using 50 yard gill nets with 5 1/2 inch " mesh. The number of nets used ranges from 2 to 7, with an average of 4 nets set for each fisherman. Fish net prices range from $130.00 to $278.00 and the average investment in nets is approximately $760.00. Most people reported that 6 or more nets is the optimum number for one person to use for commercial fishing, but the high cost of nets limited their purchase and therefore limited the potential catch. Based on the number of nets used by each fisherman and their average catch per trip, the average catch per net per trip was about 25 pounds.

The average total capital investment for a Whale Cove fisherman amounts to approximately S6,300.00. Capital investment by Whale Cove fishermen is summarized in Table 2. Fishermen must also purchase a $10.00 licence for each quota that they Want to fish, and miscellaneous supplies such as paddles, ropes, knives etc . averaging about S100.00 per season.

Most people reported that their equipment was purchased specifically for commercial fishing, however it is also used for domestic fishing and hunting. One individual received government

.BLE 2 CAPITAL INVESTMENT

	BOAT COST	MOTOR COST	NO OF NETS	COST OF NETS	TOTAL INVESTMENT
	$400 .00	$2,750.00	3	$700.00	$3,850.00
	$4 .600.00	$3,500.00	5	$1,000.00	$9,100.00
	$2,995.00	$3,550.00	2	$400.00	$6,945.00
	$3,800.00	$4.000.00	4	$1,000.00	5S,800,00
	$4,995.00	$3,000.00	2	$400.00	$8,395.00
	$2,400,00	$3,500.00	3	$825.00	$7,725.00
	$2,900.00	$1,200.00	6	$1,200.00	$5,300.00
	$1,800.00	$700.00	7	$1,330.00	$3,830.00
		$4,299.00	3	S525.00	$4,824.00
	$1,000.00	$2,600.00	2	$400.00	$4,000.00
	$3,000.00	$3,000.00	5	$650.00	$6,650.00
AVERAGE	$2,889.00	$2,918.09	4	$766.36	S6,310.82
MAXIMUM	$4,995.00	$4,299.00	7	$1,330.00	$9,100.00
MINUMUM	$400.00	$700.00	2	$400.00	$3,830.00

assistance in the form of a tourism grant, to purchase equipment. All others bought their equipment without government assistance.

Very little information was collected on the costs and use of Honda ATCs for fishing, however it appears that these vehicles were not purchased specifically for commercial fishing. Hondas are used mainly when the wind is too strong to take out a canoe, by very small producers, or for fishing that supplements fishing by canoe.

VARIABLE COSTS

Variable costs are those costs that vary with the amount of fishing effort, increasing as fishing effort increases. The major variable cost for fishermen in Whale Cove is the cost of gas and oil for their outboard motors.

Most fishermen set their nets within 5 - 10 miles of Whale Cove and their daily gas use averages between 10 and 15 gallons, costing $30 - $45.00 a trip. Some of the larger producers have more nets, and make at least two trips to their nets each day. Their daily gas costs during the busiest portion of the season ranged as high as $120.00 for 40 gallons of gas. Those fishing the more distant quotas, (Ferguson River, Copper Needle, Mistake Bay) also had higher gas costs. Gas costs are summarized in Table 3. Those who used Hondas for fishing set their nets within 5 miles of town so gas consumption was under 5 gallons ($15.00) per trip.

Since most fishermen travelled between their nets and Whale Cove during the day, rather than spending the entire day away from town, meals do not have to be taken away from home. Therefore food costs have not been included in calculating fishing costs. Some of the larger producers spend the entire day away from the town, traveling between their nets, and between their nets and Whale Cove. Average food costs for these fishermen was $34 .00 a day.

Maintenance and repair costs varied a great deal, ranging from 0 to $1500.00. The most commonly required repairs were the replacement of the bottom unit of the motor, props and gears, and the repair of holes in the canoe. Motor repair costs ranged from $500.00 to $1500.00. General maintenance and painting for the canoes averaged $100.00 for the season.

Each fisherman also loses one or two nets due to whale damage each season. These nets must be replaced, adding between $200.00 and $400.00 to seasonal costs. Variable and semi-variable costs for each fisherman are summarized in Table 4.

TABLE 3 FUEL AND OIL COSTS

Fisherman	Costs/Trip	Trips/Season	Season
1	$60.00	36	$1,860.00
2	$30.00	20	$570.00
3	$15.00	42	$990.00
4	$60.00	30	
5		28	
6	$45.00	14	$429.00
7		12	
8	$30.00	15	$390.00
9		21	
10		10	$650.00
11		15	
12	$40.00	12	$556.00
13		8	
14		10	
15	$53.00	4	$318.00
16		3	
17		3	
18		2	
19		3	
20	$40.00	1	$50.00
21	$35.00	1	$35.00
22		1	
AVERAGE	$40.80	13	$584.80
MAXIMUM	$60.00	42	$1,860.00

TABLE 4 VARIABLE AND SEMI-VARIABLE COSTS

Fisherman	Gas Cost/ Trip	Food Cost/ Trip	Repairs/ Season	Nets Replaced/ Season
1	130/wk	700/wk	$100.00	1
2	$30.00	$60.00	$90.00	1
3	$115.00			
4	$33.00	$24.00	$0.00	1
5				
6				
7	$60.00	$40.00	$1,000.00	2
8				
9	$50.00	$30.00	$50.00	0
10	$39.00	$30.00	$1,500.00	2
11	$35.00	$25.00	$0.00	2
12	$53.00	$30.00	$500.00	2
13				
14				
15	$30.00		$0.00	0
16	$30.00	$30.00	$0.00	1
17				
18				
19				
20				
21	$30.00	$40.00	$0.00	2
22				
Average	$45.91	-$34-.33	$314.00	1
Maximum	$115.00	$60.00	$1,500.00	2
Minimum	$30.00	$24.00	$0.00	0

INCOME

Fish were sold to the local fish dealer for $1.00 a pound. Weekly catches ranged from 37 pounds to 598 pounds, providing an average income of $213.00 per week. Total seasonal income before costs ranged from $37.00 to $3554.00 with an average of $916.00.

The degree of participation in the fishery ranged from full-time fishermen that made over 40 trips during the season, to those that made only 1 or 2 trips. In order to determine the level of income that can be expected from full-time participation in commercial fishing, the following analysis includes only those fishermen who made more than 10 trips during the season and who harvested mere than 500 pounds. This represents 55% of the people fishing in Whale Cove and 91% of the total catch.

ECONOMIC PERFORMANCE

In order for fishing to be economically viable as a business, fishermen must be able to cover their costs with the money earned from fish sales. Short-term viability requires that at least operating costs, those costs associated with each fishing trip, are covered.

One method of estimating short-term viability is to calculate net revenue, the difference between the gross income earned from fish sales and the fixed and variable costs involved in commercial fishing. Those fishermen with a positive net revenue are able to cover their immediate costs.

During 1987 fish sales were recorded on a weekly basis. Costs, however, were estimated on a per trip basis. Therefore an estimate of the number of fishing trips made per week by each fisherman was required to determine a per trip income value. This was arrived at by calculating each fisherman's average catch per trip during the 1986 season (when records were kept daily), and roughly dividing this average into the 1987 weekly catch It was assumed that there were no significant differences between average catches in 1986 and 1987 . Individual averages were used when an individual fished during both seasons. For those that did not fish during the 1986 season, a composite average of 60 pounds per trip was used. The average catch per trip in 1987 was $61.00 before costs.

Incomes after covering variable costs are summarized in Table 5 for the entire Whale Cove fishery and in Table 6 for full-time fishermen harvesting over 500 pounds, on both a per trip and seasonal basis. The only costs included in these tables are daily fuel and oil costs. Incomes after fuel costs for full-time fishermen ranged from $2418 to a loss of $36.00. Only one

TABLE 5 NET INCOME FOR WHALE COVE FISHERMEN

	Avg Catch trip ($)	Avg cost Trip ($)	Net Income Trip ($)	Trips/ season	Total Catch Season ($)	Gas cost/ Season ($)	Net Income/ Season ($)
1	99	60	39	36	3554	1860	1694
2	149	30	119	20	2988	570	2418
3	62	15	47	42	2590	990	1600
4	74	60	14	30"	2220		
5	58			28	1614		
6	70	45	25	14	973	429	544
7	78			12	934		
8	61	30	31	15	911	390	521
9	36			21	759		
10	61			10	614	650	-36
11	39			15	580		
12	47	40	7	12	568	556	12
13	54			8	430		
14	40			10	397		
15	93	53	40	4	373	318	55
16	49			3	147		
17	48			3	145		
18	53			2	106		
19	35			3	104		
20	66	40	26	1	66	50	16
21	45	35	10	1	45	35	10
22	37			1	37		
AVERAGE	61	41	36	13	916	585	683
MAXIMUM	149	60	119	42	3554	1860	2418
MINIMUM	35	15	7	1	37	35	-36

TABLE 6 NET INCOMES FOR FULL-TIME FISHERMEN

	Avg Catch trip ($)	Avg cost Trip ($)	Net Profit/ Trip (s)	Trips/ Season	Total Catch Season ($)	Gas Cost/ Season (s:	Net Income/ Season ($)
1	99	60	39	36	3554	1860	1694
2	149	30	119	20	2988	570	2418
3	62	15	47	42	2590	990	1600
4	74	60	14	30	2220		
5	58			28	1614		
6	70	45	25	14	973	429	544
7	78			12	934		
8	61	30	31	15	911	390	521
9	36			21	759		
10	61			10	614	650	-36
11	39			15	580		
12	47	40	7	12	568	556	12
AVERAGE	69	40	40	21	1525	778	965
MAXIMUM	149	60	119	42	3554	1860	2418
MINIMUM	36	15	7	10	568	390	-36

person interviewed sustained a loss during the 1987 season, and he reported fishing primarily for domestic consumption and selling any surplus, rather than concentrating on the commercial catch. The average full-time income after covering variable production costs was approximately $965.00

In order for fishing to be viable in the short run, the fisherman must also be able to cover fixed and semi-variable costs, including fishing licenses, repairs, replacement of lost or badly damaged nets and miscellaneous supplies. If an average value of $200.00 for net replacement and $100.00 for miscellaneous supplies are included, average net income drops to $565.00. This level of income is high enough to cover minor repairs to boat and motor, but will not cover major motor repairs. Some fishermen reported that their motors required $1000 - $1500.00 worth of repairs as a result of the fishing season. These people would be unable to cover their repair costs from their fishing income alone.

In order for fishing to be economically viable as a business over the long-run, enough profit must be made to cover both the fixed and variable operating costs, and the replacement cost of any capital assets. To determine the ability of Whale Cove fishermen to cover these costs, a breakeven analysis and return to investment analysis were performed. See Tables 7 and 8.

