

F I S H E R I E S R E S E A R C H B O A R D
O F C A N A D A

M A N U S C R I P T R E P O R T S O F T H E B I O L O G I C A L S T A T I O N S

No. 369 (2)

Title

Smelt Movements, 1943-44 tagging, Miramichi Bay

Author

R. A. McKenzie

SHELT MOVEMENTS, 1943-44 TAGGING, MIRAMICHI BAY.

Inside Miramichi Bay

Tag design #2 was put on fish tagged and released at the mouth of Bel river in the south west part of the head of baie Ste. Anne before the fishing season opened on Dec. 1/43.

During the first 2 weeks of December 31 were returned from the region of tagging, 2 from off Hardwicks, 3 in the mouth of riviere du Vin and 4 in the main Miramichi river from the mouth of the Napan to Chatham.

From Dec. 15 to 31/43, 68 more were recaptured in the tagging region, 23 along the south side of Miramichi bay from Hardwicks to the south of the Napan, 2 in the Oak point to Grand Dune island region along the north shore and 1 off Burnt Church.

In the first week of January /44 35 more were taken in the head of baie Ste. Anne and 16 along the south side of the "Bay" (hereafter used to mean Miramichi bay) as far up as point Cheval. None were returned from the north shore of the "Bay".

During the last half of January /44 9 were recought in the head of baie Ste. Anne, 23 along the south side of the Bay to point Cheval and 2 off Burnt Church.

During the remainder of the 1943-44 fishing season in February /44 about another dozen were recaptured from baie Ste. Anne and the south shore of the Bay.

All in all about 230 of the 500 tagged were recaptured, 2/3 of these in the head of baie Ste. Anne where they were tagged, and the remainder (about 85 fish) with 7 exceptions all along the south side of Miramichi bay or up the river as far as Chatham. Five of the exceptions were taken along the north shore of the Bay, 1 off Oak point, 1 off Grand Dune and 3 off Burnt Church. The other 2 were taken at the very end of the season in Tabusintac lagoon, that is, just outside the north east corner of Miramichi bay.

On the whole therefore the fish of this tagging stayed where tagged with only about 1/3 of those recaptured spreading along the southern part of Miramichi bay.

Tag design #3 was used in tagging 500 smelt well inside the mouth of riviere du Vin. Considerable fishing occurs in this river early in the season while the fish are still well up towards the head

of tide. The tagged fish were released above the nets, i.e., higher up the river than the nets, and in their descent of the river after the ice formed these fish had to run the gauntlet of all the nets in the river. During the first 2 weeks of December 145 were recaptured and all within the river where they were tagged.

In the last 2 weeks of December about 140 more were retaken in the river, 32 in baie du Vin, 1 off Hardwicks, 6 off point au Car 1 off Loggieville and 1 off Burnt Church. From early January on there is no fishing in riviere du Vin because the smelt have as a rule all left the river. However, 33 more were recaptured along the south part of Miramichi bay from baie du Vin island to point Cheval. Five were recaptured along the north shore between Grand Dune and Burnt Church.

All but 1 of the 20 recaptured from January 15 to 31/44 were also taken along the southern side of the Bay from baie Ste. Anne to point Cheval. The 1 was captured off Oak point.

From January 31/44 to the end of the fishing season 9 more were retaken in the same regions as those in the last half of January.

A total of 394 of these 500 tagged fish were recaptured and the tags returned. However, 309 or about 75% were retaken in the river fishery at riviere du Vin and only about 25% of them outside the river where they were tagged. This river fishery therefore takes a heavy toll of the fish that go up this river in the autumn.

The tagging in early January /44 on Horse Shoe Shoal just inside the main entrance to Miramichi bay was done with design #4.

During the first 2 weeks following the tagging only 4 of the 186 recaptured were taken in the tagging region, the remainder came mostly from farther up the Bay, i.e., from Burnt Church along the north side to the vicinity of Grand Dune and then in the Point au Car area and the west side of baie du Vin. One went up the Miramichi river almost to Loggieville, but none went either into Neguac bay, baie Ste. Anne, Hardwicks bay or the "Harbour". These districts comprise the outer two corners of the estuary or bay.

The second 2 week period following this tagging yielded 162 more of these tags from the same general region, but 5 of these came from one of the outer corners of the bay - Neguac Bay.

Some 43 more were recaptured in the same Burnt Church to baie du Vin region during the very last part of the fishing season.

Practically all of the 391 recaptures were made farther into the Bay than where they were tagged with none moving down into the baie Ste. Anne region and only 5 into Neguac bay. These fish when tagged thus seemed

to at once move farther into Miramichi bay, yet good fishing continued in the tagging region and few if any tagged fish of any kind were recaptured. Since tagging had been carried on in all parts of Miramichi bay, this fishery supported by untagged fish must therefore have been based on fish that moved in from outside the Bay. This is some evidence to show that fish continue to move into the fishing area from outside the Bay as the season progresses.

