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CONTENTS

FISH (SALMON) MANAGEMENT

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REPORT NO. I. Report of W. M. Chisholm for 1949.

1. Operation of Large Rawdon smolt trap.

There were some changes in the trap proper this year. Width and height (6') remained unchanged while length was increased by 2'. Major change consisted of dividing the trap longitudinally, inserting a funnel, etc., so that the trap would function for both ascent and descent of fish.

The fence was remodelled this year, made one foot higher and lathes placed on edge rather than on flat side. With greater water passage space provided the fence was put directly across the river and it held successfully during periods of high water. The width of the river at the trap site is 75 feet.

The trap was operated from May 2nd to August 29th. Daily records were complete with the exception of May 30th when high water caused a slat in the trap to be broken. No live smolt were taken on this date and since on the preceding day there were 15 live smolt, while on the following day 5 live smolt, it is presumed live smolt escaped.

The water height dropped considerably during the latter part of June though during periods of low water, height was maintained fairly constant due to the dam constructed last year.

For record of fish trapped in descent see Appendix B. The number of salmon smolt trapped this year was greater than

in 1948. From Appendix A it is noted that the water temperature at the beginning of the smolt run was 52°/46°, throughout the main part of the run 61°/52° and at the end of the run 69°/62°. Water height in the trap at the beginning of the run was 1.6', throughout the main part 1.2' and at the end of the run 1.0'. The two largest peaks in descent of smolts occurred 1) when water temperature was low (58°/52°) and 2) just before a peak in water height i. e. during a period of local flood and prior to its peak.

Trout descended in small numbers only and of a total of 32, 29 came down in May. With rising temperatures this movement appeared to stop.

Catfish descended chiefly in June with lower water height and higher water temperatures.

Sucker, of which there were more taken than any other fish, descended mainly in May.

Lamprey eels descended in June as against eels which appeared in greater numbers in May. There were a few white and yellow perch as well as gaspereau, dace and chub.

Two marked smelts (left ventral) were trapped. There were no very large salmon, but a total of four, from 30 to 40 cm. long descended. Spent gaspereau descended as late as August 24th.

The up trap (Appendix C) operated for the first time this year, did not show much upstream movement. Trout were taken chiefly in May, as well as sucker and one fairly large

salmon (40 cm.). Chub, eel and perch showed upstream movement mainly in June.

The ascent of Gaspereau began on May 18th and continued spasmodically until June 10th. The "runs" usually lasted 2-3 days, were at their peak at mid-day and early afternoon and chiefly on bright sunny days. Changes in water level in the

river (i. e. when dam opened or closed) would result in gaspereau leaving river and falling back to lake, that is they ascended with a steady flow.

2. Operation of small Rawdon trap

A smolt trap 2½' high, 2' wide and 3' long was put in operation on May 14th.

As per Appendix D the fish taken were chiefly sucker, gaspereau, eel, dace and chub. There were no salmon or trout.

Numbers of sucker, eel and dace were greater than for Large Rawdon up trap. It may be noted that fish moving up the lake along the west shore would meet the opening of this stream before reaching the Large Rawdon.

3. Fletcher trap

Trap was in operation spasmodically from May 7th to August 1st. During periods May 18th/24th and June 1st/July 2nd the trap was left open to allow gaspereau to pass on to Fletcher run.

The trap consisted of three upper portions of a fishway leading to Fletcher run from Grand Lake. For plan and dimensions see "Ascent of a smolt", Dr. V. M. Davidson, August 1949.

Early in May (see Appendix E) several small fingerling trout were trapped in the up trap. There was no down movement recorded until July when 6 smolt (one marked right ventral) were trapped. Gaspereau fry first descended in large numbers on July 25th and were to be seen in front of trap until August 8th.

4. Notes on freshets in Lower Rawdon River - 1949

May 14th: At 0900 hours all stops were put in at the dam in order to carry out some work in the small Rawdon stream. At 1430 hours 4 stops were removed from 8 gates and 8 stops from remaining gate. The head (approximately 3') released reached the trap at 1530 hours and within 15 minutes 3 parr and 9 chub were taken in the down trap. During this particular time of the month the smolt were descending and no parr had been taken prior to release of "freshet". Temperature for day was 58°/53°.

May 16th: At 2035 hours water was released at dam site and allowed to run for one hour. Height of water in trap before freshet was 1.2' and after freshet (1½ hours later) 1.55'. Height of head at dam was 2.6' before, dropped to 2.25' by end of the hour and was 2.475' by time stop logs were reinserted.