The breakeven analysis was based on the current price of $1.00 for fish, an average fuel cost of $40.00 a trip, and an average catch of $61.00 per trip. Depreciation was based on the Canadian Depreciation Guide for Farmers and Fishermen[1]. At the current average level of harvest and investment, a fisherman would have to catch 1623 pounds of fish in order to cover his costs. The top two producers in 1987 were able to exceed this level of harvest, so it is realistic to suppose that a single fishermen will be able to harvest this much fish.

The return to investment analysis indicates that the net present value of the income from commercial fishing is not sufficient to cover the cost of investment in boats, motors and nets over the 5 year lifespan of this equipment and provide a rate of return that would be acceptable in a normal business operation. However, this analysis assumes that the equipment purchased is used only for commercial fishing. In reality, the equipment purchased for commercial fishing is also used for other purposes including domestic fishing, hunting and recreation. If these activities were included, the analysis would look more positive.

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[1] C C H Canadian Ltd., Canadian Depreciation Guide 1984 Edition.

TABLE 7 BREAK EVEN ANALYSIS

UNIT SALES PRICE	1.00
UNIT COST	
Gas and oil	0.51
Total	
UNIT CONTRIBUTION MARGIN	0.49
FIXED COSTS	
Repairs	300.00
Licence	10.00
Nets and Supplies	300.00
Motor Deprec .	450.00
Canoe Deprec.	225.00
Total	1285.00
BREAKEVEN VOLUME	?623.33

TABLE 8
RETURN TO INVESTMENT

Net Cash Inflow			
Income			
Fish Sales		sl,500.00-	
Costs			
Gas and oil		S778.00	
Repairs		$320.00	
Nets and supplies		$300.00	
Total		$1,398.00	
Net Cash Inflow		$102.00	
Net Present Value - 5 year investment			
Cash Flow		@10%	@15%
S102.OC		$63.34	$50.69
Less Investment		$6,300.00	S6,300.00
Net Present Value		($6, 236 .66)	(S6,24S.31)

TABLE 9 HYPOTHETICAL FISHERMAN INCOME AND COSTS

CAPITAL INVESTMENT

BOAT	$3,000.00
MOTOR	$3,000.00
NETS	$1,200.00
TOTAL	$7,200.00

FIXED AND VARIABLE COSTS

FUEL (20 TRIPS)	$800.00
REPAIRS	$320.00
NET REPLACEMENT	$400.00
SUPPLIES	$100.00
TOTAL	$1,620.00

INCOME

GROSS	$3,000.00
AFTER FUEL	$2,200.00
AFTER COSTS	$1,380.00

One of themost frequent comments made during the interviews was that fishing would be more profitable if more nets were available, but the high costs of purchasing them limited use. If a full-time fisherman was able to use 6 nets for fishing, with an average catch of 25 pounds per net, and made 20 trips during the season, he could harvest 3000 pounds of fish. Using average values for full-time fishermen, the income from this hypothetical fisherman is summarized in Tables 9, 10 and 11.

Using 6 nets, the income after covering fuel costs increases to $2200.00 and after covering all fixed costs, increases to $1380.00. The $320.00 value used for repair costs is the average of the amount reported for repairs and maintenance during the 1987 season. At this level of income, those with high repair costs will be able to cover them using income from fish sales.

The breakeven analysis indicates that fishermen will need to harvest 2039 pounds cf fish to cover costs. During the 1987 season several fishermen exceeded this level of harvest, using fewer nets, so there should be no problem for a fisherman with 6 nets to reach this volume of catch.

The return to investment analysis shows that even at this level of harvest, a fisherman is still not able to make a return on his investment for equipment that would be acceptable in a normal business operation. At both the 10 and 15% rates of return, the net present value of the investment is negative.

COUNTRY FOOD HARVEST

In addition to the fish that was caught and sold, fishermen reported taking some fish for their personal use, to feed themselves, their families and their dogs. An estimate of the replacement value of these fish ($2.00/lb, assuming 5 lbs/fish) increases the total value of the fishery by approximately $1800.00. The major fishermen reported taking only a very few fish for domestic use (often those that were already dead in the nets, or for some reason would be rejected by the fish purchaser) as they were more concerned with earning a cash income from their effort. The bulk of their domestic harvest takes place in the spring when the ice breaks up, before the commercial season begins .

Many of the fishermen also reported being able to hunt while they were out fishing, taking whales, seals and caribou. Fishermen reported taking a total of 23 whales, 38 seals and 27 caribou while fishing. During the summer of 1987 the Whale Cove Co-op purchased Beluga muktuk for $0.85 a pound. Using this as a measure of value, the whales taken by fishermen represent a further $2300.00 in total income from the fishery. The seals and caribou were used for domestic consumption. Replacement value for these, based on substitution value, falls somewhere between

TABLE 10 BREAKEVEN ANALYSIS - HYPOTHETICAL FISHERMAN

UNIT SALES PRICE	$1.00
UNIT COST	
Fuel	$0.27
UNIT CONTRIBUTION MARGIN	$0.73
FIXED COSTS	
Repairs	$320.00
Net Replacement	$400.00
Supplies	$100.00
Motor Deprec.	$450.00
canoe Deprec.	$225.00
TOTAL	$1,495.00
BREAKEVEN VOLUME	2039

TABLE 11 RETURN TO INVESTMENT - HYPOTHETICAL FISHERMAN

NET CASH INFLOW

INCOME	
Fish Sales	$3,000.00
COSTS	
Fuel (20 Trips)	$800.00
Repairs	$320.00
Net Replacement	$400.00
supplies	$100.00
TOTAL	$1,620.00
NET CASH INFLOW	$1,380.00

NET PRESENT VALUE - 5 YEAR INVESTMENT

Cash Flow	@10%	@15%
S1,380.00	$5,231.58	.$4,625.76
Less Investment	$7,200.00	$7,200.00
Net Present Value	($1,968.42)	($2,574.24)

$4.25/kg (based on the price of hamburger) and $25.00/kg (based on the price of steak) using average Rankin Inlet prices.

FUTURE EXPANSION

Of all of the quotas available to Whale cove, only the Pistol Bay quota. was fully harvested. The other quota easily accessible to the community, Wilson River, had an additional 6763 pounds that could have been harvested. This volume of fish could support 4.5 full-time fishermen at the present average seasonal catchor several more part-time fishermen..

The other three quotas, Copper Needle, Mistake Bay and Ferguson River, were only minimally harvested, with just 13% of the available quota taken. The unexploited portions of these quotas adds up to 34,021 pounds, which could support 23 more full-time fishermen. However these quotas are difficult to access. Their distance from Whale Cove increases the costs of fuel and food supplies and, more importantly, the uncertainty of the weather makes fishing in these areas very risky. Changes in the weather can make it both dangerous and difficult to return to Whale Cove while the fish are still fresh enough to sell. The small canoes used by the Whale Cove fishermen are just not made for this type of travel.

It has been suggested by several members of the community " that a collector boat could "make the harvest of these quotas more practical, taking the responsibility for fish delivery out of the hands of the individual fishermen.

The other major impediment to participation in the commercial fishery is the high cost of initial investment. 1" was told repeatedly that there are many people in Whale Cove that are good fishermen and are interested in fishing commercially, but the cost of a boat and motor are beyond their financial abilities. The high cost of nets is also an impediment to fishing productivity. Most people interviewed indicated that they would like to use more nets to fish with and the analysis indicates that a higher number of nets increases the income from the commercial fishery to the point where all costs can be covered.

All of those interviewed felt that commercial fishing was worthwhile for the added income that it provided. 36% of the people interviewed had either another part-time or full-time job. The others were unemployed or retired, with commercial fishing as their major source of earned income.

WHALE COVE FISH DEALER OPERATIONS

1987 OPERATION

During the 1987 summer fishing season, commercial char caught in Whale Cove was sold to a local fish dealer, Lewis Voisey, for $1.00 a pound. Lewis purchased 17,565 pounds of fish and caught an additional 2,590 pounds of char on his own fishing license. All of this fish was sold to the fish plant in Rankin Inlet for $1.39 a pound, resulting in a total sales income of $29,434 .60 for the season.

The production costs in this operation included electrical and water charges to run the community ice machine and freezer, gas used in transporting the fish, and freight charges for transporting the fish to the Whale Cove airport. Freight charges were calculated at 8 cents a pound resulting in a total freight cost of $2645.84 for the season. Fifty percent of this freight cost ($1,322.92) was recovered through the Government of the NWT Assistance to Commercial Fishermen Policy Freight Subsidy. Total net earnings for the seven-week season were $8264.70. An Interim Income Statement for his 1987 operation is shown in Table 12.

A break even analysis was performed for the fish dealer's 1987 operation and the results are summarized in Table 13. At the present level of operation, Lewis Voisey must sell 4,769 pounds of fish at $1.39 a pound, to cover all of his costs. His current volume of sales is well above this level, leaving him with a healthy income.

FUTURE EXPANSION

During the 1987 season, only the Pistol Bay quota was completely harvestd. None of the other commercial quotas available to Whale Cove were fully exploited. Based on the growth seen in the commercial fishery over the last two years, and the interest shown by members of the community in commercial fishing, it is expected that the fishery will continue to grow. The fish dealer wish.ss to expand his operations over the next three to four years by increasing the amount of fish purchased from local fishermen and by capturing the Ferguson River quota with the help of hired fishermen. For the sake of simplicity, the growth from increased fish purchases and the Ferguson River quota components of the operation will be considered separately.

LOCALLY PURCHASED FISH

The projections for increased fish purchases in 1988 assume that the two quotas nearest to Whale cove, Wilson River and Pistol Bay, will be completely taken, half of the Mistake Bay and Copper Needle quotas will be captured, and all of this fish will

TABLE 12

INTERIM INCOME STATEMENT: WHALE COVE FISHERIES, SUMMER PERIOD
JULY, AUGUST, SEPTEMBER 1987

RECEIPTS	
Fish Sales	$29,434.60
Freight Allowance	$1,322.92
TCTAL	$30,757.52
DISBURSEMENTS	
Fish Purchases	$17,565.00
Electrical Hock-up	$200.00
Freight	$2,645.84
Telephone	$70.00
Business Licence	.$25,00
Water	S36.44
Gas Purchases	S259.64
Insurance	$612.00
N.C.P.C	$1,078.90
TOTAL	$22,492.82
NET EARNINGS	$8,264.70

TABLE 13

BR EAKEVEN ANALYSIS : PRESENT WHALE COVE OPERATIONS
JULY . A UGUST , SE PTEMBER 1987

UNIT SALES PRICE	$1 .43
UNIT COST:	
Fish Purchases	$0 .87
Freight	$0.08
TOTAL	SO .95
UNIT CONTRIBUTION MARGIN	.$0.48
FIXED COSTS:	
Telephone	$70.00
Business Licence	$25.00
Water	s36.44
Gas purchases	$259.64
Insurance	$612.00
N.C.P.C	$1,078.90
Electrical Hook-up	$200.00
TOTAL	$2,281.98
BREAKEVEN VOLUME	4769

be purchased by Lewis Voisey. Projections for increased fish purchases in 1989 and 1990 assume that the complete quota will be harvested in the Wilson River, Mistake Bay and Pistol Bay systems, and that half of the Copper Needle quota will be taken. Table 14 summarizes these increases.

