ECONOMIC IMPACT ASSESSMENT
LOBSTER, HERRING, SHRIMP, AND SNOW CRAB
PROVINCE OF NEW BRUNSWICK

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EXECUTIVE SUMMARY

Introduction

New Brunswick's fishing industry has long been a significant component of the province's economy. Over the last few years, we have analyzed the contribution of various sectors of the fishing industry in New Brunswick. The current study updates those analyses and uses the most recent data available, generally for 2008 but, in some cases, for 2007.

This study examines the economic contribution of four sectors of the fishing industry—lobster, herring, shrimp, and snow crab—on four levels. Accordingly, we shall discuss the impact in terms of sales generated (not by processing plants or fishers directly, but rather sales stemming from processing plant and fisher activities); employment generated (in person-years); contribution to gross domestic product; and revenue generated for governments in New Brunswick, other provincial governments across Canada, and the federal government. Our study, which combines fishing and processing, presents impact data for each county in New Brunswick.

We obtained our baseline data from various representatives of the sector (Fisheries and Oceans Canada, the New Brunswick Department of Fisheries, processing plant managers, industry representatives, and so forth). We therefore received data both on the harvesting of the four species targeted by this study and on the processing of those species. Where available cost-structure data were more than a year or two old, Statistics Canada's sectoral price-level indicators were used in order to have the appropriate figures.

Obviously, a study such as this one is based on certain general hypotheses. In other words, averages are used at various levels. By definition, averages provide a general picture and do not automatically reflect specific cases. For instance, not all processing plants and boats have the same cost structure. The baseline data

used therefore provide an overall profile of the sector rather than a snapshot of one case in particular.

Sales generated

Sales generated measure purchases made through revenue from fishing and processing effort. They do not measure sales by fishers or processing plants, but rather purchases made through revenue arising from those sales.

Table A: Total sales generated by the four sectors (does not measure fisher or processing plant sales, but rather sales in the economy stemming from fisher and processing plant activities), $ million

	Lobster	Herring	Shrimp	Snow Crab
Albert	1.6	0.9	0.1	0.4
Carleton	5.8	4.1	0.6	3.1
Charlotte	99.8	67.0	0.3	1.5
Gloucester	178.7	50.8	51.3	187.4
Kent	87.0	2.6	0.3	5.6
Kings	4.5	2.7	0.4	1.9
Madawaska	3.1	2.2	0.3	2.0
Northumberland	46.7	9.9	0.5	4.3
Queens	1.8	1.4	0.1	0.7
Restigouche	7.2	2.4	0.5	3.3
Saint John	54.9	46.5	3.7	16.5
Sunbury	1.5	0.8	0.1	0.5
Victoria	3.8	2.5	0.4	1.8
Westmorland	297.1	47.5	3.3	25.8
York	44.5	20.1	3.5	15.1
Total NB	837.8	261.3	65.5	270.0
Other provinces	1,074.0	93.6	22.4	104.6
Total Canada	1,911.8	354.9	87.8	374.5

In all, the four sectors generate sales of more than $1.4 billion in New Brunswick and nearly $1.3 billion in the other provinces, amounting to over $2.7 billion in total sales in Canada. Lobster is the largest sector. The significant impact of this sector outside New Brunswick stems in part from the sizeable quantities of lobster that are purchased outside the province for processing here.

Regional impacts vary depending on the species. The greatest impacts overall are in Gloucester, Westmorland, and Charlotte counties. The lobster sector

has a greater impact in Westmorland County; the herring sector, in Charlotte County; and the shrimp and snow crab fishery, in Gloucester County.

Employment generated

Employment generated is represented in person-years. One person-year equals 48 weeks of work. The four sectors account for more than 8,000 person-years, but, given the industry's seasonal nature, we can say that there are many more people whose jobs depend on the fishing industry. If we were to assume, for example, that these jobs last 20 weeks on average, that means the employment of over 19,000 people would depend, directly or indirectly, on the four sectors. For Canada as a whole, jobs equating to more than 15,000 person-years are dependent on the four sectors.

While lobster generates the most jobs, herring and snow crab also account for a considerable number. While the number of jobs is highest in Gloucester County, there are also significant numbers in Charlotte and Westmorland counties. Further, counties such as Saint John and York, where the fishing industry is relatively smaller or virtually non-existent, also have a large number of jobs, thereby illustrating the magnitude of the indirect and induced impacts of the fishing industry across the province.

