

# Capture and Distribution of All Fish Species at Saint John River Power Dams, New Brunswick, From Construction Years to 1971

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AT SAINT JOHN RIVER POWER DAMS, NEW BRUNSWICK,  
FROM CONSTRUCTION YEARS TO 1971

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## ABSTRACT

Smith, K.E.H. 1979. Capture and distribution of all fish species at Saint John River power dams, New Brunswick, from construction years to 1971. Can. Data Rep. Fish. Aquat. Sci. No. 171. 63 p.

Beginning in the early 1950s, a series of three major hydroelectric developments was constructed on the Saint John River system, New Brunswick, by the New Brunswick Electric Power Commission. These were the Tobique Narrows Dam, completed in 1952; the Beechwood Dam, in 1957; and the Mactaquac Dam, in 1967.

In order to protect the various fish populations utilizing the system, fish passes or fish handling facilities were constructed at each dam. Of primary importance was the anadromous Atlantic salmon, although several other species were also considered to be of significant value. To further assure the safety of the Atlantic salmon, a new hatchery was constructed in conjunction with the Mactaquac Dam.

Operation of the fish handling facilities have been monitored on a regular basis, both for the purpose of collecting broodstock salmon for the hatchery and enumerating the numbers of all species ascending. In addition, parts of the salmon runs were trucked and released to various upriver areas to enable the continuation of some level of natural reproduction and to provide stocks for important sport fisheries.

This report details the counts of all fish species ascending the fish handling facilities, from their first operation up to, and including, 1971. Also included are details of the disposal of all these fish — whether taken as hatchery broodstock, released directly above the dams or trucked to various other areas within the system.

Key words: Saint John River system, hydroelectric development, Tobique Narrows Dam, Beechwood Dam, Mactaquac Dam, fish handling facilities, hatchery, broodstock, Atlantic salmon, other anadromous species, freshwater species.

## RÉSUMÉ

Smith, K.E.H. 1979. Capture and distribution of all fish species at Saint John River power dams, New Brunswick, from construction years to 1971. Can. Data Rep. Fish. Aquat. Sci. No. 171. 63 p.

Depuis le début des années 50, la Commission d'énergie électrique du Nouveau-Brunswick a construit trois importants développements hydro-électriques sur le réseau fluvial de la rivière Saint-Jean, à savoir le barrage de Tobique Narrows, terminé en 1952, le barrage de Beechwood, terminé en 1957, et le barrage de Mactaquac, terminé en 1967.

Afin de protéger les diverses populations de poisson qui fréquentent le réseau, on a construit des passes migratoires ou autres installations spéciales pour la manutention du poisson à chaque barrage. Parmi les espèces à protéger, le saumon anadrome de l'Atlantique était la plus importante; toutefois, on estimait également que d'autres espèces avaient beaucoup de valeur. Pour assurer encore davantage la sécurité du saumon de l'Atlantique, on a construit une nouvelle station piscicole près du barrage de Mactaquac.

On a contrôlé de façon régulière l'exploitation des installations de manutention du poisson tant pour recueillir un stock reproducteur pour la station piscicole, que pour compter le nombre de poissons de toutes les espèces qui remontent le fleuve. De plus, on a transporté par camion un certain nombre des saumons qui remontent le fleuve et on les a relâchés dans diverses zones situées en amont du barrage en vue de permettre qu'une certaine reproduction naturelle se poursuive et d'assurer des stocks pour les pêches sportives importantes.

Le présent rapport indique en détail le nombre de poissons de toutes les espèces qui ont franchi les installations pour la manutention du poisson depuis le début de l'exploitation de ces dernières jusqu'à 1971 inclusivement.

Le rapport indique aussi en détail ce qu'on a fait de tous ces poissons, à savoir si on les a conservés comme stock reproducteur, si on les a relâchés directement en amont des barrages ou si on les a transportés par camion vers diverses autres zones du réseau fluvial.

Mots clés: réseau fluvial de Saint-Jean, ouvrage hydro-électrique, barrage de Tobique Narrows, barrage de Beechwood, barrage de Mactaquac, installations de manutention du poisson, station piscicole, stock reproducteur, saumon de l'Atlantique, autres espèces anadromes, espèces d'eau douce.

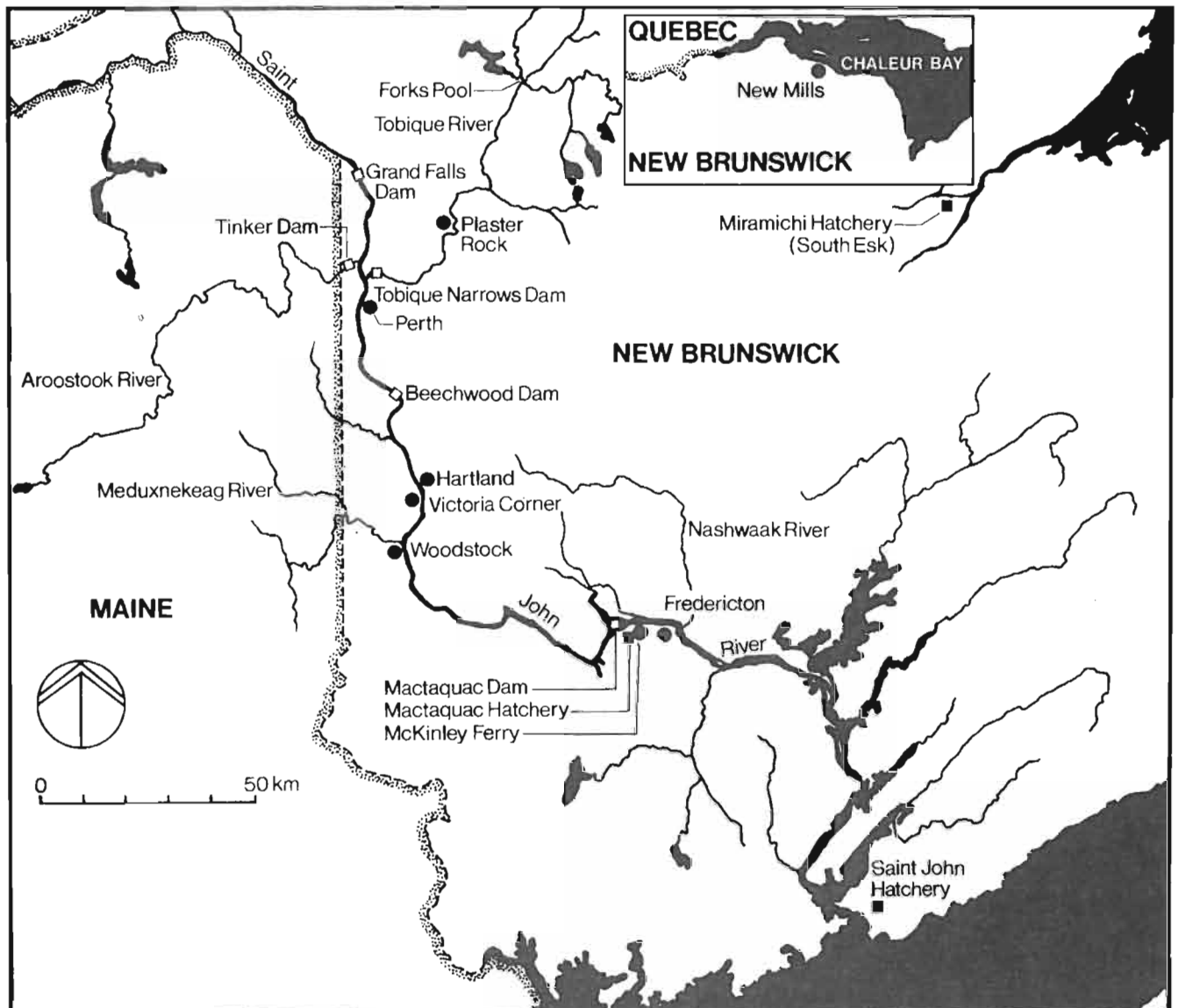
## INTRODUCTION

In the early 1950s, the New Brunswick Electric Power Commission began construction on the first of a series of three major hydroelectric power dams on the Saint John River system (Figure). The first was constructed on the Tobique River at Tobique Narrows and the second on the main river at Beechwood. Finally, construction of Mactaquac Dam on the main river effectively blocked off almost 100 percent of the Saint John system above head of tide.

Large portions of this system had been utilized as spawning and rearing area for a number of resident, anadromous and catadromous fish species, the most important of which was the Atlantic salmon. Valuable angling and commercial fisheries were dependent on the continued availability of these waters. Therefore, to assure continued access to these areas, either fish passes or fish collection facilities were provided at each dam.

Information on run timing, size and composition was recorded at each dam, to help formulate proper management plans for various species. Most species were then released immediately above the dams and allowed to proceed upriver without assistance. However, in the case of the Atlantic salmon, some were transferred to hatchery ponds for broodstock purposes and others were trucked to more desirable upriver release sites. Selection of these sites was based on the desire to support a continued sport fishery and to provide for as high a level of natural reproduction as possible.