The total expansion represents a 65% increase in the amount of fish caught. Quotas to allow this increase are presently available and unexploited. If the average catch per season in Whale Cove remains at the current level, this 65% increase could be achieved if 7 new full-time fishermen entered the industry. It could also be achieved by a combination of new fishermen entering the industry, more nets being used by those already fishing and a higher level of participation by some of the smaller producers . Given the interest shown in the commercial fishery by the members of the Whale Cove community, it should not be difficult to meet this increased harvest.

The purchased fish would all be sold to the Rankin Inlet fish plant, or, in the event that the Rankin Inlet plant is not operating, to the Chesterfield Inlet fish plant. Projected costs for fish purchases and projected income from fish sales are based on the present values of $1.00 a pound and S1.39 a pound respectively.

FERGUSON RIVER

Lewis Voisey hopes to capture the Ferguson River quota using hired fishermen and a collector boat. The fishermen would stay in a camp on the Ferguson River fishing grounds and fish for a daily wage. Lewis would use his beat as a collector boat, traveling between Whale Cove and the Ferguson River every second day to pick up fish, pack it on ice, and transport it to Whale Cove . In order to get this operation going, $30,000.00 worth of repairs must be done on the boat's engine.

Projections for the Ferguson River portion of the operation are based on the assumption that 10,000 pounds will be taken from this quota during 1988, using a hired labour force of 6 people. Projected costs for labour are based on a wage of $8.00 an hour for a 40 hour week and a 6 week season, with appropriate contributions to Unemployment Insurance and Worker's Compensation Board. Food costs were calculated at the rate of $20 a day per person for a 7 day week and a 6 week season. Twenty-four nets would be needed, at a cost of $200.00 each. The cost of these nets has been considered part of the initial investment for this operation, however replacement of nets, and subsequent increases in the number of nets used during 1989 and 1990 have been listed under annual disbursements.

Further expansion in the Ferguson River operation for 1989 would be achieved by employing 2 additional fishermen to harvest

TABLE 14 PROJECTED WHALE COVE HARVESTS

QUOTA	1987	1988	1989	1990	QUOTA AVAILABLE
WILSON RIVER	9548	17409	17409	17409	17409
COPPEP. NEEDLE	623	4000	4000	4000	8809
MISTAKE BAY	759	2200	4400	4400	4400
FERGUSON RIVER	3622	10000	15000	20000	26017
PISTOL BAY	3915	4400	4400	4400	4400
TOTAL	18467	38009	45209	50209	60835

15,000 pounds of fish. In 1990 the work week of the 8 fishermen would be increased to 50 hours a week to harvest 20,000 pounds of fish. These increases will require an investment in eight additional nets each year, and replacement of an average of 6 nets a season.

Fuel and oil costs for the collector boat were estimated to be $2.50 a gallon. Based on an 80 mile return trip between Whale Cove and the Ferguson River every other day, the cost of running the boat for the season would be approximately $5,880.00. This was added to the costs of transporting fish by truck to the airport to arrive at total fuel costs for each season. Fuel costs will increase each year as the increased volume of fish being transported will require more trips to the airport. Depreciation on the truck used for transporting the fish, the collector vessel and engine were calculated using the Canadian Depreciation Guide[1]

Lewis hopes to sell the fish taken from the Ferguson River fresh to the Freshwater Fish Marketing Corporation (FFMC) in Winnipeg. FFMC has been contacted and they are willing to purchase the fresh fish as long as it meets the freshness standards. The present price paid for fresh char is $4.00 a pound. Air freight charges to Winnipeg were calculated to be 74 cents a pound, 50% of which can be recovered through the GNWT freight subsidy. The gross income from the sale of fresh fish from the Ferguson River would therefore amount to $43,700 in 1988, $65,550 in 1989 and $87,400 in 1990.

This would be the first time that a local dealer attempted this type of fresh fish operation in the region and it does involve some risk. In order for fish to be accepted fresh by FFMC it must arrive within a very few days of harvest. Problems with weather and/or transportation may make it impossible for the fish to be delivered in Winnipeg quickly enough to be sold as fresh fish. However, during the 1986 and 1987 seasons, fresh fish was sold from the Rankin Inlet fish plant to FFMC and all of it was accepted as meeting the fresh fish criteria. Almost all of this fish originally came from Whale Cove, indicating that fresh fish sales are possible. In the event that the fish will not arrive quickly enough, it can still be sold to the Rankin Inlet plant for freezing.

The quota for the Ferguson River is very large and can easily sustain the levels of harvest that Lewis Voisey is proposing. In the past, 10,000 pounds of fish have been harvested from this quota in a single season, using a crew of

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[1] C C H Canadian Ltd., Canadian Depreciation Guide 1984 Edition.

four fishermen, gill nets and a freezer-packer vessel. In light of these precedents, Lewis Voisey's proposal appears realistic.

The total costs and projected net earnings fcr Lewis Voisey's expanded operation (from both purchased fish and the Ferguson River fishery) are summarized in Table 15. Expected net income in 1988 is $4,265.00, in 1989 is s22,710.00 and in 1990 is $30,994.00. The 1988 projection assumes that Lewis will receive a S25,000 contribution from the Commercial Renewable Resource Enhancement Program to be applied against the cost of boat repairs. Table 16 shows the situation that would occur if Lewis did not receive this grant; he would end up the season with a negative net income of S21,000.00. Because of the short fishing season in Whale Cove, annual income statements rather than monthly cash flows have been used as a more appropriate summary of income and costs, allowing for the inclusion of depreciation values.

These projections assume that the fish taken from the Ferguson River quota will be sold fresh for $4.00 a pound as described above. Table 17 summarizes the costs and resulting income that would result if none of the fish could be sold fresh, and was instead sold to one of the fish plants for $1.39 a pound. Clearly the fish from the Ferguson River must be sold fresh to justify the expenses of the collector boat and the hired fishermen.

Table 18 presents a break even analysis for the expanded operations . The Unit Sales Price used in the analysis is a weighted average based on s1,39 a pound for fish sold to the Rankin Inlet fish plant and s4.00 a pound for fish sold fresh to FFMC . It also includes income from the freight subsidy and, in 1988, the s25,000 contribution for boat repairs. In the first year of expanded operation, 35,000 pounds of fish will have to be said, if 25% of it is-sold fresh for S4.00 a pound. As discussed above, this is a realistic projection. During 1989 and 1990, once the boat repairs have been paid for, the break even volume drops down to under 20,000 pounds, again assuming that the portion taken from the Ferguson River (33% of the total catch in 1989, 40% of the catch in 1990) is sold fresh. This is approximately the same volume that Whale Cove is presently producing sc there should be no problem in maintaining this level of harvest.

The levels of harvest required to break even if none of the fish is sold fresh are shown in Table 19. The figures show that the fish taken from the Ferguson River must be sold fresh to make the project worthwhile.

In order to begin the Ferguson River operation a total investment of S34,800 is required - $30,000 for boat repairs and S4,800 for the purchase of gill nets. The projected return on

TABLE 15

PRO FORMA INCOME STATEMENTS - WHALE COVE FISH DEALER
SUMMER OPERATIONS

	1988	1989	1990
RECEIPTS			
Fish Sales	$78,932.51	$101,990.51	$121,990.51
-Freight Allowance	$4,820.36	$6,758.36	$8,608.36
Contribution	$25,000.00		
TOTAL	$108,752.27	$108,748.87	$130.598.87
DISBURSEMENTS			
Boat Repairs	$30,000.00	$1,000.00	$2,000.00
Fish Purchases	$28,009.00	$30,209.00	$30,209.00
Labour and Food	$16,560.00	$22,080.00	$29,760.00
Employer's Contributions	$460.80	$614.42	$921.60
W.C.B.	$230.40	$307.25	$460.80
Electrical Hook-up	"$200.00	$200.00	$200.00
Freight	$9,640.?2	$13,516.72	$17,216.72
Telephone	$70.00	$70.00	$70.00
Business Licence	$25.00	$25.00	$25.00
Water	$75.00	$100.00	$125.00
Fuel	$6,380.00	$6,880.00	$7,380.00
Insurance	$1,612.00	$1,612.00	$1,612.00
N.C.P.C.	$2,000.00	$2,200.00	$2,400.00
Nets	$4,800.00	$2,800.00	$2,800.00
Vehicle Deprec.	.....		
Vessel hull	$1,125.00	$1,125.00	$1,125.00
Vessel engine	$3,000.00	$3,000.00	$3,000.00
Truck	$300.00	$300.00	$300.00
TOTAL	$104,487.92	$86,039.32	$99,605.12
NET EARNINGS	$4,264.95	$22,709.55	$30,993.75
OPENING BAL.	$0.00	$4,264.95	$26,974.50
CLOSING BAL.	$4,254.95	$26,974.50	$57,968.25

TABLE 16

PRO FORMA INCOME STATEMENTS - WHALE COVE FISH DEALER
NO CONTRIBUTION
1988

RECEIPTS	
Fish Sales	$78,932.51
Freight Allowance	$4,820.36
Contribution	
TOTAL	$83,752.87
DISBURSEMENTS	
Boat Repairs	$30,000.00
Fish Purchases	$28,009.00
Labour and Food	$16,560.00
Employer's Contributions	$460,80
W.C.B.	$230.40
Electrical Hook-up	$200.00
Freight	$9,640.72
Telephone	$70.00
Business Licence	$25.00
Water	$75.00
Fuel	$6,380.00
Insurance	$1,612.00
N.C.P.C.	$2,000.00
Nets	$4,800.00
Vehicle Deprec.	
Vessel hull	$1,125.00
Vessel engine	$3,000.00
Truck	$300.00
TOTAL	$104,487.92
NET EARNINGS	($20,735.05)
OPENING BAL.	$0.00
CLOSING BAL.	($20,735.05)

BLE 17

PRO FORMA INCOME STATEMENTS - WHALE COVE FISH DEALER - SUMMER OPERATIONS
NO FRESH FISH SALES

	1988	1989	1990
RECEIPTS			
Fish Sales	S52,832.51	$62,840,51	$69,790.51
Freight Allowance	S1,520.36	$1,808.36	$2,008.36
Contribution	$25,000.00		
TOTAL	$79,352.87	S64,648.87	$71,798.87
DISBURSEMENTS			
Boat Repairs	$30,000.00	$1,000.00	$2,000.00
Fish Purchases	$28,009.00	$30,209.00	$30,209.00
Labour and Food	S16,560.00	$22,080.00	$29,760.00
Employer' s Contributions	S460.80	$614.40	.S921.60
W.C.B.	$230.40	$307.20	$460.80
Electrical Hook-up	$200.00	$200.00	$200.00
Freight	$3,040.72	$3,616.72	$4,016.72
Telephone	$70.00	$70.00	$70.00
Business Licence	$25.00	$25.00	$25.00
Water	$75.00	$100.00	s125.00
Fuel	$6,380.00	$6,880.00	$7,380.00
surance	.S1,612.00	$1,612.00	$1,612.00
C.P.C.	$2,000.00	$2,200.00	$2,400.00
Nets	S4,800.00	$2,S00.00	S2,800.00
Vehicle Deprec.			
Vessel hull	$1,125.00	$1,125.00	$1",125.00
Vessel engine	$3,000.00	$3,000.00	$3,000.00
Truck	.s300.00	$300.00	$300.00
TOTAL	S97,887.92	S76,139.32	$86,405.12
NET EARNINGS	(S18,535.05)	($11,490.45)	($14,606.25)
OPENING BAL.	$0.00	($18,535.05)	($30,025.50)
CLOSING BAL.	(S18,535.05-)	($30,025.50)	($44,631.75)

