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Experimental Troll Fishing for Atlantic Salmon in Miramichi Bay, New Brunswick

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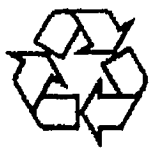

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ABSTRACT

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In 1971, 1972, 1990 and 1991, experimental fisheries were commissioned by the Department of Fisheries and Oceans (DFO) to explore the potential for troll-style fishing for Atlantic salmon in the Miramichi estuary in New Brunswick. The objective of these experiments was to assess the possibility that this type of angling might provide considerably increased angling opportunities to rationalize public investment in enhancement of small salmon rivers with major estuaries. Results of the experiments were generally successful for mackerel and less so for salmon, with catch limited to the 1972 season. This report examines these experiments, summarizing the approach, conditions and results to the extent permitted by available documentation. Included is a summary of anecdotal information from participants.

RÉSUMÉ

Fram, K. J. 1993. Experimental Troll Fishing for Atlantic Salmon in Miramichi Bay, New Brunswick. Can. Manuscr. Rep. Fish. Aquat. Sci. 2198: iv + 14 p.

En 1971, 1972, 1990 et 1991, le ministère des Pêches et des Océans du Canada (MPO) a commandé la tenue de pêches expérimentales afin d'étudier les possibilités d'une pêche aux lignes traînantes pour le saumon de l'Atlantique dans l'estuaire de la Miramichi au Nouveau-Brunswick. L'objectif de ces expériences était d'évaluer dans quelle mesure cette méthode de pêche pourrait augmenter les perspectives du secteur de la pêche à la ligne, dans un effort pour rationaliser l'investissement gouvernemental dans la mise en valeur des petites rivières à saumon qui ont d'importants estuaires. En général les expériences ont donné de bons résultats pour le maquereau, mais les résultats de la pêche au saumon n'ont pas été aussi fructeux, les prises étant limitées à la saison de 1972. Le présent rapport examine ces expériences, résume l'approche utilisée, ainsi que les conditions entourant les travaux et les résultats obtenus, dans la mesure permise par la documentation disponible. Nous avons aussi annexé de l'information fournie par les participants aux expériences.

INTRODUCTION

An experimental troll-style fishery was conducted on the Miramichi estuary in New Brunswick during 1971, 1972 and 1993 by the Department of Fisheries and Oceans. The goal was to study the feasibility of this type of angling activity with the aim of possible expansion and diversification of the salmon fishery at this location.

In 1971, trolling operations were conducted in the Miramichi River estuary (Figure 1) for three weeks, beginning on September 15. No salmon were taken throughout this period, although other species, viz., mackerel, were taken in significant numbers.

In 1972, two areas were fished: Miramichi Bay, off Escuminac, and the estuary of the Miramichi River from Millbank out to Fox and Partridge Islands (Figure 1). Five salmon were caught and returned to the water during the time of the experiment (month of June). Other species, such as mackerel and cod, also were taken.

A prolonged fishing effort was undertaken in the summer of 1991. It involved nearly 300 hours of trolling during the months of July through October, concentrating in the Miramichi Bay area down river from the Centennial Bridge at Chatham (identified as Route 11 in Figure 1). No salmon were taken, although other species were successfully angled.

The objectives of such experiments were clearly outlined in a 1990 Departmental document:

- To assess the technical and catching reliability of several trolling methods for salmon, cod and mackerel at different times in the season;

- To determine areas in the Miramichi estuary which offer best potential to entertain such activities;

- To potentially enable commercial salmon gill-net licence holders to diversify their activities and improve their income.[1]

The aim of this report is to summarize the approach and results of troll fishing experiments in Miramichi Bay in the hope that future efforts might benefit from these past experiences.

Note: Little information exists from trolling experiments conducted in 1988, 1989 and 1990 (although we know that salmon were not taken during these attempts). These experiments were largley voluntary efforts, which may explain the lack of recorded information. As a result, this report will focus on information provided for experiments conducted in 1971, 1972 and 1991.