Table B: Total number of jobs generated by the four sectors, in person-years

	Lobster	Herring	Shrimp	Snow Crab
Albert	15	7	1	4
Carleton	39	29	5	22
Charlotte	518	886	2	11
Gloucester	786	356	218	1,315
Kent	373	19	2	31
Kings	32	20	3	14
Madawaska	23	15	2	12
Northumberland	235	77	4	29
Queens	13	10	1	6
Restigouche	42	16	3	19
Saint John	339	148	24	104
Sunbury	12	7	1	4
Victoria	26	17	3	13
Westmorland	1,068	353	22	188
York	265	121	23	99
Total NB	3,787	2,081	314	1,873
Other provinces	5,880	463	115	528
Total Canada	9,667	2,544	429	2,400

Gross domestic product

Table C: Total gross domestic product generated by the four sectors, $ million

	Lobster	Herring	Shrimp	Snow Crab
Albert	0.7	0.4	0.04	0.15
Carleton	2.2	1.7	0.26	1.28
Charlotte	41.6	26.3	0.12	0.56
Gloucester	53.0	18.7	25.76	94.48
Kent	26.8	1.1	0.12	2.77
Kings	1.7	1.1	0.17	0.77
Madawaska	1.2	0.9	0.12	0.75
Northumberland	18.3	3.6	0.19	2.06
Queens	0.8	0.6	0.06	0.31
Restigouche	3.2	1.0	0.21	1.48
Saint John	22.1	14.9	1.48	6.69
Sunbury	0.7	0.4	0.05	0.23
Victoria	1.5	1.0	0.16	0.76
Westmorland	71.7	16.1	1.37	11.38
York	19.5	8.7	1.50	6.51
Total NB	264.9	96.3	31.62	130.20
Other provinces	426.7	35.4	8.63	40.37
Total Canada	691.6	131.7	40.25	170.57

Gross domestic product (GDP) measures what is sometimes called "value added". The contribution of the four sectors in New Brunswick exceeds half a billion dollars, and in Canada as a whole, more than a billion.

The lobster sector has the greatest impact, followed by snow crab and herring. The regional impact is greater in counties with considerable fishing activity (e.g., Gloucester, Westmorland, and Charlotte counties), but is present in other counties in the province as well.

Government revenue

The four sectors generate a significant amount of revenue for government coffers. However, the reduction in taxation rates in recent years means that an equivalent level of activity a few years ago generated greater revenue for government. In addition, the difficulties encountered by some companies in the fishing industry over the past few years have also impacted on government revenue.

The four sectors together generate nearly $40 million in revenue for the provincial government (Table D), while the federal government takes in nearly $130 million from them. In the case of the federal government, those revenues are generated both inside and outside New Brunswick in roughly equal proportions (Table E).

The total contribution of the four sectors to federal and provincial government coffers exceeds $200 million (Table F).

Table D: Revenue generated by the four sectors for the Government of New Brunswick, $ million

	Lobster	Herring	Shrimp	Snow Crab
Albert	0.05	0.02	0.00	0.01
Carleton	0.16	0.13	0.02	0.11
Charlotte	3.19	1.93	0.00	0.04
Gloucester	3.66	1.42	1.88	7.33
Kent	1.90	0.09	0.01	0.25
Kings	0.12	0.08	0.01	0.06
Madawaska	0.09	0.06	0.01	0.05
Northumberland	1.42	0.27	0.02	0.18
Queens	0.05	0.04	0.01	0.03
Restigouche	0.25	0.08	0.02	0.12
Saint John	1.70	1.03	0.12	0.51
Sunbury	0.04	0.02	0.00	0.02
Victoria	0.11	0.08	0.01	0.06
Westmorland	4.94	1.18	0.11	0.83
York	1.46	0.65	0.12	0.51
Total NB	19.16	7.09	2.33	10.10

Table E: Revenue generated by the four sectors for the Government of Canada, $ million

