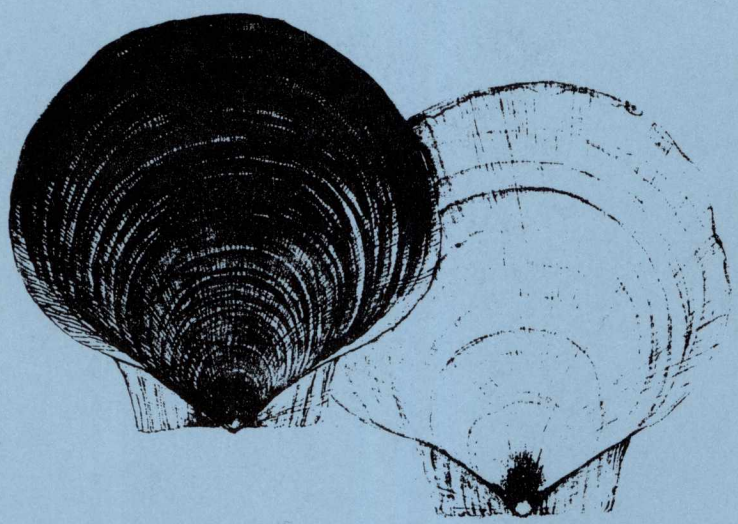
Fisheries and Oceans
Pêches et Océans

AN ECONOMIC ASSESSMENT OF THE 1982 ST. PIERRE BANK SCALLOP FISHERY



ECONOMICS BRANCH
NEWFOUNDLAND REGION

DECEMBER, 1984

Canada

AN ECONOMIC ASSESSMENT OF THE 1982 ST. PIERRE BANK SCALLOP FISHERY

M.C. Grandy
Economics Branch
Newfoundland Region

December, 1984

TABLE OF CONTENTS

LIST OF TABLES

FOREWORD

In 1983, the Resource Management Division of Fisheries Operations Branch approached Economics Branch with a request for an economic analysis of the 1982 St. Pierre Bank scallop fishery. Data were provided on the fishery which had been gathered by DFO, Scotia-Fundy Region and which were to form the basis of the analysis. The foremost question to be answered was how many scallop vessels could St. Pierre Bank support full-time, based on the 1982 operations of the Nova Scotia offshore scallop fleet on the Bank. Secondary questions were how might a Newfoundland-based scallop fleet fit into the St. Pierre Bank situation and how might such a fleet be formed. This paper addresses these questions. Because of a lack of information in a number of areas, it has been necessary to make assumptions, some of which may be critical to the establishment of a Newfoundland-based full-time scallop fishery. Further investigation should be undertaken to assess the validity and accuracy of these assumptions, and the sensitivity of the conclusions of the study to the assumptions.

This paper was originally circulated internally in the Department of Fisheries and Oceans, Newfoundland Region, in December, 1983.

INTRODUCTION

This paper investigates the viability of an annual scallop fishery on St. Pierre Bank. The analysis is based on the operations of vessels from the Nova Scotia offshore scallop fleet which fished the Bank in 1982. In addition, data from costs and earnings surveys carried out by the Economics Branch, Dept. of Fisheries and Oceans, Scotia-Fundy Region are used to conduct a breakeven analysis for an average offshore scallop dragger.

Of the 76 vessels in the 1982 fleet (all from southeast Nova Scotia), 49 fished St. Pierre Bank. A total of 121 trips were made from July to November, with most trips (108) occurring from the latter part of August to the end of October. The vessels averaged 2.5 trips to St. Pierre Bank. (In 1983, the fleet began harvesting St. Pierre Bank in May, and were still fishing in December). A total of 693 tonnes of meats were taken from St. Pierre Bank, valued at $5,774,562. (Preliminary reports indicate that 1983 landings will be comparable and that landed value will be around $7,000,000).

This paper presents information related to fleet characteristics and performance, compares (where possible) operations on St. Pierre Bank with operations on Georges Bank, and outlines the overall operations of the fleet in 1982. One shortcoming is the fact that some vessels returning from St. Pierre Bank paused to fish the Scotian Shelf (Sable and Banquereau Banks). However, the proportion of the catch presently attributed to St. Pierre Bank actually caught on the Scotian Shelf is assumed to be negligible.