EQUIPMENT

Similar trolling equipment was employed in all years of the experiment (Table 1). Three to five rods were positioned on a vessel using either weighted line or a downrigger device to control depth (Figure 2). The vessels ranged from a small Boston Whaler to a larger, 40-foot fishing vessel common to the Northumberland Strait fishery. A variety of lures, plugs and flies were used during these experiments (Tables 1 and 2; Figure 3).

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[1] Internal Gulf DFO Memorandum from Regional Director, Fisheries and Habitat Management to Regional Director General, July, 1990.

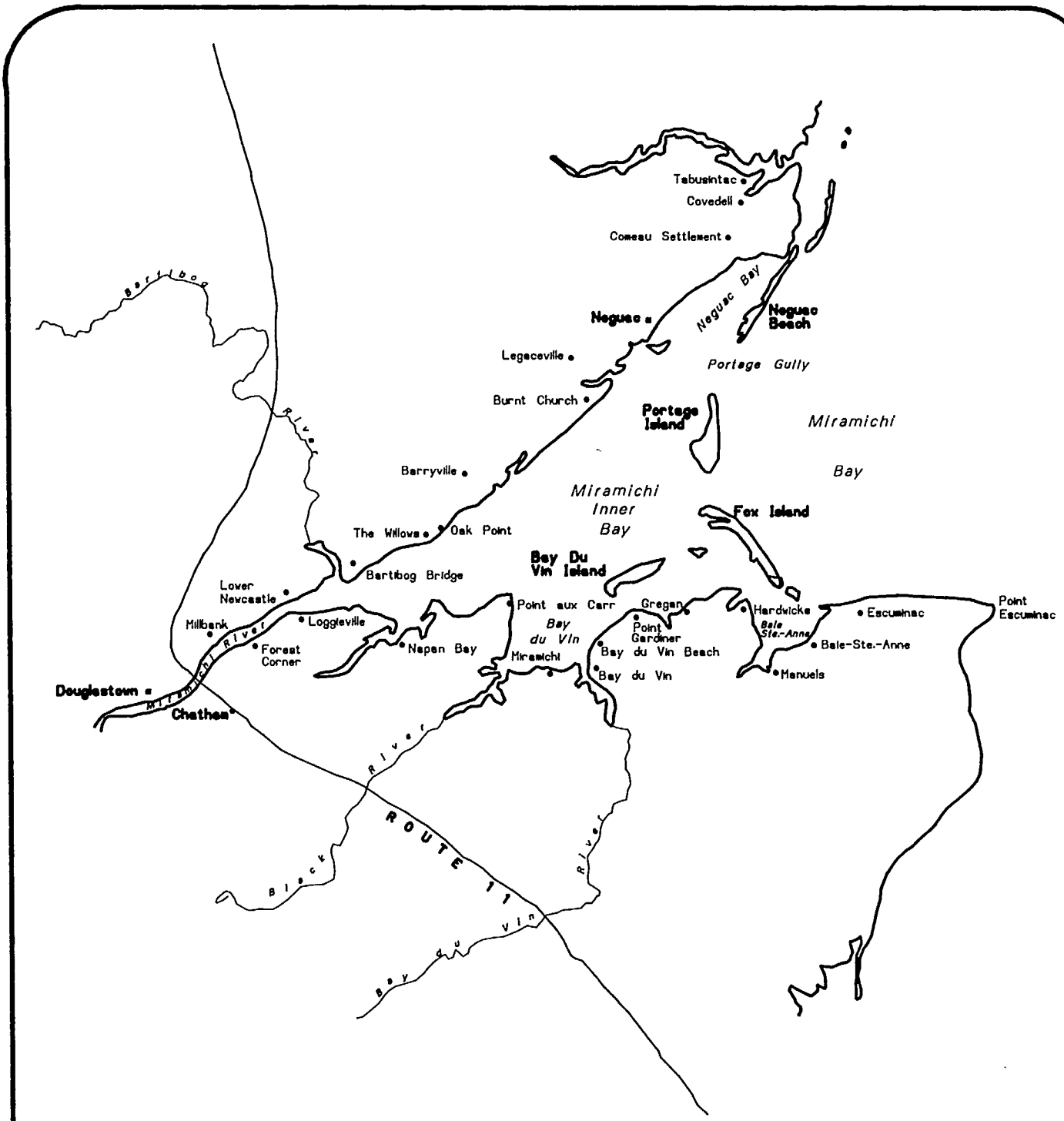

FIGURE 1. MAP OF MIRAMICHI BAY, NEW BRUNSWICK

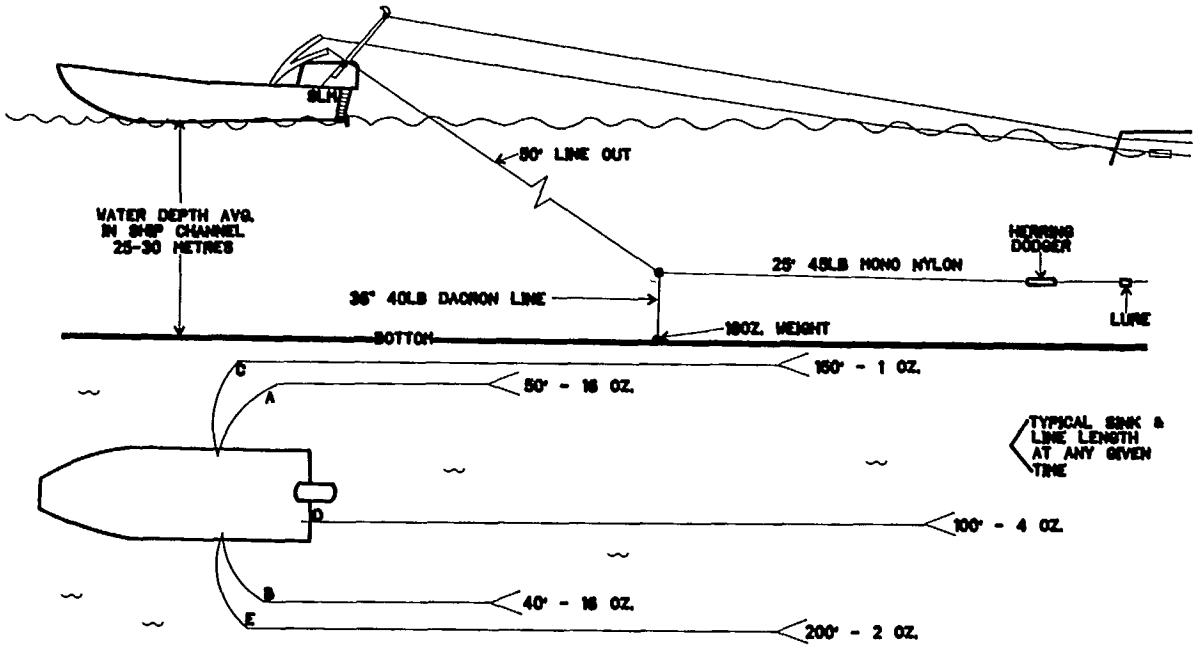

FIGURE 2. DIAGRAM OF OPERATIONAL SETUP USED IN 1971 AND 1972

METHODS

Trolling, using from three to five rods, was conducted in a particular area. Each rod was placed at a different depth in order to cover as much territory as possible as the vessel slowly swept a particular area. Based on anecdotal information, emphasis was placed on areas which were believed to be staging or milling grounds for salmon, or were considered part of the salmons' migratory route into the river system.

Different lures, plugs and flies were tested during these experiments to compare suitability of one variety of hardware over another for a variety of species.

Throughout the experiments, records were kept describing the location trolled, prevailing conditions, hours spent at a given location, etc. (Tables 3, 4, 5 and 6). Records for 1991 are more comprehensive and complete than for 1971 and 1972, with the former providing details as to daily water temperature, trolling speeds, depths trolled, etc.

Table 1. Summary of equipment utilised during 1971 and 1972 experiments.

Note: The same equipment was used in both 1971 and 1972.