The following sections summarize the available fish-count data for the three dams and information on the subsequent release and distribution of the fish up until the end of 1971. Throughout the report, common names are used for the various fish species and accepted scientific names are tabulated (Appendix A) for proper identification.



Saint John River system, New Brunswick.

## TOBIQUE NARROWS DAM

## DESCRIPTION OF DAM AND FISHWAY

The Tobique Narrows Dam is located on the Tobique River, about one-half mile (0.8 km) above its confluence with the Saint John River. It is a reinforced concrete structure, designed to operate under a head of 78 feet (24 m). Construction of the dam and fishway was completed in 1952.

The fish pass facilities are also of reinforced concrete construction. They consist of a collection gallery, situated over the draft-tube exits, and a pool-and-weir fishway, with a system of water-control gates and valves.

## OPERATION OF FISHWAY

Operation of Tobique Narrows fishway began in 1953 and has continued throughout each salmon migration season since. During the years 1953-1968, a wood-construction counting trap was operated at the fishway exit, permitting the retention of all fish or grilse size or larger. Smaller migrants were able to escape between the slats of the trap walls and no attempt was made to count them. Although the trap was removed and counting terminated at the end of 1968, the fishway has remained open and operational each year since.

When operational, the trap was fished manually and emptied one or more times daily, depending on the intensities of the runs. After recording the desired data on salmon and grilse, all fish were released directly into the headpond.

Trapping operations at the Tobique Narrows fishway usually began in mid-May and continued until late in November, so

as to cover all portions of the adult salmon migration. Recorded dates of trap installation and removal, as well as arrival dates of the earliest salmon ascending, have been summarized (Table 1).

TABLE 1. Trap operational periods and dates of first salmon ascending, Tobique Narrows fishway, 1953-68. (Trap not installed during years 1969-71.)

Year	Trap installed	First salmon	Trap removed
1953	28 Apr	24 May	19 Nov
1954	15 May	20 May	22 Nov
1955	19 May	22 May	21 Nov
1956	7 May	23 May	26 Nov
1957	14 May	23 May <sup>1</sup>	26 Nov
1958	14 May	10 Jun	27 Nov
1959	16 May	23 Jun	30 Nov
1960	19 May	4 Jun	30 Nov
1961	15 May	21 May <sup>1</sup>	30 Nov
1962	20 May	12 Jun	30 Nov
1963	22 May	6 Jun	20 Nov
1964	20 May	6 Jun	20 Nov
1965	30 May	9 Jun	18 Nov
1966	4 Jun	10 Jun	18 Nov
1967	5 Jun	— <sup>2</sup>	31 Oct
1968	— <sup>2</sup>	— <sup>2</sup>	14 Nov

<sup>1</sup>Landlocked salmon - no bright fish above Beechwood until mid-June.

<sup>2</sup>Dates not recorded.

## ATLANTIC SALMON CATCH AND DISTRIBUTION

Although detailed records of daily catches are not available, monthly totals of grilse and older salmon ascending Tobique Narrows fishway have been summarized (Table 2). The proportions of grilse to

TABLE 2. Monthly and annual totals of grilse and older salmon ascending Tobique Narrows fishway, 1953-68. (Trap not installed during years 1969-71.)

Year	May	Jun	Jul	Aug	Sep	Oct	Nov	Totals
1953	58	1,866	1,979	228	106	384	35	4,656
1954	79	1,052	1,542	1,288	836	184	5	4,986
1955	13	682	1,376	858	270	555	21	3,775
1956	2	376	1,326	751	731	467	70	3,723
1957	0	4	8	314	216	25	2	569
1958	0	61	646	824	923	146	32	2,632
1959	0	2	288	43	383	222	11	949
1960	0	40	544	148	54	259	75	1,120
1961	0	85	195	108	266	87	6	747
1962	0	26	79	33	43	82	1	264
1963	0	21	1,278	775	1,195	554	4	3,827
1964	0	56	1,919	2,262	816	217	31	5,301
1965	0	271	1,428	64	1,144	466	7	3,380
1966	0	120	132	10	10	502	6	780
1967	0	0	0	0	0	0	0	0
1968 <sup>1</sup>	-	-	-	-	-	-	-	18

<sup>1</sup>Monthly counts available.

older salmon were not recorded except for 1966, when totals were 475 (60.9%) and 305 (39.1%), respectively.

All salmon and grilse taken in the Tobique Narrows trap were released directly into the headpond and allowed to distribute themselves throughout the system.

Totals after 1956 do not accurately indicate actual size or timing of Tobique River salmon runs. This resulted from the construction of Beechwood (1957) and Mactaquac (1967) dams on the main Saint John River below. Since 1956, Tobique River escapements usually consisted at least partially, and in some years almost entirely, of fish trucked from Beechwood and Mactaquac dams to various upriver release areas. Details of these trucking operations are found in following sections dealing with distribution of fish from these dams. The numbers of fish trucked to Tobique River release points must therefore be added to the fishway counts (Table 2) to obtain actual escapements to the system.

#### OTHER SPECIES AT TOBIQUE NARROWS

Limited numbers of landlocked salmon also ascended the Tobique Narrows fishway during most years, but accurate records of the numbers were not usually maintained. Recorded totals are available for only two years, 1957 and 1962 (27 and 8 fish respectively). It is doubtful if annual totals ever exceeded one hundred.

Although lamprey regularly attempted to ascend the Tobique Narrows fishway, they were normally trapped in one of the rest pools and destroyed, so very few were successful in reaching the area above the dam. Before construction of Beechwood Dam in 1957, annual totals reaching the Tobique Narrows consisted of several thousands of individuals. From 1957 to 1959 all were removed and destroyed at Beechwood. Because of the danger of injury to other species, particularly the salmon, lamprey removal at Beechwood was discontinued from 1960 to 1966.

After construction of Mactaquac Dam in 1967, most lampreys were removed and destroyed there, so that relatively few escaped to upriver areas.

Although Tobique Narrows lamprey counts are incomplete, those available have been summarized, together with some explanatory notes (Table 3).

Other species normally utilizing the Tobique Narrows fishway in the past included shad, brook trout, eel and suckers, although no counts were recorded. Since the construction of Beechwood and Mactaquac dams, runs of such migratory species as the eel and shad have been almost completely eliminated, or at least greatly reduced. Except for Atlantic salmon, use of the fishway is now probably confined mainly to more local migrations of resident species

such as brook trout, suckers, perches and various chubs and minnows. No effort has been made to tabulate them.

TABLE 3. Annual lamprey totals at Tobique Narrows fishway, 1953-71.

Year	No. of lampreys	Notes
1953	Uncounted	Several thousands removed at Tobique Narrows.
1954	"	" " " " "
1955	"	" " " " "
1956	"	" " " " "
1957	0	All removed at Beechwood.
1958	0	" " " " "
1959	0	" " " " "
1960	35	Run reduced from previous removal of spawners.
1961	2	" " " " "
1962	107	" " " " "
1963	0	" " " " "
1964	65	Large run at Beechwood.
1965	Uncounted	Moderate run at Beechwood.
1966	"	" " " " "
1967	0	All obstructed at Mactaquac Dam.
1968	0	Most removed at Mactaquac Dam.
1969	0	" " " " "
1970	0	" " " " "
1971	0	" " " " "

## BEECHWOOD DAM

## DESCRIPTION OF DAM AND FISH PASS FACILITIES

Beechwood Dam, the second in the series, was constructed in 1956-57 on the main Saint John River, about 18 miles (29 km) below Tobique Narrows Dam (Figure). It was designed to operate under a head of 57 feet (17.4 m) and was provided with a mechanical fish pass device. The fish pass facilities consist of a collection gallery above the draft-tube exits, leading through a transportation channel and rest pool to a lift mechanism or "skip hoist". The skip is a modified hopper which carries the fish, in about one foot of water, to the top of the dam and releases them automatically into the headpond. It is powered by an electric motor and, through a system of winches and cables, is raised and lowered on an inclined track.

## OPERATION OF FISH PASS FACILITIES

Beechwood fish pass facilities first began operating in mid-June of 1957. During that season final stages of dam construction resulted in unfavorable water spill patterns and reduced fishway efficiency. The numbers of various species ascending were consequently significantly lower than expected. During the next eight years (1958-65), the fishway generally operated satisfactorily. Minor design and operational modifications were introduced occasionally to further improve efficiency.

In 1966, it was suspected that construction activities at the downriver Mactaquac Dam site may have delayed and reduced the anadromous fish runs reaching Beechwood. However, to what extent this is true has not been accurately determined.

