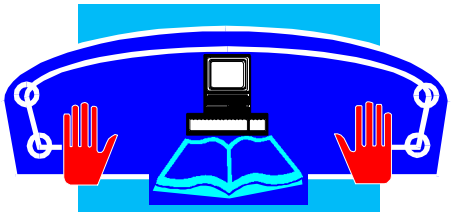

Feasibility Analysis For The Development And Operation Of A Shrimp Fishery In The Hudson Striat - Ungava Bay Region

Type of Study: Plans/strategies Fisheries, Shrimp

Date of Report: 1986

Author: Sea-borne Resources R & D Ltd

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REPORT

ON A

FEASIBILITY ANALYSIS FOR THE DEVELOPMENT AND OPERATION OF A SHRIMP FISHERY IN THE HUDSON STRAIT-UNGAVA BAY REGION

FOR THE

QIQIQTAALUK CORPORATION, N.W.T.
MAKIVIK CORPORATION, QUEBEC
LABRADOR INUIT ASSOCIATION, LABRADOR

MARCH, 1986

(PROJECT NO. 85-01)

Sea-Borne Resources, R&D Ltd.
Fredericton, New Brunswick

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PROJECT PERSONNEL

The following personnel were all members of the project team and provided significant contributions to its progress and ultimate success:

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Since no report is ever complete before it is properly put down on paper, I extend special thanks to those who have provided support services to this project, namely Beverly McDonnell for Journalistic critique and proof-reading, and to Sherry Rose for typing several sections.

Barry C, Jones
Project tlanager, President
SEA-BORNE RESOURCES, R&Il LTD.

1. SUMMARY

The objective of this project was to assess the feasibility of developing a fishery on the striped pink shrimp of eastern Hudson Strait and Ungava Bay for the benefit of the Inuit groups of Baffin Island, northern Quebec and Labrador. The background of previous harvesting attempts has been reviewed, as well as the potential of the resource relative to the extent of biological and catch data. The 750-tonne total allowable catch for the stock southwest of Resolution Island was found to be justified, and the only one suitable for planning purposes at this time.

A harvesting strategy employing the use of a single offshore shrimp factory freezer stern trawler of 40 metres (130 feet) in overall length or greater and having a storage capacity of approximately 250 tonnes has been devised which is equal to the task of harvesting the total tonnage within the ice-free season. Impact of the fishery on other species was not considered to be significant, although monitoring of such potential and catch data should be done during the course of development.

Given the uncertain extent of this essentially unexploited shrimp stock, it does not seem feasible to establish any shore-based processing facilities in the early stages of development, thereby supporting the shipboard factory suggestion, Production should be quality controlled, and discharged in Greenland for transshipment to the European market to maximize vessel fishing time. Although a significant market is developing in the United States for a peeled product, the European market is strongest for the whole-cooked form which is the easiest to produce aboard, and consequently, a safer initial market.

The options for obtaining a fishing vessel as proposed have been examined both logistically and from the financial point of view. Uessel purchase is out of the question financially especially considering the uncertain state of the stock. The only viable solution which would also likely be acceptable to licensing authorities would appear to be some form of development charter in which an increasing participation of Inuit Funds and personnel were employed. At the end of a three-year cash-flow analysis, a favorable cash balance of Just under $1 million is projected, plus total Inuit crew shares of $250,000. An initial capitalization of !3150,000 is suggested as necessary.

A structure for a commercial Joint Uenture Corporation among the aforesaid three Inuit groups is proposed. Formats for a Shareholders' Agreement and a Bylaw No, l'are outlined. A Board of Directors consisting of 11 members, two From each Inuit group, has been designed to secure continuous Inuit control and equal respresentation, any quorum requiring the presence of all. Revenue distribution and development policies and guidelines are proposed far a proper sequential and adequately funded flow of activities. Utilizing the charter form suggested will provide

only a limited number of Jobs directly, From 3 to 7 crewmen and perhaps one office staff during the first three years, not to mention the indirect community spin-off benefits which are outlined. The Corporation will, however, accrue equity toward a possible future vessel purchase and shore-based processing Facility which will entail significantly more Jobs and greater skills. Sources of funding to promote job development and training are outlined.

Licence requirements for the entire operation are discussed and are currently being pursued through Fisheries and Oceans Canada for a shrimp fishery commencing later this year. Charter arrangements must be sought as soon as possible, since any foreign vessel fishing in our waters has to conform to Canadian marine safety standards and needs time For proper outfitting.

The report concludes with suggestions for further work, some of which should be started right away, such as charter negotiations, management input, and design of a catch monitoring program, to ensure fishing activities in 19S6. Other proposals involve expansion of the fisheries resource base for 1987, and a subsequent Feasibility study in 1986 to assess operational options beyond the initial charter stage relative to vessel purchase. Depending on the outcome OF this feasibility study, further effort should be directed toward market development and a computerized system for aligning catch rates with required cash-flow.

2. INTRODUCTION

2.1 Background

With the imposition of a 200-mile fishing zone off Canadian shores. in 1977 came the responsibility, by international agreement, to **manage the harvest of marine** resources , thus enclosed to their fullest extent or allow **access** to foreign fishing fleets. This presented Fisheries and Oceans Canada with a mammoth task in the conservation and management of known fish stocks, and barely any manpower or funding to put toward newer or exploratory fisheries further from traditional harvesting areas, such as the eastern Arctic.

In the late 1960's and early 1970's a valuable shrimp fishery was developing in Ilavis Strait of the eastern Arctic off west Greenland, fished by European factory-freezer trawlers. The newly created fishing zone found part of that fishery in Canadian waters, and pressure was exerted by Canadian industry to gain control of such stocks and promote domestic exploitation. This necessitated some semblance of resource management in the area, the first step being an understanding of stock distribution and abundance, of which little was known. In 1978 Fisheries and Oceans Canada contracted a fisheries consultant to fill this data gap.

The mandate of the study involved an **assessment of the fisheries potential of pink shrimp both in Davis Strait and in** eastern Hudson Strait/Ungava Bay, but included an analysis of all other shrimp and fish species caught. One OF the Findings OF this study was that pink shrimp were largely replaced in the eastern Hudson Strait/Ungava Bay area by a different species, the striped pink shrimp (Pandalus montagui). In fact, the data, limited as it was, even suggested that concentrations of this latter species might approach harvestable quantities in two specific areas -- west of Port Burwell and southwest of Resolution Island.

In response to this opportunity the Inuit of northern Quebec had a feasibility analysis conducted to assess the development potential of a commercial offshore shrimp fishery, to include both pink and striped pink shrimp in Davis Strait and the project area. The study suggested that a viable shrimp fishery could be developed under the right circumstances. They pursued this objective by setting-up a shrimp fishing company in 1979 and chartering two shrimp fishing vessels to commence exploratory and commercial operations the same year; subsequently purchasing an offshore shrimp factory freezer trawler to replace them. In the course of operations, extensive data were collected and analysed on the commercial potential OF the striped pink shrimp, which resulted in the setting of initial Total Allowable Catch (TAC) levels in eastern Hudson Strait and Ungava Bay.

As the development of this fishery began, a period of management difficulty saw offshore trawlers of the northern shrimp fleet enter the area and attempt exploitation of the stocks with little collection of data. As a result, much potentially valuable resource and commercial management information was lost, local employment and involvement was threatened, and the spectre of over-harvesting and possible detrimental ecological impact emerged. Shortly after, this problem began, the Inuit of northern Quebec ceased their shrimp fishery operations. Fisheries and Oceans Canada subsequently closed eastern Hudson Strait and Ungava Bay to the northern shrimp fleet in 1981, tentatively reserving it For fisheries development by local Inuit groups. In that year and the one that Followed, two research cruises were undertaken by Fisheries and Oceans Canada to improve shrimp stock distribution and biomass estimates. There has been no further research or commercial effort in eastern Hudson Strait or Ungava Bay since 1982.

2.2 Project ObJective

Over the past four years of inactivity in eastern Hudson Strait and Ungava Bay, the catch rates of the northern pink shrimp fishery have declined somewhat, prompting members of this fishery to seek out new opportunities. They are now putting pressure on Fisheries and Oceans Canada to explore commercial potential OF shrimp in the proJect area since the local Inuit groups have apparently not been active in such development. The time is thus appropriate to pursue this goal in the light of current economic and political conditions. The proJect obJective "To conduct a feasibility study of developing a shrimp fishery in Hudson Strait and Ungava Bay" (Fig. 2.1) is therefore timely in order to direct possible benefits to Inuit communities, or risk the possibility of loss to the northern shrimp fleet.

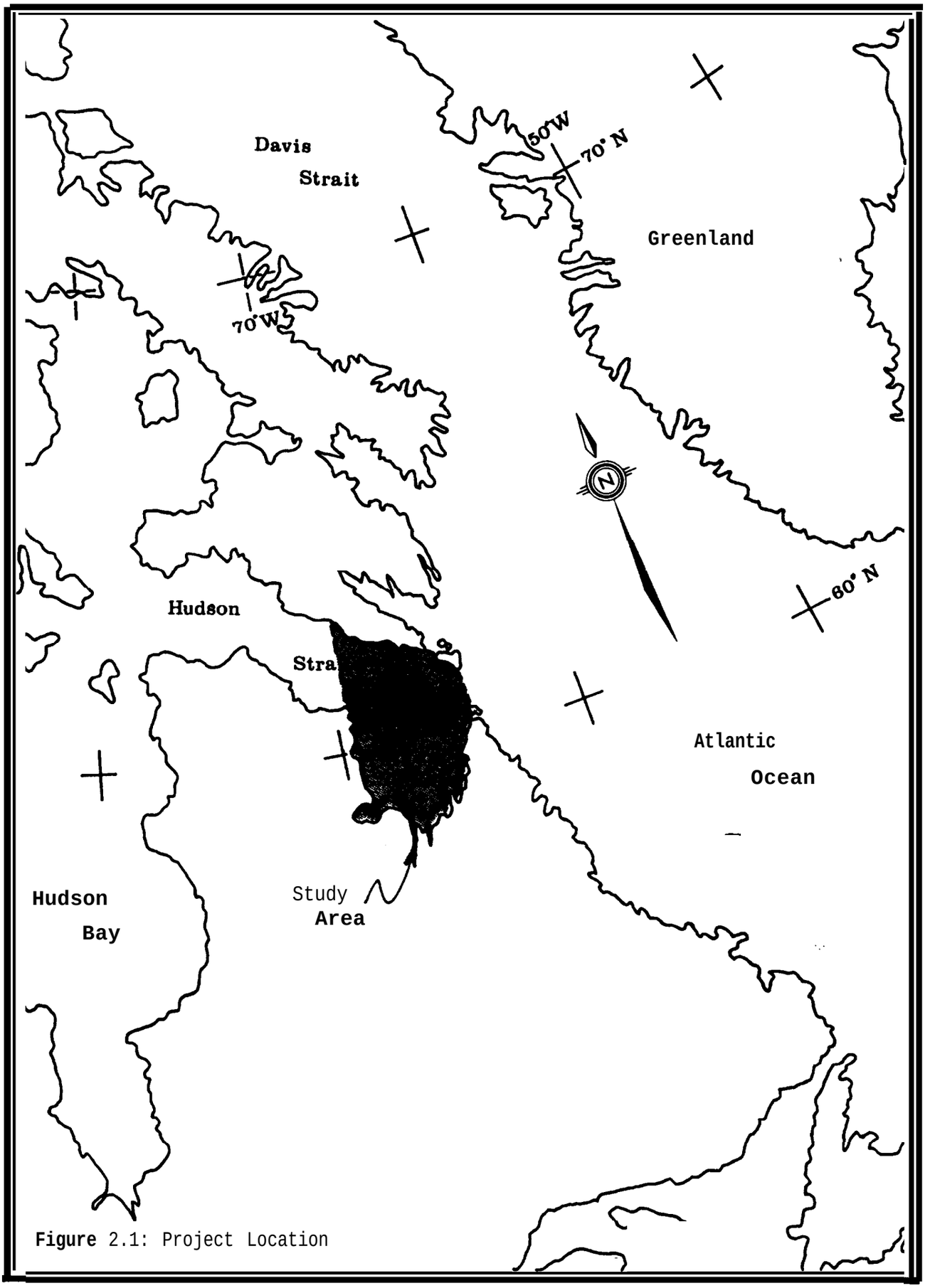

Figure 2.1: Project Location

3. RESOURCE POTENTIAL

3.1 Stock Assessment

The Ungava Bay and eastern Hudson Strait region has only within the last decade had any serious consideration given to offshore fisheries development on shrimp stocks even though Templeman and Squires (1960) and Squires (1965) noted a moderate abundance of striped pink shrimp (Pandalus montagui) in the central area of Ungava Bay. From 197B to 1982 several research and commercial vessels conducted exploratory/experimental Fisheries for this species in the area, and two potentially commercial concentrations were located. The catch history of all such effort has been summarized in Table 3.1. The relevant data on these will be discussed in the appropriate research or commercial sections below, but earlier and lesser important fishing effort is recorded in Appendix A for background information.

3.11 Research Data

Although Dunbar (1970) expressed the opinion that the potential for commercial exploitation of shrimp in **Ungava Bay and the surrounding** area was doubtful, two vessels conducting exploratory fisheries recorded striped pink shrimp catches in the vicinity of 0.14 t/hr for the area west of Resolution Island in 1978 (Fig. A1 & A2), Similarly, 40 nautical miles west of Killiniq Island the same year, one of these vessels also recorded a catch OF 0.51 t/hr (MMI, 19791. Since mean commercial landings approximate 0.29 t/hr for pink shrimp in the Davis Strait (Table 3.2), such catch rates showed some promise for commercial exploitation. For this reason, in 1979 a combination research and experimental commerial fishery For shrimp in this area was undertaken. During the research component (Fig. A3), the existence of the two areas of concentration were verified, with even higher catch rates than before, as well as suggesting other promising locations far further study. In 1981 and 1982 Fisheries and Oceans Canada conducted exploratory research cruises into the two areas (Fig. 3,1, A5 & A6) recording mean catch rates for Hudson Strait of 1.09 and 0.47 t/hr respectively (Table 3.1), but significantly lower in Ungava Bay giving rise to some doubt as to the potential for the latter location (Parsons et al, 1983). The catch potential for southwest of Resolution Island was determined to be even greater than previous estimates.

3.1? Commercial Effort

The only commercial shrimp fishery in Ungava Bay and Hudson Strait occured in 1979 and 1980. Catch rates were significant in both locations in both years (Table 3.1). In 1979, the commercial component of the combination cruise noted above landed 88 tonnes of shrimp, mostly from the Hudson Strait location (Table 3,1, Fig. 3.2 & 3.3). In 1960 there were more vessels, which recorded a total catch of about 200 tonnes, again

Table 3.1: Catch History (per vessel) for Ungava Bay - Eastern Hudson Strait.

Source	Year	Mean Catch Rate (t/hr)	Total Catch (t)	Total Time (hr)
UNGAVA BAY	1978	0.06	0.26	4.0
Research	1979	0.04	2.20	52.0
		0.07	0.90	13.0
Directed Research*	1981	0.12	3.86	31.5
	1982	0.03	0.50	17.7
Commercial	1979	0.36	24.38	67.1
	1980	0.46	49.57	107.0
HUDSON STRAIT	1978	0.02	0.12	5.0
Research	1979	0.01	2.00	42.2
Directed Research*	1981	1.09	6.60	6.1
	1982	0.47	15.42	32.6
Commercial	1979	0.28	63.95	230.7
	1980	0.10	2.14	17.0
		1.33	59.19	44.6
		1.74	91.50	52.7

* Directed research focused on identified commercial areas only.

Table 3.2: Comparative Canadian Pink Shrimp Catch Rates In Davis Strait (tonnes/day)

Source	1981	1962	19s3	1984	1995	tlean
Domestic Fleet	4.6	5.9	3.9	4.5	5.4	4.6
Foreign Charters	5.0	?.0	5.6	5.s	6.1	6.1
tlean	5.1	?.1	4.6	5.2	5.9	5.4

** Given a mean tow duration of 3.5 to 4 hours, separated by one-hour haul and shoot periods, then the gear is typically on the bottom for approximately 18.5 hours per day. At a mean catch level of 5.W tonnes per day as above, the catch rate for standard commercial gear i's therefore calculated to be 0.29 t/hr.