Two wire line sets:
- 5 1/2" Peetz Recorder reel with 505 Major Glass Rod
- 600 ft of 45lb test Monel line
- 16 oz. weight
- (gear used for deep trolling efforts)

Three mono nylon sets:
- 5" Allcock Reel with Rich-make 9ft hollow glass rod
- 600-900ft of 25lb test mono nylon line
- 1/2 oz weight, 1 to 10 feet
- (gear used for shallow trolling efforts)

Plugs:
- wobbling swimming lure
- simulated herring lure
- simulated shrimp lure
- colours: greens, blues, scaled, fluorescent pinks, reds & greens

Spoons:
- wobbling metallic lure
- colours: chrome, 1/2 chrome, 1/2 fluorescent red, white and fluorescent orange/red, pearl plastic

Flies:
- Hair type lure
- deer
- polar bear hair
- poly metallic filament
- radiant mylor
- action flashtail.
- (all tandem hook flies, fished with spinners or behind dodgers)

Octopus or squid lures:
- soft plastic in complete range of colours, fished behind flasher or dodger

Natural bait lures:
- plastic holder for bait which activates in a spiral wobbling action

Sonic lures:
- wobbling, darting lure called Buzz Bomb in grey, grey & white, pink & white

Dodger, flasher:
- (dodgers wobble while flashers revolve)
- Krippled K
- Slasher
- Chrome finish: 6 to 14 inches (used for attraction purposes only)

RESULTS

In the 1971 and 1991 seasons, mackerel were caught in Miramichi Bay, even though no salmon were landed. This is a significant factor, since the ultimate success of a saltwater trolling operation will depend on fishing diversity, rather than on total dependence on one species.

Approximately 45 hours of effort in 1971 demonstrated a good potential for mackerel, and a considerable number of salmon sightings (Table 3).

Approximately four weeks of effort in 1972 resulted in success in the form of four salmon and one grilse, along with the continued success for mackerel and, it is interesting to note, some cod (Table 4).

The effort in 1991 was more vigorous, with almost 300 hours spent trolling Miramichi Bay. The results were mixed: mackerel were captured in small numbers and a significant number of salmon were sighted (Table 6).

Results point to an increased potential for mackerel during peak summer months in the outer Bay. Based on sightings, it would also appear that salmon concentrations reach their greatest levels in the Millbank-Bartibog area, before the fish proceed up river.

Table 2. Summary of equipment utilised during 1991 experiment.

1991
- Big Jon electric downriggers (4 ft booms) - 7 ft Shakespeare troll rods - Penn trolling reels - Mitchell spinning rods & reels - Coloured downrigger weights - Assortment of dodgers and flashers from 2 by 6" to 3 by 8", plain and patterned silver - Assortment of lures & hooks - Assortment of wet flies - Eagle fishfinder and depth sounder - 18 ft boat - Power, 85 hp Mercury engine - Auxiliary power, 15 hp engine

OBSERVATIONS

A number of observations were offered by individuals involved in the various experiments. While anecdotal, this information is included, as it relates to the fishery. In 1971, it was noted that approximately 75% of jumping salmon in the deeper water of the shipping channel in the estuary, while about 95% of all jumping salmon were observed in the general vicinity from Sheldrake Island to Millbank (Figure 1). Surface wind appeared to have caused the fish jumping activity to increase. Most jumpers were grilse. Heavy concentrations of jumpers were observed the evening of September 17 (i.e., 12 to 15 jumpers in a 30-minute period in the Millbank trap area). Larger mackerel appeared toward the mouth of the estuary. They could be taken in the deepest water, and appeared to be found in concentrated schools. These schools had to be found before large catches could be made. Natural-looking plugs and spoons resulted in the best capture of mackerel.

The 1972 experiment proved that salmon can be taken on sports-trolled tackle in saltwater. It also detected a relationship between tides and jumping activity among salmon in the estuary. Increased activity was noted during tide change and up to two hours thereafter.

In 1991, as also noted in 1971 observations, salmon were more frequently sighted in the general vicinity of Millbank.

Figure 3. Assortment of lures and hooks used in 1991 experiment.

DISCUSSION

Based on results from the various troll fishing experiments conducted in Miramichi Bay since 1971, it is possible to draw certain conclusions, in spite of what would superficially appear to be poor results (i.e. no salmon captured in 1971 and 1991):

1) Atlantic salmon can be taken in saltwater using troll-style sports angling equipment.

2) Atlantic salmon appear to mill or stage in the Millbank to Bartibog area of the estuary.