Early in 1967, dam construction at Mactaquac completely blocked the river, except for a temporary fish pass arrangement in one of the spill gates. It is felt that very few, if any, fish ascended by this route. In August, all gates at Mactaquac Dam were closed, and thereafter essentially all anadromous fish ascending Beechwood fishway resulted from those trucked and released between the two dams. Operation of the Beechwood fish pass facilities was continued each year, to provide passage for both resident species and trucked anadromous runs.

Although the Beechwood facilities were designed to operate automatically, this has been prevented by the necessity of conducting various fishery biological studies and observations. Each time the "skip hoist" is raised, an attendant is on hand to record the numbers of each species, check for marked or tagged fish and carry out any necessary sampling. The skip is normally checked two or more times daily, depending on the intensities of the runs, and the fish are released directly into the headpond. Exceptions to this procedure

did occur during some years, when portions of the salmon runs were trucked to hatcheries for broodstock use and to up-river areas to improve early season angling potential. Details of these trucking operations are outlined in following sections.

During most seasons the Beechwood fish pass facilities began operating in late May or early June and continued until about mid-November. Opening and closure dates, together with dates of first and last salmon ascending have been summarized (Table 4).

TABLE 4. Operational periods and dates of first and last salmon ascending, Beechwood fish pass facilities, 1957-71.

Year	Fish pass opened	First salmon	Last salmon	Fish pass closed
1957	14 Jun	15 Jun	6 Nov	4 Dec
1958	1 Jun	2 Jun	14 Nov	21 Nov
1959	20 May	23 May	28 Oct	23 Nov
1960	27 May	28 May	10 Nov	22 Nov
1961	12 Jun	14 Jun	12 Nov	21 Nov
1962	2 Jun	7 Jun	29 Oct	12 Nov
1963	30 May	2 Jun	9 Nov	19 Nov
1964	21 May	30 May	19 Nov	25 Nov
1965	17 May	30 May	8 Nov	17 Nov
1966	26 May	4 Jun	31 Oct	14 Nov
1967	2 Jun	14 Jul	10 Nov	20 Nov
1968	15 May	19 Jun	28 Oct	18 Nov
1969	5 Jun	20 Jun	1 Nov	4 Nov
1970	2 Jun	25 Jun	4 Nov	12 Nov
1971	1 Jun	15 Jun	7 Nov	8 Nov

## ATLANTIC SALMON CATCH AT BEECHWOOD DAM

For each year of operation, monthly counts of grilse and older salmon taken in the Beechwood fish pass facilities have been summarized (Table 5). For the years 1957-59, separate records were not maintained for grilse as opposed to older salmon. In 1960, except for 12 days, grilse counts were distinguished from those of older salmon. The grilse to salmon breakdown for those few days was estimated and included in the recorded totals (Table 5). For each succeeding year, grilse and older salmon counts were recorded separately. A more detailed list, showing daily counts of grilse and older salmon ascending Beechwood, is also provided (Appendix B).

The distinction between grilse and older salmon in this report was not usually made on the basis of scale readings, but on fish lengths. Those fish 26 inches (66 cm) or less in total length were classified as grilse, and those greater as older salmon. To check on the accuracy of this division, scales were read from a number of samples of fish in the 25- to 27-inch (63.5- to 68.6-cm) group and, in each case, sea-life ages agreed with those estimated by the total length method. It is possible that exceptions may occasionally occur, but

for the Saint John River system this method has been sufficiently accurate for most purposes. In the case of hatchery brood-

stock collections, distinctions between grilse and older salmon were made on the basis of scale readings.

TABLE 5. Monthly and annual totals of grilse and older salmon ascending Beechwood fishway, 1957-71. (Stage: G = grilse, S = older salmon, T = totals.)

Year	Stage	May	Jun	Jul	Aug	Sep	Oct	Nov	Totals
1957	T	0	10	9	882	213	8	3	1,125
1958	T	0	138	1,363	1,398	1,332	263	71	4,565
1959	T	116	354	1,018	331	407	362	0	2,588
1960	G	0	9	1,136	162	40	249	31	1,627
	S	8	189	694	27	14	117	12	1,061
	T	8	198	1,830	189	54	366	43	2,688
1961	G	0	3	162	119	125	43	0	452
	S	0	183	413	149	161	70	3	979
	T	0	186	575	268	286	113	3	1,431
1962	G	0	2	36	89	62	62	0	251
	S	0	78	107	4	14	30	0	233
	T	0	80	143	93	76	92	0	484
1963	G	0	12	2,172	1,726	2,410	880	4	7,204
	S	0	26	279	252	364	209	0	1,130
	T	0	38	2,451	1,978	2,774	1,089	4	8,334
1964	G	0	28	2,550	2,408	670	256	23	5,935
	S	3	275	897	306	173	102	4	1,760
	T	3	303	3,447	2,714	834	358	27	7,695
1965	G	0	18	536	31	1,553	910	4	3,052
	S	3	786	900	9	429	269	1	2,397
	T	3	804	1,436	40	1,982	1,179	5	5,449
1966	G	0	12	68	1	85	577	0	743
	S	0	227	110	0	21	109	0	467
	T	0	239	178	1	106	686	0	1,210
1967	G	0	0	0	0	6	2	4	12
	S	0	0	4	0	20	0	7	31
	T	0	0	4	0	26	2	11	43
1968	G	0	0	6	3	1	29	0	39
	S	0	1	7	0	0	17	0	25
	T	0	1	13	3	1	46	0	64
1969	G	0	2	5	3	40	72	3	125
	S	0	7	7	2	15	24	0	55
	T	0	9	12	5	55	96	3	180
1970	G	0	2	9	0	108	46	1	166
	S	0	1	0	0	13	16	0	30
	T	0	3	9	0	121	62	1	196
1971	G	0	0	7	24	215	89	3	338
	S	0	2	2	2	67	42	1	116
	T	0	2	9	26	282	131	4	454

#### DISTRIBUTION OF SALMON FROM BEECHWOOD DAM

Most grilse and older salmon ascending the Beechwood fish pass facilities were released into the headpond and allowed to proceed upriver in their own time and to destinations of their own choice. However, as noted previously, some exceptions did

occur. In an attempt to improve the early angling fishery in the Tobique River, portions of the runs to Beechwood during 1959-62 were trucked and released directly into that system. The exact breakdowns of grilse and older salmon are only partially available. However, most May and June fish were older salmon and most July and August

fish were grilse. Monthly and annual totals of these transfers have been summarized (Table 6) and, where known, older salmon are shown in parentheses.

TABLE 6. Grilse and older salmon trucked from Beechwood Dam to the Tobique River, 1959-62.

Year	May	Jun	Jul	Aug	Totals
1959	114	354	275	0	743
1960	0	96 (96)	925	66	1,087
1961	0	102 (102)	94	0	196
1962	0	32 (31)	7 (4)	0	39 (35)

Other significant transfers of grilse and older salmon from Beechwood were hatchery broodstock collections made during the years 1963-66 (Table 7). These collections were made in anticipation of an expected reduction in natural production due to the proposed construction of Mactaquac Dam.

TABLE 7. Hatchery broodstock collections from Beechwood fishway, 1963-66. (Run: E - early, L - late.)

Year	Run	Grilse		Salmon		Totals
		No.	Dates	No.	Dates	
1963	L	0	-	107	11-31 Oct	107
1964	E	84	7-24 Jul	30	6-24 Jun	114
	L	50	14 Sep-30 Oct	38	14 Sep-30 Oct	88
1965	E	25	2-24 Jul	62	11 Jun-2 Jul	87
	L	0	-	31	29 Sep-9 Oct	31
1966	E	14	26-29 Jun	38	26 Jun-28 Jul	52
	L	0	-	59	6-28 Oct	59

Other grilse and older salmon not released into the Beechwood headpond include small accidental mortalities and a few fish (2-10 per year) taken for display purposes at nearby exhibitions and fairs. These display fish were later released into the main river below Beechwood.

#### SPECIES OTHER THAN ATLANTIC SALMON AT BEECHWOOD

Several species other than Atlantic salmon also regularly utilize the fish pass facilities at Beechwood Dam. Annual totals have been summarized (Table 8) and a semi-monthly breakdown is attached (Appendix C).

Most of these fish, with the exception of the lamprey, were normally released directly into Beechwood headpond. Recorded totals generally represent fairly accurate counts, although those in italics consist

partially of estimated sub-totals. Annual totals were not estimated for adult eels or for elvers, many thousands of which ascended, particularly during the months of June and July. Also, totals were not estimated for the juveniles of several other species, including salmon, which were too small to be confined within the meshes of the skip-hoist sides. Counts or estimates were not usually made of the various species of chubs and minnows. These usually amounted to only a few hundreds or less per year. However, an extremely large run of golden shiner (estimated at least 10,000) ascended in 1970, and over 2,300 were counted in 1971. Smaller numbers of common shiner, stickleback and fallfish were observed each year.

Further explanatory comments on some species are provided in the following sections.