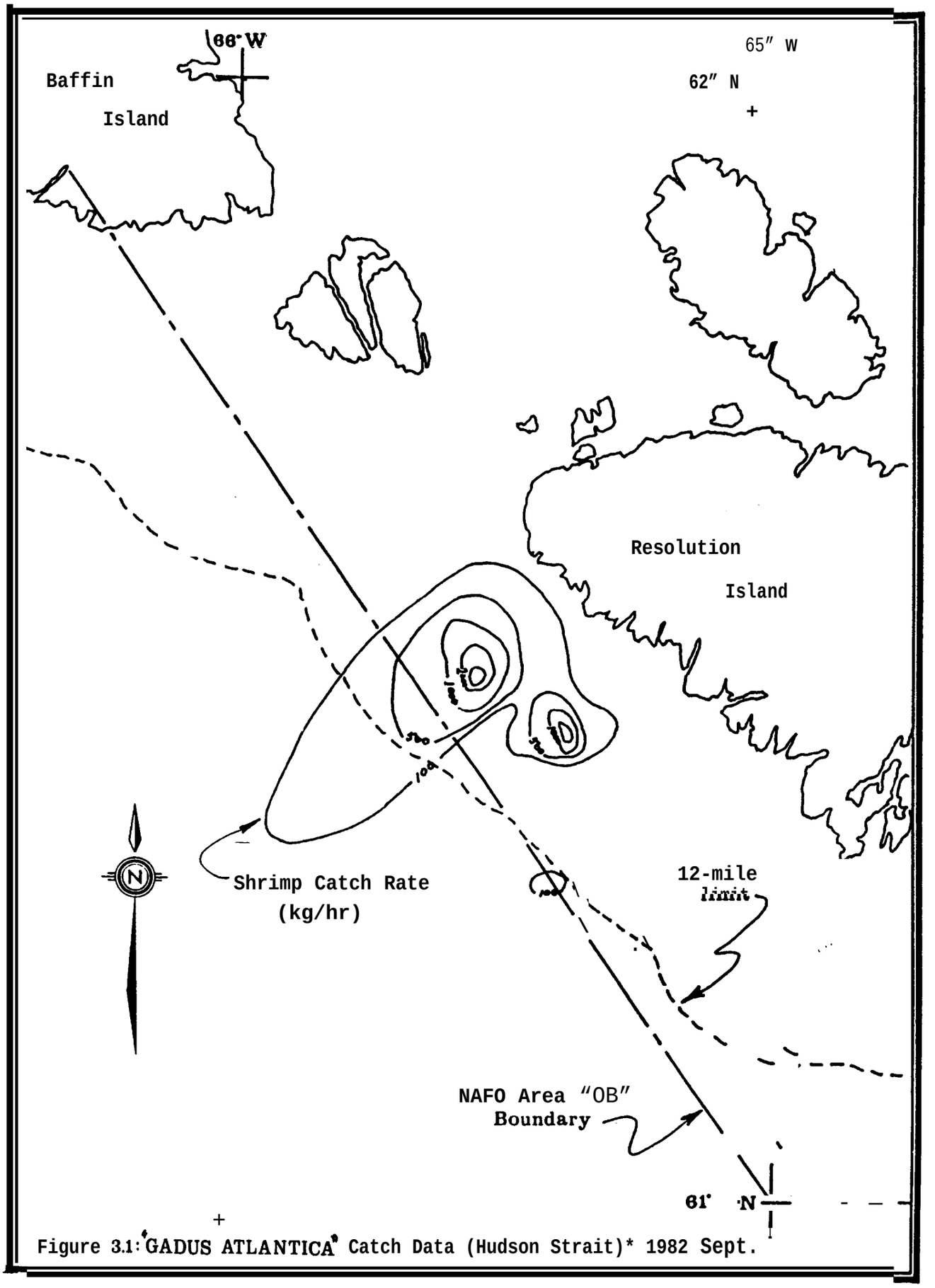

Figure 3.1: 'GADUS ATLANTICA' Catch Data (Hudson Strait)* 1982 Sept.

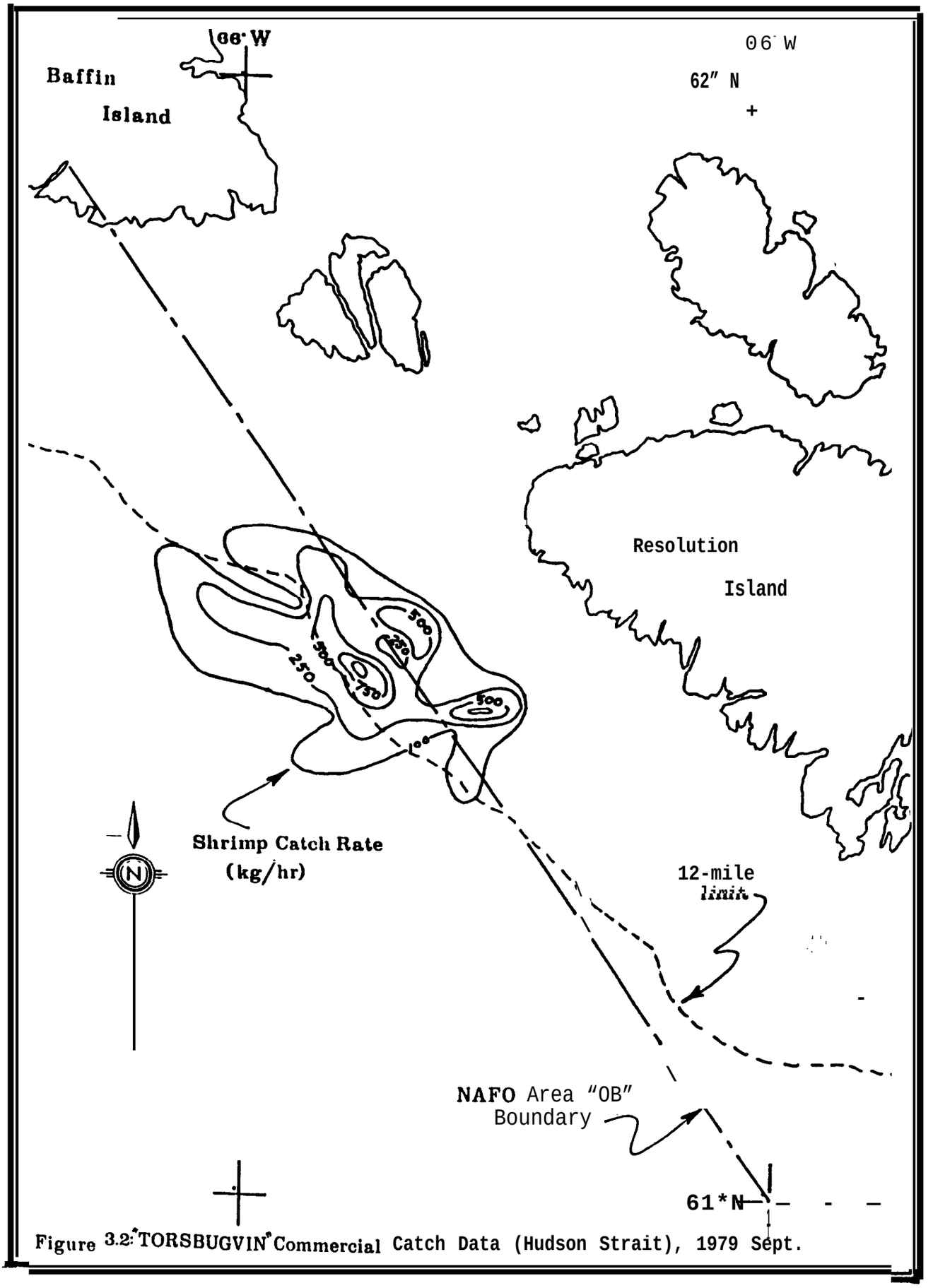

Figure 3.2: TORSBUGVIN Commercial Catch Data (Hudson Strait), 1979 Sept.

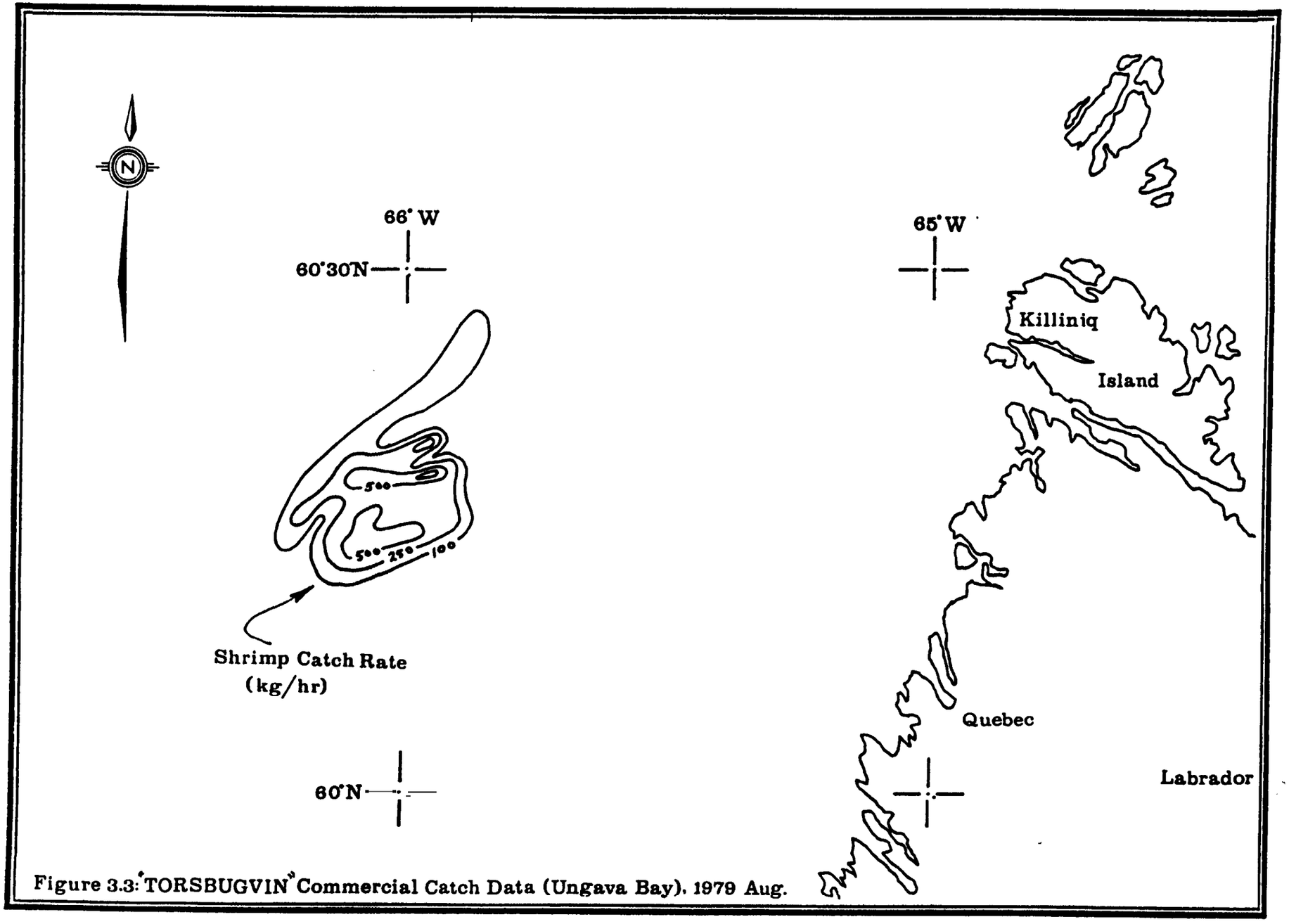

Figure 3.3: "TORSBUGVIN" Commercial Catch Data (Ungava Bay), 1979 Aug.

primarily from the Hudson Strait. Catch rates were most promising in the Hudson Strait area at well over 1 t/hr, more than double those off Killinig at Just less than 0.5 t/hr. The latter are still promising though, and Justify further exploration.

3.2 Quota Recommendations

Stocks of the striped pink shrimp in eastern Hudson Strait and Ungava Bay have been divided into three distinct groups for management purposes based on apparent geographical segregation and the availability of data, These locations are those mentioned earlier, off **Resolution and** Killiniq Islands, and the third **being** collectively all the rest of the study area. Available data only allow calculations of biomass estimates for the two known concentrations . The first estimates were based on catch data recorded aboard the **IORSBUGUIN in 1979** (Table 3.3), and suggested a stock of **2428 tonnes** off Resolution Island and **1468 tonnes** off Killiniq Island (Parsons et al, **1981a).** Using a **25%** sustainable yield harvesting strategy as derived for other virgin stocks of shrimp, potential, yield for these regions could well be 621 and 367 **tonnes respectively.** However, since these stocks were practically unknown, the catch data were weak, biological information poor, and there were local fears of possible detrimental impact on other species in the area, the first total allowable catches (IAC) set by Fisheries and **oceans Canada were significantly below these** levels at 100 tonnes for each of the three areas as a precautionary **measure.** These **IAC's** were in effect from 1960 to 1982. After the more extensive research cruise of the **GADUS AILANTICA** in 1982, the new **data collected suggested an** increase in biomass off Resolution Island to 6617 **tonnes and a decrease** off Killiniq Island to **451 tonnes.** The new yield level for Hudson Strait **was** changed accordingly to 875 **tonnes, with an increase** in IAC set at the **conservative lower level of confidence of this estimate at 750 tonnes. This new IAC has been in** effect since **1983. The new biomass** level for **Ungava Bay, although** possibly erroneous since their **catch pattern seems to be too far east of previous sampling areas, would** still suggest a IAC of Just over 100 tonnes, and therefore, **no change** from the current level. The 100-tonne general IAC for areas other than these two also remains in effect. At this time, **all IAC's** are realistic relative to the available data, **With renewed and** properly recorded fishing effort in the study region, the biomass estimates can and should be refined, and new IAC levels can be set as required.

3.3 Fishery tlanagement

Fishing for the striped pink shrimp in eastern Hudson Strait and Ungava Bay has only recently been covered by specific Fisheries and Oceans Canada regulations (Sect. 3(1) & Schedule I of Appendix B); the shrimp being covered within the general context of all Pandalus species. For management and statistical purposes, zones for shrimp fishing have been identified (Sect.72 & Schedules XUII & XUIII). The proJect area falls within shrimp

Table 3.3: Commercial Shrimp Fisheries Potential Of Ungava Bay And Eastern Hudson Strait.

Sources	Area Southwest of Resolution Island	Area West of Port Burwell
TORSBUGVIN (1979)		
Biomass	2428(1916-3049) t	1%66(1166-1769) t
Potential Yield*	621(479-762) t	367(292-442) t
TAC Set, 1990-S2	100 t	100 t
GADUS ATLANTICA (1982)		
Biomass	6617(2530-10704) t	451(240-662) t
Potential Yield*	875(750-1000) t	--
TAC Set, 1983-85	750 t	100 t

* Typically based on 25% harvesting strategy far virgin stock,

zone "1", which also includes the waters of Davis Strait. The closed time regulation is just a formality at this time in that an open season currently exists, but if closure becomes necessary, then the means to do so is already in place.

In order to participate in this shrimp fishery, a set licence fee is payable to Fisheries and Oceans Canada. The fee has been set at, S2000 per year for vessels 30.S to 45.7 metres (100 to 150 feet) in overall length (Schedule 11), a size that is considered appropriate for this species. Uessels of greater length would be charged S2500; vessels smaller S200,

For conservation purposes, there is a restriction on fishing gear mesh size to allow the smaller immature shrimp to escape and contribute to stock reproductive potential. The minimum mesh size that can be used at this time is 40 mm, measured knot-to-knot when stretched (Sect. 73).

With offshore fisheries, especially foreign charters, Fisheries and Oceans Canada reserves the right as a condition of licence to put an observer aboard each vessel for purposes of checking adherence to regulations and monitoring of catch (Sect. 103). This has often been applied in the northern shrimp fishery, and in Fact, should be a welcome addition as a show of good faith. It does, however, entail the provision of Food, accommodation, and working space (Sect. 104 & 105). In the development of this fishery, an arrangement could probably be worked out with Fisheries and Oceans Canada for the observer to collect other catch data as might be desirable to the potential Joint venture in assessing the feasibility of operations.

Upon examining the resource data in detail, it became apparent that problems might exist in the regulations relative to harvesting the stock southwest of Resolution Island. Uessels of the northern shrimp fleet which were previously permitted to fish far shrimp in Davis Strait were assigned access to N.A.F.O. area "O" CSchedule III). However, the southwest boundary of this area falls within eastern Hudson Strait, and even subdivides the striped pink shrimp stock (Fig. 3.1 & 3.2), thereby technically allowing access of this fleet to these shrimp, even though the Hudson Strait area was classified as off limits to the fleet. The new shrimp zones (Schedule XUII) go further and even eliminate this boundary such that access would appear to be even more available to the northern fleet. This possible conflict must be resolved if the shrimp stock in question is to be properly developed for local economic benefit. Representations to Fisheries and Oceans Canada have already been made in this regard, and we are assured that this can be overcome,

To further complicate matters, the shrimp stock southwest OF Resolution Island is also subdivided by the twelve-mile limit (Fig. 3.1 & 3.2) established by the Fisheries Act as inshore waters and thereby not accessible to vessels larger than 19.8 metres (65 feet) in length using otter trawl gear, which is the type employed in shrimp fishing (Sect, 51(3)). Fisheries and

Oceans Canada have also been contacted in this regard, and have pointed out that there is provision in the Act (Sect. 51(4)) which allows the Federal tlinister of Fisheries to grant special exemptions to the twelve-mile limitation. It has been suggested that this would not be a problem in the project area, given its remoteness from tradional southern fishing areas for which the regulations were originally derived.

3.4 By-Catch

Shrimp catches in Ungava Bay and eastern Hudson Strait are reported to be quite free of other marine species caught incidentally. Where a bU-catch occurs, it is usually small relative to the amount of shrimp present, averaging about 1 to 30 percent of the catch (MMI, 1978b; Parsons et al, 1993). The main species caught with shrimp are Greenland halibut, Arctic cod and thorny skate (Allard, 1900; Parsons et al, 1981b & 1983). Some wolffish, roughhead grenadier, cod, American plaice and redfish also occur, but in still lesser quantities. Of the bU-catch, Greenland halibut is most prevalent and might well become a marketable species someday (Allard, 19s0). Based on this admittedly limited information, by-catch of other species does not appear to be a problem, but should be monitored in any shrimp fisheries development activity in the area to minimize possible detrimental impacts.

q. HARVESTING STRATEGY

4.1 Operational Limitations

Fishing in Hudson Strait and Ungava Bay is very much controlled by the weather/climate and currents/tides of the area, and as such, must be understood to appreciate in what' way harvesting strategy must be adapted to these particular circumstances.