TABLE 18

BREAKEVEN ANALYSIS - WHALE COVE FISH DEALER

	1988	1989	1990
UNIT SALES PRICE	$2.86	$2.41	$2.60
UNIT COST:			
Fish Purchases	$0.74	$0.67	$0.60
Labour and Food	$0.44	$0.49	$0.59
Employer's Contributions	$0.01	$0.01	$0.02
W.C.B.	$0.01	$0.01	$0.01
Freight	$0.25	$0.30	$0.34
TOTAL	$1.44	$1.48	$1.56
UNIT CONTRIBUTION MARGIN	$1.42	$0.93	$1.04
FIXED COSTS:			
Boat Repairs	$30,000.00	$1,000.00	$2,000.00
Electrical Hook-up	$200.00	$200.00	$200.00
Telephone	$70.00	$70.00	$70.00
Business Licence	$25.00	$25.00	$25.00
Water	$75.00	$100.00	$125.00
Fuel	$6,380.00	$6,880.00	$7,380.00
Insurance	$1,612.00	$1,612.00	$1,612.00
N.C.P.C.	$2,000.00	$2,200.00	$2,400.00
Nets	$4,800.00	$1,600.00	$1,600.00
Vehicle Deprec.			
Vessel hull	$1,125.00	$1,125.00	$1,125.00
Vessel engine	$3,000.00	$3,000.00	$3,000.00
Truck	$300.00	$300.00	$300.00
TOTAL	$49,587.00	$18,112.00	$19,837.00
BREAKEVEN VOLUME	35001.32	19485.84	19142.45

this investment is shown in Table 20. Cash inflow has been calculated using only t-nose fish sales that will be the direct result of using the collector boat in the Ferguson River and the disbursements are only those directly related to this portion of the fish dealer's operation.

Because this is the first time that this type of operation has been tried in Whale Cove, it is impossible to predict the amount of risk associated with it. Therefore three different levels of discounting for net present value have been used: 10% (generally acceptable level of return for low risk projects), 15% and 20% (acceptable for high risk projects). A time horizon of three years was used as this is the length of time that it will take to reach full expansion of the operation, at the projected rate of increase.

As seen in Table 20, the net present value is positive at both 10% and 15% rates of discounting, indicating that a positive return on the investment will be seen at the end of the three years. At the 20% rate of discounting, the net present value is negative after 3 years but would be strongly positive after 4 years, which is well within the expected lifespan of the repaired motor. Based on this analysis, the investment would be a sound one.

TABLE 19

BR EAKEVEN ANALYSIS - WHALE COVE FISH DEALER - NO FRESH FISH

	1988	1989	1990
UN I T SALES PP. ICE	$2.09	$1 .43	$1.42
UNIT COST:			
Fish Purchases	$0.74	S0.67	$0.60
Labour and Food	$0.44	$0.49	$0.59
Employer's Contributions	$0.01	$0.01	$0.02
W.C.B.	$0.01	$0.01	$0.01
Freight	.$0.08	$0.08	$0.08
TOTAL	$1.27	$1.26	$1.30
UNIT CONTRIBUTION MARGIN	$0.82	$0.17	$0.13
FIXED COSTS:			
Boat Repairs	$30,000.00	$1,000.00	$2,000.00
Electrical Hook-up	$200.00	$200.00	$200.00
Telephone	$70.00	$70.00	$70.00
Business Licence	$25.00	$25.00	$25.00
Water	.s75.00	Sloe.oo	S125.00
Fuel	S6,380.00	$6,880.00	$7,380.00
Insurance	S1,612.00	s1,612.00	s1,612.00
N.C.P.C.	$2,000.00	$2,200.00	S2,400.00
Nets	$4,800.00	$1,600.00	S1,600.00
Vehicle Deprec.			
Vessel hull	$1,125.00	s1,125.00	S1,125.00
Vessel engine	$3,000.00	$3,000.00	$3,000.00
Truck	$300.00	$300.00	$300.00
TOTAL	$49,587.00	$18.112.00	S29,837.00
BREAKEVEN VOLUME	60704.41	104688.38	154880.21

\BLE 20

RETURN TO INVESTMENT - WHALE COVE FISH DEALER
FER GUS ON RIVER OPERATIONS

CASH INFLOW

	1988	1989	1990
R ECEIPTS			
Fisk Sales	$40,000.00	$60,000.00	$80,000.00
Freight Allowance	$3,700.00	$5,550.00	$7,400.00
TOTAL	$43,700.00	$65,550.00	$87,400.00
DISBURSEMENTS			
Boat Repairs	$0.00	$1,000.00	.$2,200.00
Labour and Food	$16,560.00	$22,080.00	$29,760.00
Employer's contributions	$460.80	$614.40	$921.60
W.C.B.	$230.40	$307.20	$460.80
Freight	$7,400.00	.$11,100.00	$14,800.00
Fuel	$6,130.00	$6,630.00	$7,130.00
Insurance	$1,000.00	$1,000.00	$1,000.00
Nets	$0.00	$2,800.00	$2,800.00
Vehicle Deprec.			
Vessel hull	$1,125.00	$1,125.00	$1,125.00
essel engine	$3,000.00	$3,000.00	$3,000.00
TOTAL	$35,906.20	$49,656.60	$62,997.40
NET CASH INFLOW	$7,793.80	$15,893.40	$24,402.60

NET PRESENT VALUE

Year	Cash Inflow	@10%	@15%	@20%	@20% OVER 4 YEARS
1	$7,793.80	$7,0S4.56	$6,780.61	$6,492.24	$6,492.24
2	$15,893.40	$13,127.95	$12,015.41	$11,030.02	$11,030.02
3	$24,402.60	$18,326.35	$16,056.91	$14,129.11	$14,129.11
	$24,402.60				$11,762.05
PRESENT VALUE		$38,539.87	$34,852.93	$31,651.36	$43,413.41
LESS INVESTMENT		$34,800.00	$34,800.00	$34,800.00	$34,800.00
NET PRESENT VALUE		$3,738.97	$52.93	($3,148.64)	$8,613.41

FISHERIES

3-7-8

AN ECONOMIC ANALYSIS OF THE 1987 WHALE COVE COMMERCIAL CHAR FISHERY

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AN ECONOMIC ANALYSIS OF THE 1987 WHALE COVE COMMERCIAL CHAR FISHERY

Lynda Yonge
March 1988

WHALE COVE FISHERY

During the summer of 1987 the community of Whale Cove ran a successful commercial char fishery. Twenty-two men and women harvested a total of 20,155 pounds of fish between the last week of July and the second week in September. The fish was all purchased by a local fish dealer and then sold to the Issatik Food Plant in Rankin Inlet. This report summarizes the economic performance of both the individual fishermen of Whale Cove and the local fish dealer, and examines the potential for future expansion of the commercial fishery in this community.

INDIVIDUAL FISHING OPERATIONS

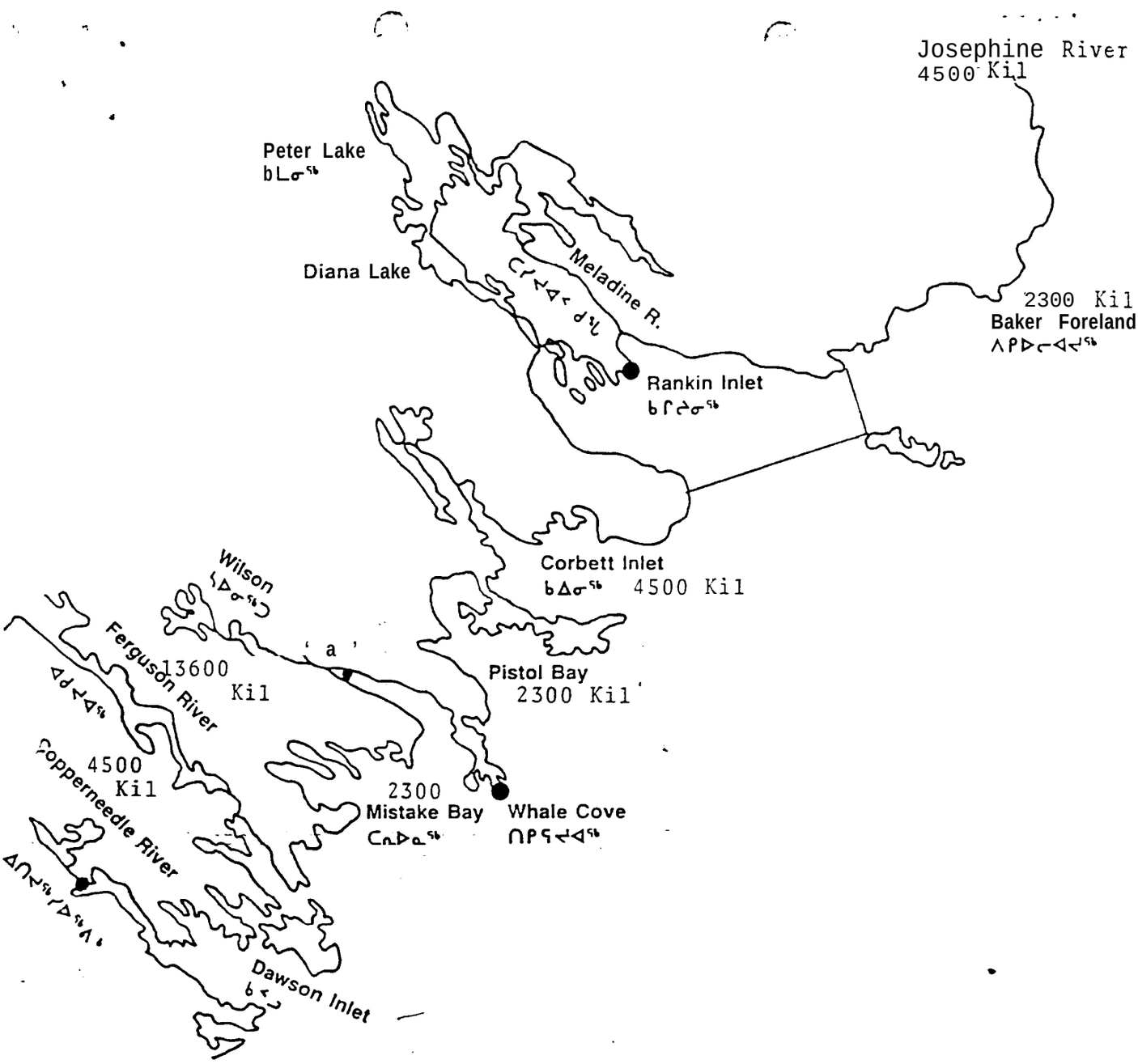
A wide variety of community members fished commercially in 1987. Young men and women, grandmothers, retired people, employed and unemployed workers, all participated to varying degrees. Fish were caught by setting gillnets and checking them at low tide, usually twice a day. Nets were left in place as long as sufficient amounts of fish were caught. When catches were small, they were moved to a more productive site.