3) Together, Atlantic salmon and mackerel give potential to the establishment of a troll-style sportfishery in the Miramichi estuary during the summer and early autumn months.

Explanations as to why salmon were not more successfully angled during these experiments are difficult to construct. It may be a case of conducting experiments during years of poor returns (Table 7). It is generally agreed that a troll fishery requires a concentration of salmon to be successful. This problem is mitigated, however, if it is known that salmon concentrate in certain regions of the estuary and trolling is limited to these regions.

More significant, perhaps, is the need to develop directed fishing techniques which achieve a greater catch rate in Miramichi Bay. This can be accomplished by placing greater emphasis and further study on more effective lures, flies, etc., and methodologies associated with their use.

With continued management efforts aimed at Atlantic salmon stock conservation and restoration, along with increased demands for diversification within the fishing and tourism sectors, future development of sports troll fishing on Miramichi Bay may hold the key to increased benefits for the entire region.

ACKNOWLEDGEMENTS

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Table 3. 1971 trolling experiment results in the Miramichi estuary. Five lines were fished with many and varied combinations of lines, flies and bait. Depth varied from 1 to 30 ft. Trolling speeds in the 2-4 mph range.

DATE	AREA TROLLED	HOURS	FISH TAKEN	SALMON SIGHTINGS	COMMENTS/ OBSERVATIONS
SEPT 15	15 miles off Fox & Portage Isles	8	17 mackerel	nil	nil
Sept 16	Millbank and Napan Bay	8	10 mackerel	6 grilse	mackerel taken off Napan Bay.
Sept 17	Millbank to Bartibog River	7	nil	12 to 15 grilse	started at daybreak to ascertain early morning activity.
Sept 20	in channel between Fox and Portage Islands	8	11 mackerel	1 grilse	began trolling at 10:30 hrs.
Sept 21	area off Napan Bay	6	10 mackerel	4 grilse	nil
Sept 22	between Millbank and Loggieville	6	1 mackerel	11 grilse 1 salmon	between 10:00 & 10:30 six grilse and one salmon were spotted in a relatively small area.

Table 4. 1972 trolling experiment results off Escuminac. Five lines were used off a 40-foot drifter vessel. Varied combinations of flies, lures and plugs were tested at all depths. Water depths themselves varied from 30 to 90 feet. Trolling speeds varied between 2-3 mph. All trolling occurred during the month of June.

AREA FISHED	FISH TAKEN	COMMENTS/OBSERVATIONS
four to five miles due East of Fox Island in tide line.	1 salmon	Caught in an ebb tide. Used shrimperized pink kamlure with pink strands on hook. Used 150 feet of 25 lb test mono line with 1/2 oz lead sinker.
six to seven miles off Escuminac.	1 salmon	Similar gear as noted above. Trolled at 25-30 ft depth.
seven miles off Escuminac.	1 grilse	Trolled at 25-30 ft depth.
miscellaneous	mackerel and cod also taken in this area	Two more salmon strikes experienced using kamlure on surface trolling gear. Occurred off river's mouth, one 4-5 miles, the other 12 miles. Both were in tide line areas laying East of the mouth. Mackerel most productive at 30-35 ft depth.

Table 5. 1972 trolling experiment results in the Miramichi estuary. Equipment set up as for Escuminac area. Estuary portion fished from Millbank to one mile offshore from Fox-Portage Islands. Fished from shallow waters of estuary to deep channel off Horseshoe Shoals. Trolling speed in the 2-3 mph range. Jumping grilse were seen throughout the estuary.

AREA FISHED	FISH TAKEN	COMMENTS/OBSERVATIONS
between Fox and Portage Islands	1 grilse	Taken at depth of 20 ft.
one mile Southward from gap between Fox and Portage Islands.	1 salmon	Taken on 150 ft line with 1/2 oz lead sinker. Excellent fighter (9.5 lbs) on this light gear.
around Horseshoe Shoals	limited number of mackerel	nil

Table 6. 1991 trolling experiment results in the Miramichi estuary. Trolling took place from July 3 to October 31, for a total of 296 hours. Three to four rods were utilised at various depths. Trolling speed ranged from 1.5 to 4 mph.