9.11 Weather/Climate

The prime influences **on Fishing operations** from weather and climate are associated with winds and ice. The ever-present Arctic air mass maintains an intense low pressure system in the area, although somewhat less severe in the summer months (Bryson and Hare, 1974; Maxwell, 1990). This system results in average wind speeds OF between 29 to 36 km/hr with summer winds increasing by 30 to 40 percent (Drinkwater, in press). Such wind speeds can cause high waves making the handling OF gear and trawling difficult and slowing operations to **a** degree dependent upon the size and power of the vessel used.

More important is the overall impact OF ice conditions, which in Hudson Strait are dependent upon atmospheric circulation (Catchpole and Faurer, 1903; Crane, 19761. Usually in late October the ice From Foxe Channel starts to move eastward down into western Hudson Strait, Finally covering the entire strait by late November to early December (Catchpole and Faurer, 1983; Drinkwater, in press). At the same time, ice Forming off eastern Baffin Island moves westwards into the strait, completing its occlusion. In Ungava Bay, Freezing begins along the shoreline in November, spreading outward to meet the ice of Hudson Strait (Drinkwater, in press).

In flay the ice starts to break up, and by July only pack ice remains, mostly in LJngava Bay and the southern part of Hudson Strait, which is gone within weeks (Catchpole and Faurer, 1963). The ice free season in Ungava Bay and eastern Hudson Strait is, therefore, typically from mid-July to mid-November, a period of four months in which shrimp Fishing can be conducted unhindered by ice.

4.12 Currents/Tides

During the ice-free season when a fishery can be conducted, vessels must contend with currents resulting from both the flow of large water masses and the tidal cycle. We will not try to distinguish between these in this section, but simply deal with the impact of current strength and direction generally.

Since the early visitors to Hudson Strait, strong currents have been recorded by these and other people working in the area (Catchpole and Faurer, 1903; Drinkwater, in press;

Dunbar, 1958; MMI, 1978a; MMI, 1979; LeBlond et al, 1961; Osborn et al, 1978). These currents have been measured at from 3 to 6 knots in the vicinity of the Gabriel and Hudson Strait Junction, and between 3 to 4 knots at the eastern mouth of Hudson Strait as it joins Davis Strait.

Surface circulation in Hudson Strait can be divided into three parts: first, a current Flowing northwesterly along southern Baffin Island which is robably part of the Baffin Current (Iselin, 1927; LeBlond, 1%0); a second one From Hudson Bay going southeasterly along the Quebec coast and Ungava Bay <some of it entering the Bay) and Joining Davis Strait at Killiniq Island; and the last current flowing across the strait (in the eastern part) from Baffin Island toward Ungava Bay. It appears that the bathymetry (bottom contours) controls the splitting of the Baffin Current around Resolution Island and through Gabriel Strait, which helps to explain the cross-channel current in this area (Smith, 1937; Kollmeyer et al, 1967; LeBlond et al, 1901; Sanderson and LeBlond, 1984). This current split, in conjunction with the opposing Hudson Bay outflow and a possible interaction due to the saltier, more dense nature of the Baffin Current, may account for the confused state of water movement at the mouth of Hudson Strait as it enters Davis Strait (Campbell, 1959; LeBlond et al, 1981).

The currents in Ungava Bay range from 1 to 2 knots throughout the bay and to 3 knots in the shallower areas mostly around the mouth (Drinkwater, in press; Osborn et al, 19781. There is very little information about circulation in Ungava Bay, but from observing drifting ice, tlecking (1906) showed that the surface waters came from the Hudson Strait entering the bay between mainland Quebec and Akpatok Island, and flowed cyclonically around the bay to exit at Killiniq Island. llunbar (19581 also noted this circulation pattern in Ungava Bay, but suggested that the Hudson Strait waters entered from both sides of Akpatok Island.

These data indicate current strengths of 3 to 6 knots in the areas southwest of Resolution Island and west of Killiniq Island that are identified as having shrimp concentrations, Vessels fishing these stocks must have sufficient power not only to tow a trawl, but also to do so possibly full against such currents. To add to these difficulties, the data published to date fail to describe the extreme current situation in deeper waters which is, however, well known to offshore fishermen and others who have worked in the area. Among the problems that such strong sub-surface currents create is, for example, the situation in which the trawl is found to be towing sideways off to one side of the vessel, and obviously not Fishing effectively. Fishing vessels of adequate size and power are thus essential for effective operation in the prOJeCt area.

4.2 Fishing Equipment

The type, size and number OF vessels necessary to carry out an efficient shrimp fishery in eastern Hudson Strait and Ungava Bay, assuming adequate catch rates and quota, must be evaluated in light of the following characteristics:

(a) Processing and marketing strategy
(b) Distance from base of operations
(c) Size relative to weather potential and working space
(d) Power relative to maximum currents and depth
(e) Catching and processing capacity relative to season

These topics are discussed in an integrated manner among the other parts of this section rather than individually.

4.21 Uessel Specifications

The stocks of striped pink shrimp in the project area inhabit waters 348 metres (1142 feet) in average depth west of Killiniq Island and 269 metres (883 feet) southwest of Resolution Island. At such depths, only the largest of the inshore vessels could likely trawl for them, vessels of 19.0 metres (65 feet] in overall length. The strong surface currents and possibly high winds would verify this minimum size in terms Of marine safety. However, the strong surface and sub-surface currents would likely be far too much for such a vessel to fish with any degree of efficiency, a size greater than 30.5 metres (100 feet> with twice the main engine power being more necessary.

To Further assess vessel appropriateness, we must now consider the processing and marketing strategy; how and where to process the catch, store it, and transport it to a point of sale. The First step is to examine the potential market as reviewed in Section 7 of this report. It is recommended therein to start development of this fishery through the European market which is currently concentrating on a high quality, cooked, shell-on, frozen product, where the shrimp are processed while still alive such that the flesh remains firm in texture and tightly coiled. In order to attain this goal, the shrimp must be processed, aboard the vessel to the market-ready packaged form, thus the vessel must be a shrimp factory freezer trawler.

Since the project area is remote from normal sources of supply and markets, the fishing vessel must be much more self-sufficient than the ordinary trawler, being purpose-built for long-range operations. As such it should have a reasonably large fuel capacity, In addition, because it will function in essentially Arctic waters, it should also be more ice-strengthened, and have better crew accommodations and facilities than the average fishing vessel for the long periods the vessel must remain at sea. Incorporating such characteristics with adequate processing space, freezing capacity and storage suggests an even larger vessel than previously indicated, more likely one greater than 40 metres (130 feet) in overall length, such as are

employed in Canada's northern shrimp fishery. A shrimp factory freezer stern trawler of this size would likely have storage capacity for approximately 200 to 250 tonnes of frozen packaged shrimp.

4.22 Fleet Structure

Given the total allowable catch in eastern Hudson Strait of 750 tonnes for 1986 as indicated in Section 3.2 of this report, a vessel of the recommended size and catching capacity could take 33% (250 tonnes) of this amount in one trip. Under this scenario, one, two, or even three vessels could be used. However, the complexities of arranging and operating such vessels would certainly suggest the employment of only one vessel taking several loads. This operation might well conform to the following schedule:

			Landings
Trip 1:	Fishing time @ 7.8 t/d	32 days	250 t
	Steaming & offloading (Greenland)	6 days	
	Weather loss (10%)	4 days	
	Subtotal	42 days	
Trip 2:	Fishing time @ 7.8 t/d	32 days	250 t
	Steaming & offloading (Greenland)	6 days	
	Weather loss (10%)	4 days	
	Subtotal	42 days	
Trip 3:	Fishing time @ 7.8 t/d	32 days	250 t
	Weather loss (10%)	4 days	
	Subtotal	36 days	
	Totals	120 days	750 t

This distribution of time corresponds with the four-month (120 day) ice-free season, and accounts for the full 750 tonnes of shrimp available. It-does, however, have two caveats; firstly, that daily landings attain 7.B tonnes per day, and secondly, that steaming time for offloading is minimized,

As for the daily catch level, estimates of 20 to 30 tonnes per day are suggested as possible by the limited data available as noted in the tables of Section 3, but these are not likely on a sustained basis and may in fact be more of a problem than a blessing in that processing capacity of the vessel might well only be 15 to 20 tonnes per day. More realistically one could expect landings in the order of 5.5 to 7.8 tonnes per day as for pink shrimp in the Ilavis Strait. In this projection we have selected the higher catch rate since this shrimp is an unexploited stock in comparison, and one which will typically only stabilize at a lower than initial catch rate under a sustained Fishery,

With regard to steaming time for offloading, various destinations can be considered relative to the project area either as transshipment points or as final markets as follows:

	Steaming	Offloading	Distance
Greenland.	4 days	2 days	450 n. miles
Halifax.	10 days	2 days	1300 n. miles
Europe. ,... , ...	19 days	3 days	2500 n, miles

In order to minimize steaming time as required for the above projections, we have utilized the turn-around time for Greenland, which is a transshipment point for European markets. The final load would be taken directly to a market destination,

In summary, the recommended fleet structure for at least the First year of **development of this shrimp stock would be Just the use of one vessel of adequate catching, processing, and storage capacity to meet the schedule suggested.**

4.23 Gear Technology

The fishing gear used by vessels of this size **are all** relatively similar in that they are typically otter trawls having large rollers on the footrope, half-metre chains to the fishing line in order to minimize by-catch of bottom fauna, and a high-lift headline to maximize catch of shrimp rising in the water column. The common ones employed are the Sputnik 1600 and 1800, and the Kalut, the codends of which must all have a minimum mesh size of 40 mm for the escape of **immature shrimp as noted in Section 3.3 of this** report. These nets are also similar in size despite some difference in length of vessel, depending more on the available towing power or shorter tows. Catching capability seems to depend more on the experience of the **captain than on design** differences.

4.3 Obtaining Vessels

4.31 Chartering

The least expensive means of obtaining a fishing vessel to harvest this stock is through chartering, paying for Just the landings or vessel time with or without crew as required. Typically most or at least some of the regular crew who are familiar with the vessel remain aboard. Most recently, shrimp factory freezer trawlers have been more likely available for charter among the European nations which were involved with the development of offshore shrimp stocks prior to the advent of 200-mile sovereignty zones. The institution of the latter led to the exclusion of some vessels From traditional harvesting areas, and consequently to excess fleet capacity which was then put up for sale or charter. Such vessels may still be found in Norway, WeSt Germany, Denmark, Faroe Islands, and Iceland. The Canadian northern shrimp fleet is made up almost exclusively of vessels

From this source, but it is unlikely that any would be interested in a charter since the fishing season for the proJect species would coincide with their own shrimp operations. Given the proximity of the Greenland transshipment paint, the circumpolar Inuit connection in that country, the Arctic fisheries experience of its fishermen, and its duty–free access to European markets, serious consideration should be directed toward a charter from Greenland as the preferable alternative if one can be found>

4.32 Purchasing

Acquiring a vessel of the size suggested above through purchase may be done either second-hand or as a new-building, and is a very significant financial commitment in either case, being in the order of $5 to 10 million respectively. Servicing this debt load would certainly require full-time operation of the vessel in a viable fishery. Used vessels may be available in Europe as indicated in the previous section, but would definitely need some degree of modification to meet Canadian marine safety standards, an expense factor which must be kept in mind in purchase negotiations, Having a vessel built to specifications is ideal in that it eliminates potential unknown problems and is designed to suit both the particular target harvesting conditions and Canadian standards. However, it is twice as expensive and not likely the avenue to commence a seasonal, undeveloped fishery. In the purchase of new or used vessels, one should consider export financing availability in foreign countries. It may well be that it is less expensive to purchase a vessel in Europe than in Canada, since a number of countries subsidize their ship-building industries for export purposes to develop foreign exchange reserves.

4.4 Ecological Impact

— Significant concern in regard to harvesting striped pink shrimp in the proJect area has been expressed relative to any potential detrimental impact on subsistence hunting and fishing species. Examination of the published literature and discussions with relevant scientists working on species in the area have shown no clear connection between this shrimp and other species present, although a divergence of opinion certainly exists.

Among marine mammals, narwhal stomachs have been found to contain some shrimp remains, but these have been mostly from pelagic shrimp. Their main diet appears to be squid and fish. The diet of Beluga or white whales is very similar (Winn and Olla, 1979), Bearded seals appear to be the main seal species to take shrimp, although occasional shrimp remains have been recorded in stomachs of harp, harbour and ringed seals. However, the main diet of seals appears to be either smaller crustaceans or fish, Walruses are not known to feed on shrimp, at least not on the striped pink shrimp. None of the distribution of marine mammals appears to coincide with the known locations of shimp concentrations,

Few Fish in the project area are known to consume shrimp, although some were found in the stomachs of Arctic cod and Greenland halibut. Although the latter are widely distributed, some concentrations were Found to overlap with those of the striped pink shrimp. Such an overlap might well be expected since the Greenland halibut feeds on many species and thereby would be likely to eat any abundant smaller species. This type of relationship usually means that should the population of the smaller species diminish, the larger would switch feeding habits on to another species. This switch is as likely here as with the marine mammals which might feed on "shrimp-eating" fish. Normal distribution patterns of other fish are not particularly coincident with these shrimp.

The marine birds in the area, such as thick-billed murres and guillemots, do not appear to eat shrimp. Thus, any shrimp remains found in the stomachs of these species would likely be incidental, and of little real consequence.

In conclusion, any harvesting of the striped pink shrimp populations in Ungava Bay and eastern Hudson Strait would not likely have any adverse effect upon the other marine species in the area as the shrimp do not appear to be a major element in these animals' diets. It would, however, be prudent to maintain an awareness of any possible impacts on such species during the development of such a shrimp fishery through opportunistic stomach analysis and observed population changes.

4.5 Catch Monitoring

The development of a commercial shrimp fishery in eastern Hudson Strait and Ungava Bay at this time would be done on a very limited information base. Since the obvious objective of this venture is for long-term management, the collection of sound catch data in order to accurately assess stocks is essential.

The necessary information all relates to catches on a tow by tow basis and can be divided into two parts, one from the wheelhouse and one from the deck, which must be integrated to be of any value. Such data is as follows:

From wheelhouse - Date of tow
Position of set and haul
Time of set and haul (on bottom)
Depth of set and haul
Type of gear used

From the deck - Weight of shrimp catch
Size distribution OF shrimp
By-catch weight per species

Such data will allow calculation of the bottom area swept by the net, and thereby an indication of the density and biomass of shrimp and other species in a specific location. On a long-term basis, it would show changes in biomass and distribution.

5. PROCESSING FACILITIES

S.1 Shore Plant

At the first stage of developing a striped pink shrimp fishery in eastern Hudson Strait and Ungava Bay, the possibility of processing facilities ashore cannot be entertained because they are very costly to put in place and operate, especially in this remote project area and for seasonal operation only. In addition, such a move may be contrary to the best market orientation for this species at this time, which appears to be in a Form requiring live-cooking that must be done at sea. When a peeled or canned product is planned, which is more likely to utilize shore processing facilities, the feasibility and economic contribution should be considered in determining an appropriate location.

S.2 Shipboard Factory

The normal shrimp factory freezer trawler has sufficient equipment to process the catch to the packaged market-ready stage. The catch is normally dumped from the net into a large tank accompanied by a fair amount of water, where they are held alive until they are processed. From this tank they are put through graders, normally to yield three size groups which are then stacked on separate racks to await cooking. Each group is fed through the cooker, drained, weighed, and packaged typically in 5 kg boxes. These boxes are strapped and marked, and put into a blast freezer before storage in the refrigerated hold. There are some variations on this method, such as the IQF (Individually Quick Frozen), where each shrimp goes through a freezing tunnel and may be glazed before packaging and storage. These methods yield a whole-cooked, frozen product.

Some of the larger vessels grade to additional size groups, and employ peelers and vacuum packers. Such vessels can cater to a greater range of market demands with less waste, in that the smaller shrimp which might otherwise go through tha graders and be washed overboard are saved and put through the peelers. To operate a factory of this size and complexity requires being in constant contact with world market demand to orient the product mix to strong markets or ones on the up-swing.

5.3 Quality Control

Canadian shrimp products have at times been suggested to be of poor or variable quality. Most producers do not accept this designation, but it is known that some poor product has reached the European market, and this is an image that must be overcome. Consequently it cannot be over-emphasized that production be of a uniformly high quality. To accomplish this objective, landings must not exceed processing capacity, processing must be without delay before the shrimp die, and factory control and sanitation standards must be maintained.

6. TRANSPORTATION AND STORAGE

Under the suggested initial operational method of utilizing a solitary shrimp factory freezer trawler to harvest and process the striped pink shrimp stocks in the project area, the product would be retained aboard in freezer storage until the hold is full. The options then exist of either steaming to and discharging at a transshipment point or taking the load directly to some market location.

6.1 Direct Sales

Transporting a load of shrimp directly to a point of sale should be a decision based on a financial assessment of maximized fishing time relative to vessel investment, transshipment costs, and market fluctuations. Logistic and quality impacts would also be considered. In the one-vessel scenario noted above, tha last trip would almost certainly be direct to market; the vessel may be heading in that direction anyway. The choice thus remains as to the course of action For the first two loads. Under some circumstances there may be no choice, such as where freezer storage at a transshipment point is full. When the direct sales route is taken, it usually involves greater coordination of vessel activities and consideration to crewmen for lost fishing time. Overall finances would likely show that maximizing fishing time would be the most profitable course OF action,

6.2 Transshipment

In order to qualify as a significant transshipment facility, the port in question must have adequate discharging equipment, sufficient freezer storage capacity, and the infrastructure to process the interchange. The closest such port to the project area lies in Greenland, Just two days steam away. To maximize the fishing time of the suggested vessel schedule proposed in Section 4 of this report, Greenland has been used for this purpose. The services OF a shipping agent in Greenland would be essential, and have been allowed for in the financial projections of Section 9 of this report, Although some facilities exist along the north Labrador coast, they would be grossly inadequate in their current state to service the catch OF a vessel such as this.