Five hundred fish also were tagged with design #5 off Lower Meguac just previous to December 1/43. During the first half of December there was no ice fishing and only a restricted amount of "open water" fishing, some off Meguac, some in the south of the Napan and some in the main Miramichi as far up as Newcastle. Within this period 6 were recaptured off Meguac, 7 in the lower part of the Napan, and 8 in the Miramichi. One was recaptured off Tabusintac outside Miramichi bay and to the north.

During the second half of December 45 of this tagging were retaken from all parts of Miramichi bay including baie Ste. Anne and 3 of them came from the Tabusintac region.

From January 1 to 14 inclusive 50 more were retaken from all over the Bay, 7 of them being from off Tabusintac.

During the last 2 weeks of January 14 more were recaptured within the Bay and 4 outside while in early February 4 were recaptured within and 1 outside the Bay.

From the tagging off Lower Meguac 188 tagged fish were recaptured, only 17 of them being retaken near the point of tagging. The others moved into all parts of Miramichi bay and 17 even went outside of the bay to the north east along the coast.

Design #6 was put on 500 smelt at Rockhead just above Loggieville before the season opened, and during the first 2 weeks of December 39 were taken in the Miramichi river above the Oak point, point Cheval line, 22 above Rockhead and 17 below it. In addition to these, 6 were retaken in riviere du Vin and 1 in Bel river at the head of baie Ste. Anne.

From Dec. 16 to 31/43, 50 more of these were recaptured, 3 in the Miramichi above Rockhead, 24 below, 22 along the southern side of Miramichi bay as far out as baie Ste. Anne, 2 off Grand Dune, 1 in Malpeque bay (east end Meguac bay) and 1 off Tabusintac.

By early January smelt fishing in the Miramichi river above Loggieville usually ceases for lack of fish. During the first half of January /44 no tagged fish were taken in Miramichi river above Sheldrake Island, but 65 were retaken in Miramichi bay, 18 down the north side as far as Burnt Church, 45 along the southern shore of the Bay as far out as Baie Ste. Anne and 2 were retaken off Tabusintac just outside the north-east entrance to Miramichi bay.

During the last half of January /44 58 more were retaken over the same area of the Bay but none were taken outside the Bay as off Tabusintac.

The fishery during February /44 yielded 20 more tagged fish, 19 in the upper part of the Bay and only 1 in the further out parts -- baie Ste. Anne.

All in all, 243 or almost half of these tags were returned, with only 3 of them coming from outside Miramichi bay -- off Tabusintac. After release these fish gradually spread down out of the river and into all shores of the Bay. They were however, rather scarce from the north eastern corner of the Bay, i.e. from Burnt Church on out into Neguac and Malpeque bays, though 3 did go farther, to off Tabusintac. In common with the other taggings few if any recaptures were made in the lower central part of Miramichi bay, i.e. just inside the Portage Fox island gully.

Tagging off Grand Dune island with design #7 in mid January yielded 220 recaptures during the remainder of January. All of these were within the Bay mostly in the region of Burnt Church to point Cheval and point au Car, though 1 was taken off Neguac and about 15 along the southern side from Black river to Hardwicke.

During the first 2 weeks of February 104 more were retaken, distributed about as the previously mentioned 220, though the proportion along the southern side of the Bay was greater. Three were also taken in the Horse Shoe shoal to Horse Shoe bar region of the lower central part of the Bay.

From February 15 to 19/44 23 more were recaptured, mostly in the upper part of the Bay. This brought the total recaptures to 347.

Tagging with design #8 just inside Fox gully in the northern part of baie Ste. Anne about mid-January /44 yielded 322 recaptures from baie Ste. Anne, 22 off Hardwicke, 12 in the Harbour and 13 from other parts of the inner section of the Bay, both the north side from Burnt Church inwards as well as the south side, during the first 2 weeks following the tagging. During the next 2 weeks or so 44 more were added to this total, distributed over the Bay in almost exactly the same way.

None of this tagging were returned from outside the Bay, in the main Miramichi above point Cheval or out along the north side farther than Burnt Church.

On January 18/44 500 were tagged using design #9 about the centre of baie du Vin. From then until February 2 199 were retaken mostly from the inner part of the Bay, though a few were recaptured as far out along the north side as Church point and along the south shore 2 were even taken in baie Ste. Anne.

During the remainder of the fishing season to February 24/44, 117 more were returned from the same area, but none came from baie Ste. Anne.

On January 19/44 500 tags, design #10 were put on smelt off Bay island. To February 3rd. 199 of these were recaptured spread out along the north side of the Bay from Malpeque bay to Oak point and 10 of them were taken off the point Cheval -- point au Gar region, but no more anywhere along the southern shore of the Bay. The period February 4 to 19 yielded 97 more from the same districts but of these 2 came from near the mouth of Black river, 7 off the west end of baie du Vin island and 1 from baie Ste. Anne.