Most of the fishermen used canoes equipped with outboard motors. Some of the smaller producers fished close to town, either walking to their nets or using a Honda ATC for transportation. This type of fishing is more or less an extension of the domestic fishery and involves very little capital investment and little or no expenses for fuel and food.

There are five commercial quotas available to the fishermen of Whale Cove. These are shown in Figure 1. Fish were harvested regularly from the Wilson River, Pistol Bay, Mistake Bay and Ferguson River quotas. Only one catch came from the Copper Needle quota. Catches from each quota are summarized in Table 1. Pistol Bay and Wilson River are the most easily accessible quotas and made up 75% of the total catch.

The fishermen of Whale Cove are self-employed and own their own equipment. They either fish alone, or accompanied by friends or relatives. Although the fisherman supplies food for everyone on a fishing trip, none of the fishermen paid hired labour. There are seine husband and wife teams where the wife fishes close to town using a Honda ATC to bring in her catch and the husband uses a beat and motor to set nets farther away. The total catch is recorded under one licence.

Of the 22 active fishermen in Whale Cove, information was gathered from 14 people (including two husband and wife teams fishing on the same licence) through a questionnaire, interviews, and a public meeting. This represents 55% of the licensed fishermen and 80% of the total catch for 1987.



Keewatin Major River Systems
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Rankin Inlet/Whale Cove Areas
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TABLE 1 WHALE COVE FISH HARVESTS - SUMMER 1987

River System	Date	Harvest (lbs)	Total Quota Dressed (lbs)
Wilson River	July 31	738	
	August ?	1076	
	August 14	757	
	August 21	1830	
	August 28	2272	
	Sept 4	3330	
	Sept 11	643	
Total		10646	17409
Copper Needle	July 31	623	8609
Mistake Bay	August 7	355	
	August 14	20	
	August 21	278	
	September	106	
Total		759	4400
Ferguson	August 7	752	
	August 14	209	
	August 21	387	
	August 28	1059	
	September	1215	
Total		3622	26017
Pistol Bay	July 31	252	
	August 7	346	
	August 14	268	
	August 21	590	
	August 28	1655	
	Sept 4	1394	
Total		4505	4400
TOTAL		20155	60834

FISHING COSTS

The major costs incurred by commercial fishermen can be divided into two categories, the fixed capital expenses for boat, motor, and gill nets, and the variable and semi-variable costs associated with each trip - gas and oil for the outboard motor, maintenance and repairs on the boat and motor, and food and supplies. None of the fishermen took a wage or paid out wages for fishing.

CAPITAL INVESTMENT

The major capital investments required to participate in commercial fishing are a boat and meter, and a number of gillnets. The fishermen in Whale Cove use canvas covered wooden canoes ranging in length from 20 to 24 feet, with the most common being 22 feet long. The average cost of a canoe is approximately $3,000.00, although the prices paid ranged from $400.00 for a used canoe, up to $5000.00. The expected operating life of these canoes averaged 6 years.

The motors used range in size from 20 to 65 horse power, the most common falling between 25 - 30 hp. The cost of these motors ranges from $700.00 to $4300.00, with the average cost being approximately S3000.00. Maters are expected to last an average of 5 years, although they may require extensive repairs each season. The average capital investment for a beat and mater was approximately $5500.00.

Fish are caught using 50 yard gill nets with 5 1/2 inch " mesh. The number of nets used ranges from 2 to 7, with an average of 4 nets set for each fisherman. Fish net prices range from $130.00 to $278.00 and the average investment in nets is approximately $760.00. Most people reported that 6 or more nets is the optimum number for one person to use for commercial fishing, but the high cost of nets limited their purchase and therefore limited the potential catch. Based on the number of nets used by each fisherman and their average catch per trip, the average catch per net per trip was about 25 pounds.

The average total capital investment for a Whale Cove fisherman amounts to approximately S6,300.00. Capital investment by Whale Cove fishermen is summarized in Table 2. Fishermen must also purchase a $10.00 licence for each quota that they Want to fish, and miscellaneous supplies such as paddles, ropes, knives etc . averaging about S100.00 per season.

Most people reported that their equipment was purchased specifically for commercial fishing, however it is also used for domestic fishing and hunting. One individual received government

.BLE 2 CAPITAL INVESTMENT

	BOAT COST	MOTOR COST	NO OF NETS	COST OF NETS	TOTAL INVESTMENT
	$400 .00	$2,750.00	3	$700.00	$3,850.00
	$4 .600.00	$3,500.00	5	$1,000.00	$9,100.00
	$2,995.00	$3,550.00	2	$400.00	$6,945.00
	$3,800.00	$4.000.00	4	$1,000.00	5S,800,00
	$4,995.00	$3,000.00	2	$400.00	$8,395.00
	$2,400,00	$3,500.00	3	$825.00	$7,725.00
	$2,900.00	$1,200.00	6	$1,200.00	$5,300.00
	$1,800.00	$700.00	7	$1,330.00	$3,830.00
		$4,299.00	3	S525.00	$4,824.00
	$1,000.00	$2,600.00	2	$400.00	$4,000.00
	$3,000.00	$3,000.00	5	$650.00	$6,650.00
AVERAGE	$2,889.00	$2,918.09	4	$766.36	S6,310.82
MAXIMUM	$4,995.00	$4,299.00	7	$1,330.00	$9,100.00
MINUMUM	$400.00	$700.00	2	$400.00	$3,830.00

assistance in the form of a tourism grant, to purchase equipment. All others bought their equipment without government assistance.

Very little information was collected on the costs and use of Honda ATCs for fishing, however it appears that these vehicles were not purchased specifically for commercial fishing. Hondas are used mainly when the wind is too strong to take out a canoe, by very small producers, or for fishing that supplements fishing by canoe.

VARIABLE COSTS

Variable costs are those costs that vary with the amount of fishing effort, increasing as fishing effort increases. The major variable cost for fishermen in Whale Cove is the cost of gas and oil for their outboard motors.

Most fishermen set their nets within 5 - 10 miles of Whale Cove and their daily gas use averages between 10 and 15 gallons, costing $30 - $45.00 a trip. Some of the larger producers have more nets, and make at least two trips to their nets each day. Their daily gas costs during the busiest portion of the season ranged as high as $120.00 for 40 gallons of gas. Those fishing the more distant quotas, (Ferguson River, Copper Needle, Mistake Bay) also had higher gas costs. Gas costs are summarized in Table 3. Those who used Hondas for fishing set their nets within 5 miles of town so gas consumption was under 5 gallons ($15.00) per trip.

Since most fishermen travelled between their nets and Whale Cove during the day, rather than spending the entire day away from town, meals do not have to be taken away from home. Therefore food costs have not been included in calculating fishing costs. Some of the larger producers spend the entire day away from the town, traveling between their nets, and between their nets and Whale Cove. Average food costs for these fishermen was $34 .00 a day.

Maintenance and repair costs varied a great deal, ranging from 0 to $1500.00. The most commonly required repairs were the replacement of the bottom unit of the motor, props and gears, and the repair of holes in the canoe. Motor repair costs ranged from $500.00 to $1500.00. General maintenance and painting for the canoes averaged $100.00 for the season.

Each fisherman also loses one or two nets due to whale damage each season. These nets must be replaced, adding between $200.00 and $400.00 to seasonal costs. Variable and semi-variable costs for each fisherman are summarized in Table 4.

TABLE 3 FUEL AND OIL COSTS

Fisherman	Costs/Trip	Trips/Season	Season
1	$60.00	36	$1,860.00
2	$30.00	20	$570.00
3	$15.00	42	$990.00
4	$60.00	30	
5		28	
6	$45.00	14	$429.00
7		12	
8	$30.00	15	$390.00
9		21	
10		10	$650.00
11		15	
12	$40.00	12	$556.00
13		8	
14		10	
15	$53.00	4	$318.00
16		3	
17		3	
18		2	
19		3	
20	$40.00	1	$50.00
21	$35.00	1	$35.00
22		1	
AVERAGE	$40.80	13	$584.80
MAXIMUM	$60.00	42	$1,860.00

TABLE 4 VARIABLE AND SEMI-VARIABLE COSTS

Fisherman	Gas Cost/ Trip	Food Cost/ Trip	Repairs/ Season	Nets Replaced/ Season
1	130/wk	700/wk	$100.00	1
2	$30.00	$60.00	$90.00	1
3	$115.00			
4	$33.00	$24.00	$0.00	1
5				
6				
7	$60.00	$40.00	$1,000.00	2
8				
9	$50.00	$30.00	$50.00	0
10	$39.00	$30.00	$1,500.00	2
11	$35.00	$25.00	$0.00	2
12	$53.00	$30.00	$500.00	2
13				
14				
15	$30.00		$0.00	0
16	$30.00	$30.00	$0.00	1
17				
18				
19				
20				
21	$30.00	$40.00	$0.00	2
22				
Average	$45.91	-$34-.33	$314.00	1
Maximum	$115.00	$60.00	$1,500.00	2
Minimum	$30.00	$24.00	$0.00	0

INCOME

Fish were sold to the local fish dealer for $1.00 a pound. Weekly catches ranged from 37 pounds to 598 pounds, providing an average income of $213.00 per week. Total seasonal income before costs ranged from $37.00 to $3554.00 with an average of $916.00.

The degree of participation in the fishery ranged from full-time fishermen that made over 40 trips during the season, to those that made only 1 or 2 trips. In order to determine the level of income that can be expected from full-time participation in commercial fishing, the following analysis includes only those fishermen who made more than 10 trips during the season and who harvested mere than 500 pounds. This represents 55% of the people fishing in Whale Cove and 91% of the total catch.

ECONOMIC PERFORMANCE

In order for fishing to be economically viable as a business, fishermen must be able to cover their costs with the money earned from fish sales. Short-term viability requires that at least operating costs, those costs associated with each fishing trip, are covered.

One method of estimating short-term viability is to calculate net revenue, the difference between the gross income earned from fish sales and the fixed and variable costs involved in commercial fishing. Those fishermen with a positive net revenue are able to cover their immediate costs.