Some caution is necessary in using the Scotia-Fundy costs and earnings data. The survey was based on four vessels, and the information was collected on a voluntary rather than random basis. Thus the sample may not be representative of the fleet. Aside from the small sample size, data collected in this manner has a tendancy to have an upward bias due to the predominance of more efficient fishermen in a voluntary sample. It is not known if the four vessels which were surveyed in 1982 participated in the St. Pierre Bank fishery; however, the information does indicate clearly the costs involved in operating a scallop dragger. Table 1 gives a profile of the Nova Scotia offshore scallop vessels which fished St. Pierre Bank in 1982.

TABLE 1
PROFILE OF SCALLOP DRAGGERS FISHING ST. PIERRE BANK, 1982

TYPE OF CONSTRUCTION	NUMBER OF VESSELS	AVERAGE			
		AGE (YRS.)	LENGTH (FT.)	GROSS TONNAGE (TONS)	BRAKE HORSEPOWER
Wood	35	18.5	101.2	n.a.	711.3
Steel	14	10.5	117.5	n.a.	840.7
	49	16.5	105.6	n.a.	749.1

n.a. = not available

VESSEL OPERATIONS

Tables 2 (p.3), 3 and 4 (p.5) present data on performance of the offshore scallop fleet in 1982. A noticeable difference occurs in the hourly catch rates given. Catch rates on St. Pierre Bank averaged 208.0 lbs of meats per hour fished. On Georges Bank, the average

catch rate in 1982 was 118.6 lbs per hour fished. This indicates the relative attractiveness of the St. Pierre Bank fishery vis-a-vis Georges Bank under 1982 conditions.

The average catch/hour on St. Pierre Bank dropped off near the end of the season (Table 4, p.5). The cause of this decline is not known, but may be due to inclement weather. Stock depletion does not appear to be a factor in the decline since the fleet is back fishing St. Pierre Bank in 1983.

TABLE 2
AVERAGE OPERATIONAL PERFORMANCE OF SCALLOP DRAGGERS, 1982[1]

AVERAGE	NOVA SCOTIA OFFSHORE SCALLOP FLEET	ST. PIERRE BANK VESSELS
# Men in Crew	14.6	16.7
# Trips	13.5	2.5
# Days Fished	77.2	16.8
# Hours Fished	1,395.0	151.8
Landings (lbs)	173,535	31,180
Landed Value ($)[2]	n.a.	117,136
Price Received ($/lb)	n.a.	3.76

n.a. = not available

[1] Comparisons between the St. Pierre Bank data and the total fleet data cannot be made directly. The St. Pierre Bank data covers 49 vessels which made one or more trips to that Bank, while the total fleet data covers 76 vessels, including those which fished St. Pierre Bank.

[2] The average landed value (and price received) is not available for the fleet as a whole. For the time period in which the St. Pierre Bank was being fished, the average price being paid for offshore scallops in Lunenburg, N.S. was $3.65/lb. (Sou-wester, 1982, July-November issues). Why the average price received for St. Pierre scallops was higher than the $3.65 published price is not known. For comparative purposes, if one assumes that the fleet average was the same as the St. Pierre Bank average, i.e. $3.76/lb., then the average landed value is $652,492.

Another difference is the number of hours fished per day by the average vessel when operating on St. Pierre Bank as compared to Georges Bank. The average vessel fished 9.1 hours on St. Pierre Bank versus 13.1 hours on Georges Bank (Table 3, p.5). No ready explanation for this difference is available. It is possible that the smaller Iceland scallops (which represent 10% the St. Pierre Bank landings) require more shucking time than do Sea scallops (which are the only scallops caught on the Georges Bank) and thus afford crews fewer fishing hours.

TABLE 3

AVERAGE OPERATIONAL EFFICIENCY OF SCALLOP DRAGGERS, 1982[1]

AVERAGE	ST. PIERRE BANK	GEORGES BANK	FLEET
# Days Fished Per Trip	6.7	n.a.	10.2
# Hours Fished Per Day	9.1	13.1	10.1
# Hours Fished Per Trip	60.7	n.a.	103.0
Landings Per Hour Fished (lb)	208.0	118.6	124.4
Landings Per Day Fished (lb)	1,885.0	1,553.7	1,260.3
Landings Per Manhour Fished (lb)	12.3	7.3	8.5
Landings Per Manday Fished (lb)	111.1	95.6	86.1
Landings Per Trip (lb)	12,627.0	n.a.	12,817.0
Landed Value Per Trip ($)	47,478	n.a.	n.a.