Summarizing the recaptures within the Bay from pre-season tagging it is found that the fish tagged and released off the mouth of Bel river baie Ste. Anne spread inwards to some extent along the southern side of Miramichi bay and up the Miramichi river as far as Chatham. Of the 230 recaptured 146 came from baie Ste. Anne and 84 from other districts mostly into the Bay along the southern shore, though 7 were taken along the north shore from Oak point out, 2 of them being from off Tabusintac.

Tagging in riviere du Vin above the fishing area yielded 394 recaptures. Of these, 298 were retaken in this river's fishery. The other 96 came mostly from the inner part of the southern side of Miramichi bay, though 10 were retaken between Oak point and Church point along the north side.

The Rockhead recaptures at first came from the lower part of the Miramichi river but as the fishing season advanced from mid-December on these recaptures were made down both sides of the Bay to Tabusintac on the north and baie Ste. Anne on the south. Altogether 3 were retaken off Tabusintac.

Of the 500 tagged off Lower Neguac 188 were recaptured, 17 of them being from outside Miramichi bay while the other 171 were retaken in all parts of the Bay 109 of them along the south side from the Napan river out.

On the whole, fish tagged before the fishing season opened along the south side of the Bay remained there while fish tagged up the Miramichi river itself spread down along both sides of the Bay, as the ice formed. Fish tagged along the north shore showed a great tendency to move to the south side while fish from both the Miramichi river and the north side moved outside of the Bay also. None of the south side taggings did this.

Tagging in mid-season off the outer part of the southern shore of the Bay yielded the same results as earlier, but tagging off the inner part of the southern side showed the fish to have a distinct tendency to move out along the north side as far as Church point. North shore taggings showed a definite tendency to move to the south side of the Bay but not to quite such an extent as those tagged earlier. Tagging just inside the entrance to the lower central part of Miramichi bay showed the fish moving towards the head of the Bay and spreading out a little more along the northern side than the southern side. Only 1 mid-season tagged fish went outside the Bay.

Outside Miramichi Bay.

Only 23 tags all told were returned from points outside the Bay. These returns were all from north eastwards along the coast (none at all from southward) and originated as follows:

Tagging no.	2	--	2	
"	"	3	--	0
"	"	4	--	1
"	"	5	--	17
"	"	6	--	3
"	"	7	--	0
"	"	8	--	0
"	"	9	--	0
"	"	10	--	0

23

All but 1 are seen to have come from the pre-season tagging and only 2 from tagging done on the south side of the Bay, and almost 75% from tagging done in the north east corner of Miramichi bay off Lower Reguac.

Only fish tagged at Lower Reguac moved farther than Tabusintac and there were only 5 of these. Three of them were retaken in the Tracadie region and the other 2 in the Shippigan area.

Though fishing takes place just outside the south eastern corner of Miramichi bay off Escominac no tagged fish were retaken there or farther out. This lack of movement in this direction is opposed to Roger's statement "There are indications of a general drift of smelts along the coast in the direction of the prevailing currents."

Lack of recaptures outside the south eastern passages into Miramichi bay, lack of recaptures just inside the main passage into the lower central part of the Bay and presence of tagged fish outside the north eastern passages into Miramichi bay seem to indicate that fish may enter by the south eastern and central passages and leave, to some degree at least, by way of the north eastern passages.

Tagging outside both the north eastern and south eastern sections of Miramichi bay might throw light on this question.

July 25/45

P. S.

Thirteen of the 1943-44 tags were taken from fish recaptured during the 1944-45 season. The details are as follows:-

Tag design	# 1	--	1	Off Pt. au Car
" "	# 2	--	1	" " " "
" "	# 3	--	0	
" "	# 4	--	1	In Baie du Vin
		--	1	Off Grand Dune
		--	2	In Hardwicke bay
" "	# 5	--	1	Off head of Baie du Vin island
		--	1	Either off the back of Baie du Vin island or in Hardwicke bay.
" "	# 6	--	0	
" "	# 7	--	1	Off Pt. Cheval
" "	# 8	--	2	Inside Fox island
		--	1	Either off the back of Baie du Vin island or in Hardwicke bay.
" "	# 9	--	1	Either off the back of Baie du Vin island or in Hardwicke bay.
" "	#10	--	0	

13

These recaptures were all made within Miramichi bay and in the same districts as similarly tagged fish were found during the season of 1943-44.

None were found to migrate farther than during the preceding season and there is no evidence to show that Miramichi smelt leave the Miramichi as adults to populate any other region to any extent. These recaptures also show that this style of tag can remain on the smelt for a year at least.

About 65% of the 1943-44 taggings were recovered during that season leaving possibly 1600 tagged individuals at large. However, instead of retaking 65% of these during the 1944-45 season or about 1040 individuals, only 13 or less than 1% were retaken. The probable solution is that a great number of the tags were lost off the fish.