	Lobster	Herring	Shrimp	Snow Crab
Albert	0.08	0.04	0.00	0.02
Carleton	0.28	0.23	0.04	0.19
Charlotte	5.17	3.21	0.01	0.06
Gloucester	6.08	2.35	3.08	12.02
Kent	3.13	0.14	0.02	0.40
Kings	0.21	0.14	0.02	0.10
Madawaska	0.15	0.11	0.02	0.09
Northumberland	2.30	0.45	0.03	0.29
Queens	0.09	0.08	0.01	0.04
Restigouche	0.43	0.13	0.03	0.21
Saint John	2.88	1.78	0.20	0.87
Sunbury	0.08	0.04	0.01	0.03
Victoria	0.19	0.13	0.02	0.11
Westmorland	8.22	1.99	0.18	1.40
York	2.51	1.12	0.20	0.86
Total NB	31.79	11.96	3.86	16.70
Other provinces	53.76	4.67	1.14	5.35
Total Canada	85.55	16.62	4.99	22.05

Table F: Government revenue generated by the four sectors for Canada's federal and provincial governments, $ million

	Lobster	Herring	Shrimp	Snow Crab
Total NB	50.94	19.05	6.12	26.80
Other provinces	84.27	7.22	1.76	8.30
Total Canada	135.22	26.28	7.95	35.09

ECONOMIC IMPACT ESTIMATE

We shall now present detailed information on the economic impacts of the lobster, herring, shrimp, and snow crab sectors. We should point out once again that these are estimates, meaning that we had to work with averages. The results therefore reflect the situation as a whole, but an overly literal interpretation of the data could produce inaccurate analyses. In other words, we are very confident that our estimates present results that reflect the overall situation, but caution must be exercised when interpreting specific cases. For example, the number of jobs created reflects the true situation, even though the exact figure for a given county could have a certain margin of error. It should be noted, however, that the approach used is identical to that used in connection with previous studies.

A – Lobster

The lobster sector generates more than $800 million in sales in New Brunswick and nearly $2 billion in Canada as a whole (Table 1). The counties where the impact is the greatest are Westmorland, Gloucester, Kent, and Charlotte. Indirect and induced impacts are also observed in counties where direct impacts are not as high, such as in Saint John and York, as well as outside the province.

The lobster sector directly contributes more than 1,900 jobs—measured in person-years—in New Brunswick and almost as many at the indirect and induced levels, for a total of nearly 3,800 person-years (Table 2). Given the seasonal nature of the sector, we know that many more people than that benefit from employment thanks to the lobster sector.

These jobs are not concentrated in one region alone but are scattered across the province. The sector's contribution outside New Brunswick is even greater, accounting for more than 9,600 person-years in Canada as a whole.

The sector's impact on the province's gross domestic product is significant, with a direct contribution of $134 million and a total contribution of $265 million

(Table 3). The sector contributes nearly $700 million to GDP in Canada as a whole.

For the New Brunswick government, the lobster sector generates nearly $20 million in revenue for the Government of New Brunswick (Table 4). For the federal government, New Brunswick's lobster sector generates more than $85 million.

Table 1: Sales generated by the lobster sector (does not measure fisher or processing plant sales, but rather sales in the economy stemming from fisher and processing plant activities), $ million

	Direct	Indirect	Induced	Total
Albert	0.2	0.3	1.1	1.6
Carleton	0	2.4	3.4	5.8
Charlotte	52.3	6.9	40.6	99.8
Gloucester	109.4	12.8	56.4	178.7
Kent	56.6	4.3	26.1	87.0
Kings	0	1.1	3.4	4.5
Madawaska	0	1.0	2.1	3.1
Northumberland	24.4	3.1	19.1	46.7
Queens	0	0.7	1.1	1.8
Restigouche	0.7	2.4	4.1	7.2
Saint John	5.8	16.2	32.9	54.9
Sunbury	0	0.4	1.1	1.5
Victoria	0	1.2	2.6	3.8
Westmorland	192.3	16.9	87.9	297.1
York	0	16.1	28.3	44.5
Total NB	441.7	86.0	310.2	837.8
Other provinces	0	490.9	583.0	1,074.0
Total Canada	441.7	576.9	893.2	1,911.8

Table 2: Jobs generated by the lobster sector, in person-years

	Direct	Indirect	Induced	Total
Albert	2	3	10	15
Carleton	0	17	22	39
Charlotte	360	54	104	518
Gloucester	496	94	196	786
Kent	271	35	66	373
Kings	0	9	22	32
Madawaska	0	8	16	23
Northumberland	147	26	62	235
Queens	0	5	9	13
Restigouche	4	15	22	42
Saint John	58	89	192	339
Sunbury	0	3	9	12
Victoria	0	9	17	26
Westmorland	570	131	367	1,068
York	0	91	173	265
Total NB	1,909	591	1,286	3,787
Other provinces	0	3,198	2,862	5,880
Total Canada	0	3,789	3,968	9,667