7. MARKETING

7.1 The Global Situation

The annual world production of shrimp is estimated to be 1.4 million tonnes, which includes warm and cold water species as well as those raised by mariculture. Cold water shrimp or prawns comprise 14% of the total or approximately 195,000 tonnes of product (Table 7.1), up significantly over the past five years. Major producers of cold water shrimp are Norway, Greenland, Iceland, Canada, and the United States. The U.S.S.R. is also a large producer, but data on landings are not available at this time.

Norway is estimated to have produced 88,000 tonnes of shrimp last year, by far the greatest amount by the producing nations, and more than doubling its landings since 1901. Iceland has shown a similar dramatic increase in production over this period. Greenland is the second largest producer, but landings have remained relatively stable over the past five years. The United States landings have dropped to less than half their former levels, but all on the Pacific coast while the Atlantic region improved slightly. Canadian production, which is entirely from the Atlantic coast, has remained nearly stable at a mean 13,000 tonnes annually, and has surpassed that of the United States in recent years. Of our landings on a provincial basis CTable 7.2), Canadian-owned shrimp vessels accounted for more than 10,300 tonnes in 1985, the rest being taken by foreign charters which did not land their catches in Canada. In the past three years, Quebec has been the prime producer, followed by Newfoundland.

7.2 Current Product Expectations

All of the shrimp produced in Canada at this time are tba pink shrimp (Pandalus borealis). The Hudson Strait and Ungava Bay stock under consideration in this prOJeCt is the striped pink shrimp (Pandalus montagui), a cold water species which is essentially not commercially produced, and in consequence, for which little or no market data exist. ThereFore, for purposes of this analysis, the nearest relative both in appearance, form and iocation, the pink shrimp of Davis Strait, which should command the same market price, is examined.

Current Canadian exports of shrimp (Table 7.3) total 3000 tonnes of product valued at $20 million. These largely go to the United States at 1400 tonnes. Japan and the United Kingdom vie for second position with approximately 550 tonnes, with the remainder being almost all consumed in the rest of Europe.

The United States is by far the world's greatest shrimp consumer market, importing close to 150,000 tonnes annually, and as such, plays a considerable role in any market analysis. Their shrimp imports are basically of two forms, shell-on CTable 7.4) and peeled (Table 7.5), the former being twice as numerous as the

Table 7.1: Cold Water Shrimp Landings For Selected Countries
(live weight - 1000's **tonnes)**

Country	1901	1982	1903	1984	1905*
Norway	41.0	52.0	77.0	02.0	00.0
Greenland	48.0	44.5	48.0	48.0	43.0
Iceland	8.2	0.5	18.6	24.0	2s.0
United States:					
Pacific	30.0	20.2	9.4	8.8	1005
Atlantic	1.0	1.5	1.4	2.9	4.0
Canada	13.6	12.8	14.1	10.9	14.0
Denmark	3.3	4.0	3.0	4.0	6.0
Faroe Islands	2.9	4.6	6,0	6.0	4.5
Total	148.8	148.1	177.5	1s6.6	195.0

* Preliminary; **data** ranked **from largest to smallest** for 19S5

Table ?.2: Canadian Atlantic Coast Shrimp Landings
(live weight - tonnes)

Province	1983	198%	January - September 1989	1985a
Nova Scotia	1888	1878	678	31s
New Brunswick	2197	1072	918	1808
Quebec	5914	5277	4504	5679
Newfoundland	4083	2696	2337	2534
Total(b)	14082	10923	8437	10338

(a) Preliminary.
(b] Does not include catches of chartered vessels as these are not landed in Canada.

Table 7.3: Canadian Fresh and Frozen Shrimp And Prawn Exports
(Quantity in tonnes, Value in S1000's)

Destination	1983		1984		January - September 1985a	
	Q	U	Q	U	I J	u
United Kingdom	534	3489	451	2207	47	461
Belgium - Lux.	7s	565	30	304	--	--
Denmark	--	--	100	271	--	--
France	199	664	121	478	0	1
Fed. Pep. Ger.	38	335	8	72	55	888
Norway	56	175	7	64	--	--
Sweden	322	997	144	480	10	114
Switzerland	140	1%21	152	1613	61	573
Hong Kong	59	621	65	589	60	489
Japan	485	1905	442	1704	206	717
United States	1606	11482	1409	11112	1339	10172
Other Countries	81	405	70	621	49	285
Total	356s	22059	2999	19515	1035	13700

(al Preliminary; quantity and value to date similar to 1984.

Table 7.4: U.S. Imports Of Shell-On Shrimp and Pawns For Selected Countries (tonnes)

Origin	1983	1984	January - September 1984	1985a
Canada	661	295	230	311
Greenland	34	23	23	71
Iceland	65	349	293	629
Sweden	5	23	13	156
Norway	237	175	85	254
Denmark	125	126	102	132
United Kingdom	62	18	18	42
Netherlands	54	4	4	13
U.S.S.R.	1494	83	65	102
Subtotal	2737	1096	033	1710
IOTAL	98408	10237s	7 1096	72000

(a) Preliminary .

Table 7.5: U.S. Imports Of Peeled Shrimp And Prawns For Selected Countries (tonnes)

Origin	19e3	1984	January - September 1984	1985a
Canada	1279	943	684	96S
Iceland	391	675	$&99	958
Sweden	94	350	223	140
Norway	4584	5564	3702	4956
Denmark	35	128	124	33
United Kingdom	057	71s	624	526
Netherlands	6	295	65	93
U.S.S.R.	671	42	--	19
Subtotal	7917	8712	5921	7693
TOTAL	49269	46676	32776	36299

(a) Preliminary

latter at this time. Of the shell-on form, cold water shrimp constitute only 2% of the market, the Canadian share being 25% of this at just under S00 tonnes. Our major competitors in this market are Iceland and Norway, although the U.S.S.R. has recently been a strong contender.

Among Llnited States imports of peeled shrimp, cold water shrimp make up greater than 17% of the market, which seems to be growing strongly. Canada's share OF the peeled market is in excess Of 13% at more than 1100 tonnes, second only to imports from Norway, and mare than double our exports of shell-on shrimp to the United States. The value of peeled cold water shrimp has risen to US$3.75 per lb for the 250-350 count and to US$4.00 For the 125-175 count, good price levels. It is estimated that of the Canadian whole shrimp production being exported to the Scandinavian countries, a large part of this is peeled and exported back to the United States. If this is indeed the case, then Canadian producers should concentrate a greater effort in directing peeled products to the U.S. market in the near future.

Inventories of cold water shrimp are low in all countries at this time, and it is expected that this shrimp supply will decrease by a further 5 to 7%. Lower supplies coupled with stronger European and Japanese currencies suggest livelier market conditions for 1986.

Based on this current status report, the best short-term approach to development of the striped pink shrimp resource in the proJect area would appear to be to market the product in the whole cooked Form into Europe, as it is believed that their currencies will strenghten against the Canadian dollar. Entering the peeled market at this early stage involves much more complicated and expensive processing equipment. In addition, if harvesting of the unutilized shrimp stocks of the prOJeCt area can b—e done through some form of unit-price charter, then the creation of demand in the market for this new species can occur at minimal cost to the Canadian venturer,

7.3 Long-Term Prospects

A growing demand is expected for the production of whole cooked shrimp for export. However, even with indications OF reduced foreign stocks of cold water shrimp of 5 to 7%, only medium price increases are suggested in the near term.

The increasing demands of consumers for quality product coupled with growing requirements for convenience shrimp among the fast food outlets suggest that there is a very promising market for a Finished peeled product in North America, with the added advantage of being largely able to deal in Canadian currency. It is estimated that this rising demand will continue for quite some time, at an average of 4 to 5% annually. In the long-term the peeled market in the United States may be the most lucrative avenue and bears serious reconsideration at a later date.

8. OPERATIONAL OPTIONS

From the point of view of obtaining an appropriate vessel to harvest shrimp under the mandate of this project objective, a number of alternatives are possible. These range from full operational involvement of the proposed corporation, the supposed licence holder, to none; and from high initial capitalization to zero. The two extremes in this range are addressed here, as are two of the more moderate, though still distinctive, options. The specific characteristics of each are described below, along with a suggestion of its reception by Fisheries and Oceans Canada, the government agency responsible far issuing such shrimp licences.

8.1 Royalty Charter

Strictly speaking, this charter form involves the purchase of the right to fish for a certain quantity of a particular stock from the assigned licence holder by a vessel owner for a set fee per unit weight landed. It does not include any input of labour or resources by the licence holder, and thereby implies no commitment to develop a fishery on that stack, or interest in its long-term conservation or any local benefit relationship that could be established. For these reasons Fisheries and Oceans Canada would not likely accept this approach.

8.2 Development Charter

This category incorporates a broad spectrum of possible scenarios, but all including same degree of participation of labour and/or resources by the licence holder. Such involvement not only demonstrates an interest in developing the fishery and in establishing a strong conservation to benefit relationship, it also provides a significant opportunity to do so. As Inuit crew gain sea experience and the stock becomes better known (and presumably more stable], increasingly greater involvement by the licence holder becomes possible even under charter terms, leading ultimately toward complete involvement. Discussions with Fisheries and Oceans Canada have indicated their mare likely acceptance of this option over the Royalty Charter because of its obvious commitment to development and local economic benefit.

S.3 Time Charter

Another term for this option as envisaged in the present context would be a Bare-Boat Charter, indicating that a vessel is obtained without crew, to be totally manned and aperated by the licence holder, In fact, such an arrangement often includes the necessary supervisory members of the normal crew at additional expense. This is a costly approach to harvesting a stack, especially one that is poorly known and by a new fishing corporation that is not very familiar with vessel operations. It does, however, have the advantage of allowing the corporation to fish the vessel where and when it chooses, such as in an exploratory manner. Fisheries and Oceans Canada would likely

have no objection to this form OF charter provided that it followed an approved exploratory format, and all catch data was properly recorded and submitted to them some reasonably set time after completion,

8.4 Vessel Purchase

At the opposite extreme from the Royalty Charter is the actual purchase of a vessel by the licence holder. Given that the necessary vessel for this type of fishery costs at least several millions of dollars, not to mention very significant operating expenses, maximum annual usage in profitable fisheries is essential to offset costs. The available quota in this fishery and the climatic conditions of the project area would not allow the continuous employment of such a vessel. Although Fisheries and Oceans Canada would certainly prefer this option since it reflects total commitment, they also realize that it is not a Practical one at this time from the resource and financial points of view.

The above descriptions obviously suggest preferences among the listed options. However, a complete financial assessment of each of these four approaches will be found in the next section so that an even more discriminating choice can be made.

9. FINANCIAL FEASIBILITY ANALYSIS

This section examines the revenue and expense projections and assesses the potential cash Flow situation of the four major operational options described in the last section, such that their cost effectiveness can be determined and an informed choice can be made among them as to the most appropriate form far the project obJective.

9.1 Target Production Levels

Income projections of all options are based on the total harvest of the 750-tonne catch limit established for the striped pink shrimp in the area southwest of Resolution Island, since its existence and biomass there are better known at this time than in other sectors of the proJect region. This would appear to be a reasonable first-target level, being the conservative lower boundary for the standard 25% of virgin stock biomass calculated as the allowable catch which is used in current scientific shrimp stock assessment work. This figure is also reasonably consistent with similar projections determined from an experimental Fishery several years prior. This information can be substantiated by reference to Section 3 on Resource Potential and to Appendix A For further background material at the end of this report.

9.2 Revenue And Expense Projections

For comparative purposes related to ease of assessment of all options, projections are assumed to commence with a zero-base initial capitalization. Disbursements do not include costs beyond the normal corporate functional unit, for instance, honoraria and associated expenses for meetings among members of the Board of Directors are not covered. Further data on the assumptions behind all aspects of these financial projections may be found in Appendix C.

9.21 Quarterly Disbursements

Expense projections for the first year are indicated for each operational option on a quarterly basis in Table .9.1, this being adequate for such a limited seasonal fishery. Such disbursements are separated into Administrative Costs, Operating costs, and Sales Costs, not all of which are appropriate to each option. Among Operating Costs some items have been set apart as Crew Deductibles in order to determine crew share, which is normally a fixed percentage of the gross revenue after allowance for such deductibles and all Sales Costs.

As per the order For level of commitment among the options as laid out in Section El, an Increasing number of administrative staff, crew, and use of corporate funds is indicated as follows:

Royalty Charter (Table 9.1a) - Staff of one, no Inuit crew, and estimated First year expenses of $96,403 for administration and S2,650 for operations, for a total of S99,0S3. Administrative costs cover the full year, and Operating Costs cover the fishing season which spans mid-July to mid-November, a period of four months.

Development Charter (Table 9.1b) - Staff of two,' with Inuit crew of three the first year, and estimated expenses of $124,574 For administration and $15,806 for operations, for a total of $140,380. Administrative and Operating Costs cover the time periods as above.

Time Charter (Table 9.1c) - Staff of three, with Inuit crew of four the first year, and estimated expenses of $227,237 for administration, $1,558,899 for operations, and $667,825 for sales, for a total of $2,453,961. Administrative and Operating Cost coverage is also as above. The major costs of fuel and charter fees come during the latter part of the year, and with the inclusion of interest on working capital, account for approximately S9350 per day. Thus, if catch rates average higher than expected, fewer fishing days would be required, and such costs would be reduced accordingly.

Vessel Purchase (Table 9.1d) - Staff of four, with Inuit crew of four the first year, and estimated expenses of $88,583 for administration, $1,343,302 for operations, and $667,825 for sales, for a total of S2,099,710. At first glance this may appear as having fewer disbursements than the Time Charter, but in this option all expenses have been pro-rated to four months. This was found necessary for strictly comparative purposes, as it would be totally infeasible to purchase a vessel in the millions of dollars for a part-time fishery. Thus, in fact, expenses would be three times higher, but divided on this basis presumes that during the rest of the year an equally profitable fishery is conducted. The major costs of fuel, interest on vessel loan, and depreciation allowance for vessel occur at the latter part of the year, and account for approximately $6850 on a daily basis. Thus, as with the Time Charter, higher mean catch rates can reduce vessel time in this fishery, and, in consequence, operating costs for this option. However, as suggested above, time saved in this manner must then be utilized in a similarly profitable fishing activity, since more than 71% of such expenses are fixed co5ts. Crew deductibles, crew share, and sales costs are the same in this option as in the Time Charter.

9.22 Annual Disbursements

Expense projections are carried forward for a three-year period only, being that amount of time likely to be allowable by Fisheries and Oceans Canada for charter operations in northern shrimp fisheries. Annual disbursements follow tha same format as for Quarterly disbursements, and are found in Table 9.2a&b. Yearly changes largely reflect a 5% inflationary

Table 9.la: Quarterly Disbursements (First Year)
Option 1 - ROYALTY CHARTER

SOURCES	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	YEAR 1
Administrative Costs					
Salaries	11250	11250	11250	11250	%5000
Benefits	1350	13s0	1350	1350	5%00
Travel	5000	5000	5000	5000	20000
OFfice Rent	1s00	1500	1500	1500	6000
Communications	300	300	450	450	1500
Taxes & Licences	1000	--	--	--	1000
OFF. Sup. & Exp.	300	300	300	300	1200
Dep.- OFF. Equip.	--	--	--	450	450
Member. & Assoc.	Soo	--		--	500
Uehicle Expenses	--	--	--	--	--
Uehicle Lease	--	--	--	--	--
Audit & Legal Fees	3000		--	2000	5000
Conferences	500	500	500	500	2000
Promotions	--	--	--		--
Bank Charges	250	250	250	250	1000
Bank Interest	627	1507	3019	--	5353
Contingencies	500	500	500	500	2000
SUBTOTAL	26277	22457	2%119	23s50	96403
Operating Costs					
Vessel Insurance	--	--	--	--	--
Maint. & I?epairs	--	--	--	--	--
Fishing Gear	--	--	--	--	--
Fuel	--	--	--	--	--
BeneFits	--	--	--	--	--
Uessel Surveys	--	--	--	--	--
Licences	2000	--	--	--	2000
Crew Changes	--	--	--	--	--
Oper.- Travel	--	--	--	--	--
Oper.- Commun.	--	--	--	--	--
Watchmen	--	--	--	--	--
Port Charges	--	--	--	--	--
Agent Fees	--	--	--	--	--
Sun. Equip. Purch.	--	--	--	--	--
Suppl. & Materials	--	--	--	--	--
Mar. SaF, Consum.	--	--	--	--	--
Uessel Commun.	--	--	--	--	--
Int.- Working Cap.	65	130	195	260	650
Int.- Vessel Loan	--	--	--	--	--
Depreciation	--	--	--	--	--
Contingencies	--	--	--	--	--
Charter Fees	--	--	--	--	--
Observer	--	--	--	--	--
Part-Total	2065	130	195	260	2650
Crew Deductibles:					
Provisions	--	--	--	--	--
Crew Insurance	--	--	--	--	--
Laundry & Clean.	--	--	--	--	--
Discharge	--	--	--	--	--
Part-Total	--	--	--	--	--
Crew Share	--	--	--	--	--
SUBTOTAL	2065	130	1s5	260	2650
Sales Costs					
Commission	--	--	--	--	--
Freight & Insur.	--	--	--	--	--
Storage	--	--	--	--	--
Production	--	--	--	--	--
Samples	--	--	--	--	--
Sales Commun,	--	--	--	--	--
SUBTOIAL	--	--	--	--	--
TOIAL COSTS	28342	22507	24314	23810	99053