During 1987 fish sales were recorded on a weekly basis. Costs, however, were estimated on a per trip basis. Therefore an estimate of the number of fishing trips made per week by each fisherman was required to determine a per trip income value. This was arrived at by calculating each fisherman's average catch per trip during the 1986 season (when records were kept daily), and roughly dividing this average into the 1987 weekly catch It was assumed that there were no significant differences between average catches in 1986 and 1987 . Individual averages were used when an individual fished during both seasons. For those that did not fish during the 1986 season, a composite average of 60 pounds per trip was used. The average catch per trip in 1987 was $61.00 before costs.

Incomes after covering variable costs are summarized in Table 5 for the entire Whale Cove fishery and in Table 6 for full-time fishermen harvesting over 500 pounds, on both a per trip and seasonal basis. The only costs included in these tables are daily fuel and oil costs. Incomes after fuel costs for full-time fishermen ranged from $2418 to a loss of $36.00. Only one

TABLE 5 NET INCOME FOR WHALE COVE FISHERMEN

	Avg Catch trip ($)	Avg cost Trip ($)	Net Income Trip ($)	Trips/ season	Total Catch Season ($)	Gas cost/ Season ($)	Net Income/ Season ($)
1	99	60	39	36	3554	1860	1694
2	149	30	119	20	2988	570	2418
3	62	15	47	42	2590	990	1600
4	74	60	14	30"	2220		
5	58			28	1614		
6	70	45	25	14	973	429	544
7	78			12	934		
8	61	30	31	15	911	390	521
9	36			21	759		
10	61			10	614	650	-36
11	39			15	580		
12	47	40	7	12	568	556	12
13	54			8	430		
14	40			10	397		
15	93	53	40	4	373	318	55
16	49			3	147		
17	48			3	145		
18	53			2	106		
19	35			3	104		
20	66	40	26	1	66	50	16
21	45	35	10	1	45	35	10
22	37			1	37		
AVERAGE	61	41	36	13	916	585	683
MAXIMUM	149	60	119	42	3554	1860	2418
MINIMUM	35	15	7	1	37	35	-36

TABLE 6 NET INCOMES FOR FULL-TIME FISHERMEN

	Avg Catch trip ($)	Avg cost Trip ($)	Net Profit/ Trip (s)	Trips/ Season	Total Catch Season ($)	Gas Cost/ Season (s:	Net Income/ Season ($)
1	99	60	39	36	3554	1860	1694
2	149	30	119	20	2988	570	2418
3	62	15	47	42	2590	990	1600
4	74	60	14	30	2220		
5	58			28	1614		
6	70	45	25	14	973	429	544
7	78			12	934		
8	61	30	31	15	911	390	521
9	36			21	759		
10	61			10	614	650	-36
11	39			15	580		
12	47	40	7	12	568	556	12
AVERAGE	69	40	40	21	1525	778	965
MAXIMUM	149	60	119	42	3554	1860	2418
MINIMUM	36	15	7	10	568	390	-36

person interviewed sustained a loss during the 1987 season, and he reported fishing primarily for domestic consumption and selling any surplus, rather than concentrating on the commercial catch. The average full-time income after covering variable production costs was approximately $965.00

In order for fishing to be viable in the short run, the fisherman must also be able to cover fixed and semi-variable costs, including fishing licenses, repairs, replacement of lost or badly damaged nets and miscellaneous supplies. If an average value of $200.00 for net replacement and $100.00 for miscellaneous supplies are included, average net income drops to $565.00. This level of income is high enough to cover minor repairs to boat and motor, but will not cover major motor repairs. Some fishermen reported that their motors required $1000 - $1500.00 worth of repairs as a result of the fishing season. These people would be unable to cover their repair costs from their fishing income alone.

In order for fishing to be economically viable as a business over the long-run, enough profit must be made to cover both the fixed and variable operating costs, and the replacement cost of any capital assets. To determine the ability of Whale Cove fishermen to cover these costs, a breakeven analysis and return to investment analysis were performed. See Tables 7 and 8.

The breakeven analysis was based on the current price of $1.00 for fish, an average fuel cost of $40.00 a trip, and an average catch of $61.00 per trip. Depreciation was based on the Canadian Depreciation Guide for Farmers and Fishermen[1]. At the current average level of harvest and investment, a fisherman would have to catch 1623 pounds of fish in order to cover his costs. The top two producers in 1987 were able to exceed this level of harvest, so it is realistic to suppose that a single fishermen will be able to harvest this much fish.

The return to investment analysis indicates that the net present value of the income from commercial fishing is not sufficient to cover the cost of investment in boats, motors and nets over the 5 year lifespan of this equipment and provide a rate of return that would be acceptable in a normal business operation. However, this analysis assumes that the equipment purchased is used only for commercial fishing. In reality, the equipment purchased for commercial fishing is also used for other purposes including domestic fishing, hunting and recreation. If these activities were included, the analysis would look more positive.

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[1] C C H Canadian Ltd., Canadian Depreciation Guide 1984 Edition.

TABLE 7 BREAK EVEN ANALYSIS

UNIT SALES PRICE	1.00
UNIT COST	
Gas and oil	0.51
Total	
UNIT CONTRIBUTION MARGIN	0.49
FIXED COSTS	
Repairs	300.00
Licence	10.00
Nets and Supplies	300.00
Motor Deprec .	450.00
Canoe Deprec.	225.00
Total	1285.00
BREAKEVEN VOLUME	?623.33

TABLE 8
RETURN TO INVESTMENT

Net Cash Inflow			
Income			
Fish Sales		sl,500.00-	
Costs			
Gas and oil		S778.00	
Repairs		$320.00	
Nets and supplies		$300.00	
Total		$1,398.00	
Net Cash Inflow		$102.00	
Net Present Value - 5 year investment			
Cash Flow		@10%	@15%
S102.OC		$63.34	$50.69
Less Investment		$6,300.00	S6,300.00
Net Present Value		($6, 236 .66)	(S6,24S.31)

TABLE 9 HYPOTHETICAL FISHERMAN INCOME AND COSTS

CAPITAL INVESTMENT

BOAT	$3,000.00
MOTOR	$3,000.00
NETS	$1,200.00
TOTAL	$7,200.00

FIXED AND VARIABLE COSTS

FUEL (20 TRIPS)	$800.00
REPAIRS	$320.00
NET REPLACEMENT	$400.00
SUPPLIES	$100.00
TOTAL	$1,620.00

INCOME

GROSS	$3,000.00
AFTER FUEL	$2,200.00
AFTER COSTS	$1,380.00

One of themost frequent comments made during the interviews was that fishing would be more profitable if more nets were available, but the high costs of purchasing them limited use. If a full-time fisherman was able to use 6 nets for fishing, with an average catch of 25 pounds per net, and made 20 trips during the season, he could harvest 3000 pounds of fish. Using average values for full-time fishermen, the income from this hypothetical fisherman is summarized in Tables 9, 10 and 11.

Using 6 nets, the income after covering fuel costs increases to $2200.00 and after covering all fixed costs, increases to $1380.00. The $320.00 value used for repair costs is the average of the amount reported for repairs and maintenance during the 1987 season. At this level of income, those with high repair costs will be able to cover them using income from fish sales.

The breakeven analysis indicates that fishermen will need to harvest 2039 pounds cf fish to cover costs. During the 1987 season several fishermen exceeded this level of harvest, using fewer nets, so there should be no problem for a fisherman with 6 nets to reach this volume of catch.

The return to investment analysis shows that even at this level of harvest, a fisherman is still not able to make a return on his investment for equipment that would be acceptable in a normal business operation. At both the 10 and 15% rates of return, the net present value of the investment is negative.

COUNTRY FOOD HARVEST

In addition to the fish that was caught and sold, fishermen reported taking some fish for their personal use, to feed themselves, their families and their dogs. An estimate of the replacement value of these fish ($2.00/lb, assuming 5 lbs/fish) increases the total value of the fishery by approximately $1800.00. The major fishermen reported taking only a very few fish for domestic use (often those that were already dead in the nets, or for some reason would be rejected by the fish purchaser) as they were more concerned with earning a cash income from their effort. The bulk of their domestic harvest takes place in the spring when the ice breaks up, before the commercial season begins .

Many of the fishermen also reported being able to hunt while they were out fishing, taking whales, seals and caribou. Fishermen reported taking a total of 23 whales, 38 seals and 27 caribou while fishing. During the summer of 1987 the Whale Cove Co-op purchased Beluga muktuk for $0.85 a pound. Using this as a measure of value, the whales taken by fishermen represent a further $2300.00 in total income from the fishery. The seals and caribou were used for domestic consumption. Replacement value for these, based on substitution value, falls somewhere between

TABLE 10 BREAKEVEN ANALYSIS - HYPOTHETICAL FISHERMAN

UNIT SALES PRICE	$1.00
UNIT COST	
Fuel	$0.27
UNIT CONTRIBUTION MARGIN	$0.73
FIXED COSTS	
Repairs	$320.00
Net Replacement	$400.00
Supplies	$100.00
Motor Deprec.	$450.00
canoe Deprec.	$225.00
TOTAL	$1,495.00
BREAKEVEN VOLUME	2039

TABLE 11 RETURN TO INVESTMENT - HYPOTHETICAL FISHERMAN

NET CASH INFLOW

INCOME	
Fish Sales	$3,000.00
COSTS	
Fuel (20 Trips)	$800.00
Repairs	$320.00
Net Replacement	$400.00
supplies	$100.00
TOTAL	$1,620.00
NET CASH INFLOW	$1,380.00

NET PRESENT VALUE - 5 YEAR INVESTMENT

Cash Flow	@10%	@15%
S1,380.00	$5,231.58	.$4,625.76
Less Investment	$7,200.00	$7,200.00
Net Present Value	($1,968.42)	($2,574.24)

$4.25/kg (based on the price of hamburger) and $25.00/kg (based on the price of steak) using average Rankin Inlet prices.

FUTURE EXPANSION

Of all of the quotas available to Whale cove, only the Pistol Bay quota. was fully harvested. The other quota easily accessible to the community, Wilson River, had an additional 6763 pounds that could have been harvested. This volume of fish could support 4.5 full-time fishermen at the present average seasonal catchor several more part-time fishermen..

The other three quotas, Copper Needle, Mistake Bay and Ferguson River, were only minimally harvested, with just 13% of the available quota taken. The unexploited portions of these quotas adds up to 34,021 pounds, which could support 23 more full-time fishermen. However these quotas are difficult to access. Their distance from Whale Cove increases the costs of fuel and food supplies and, more importantly, the uncertainty of the weather makes fishing in these areas very risky. Changes in the weather can make it both dangerous and difficult to return to Whale Cove while the fish are still fresh enough to sell. The small canoes used by the Whale Cove fishermen are just not made for this type of travel.

It has been suggested by several members of the community " that a collector boat could "make the harvest of these quotas more practical, taking the responsibility for fish delivery out of the hands of the individual fishermen.