TABLE 4

EFFORT DATA FOR SCALLOP DRAGGERS FISHING ST. PIERRE BANK, 1982

	JULY	AUG.	SEPT.	OCT.	NOV.	TOTAL
Number of Trips	1	21	57	30	12	121
Av. Days Fished/Trip	6.0	8.8	5.5	7.0	7.3	6.7
Av. Hours Fished/Trip	62.0	83.6	44.6	63.9	86.2	60.7
Av. Hours Fished/Day	10.3	9.4	8.3	9.0	12.2	9.1
Av. Landings (lb) Trip	12,985	17,646	10,942	12,515	12,092	12,627
Av. Landings (lb)/hr Fished	209.4	211.1	245.3	195.9	140.3	208.0

[1]Data for Georges Bank and the Total Fleet were supplied by the Economics and Research Branches, Scotia-Fundy Region.

The data on the operational performance of the scallop draggers compare St. Pierre Bank with Georges Bank (and the fleet as a whole) in 1982. The average vessel on St. Pierre Bank had a catch rate of 208 lb/hr (meats) for the July to November period. If this rate could be sustained through the year, then at the fleet average of 1,395 fishing hours per year, a dragger could catch approximately 290,000 lbs of meats. At this level of catch, five vessels could land the total 1982 catch from St. Pierre Bank on an annual basis.

FINANCIAL POSITION OF THE OFFSHORE SCALLOP FLEET

Tables 5, 6 and 7 (pp. 7,8) give a picture of the financial position of the Nova Scotia offshore scallop fleet. These data are taken from the Costs and Earnings surveys of the Economics Branch, Dept. of Fisheries and Oceans, Halifax. The operating costs for St. Pierre Bank may be higher due to the distance from home port. However, if we assume the duration of a trip to St. Pierre Bank averages the same number of days as to Georges Bank, then fuel costs would be roughly equivalent - the only difference being the amount of fuel used in fishing activity as compared with steaming. Other costs may be assumed to be the same, if we can also assume that the surveyed vessels are representative of those vessels which fished St. Pierre Bank.

TABLE 5
AVERAGE RECEIPTS, EXPENDITURES, AND NET RETURNS
NOVA SCOTIA OFFSHORE SCALLOP FLEET, 1981 AND 1982[1]

	1981		1982	
	$	%	$	%
RECEIPTS				
Fish Sales	1,072,331	100	706,667	100
EXPENDITURES				
Maintenance & Repair	173,844	16.2	153,397	21.7
Operating Expenses	139,805	13.0	173,899	24.6
Fixed Charges	80,170	7.5	73,861	10.5
Total	393,819	36.7	401,157	56.8
NET RETURNS TO LABOUR AND CAPITAL	678,512	63.3	305,510	43.2
NET CREW SHARE	552,294	51.5	318,803	45.1
NET BOAT SHARE	126,218	11.8	(13,293)	(1.9)
DEPRECIATION	42,048	3.9	42,048	6.0
NET PROFIT	84,170	7.9	(53,341)	(7.8)

TABLE 6
AVERAGE CAPITAL INVESTMENT
NOVA SCOTIA OFFSHORE SCALLOP DRAGGER, 1981[1]

INVESTMENT:	
Acquisition Cost	$946,671
Gear Cost	24,023
Rented Equipment Value	6,450
TOTAL	$977,144

[1]Economics Branch, Department of Fisheries and Oceans, Halifax, N.S.

TABLE 7
AVERAGE NET RETURN ON INVESTMENT
NOVA SCOTIA OFFSHORE SCALLOP DRAGGER, 1981[1]

Capital Investment	$977,144
Depreciated Investment	$367,406
Net Profit	$ 84,170
Net Return on Capital Investment	8.6%
Net Return on Depreciated Investment	22.9%

BREAKEVEN ANALYSIS

Using the Nova Scotia Costs and Earnings survey, it is possible to calculate the breakeven point for the average scallop dragger. The analytic technique applied is a form of breakeven analysis which has been described previously[2]. The quantity of scallop meats required to break even is approximately 322,400 lbs. At $3.76/lb this is worth $1,212,224.