Table 9.lb: Quarterly Disbursements (First Ysar) ,
Option 2 - DEVELOPMENT CHARTER

SOURCES	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	YEFIR 1
Administrative Costs					
Salaries	15750	15750	15750	15750	63000
Benefits	1890	1890	1690	1090	7S60
Travel	5000	5000	5000	5000	20000
Office Rent	3000	3000	3000	3000	12000
Communications	300	300	950	%50	1500
Taxes 6 Licences	1000	--	--	--	1000
OFf. Sup. & Exp.	300	300	300	300	1200
Dep.- Off. Equip.	--	--	--	900	900
tlember. & Assoc.	!500	--	--	--	500
Uehicle Expensee	--	--	--	--	--
Uehicle Lease	--	--	--	--	--
Audit & Legal Fees	3000	--	--	.2000	5000
Conferences	500	500	500	500	2000
Promotions	--	--	--	--	--
Bank Charges	250	?50	250	250	1000
Bank Interest	1050	1953	3911	--	6919
Contingencies	500	500	500	500	2000
SUBTOIAL	33090	29443	31551	30590	124574
Operating Costs					
Uessel Insurance	--	--	--	--	--
Ilaint. & Repairs	--	--	--	--	--
Fishing Gear	--	--	--	--	--
Fuel	--	--	--	--	--
Benefits	--	--	--	--	--
Uessel Surveys	--	--	--	--	--
Licences	?000	--	--	--	2000
Crew Change	--	--	2250	2250	9500
Oper.- Travel	--	--	--	--	--
Oper.- Commun.	--	--	2s0	250	500
Watchmen	--	--	--	--	--
Port Charges	--	--	--	--	--
Agent Fees	--	--	--	--	--
Sun. Equip. Purch.	--	--	--	--	--
Suppl. & Materials	--	--	--	--	--
Mar. Saf. Consum.	--	--	--	--	--
Uessel Commun.	--	--	500	500	1000
Int.- Working Cap.	65	105	355	645	1170
Int.- Uessel Loan	--	--	--	--	--
Depreciation	--	--	--	--	--
Contingencies	--	--	--	--	--
Charter Fees	--	--	--	--	--
Observer	--	--	--	--	--
Part-Total	2065	105	33s5	3645	9170
Crew Deductibles:					
Provisions	--	--	2700	2700	5900
Crew Insurance	--	1236	--	--	1236
Laundry & Clean.	--	--	--	--	--
Discharge	--	--	--	--	--
Part-Total	--	1236	2700	2700	6636
Crew Share	--	--	--	--	--
SUBTOIAL	2065	1341	6055	63%5	1S006
Sales Casts					
Commission	--	--	--	--	--
Freight & Insur.	--	--	--	--	--
Storage	--	--	--	--	--
Production	--	--	--	--	--
Samples	--	--	--	--	--
Sales Commun.	--	--	--	--	--
SUBTOIAL	--	--	--	--	--
IOIAL COSTS	35105	30784	37606	36805	140380

Table 9.lc: **Quarterly Disbursements (First** Yeer)
Optian 3 - **TIRE CHARTER**

SOURCES	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	YEAR 1
Administrative Costs					
Salaries	24500	24500	2%00	24500	98000
Banefita	2940	2940	2940	2990	11760
Travel	3750	3750	3750	3750	15000
Office Rent	4500	4500	9500	9500	18000
Communications	600	600	eoo	1200	3200
Taxes & Licences	1000	--	--	--	1000
Off. Sup. R Exp.	600	600	600	600	2400
Oep.- **Off,** Equip, flamber. & Assoc.	-- 500	-- --	-- --	13s0 --	13s0 Soo
Uehicle Expenses	1150	11s0	1500	1000	5600
Uehicla Lease	900	Soo	900	Soo	3600
Audit 6 Legal Fees	3000	--	--	2000	5000
Conferences	1000	1000	1000	1000	9000
Promotions	3000	Sooo	7000	10000	2s000
Bank Charges	625	62S	625	62S	2s00
Bank **Interest**	1630	3179	6434	13084	24327
Contingencies	1s00	1s00	1s00	1s00	6000
SUBIOIAL	S1195	50244	56049	6S799	227237
Operating Costs					
Vessel Insurance	--	17500	17500	--	3s000
Plaint. & Repairs	--	--	5000	5000	10000
Fishing Gear	--	7s00	7s00	--	1s000
Fuel	--	--	13s000	135000	270000
Benefits	--	SOoo	Sooo	5000	1s000
Vessel Surveys	--	10000	--	10000	20000
Licences	2000	--	--	--	2000
Crew Change	--	--	3000	3000	6000
Oper,- Travel	--	--	Sooo	Sooo	10000
Oper,- **Commun.**	--	Soo	500	Soo	1s00
Watchmen	--	--	17s0	17s0	3500
Port Charges	--	--	12s0	1250	??500
Agent Fees	--	--	2500	2s00	5000
Sun. Equip. Purch.	--	--	--	--	--
Suppl. & Materials	--	1000	2000	2000	Sooo
Mar. Saf. Consum.	--	--	--	--	--
Uessel Commun.	--	--	1500	1500	3000
Into- **Working** Cap.	65	1641	2'0960	48465	7063S
Int.- **Vessel** Loan	--	--	--	--	--
Depreciation	--	--	--	--	--
Contingencies	--	--	5000	Sooo	10000
Charter Fees	--	--	360000	360000	720000
Observer	--	--	--	15000	1s000
Part-Total	206S	93191	S72968	600S6S	1219139
Crew Deductibles:					
Provision	--	--	15300	15300	30600
Crew Insurance	--	7000	--	--	7000
Laundry & Clean.	--	--	1500	1500	3000
Discharge	--	--	7500	7500	15000
Part-Total	--	7000	24300	24300	5S600
Crew Share	--	--	--	284160	284160
SUBIOIAL	2065	50141	597268	90s%2s	15s8899
Sales Coste					
Commission	--	--	--	66925	66825
Freight & **Insur.**	--	--	1031E?S	30s375	412500
Storage	--	--	S375	28125	37s00
Production	--	--	150000	--	150000
Samples	--	--	100	300	400
Sales Commun.	--	--	300	300	600
SUBIOIAL	--	--	262s00	404925	66702S
IOIAL COSTS	53260	1003ES	916217	1384099	29S3S61

Table 9.ld: Quarterly Disbursements CFirst Year)*
Option 4 - VESSEL PURCHASE

SOURCES	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	YEAR 1
Administrative Costs					
Salaries	10167	10167	10167	10167	40668
Benefits	1220	1220	1220	1220	4880
Travel	1250	1250	1250	1?50	5000
Office Rent	1500	1500	1s00	1s00	6000
Communications	900	400	400	400	1600
Texee & Licences	333	--	--	--	333
Off. Sup. 6 Exp.	200	.200	200	200	000
Dep.- OfF. Equip.	--	--	--	450	450
Member. & **Assoc.**	166	--	--	--	166
Uehicle Expenses	467	467	467	467	1868
Uehicle Lease	300	300	300	300	1200
Audit & Legal Fees	2000	--	--	1333	3333
Conferences	333	333	333	333	133?
Promotions	2083	2083	20s3	2083	B332
Bank **Charges**	200	208	208	209	032
Bank Interest	687	1292	2584	5226	S70S
Contingencies	500	500	500	500	2000
SUBTOTAL	21814	19920	21212	25637	88583
Operating Costs					
Uessel Insurance	--	17500	17500	--	35000
llaint. % Repairs	--	65000	--	--	65000
Fishing Gear	--	16000	--	--	16000
Fuel	--	--	135000	135000	270000
Benefits	--	5000	5000	5000	15000
Vessel Surveys	10000	--	--	--	10000
Licences	2000	--	--	--	2000
Crew Change	--	--	3000	3000	6000
Oper.- Travel	--	--	Sooo	5000	10000
Oper.- **Commun.**	--	500	500	Soo	1500
Watchmen	--	--	1750	1750	3s00
Port Charges	--	--	1250	1250	2500
Agent Fees	--	--	2500	2s00	5000
Sun. Equip. Purch.	--	16000	--	--	160m
Suppl. **&** Materials	--	1000	2000	2000	Sooo
Mar. **Saf.** Consum.	--	1000	--	--	1000
Vessel Commun.	--	--	1s00	1s00	3000
Int.- Working Cap.	390	513s	12165	31019	48709
Int.- Uessel Loan	--	--	--	208333	208333
Depreciation	--	--	--	250000	250000
Contingencies	--	5000	5000	5000	15000
Charter Fees	--	--	--	--	--
Observer	--	--	--	15000	15000
Part-Total	123S0	132135	192165	666852	1003S%2
Crew Deductibles:					
Provisions	--	--	15300	15300	30600
Crew Insurance	--	7000	--	--	7000
Laundry & Clean.	--	--	1s00	1500	3000
Discharge	--	--	7500	7500	15000
Part-Total	--	7om	24300	24300	5S600
Crew Share	--	--	--	284160	284160
SUBTOTAL	12390	139135	216465	975312	13%330?
Sales Costs					
Commission	--	--	--	6682S	66825
Freight & Insur.	--	--	103125	309375	412500
Storage	--	--	S37S	2912s	37500
Production	--	--	150000	--	150000
Samples	--	--	100	300	400
Sales **Commun,**	--	--	300	300	600
SUBTOTAL	--	--	262900	404925	667025
TOTAL COSTS	34204	15s055	500S77	1405874	2099710

* Pro-rated to 4 months where necessary.

Table 9.2a: Annual Disbursements (Three-year Period) – All Options

SOURCES	ROYALTY CHARTER YERR 1	YEAR 2	YERR 3	DEVELOPMENT CHARTER YERR 1	YEAR 2	YEAR 3
Administrative Costs						
Salaries	95000	47250	49613	63000	66150	69950
Benefits	5400	5670	5959	7560	7938	633s
Travel	20000	21000	22050	20000	21000	22050
Office Pent	6000	6300	661s	12000	12600	13230
Communications	1500	1575	1654	1500	1575	1654
Taxes & Licences	1000	1000	1000	1000	1000	1000
Off, Sup, & Exp.	1200	1260	1323	1200	1260	1323
Ilep.- Off. Equip,	450	*50	450	900	900	900
Member. & Assoc.	500	525	550	500	525	550
Uehicle Expenses	--	--	--	--	--	--
Uehicle Lease	--	--	--	--	--	--
Audit & Legal Fees	5000	5250	5513	5000	5250	5s13
Conferences	2000	2100	2205	2000	2100	2205
Promotions	--	--	--	--	--	--
Bank Charges	1000	1050	1102	1000	10s0	110Z
Bank interest	5353	--	--	6914	--	--
Contingencies	2000	2100	2205	2000	2100	220s
SUBTOTAL	96903	95530	100234	124574	123448	129525
Operating Costs						
Uessel Insurance	--	--	--	--	--	--
Maint. & Repairs	--	--	--	--	--	--
Fishing Gear	--	--	--	--	--	--
Fuel	--	--	--	--	--	--
Benefits	--	--	--	--	--	--
Uessel Surveys		--	--		--	--
Licences	2000	2000	2000	2000	2000	2000
Crew Change	--	--	--	4500	7B75	11576
Oper.- Travel	--	--	--	--	--	--
Oper.- Commun.	--	--	--	Soo	S25	SSo
Watchmen	--	--	--	--	--	--
Port Charges	--	--	--	--	--	
Agent Fees	--	--	--	--	--	--
Sun. Equip. Purch.	--	--	--	--	--	--
Suppl. & Ilateriels	--	--	--	--	--	--
Mar. Saf. Consum.	--	--	--	--	--	--
Uessel Commun.	--	--	--	1000	10s0	1102
Int.- Working Cap.	650	--	--	1170	--	--
Int.- Uessel Loan	--	--	--	--	--	--
Depreciation	--	--	--	--	--	--
Contingencies	--	--	--	--	--	--
Charter Fees	--	--	--	--	--	--
Observer	--	--	--	--	--	--
Part-Total	2650	2000	2000	9170	11%0	1S22B
Crew Deductibles:						
Provisions	--		--	5400	9950	13230
Crew Insurance	--	--	--	1236	2163	31B3
Laundry & Clean.	--	--	--	--	--	
Discharge	--	--	--	--	--	--
Part-Total	--	--	--	6636	11613	16413
Crew Share	--	--	--	--	--	--
SUBTOTAL	26s0	2000	2000	15806	23063	31641
Sales Casts						
Commission	--	--	--	--	--	--
Freight & Insur,	--	--	--	--	--	--
Storage	--	--	--	--	--	--
Production	--	--	--	--	--	--
Samples	--	--	--	--	--	--
Sales Commun.	--	--	--	--	--	--
SUBTOTAL	--	--	--	--	--	--
TOTAL COSTS	990s3	97s30	102234	140380	146511	161166

Table 9.2b: Annual Disbursements (Three-year Period) '- All Options

SOURCES	TIME CHARTER YEAR 1	TIME CHARTER YEAR 2	TIME CHARTER YEAR 3	UESSEL PURCHASE YE*R 1	UESSEL PURCHASE YEAR 2	UESSEL PURCHASE YEAR 3
Administrative Costs						
Salaries	99000	loi?900	10BO95	40668	%2701	44836
Benefits	11760	12348	1296S	4880	5124	S3B0
Travel	15000	15750	16537	5000	5250	5513
Office Rent	18000	10900	19845	6000	6300	6615
Communications	3200	3360	3528	1600	1680	1764
Taxes & Licences	1000	1000	1000	333	333	333
Off. Sue. & Exp.	2900	2520	2646	800	840	BEE!
Dep.- Off. Equip.	13s0	1350	1350	450	450	450
Member. & Assoc.	500	525	550	166	174	183
Uehicle Expenses	5600	5880	617%	1868	1961	2059
Uehicle Lease	3600	3600	3600	1200	1200	1200
Audit & Legal Fees	5000	52s0	S500	3333	3500	3675
Conferences	%000	Woo	4410	1332	1399	1969
Promotions	25000	26250	27562	B332	8749	9186
Bank Charges	2s00	2625	2756	832	a73	917
Bank Interest	24327	255?3	26020	9789	10278	10792
Contingencies	6000	6300	6615	2000	2100	2205
SUBTOTAL	227237	238301	249903	88583	92911	97459
Operating Costs						
Uessel Insurance	35000	36750	38588	35000	367!50	38588
Maint. & Repairs	10000	10500	11025	65000	60250	71663
Fishing Gear	15000	15750	16539	16000	16800	17640
Fuel	270000	283500	29767S	270000	203500	297675
Benefits	15000	15750	16538	15000	15750	16538
Uessel Surveys	.?0000	21000	22050	10000	10500	11025
Licences	2000	2000	2000	2000	2000	2000
Crew Change	6000	9550	13230	6000	9450	13230
Oper.- Travel	10000	10500	11025	10000	10500	110Z5
Oper.- Commun.	1500	1575	1659	1500	1575	1654
Watchmen	3500	3675	3059	3500	3675	3059
Port Charges	2500	2625	2756	2500	262S	2756
Agent Fees	5000	5250	5513	5000	52s0	5513
Sun. Equip, Purch.	--	--	--	16000	16000	176%0
Suppl. & Materials	5000	5250	5s13	5000	5250	5513
Mar. Saf. Consum.	--	--	--	1000	1050	1102
Uessel Commun,	3000	3150	3308	3000	3150	330e
Int.- Working Cap.	70639	74170	77880	48709	51144	53702
Int.- Uessel Loan	--	--	--	208333	194444	100556
Depreciation	--	--	--	250000	?50000	250000
Contingencies	10000	10500	11025	15000	15750	16537
Charter Fees	720000	756000	793000	--	--	--
Observer	15000	15750	16538	15000	157s0	16530
Part-Total	1219139	1283145	1350515	10035W	1019963	1036062
Crew Deductibles:						
Provisions	30600	32130	33737	30600	32130	33737
Crew Insurance	7000	7350	7710	7000	7350	7718
Laundry & Clean.	3000	3150	3300	3000	3150	3300
Discharge	15000	15750	16538	15000	1s750	1653S
Part-Total	55600	58380	61301	S5600	58380	61301
Crew Share	284160	%9063	%02016	284160	%59063	482016
SUBTOTAL	1558899	1800588	1893832	1393302	1537406	1581379
Sales Costs						
Commission	6602s	92441	97063	66025	92441	97063
FreiDht & Insur.	912500	433125	454781	412500	433125	454781
Storage	37500	39375	41344	37500	39375	41344
Production	1s0000	157s00	165375	150000	157500	165375
Samples	400	420	441	400	420	421
Sales Commun.	600	630	662	600	630	662
SUBTOTAL	667025	723991	759666	667025	723491	759666
TOTAL COSTS	2953S61	27623S0	2903901	209S710	2353800	2438504

increase, except for depreciation of furniture and the vessel which use a flat-rate capital cost allowance, and interest on the vessel loan which reflects a decreasing principle balance. On items influenced by the payment schedule For landings, such as crew share and Sales Costs, the effect of a 60-day delay is included, Operating Costs For the latter three options also include an increase in Inuit crew numbers by two members each year.