Table 3: Gross domestic product generated by the lobster sector, $ million

	Direct	Indirect	Induced	Total
Albert	0.1	0.1	0.4	0.7
Carleton	0	1.0	1.2	2.2
Charlotte	29.4	2.8	9.4	41.6
Gloucester	31.8	5.7	15.4	53.0
Kent	18.9	1.8	6.1	26.8
Kings	0	0.5	1.2	1.7
Madawaska	0	0.4	0.8	1.2
Northumberland	12.3	1.3	4.7	18.3
Queens	0	0.4	0.4	0.8
Restigouche	0.5	1.2	1.5	3.2
Saint John	3.2	6.6	12.3	22.1
Sunbury	0	0.2	0.5	0.7
Victoria	0	0.5	0.9	1.5
Westmorland	37.8	7.8	26.1	71.7
York	0	8.3	11.3	19.5
Total NB	134.0	38.7	92.3	264.9
Other provinces	0	222.3	204.3	426.7
Total Canada	134.0	261.0	296.6	691.6

Table 4: Government revenue generated by the lobster sector, $ million

	Provincial	Federal	Total
Albert	0.05	0.08	0.13
Carleton	0.16	0.28	0.44
Charlotte	3.19	5.17	8.36
Gloucester	3.66	6.08	9.75
Kent	1.90	3.13	5.03
Kings	0.12	0.21	0.33
Madawaska	0.09	0.15	0.23
Northumberland	1.42	2.30	3.72
Queens	0.05	0.09	0.15
Restigouche	0.25	0.43	0.68
Saint John	1.70	2.88	4.58
Sunbury	0.04	0.08	0.12
Victoria	0.11	0.19	0.30
Westmorland	4.94	8.22	13.16
York	1.46	2.51	3.98
Total NB	19.16	31.79	50.94
Other provinces	30.51	53.76	84.27
Total Canada	49.67	85.55	135.22

B – Herring

The herring sector generates more than $260 million in sales in New Brunswick and more than $350 million in Canada as a whole (Table 5). Interestingly enough, the indirect and induced impacts in New Brunswick are more than double the direct impacts.

In New Brunswick, the impacts are concentrated mainly in Charlotte, Gloucester, Westmorland, and Saint John counties.

In New Brunswick, more than 2,000 jobs measured in person-years result from activities in the herring sector (Table 6). In Canada as a whole, the herring sector accounts for more than 2,500 jobs (in person-years). Regionally, impacts are greatest in Charlotte County, followed by Gloucester and Westmorland counties.

The herring sector's contribution to gross domestic product totals nearly $100 million in New Brunswick and over $131 million for Canada as a whole (Table 7).

Lastly, the New Brunswick government takes in more than $7 million in revenue from the herring sector, and the federal government, over $16 million (Table 8).

Table 5: Sales generated by the herring sector (does not measure fisher or processing plant sales, but rather sales in the economy stemming from fisher and processing plant activities), $ million

	Direct	Indirect	Induced	Total
Albert	0	0.5	0.4	0.9
Carleton	0	2.4	1.7	4.1
Charlotte	36.6	4.9	25.5	67.0
Gloucester	17.4	14.4	19.0	50.8
Kent	0.1	1.4	1.2	2.6
Kings	0	1.2	1.5	2.7
Madawaska	0	1.2	1.0	2.2
Northumberland	3.2	3.0	3.8	9.9
Queens	0	0.8	0.6	1.4
Restigouche	0.0	1.2	1.2	2.4
Saint John	9.9	19.1	17.6	46.5
Sunbury	0	0.4	0.5	0.8
Victoria	0	1.3	1.2	2.5
Westmorland	16.3	11.9	19.3	47.5
York	0	9.0	11.1	20.1
Total NB	83.4	72.5	105.4	261.3
Other provinces	0	28.2	65.4	93.6
Total Canada	83.4	100.6	170.8	354.9

Table 6: Jobs generated by the herring sector, in person-years

	Direct	Indirect	Induced	Total
Albert	0	4	3	7
Carleton	0	20	9	29
Charlotte	655	141	90	886
Gloucester	201	90	64	356
Kent	2	11	6	19
Kings	0	11	8	20
Madawaska	0	9	6	15
Northumberland	41	21	14	77
Queens	0	7	3	10
Restigouche	0	9	7	16
Saint John	0	106	42	148
Sunbury	0	3	3	7
Victoria	0	11	6	17
Westmorland	173	93	88	353
York	0	56	65	121
Total NB	1,072	593	415	2,081
Other provinces	0	134	330	463
Total Canada	1,072	727	745	2,544