No fish were taken in the up or down trap. Temperature was 59.5°/53°. It will be noted from graph (Appendix A. Report on Rawdon Down Trap) that this freshet was during the smolt run and that the number of smolt taken the next morning did not show an increase.

June 1st: As on the 14th May the effect of a reverse freshet was observed due to the fact the water was cut off at dam to allow work to be done in trap. This was done at 1200 hours and at 1500 hours 2 smolt were removed from down trap. Again, this was during the smolt run but the first time smolt had been taken during mid-afternoon.

At 1800 hours the water was released and at 2000 hours there

were 6 smolt taken in the down trap. Temperature was 59.5°/55°.

This particular period was one following a period of particularly high water - see Appendix A. Report on Rawdon Down Trap.

June 10th: Freshet was released at 1955 hours and stopped at 2055 hours. Water height at trap before and at end, respectively was 1.2' and 1.7', while at dam 3.0' and 2.6'.

Fish taken in trap following freshet consisted of 4 smolt and 9 medium-large (28-32 cm.) sucker.

The time of this freshet was the 4th day after the conclusion of the main run - i. e. no smolt had been taken during preceding four days nor were there any further taken until June 14th when one was trapped. Temperature was 63.5°/59.5°.

June 17th: Freshet released at 2030 hours and stopped at 2130 hours. Water height at trap before and after, respectively, was .9' and 1.6', while at the dam was 2.85' and 2.45'.

Prior to freshet fish taken out of down trap included 1 chub, 11 small eel, 8 dace and 4 small sucker. Following the freshet 13 small eel, 1 large gaspereau and 2 large sucker were removed from down trap. Water temperature was 77°/70°.

July 28th: Freshet was released at 1915 hours and stopped at 2045 hours. Water heights changed (before and after) from 2.55' to 2.2' at dam and .4' to 1.6' at trap.

At 2035 hours 2 eel, 3 sucker, 5 spent gaspereaux and 1 minnow were taken in/down the trap. At 2130 hours 6 spent gaspereaux

2 sucker and 3 eels were taken in down trap and one eel in the up trap. Temperature was 79.5°/71.5°.

August 20th: On August 19th a very heavy rainfall created a natural freshet which lasted for 5 days. By the morning of the 20th the lake level had changed from 2.35' to 3.0' and the Lower Rawdon river from .4' to 1.2'. Water temperature throughout the freshet may be seen on Appendix A. Trapping results are as follows:

The trap in the Small Rawdon held 2 trout (28-30 cm.) 6 sucker (24-30 cm.) and 1 eel (36 cm.).

The large Rawdon down trap held 19 sucker (14-38 cm.) 128 eel (30-100 cm.), 3 chub, 16 white perch, gaspereaux - 204 spent and 1069 fry - and it is thought many went through the fence because more fry were seen than were trapped.

For the Large Rawdon up trap 7 eel (30-50 cm.) and 2 sucker (12-26 cm.). To explain why the Large Rawdon should show less up stream movement than the Small Rawdon it is felt that up stream movement would be less likely to enter Large Rawdon trap than Small Rawdon since the trap projects back 10' from the fence and fish moving up would be more likely to make their way past the trap up to the fence rather than enter the trap. The matter of up lake movement along the west shore reaching the mouth of the small Rawdon before that of the large Rawdon must also be considered.

In general it was noted that:-

1) the freshets appeared to have an effect on the fish moving at the time and particularly in one case (June 10th) resulted in 4

smolt being taken when none were seen for 4 days preceding or following.

2) The time it took water to reach the trap (prior to channeling of river) depended chiefly on water level in the river. This latter as well governed the height to which the water was raised in the trap though probably more important was the extent to which leaves, etc., had been removed from fence.

3) Fish entering the trap, generally speaking, were taken during the rise or fall of water in the trap - i. e. not at the peak of the flood. Records on mornings following a freshet showed no change from "normal".

4) With exception of 1 eel (July 28th) all fish taken were trapped in the down trap.

5. Work carried out in Lower Rawdon River - Summer 1949

Such may be classified as follows:

Fishway: This was constructed of 12" board to form a rectangular box approximately 15' long. Baffles were placed approximately 18" apart. The fishway was placed in one of the gateways at the dam and though not seen to work successfully it is presumed it did so since spent gaspereaux reached the trap when only passage downstream, past the dam, was via the fishway.