DATE/HRS TROLLED	AREA TROLLED	FISH TAKEN	SALMON SIGHTINGS	DEPTH RANGE	COMMENTS/ WATER TEMPERATURE
June 28/ 6 hrs-pm	along inside of Portage Island to entrance through easterly direction to bell buoy.	1 cod	1 salmon	32 ft	cod taken on Canadian Wiggler lure. 58.5°F
July 1/ 5 hrs-am	off Neguac beach.	nil	nil	8-60 ft	60.2°F
July 3/ 6 hrs-am 5 hrs-pm	am: fished channel from entrance to Ground Down light. pm: Gammons buoy to head of Portage Island.	nil 2 mackerel	nil nil	nil 15 ft	nil 61.0°F
July 6/ 6 hrs-am	lower end of Sheldrake Island to Loggieville wharf.	nil	nil	8-24 ft	65.5°F
July 9/ 6 hrs-am	Neguac Gully, around Bell buoy.	2 mackerel	nil	12-26 ft	59.0°F
July 12/ 7 hrs-am	Gordon's wharf to Millbank fish trap to Bartibog Island.	nil	nil	25-44 ft	68.2°F
July 13/ 6 hrs-am	Neguac bell buoy.	4 mackerel	nil	24 ft	mackerel caught with surface salmon squids 60.0°F
July 17/ 8 hrs	Lower Newcastle.	nil	numerous salmon and grilse	surface	68.5°F

Table 6 (cont'd). 1991 trolling experiment results in the Miramichi estuary.

DATE/HRS TROLLED	AREA TROLLED	FISH TAKEN	SALMON SIGHTINGS	DEPTH RANGE	COMMENTS/ WATER TEMPERATURE
July 18/ 6 hrs-am	Millbank wharf to salmon trap.	nil	4 salmon	surface	salmon spotted around time of tide shift. 67.2 °F
July 19/ 4 hrs-pm	Bell buoy to Portage Island.	4 mackerel	nil	10-35 ft	mackerel taken at 35 ft.
July 21/ 5 hrs-pm	Tabusintac Bell.	3 mackerel	nil	n/a	63.2°F
Aug 2/ 5 hrs-pm	Burnt Church to Point Cheval.	1 mackerel	nil	surface	mackerel taken on wet fly. 66.4°F
Aug 9/ 8 hrs	Burnt Church to Fox Island then to Millbank wharf.	3 mackerel	2 salmon	30-37 ft	salmon spotted at Millbank. 71.4°F
Aug 12/ 5 hrs-am	Bell buoy eastward to dunes at Neguac.	2 mackerel	nil	32 ft	fish taken on salmon squid near bottom. 68.2°F
Aug 14/ 3 hrs-pm	Bell buoy to Fox Island.	nil	nil	24 ft	68.9°F
Aug 22/ 6 hrs-pm	Sheldrake Island to Gordon's wharf to Millbank trap.	nil	nil	n/a	murky water 66.6°F
Aug 27/ 8 hrs	Gordon's wharf to Millbank to Bartibog River.	nil	6 salmon	8-10 ft	66.0°F
Aug 30/ 8 hrs	Oak Point to Sheldrake Island to Gordon's wharf.	nil	5 salmon	7-8 ft	68.0°F
Sept 1/ 7 hrs	Gordon's wharf to Millbank wharf.	1 striped bass	nil	8-10 ft	62.5°F
Sept 2/ 8 hrs	Bartibog Island to Gordon's wharf to Millbank.	nil	8 salmon	n/a	61.1°F

Table 6 (cont'd). 1991 trolling experiment results in the Miramichi estuary.