Table 7: Gross domestic product generated by the herring sector, $ million

	Direct	Indirect	Induced	Total
Albert	0	0.2	0.2	0.4
Carleton	0	1.1	0.5	1.7
Charlotte	17.9	2.5	6.0	26.3
Gloucester	8.7	4.8	5.1	18.7
Kent	0.1	0.6	0.3	1.1
Kings	0	0.6	0.5	1.1
Madawaska	0	0.5	0.3	0.9
Northumberland	1.5	1.1	1.0	3.6
Queens	0	0.4	0.2	0.6
Restigouche	0.0	0.5	0.5	1.0
Saint John	0.0	8.9	6.0	14.9
Sunbury	0	0.2	0.2	0.4
Victoria	0	0.6	0.4	1.0
Westmorland	4.5	5.5	6.1	16.1
York	0	4.5	4.2	8.7
Total NB	32.7	32.1	31.5	96.3
Other provinces	0	10.6	24.8	35.4
Total Canada	32.7	42.7	56.3	131.7

Table 8: Government revenue generated by the herring sector, $ million

	Provincial	Federal	Total
Albert	0.02	0.04	0.07
Carleton	0.13	0.23	0.36
Charlotte	1.93	3.21	5.14
Gloucester	1.42	2.35	3.78
Kent	0.09	0.14	0.23
Kings	0.08	0.14	0.22
Madawaska	0.06	0.11	0.17
Northumberland	0.27	0.45	0.72
Queens	0.04	0.08	0.12
Restigouche	0.08	0.13	0.21
Saint John	1.03	1.78	2.81
Sunbury	0.02	0.04	0.07
Victoria	0.08	0.13	0.21
Westmorland	1.18	1.99	3.17
York	0.65	1.12	1.77
Total NB	7.09	11.96	19.05
Other provinces	2.56	4.67	7.22
Total Canada	9.65	16.62	26.28

C – Shrimp

Of the four sectors under review, the shrimp fishery has the smallest economic impact. However, the sector still makes a significant contribution, with sales of $65 million in New Brunswick and $87 million in Canada as a whole. Further, the impact on Gloucester County, where the fishery is concentrated, is considerable (Table 9).

The shrimp sector generates more than 300 jobs (in person-years) in New Brunswick, again mainly in Gloucester County, and more than 400 in Canada as a whole (Table 10). The sector contributes $31 million to New Brunswick's gross domestic product and $40 million to Canada's (Table 11).

Lastly, the shrimp sector is responsible for more than $2 million in government revenue for New Brunswick and $5 million for the federal government (Table 12).

Table 9: Sales generated by the shrimp sector (does not measure fisher or processing plant sales, but rather sales in the economy stemming from fisher and processing plant activities), $ million

	Direct	Indirect	Induced	Total
Albert	0	0.0	0.1	0.1
Carleton	0	0.3	0.4	0.6
Charlotte	0	0.1	0.2	0.3
Gloucester	22.7	1.4	27.3	51.3
Kent	0	0.1	0.2	0.3
Kings	0	0.1	0.3	0.4
Madawaska	0	0.1	0.2	0.3
Northumberland	0	0.1	0.3	0.5
Queens	0	0.0	0.1	0.1
Restigouche	0	0.1	0.3	0.5
Saint John	0	0.7	3.0	3.7
Sunbury	0	0.0	0.1	0.1
Victoria	0	0.1	0.3	0.4
Westmorland	0	0.6	2.7	3.3
York	0	0.5	2.9	3.5
Total NB	22.7	4.4	38.5	65.5
Other provinces	0	3.2	19.1	22.4
Total Canada	22.7	7.6	57.6	87.8

Table 10: Jobs generated by the shrimp sector, in person-years

	Direct	Indirect	Induced	Total
Albert	0	0	1	1
Carleton	0	2	2	5
Charlotte	0	1	2	2
Gloucester	122	12	83	218
Kent	0	1	1	2
Kings	0	1	2	3
Madawaska	0	1	1	2
Northumberland	0	1	2	4
Queens	0	0	1	1
Restigouche	0	1	2	3
Saint John	0	4	20	24
Sunbury	0	0	1	1
Victoria	0	1	2	3
Westmorland	0	4	18	22
York	0	4	20	23
Total NB	122	34	157	314
Other provinces	0	14	100	115
Total Canada	122	49	258	429