The other major impediment to participation in the commercial fishery is the high cost of initial investment. 1" was told repeatedly that there are many people in Whale Cove that are good fishermen and are interested in fishing commercially, but the cost of a boat and motor are beyond their financial abilities. The high cost of nets is also an impediment to fishing productivity. Most people interviewed indicated that they would like to use more nets to fish with and the analysis indicates that a higher number of nets increases the income from the commercial fishery to the point where all costs can be covered.

All of those interviewed felt that commercial fishing was worthwhile for the added income that it provided. 36% of the people interviewed had either another part-time or full-time job. The others were unemployed or retired, with commercial fishing as their major source of earned income.

WHALE COVE FISH DEALER OPERATIONS

1987 OPERATION

During the 1987 summer fishing season, commercial char caught in Whale Cove was sold to a local fish dealer, Lewis Voisey, for $1.00 a pound. Lewis purchased 17,565 pounds of fish and caught an additional 2,590 pounds of char on his own fishing license. All of this fish was sold to the fish plant in Rankin Inlet for $1.39 a pound, resulting in a total sales income of $29,434 .60 for the season.

The production costs in this operation included electrical and water charges to run the community ice machine and freezer, gas used in transporting the fish, and freight charges for transporting the fish to the Whale Cove airport. Freight charges were calculated at 8 cents a pound resulting in a total freight cost of $2645.84 for the season. Fifty percent of this freight cost ($1,322.92) was recovered through the Government of the NWT Assistance to Commercial Fishermen Policy Freight Subsidy. Total net earnings for the seven-week season were $8264.70. An Interim Income Statement for his 1987 operation is shown in Table 12.

A break even analysis was performed for the fish dealer's 1987 operation and the results are summarized in Table 13. At the present level of operation, Lewis Voisey must sell 4,769 pounds of fish at $1.39 a pound, to cover all of his costs. His current volume of sales is well above this level, leaving him with a healthy income.

FUTURE EXPANSION

During the 1987 season, only the Pistol Bay quota was completely harvestd. None of the other commercial quotas available to Whale Cove were fully exploited. Based on the growth seen in the commercial fishery over the last two years, and the interest shown by members of the community in commercial fishing, it is expected that the fishery will continue to grow. The fish dealer wish.ss to expand his operations over the next three to four years by increasing the amount of fish purchased from local fishermen and by capturing the Ferguson River quota with the help of hired fishermen. For the sake of simplicity, the growth from increased fish purchases and the Ferguson River quota components of the operation will be considered separately.

LOCALLY PURCHASED FISH

The projections for increased fish purchases in 1988 assume that the two quotas nearest to Whale cove, Wilson River and Pistol Bay, will be completely taken, half of the Mistake Bay and Copper Needle quotas will be captured, and all of this fish will

TABLE 12

INTERIM INCOME STATEMENT: WHALE COVE FISHERIES, SUMMER PERIOD
JULY, AUGUST, SEPTEMBER 1987

RECEIPTS	
Fish Sales	$29,434.60
Freight Allowance	$1,322.92
TCTAL	$30,757.52
DISBURSEMENTS	
Fish Purchases	$17,565.00
Electrical Hock-up	$200.00
Freight	$2,645.84
Telephone	$70.00
Business Licence	.$25,00
Water	S36.44
Gas Purchases	S259.64
Insurance	$612.00
N.C.P.C	$1,078.90
TOTAL	$22,492.82
NET EARNINGS	$8,264.70

TABLE 13

BR EAKEVEN ANALYSIS : PRESENT WHALE COVE OPERATIONS
JULY . A UGUST , SE PTEMBER 1987

UNIT SALES PRICE	$1 .43
UNIT COST:	
Fish Purchases	$0 .87
Freight	$0.08
TOTAL	SO .95
UNIT CONTRIBUTION MARGIN	.$0.48
FIXED COSTS:	
Telephone	$70.00
Business Licence	$25.00
Water	s36.44
Gas purchases	$259.64
Insurance	$612.00
N.C.P.C	$1,078.90
Electrical Hook-up	$200.00
TOTAL	$2,281.98
BREAKEVEN VOLUME	4769

be purchased by Lewis Voisey. Projections for increased fish purchases in 1989 and 1990 assume that the complete quota will be harvested in the Wilson River, Mistake Bay and Pistol Bay systems, and that half of the Copper Needle quota will be taken. Table 14 summarizes these increases.

The total expansion represents a 65% increase in the amount of fish caught. Quotas to allow this increase are presently available and unexploited. If the average catch per season in Whale Cove remains at the current level, this 65% increase could be achieved if 7 new full-time fishermen entered the industry. It could also be achieved by a combination of new fishermen entering the industry, more nets being used by those already fishing and a higher level of participation by some of the smaller producers . Given the interest shown in the commercial fishery by the members of the Whale Cove community, it should not be difficult to meet this increased harvest.

The purchased fish would all be sold to the Rankin Inlet fish plant, or, in the event that the Rankin Inlet plant is not operating, to the Chesterfield Inlet fish plant. Projected costs for fish purchases and projected income from fish sales are based on the present values of $1.00 a pound and S1.39 a pound respectively.

FERGUSON RIVER

Lewis Voisey hopes to capture the Ferguson River quota using hired fishermen and a collector boat. The fishermen would stay in a camp on the Ferguson River fishing grounds and fish for a daily wage. Lewis would use his beat as a collector boat, traveling between Whale Cove and the Ferguson River every second day to pick up fish, pack it on ice, and transport it to Whale Cove . In order to get this operation going, $30,000.00 worth of repairs must be done on the boat's engine.

Projections for the Ferguson River portion of the operation are based on the assumption that 10,000 pounds will be taken from this quota during 1988, using a hired labour force of 6 people. Projected costs for labour are based on a wage of $8.00 an hour for a 40 hour week and a 6 week season, with appropriate contributions to Unemployment Insurance and Worker's Compensation Board. Food costs were calculated at the rate of $20 a day per person for a 7 day week and a 6 week season. Twenty-four nets would be needed, at a cost of $200.00 each. The cost of these nets has been considered part of the initial investment for this operation, however replacement of nets, and subsequent increases in the number of nets used during 1989 and 1990 have been listed under annual disbursements.

Further expansion in the Ferguson River operation for 1989 would be achieved by employing 2 additional fishermen to harvest

TABLE 14 PROJECTED WHALE COVE HARVESTS

QUOTA	1987	1988	1989	1990	QUOTA AVAILABLE
WILSON RIVER	9548	17409	17409	17409	17409
COPPEP. NEEDLE	623	4000	4000	4000	8809
MISTAKE BAY	759	2200	4400	4400	4400
FERGUSON RIVER	3622	10000	15000	20000	26017
PISTOL BAY	3915	4400	4400	4400	4400
TOTAL	18467	38009	45209	50209	60835

15,000 pounds of fish. In 1990 the work week of the 8 fishermen would be increased to 50 hours a week to harvest 20,000 pounds of fish. These increases will require an investment in eight additional nets each year, and replacement of an average of 6 nets a season.

Fuel and oil costs for the collector boat were estimated to be $2.50 a gallon. Based on an 80 mile return trip between Whale Cove and the Ferguson River every other day, the cost of running the boat for the season would be approximately $5,880.00. This was added to the costs of transporting fish by truck to the airport to arrive at total fuel costs for each season. Fuel costs will increase each year as the increased volume of fish being transported will require more trips to the airport. Depreciation on the truck used for transporting the fish, the collector vessel and engine were calculated using the Canadian Depreciation Guide[1]

Lewis hopes to sell the fish taken from the Ferguson River fresh to the Freshwater Fish Marketing Corporation (FFMC) in Winnipeg. FFMC has been contacted and they are willing to purchase the fresh fish as long as it meets the freshness standards. The present price paid for fresh char is $4.00 a pound. Air freight charges to Winnipeg were calculated to be 74 cents a pound, 50% of which can be recovered through the GNWT freight subsidy. The gross income from the sale of fresh fish from the Ferguson River would therefore amount to $43,700 in 1988, $65,550 in 1989 and $87,400 in 1990.

This would be the first time that a local dealer attempted this type of fresh fish operation in the region and it does involve some risk. In order for fish to be accepted fresh by FFMC it must arrive within a very few days of harvest. Problems with weather and/or transportation may make it impossible for the fish to be delivered in Winnipeg quickly enough to be sold as fresh fish. However, during the 1986 and 1987 seasons, fresh fish was sold from the Rankin Inlet fish plant to FFMC and all of it was accepted as meeting the fresh fish criteria. Almost all of this fish originally came from Whale Cove, indicating that fresh fish sales are possible. In the event that the fish will not arrive quickly enough, it can still be sold to the Rankin Inlet plant for freezing.

The quota for the Ferguson River is very large and can easily sustain the levels of harvest that Lewis Voisey is proposing. In the past, 10,000 pounds of fish have been harvested from this quota in a single season, using a crew of

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[1] C C H Canadian Ltd., Canadian Depreciation Guide 1984 Edition.

four fishermen, gill nets and a freezer-packer vessel. In light of these precedents, Lewis Voisey's proposal appears realistic.

The total costs and projected net earnings fcr Lewis Voisey's expanded operation (from both purchased fish and the Ferguson River fishery) are summarized in Table 15. Expected net income in 1988 is $4,265.00, in 1989 is s22,710.00 and in 1990 is $30,994.00. The 1988 projection assumes that Lewis will receive a S25,000 contribution from the Commercial Renewable Resource Enhancement Program to be applied against the cost of boat repairs. Table 16 shows the situation that would occur if Lewis did not receive this grant; he would end up the season with a negative net income of S21,000.00. Because of the short fishing season in Whale Cove, annual income statements rather than monthly cash flows have been used as a more appropriate summary of income and costs, allowing for the inclusion of depreciation values.

These projections assume that the fish taken from the Ferguson River quota will be sold fresh for $4.00 a pound as described above. Table 17 summarizes the costs and resulting income that would result if none of the fish could be sold fresh, and was instead sold to one of the fish plants for $1.39 a pound. Clearly the fish from the Ferguson River must be sold fresh to justify the expenses of the collector boat and the hired fishermen.

Table 18 presents a break even analysis for the expanded operations . The Unit Sales Price used in the analysis is a weighted average based on s1,39 a pound for fish sold to the Rankin Inlet fish plant and s4.00 a pound for fish sold fresh to FFMC . It also includes income from the freight subsidy and, in 1988, the s25,000 contribution for boat repairs. In the first year of expanded operation, 35,000 pounds of fish will have to be said, if 25% of it is-sold fresh for S4.00 a pound. As discussed above, this is a realistic projection. During 1989 and 1990, once the boat repairs have been paid for, the break even volume drops down to under 20,000 pounds, again assuming that the portion taken from the Ferguson River (33% of the total catch in 1989, 40% of the catch in 1990) is sold fresh. This is approximately the same volume that Whale Cove is presently producing sc there should be no problem in maintaining this level of harvest.