Stream improvement: Approximately 10 days were spent clearing a channel from the dam to the mouth of the river. Such served to provide a deeper channel for any movement either up or downstream with low water and also one relatively free from large

stones which shelter eels. It also resulted in many small areas of gravel being uncovered. This condition is nearer that of good salmon streams and the change may result in greater production of smolts.

Turbulators: This, which was built at the head of a large deep natural pool, was made in the form of a "V" using three logs on each side which were anchored to either bank. The longer main logs were held together at their butts in the centre of the stream by a short chain. The desired effect of digging a hole in the bottom of the pool was observed after a freshet had been released. Large stones had been pushed to either side to leave a hole approximately 4' long, 2' wide and 1' deep. Later in the summer a natural freshet increased the hole to six feet in length and the effect of digging could be seen as far back as 12 feet from the apex of the turbulator.

A second turbulator was built at the upper end of a smaller pool (see below), again in the form of a "V" but using only 2 logs. Rock was used to anchor them to the bottom and a strip of 2x4 was placed across the butts where they projected into the pool.

POOLS: Two pools were made just above the trap by improvement of natural pools. One pool was improved by cleaning out rock, building up the sides and cleaning out a channel above it, which resulted in a small fall into it. The second pool was similarly cleaned of rocks and the level raised by building up the sides. Then a turbulator was placed at the end of this pool as described above.

Appendix "A".

Chart showing water heights in lake and trap, temperatures, and numbers of smolt and trout.

APPENDIX "B"

	MAY		JUNE		JULY		AUG.	
	No.	Size Range cm.	No.	Size Range cm.	No.	Size Range cm.	No.	Size Range cm.
Parr	6	6-16	13	8-20				
Smolt	288	14-32	29	18-24				
Salmon	4	40	1	45				
Trout	29	12-24	3	8-16				
Catfish	3	8-16	20	8-16	2	12-14		
Chub	62	6-14	73	8-12	8	2-25	3	
Dace	3	6	66	6-10	14	2-2.5		
Eel	98	45-70	18	45-65	14	30-55	128	30-100
Gasp.	124	20-26	122	22-26	149	22-26	204 spent 1069 fry	22-26 6-10 cm.
Lamprey	3	50-75	66	40-65	3	45-65		
Perch	8	14-22	6	8-20	3 (w)	6-22	16	
Sucker	1162	10-50	141	6-30	4	24-30	19	14-38 cm.
TOTALS	1790		558		197			

RAWDON LARGE - DOWN

APPENDIX "C"

	MAY		JUNE		JULY		AUG.	
	No.	Size Range cm.	No.	Size Range cm.	No.	Size Range cm.	No.	Size Range cm.
Parr					1	12		
Smolt								
Salmon	1	30						
Trout	9	8-16	4	16-18				
Catfish			1	10				
Chub	6	6-12	13	8-10				
Dace			14	8-10				
Eel	14	40-60	21	30-60	3	40-55	7	30-50
Gasp.	48	20-26	163	22-26	2	24-26		
Lamprey			1	50				
Perch	2	10-12	3	8-14				
Sucker	42	12-40	6	20-26			2	12-26
TOTALS	122		226		6			

RAWDON - LARGE - UP

APPENDIX "D"

	MAY		JUNE		JULY		AUG.	
	No.	Size Range cm.	No.	Size Range cm.	No.	Size Range cm.	No.	Size Range cm.
Parr								
Smolt								
Salmon								
Trout							2	28-30
Catfish								
Chub	2	10	3	10				
Dace	54	6-10	31	8-10				
Eel	37	30-60	29	35-55			1	40
Gasp.	51	20-26	87	20-26				
Lamprey								
Perch								
Sucker	77	14-50	41	14-30			6	24-30
TOTALS	221		191					

RAWDON SMALL - UP

APPENDIX "E"

	MAY		JUNE		JULY		AUG.	
	No.	Size Range cm.	No.	Size Range cm.	No.	Size Range cm.	No.	Size Range cm.
Smolt					6 (1 marked R.V.)			
Salmon	1	26						
Trout	10	10-16						
Chub								
Dace								
Eel					2 (1 up 1 down)			
Gasp.	6	24-28						
Sucker	18	16-35						
Lamprey								
Perch								
Catfish								
Totals	50				Fry ∞			

FLETCHER