9.23 Total Income

Evaluation OF income from the 750-tonne level of landings utilizes estimates based on previous shrimp charters of $750 per tonne for the first option, S500 per tonne for the First year OF the second option and increasing by !6100 per tonne for subsequent years, and a recent blended average price of S2970 per tonne as described in Section 7 on Marketing for the last two options. All income figures are also increased by a 5% inflation factor similar to that applied to annual expense increases.

Total income from these projections can be summarized as follows:

Options	Year 1	Year 2	Year 3
Royalty Charter	$ 562,500	$ 590,625	S 620,156
Development Charter	375,000	472,500	577,500
Time Charter	2,227,500	2,338,875	2,455,819
Vessel Purchase	2,227,500	2,338,875	2,455,819

Actual receipt of these funds includes a 60-day payment period from the date of off-loading. For this reason, we have assumed for cash flow purposes that 25% OF the income in any one year will not be paid until the following year.

9.3 Cash Flow Analysis

Combination OF the disbursements and revenue, as outlined in the previous sections, relative to their likely occurrence as an indicator of cash flow and final cash position of the project after three years is shown in Table 9.3 for all options. Expenses are shown as occurring over a full year, whereas, if fishing activity can be commenced this year, some OF the fixed costs will certainly be lower. Revenue is not expected to accrue until the Fourth quarter; a carry-over in accounts receivable also occurs in each year, The final cash position over the suggested three year period for each option is as follows:

Royalty Charter - At the end of the First year it is expected that $322,822 will have accrued to this means of operation, and increasing by approximately S500,000 per year, for a final cash position of $1,319,424.

Development Charter - A lesser amount of $140,870 compared to the above option is expected to remain at the end of

Table 9.3: Consolidated Cash Flow (All Options)

	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year 1	Year 2	Year* 3
ROYALTY CHARTER:							
Past Year Receivables	--	--	--	--	--	140625	147656
Current Year Rec.(a)	--	--	--	421875	421875	442968	465117
Total Receipts	--	--	--	421875	421875	583593	612773
Cash Forward	--	(25342)	(50929)	(75243)	--	322822	808885
Subtotal	--	(25342)	(50929)	346632	421875	906415	1421658
Total Disbursements	25342	25258	24314	23810	99053	97530	102234
Final Cash	(25342)	(50929)	(75243)	322822	322822	808885	1319424
DEVELOPMENT CHARTER:							
Past Year Receivables	--	--	--	--	--	93750	118125
Current Year Rec.(b)	--	--	--	281250	281250	354375	433125
Total Receipts	--	--	--	281250	281250	448125	551250
Cash Forward	--	(35105)	(65889)	(103495)	--	141870	442484
Subtotal	--	(35105)	(65889)	177755	281250	588995	993734
Total Disbursements	35105	30784	37606	36885	140380	146511	161166
Final Cash	(35105)	(65889)	103495)	140870	140870	442484	832568
TIME CHARTER:							
Past Year Receivables	--	--	--	--	--	556875	584718
Current Year Rec.(c)	--	--	--	1670625	1670625	1754156	1841865
Total Receipts	--	--	--	1670625	1670625	2311031	2426583
Cash Forward	--	(53260)	(153645)	(1069862)	--	(783336)	(1234685)
Subtotal	--	(53260)	(153645)	600763	1670625	1527695	1191898
Total Disbursements	53260	100385	916217	1384099	2453961	2762380	2903401
Final Cash	(53260)	153645)	1069862)	(783336)	(783336)	(1234685)	(1711503)
VESSEL PURCHASE:							
Past Year Receivables	--	--	--	--	--	556875	584718
Current Year Rec.(d)	--	--	--	1670625	1670625	1754156	1841865
Total Receipts	--	--	--	1670625	1670625	2911031	2426583
Cash Forward	--	(34204)	(193259)	(693836)	--	(429085)	(471862)
Subtotal	--	(34204)	(193259)	976789	1670625	1881946	1954721
Total Disbursements	34204	159055	500057	1405874	2099710	2353808	2438504
Final Cash	(34204)	(193259)	(693836)	(429085)	(429085)	(471862)	(483783)

* Accounts receivable uncollected at third-year end: a- [illegible]. b- $144,375; c- $613,955; d- $613,955.

the first year in this option. However, the rate of increase for subsequent years will be greater; roughly S300,000 for the second year and $400,000 for the third year, fur a final level of 3832,S68. Projected into the future, the final cash position of this option might well be expected to approximate that of a Royalty Charter.

Time Charter - A debt position of $783,336 is expected at the end of the first year for this option. This is expected to grow by nearly SS00,000 per year to a final cash debt of S1,711,S03 by the end of three years.

Vessel Purchase - Like the Time Charter, this option is expected to result in a debt position at the end of the first year, even based on only four months disbursements. This level of $429,085 is, however, expected to increase only very slowly over the next two years to a final cash position of $483,783.

From these data we can project the initial capitalization likely necessary for each option. These are suggested below along with the figures used to justify them:

Options	Total Ilisbursements	Initial Capitalization	Final Cash
Royalty Charter	$ 99,053	$ 100,000	$ 322,822
Development Charter	140,380	150,000	140,870
Time Charter	2,453,961	800,000	(783,336)
Vessel Purchase	2,099,710	650,000	(429,085)

The basis for suggesting the initial capitalization for the first two options lies in covering the total disbursements before input of revenue. For the latter two options, it lies in making up for the final cash debt position. For the Uessel Purchase, it also includes provision for a S500,000 down payment, but the elimination of vessel depreciation allowance in Operating Costs. It should be remembered at this point that the Uessel Purchase option cannot be taken at face value here, because it only represents four months of the year, and any calculation of initial capitalization must take into consideration the overall final cash position for the first and subsequent years.

9.4 Operational Option Assessment

Given the unknown factors in regard to stock biomass and pertinent biological parameters, investment in plant processing facilities ashore at this time is not considered a viable option. The only alternative is thus the use of a vessel to do both harvesting and processing to final market form. Since trawling power, processing capability, and product storage and fuel capacity necessary for operation in this northern region of the project area, as discussed in Section 4, are insufficient in smaller vessels, options have only been examined relative to adequate types and sizes of vessels currently available for purchase or charter, namely those in the 35 to 50 metre overall

length category. The overall economic benefits of the Four options examined in this group have been summarized (Table 9.4), and are assessed below.

The Royalty Charter, although more profitable than the others in generating almost $1.5 million, does not demonstrate any commitment toward the betterment of regional interests with no Inuit crew shares, and therefore would not likely be acceptable by Fisheries and Oceans Canada.

As with the setting up of shore facilities, the major commitment toward Uessel Purchase cannot be Justified given current knowledge of the stock, not to mention the final cash debt position (even though close to break-even) and the obvious lack of alternative Fisheries during the other eight months of the year.

The use of a Time Charter would likely be acceptable to Fisheries and Oceans Canada, but would be prohibitively expensive at a final cash debt position of almost 31.5 million. The complexity OF setting up and operating this type of approach also takes much more time and effort than are likely available at this stage.

The final option, and therefore the most acceptable option, appears to be the Development Charter, which shows a final cash position of close to $1 million and Inuit crew shares of nearly $250,000, the latter not grossly different from the Time Charter or Uessel Purchase. This form also allows an increasing degree of participation by the Corporation, dependent upon fishing success and corporate objectives. The final cash position of somewhat better than S1.1 million at the end of three years, with the inclusion of the initial capitalization suggested for this option, would allow serious consideration of purchasing a vessel at that time, when the stock and operating costs are better known. This should cover the proposed S0.S million down payment on the vessel and the inflated final cash debt position of close to 30.5 million as indicated, with approximately S100,000 left over for up-front preparation of the vessel for purposes other than shrimp fishing.

Table 9.4: Total Economic Benefit Projections (After Three Years)

Sources	Royalty Charter	Development Charter	Time Charter	Uessel Purchase
Final Cash	1319424	832568	(1711503)	(483783)
Uncollected Rec.	155039	144375	613955	613955
Sales Costs Owing	--	--	(190159)	(190159)
Crew Shares Owing	--	--	(127139)	(127139)
Cash Subtotal	1474463	976943	(1414845)	(187125)
Inuit Crew Shares:				
Paid	--	217395	258236	258236
Due	--	2S666	33904	33903
Crew Subtotal	--	247061	292140	292140
Total Benefits	1474463	1224004	(1122?05)	10s015

10. COMMERCIAL JOINT UENTURE

As it is the intention of the three Inuit groups of Baffin Island, northern Quebec, and Labrador contracting this project to pursue this potential fishery together to the mutual benefit of their peoples, this section outlines a framework whereby this goal can be approached -- a Joint Uenture Corporation with equal rights for each.

10.1 Goals and Objectives

Corporate Mission

To realize the maximum long-term economic and social benefits from the living marine resources of Hudson Strait and Ungava Bay.

Corporate Goals

1. To establish and maintain a profitable joint venture corporation which will manage the harvesting, processing and marketing of the living marine resources of Hudsun Strait and Ungava Bay.

2. To make maximum use and development of the human resources in the area of corporate operations.

3. To ensure that the practice of the corporation involves the pursuit of social and economic benefits for persons, businesses and corporations operating in the Hudson Strait and Ungava Bay areas.

Corporate Objectives

1. To develop a corporate structure which will manage the business activities of the Joint Uenture at minimal risk to shareholders.

2. To acquire the necessary and sufficient financial and human resources to ensure the success of the business venture by making effective use of economic development funds from private and public sources.

3. To acquire the fishing licences necessary to harvest the resources of Hudson Strait and Ungava Bay and to ensure that the resource base can safely provide marketable product in quantities which will make the operation profitable.

4. To develop agreements with corporations and individuals, when necessary, for the harvesting and processing activities. These agreements are to allow the maximum return on investment and, where possible, to yield a 10% advantage to corporations or individuals maximizing local resources.

5. To identify and develop agreements and/or contracts for the sale of products. To the extent possible the pre-sale of products will be pursued.

6. To ensure maximum re-investment of net prufits is maintained until the corporation's financial position is stable.

10.2 Corporate Structure

This section presents an overview of the corporate structure which is suggested as the means of implementing the Joint Uenture.

10.21 Shareholders

The Joint Uenture will be managed and operated as a Federally chartered limited liability corporation where the voting shares will be held by the following three corporations:

1. QIQIQTAALUK CORPORATION
2. LABRADOR INUIT ASSOCIATION and
3. MAKIVIK CORPORATION

These corporations, as shareholders of the new corporation, should therefore identify individuals who are their legal representatives to vote the shares of the new Joint Uenture Corporation.

The shareholders should also develop a document which clearly identifies the delegation of authority allowed by each legal representative, and these documents should be made known to all shareholders so that each clearly understands the limits of authority delegated to these representatives.

The three legal representatives of the shareholders should also serve as directors of the Joint Uenture Corporation (JVC).

10.22 Directors

The directors of the corporation are to be selected on the basis of their ability to assist in the development and promotion of the goals and objectives of the corporation. To allow the best mix of persons For this it is suggested that the Board of Ilirectors consists of the following (Fig, 10.1):

Position 1- Chairman; President and Managing Director of the Joint Uenture Corporation
Position 2- Shareholder Representative of Qiqiqtaaluk Corporation
Position 3- Shareholder Representative of Labradour Inuit Assoc.
Position 4- Shareholder F?epresentative of Makivik Corporation
Position 5- llember; Board of Directors, Qiqiqtaaluk Corporation
Position 6- flember; Board OF Directors, Labrador Inuit Assoc.

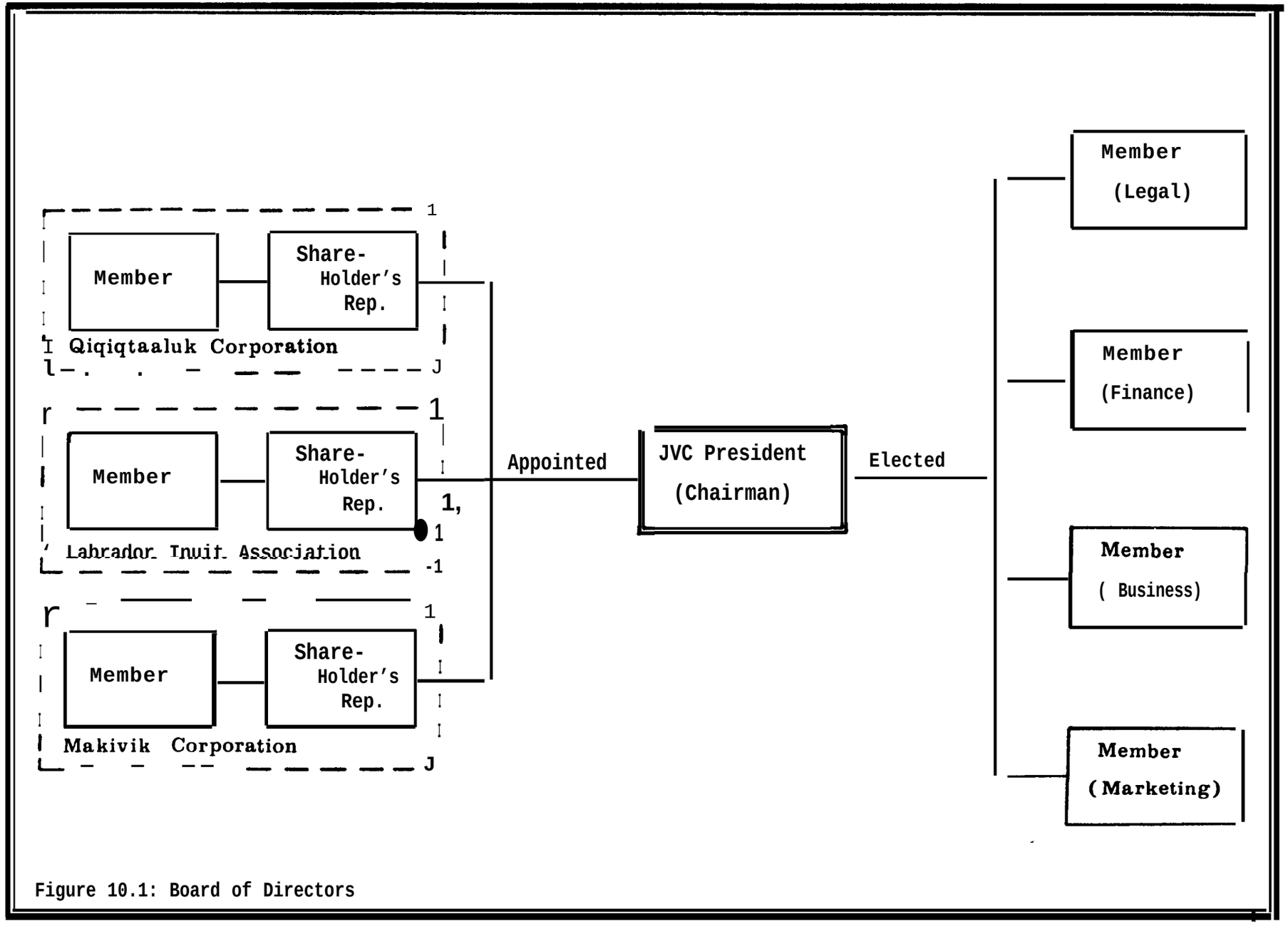

Figure 10.1: Board of Directors

Position ?- Member; Board of Directors, Makivik Corporation
Position 8- Elected member with legal credentials
Position 9- Elected business person
Position 10-Director of Finance
Position n-Director of Marketing

The tenure of office for the above positions should be as follows:

Position 1 Chairman: President and Managing Director of the Joint Venture Corporation

This position should be for a period of three years minimum with no limits to the number of successive appointments as President and Managing llirector and Chairman of the Board of Directors (BOD).

Position 2 Shareholder Representat ive of Qiqiqtaaluk Corporation

This position should be for a period of two years but should be timed so as not to coincide with the period of the President. If appointments to the board are simultaneous with the President, then the first period should be for a period of four years. There is no limit to the number of successive terms a Person may serve in this position.

Position 3 Shareholder F?epresentative of Labrador Inuit Assoc.

This position has the same terms as position number 2.

Position 4 Sharehol der F?epresentative of Makivik Corporation

This position has the same terms as position number 2.

Position 5 Member; B—o-~-d- of Directors, Qiqiqtaaluk Corporation

This position has a period of two years and the appointee should not be eligible for more than 3 successive terms. However, election or appointment of the incumbent must take place every two years.

Position 6 Member; Board of Directors, Labrador Inuit Assoc.

This position is the same as position 5.

Position 7 Member; Board of Directors, Makivik Corporation

This position is the same as position 5.

Position e Elected member with legal credentials

This position is an annual term appointment where there is a limit OF five successive terms allowed for any one person.

Position 9 Elected- business person

This position is a 2 year term appointment where there is a limit of four successive terms allowed for any one person.

Position 10 Director Of F-inance

This position is For a term of two years with no 'limit to the number of successive terms the person may serve.

Position 11 Director or Marketing

This position is for a term of two years with no limit to the number of successive terms the person may serve.

10.23 Development Plan

The proposed organization is presented for the first three years in accordance with the financial projections. This approach is taken because the anticipated revenue and operating capital could not support a larger structure at this stage of development, nor would additional staff have sufficient duties during this period,

The start-up organization (Fig. 10.2) will establish:

1. The Shareholders
2. The Board OF Directors
3. The President and Managing Director
4. The Secretarial and Administrative Support

The shareholders of the Corporation, being themselves corporations, namely: Qiqiqtaaluk Corporation, Labrador Inuit Association and Makivik Corporation must ensure that the person selected to vote the shares of the corporation is duly authorized to represent the holding corporation in all responsibilities of the shareholder,

It is recommended that the presidents of the three corporations holding the shares be duly authorized to perform all responsibilities of the shareholders OF the Joint Uenture Corporation in a formal, legal document.