#### Lamprey

During the years 1957-59, all lamprey entering the Beechwood fish lift were removed and destroyed. Many more died below the dam, apparently without spawning. This, combined with the effects of lamprey removal at the Tobique Narrows from 1953 to 1956, resulted in much-reduced spawning runs to the Tobique River in later years (Table 3).

After 1959, lamprey were generally not removed at Beechwood because of excessive disturbance and the danger of injury or mortality of salmon and other desirable species. However, those reaching the Tobique Narrows fishway were removed and destroyed. The relatively large runs to Beechwood in 1962 and 1964 (Table 8) cannot be fully explained. They may have been partially due to better than average fishway-entry conditions. In spite of the large numbers released at Beechwood during these two years, counts at Tobique Narrows were only slightly higher than in other recent years. This may indicate a very strong homing instinct. Since the destruction of the Tobique River run had begun four years earlier (1953-56) than at Beechwood, the Tobique run by this time may have been near extinction. If the relatively large runs at Beechwood had originated in other areas of the upper river, they could possibly be homing to those areas only, and consequently did not return to the Tobique Narrows.

Counts were not recorded for the Beechwood lamprey runs of 1966, 1968 and 1969. A moderate run was reported for 1966, the last year before complete obstruction by Mactaquac Dam. A very few individuals were reported at Beechwood in 1968 and 1969, resulting from inadvertent releases with other species trucked above Mactaquac.

#### Gaspereau

Gaspereau counts through Beechwood during the early years of operation were



TABLE 8. Annual totals of species other than Atlantic salmon ascending Beechwood fish pass facilities, 1957-71. (Totals in italics consist partially of estimated sub-totals. A zero indicates absence of a species, a dash indicates no counts or estimates recorded, although runs did occur.)

Species	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Landlocked salmon	2	2	6	28	74	49	40	94	67	70	123	167	97	93	29
Brook (speckled) trout	88+	929	1,478	305	327	561	436	723	784	565	868	815	453	425	194
Rainbow trout	5	4	26	12	7	1	11	2	6	1	4	1	4	7	10
Lamprey	1,707+	3,117	4,357	1,489	386	4,473	445	<i>7,300</i>	1,232	-	0	-	-	0	0
Gaspereau	0	47	145	2,946	941	107	2,658	<i>12,228</i>	<i>18,428</i>	<i>22,031</i>	0	<i>2,710</i>	<i>22,865</i>	<i>40,542</i>	<i>60,179</i>
Shad	0	55	1,155	1,490	251	209	43	103	139	199	0	0	17	9	16
Yellow perch	9	22	79	151	145	101	<i>545</i>	<i>304</i>	<i>767</i>	<i>666+</i>	<i>981</i>	-	-	<i>24,993+</i>	<i>38,220</i>
White perch	10	180	79	108	328	36	96	<i>249</i>	<i>703</i>	<i>144+</i>	-	-	-	<i>458</i>	<i>426</i>
Chain pickerel	4	14	14	21	24	28	15	28	57	38	33	52	1,425	238	81
Sunfish	-	7	39	130	118	68	76	61	38	65+	65	109	223	499	324
Striped bass	1	24	7	9	50	4	25	17	90	0	0	0	1	-	3
Suckers	842+	<i>5,929</i>	<i>23,369</i>	<i>16,089</i>	<i>7,569</i>	<i>5,468</i>	<i>3,962</i>	<i>12,255</i>	<i>3,649</i>	-	-	-	-	<i>26,890+</i>	<i>35,581</i>
Minnows, Sticklebacks, Killifishes, etc.	98+	207	<i>2,874+</i>	<i>642+</i>	<i>187+</i>	<i>33+</i>	<i>220+</i>	<i>133+</i>	<i>551</i>	-	-	-	-	<i>9,285+</i>	<i>2,365+</i>
Burbot	0	1	1	0	0	0	1	0	0	0	0	0	0	0	2
Smelt	0	3	0	2	0	1	1	0	2	0	0	0	0	0	0
Catfish	0	2	1	0	5	1	0	0	0	0	0	0	0	3	5
Whitefish	0	1	2	3	3	11	4	17	2	2	0	2	0	0	3

partially governed by run size, but were also frequently affected by poor spill and flow patterns in the tailrace, resulting in unsuitable attraction conditions at the collection gallery entrances. Complete absence of a run in 1967 resulted from the obstruction at Mactaquac Dam. Since 1967, all gaspereau reaching Beechwood came from those trucked and released in the Mactaquac headpond. During the 1968-71 period, approximately 22% of the gaspereau released above Mactaquac eventually ascended the Beechwood fishway. These percentages varied from a low of 12.3% in 1968 to a high of 48.0% in 1970.

#### Shad

Shad counts through Beechwood fishway were normally much lower than those of gaspereau. Observed accumulations of many shad in the tailrace area indicate that fishway entrance conditions may often have been unsuitable for this species.

Since construction of Mactaquac in 1967 and the beginning of trucking operations in 1968, shad counts at Beechwood have been especially low. Far less than one percent of those released above Mactaquac ever ascended the Beechwood facilities. These low totals may have been largely due to high mortalities, observed during trucking and soon after release into Mactaquac headpond.

#### Yellow Perch

Between 1957 and 1967, yellow perch runs at Beechwood varied from only a few fish to nearly one thousand. A marked increase occurred in 1968 and, although not counted, the total was estimated to be several thousands. A further increase was noted in 1969. Again, an actual count was not made but the total was estimated to be "many thousands". For 1970 and 1971, accurate counts again could not be readily made, but runs were estimated at about 25,000 and 38,000 respectively.

Much of the increase in abundance since 1967 was composed of juveniles. In 1969, lengths were noted to be "two inches (5.1 cm) and up". Much of the 1970 run was also composed of juveniles less than four inches (10.2 cm) in length; although larger fish, up to about 12 inches (30.5 cm) in length, were more numerous than in 1969.

#### Chain Pickerel

Annual totals of pickerel ascending Beechwood were normally below one hundred fish. However, an unusually large run (1,425 fish) occurred in 1969. The run fell off to only 238 fish in 1970, but was still well above normal. A further drop occurred in 1971 to only 81 fish.

#### Sunfish (Pumpkinseed)

Sunfish runs normally varied from only a few to a little over 100 fish annually. However, significant increases were noted in the 1969-71 seasons, with a high of 499 fish recorded in 1970.

#### Striped Bass

Annual striped bass totals ascending Beechwood varied widely from 1957 to 1965 (1-90 fish). The complete absence of a run in 1966 may have been largely due to dam construction at Mactaquac, although the obstruction was not complete until mid-summer. From 1968 onward, the few striped bass reaching Beechwood all resulted from trucked releases above Mactaquac Dam.

#### Suckers

Each year, both common white and longnose suckers ascended the Beechwood fish pass facilities and no attempts were made to determine their relative abundance. Precise counts were not recorded but estimates were made for most years, varying from about 1,000 to over 35,000. Although counts or estimates were not made for the years 1966-69, runs were considered to be of moderate size. Again with these species, significant increases in run sizes were noted in more recent years.

## MACTAQUAC DAM

### DESCRIPTION OF DAM AND FISH COLLECTION FACILITIES

The third obstruction in this series, Mactaquac Dam, is the largest and most recently constructed. It is located about 10 miles (16 km) upriver from the city of Fredericton and about 1.5 miles (2.4 km) above the head of tide (McKinley Ferry). The dam is an earth-fill structure, with reinforced concrete sluice-gate sections and a powerhouse located on a bypass canal. It was designed to operate under a head of 110 feet (33.5 m) and forms a complete obstruction to upstream migrant fish. Construction began in 1965 and was essentially complete, with first power produced, in the fall of 1967.

Fish handling facilities here, instead of passing fish directly from the tailrace to the headpond, consist of a collection and trucking system. Fish are collected through a more or less conventional collection gallery, located over the powerhouse draft-tube exits. By means of pumped attraction-water flows and a mechanical crowder, the fish are led into a pair of brail pools. From here they are removed by a hopper and placed in specially equipped tank trucks for transport to hatchery holding ponds or upriver distribution points.

### OPERATION OF FISH COLLECTION FACILITIES

Dam construction reached the stage of complete obstruction to upstream migrants early in 1967. In an attempt to provide passage to at least a portion of that season's Atlantic salmon runs, a temporary fishway was installed in one of the regulating-gate openings. However, no conclusive evidence was found to indicate any fish ascended by this means. To assure the safety of the runs, floating trapnets were fished all summer in the tailrace area of the dam. Portions of the runs were retained as hatchery broodstock and most of the remainder were trucked to upriver release points. In addition, a few salmon were released below Mactaquac Dam. Details of these releases are described in following sections.

Permanent fish-handling facilities at Mactaquac became fully operative in the spring of 1968, and all anadromous species subsequently reaching upriver areas have resulted from trucking operations from the dam. Distribution of fish taken at the collection facilities is detailed in a later section.