The levels of harvest required to break even if none of the fish is sold fresh are shown in Table 19. The figures show that the fish taken from the Ferguson River must be sold fresh to make the project worthwhile.

In order to begin the Ferguson River operation a total investment of S34,800 is required - $30,000 for boat repairs and S4,800 for the purchase of gill nets. The projected return on

TABLE 15

PRO FORMA INCOME STATEMENTS - WHALE COVE FISH DEALER
SUMMER OPERATIONS

	1988	1989	1990
RECEIPTS			
Fish Sales	$78,932.51	$101,990.51	$121,990.51
-Freight Allowance	$4,820.36	$6,758.36	$8,608.36
Contribution	$25,000.00		
TOTAL	$108,752.27	$108,748.87	$130.598.87
DISBURSEMENTS			
Boat Repairs	$30,000.00	$1,000.00	$2,000.00
Fish Purchases	$28,009.00	$30,209.00	$30,209.00
Labour and Food	$16,560.00	$22,080.00	$29,760.00
Employer's Contributions	$460.80	$614.42	$921.60
W.C.B.	$230.40	$307.25	$460.80
Electrical Hook-up	"$200.00	$200.00	$200.00
Freight	$9,640.?2	$13,516.72	$17,216.72
Telephone	$70.00	$70.00	$70.00
Business Licence	$25.00	$25.00	$25.00
Water	$75.00	$100.00	$125.00
Fuel	$6,380.00	$6,880.00	$7,380.00
Insurance	$1,612.00	$1,612.00	$1,612.00
N.C.P.C.	$2,000.00	$2,200.00	$2,400.00
Nets	$4,800.00	$2,800.00	$2,800.00
Vehicle Deprec.	.....		
Vessel hull	$1,125.00	$1,125.00	$1,125.00
Vessel engine	$3,000.00	$3,000.00	$3,000.00
Truck	$300.00	$300.00	$300.00
TOTAL	$104,487.92	$86,039.32	$99,605.12
NET EARNINGS	$4,264.95	$22,709.55	$30,993.75
OPENING BAL.	$0.00	$4,264.95	$26,974.50
CLOSING BAL.	$4,254.95	$26,974.50	$57,968.25

TABLE 16

PRO FORMA INCOME STATEMENTS - WHALE COVE FISH DEALER
NO CONTRIBUTION
1988

RECEIPTS	
Fish Sales	$78,932.51
Freight Allowance	$4,820.36
Contribution	
TOTAL	$83,752.87
DISBURSEMENTS	
Boat Repairs	$30,000.00
Fish Purchases	$28,009.00
Labour and Food	$16,560.00
Employer's Contributions	$460,80
W.C.B.	$230.40
Electrical Hook-up	$200.00
Freight	$9,640.72
Telephone	$70.00
Business Licence	$25.00
Water	$75.00
Fuel	$6,380.00
Insurance	$1,612.00
N.C.P.C.	$2,000.00
Nets	$4,800.00
Vehicle Deprec.	
Vessel hull	$1,125.00
Vessel engine	$3,000.00
Truck	$300.00
TOTAL	$104,487.92
NET EARNINGS	($20,735.05)
OPENING BAL.	$0.00
CLOSING BAL.	($20,735.05)

BLE 17

PRO FORMA INCOME STATEMENTS - WHALE COVE FISH DEALER - SUMMER OPERATIONS
NO FRESH FISH SALES

	1988	1989	1990
RECEIPTS			
Fish Sales	S52,832.51	$62,840,51	$69,790.51
Freight Allowance	S1,520.36	$1,808.36	$2,008.36
Contribution	$25,000.00		
TOTAL	$79,352.87	S64,648.87	$71,798.87
DISBURSEMENTS			
Boat Repairs	$30,000.00	$1,000.00	$2,000.00
Fish Purchases	$28,009.00	$30,209.00	$30,209.00
Labour and Food	S16,560.00	$22,080.00	$29,760.00
Employer' s Contributions	S460.80	$614.40	.S921.60
W.C.B.	$230.40	$307.20	$460.80
Electrical Hook-up	$200.00	$200.00	$200.00
Freight	$3,040.72	$3,616.72	$4,016.72
Telephone	$70.00	$70.00	$70.00
Business Licence	$25.00	$25.00	$25.00
Water	$75.00	$100.00	s125.00
Fuel	$6,380.00	$6,880.00	$7,380.00
surance	.S1,612.00	$1,612.00	$1,612.00
C.P.C.	$2,000.00	$2,200.00	$2,400.00
Nets	S4,800.00	$2,S00.00	S2,800.00
Vehicle Deprec.			
Vessel hull	$1,125.00	$1,125.00	$1",125.00
Vessel engine	$3,000.00	$3,000.00	$3,000.00
Truck	.s300.00	$300.00	$300.00
TOTAL	S97,887.92	S76,139.32	$86,405.12
NET EARNINGS	(S18,535.05)	($11,490.45)	($14,606.25)
OPENING BAL.	$0.00	($18,535.05)	($30,025.50)
CLOSING BAL.	(S18,535.05-)	($30,025.50)	($44,631.75)

TABLE 18

BREAKEVEN ANALYSIS - WHALE COVE FISH DEALER

	1988	1989	1990
UNIT SALES PRICE	$2.86	$2.41	$2.60
UNIT COST:			
Fish Purchases	$0.74	$0.67	$0.60
Labour and Food	$0.44	$0.49	$0.59
Employer's Contributions	$0.01	$0.01	$0.02
W.C.B.	$0.01	$0.01	$0.01
Freight	$0.25	$0.30	$0.34
TOTAL	$1.44	$1.48	$1.56
UNIT CONTRIBUTION MARGIN	$1.42	$0.93	$1.04
FIXED COSTS:			
Boat Repairs	$30,000.00	$1,000.00	$2,000.00
Electrical Hook-up	$200.00	$200.00	$200.00
Telephone	$70.00	$70.00	$70.00
Business Licence	$25.00	$25.00	$25.00
Water	$75.00	$100.00	$125.00
Fuel	$6,380.00	$6,880.00	$7,380.00
Insurance	$1,612.00	$1,612.00	$1,612.00
N.C.P.C.	$2,000.00	$2,200.00	$2,400.00
Nets	$4,800.00	$1,600.00	$1,600.00
Vehicle Deprec.			
Vessel hull	$1,125.00	$1,125.00	$1,125.00
Vessel engine	$3,000.00	$3,000.00	$3,000.00
Truck	$300.00	$300.00	$300.00
TOTAL	$49,587.00	$18,112.00	$19,837.00
BREAKEVEN VOLUME	35001.32	19485.84	19142.45

this investment is shown in Table 20. Cash inflow has been calculated using only t-nose fish sales that will be the direct result of using the collector boat in the Ferguson River and the disbursements are only those directly related to this portion of the fish dealer's operation.

Because this is the first time that this type of operation has been tried in Whale Cove, it is impossible to predict the amount of risk associated with it. Therefore three different levels of discounting for net present value have been used: 10% (generally acceptable level of return for low risk projects), 15% and 20% (acceptable for high risk projects). A time horizon of three years was used as this is the length of time that it will take to reach full expansion of the operation, at the projected rate of increase.

As seen in Table 20, the net present value is positive at both 10% and 15% rates of discounting, indicating that a positive return on the investment will be seen at the end of the three years. At the 20% rate of discounting, the net present value is negative after 3 years but would be strongly positive after 4 years, which is well within the expected lifespan of the repaired motor. Based on this analysis, the investment would be a sound one.

TABLE 19

BR EAKEVEN ANALYSIS - WHALE COVE FISH DEALER - NO FRESH FISH

	1988	1989	1990
UN I T SALES PP. ICE	$2.09	$1 .43	$1.42
UNIT COST:			
Fish Purchases	$0.74	S0.67	$0.60
Labour and Food	$0.44	$0.49	$0.59
Employer's Contributions	$0.01	$0.01	$0.02
W.C.B.	$0.01	$0.01	$0.01
Freight	.$0.08	$0.08	$0.08
TOTAL	$1.27	$1.26	$1.30
UNIT CONTRIBUTION MARGIN	$0.82	$0.17	$0.13
FIXED COSTS:			
Boat Repairs	$30,000.00	$1,000.00	$2,000.00
Electrical Hook-up	$200.00	$200.00	$200.00
Telephone	$70.00	$70.00	$70.00
Business Licence	$25.00	$25.00	$25.00
Water	.s75.00	Sloe.oo	S125.00
Fuel	S6,380.00	$6,880.00	$7,380.00
Insurance	S1,612.00	s1,612.00	s1,612.00
N.C.P.C.	$2,000.00	$2,200.00	S2,400.00
Nets	$4,800.00	$1,600.00	S1,600.00
Vehicle Deprec.			
Vessel hull	$1,125.00	s1,125.00	S1,125.00
Vessel engine	$3,000.00	$3,000.00	$3,000.00
Truck	$300.00	$300.00	$300.00
TOTAL	$49,587.00	$18.112.00	S29,837.00
BREAKEVEN VOLUME	60704.41	104688.38	154880.21

\BLE 20

RETURN TO INVESTMENT - WHALE COVE FISH DEALER
FER GUS ON RIVER OPERATIONS

CASH INFLOW

	1988	1989	1990
R ECEIPTS			
Fisk Sales	$40,000.00	$60,000.00	$80,000.00
Freight Allowance	$3,700.00	$5,550.00	$7,400.00
TOTAL	$43,700.00	$65,550.00	$87,400.00
DISBURSEMENTS			
Boat Repairs	$0.00	$1,000.00	.$2,200.00
Labour and Food	$16,560.00	$22,080.00	$29,760.00
Employer's contributions	$460.80	$614.40	$921.60
W.C.B.	$230.40	$307.20	$460.80
Freight	$7,400.00	.$11,100.00	$14,800.00
Fuel	$6,130.00	$6,630.00	$7,130.00
Insurance	$1,000.00	$1,000.00	$1,000.00
Nets	$0.00	$2,800.00	$2,800.00
Vehicle Deprec.			
Vessel hull	$1,125.00	$1,125.00	$1,125.00
essel engine	$3,000.00	$3,000.00	$3,000.00
TOTAL	$35,906.20	$49,656.60	$62,997.40
NET CASH INFLOW	$7,793.80	$15,893.40	$24,402.60

NET PRESENT VALUE

Year	Cash Inflow	@10%	@15%	@20%	@20% OVER 4 YEARS
1	$7,793.80	$7,0S4.56	$6,780.61	$6,492.24	$6,492.24
2	$15,893.40	$13,127.95	$12,015.41	$11,030.02	$11,030.02
3	$24,402.60	$18,326.35	$16,056.91	$14,129.11	$14,129.11
	$24,402.60				$11,762.05
PRESENT VALUE		$38,539.87	$34,852.93	$31,651.36	$43,413.41
LESS INVESTMENT		$34,800.00	$34,800.00	$34,800.00	$34,800.00
NET PRESENT VALUE		$3,738.97	$52.93	($3,148.64)	$8,613.41