If the shareholders of the three holding corporations create specific procedures For authorizing their presidents to vote their shares of the JUC, then these should be made known to all three parties so that a clear understanding of all delegated authority will be established and will allow smooth operations of the JUC.

The shareholders should approve a shareholders agreement and Bylaw No. 1 at the time of the appointment of their legal representatives ,

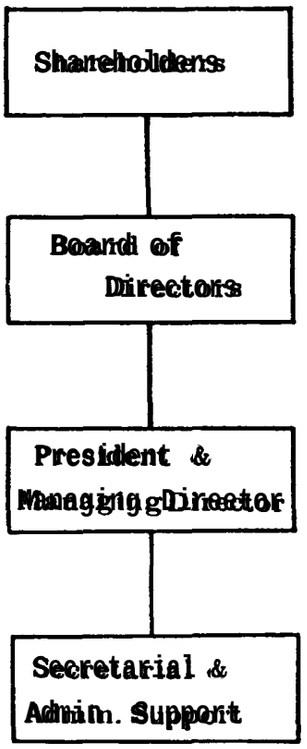

Figure 102: Corporate Organization

10.3 Agreements

10.31 Shareholders Agreement

A guide to the development of a legal shareholders agreement, including terms and conditions which should be considered, may be found in Appendix . In addition, attention to the following specific points are recommended:

(9) Appointments and Proxys

The shareholders of the Joint Uenture Corporation (JUC) are in fact other corporations which in themselves have shareholders and directors. This, therefore, necessitates the establishment of representatives who have the delegated authority to vote the shares of the JUC. Each of the three shareholders must therefore designate such a legal representative.

Recommendations

The legal representatives designated to vote the shares of the Joint Uenture Corporation will be the presidents of the three corporate shareholders.

A detailed and proxy document which defines the powers and procedures for executing these powers should be developed and signed by the members of the Board of Directors of each shareholder corporation. This document should be filed with and included in the corporate documents of the Joint Uenture Corporation so that each shareholder is aware of and clearly understands the authority delegated to the legal representative.

The Joint Uenture Corporation Bylaw No.1 must provide sufficient time and process to allow the legal representatives to consult with their own Board of Directors prior to the annual meeting of shareholders or any meeting of the Board of Directors where issues not included in the proxy document are to be addressed.

(B) Issue of Shares

The shareholders should agree to issue a specific number of voting shares and this number of shares should be divisible by three with equal numbers for each party, The common shares must be covered with a shareholders agreement which includes all normal and some special aspects of control of shares. The suggested inclusions in the shareholders agreement section, while not exhaustive, should form the essence of the agreement. The Corporation should **also** create at least three other classes of shares **which** are **non-voting** but preferred shares to be created and issued as a means of attracting investment and/or Joint ventures designed to be of assistance to the development of the corporate business. These other shares should be redeemable by the Corporation as and when agreed conditions are met.

Recommendat ions

The Corporation issues 10,000 common shares to each of the three parties and these shares be governed by a shareholders agreement.

The Corporation should be capable of issuing three other classes OF shares, such as:

CLASS A - Non-voting preferred shares

These shares are to be issued by an unanimous decision OF the Board OF Directors and should be issued For raising Funds For the Corporation. The shares should be redeemable under stated conditions and should have specific rates OF interest For each share.

CLASS B - Non-voting preferred shares

These shares should be created on a need basis and should be specifically created to provide a means OF payment to persons or corporations who may become involved in a joint venture where payment OF dividends on this class of share may be beneficial to the members OF the joint venture.

CLASS C - Non-voting preferred shares

These shares may be the same as above, but may have the additional benefit of being owned by the Corporation itself. These must, however, comply with the Canadian Business Corporations Act sections which govern shares issued and owned by the same corporation.

10.32 Bylaw No.1

A sample first bylaw has been included in this document as Appendix E. It is presented For consideration of the Board of Directors of the Corporation. Although it has been modified to fit the circumstances of the JUC somewhat, further examination of each clause as to its exact relevance is warranted. Of 'prime consequence is the adaptation of the quorum as appropriate to this proposed JUC wherein representatives of all shareholders must be present at meetings of shareholders and the Board OF Directors to constitute a quorum, such that the interests of each of the three Inuit groups is saFeguarded.

10.33 Corporate Policies

These policies are presented as a framework for development of detailed policies to be prepared and submitted For approval by the Board of Directors. Implementation will be upon appointment or election of the President and tlanaging Director.

General Management Policies

Policy #1

It is the policy of this corporation to be managed within the conFines of (a) a long term strategy plan, (b) an annual workplan and (c) an annual budget.

The strategic plan will be developed and submitted to the Board of Directors on an annual basis and will be received by the Board at least three months prior to the start of the new fiscal year.

The work plan and budget will be developed **and submitted to the Board of** Directors at least one month prior to the start of a new fiscal year.

Policy #2

The Board of Directors will receive a quarterly performance report against the workplan and budget. This performance report will be based on exception reporting and will consist of explanations of variations and impact of variations.

Policy #3

It is the policy of the corporation to pursue the development of all staff in accordance with the human resource requirements of the corporation and the skills, capabilities and capacities of employees through **a process of career planning,** succession planning and internal and external training.

Policy #4

It is the policy of this corporation to make maximum use of modern technology in all operational and administrative areas of the corporation.

Policy #5

It is the policy of this corporation to make the maximum use of local support services and human resources. **The local services and** human **resources are defined as being individuals, businesses and corporations who are operating in the geographical areas of the corporate operation or function.**

Policy #6

It is the policy of this corporation to acquire **all services and material** through a competitive process. **This competitive** process can be as simple as price comparisons or request For proposals **to public tender for services and** materials.

Policy #7

It is the policy of **this corporation to** manage its development **within the following priorities:**

(a) The maintenance of the minimal long-term debt through a process of strong debt control, investment promotion, government assistance for human resource development, and re-investment of retained earnings into development.

(b] Creation of the minimal management infra-structure with a well developed plan of expansion based on corporate revenue and management requirements.

(c) Ilevelopment of business on the basis of capitalization on the fastest return on investment during start-up, with growth being in accordance with long-term return on investments after this has been realized.

Policy #8

It is the policy of the corporation to staff all management and supervisor positions in the Corporation only **after the** position describing the duties, the authorities and candidate profiles are presented to the Board of Directors and approved by an unanimous vote.

Financial Policies

Policy #l

It is the policy of this corporation to ensure its financial viability through the re-investment of earnings in the corporation's development until its balance sheet demonstrates a net worth in excess of one million dollars,

Policy #2

The corporate policy for financial planning involves the production of monthly statements of accounts which as a minimum shall include:

(a) **a** profit and loss statement
(b) a balance sheet
(c) an aging of **accounts receivable with an explanation for accounts over 90 days**
(d) **an aging of accounts** payable with an explanation for accounts over 90 days
(e) a summary of contracts For services and/or materials For values **in excess of $5,000**
(f) a budget variance report
(g) a travel expenditure report

On a quarterly basis, the financial report will include all of the monthly reports. However, the following performance measures will also be reported:

(a) a **budget** variance repurt with a forecast of the year-end financial position **relative** to the budget

(b) when sufficient history is available, the quarterly report will **include** a comparison Of:
    1. this year to date vs. last year to date
    2. this quarter vs. last quarter

These comparisons will be with respect to budgets and the approved financial performance measures.

Policy #3

It is the policy OF this corporation to send statements on **a minimum of** twice monthly and to actively pursue accounts not paid up **within 45** days of the statement. All accounts over 90 days will be actively pursued and at 120 days legal **action will** be taken by the corporation.

Policy #~

The Board of Ilirectors will approve the terms of credit for customers by: stating the rate-of interest on outstanding accounts, the period for application of interest on the account, the process for conducting credit **checks and the process for collecting overdue accounts. The President and Managing Ilirector must submit a proposal for the above credit terms on an annual** basis.

Policy #5

It is the policy of the corporation to manage and control travel costs For all employees and directors **of** the corporation. The operational workplan will provide the process of approval for regular or scheduled travel throughout the year. Non-scheduled travel, however, shall be managed through a **process of pre-travel approval.** This approval will involve the following:

(1) charters of aircraft, boats, ships, special vehicles (non-automobile type] require the approval of the **Board of Ilirectors**

(2) emergency charters may be approved by the President and Managing Director but must be **presented to the Board** of Directors at the first **meeting** after the approval of the emergency charter

(3) non-scheduled operational **and/or** management travel must be approved by the senior functional manager if it ~~is~~ not contained in the annual workplan; the President and Managing Director **may approve any domestic or foreign travel**

(4) **all foreign** travel is **specifically reported in the** monthly financial **report system**

(5) only in the case of emergency or corporation urgency may any officer or employee travel first class at corporate expense. The individual may select first class provided that he/she personally pays the difference between economy **class and** first class

(6) Violation **of** travel policies are grounds for disciplinary action which can include suspension without pay or dismissal from the Joint Uenture Corporation

Policy #6

It is the policy of the corporation to provide transportation to contractors working u“nder contract to the corporation, All cantracts must contain specific clauses which restrict travel expenses to economy class and charters.

Policy #7

It is the policy of the corporation not to pay travel or accommodation costs for persons not employed by the corporation. Families of corporate staff may be provided transportation under special conditions as approved by the Board of Directors from time to time, but each case must have prior approval of the President and Managing Director and be reported in the monthly financial reports to the directors.

Policy #8

It is the policy of the corporation to maintain a record of delegation OF authority for signing of contracts, bank loans and cheque issuing. This instrument will be reviewed From time to time and will be modified by the Board of Directors' majority vote,

10.Y Operational Procedure Guidelines

These guidelines are presented for executive discussion and modifications. The directives herein are For defining the procedures to be implemented on appointment of the President and flanaging Ilirector.

The Board of Directors will approve the following practices:

1. The President and Managing Director will be responsible for acquiring the necessary professional assistance, on an as required when required basis, to prepare for submission to the Board of Directors the following documents:

(a) A business plan For a three-year period which consists of: a one year budget on a monthly basis and the remaining two years on a quarterly basis, a cash-Flow analysis for three years, an opening balance sheet and a detailed description of the revenue Forecast.

(b) A corporate operational strategy and workplans which will be prepared and presented to the Board of Directors at least three months prior to the end of the fiscal year. The corporate operational strategy will cover a five-year period with annual objectives and the workplan will cover a three-year period with details by quarter.

(c) Monthly performance reports to the Board of Directors which report on variances between plans and performance.

(d) The Annual Report to the Shareholders.

2. The President and Managing Director will be authorized by the Board of Directors to:

ia) Sign any contract for the sale of product up to and including the value of $200,000. Ualues in excess of this

require Board of Directors approval unless specific directions have been given to the President and Ilanaging Director prior to the contract signing.

(b) Authorize the contracting or purchase of any service, commodity, or equipment up to a value OF .%100,000 provided that the service, commodity or equipment has been approved in the operational workplan and budget. If not in the budget or plan the maximum value is %20,000.

(cl Engage employees and dismiss employees as the workload and or performance of individuals warrants. Positions in Finance, operations and marketing are included in this authority.

(d) Approve contracts for consultation services as follows:

(i) Single source, directed contracts up to !620,000 if the work was included in workplans.

(ii) Contracts resulting from tenders or requests for proposals of a value up to S100,000 if the work was approved in the workplan.

(iii) If the work is not included in the workplan the maximum value is !310,000.

(e) Authorize the following:

(i) Creation of a special management advisory ad hoc committee for analysis of various aspects of business opportunities. These committees will have complete terms of reference approved by the Board of Directors and will deal with specific subJects.

(ii) Determine the honorarium of ad hoc committees and authorize expense claims. These are also governed by corporate travel policies.

(iii) Approve overseas travel associated with work-related duties of corporate employees and other non-employees approved to travel on corporate business.

(iv) Any activities which are directed towards receiving federal or provincial government assistance in the areas of: training assistance, wage subsidies, government grants and/or contribution for economic or social development and/or capital or operational funding or loan guarantees.

11. 13 EVELOPMENT-OPER ATIONAL PLAN

This section is intended to define, in sequence, the activities necessary to implement the Joint Venture Corporation.

11.1 Organizational Structure

To properly develop the organizational structure, it will be necessary to control the appointment of staff such that the corporation will remain financially viable with minimal operational funds. The policies and objectives of the Joint Uenture Corporation are designed to minimize capital Funding risk and, therefore, all activities should be examined to minimize expenditures.

11,11 Shareholders

There is, however, the necessity to expend funds for setting up of the Joint Uenture Corporation and to manage these activities throughout the development period. In order to ensure that the venture is under good management at all times, the following plan of action is recommended.

1. All three shareholders identify a mutually acceptable person to serve as a coordinator and temporary custodian of documents and funds for the period of development and up to the appointment of the President and Managing Director.

2. The custodian will be responsible for ensuring all activities are organized and managed and that necessary expenditures are controlled as directed by the three prospective shareholders.

3. The shareholders should—authorize the custodian to arrange the following:

(a) To open a temporary bank account from which costs of incorporation will be paid, and to receive from each shareholder a deposit of five thousand dollars (%5,000).

(b) To develop from this document, instructions to a lawyer for the formation of the Joint Uenture Corporation with sufficiently broad letters of patent to cover all aspects of fisheries and related business.

(c) To arrange for the shareholders agreement and the official Bylaw No.1.

(d) To prepare for the shareholders, a number of proposed corporate names.

4. The custodian will then proceed with:

(a) Obtaining the name search and having the application for Incorporation completed and submitted. This will require decisions on: share structure, address of the corporation, shareholder identifications, directors, and the like.

(b) Developing the banking resolution and transfer of funds remaining into the corporate account. This will require decisions on borrowing money and cheque signing authorities.

(c) Signing the shareholders agreement and convening the first shareholders meeting.

(d) If the shareholders deem it economically sound, they may at this time appoint a President and Managing Director or they may continue with the custodian.

(e) The custodian, or the President and flanaging Director if engaged, will then convene the first meeting of the Board of Directors.

11.12 Directors

At start-up, the number of members on the Board of Directors need only be seven, namely the President and tlanaging Director plus the two appointed representatives from each of the three shareholders, As the JUC develops, the other four elected members can be added as necessary.

Upon appointment, the first members of the Board of Directors will:

1. Review and adopt the official Bylaw No. 1, which will necessitate the determination of initial capitalization on a per share basis required to successfully pursue the objectives of the JUC, establishment of the location for an operational office, and setting of the fiscal year relative to start-up and /or expected cash flow from fishing activities.

2. Direct the President and tlanaging Director or the custodian to review all proposed financial and operational policies and procedures and to prepare these for submission to the Board of Directors for approval.

3. Direct the President and Managing Ilirector or the custodian to prepare a strategic plan and workplan based on the feasibility study and direction from the Board of Ilirectors. This Will include a scheduled cash-flow analysis.

4. Direct the President and Managing Director or the custodian to prepare a position description and candidate profile for any positions deemed necessary for start-up development. This will also include a schedule of delegation of authority to these positions.

5. Direct the President and Managing Director or custodian to

establish the office and obtain the necessary corporate supplies to operate during this development period.

11.13 Executives

The recruitment and selection of corporate executives will be conducted over time such that development is in accordance with financial constraints. The executive group will consist of the President and Managing Director, and the Directors of Finance and Marketing. It may be advisable during the development period to consider contracting-out the work of the latter two positions on a task oriented basis.

The concept of contracting-out the marketing and finance may be viable and economical if the business development has a substantial seasonal peak with a lower level of activity on the off season.

The complexities of start-up with minimal operating funds makes the risk associated with executive selection very high, and for this reason it is recommended that prior to engaging an executive, the duties and authorities be clearly defined and that a comprehensive candidate profile be developed prior to recruitment. It is recommended that professional assistance be obtained on development of the candidate profile and that once this is developed it forms a key component of the selection process.

11.2 Development Procedure Guidelines

The development procedures to be followed by the corporation are mainly dictated by the policies presented in this document. However, since the start-up period will be tightly constrained due to limited Financial resources, it is suggested that the following -practices be implemented,

1. The shareholders appoint one of their executives as a volunteer custodian. Since this will be a part-time position until such times as licences, markets and harvesters are identified and evaluated, the custodian would maintain the activities without being a burden.

2. The custodian could be selected on the basis that he/she would be a likely candidate as either the legal representative of the shareholder or the member of the Board of Directors, or one of the shareholders who would be a likely member of the Board of Directors of the Joint Uenture Corporation at a later date,

3. The custodian would prepare a detailed activity plan and schedule for start-up development and submit it to the President of each of the shareholder corporations. Upon each President signing the plan and schedule, the custodian would then report on a weekly basis progress made according to the plan.

4. The custodian would have the Full powers of the President and

Managing Director and would perform all duties associated with planning and management of the corporation until such time as the first set of directors is appointed.

5. The Board of Directors of the Joint Uenture Corporation will, during start-up, meet at least once per month for the purpose of approving the operational plan and schedule of the custodian or the President and Managing Ilirector.

6. The custodian or the President and Managing Director may use members of the Board of Directors of the Joint Uenture Corporation to assist in arranging or conducting liaison work with officials of governments and other businesses.

7. The custodian will control the expenditures of all monies allocated to the corporation prior to the approval of the banking resolution and the establishment of a corporate bank account requiring his/her signature plus one other signature of a representative of one of the shareholder corporations.