The collection facilities are designed to operate on a semi-automatic basis. Water levels in the system and collection-gallery gate openings are regulated automatically in relation to changes in the tailrace level. Removal of fish from the facilities and transportation, of course, require attendants. Depending on the

intensity of the runs, the facilities are checked and emptied from two to several times daily. Occasionally, particularly during the peak of the shad and gaspereau runs, fishing operations are carried out over nearly the full 24-hour period.

Except for a few short-term interruptions due to mechanical or electrical problems, the collection facilities were operational continuously each season, beginning as soon as water conditions would permit in May and ending in November, after completion of the salmon spawning runs. Operational periods and dates of first and last salmon taken have been summarized (Table 9).

TABLE 9. Operational periods and dates of first and last salmon taken, Mactaquac fish collection facilities, 1967-71.

Year	Collection facilities opened	First salmon	Last salmon	Collection facilities closed
1967 <sup>1</sup>	9 Jun	9 Jun	18 Nov	18 Nov
1968	14 May	24 May	7 Nov	21 Nov
1969	16 May	21 May	31 Oct	25 Nov
1970	20 May	29 May	8 Nov	18 Nov
1971	22 May	23 May	7 Nov	16 Nov

<sup>1</sup>Collection facilities in 1967 were temporary, consisting of floating trapnets, fished in the tailrace of Mactaquac Dam. Permanent collection facilities were operational during 1968-71.

### ATLANTIC SALMON CATCH AT MACTAQUAC DAM

During each year of operation of the Mactaquac fish collection facilities, daily counts of grilse and older salmon taken were recorded (Appendix D). Preliminary counts were normally made at the collection facilities or at the hatchery holding ponds when the fish were being unloaded from the transportation trucks.

When peak-run periods of both salmon and other species, such as gaspereau and shad, occurred simultaneously, speed in clearing the facilities of fish was of the utmost importance to avoid undue injury or mortality. At such times, inaccuracies in daily total counts and in the distinction between grilse and older salmon were sometimes unavoidable. However, these preliminary figures do provide a close indication of timing, intensity and composition of the runs.

Later, closer examination of the fish at Mactaquac Hatchery, during secondary sorting and broodstock selection, enabled accurate total counts and correct differentiation between grilse and older salmon to be made. Because of frequent overcrowding at the sorting site, individual daily separation was not always possible and, consequently, precise month-end totals could not be determined. However, monthly

and annual totals have been summarized from the preliminary daily records, together

with corrected annual totals as determined during secondary sorting at the hatchery (Table 10).

TABLE 10. Monthly and annual totals of grilse and older salmon ascending Mactaquac fish pass facilities, 1967-71.

Year	Stage	Numbers of fish								Corrected totals
		May	Jun	Jul	Aug	Sep	Oct	Nov	Totals	
1967	G	0	24	275	300	250	164	168	1,181	1,181
	S	0	182	405	121	192	142	229	1,271	1,271
	T	0	206	680	421	442	306	397	2,452	2,454 <sup>1</sup>
1968 <sup>2</sup>	G	0	10	700	322	24	146	0	1,202	1,265
	S	6	164	277	75	28	192	10	752	759
	T	6	174	977	397	52	338	10	1,954	2,024
1969	G	0	114	1,616	242	450	118	0	2,540	2,569
	S	1	548	784	99	235	114	0	1,781	1,750
	T	1	662	2,400	341	685	232	0	4,321	4,321 <sup>3</sup>
1970	G	0	167	1,989	190	418	187	1	2,952	2,968
	S	6	414	1,453	72	375	141	4	2,465	2,449
	T	6	581	3,442	262	793	328	5	5,417	5,417
1971	G	0	11	907	280	498	199	2	1,897	1,928
	S	32	1,082	728	69	311	79	2	2,303	2,272
	T	32	1,093	1,635	349	809	278	4	4,200	4,200

<sup>1</sup>Total includes two additional fish, unidentified as to grilse or older salmon - one taken on 18 Jul and one on 26 Jul.

<sup>2</sup>First year of operation of permanent fish collection facilities. The final count at secondary sorting was 1,265 grilse and 740 older salmon. The additional 19 older salmon were taken by trapnet below the dam.

<sup>3</sup>The final count at secondary sorting was 2,569 grilse and 1,750 salmon, plus two unidentified upriver releases.

As noted previously, construction of permanent collection facilities at Mactaquac Dam was incomplete in 1967, and all fish were taken by trapnets located in the tailrace area. Practically all other fish summarized in Table 10 were taken in the permanent collection facilities.

One exception was a trapnet catch of 19 older salmon from Mactaquac tailrace in 1968. These fish were retained as part of the early-run broodstock collection. The trapnet was operated from May 7 to June 12 to check on the arrival time of early-run fish and to determine whether or not there was any significant delay in entry to the permanent collection facilities.

The second exception was the 1971 recovery of 132 grilse and 4 older salmon in the transportation or smolt-release channel at Mactaquac Hatchery. Over 90% of this group was identified by a tag and/or a clipped adipose fin as being of hatchery origin, and most were retained for broodstock. The remainder were apparently strays from the native wild stock.

#### DISTRIBUTION OF SALMON FROM MACTAQUAC DAM

Distribution of salmon taken at Mactaquac is carried out for two main purposes. The first is to insure the survival and rehabilitation of the present runs and the second is to provide for a reasonable level of angling success. Top priority in salmon distribution was therefore assigned to the provision of sufficient broodstock for Mactaquac Hatchery. As an added insurance against any possible hatchery failure, attempts were made to guarantee a high rate of natural reproduction. For this purpose, fish in excess of hatchery requirements were transported to upriver release areas, selected for their high reproductive potential. It was anticipated that a portion of these releases would assure that the second purpose for distribution, that of providing for the angler, would be fulfilled.

The two major upriver release locations were the Tobique River system and the main Saint John River in the Woodstock-Hartland area. During the spring and summer periods, most fish were released in the Tobique River, where water conditions were generally more favourable to survival.

Heavier releases were made in the Woodstock-Hartland area during late summer and fall, when periods of critically high water temperatures and low dissolved oxygen levels had passed. Minor releases were sometimes made at other sites, including the headpond immediately above Mactaquac Dam, the main Saint John River near Perth and the Meduxnekeag River. Distribution totals are detailed in the following sections and an overall summary is presented (Appendix E).

#### Hatchery Broodstock Collections

Both grilse and older salmon were collected annually as broodstock for the Mactaquac Hatchery. To insure adequate representation from all runs to the river, these were divided into spring-, summer- and fall-run segments (Table 11).

TABLE 11. Hatchery broodstock collections from Mactaquac fish collection facilities, 1967-71.

Year	Run	Numbers of fish					
		Grilse	Salmon	Totals			
1967	Spring	6	118	124			
	Summer	301	337	638			
	Fall	121	190	311			
	Totals	428	645	1,073			
1968	Spring	21	190	211			
	Summer	239	359	598			
	Fall	12	68	80			
	Totals	272	617	889			
1969 <sup>1</sup>	Spring	53	42- 448	283- 501	315		
	Summer	166	140	553	524	719	664
	Fall	23	23	105	105	130 <sup>2</sup>	128
	Totals	242	205-	1,106	912-	1,350 <sup>2</sup>	1,107
1970	Spring	23	354	377			
	Summer	62	450 <sup>3</sup>	512			
	Fall	23	95	118			
	Totals	108	899	1,007			
1971	Spring	8	323	331			
	Summer	132	209	341			
	Fall	93	88	181			
	Totals	233	620	853			

<sup>1</sup>In 1969, some of the fish collected for spring- and summer-run broodstock were found to be in excess of hatchery requirements. Totals eventually retained are shown in italics. To best utilize the reproductive potential of these excess fish, 207 were trucked and released in the Forks Pool of the Tobique River in late October and early November.

Spring-run releases totaled 186 - 11 grilse, 165 older salmon and 10 of unknown sea age (tags lost in holding ponds and grilse:salmon differentiation not recorded). Summer-run releases totaled 21 - 15 grilse and 6 older salmon. Hatchery records of broodstock retained indicate the loss of an additional 36 fish - 11 grilse, 23 older salmon and 2 of undetermined sea age - apparently through mortalities during transportation and holding periods

or from unrecorded release of excess broodstock.

During other years, smaller numbers of excess broodstock (unrecorded) were released late in the season into the Nashwaak River.

<sup>2</sup>Two fall-run fish of undetermined sea age are included in the totals collected.

<sup>3</sup>On 11 and 12 July, 30 of these older salmon were transferred to New Mills for holding until spawning time.

Although broodstock collections were designed to cover these three seasonal periods, there were no defined cut-off dates, and collection periods varied from year to year. This was necessary due to variations in run timing between years and the relative availability of fish.

Cut-off dates were more or less arbitrary and were varied to insure sampling of the more obviously different segments of the runs. In one instance, during 1969, there was actually a time overlap in the late-summer and early-fall collections (Table 12). This, apparently, was necessary in order to obtain a sufficient number of the summer-run segment.