Based on the 1982 landings of 1,527,809 lbs of scallop meats from St. Pierre Bank, this resource could support 4.7 average scallop draggers at the breakeven level. Of course, this is based on the premise that the harvest could be sustained at this level, and the price does not decline.

---

[1]Economics Branch, Dept. of Fisheries and Oceans, Halifax, N.S.

[2]Fisher, C.F., et al, The Economic Performance of Fleets Engaged in the Gulf of St. Lawrence Shrimp Fisheries, 1979, Dept. of Fisheries and Oceans, October, 1980.

SCALLOP PRICES

An important factor in all calculations is the price received. The 1983 mid-June Boston Blue Sheet reported a price of U.S. $6.00 for 30-40 count Canadian Sea scallops. This is approximately Cdn. $7.20 or almost twice the $3.76/lb ex-vessel price for St. Pierre Bank scallops in 1982. In September (1983) the ex-vessel price for offshore Sea scallops in Lunenburg was $5.20/lb. At this price, a vessel would require 233,120 lbs of meats to break even, including a 10% return on investment (undepreciated). Thus, the 1982 St. Pierre catch of 1,527,809 lbs could support 6.6 average vessels on an annual basis. If this high level of harvest is not sustainable, high scallop prices may still permit a viable annual fishery for a limited number of vessels. Scallop prices are expected to remain high according to the latest Dept. of Fisheries and Oceans market forecast.[1]

Scallop prices also reflect differences in raw material quality. The present handling system in Nova Scotia entails on-board colour-coding of the product according to time of catch. This is done by stitching the bags with red, black or white thread which indicate the day of catch.

---

[1] Shellfish Market Bulletin, Marketing Directorate, Dept. of Fisheries and Oceans, Ottawa, June, 1983.

As much as possible of the catch is marketed fresh because of the higher value. Most of the Maritimes product is presently frozen, with the lesser quality meats being breaded and frozen.

VIABILITY OF A NEWFOUNDLAND FLEET

Scallop draggers based on the Burin Peninsula of Newfoundland, because of their proximity to port markets (and thus their ability to land a fresher product), should obtain higher prices than Nova Scotia-based vessels for St. Pierre Bank scallops. However, the longer distance to product markets (primarily New England) faced by processors may offset this advantage. Further information is required on relative transportation costs, but it is probably safe to assume that if the Nova Scotia-based vessels can make a contribution to vessel overheads by fishing St. Pierre Bank, Burin Peninsula-based vessels should also be able to do so because of their comparative advantage vis-a-vis port markets.

The current high prices for scallops combined with the low landings of the Georges Bank fishery provides an incentive for the Nova Scotia fleet to continue fishing St. Pierre Bank. A point to be remembered is that at present, it is not possible to exclude Nova Scotia vessels from fishing this area.

A further consideration is the stated aim of the government of France to enter the scallop fishery on the Bank. It is not known how many vessels they plan to utilize, but there would be major ramifications if such an initiative were implemented. The resource

can only support a limited amount of effort. It appears very unlikely that a healthy status for the St. Pierre Bank scallop resource could be sustained in the face of current Canadian fishing effort, in conjunction with new and additional effort on the part of a French fleet. The collapse of the fishery would likely follow any significant increase in fishing effort. Resource depletion could effectively preclude the establishment of a viable fishery for several years or more.

The biggest problem lies in determining what amount of fishing effort St. Pierre Bank could sustain in the long run. The biological advice available indicates that recruitment seems to come from outside the Bank, i.e. even if fished out completely, the stock will rebuild. There cannot be recruit overfishing, but there can be growth overfishing. Thus, the stock can quite easily be overfished economically, making sustained effort impossible. St. Pierre Bank has two resident scallop species, the Sea scallop and the Iceland scallop. The present effort is directed towards Sea scallops (90% of the catch) but the Iceland scallop is the more predominant species on the Bank. Sea scallops are generally larger and easier to shuck than are Iceland scallops. Without any definitive statement as to the size of the resource, it is not possible to determine the size of fleet it can support. However, there can be no doubt that if in excess of 600 tonnes can be harvested in two consecutive years, then less intensive effort should indeed support several vessels on a sustainable basis.