Table 11: Gross domestic product generated by the shrimp sector, $ million

	Direct	Indirect	Induced	Total
Albert	0	0.00	0.03	0.04
Carleton	0	0.14	0.12	0.26
Charlotte	0	0.04	0.08	0.12
Gloucester	18.29	0.62	6.86	25.76
Kent	0	0.05	0.07	0.12
Kings	0	0.05	0.11	0.17
Madawaska	0	0.04	0.08	0.12
Northumberland	0	0.08	0.12	0.19
Queens	0	0.02	0.04	0.06
Restigouche	0	0.06	0.15	0.21
Saint John	0	0.27	1.22	1.48
Sunbury	0	0.01	0.04	0.05
Victoria	0	0.06	0.10	0.16
Westmorland	0	0.28	1.09	1.37
York	0	0.26	1.24	1.50
Total NB	18.29	1.97	11.35	31.62
Other provinces	0	1.18	7.45	8.63
Total Canada	18.29	3.16	18.80	40.25

Table 12: Government revenue generated by the shrimp sector, $ million

	Provincial	Federal	Total
Albert	0.00	0.00	0.01
Carleton	0.02	0.04	0.06
Charlotte	0.00	0.01	0.02
Gloucester	1.88	3.08	4.96
Kent	0.01	0.02	0.02
Kings	0.01	0.02	0.02
Madawaska	0.01	0.02	0.02
Northumberland	0.02	0.03	0.04
Queens	0.01	0.01	0.01
Restigouche	0.02	0.03	0.05
Saint John	0.12	0.20	0.31
Sunbury	0.00	0.01	0.01
Victoria	0.01	0.02	0.04
Westmorland	0.11	0.18	0.29
York	0.12	0.20	0.32
Total NB	2.33	3.86	6.12
Other provinces	0.62	1.14	1.76
Total Canada	2.96	4.99	7.95

D – Snow Crab

As was the case with shrimp, the impact of the snow crab sector is concentrated mainly in Gloucester County. The sector accounts for $270 million in sales in New Brunswick and $374 million in Canada as a whole (Table 13).

The impact in terms of employment is significant, with nearly 1,900 person-years for the province (mostly in Gloucester County), and 2,400 person-years in Canada as a whole (Table 14). The snow crab sector injects $130 million into New Brunswick's gross domestic product and $170 million into the national economy (Table 15). Lastly, the provincial government takes in $10 million in revenue from the snow crab sector, and the federal government, $22 million (Table 16).

Table 13: Sales generated by the snow crab sector (does not measure fisher or processing plant sales, but rather sales in the economy stemming from fisher and processing plant activities), $ million

	Direct	Indirect	Induced	Total
Albert	0	0.1	0.3	0.4
Carleton	0	1.6	1.5	3.1
Charlotte	0	0.5	1.0	1.5
Gloucester	88.1	9.9	89.3	187.4
Kent	1.9	0.8	2.8	5.6
Kings	0	0.7	1.3	1.9
Madawaska	0	1.1	0.9	2.0
Northumberland	0.9	1.0	2.4	4.3
Queens	0	0.3	0.4	0.7
Restigouche	0.5	0.9	1.8	3.3
Saint John	0	5.3	11.2	16.5
Sunbury	0	0.1	0.4	0.5
Victoria	0	0.8	1.1	1.8
Westmorland	5.8	4.7	15.3	25.8
York	0	4.3	10.8	15.1
Total NB	97.2	32.2	140.6	270.0
Other provinces	0	24.3	80.3	104.6
Total Canada	97.2	56.5	220.8	374.5

Table 14: Jobs generated by the snow crab sector, in person-years

	Direct	Indirect	Induced	Total
Albert	0	1	3	4
Carleton	0	14	8	22
Charlotte	0	4	7	11
Gloucester	966	88	261	1,315
Kent	15	7	9	31
Kings	0	6	7	14
Madawaska	0	7	6	12
Northumberland	8	9	12	29
Queens	0	3	3	6
Restigouche	4	6	9	19
Saint John	0	34	70	104
Sunbury	0	1	3	4
Victoria	0	7	6	13
Westmorland	72	37	79	188
York	0	31	68	99
Total NB	1,065	256	552	1,873
Other provinces	0	115	413	528
Total Canada	1,065	371	965	2,400