TABLE 12. Collection periods for Mactaquac broodstock fish, 1967-71.

Year	Spring run	Summer run	Fall run
1967	9-22 Jun	10 Jul-25 Aug	14 Sep-19 Oct
1968	22 May-3 Jul	4 Jul-23 Oct	24 Oct-12 Nov
1969	10 Jun-2 Jul	5 Jul-3 Oct	16 Sep-23 Oct
1970	5 Jun-4 Jul	13 Jul-24 Aug	10 Sep-8 Oct
1971	4 Jun-7 Jul	8 Jul-3 Sep	8-28 Sep

Since adult holding facilities were not constructed at Mactaquac Hatchery until late in 1971, broodstock fish were generally held from collection until spawning time in the Miramichi Hatchery holding ponds at South Esk.

In the fall, stripping operations were conducted at South Esk. The eggs were then transferred to various stations for hatching and rearing. Although Mactaquac Hatchery was the primary station, Saint John and Yarmouth (Nova Scotia) hatcheries were also utilized as an insurance measure against any potential problems at the new Mactaquac facilities. Spent or spawned fish were transported from South Esk and released into the Nashwaak River late in the fall.

#### Salmon Transfers, Mactaquac to Tobique River

In June 1967, most grilse and older salmon taken in trapnets below Mactaquac Dam were retained for broodstock. The remainder were released below the dam to check on the efficiency of a temporary fish pass. From July to September inclusive, most fish in excess of broodstock requirements were trucked directly to the Tobique

River. During subsequent years, fairly heavy transfers to the Tobique River were made in the spring and summer, when poor water or the threat of poor water conditions usually made it inadvisable to release significant numbers in the main Saint John River (Table 13). Most Tobique River transfers were released in the headpond, 1-3 miles above Tobique Narrows Dam. In early years, a few fish were released a short distance above Plaster Rock; and, in 1969, a direct transfer of 207 fish was made from South Esk ponds to the Forks Pool.

TABLE 13. Atlantic salmon transfers from Mactaquac collection facilities to Tobique River, 1967-71.

Year	Stage	Numbers of fish						Totals
		Jun	Jul	Aug	Sep	Oct	Nov	
1967	G	0	77	170	166	0	0	413
	S	0	110	38	51	0	0	199
	T	0	187	208	217	0	0	612
1968 <sup>1</sup>	G	0	322	22	0	0	0	344
	S	0	60	2	0	0	0	62
	T	0	382	24	0	0	0	406
1969 <sup>2</sup>	G	38	1,393	251	136	20	6	1,844
	S	16	436	38	16	111	60	677
	U	0	0	0	0	0	10	10
	T	54	1,829	289	152	131	76	2,531
1970	G	71	1,772	183	35	0	0	2,061
	S	60	1,037	28	59	0	0	1,184
	T	131	2,809	211	94	0	0	3,245
1971	G	2	583	202	0	0	0	787
	S	473	867	29	0	0	0	1,369
	T	475	1,450	231	0	0	0	2,156

<sup>1</sup>In addition to these totals, two grilse and 12 salmon were released in the main Saint John River, about two miles below Perth on July 9, 1968. These fish were originally intended for release in the Tobique River and were included in those totals on Mactaquac Hatchery records.

<sup>2</sup>October and November releases consisted of 207 excess broodstock collected at Mactaquac and held at South Esk until spawning time. These fish included 11 grilse, 165 salmon, and 10 of undetermined sea age from the spring run; and 15 grilse and six salmon from the summer run. They were transferred to the Forks Pool of the Tobique River on October 30 and November 10, 1969.

#### Salmon Transfers, Mactaquac to Woodstock-Hartland Area

Greater releases were usually made in the Woodstock-Hartland area in late summer and fall, after more critical summer water conditions had passed (Table 14). Since permanent collection facilities at Mactaquac were not operational in 1967, many migrants may have suffered abnormal delay. Late fall catches and transfers were unusually large that season.

TABLE 14. Atlantic salmon transfers from Mactaquac collection facilities to the Woodstock-Hartland area, 1967-71.

Year	Stage	Numbers of fish					Totals	
		Jun	Jul	Aug	Sep	Oct		
1967	G	0	0	0	0	126	170	296
	S	0	0	0	0	103	216	319
	T	0	0	0	0	229	386	615
1968	G	0	101	354	11	147	6	619
	S	4	23	14	9	10	2	62
	T	4	124	368	20	157	8	681
1969	G	0	45	2	269	125	0	441
	S	0	3	1	64	29	0	97
	T	0	48	3	333	154	0	538
1970	G	0	203	0	364	190	2	759
	S	0	1	0	214	130	1	346
	T	0	204	0	578	320	3	1,105
1971	G	1	139	105	453	252	0	950
	S	3	4	32	174	106	0	319
	T	4	143	137	627	358	0	1,269

The major release point in the Woodstock-Hartland area was at Victoria Corner, near the upper extremity of Mactaquac headpond. Other releases were made a few miles downriver, near the town of Woodstock.

#### Salmon Transfers, Mactaquac to Meduxnekeag River

In an attempt to expand the utilization of available spawning area in 1969, a number of fish were transferred from Mactaquac to the Meduxnekeag River (Table 15). The Meduxnekeag is a relatively small tributary, joining the main Saint John River at the town of Woodstock. Although the Meduxnekeag River contains a significant amount of potentially good spawning and nursery area, its confluence with the main river lies below the normal adult release points.

TABLE 15. Atlantic salmon transfers, Mactaquac to Meduxnekeag River, 1969.

Stage	Numbers of fish			Totals
	Sep	Oct	Nov	
Grilse	43	12	1	56
Salmon	7	7	5	19
Totals	50	19	6	75

#### Salmon Transfers, Mactaquac Collection Facilities to Headpond

In some years, small numbers of grilse and older salmon were inadvertently released into the Mactaquac headpond immediately above the dam (Table 16). These

releases occurred during peak-run periods of gaspereau and shad, when transportation facilities were frequently taxed to their limits. At such times, efforts to remove a stray grilse or salmon from the facilities would have resulted in excessive delay and the possibility of high mortalities to all species involved. Consequently, these salmon were released with the remainder of the load. In addition to those fish recorded, a few others may have escaped detection during heavy-run periods.

TABLE 16. Atlantic salmon releases immediately above Mactaquac Dam, 1967-71.

Stage	Numbers of fish				
	1967	1968	1969	1970	1971
Grilse	0	14	0	2	2
Salmon	0	1	0	0	1
Totals	0	15	0	2	3

Salmon Transfers, Mactaquac Collection Facilities to Areas Below the Dam

Relatively small numbers of grilse and older salmon have been released below Mactaquac Dam (Table 17). Most of these releases occurred in 1967, when collection facilities were restricted to trapnets fished in the tailrace area. The majority of these fish (39 grilse and 111 older salmon) were tagged and released intentionally near the trapping site. Another 20 fish (8 grilse, 10 older salmon and 2 of undetermined sea age) were tagged for upriver release, but escaped into the tailrace from temporary holding cages or during truck-loading operations. A third group of 14 fish (1 grilse and 13 older salmon), which was selected and tagged for broodstock, also escaped into the tailrace.

TABLE 17. Atlantic salmon releases below Mactaquac Dam, 1967-71.

Stage	Numbers of fish				
	1967 <sup>1</sup>	1968	1969	1970	1971
Grilse	48	0	0	18	34
Salmon	134	0	0	14	2
Undeter.	2	0	0	0	0
Totals	184	0	0	32	36

<sup>1</sup>Throughout the 1967 season, a number of tagged fish released below the dam were recaptured a second or third time. Some of these were again released into the tailrace, while others were distributed to upriver locations. After subtracting these upriver releases the final escapement total below the dam was 132 fish (38 grilse, 92 older salmon and 2 of undetermined sea age).

No releases were made below the dam in 1968 or 1969. Small numbers released in 1970 and 1971 were mainly injured or non-fertile fish, together with a few excess spawners very late in the season.

Disposition of Other Salmon from Mactaquac

In addition to those fish retained for broodstock and those transferred and released, a few mortalities occurred each year (Table 18). Most mortalities were accidental and occurred during difficult conditions in the collection and transportation operations. A very few others were sacrificed for scientific study purposes.

TABLE 18. Atlantic salmon mortalities from collections at Mactaquac, 1967-71.

Stage	Numbers of fish				
	1967	1968	1969 <sup>1</sup>	1970	1971
Grilse	6	14	12	20	28
Salmon	16	5	22	6	21
Totals	22	19	34	26	49

<sup>1</sup>These totals are in addition to the 1969 broodstock loss of 11 grilse, 21 older salmon and 2 fish of undetermined sea age, as described in Footnote No. 1 of Table 11.