0. A petty cash account of an amount not exceeding S300 will be established by the custodian.

9. The Corporation will pay an honorarium for participation of members at Board of Directors meetings at the rate of S1OO per meeting, and also travel costs from the residence of the Board members to and from the designated meeting place in accordance with travel allowances as approved for corporate staff. Any member of the Board may Waive the right to the honorarium and yet apply for the travel allowance.

11.3 Revenue Relocation

The Joint Uenture Corporation Is to be considered as a long-term investment by each of the shareholders and, therefore, the revenue allocation plan is designed to reflect this commitment.

The methods of distribution of profit after taxes will be dependent on the terms and conditions of all classes of shares. IF any shares other than the capital stock shares of the JUC have been issued, the distribution of profits will be utilized to meet the commitments of these shares and the balance of the profit will then be allocated to the capital stock shares.

The policy OF the Corporation is to not declare a dividend in the capital stock shares unless both of the Following conditions have been met:

1. The retained earnings exceed $250,000 during the fiscal year,

2. The Corporation has reinvested at least one million dollars of earnings back into the Corporation.

When the above conditions have been met then the dividends will be distributed on an equal share basis to the shareholders.

12. EMPLOYMENT AND TRAINING

The objectives of the Corporation require the executive and management to make every reasonable effort to engage local staff, and where necessary and feasible, to train and develop persons to meet the skill requirements over time.

12.1 Job Creation

The corporate strategy of business development with restricted capital investment will most probably limit the number of new Jobs to be created during start-up. For the selected Development Charter option, it is anticipated that the following Jobs would be created:

(a) President and flanaging Director
(b) Office Secretarial Support
(c) 3 to 7 vessel crewmen

12.2 Human Resource Development

The development of human resources should consist of a program supported by the Canadian Employment and Immigration Commission's Employment Strategy Program. This program has at least three elements which are applicable to the development of the Joint Uenture Corporation activities.

The "Job Entry" sub-program is directed toward young people who have experienced difficulty in making the transition from school to gainful employment. This program allows a corporation or person to provide both classroom and on the Job training for a person for a period up to 52 weeks. There is no cost to the business serving as a training place host to the program.

The "Job Development" sub-program is designed to provide subsidies for classroom and on the Job training for persons of all ages who have been unemployed for considerable time and are required to improve skills to become more employable. This sub-program under certain conditions provides 60% of wages plus cost of training.

The "Re-Entry" sub-program is designed to assist in the development OF marketable skills for persons who have been out of the work force for some time and provides training costs and trainee's income.

All of these programs are available to assist the Joint Uenture Corporation develop a skill base within the local labour force. When the Corporation has a definitive development schedule and is in a position to develop their staff, maximum use should be made of such programs so that career planning within the Corporation is well developed and practical.

13. LICENSING REQUIREMENTS

13.1 Harvesting

In order to fish for any species within Canadian waters, it is necessary to have a valid fishing licence from Fisheries, and Oceans Canada for the species and area in which operations are intended. Given the limited entry policy that department has in regard to new fishing effort, permission for this enterprise would undoubtedly have to come directly from the federal flinister of Fisheries. At this time representations have been made to the flinister, and discussions have been held in this regard with senior departmental staff members, the idea having been met with a significant degree of support.

Similarly, if it is not possible to arrange a Canadian registered charter vessel for this operation, permission to obtain a foreign charter would have to come directly from the Minister. This possibility has also been broached in the representation to him for a licence. In this instance, such a vessel would also have to meet Canadian Steamship Inspection (CSI) marine safety standards, and may well require some time for appropriate modifications. In some cases this could involve major structural changes which may not be worthwhile. A fishing vessel already so approved might be inclined toward easier fee negotiations as no additional costs would be necessary.

13.2 Processing

All processing facilities ashore are the Jurisdiction of the provinces or territories except where product is intended for export. However, we are herein proposing only processing aboard ship, which is a federal responsibility. As such it must , be inspected and approved by Fisheries and Oceans Canada as meeting minimum sanitation standards for the production of seafood for human consumption. Canadian charters would already be so approved; foreign charters would likely have little difficulty in becoming qualified as such.

13.3 Exporting

Unlike the Canadian groundfish industry, there are currently no restrictions, other than production under normal sanitation guidelines, regarding the export of shrimp to other countries. The designation of "product of Canada" is not a factor in this context, although it bears some significance in terms of other Canadian shrimp producers. If a European c'harter is used and its catch is marked as a product of the flag state, some special tariff advantage may be gained for product intended for the European market over Canadian produced shrimp. Such an advantage constitutes a competitive edge in the marketplace, and sometimes spells the difference between profit and loss or reflects on the ease at which such charters are negotiated if at all.

14. INDIRECT BENEFITS

1%.1 Economic Development

In addition to the direct benefits of increasing equity and employment projected through the proposed Joint-venture shrimp operation in eastern Hudson Strait and Ungava Bay, economic spinoffs will also accrue to the Inuit communities which contribute crewmen or office staff to the Fishery, and whose earnings will likely return to be spent in such communities. For those living in areas close to the fishing operations, further gain may derive from providing small boat ferrying, trading, and communications services. Given the high levels of unemployment, some degree of alleviation is contributed from this source. In the event that any shore-based processing Facilities become practical in the future, a further source of employment may be envisaged. Development of good fishing skills for shrimp may also allow the better fishermen to consider specialized training and possibilities of more advanced fishing positions on vessels of this corporation or on others in the Canadian fleet,

14.2 Inuit Interaction

The development of this shrimp fishery would appear to be a step forward in cooperation among Inuit groups in the undertaking of such a venture. The proposed use of Greenland as a possible charter source and transshipment point will also bring the joint-venture into some additional degree of contact with the Graenland Inuit. This avenue may be of further value for training purposes in that they have been involved in skilled fisheries like that proposed for many years, and are very familiar with operating under Arctic conditions. Such contact might well be of additional value in adding weight to fisheries negotiations between Canada and Greenland which at this time are strictly among senior government personnel.

14.3 Killiniq Support

The newly re-established fish processing plant on Killiniq Island is in a remote position relative to sources of supplies and product markets, In as much as the striped pink shrimp concentrations under consideration are very close to this location, and as the proposed vessel both at this early stage of development and later will steam to the area empty at the beginning and after every trip, some degree of assistance in transportation of supplies and personnel to the site and possibly removal of the more valuable products might be arranged. Such cooperation could generate funding to the vessel or could be bartered in exchange for personnel or vessel support services like fuel, provisions, repairs, or similar benefits.

15. RECOMMENDATIONS FOR FURTHER WORK

There are a number of activities which are at this time either beyond the scope of this project or can only be dealt with at a later date after fisheries development is well underway. This section outlines the major components of these below, and the ways and means by which Sea-Borne Resources, R&D Ltd. could be of assistance in fulfilling these needs.

1S.1 Charter Arrangement

In order to carry out the proposed scheme of development in this fishery using an offshore shrimp factory freezer trawler, it is necessary to locate and communicate with vessel owners or agents who are aware of both their existence and availability. A number of such individuals have already been contacted in regard to their interest in this type of venture. Several have indicated a positive intent, but wanted confirmation of the existence of a fishing licence for the species, quantity and area before any detailed discussion. When the corporation is established and the licence secured, charters can be sought out and negotiations begun regarding fees, terms and conditions, and crew members. An understanding of the various charter formats is essential in this process, and an inspection of the vessel of any serious contender with a qualified naval architect must be conducted to verify the condition of the vessel and capability of the processing equipment to fulfill the stated requirements. Critical assessment of potential fishing vessels and favorable contract terms are imperative to success in this venture. This process must be started soon to fish in the 1986 season which commences in late July to early August.

1S.2 tlanagement Involvement

Resource management and industry input in regard to all northern shrimp stocks including eastern Hudson Strait and Ungava Bay striped pink shrimp has to date been through Fisheries and Oceans Canada's Northern Shrimp flanagement Advisory Committee. This is not likely to change since this is the only committee dealing with the offshore shrimp fleet which falls in the same category as the operation proposed in this project. It would he prudent to solicit membership on this committee not only in order to have a voice in management of the stock in question, but also to gain experience from the more knowledgeable members and to remain aware of current happenings in the industry, both of which can be invaluable. The meetings are held 2 to 3 times every year at different cities anywhere between Ottawa and St. John's, Newfoundland, For industry members, Fisheries and Oceans Canada pays travel expenses at set rates and, under some conditions, an honorarium for lost income while attending the meetings. It should of course be remembered that committee membership never excludes the corporation from making representations directly to the federal Minister of Fisheries.

1S.3 Catch tlonitoring

An integral component of good resource management is keeping complete and accurate records of Fishing operations and landings. The observer that may be placed aboard by Fisheries and Oceans Canada will collect some of this information, but may nut always be present or as thorough as necessary in relation to corporate needs. For this reason it is recommended that an appropriate practical monitoring plan acceptable to Fisheries and Oceans Canada be designed to cover corporate and fisheries research goals prior to chartering, such that it may be negotiated as a part of the contract. Although such data will of necessity be turned over to departmental scientists, the analysis and impact on the stock biomass and subsequent catch limits will not normally be known or reported upon until the following spring, which does not allow much time for developing the year's fishing plan. A component of corporate monitoring should thus also be an independent and more timely assessment of such data, which will further allow verification of Fisheries and Oceans Canada estimates.

15.4 Resource Expansion

The known concentrations of striped pink shrimp in eastern Hudson Strait and Ungava Bay are not well understood or of great extent and may diminish somewhat under regular fishing pressure. Far these reasons some degree of exploratory fishing to locate other populations of such shrimp should be carried out on a regular basis to augment such possible decreased catches if not to expand fishing effort itself, Previous research work has pointed out locations of potential which should be pursued further, notably the location west of Killiniq Island as an alternative if catch rates off Resolution Island decrease overly this year. Another area which should be explored has been suggested by reasonable landings in Hudson Strait close to Baffin Island opposite the western side of Ungava Bay. This area may possibly indicate some potential for shrimp in western Hudson Strait which at this time is admittedly unknown, It is proposed that in 1967 a small component of charter vessel time be devoted to this latter cause, a fishing" plan for which has already been derived. Charter negotiations involving exploratory fishing usually require some minimum wage guarantee to crewmen, but some research funding might be arranged through Fisheries and Oceans Canada to support this phase of operation.

1S.S Feasibility Extension

Financial projections in this report are limited to three years based on realistic expectations of stock dynamics, market fluctuations, and the likelihood of government acceptance. In order to develop plans beyond this period, another more extensive feasibility study should be conducted regarding vessel purchase, based on the financial record and equity position of the proposed corporation after two complete years of operation, in 1988. At this time both the stock and its marketability will be better

known and a more informed decision can be made in regard to corporate planning and development.

15.6 tlarket Development

Under the currently proposed circumstances of charter aperation, active market development is not necessary as it would be performed by the vessel owner. However, in anticipation of becoming more committed to the fishery through vessel ownership at a later date, it would be wise to familiarize staff with whatever marketing exposure possible to develop methodology and contacts. Such an early investment can result in significant savings at a later date through marketing by the corporation instead of market agents who charge healthy commissions of up to 5% or more. When a decision is made for greater commitment to the fishery, a thorough market analysis should be done since this is a new species in the marketplace even is it is similar to the pink shrimp. Such an analysis should definitely include developing the peeled shrimp market sector in the United States given its apparent potential. Up to this point, the market intelligence services of Fisheries and Oceans Canada can be used to some extent, but their data are normally somewhat less than immediate, and cannot satisfy day to day needs.

15.7 Computerized Cash-Flow

When a commitment has been made to greater involvement in the fishery, consideration should be given toward developing a computerized system which could create instantaneous cash-flow projections. Such a system, which has been done by hand, is immeasurably valuable in directing day to day vessel operations by being able to assess the adequacy of current catch rates relative to overall investment, thus improving corporate planning and maximizing profits. Systems of this sort are currently being investigated by the Project Manager, and should be closer to a reality by the time they are needed by the Corporation,

LITERATURE CITED

Allard, M. P., 1900. Ungava Bay exploratory cruise: September 1979. Makivik Res. Dept. 23pp.

Bryson, R.A., and F.K. Hare (eds.), 1974. The climates of North America. In: Climates of North America, World Survey of Climatology, vol. 11, Elsevier, Amsterdam, The Netherlands, 1-47 pp.

Campbell, N.J., 1958. The oceanography of Hudson Strait. Fish. Res. Board Can., MS Rep. Ser. (Oceanogr. Limnol.) 46: 45pp.

Catchpole, R.J.W., and M.A. Faurer, 1993. Summer sea ice severity in Hudson Strait, 1751-1870. Climatic Changes 5(2): 115-139.

Crane, R.G., 1978. Seasonal variations of sea ice extent in Davis Strait - Labrador Sea area and relationship with synoptic-scale atmospheric circulation. Arctic 31: 434-447.

Drinkwater, K.F., in press. Chapter 13: Physical oceanography of Hudson Strait and Ungava Bay. In: Canadian Inland Seas: Hudson Bay, Foxe Basin, Hudson Strait published by Elsevier, Amsterdam, The Netherlands.

Dunbar, M.J., 1958. Physical oceanographic results of the CALANUS expedition in Ungava Bay, Frobisher Bay, Cumberland Sound, Hudson Strait and northern Hudson Bay, 1949-1955. J. Fish. Res. Board Can. 15: 155-201.

Dunbar, M.J., 1970. On the fishery potential of the sea waters of the Canadian North. Arctic 23: 150-174.

Easton, A.K., 1972. Tides of Hudson Strait. Bedford Institute Oceanographic Rep. Ser. BI-R-72-6: 14pp.

Iselin, C.O., 1927. A study of the northern part of the Labrador Current. Bull. Nat. Res. Council No. 61, Nat. Read. Sci., Washington, D.C.: 217-222.

Kollmeyer, R.C., D.A. McGill, and N. Corwin, 1967. Oceanography of the Labrador Sea in the vicinity of Hudson Strait in 196S. U.S. Coast Guard Oceanographic Rep. No. CG373-12:92pp.

LeBlond, P.H,, 1980. On the surface circulation in some channels of the Canadian Arctic archipelago. Arctic 33 189-197.

LeBlond, P.H., T.F?. Osborn, D.O. Hodgins, l?. Goodman and M. Metge, 1901, Surface circulation in the western Labrador Sea, Deep-Sea Res. 28A(7): 683-693.

Mac Laren Marex inc. , 1978a . Report on CANSO CONDOR Shrimp and groundf ish cruise of July 28 - September 4, 1978 in northeastern Canadian waters, For Supply and Services Canada and Fisheries and Environment Canada. October, 197a.

llacLaren Marex Inc., 1978b. Report on exploratory fishing assessment of pink shrimp fishery potential in northeastern Canadian waters, for supply and Services Canada ' and Fisheries and Environment Canada. November, 1978.

flacLaren Marex Inc., 1979. Report on feasibility analysis for the development of a commercial offshore fishery in the Ungava Bay - Davis Strait region, for Makivik Corporation, Fort Chime, Quebec. April, 19?9.

Maxwell, J.B., 1980. The climate of the Canadian Arctic Islands and adjacent waters, Uol. 2. Climatological Studies 30. Atmospheric Environment Service, Environment Canada, Ottawa, 5B9pp.

Mecking, L., 1906. Eisrift ans dem Bereicht der Baffin Bay, beherscht von Strom und Wetter, Ueroffent lichungen d. Inst. f. Meereskunde u. d. Geogr. Inst., Univ. Berlin: 1-135.

Osborn, T.F?., P.H. LeBlond and D.O. Hodgins, 1970. Analysis of ocean currents. Davis Strait 1977 Vol. 1 APOA Report 138 (prepared for Imperial Oil Ltd, Calgary), 264pp.

Parsons, D.G,, G.E. Tucker and P.J. Ueitch, 1981a. Estimates of potential yield for shrimp (Pandalus montagui) in the eastern Hudson Strait and Ungava Bay. CAFSAC Res. Dec. S1/6: 22pp.

Parsons, D.G,, G.E. Tucker and P.J. Veitch, 1981b. Review of abundance indices and stock assessment for shrimp (Pandalus borealis) in the Labrador Channels. . CAFSAC Res. Dec. 81/7: 40pp.

Parsons, D.G., P.J. Ueitch and G.E. Tucker, 1983. Distribution, abundance and some biological characteristics of the striped pink shrimp (Pandalus montagui) in eastern Hudson Strait and Ungava Bay. CAFSAC Res. hoc. 83/11: 28pp.

Sanderson, B.G., and P,H. LeBlond, 1984. The cross-channel flow at the entrance of Lancaster Sound. Atmosph.-Ocean 22: 484-997.

Smith, E,H., 193?, The MARION expedition to Davis Strait and Baffin Bay. U.S. Coast Guard Bulletin No. 19, part 2. Report of the International Ice Patrol Service in the North Atlantic Ocean, 259pp.

Squires, H,J., 1965. Decapod crustaceans of Newfoundland, Labrador and the Canadian" Eastern Arctic. Fish. Res. Board Can., MS Pep, Ser. 810: 212pp.

Templeman, W., and H.J. Squires, 1960. Northern cruise - **A.T. CAMERON.** p.33-38. Annual **Rep. St.** John's **Biol.** Stn. 1959-1960. Fish. F?es. Beard Can.

Winn, H.E., and B.L. Olla (editors), 1979. Behavior of Marine Animals: **Current Perspectives in Research** Volume 3: Cetaceans. Plenum Press, London, p.154-155.