Table 15: Gross domestic product generated by the snow crab sector, $ million

	Direct	Indirect	Induced	Total
Albert	0	0.00	0.12	0.15
Carleton	0	0.79	0.49	1.28
Charlotte	0	0.22	0.33	0.56
Gloucester	68.19	4.40	21.89	94.48
Kent	1.70	0.36	0.71	2.77
Kings	0	0.33	0.43	0.77
Madawaska	0	0.44	0.32	0.75
Northumberland	0.86	0.51	0.70	2.06
Queens	0	0.16	0.15	0.31
Restigouche	0.43	0.40	0.65	1.48
Saint John	0	2.29	4.40	6.69
Sunbury	0	0.08	0.16	0.23
Victoria	0	0.39	0.37	0.76
Westmorland	3.85	2.27	5.26	11.38
York	0	2.13	4.38	6.51
Total NB	75.03	14.82	40.35	130.20
Other provinces	0	9.51	30.86	40.37
Total Canada	75.03	24.33	71.21	170.57

Table 16: Government revenue generated by the snow crab sector, $ million

	Provincial	Federal	Total
Albert	0.01	0.02	0.03
Carleton	0.11	0.19	0.30
Charlotte	0.04	0.06	0.10
Gloucester	7.33	12.02	19.35
Kent	0.25	0.40	0.65
Kings	0.06	0.10	0.16
Madawaska	0.05	0.09	0.15
Northumberland	0.18	0.29	0.47
Queens	0.03	0.04	0.07
Restigouche	0.12	0.21	0.33
Saint John	0.51	0.87	1.38
Sunbury	0.02	0.03	0.04
Victoria	0.06	0.11	0.17
Westmorland	0.83	1.40	2.23
York	0.51	0.86	1.37
Total NB	10.10	16.70	26.80
Other provinces	2.95	5.35	8.30
Total Canada	13.04	22.05	35.09

CONCLUSION

The results of our analysis of the economic impact of four sectors of the fishing industry—lobster, herring, shrimp, and snow crab—enable us to conclude that these are major sectors. At a time when our economies are becoming increasingly urbanized, these sectors are generating spinoffs, to varying degrees, in each region of the province. In addition, those impacts very often occur in more rural communities.

Our study reveals some significant numbers. The contribution of these sectors to sales, employment, gross domestic product, and government revenues is considerable. While modelling does not automatically generate data with a perfect reliability rate, the order of magnitude of the findings is undeniable. The lobster sector is the largest of the four, with its impact spread across the regions. The impacts of the herring and in particular the shrimp and snow crab sectors are more centralized. However, indirect and induced impacts are observed in every region of the province … and the country.

Ultimately, the four sectors generate very significant spinoffs:

- sales generated: $1.4 billion in New Brunswick and $2.7 billion in Canada
- jobs: 8,000 person-years in New Brunswick and 15,000 in Canada
- gross domestic product: $523 million in New Brunswick and $1 billion in Canada as a whole
- Government revenue: $38 million for the provincial government and $129 million for the federal government.

APPENDIX A – Methodology

This type of analysis must be carried out using a proven economic model, in this case, the input-output model. We obtained our baseline data from various representatives of the sector (Fisheries and Oceans Canada, the New Brunswick Department of Fisheries, processing plant managers, industry representatives, and so forth). We therefore received information both on the harvesting of the four species targeted by this study and on the processing of those species. Where available cost-structure data were more than a year or two old, Statistics Canada's sectoral price-level indicators were used in order to have the appropriate figures.

We then used an input-output model developed by EcoTec Consultants in order to quantify with relative precision the total, detailed economic impact of the sectors. The baseline data used in this analysis were obtained during our consultations. The principle of the input-output model is that it basically tracks the money spent by the sector. For example, a processing plant may purchase packaging from a factory in Moncton or Saint John which, as a result of this, hires employees, buys raw materials, etc. Those expenditures in turn will have an effect, i.e., the workers spend their wages, pay taxes, and so on. The input-output model takes into account the different facets of the economy and has a special characteristic in that it is based on the inputs (purchases) and outputs (production) of various large sectors of the economy. Our model has the added advantage of breaking these down geographically, by county.