SPECIES OTHER THAN ATLANTIC SALMON AT MACTAQUAC

In addition to Atlantic salmon, many other species normally ascend the Mactaquac fish collection facilities each year. Daily counts were recorded for the more important and more prominent species. Annual totals are summarized (Table 19) and semi-monthly totals are tabulated (Appendix F) for most species. Other uncounted species using the facilities include the American eel (adults and elvers), chubs, minnows, sunfish (pumpkinseeds) and juvenile salmon.

Recorded totals for most species represent either actual counts or fairly accurate estimates. Due to the nature of the collection facilities and periodic over-crowding by large runs of gaspereau, shad and suckers, it was often impossible to obtain counts or accurate estimates, particularly in the case of the smaller fish. For most of these, the totals recorded must be considered as only minimal or incomplete. No attempt was made to estimate totals for the many thousands of adult eels and elvers ascending annually.

With the exception of the lamprey, fish were normally trucked from the collection facilities and released in the headpond a short distance above the dam. Most lamprey were removed and destroyed, although some were inadvertently released into the headpond with loads of other

species. Particular efforts were made to transport the gaspereau and shad spawning runs safely upriver.

TABLE 19. Annual totals of major species, other than Atlantic salmon, ascending Mactaquac Dam fish collection facilities, 1968-71. (Partially estimated totals in italics.)

Species	Numbers of fish <sup>1</sup>			
	1968	1969	1970	1971
Landlocked salmon	11	4	35	25
Brook (speckled) trout	1,052	500	128	47
Lamprey <sup>2</sup>	<i>8,691</i>	<i>5,088</i>	<i>1,046</i>	<i>1,786</i>
Gaspereau <sup>2</sup>	<i>22,122</i>	<i>106,288</i>	<i>84,505</i>	<i>369,065</i>
Shad <sup>2</sup>	<i>38,838</i>	<i>37,449</i>	<i>36,437</i>	<i>15,834</i>
Chain pickerel	27	123	480	282
Yellow perch <sup>3</sup>	298+	6,580+	1,212+	3,548+
White perch <sup>3</sup>	-	-	250+	500+
Striped bass <sup>3</sup>	872+	52+ <sup>6</sup>	127	13
Smallmouth black bass <sup>3</sup>	6+	90+ <sup>7</sup>	40+	84
Suckers (common and longnose) <sup>3</sup>	4,818+	4,731+	2,479+	3,570+
Whitefish <sup>4</sup>	2,440	1,168	575	15+
Sturgeon <sup>5</sup>	1	0	0	0

<sup>1</sup>During 1967, when all Mactaquac area catches were taken by trapnet, only salmon were transported above the dam. Other species were uncounted and were released at the trapping site.

<sup>2</sup>During peak-run periods, individuals of these species were frequently too numerous to count, if heavy mortalities were to be avoided. At such times, numbers were estimated.

<sup>3</sup>Accurate counts, in most cases, were not attempted. Totals shown are those recorded on daily data sheets, but in many cases are incomplete and indicated by a "+".

<sup>4</sup>Whitefish spawning runs were usually still in progress when collection facilities were closed for the season, so that totals shown must be considered minimal. This was particularly evident in 1971. When facilities were drained on November 16, 50 were recovered from the crowder pool and released into the tailrace, and 35 were found dead in the entrance channel.

<sup>5</sup>Unidentified as to whether Atlantic or short-nose - both species occur in the system, but are found mainly below head of tide.

<sup>6</sup>Approximately 250 additional striped bass were recovered from the collection facilities and released into the tailrace in early August, and 5 accidental mortalities occurred on November 25.

<sup>7</sup>Approximately 250 additional black bass were recovered from the collection facilities and released into the tailrace in early August.



APPENDIX A  
GLOSSARY OF COMMON AND SCIENTIFIC  
NAMES OF FISH SPECIES

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Common name	Scientific name
Atlantic salmon	<i>Salmo salar</i>
Landlocked salmon	<i>Salmo salar</i>
Brook (speckled) trout	<i>Salvelinus fontinalis</i>
Rainbow trout	<i>Salmo gairdneri</i>
Lake whitefish	<i>Coregonus clupeaformis</i>
Gaspereau	<i>Alosa pseudoharengus</i>
Shad	<i>Alosa sapidissima</i>
Lamprey	<i>Petromyzon marinus</i>
Chain pickerel	<i>Esox niger</i>
Common white sucker	<i>Catostomus commersoni</i>
Longnose sucker	<i>Catostomus catostomus</i>
American smelt	<i>Osmerus mordax</i>
Golden shiner	<i>Notemigonus crysoleucas</i>
Common shiner	<i>Notropis cornutus</i>
Fallfish	<i>Semotilus corporalis</i>
Catfish (brown bullhead)	<i>Ictalurus nebulosus</i>
American eel	<i>Anguilla rostrata</i>
Burbot	<i>Lota lota</i>
Striped bass	<i>Morone saxatilis</i>
Smallmouth black bass	<i>Micropterus dolomieu</i>
White perch	<i>Roccus americanus</i>
Yellow perch	<i>Perca flavescens</i>
Sunfish (pumpkinseed)	<i>Lepomis gibbosus</i>
Sturgeon (Atlantic & shortnose) <sup>1</sup>	<i>Acipenser oxyrhynchus &amp; brevirostrum</i>
Sticklebacks	<i>Gasterosteidae</i>
Minnnows	<i>Cyprinidae</i>
Killifishes	<i>Cyprinodontidae</i>

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<sup>1</sup>Both species occur in the Saint John River system, mainly below head of tide.



## APPENDIX B

DAILY COUNTS OF GRILSE AND OLDER SALMON ASCENDING  
BEECHWOOD DAM FISH PASS FACILITIES, 1957-71

In the following tables, the timing, composition and intensity of the runs of grilse and older salmon are indicated by daily counts. The division between grilse and older salmon was made on the basis of total length. Those 26 inches (66 cm) or less in length were considered as grilse and those of greater length as older salmon.

For the years 1957-59, the distinction between grilse (G), and older salmon (S) was not recorded on the original records. Totals are listed under the older-salmon column. In 1960, the grilse/older salmon distinction was not recorded on certain days. However, estimates of the breakdown were made and entered in the table, so that totals must be considered as only approximate.

A zero in the tables indicates no fish were taken; a dash indicates the facilities were not operational.

From 1967 to 1971, all fish reaching Beechwood Dam resulted from those trucked to areas above Mactaquac. Since these were essentially the culls, after collection of broodstock, accurate timing, intensity and composition of the runs is not indicated.

TABLE B-1. Atlantic salmon counts, Beechwood fish pass facilities, 1957. (1957 total - 1,125 grilse and older salmon combined.)

Day	N u m b e r s o f f i s h <sup>1</sup>														
	May		Jun		Jul		Aug		Sep		Oct		Nov		
	G	S	G	S	G	S	G	S	G	S	G	S	G	S	
1					0		0		8		0		0		
2					2		0		4		0		0		
3					0		0		6		0		0		
4					0		14		33		0		2		
5					0		0		1		0		0		
6					0		2		3		0		1		
7					0		1		2		0		0		
8					2		15		66		0		0		
9					1		23		29		0		0		
10					0		88		2		3		0		
11					0		131		11		1		0		
12					0		112		20		1		0		
13				-	0		50		4		0		0		
14				0	0		14		3		1		0		
15				1	0		147		2		0		0		
16				0	0		12		3		0		0		
17				4	0		22		2		0		0		
18				0	0		27		1		0		0		
19				0	0		18		1		0		0		
20				0	0		41		0		0		0		
21				0	0		72		3		0		0		
22				0	0		36		3		0		0		
23				1	0		6		0		0		0		
24				3	4		11		0		0		0		
25				0	0		2		4		0		0		
26				0	0		11		1		0		0		
27				0	0		2		0		2		0		
28				0	0		2		1		0		0		
29				0	0		5		0		0		0		
30				1	0		13		0		0		0		
31				-	0		5		-		0		-		
Totals					10		9		882		213		8		3

<sup>1</sup>The breakdown of grilse vs. older salmon was not recorded. The figures under the "S" column include both.

TABLE B-2. Atlantic salmon counts, Beechwood fish pass facilities, 1958. (1958 total - 4,565 grilse and older salmon combined.)