Another point to be considered is whether a vessel could actually land the minimum quantity of scallops required to make a profit. At the 1982 catch rate of 208 lbs/hr and at various prices, it is possible to determine the quantity required and the requisite number of fishing hours. These calculations are described in Table 8 (p.13).

In 1982, an offshore scallop dragger fished 1,395 hours on average. At the St. Pierre Bank average of 9.1 hours fished per day, a vessel would have to fish 153.3 days to meet the fleet average. Table 8 shows that a vessel receiving an average of $4.00/lb would have to fish 1,457 hours to earn a 10% return on investment. This means fishing 160 days per year at 9.1 hours/day. This is comfortably within the realm of possibility for vessels in this size category operating on St. Pierre Bank.

It is also possible that vessels as large as those in the Nova Scotia fleet are not necessary to fish St. Pierre Bank if they were based on the Burin Peninsula. Vessels less than 65 feet could probably harvest the resource on a profitable basis - perhaps more profitably than vessels greater than 65 feet given the lesser operating and capital costs involved. Longliners in the 55-65 feet range presently fish St. Pierre Bank for groundfish for much of the year.

TABLE 8
LANDINGS REQUIRED (AT VARIOUS PRICES), AND FISHING HOURS REQUIRED (AT 208 LBS/HR) TO ENABLE A SCALLOP DRAGGER TO BREAK EVEN

$/LB	BREAKEVEN LANDINGS	FISHING HOURS REQUIRED AT 208 LB/HR
	(lbs)	
4.00	303,022	1,457
5.00	242,273	1,165
6.00	202,026	971
7.00	173,172	833

In conjunction with the viability of the fleet, consideration was also given to the viability of a scallop plant operation. A review of 1982 throughputs of five independent plant operations in Nova Scotia indicate that the average plant operated with a throughput of 1.7 million pounds of scallop meats, ranging from 641,534 lbs for the plant with the lowest throughput to 2,654,321 lbs for the plant with the highest (Table 9, p.14). Additional data and analyses are required to determine the viability of different scales of operation. Given the existing plant capacity on the Burin Peninsula, the introduction of a new fishery should not require any major capital expenditures.

TABLE 9
VESSELS, LANDINGS, AND PLANT THROUGHPUT
OF SELECTED NOVA SCOTIA SCALLOP PLANTS, 1982

	NO. OF VESSELS OPERATED	LANDINGS OF VESSELS (LBS)	TOTAL PLANT THROUGHPUT (LBS)
Average	9	1,321,633	1,726,190
Lowest	4	626,102	641,534
Highest	12	2,144,198	2,654,321

Scallops require no processing when landed, and are ready for packaging. Thus plant operating expenses are probably relatively low, as is employment generated. Information as to the financial performance of the above plants is unavailable. If we assume they are profitable, it shows that a small plant can operate with less than 1 million lbs of product throughput. This has further positive implications for a Newfoundland-based scallop fishery.

It is also possible that onshore shucking might be a more desirable means of conducting a fishery on St. Pierre Bank. A more definitive investigation into the actual costs and benefits involved in the land-based sector of the scallop fishery is clearly indicated.

COMPOSITION OF A NEWFOUNDLAND FLEET

As stated previously, it may be possible to utilize existing Newfoundland nearshore vessels (< 65') to harvest the St. Pierre scallops. The larger seiners, as well as otter trawlers and crab vessels might be adaptable to scallop dragging. Scallop fishing would be a means of augmenting their present revenues. This would have several benefits: (1) there is no need for large capital expenditure to establish a fleet; (2) there is less dependence on a single resource; and, (3) it may improve the profitability of presently marginal enterprises. This is probably the most promising option.

A second option for the establishment of a fleet may be to convert some of the Newfoundland side trawler fleet to scallop draggers. Table 10 compares the Nova Scotia scallop fleet with the side trawler fleet.