Obviously, a study such as this one is based on certain general hypotheses. In other words, averages are used at various levels. By definition, averages provide a general picture and do not automatically reflect particular cases. For instance, not all processing plants and boats have the same cost structure. The baseline data used therefore provide an overall profile of the sector rather than a snapshot of one case in particular.

We shall now present a somewhat more detailed description of the model.

Direct impacts

Direct employment for a given sector, e.g., the construction industry, refers to the employees in that sector (e.g., carpenters, plumbers). In the fishing industry, this is divided into two sectors: fishing (fishing, hunting, and trapping) and food manufacturing (processing plants). The direct value added by each sector (i.e., its contribution to New Brunswick's gross domestic product) is the total remuneration of the production factors in each sector.

Indirect impacts

The indirect economic impacts are those resulting from the purchase of goods and services between companies. For example, the transportation of boxes between the box production plant and the processing plants constitutes an indirect impact as a result of the purchase of a service (transportation) by the processing plant. Purchases made by the truck drivers (e.g., gasoline, insurance, truck repairs) also represent indirect impacts.

Induced impacts

Induced economic impacts are generated through purchases made by consumers (plant workers, truck drivers, fishers, etc.) using their wages.

Models and algorithms

EcoTec Consultants develops and continuously updates a variety of models for calculating economic impacts. The most widely used models are the interprovincial model—which calculates economic impacts by province—and the intercounty model—which calculates economic impacts by county in New Brunswick. Those two models were used in this study in calculating economic impacts.

The New Brunswick county model is capable of estimating the economic impacts of expenditures in a given county (e.g., Kent) for each county in the province. In New Brunswick, economic impacts can be broken down for the 15 counties.

The county model works in tandem with the interprovincial algorithm and contains the same number of goods and services (476) and industries (117). This tandem approach ensures that the model remains balanced and that the total economic impact by county is the same as or very similar to the New Brunswick data generated by the interprovincial model. Two models therefore run simultaneously in the regional model, thereby simulating the actual workings of the Canadian economy (interprovincial model) and the New Brunswick economy (regional model).

Transactions between the industries in the various counties are calculated in the same way as in the interprovincial model, that is, using a complex, three-dimensional matrix of trade flows (goods and services transactions). Special algorithms were developed to calculate flows between each of the 15 counties.

A simulation starts when a vector containing expenditures by goods (476) or by industry (117) is introduced into the model. The main algorithm begins by calculating imports from other countries and from each of the other nine provinces in Canada and then subtracts these imports from the expenditure vector. Consequently, the dollars remaining in the model represent the amount that will initially stay in the economy for one round of expenditures.

The model then identifies the industries that will produce the initially consumed commodities (initial expenditure vector). For example, if the initial

expenditures include $10,000 for the transportation of boxes, that amount will show up in the truck transportation industry.

The model will extract the gross domestic product (GDP) component from these data on sales by industry. Lastly, government tax revenue is calculated for four main revenue streams: personal income taxes, sales taxes, taxes on corporate profits, and other indirect taxes (e.g., excise taxes).

The second round of expenditures will involve companies that make purchases to meet the initial demand. The model will continue to iterate for up to 15 years following the initial expenditure. At each round of expenditures, the amount of money remaining in the economy will decrease on account of three main factors: imports of goods and services from other countries and the nine other provinces, taxes collected by governments, and household and corporate savings.

Since the model is an interprovincial one, at each round of expenditures, purchases by New Brunswick companies from other provinces are entered into the model.

Induced impacts are calculated using a special model simulation, called a closed simulation. This means that households can spend their wages according to a consumer expenditure structure specific to New Brunswick. Since consumer expenditures account for more than 60% of the New Brunswick and Canadian economies, it is important to be able to calculate induced impacts accurately in order to have a comprehensive overview of all of the economic impacts.

To ensure that induced impacts are not overestimated, the model takes a number of actions, including the following:

- Federal and New Brunswick personal income tax are both collected before households spend their wages.

- Workers' social contributions (Employment Insurance, public/private pension plan contributions, etc.) are collected.

- A rate of 92% is used for the average propensity to consume (APC) (the remainder, 8%, is considered household savings). This is very conservative since household APC in New Brunswick was close to 99% in 2008.

The total impacts are the sum of the direct, indirect, and induced impacts. Together, these statistics provide a complete picture of the economic impacts generated by the initial expenditures used to begin the simulation. It should be noted that, since this is an interprovincial model, federal government taxation revenue includes all federal revenue for Canada's 10 provinces.