DATE/HRS TROLLED	AREA TROLLED	FISH TAKEN	SALMON SIGHTINGS	DEPTH RANGE	COMMENTS/ WATER TEMPERATURE
Sept 4/ 8 hrs	Bartibog to Gordon's wharf to Millbank.	nil	3 salmon	18-22 ft	fish on sounder 63.5°F
Sept 5/ 10 hrs	Burnt Church to Sheldrake Island to Gordon's wharf.	nil	1 salmon	6-11 ft	64.0°F
Sept 18/ 9 hrs	Gordon's wharf to Millbank wharf to Bartibog.	nil	some sightings	8-12 ft	62.9°F
Sept 19/ 10 hrs	Mouth of Bartibog to Gordon's wharf to Millbank to Bartibog Island.	nil	many sightings	5-12 ft	61.2°F
Sept 20/ 9 hrs	Gordon's wharf to Oak Point wharf to Sheldrake Island to Millbank.	nil	1 sighting	surface	60.1°F
Sept 21/ 8 hrs	Oak Point to Oyster River; Sheldrake Island to Gordon's wharf.	nil	some sightings	12 ft	fish showing along tide ripple 58.6°F
Sept 23/ 8 hrs	Gordon's wharf to Bartibog down to Loggieville wharf.	nil	nil	12-23 ft	58.6°F
Sept 24/ 9 hrs	Bartibog Island to Gordon's wharf to Millbank.	nil	2 sightings	25 ft	58.3°F
Sept 27/ 9 hrs	Gordon's wharf to Bartibog Island to Millbank to Loggieville to Sheldrake Island.	nil	3 sightings	15-20 ft	53.4°F
Sept 28/ 9 hrs	Sheldrake Island to Gordon's wharf; from Bartibog to Millbank.	nil	nil	22-36 ft and 5-12 ft	51.4°F

Table 6 (cont'd). 1991 trolling experiment results in the Miramichi estuary.

DATE/HRS TROLLED	AREA TROLLED	FISH TAKEN	SALMON SIGHTINGS	DEPTH RANGE	COMMENTS/ WATER TEMPERATURE
Oct 1/ 8 hrs	Gordon's wharf to Sheldrake Island to Bartibog Island; Oyster River to Oak Point.	nil	1 salmon along channel at Sheldrake	8-12 ft	49.6°F
Oct 2/ 9 hrs	Gordon's wharf to Sheldrake Island; Bartibog River to Gordon's wharf to Millbank.	nil	4 sightings	15-40 ft	51.9°F
Oct 4/ 8 hrs	Gordon's wharf to mouth of Bartibog River to Millbank.	nil	nil	12-40 ft	52.6°F
Oct 6/ 8 hrs	Lower Newcastle to Chatham wharf to Millbank.	-	2 sightings	18-40 ft	53.4°F
Oct 7/ 8 hrs	Sheldrake Island to Loggieville wharf to mouth of Bartibog River.	nil	nil	6-12 ft	windy, with chop 51.0°F
Oct 8/ 10 hrs	Burnt Church to Fox Island to Portage Island.	3 mackerel	Signs of fish on sounder	23-40 ft	51.2°F
Oct 9/ 10 hrs	Bartibog Island to Millbank trap.	nil	nil	n/a	51.9°F
Oct 10/ 10 hrs	Burnt Church wharf to entrance along channel to Fox Island.	nil	nil	20-35 ft	several seals arrived on Portage Island 51.6°F
Oct 15/ 8 hrs	Burnt Church via entrance to Fox Island.	nil	Signs of fish on sounder	10-40 ft	numerous seals 51.2°F

Table 7. Salmon returns on the Miramichi River 1971-1992

Year	Large Salmon	Small Salmon	Total
1971	24,407	35,673	60,080
1972	29,049	46,275	75,324
1973	27,192	44,545	71,737
1974	42,592	73,418	116,010
1975	28,817	64,902	93,719
1976	22,801	91,580	114,381
1977	51,842	27,743	79,585
1978	24,493	24,287	48,780
1979	9,054	50,965	60,019
1980	36,318	41,588	77,906
1981	16,182	65,273	81,455
1982	30,758	80,379	111,137
1983	27,924	25,184	53,108
1984	15,137	29,707	44,844
1985	20,738	60,800	81,538
1986	31,285	117,549	148,834
1987	19,421	84,816	104,237
1988	21,745	121,919	143,664
1989	17,211	75,231	92,442
1990	28,574	83,448	112,022
1991	29,949	60,869	90,818
1992	31,759	152,647	184,406

NOTE: Large salmon are defined as >63 cm (24.5 inches). Salmon smaller than this are commonly called grilse.