TABLE 10
PROFILES OF THE NOVA SCOTIA SCALLOP FLEET AND THE NEWFOUNDLAND SIDE TRAWLER FLEET

	Number	AVERAGE			
		LOA (Ft)	Tonnage	BHP	Age (yrs)
A. NOVA SCOTIA SCALLOP FLEET:					
Wood	60	102	190	711	18.5
Steel	17	114	389	841	10.5
Overall	77	106	234	749	16.5
B. NEWFOUNDLAND SIDE TRAWLER FLEET:					
Overall	15	128	298	707	20
Newest	5	124	301	684	16.8

In 1983, the cost of converting a steel scallop dragger to a side trawler was estimated at $200,000 - $300,000.[1] Presumably the estimated cost would be the same for the reverse process, given boats of similar design and age.

Table 10 shows that the side trawlers are greater in length and age than the scallop draggers, but on average have lower tonnage and horsepower, especially when compared to the newer steel vessels. This may mean extra conversion expense to boost the power.

If we assume the side trawler's cost of acquisition is only the conversion cost of $300,000, and allowing a 10% return on investment and annual depreciation expense of 10% of capital cost, then with the average cost structures which apply to the Nova Scotia fleet, the required landings of such a vessel would be as given in Table 11.

TABLE 11
REQUIRED SCALLOP LANDINGS OF A CONVERTED SIDE TRAWLER AT VARIOUS PRICES

$/LB.	REQUIRED BREAKEVEN LANDINGS
	(lbs)
4.00	237,168
5.00	189,747
6.00	158,121
7.00	138,537

[1] R.D.S. MacDonald, Economics Branch, Dept. of Fisheries and Oceans, Scotia-Fundy Region, Personal communication.

Another (unlikely) means of obtaining a Newfoundland-based operation would be to transfer vessels from the former H.B. Nickerson fleet of Riverport, N.S. to Newfoundland. This fleet presently lands at Riverport, and trucks its catch to plants located elsewhere in Nova Scotia. It is part of the restructured Fishery Products International. Many crewmembers of this fleet are from Newfoundland's south coast, and may be amenable to the move. Undoubtedly, problems would be created for interprovincial relations should such a transfer occur. However, given the present Canada-US boundary dispute over Georges Bank as well as the current low catch levels for scallops, some permanent redeployment of effort may be possible. It might, for instance, be feasible for certain vessels to relinquish access to Georges Bank in return for exclusive Canadian access to St. Pierre Bank. However, this is highly unlikely.

SUMMARY AND CONCLUSIONS

In 1982, 1,527,809 lbs of scallop meats were taken from St. Pierre Bank. As of December 1, 1983, the Bank had yielded another 1,289,457 lbs. This is considerably higher than historic annual landings (Table 12, p.18).

The average price/lb for scallops in 1983 is $5.20, up from the $3.76/lb average received for St. Pierre Bank scallops in 1982.

The number of vessels the fishery can support at an average 10% return on investment for each vessel, for varying levels of total catch, is shown in Table 13 (p.18). It is assumed that the 1982 catch represents the maximum potential harvest, although this assumption may not be valid.

TABLE 12
CATCH DATA FOR ST. PIERRE BANK SCALLOP FISHERY

YEAR	MEATS (tonnes)
1963	40
1964	343
1965	14
1966	-
1967	164
1968	9
1969	83
1970	127
1971	27
1972	29
1973	36
1974	-
1975	-
1976	-
1977	-
1978	23
1979	1
1980	35
1981	-
1982	693
1983	585*
TOTALS	2,209

* Preliminary

TABLE 13
NUMBER OF AVERAGE SCALLOP DRAGGERS WHICH CAN BE SUPPORTED BY ST. PIERRE BANK AT VARYING PRICE/LB AND VARYING RESOURCE SIZE (AS A % OF THE 1982 CATCH)

RESOURCE SIZE (lbs) / PRICES ($/lb)	1,527,809 (100%)	1,145,857 (74%)	763,905 (50%)	381,952 (25%)
		NUMBER OF VESSELS		
4.00	5.0	3.9	2.5	1.3
5.00	6.3	4.7	3.2	1.6
6.00	7.6	5.7	3.8	1.9
7.00	8.8	6.6	4.4	2.2

Table 13 is based on the cost profile of an average scallop dragger as described in the 1981 Nova Scotia Costs and Earnings survey. There is no guarantee that the survey is representative of the fleet, so the St. Pierre Bank resource may support more or fewer vessels than indicated.

Without a definitive statement as to the size of the resource, or the rate at which recruitment occurs, it is not prudent to suggest a particular fleet size. However, there can be no doubt that if 600 tonnes can be harvested in two consecutive years, then a somewhat lower catch level should support a limited number of vessels over an extended period of time.

Based on 1982 catch rates and available vessel operational data, scallop dragging could be economically viable on St. Pierre Bank on a year-round basis. With rising scallop prices, the fishery becomes even more promising.

It is emphasized that the scallop fishery on St. Pierre Bank to date has been almost exclusively for Sea scallops. Given that the biological research indicates a large biomass of Iceland scallops, (probably larger than the Sea scallop resource), a sustained fishery on the Bank may be more likely than is indicated by the operations of the Nova Scotia fleet.

PUBLICATIONS LISTING

PUBLICATIONS LISTING OF THE ECONOMICS BRANCH FISHERIES AND OCEANS P.O. BOX 5667 ST. JOHN'S, NFLD.

1983

1. A Review of the Newfoundland Bait Service: Action Alteratives for the 80's, W.M. Follett, February, 1983. (INTERNAL-CONFIDENTIAL)

2. Costs and Earnings of Selected Inshore and Nearshore Fishing Enterprises in the Newfoundland Region, 1981, Economics Branch, May, 1983.

3. Cost Recovery and Proposed Action Plan for Newfoundland Bait Service, W.M. Follett, July, 1983. (INTERNAL-CONFIDENTIAL)

4. Costs and Earnings of Shrimp Fishing Enterprises in the Esquiman Channel, Gulf of St. Lawrence, 1981, Economics Branch, August, 1983.

5. An Economic Assessment of the Esquiman Channel Shrimp Fishery, Gulf of St. Lawrence, 1981, P.R. Hood, August, 1983.

6. Costs and Earnings of Selected Inshore Fishing Enterprises by Vessel Type and NAFO Division, Newfoundland Region, 1981, Economics Branch, August, 1983.

7. Costs and Earnings of Selected Nearshore Fishing Enterprises by Vessel Type and NAFO Division, Newfoundland Region, 1981, Economics Branch, August, 1983.

8. Regional Profiles of the Area North of 50° Latitude in Newfoundland and Labrador, K. Voutier, October, 1983 (INTERNAL-CONFIDENTIAL)

1984

9. An Assessment of the Economic Viability of the Northern Shrimp Fishery, 1983, K. Voutier, January, 1984.

10. Costs and Earnings of Selected Inshore and Nearshore Fishing Enterprises in the Newfoundland Region - 1982, Economics Branch, March, 1984.

11. Economic Indicators of Inshore and Nearshore Fishing Enterprises 1979-1982, Economics Branch, March, 1984.

12. The Processing Sector North of 50° Latitude: A Financial Profile, J.E. Davis and W.M. Follett, July, 1984 (INTERNAL-CONFIDENTIAL)

PUBLICATIONS LISTING

13. An Economic Assessment of the Middle Distance Longline Pilot Project Using the Norwegian Longliner MV KELTIC, M.C. Grandy, July, 1984

14. Costs and Earnings of Selected Inshore and Nearshore Fishing Enterprises in the Newfoundland Region - 1983, Economics Branch, September, 1984.

15. The Socio-Economic Importance of the Commercial Salmon Fishery in Newfoundland and Labrador, A Report Prepared for the 1984 Atlantic Salmon Task Group by Economics Branch, Department of Fisheries & Oceans, Nfld. Region, October, 1984.

16. Benefit/Cost Analysis - Direct Sales Program - Newfoundland Region, 1984, Brian Donahue, November, 1984

17. An Economic Assessment of the 1982 St. Pierre Bank Scallop Fishery, M.C. Grandy, December, 1984.

18. An Economic Assessment of the Purse Seine Fishery in the Newfoundland Region, M.C. Grandy, December, 1984.

19. Economic Indicators of Inshore and Nearshore Fishing Enterprises in the Newfoundland Region 1979-1983, Economics Branch, December, 1984