Day	N u m b e r s o f f i s h <sup>1</sup>													
	May		Jun		Jul		Aug		Sep		Oct		Nov	
	G	S	G	S	G	S	G	S	G	S	G	S	G	S
1			0		10		26		187		6		6	
2			1		3		85		175		23		3	
3			0		3		174		42		18		0	
4			0		0		98		45		8		2	
5			5		2		147		43		14		1	
6			7		28		0		33		7		1	
7			1		26		32		37		5		0	
8			8		1		74		46		2		2	
9			5		14		28		107		0		2	
10			6		25		0		13		1		1	
11			19		1		0		13		6		0	
12			17		26		1		10		8		0	
13			4		103		1		19		26		2	
14			13		14		66		21		8		2	
15			18		43		51		6		26		0	
16			7		73		42		14		18		0	
17			2		83		20		5		19		0	
18			0		186		12		22		15		0	
19			1		47		0		21		0		0	
20			0		46		0		32		12		0	
21			1		39		1		166		12		0	
22			0		20		1		60		4		1	
23			3		21		0		67		0		-	
24			6		30		0		56		5		-	
25			3		4		0		32		1		-	
26			3		122		8		11		2		48 <sup>2</sup>	
27			6		47		8		8		5		-	
28			0		66		4		14		4		-	
29			0		108		4		16		2		-	
30			2		86		236		11		1		-	
31		-	-		86		279		-		5		-	
Totals		-		138		1,363		1,398		1,332		263		71

<sup>1</sup>The breakdown of grilse vs. older salmon was not recorded. The figures under the "S" column include both.

<sup>2</sup>Dipped from the water-supply pool after facilities were drained for winter.

TABLE B-3. Atlantic salmon counts, Beechwood fish pass facilities, 1959. (1959 total - 2,588 grilse and older salmon combined.)

Day	N u m b e r s o f f i s h <sup>1</sup>													
	May		Jun		Jul		Aug		Sep		Oct		Nov	
	G	S	G	S	G	S	G	S	G	S	G	S	G	S
1			9		22		0		60		22		0	
2			18		14		0		13		67		0	
3			7		6		7		17		20		0	
4			52		6		0		7		29		0	
5			53		52		10		2		40		0	
6			49		4		4		2		55		0	
7			41		7		1		3		38		0	
8			32		20		1		13		2		0	
9			19		8		0		30		2		0	
10			17		32		1		16		2		0	
11			18		38		2		48		11		0	
12			6		136		12		41		12		0	
13			2		23		17		14		3		0	
14			0		26		13		43		0		0	
15			1		63		22		23		8		0	
16			0		13		23		9		7		0	
17			0		63		9		4		13		0	
18			0		12		8		3		4		0	
19		-	0		19		9		2		3		0	
20		0	0		170		2		1		0		0	
21		0	1		111		7		0		4		0	
22		0	3		14		17		1		1		0	
23		2	2		48		18		6		0		0	
24		0	7		6		14		6		0		-	
25		1	2		14		2		1		0			
26		3	5		63		37		3		0			
27		15	1		25		46		7		11			
28		24	6		0		15		10		8			
29		8	1		1		9		7		0			
30		22	2		1		13		15		0			
31		41	-		1		12		-		0			
Totals		116	354		1,018		331		407		362		0	

<sup>1</sup>The breakdown of grilse vs. older salmon was not recorded. The figures under the "S" column include both.

TABLE B-4. Atlantic salmon counts, Beechwood fish pass facilities, 1960. (1960 totals - 1,627 grilse and 1,061 older salmon.)

Day	N u m b e r s o f f i s h													
	May		Jun		Jul		Aug		Sep		Oct		Nov	
	G	S	G	S	G	S	G	S	G	S	G	S	G	S
1			0	2	8	10	8	2	0	0	1	0	6	0
2			0	19	11	16	3	1	0	0	1	0	5	1
3			0	11	12	10	0	0	0	0	3	12	4	5
4			0	13	18	22	5	0	0	0	9	7	0	2
5			0	3	46	35	7	1	0	0	3	2	3	1
6			0	1	45 <sup>1</sup>	44 <sup>1</sup>	9	1	1 <sup>1</sup>	0 <sup>1</sup>	13	12	3	1
7			0	5	59 <sup>1</sup>	59 <sup>1</sup>	1	0	0	0	9	8	2	0
8			0	2	80 <sup>1</sup>	79 <sup>1</sup>	8	1	0	0	5	1	0	0
9			0	0	48 <sup>1</sup>	48 <sup>1</sup>	11	1	1 <sup>1</sup>	0 <sup>1</sup>	7	6	0	0
10			0	1	97	144	4	0	1 <sup>1</sup>	0 <sup>1</sup>	1	0	1	0
11			0	1	46	56	12	1	0	0	11	6	0	0
12			0	0	17 <sup>1</sup>	17 <sup>1</sup>	8	1	0	0	12	5	0	0
13			0	8	68	25	36	7	4	1	6	9	0	0
14			0	11	56	20	14	5	0	0	7	2	0	0
15			0	8	35	11	11	2	3	0	3	2	0	0
16			1	1	18	6	1	1	3	1	14	3	0	0
17			0	2	56	23	3	1	1	0	7	3	0	0
18			0	6	87	18	5	0	1	0	8	3	0	0
19			0	19	26	8	0	0	1	0	2	0	0	0
20			0	17	44	3	1	0	3	2	6	1	0	0
21			0	7	45	6	0	0	1	0	3	0	0	0
22			0	4	27	5	2 <sup>1</sup>	0 <sup>1</sup>	1	1	5	2	7 <sup>2</sup>	2 <sup>2</sup>
23			0	8	50	5	4 <sup>1</sup>	1 <sup>1</sup>	2	1	3	0	-	-
24			0	1	42	8	3 <sup>1</sup>	1 <sup>1</sup>	1	0	2	0		
25			0	10	25	4	0	0	0	0	10	1		
26	-	-	0	5	13	2	1 <sup>1</sup>	0 <sup>1</sup>	2	0	6	4		
27	0	0	0	5	13	2	0	0	5	1	41	16		
28	0	1	0	0	22	4	3	0	5	4	27	5		
29	0	0	3	13	12	1	0	0	3	2	12	6		
30	0	0	5	6	4	3	1	0	1	1	6	1		
31	0	7	-	-	6	0	1	0	-	-	6	0		
Totals	0	8	9	189	1,136	694	162	27	40	14	249	117	31	12

<sup>1</sup>Grilse vs. older salmon: Breakdown estimated - original records indicated totals only on these days.

<sup>2</sup>Dipped from water supply pool after facilities were drained for winter.

TABLE B-5. Atlantic salmon counts, Beechwood fish pass facilities, 1961. (1961 totals - 452 grilse and 979 older salmon.)

Day	N u m b e r s o f f i s h													
	May		Jun		Jul		Aug		Sep		Oct		Nov	
	G	S	G	S	G	S	G	S	G	S	G	S	G	S
1					0	4	6	7	1	1	0	1	0	1
2					2	12	9	14	6	6	0	0	0	0
3					0	3	3	2	1	1	0	0	0	0
4					2	6	7	6	2	7	1	0	0	0
5					1	8	13	4	2	4	0	1	0	0
6					2	22	3	6	0	1	2	2	0	0
7					7	17	0	0	6	6	3	3	0	0
8					1	11	1	2	6	5	4	4	0	1
9					16	66	7	7	2	2	1	6	0	0
10					11	39	4	1	19	16	3	9	0	0
11			-	-	4	16	2	0	11	13	3	8	0	0
12			0	0	2	1	1	1	8	11	5	6	0	1
13			0	0	2	5	20	20	6	13	7	7	0	0
14			0	2	3	1	0	9	4	6	3	6	0	0
15			0	2	25	37	5	6	2	4	5	6	0	0
16			0	1	18	52	1	0	4	5	5	8	0	0
17			0	8	7	15	0	1	0	1	0	0	0	0
18			0	43	5	5	2	1	0	1	1	0	0	0
19			0	15	1	1	4	5	0	0	0	0	0	0
20			0	6	3	5	0	3	0	1	0	0	0	0
21			0	11	2	3	2	6	2	4	0	1	0	0
22			0	9	0	3	2	3	7	11	0	0	-	-
23			0	15	12	13	7	5	7	8	0	0		
24			0	24	22	37	5	4	16	20	0	0		
25			0	25	2	14	0	16	7	12	0	0		
26			0	3	7	2	2	1	6	1	0	0		
27			0	3	3	5	1	2	0	1	0	0		
28			3	9	1	5	4	7	0	0	0	1		
29			0	3	0	2	1	3	0	0	0	1		
30			0	4	0	0	5	4	0	0	0	0		
31			-	-	1	3	2	3	-	-	0	0		
Totals			3	183	162	413	119	149	125	161	43	70	0	3



TABLE B-6. Atlantic salmon counts, Beechwood fish pass facilities, 1962. (1962 totals - 251 grilse and 233 older salmon.)

Day	N u m b e r s o f f i s h													
	May		Jun		Jul		Aug		Sep		Oct		Nov	
	G	S	G	S	G	S	G	S	G	S	G	S	G	S
1			-	-	0	1	1	0	0	0	0	0	0	0
2			0	0	1	2	2	0	1	0	11	4	0	0
3			0	0	0	1	5	1	0	0	5	2	0	0
4			0	0	2	0	5	0	0	0	3	1	0	0
5			0	0	0	0	2	0	1	1	4	0	0	0
6			0	0	0	0	3	0	0	0	7	1	0	0
7			0	3	2	17	0	0	0	0	2	1	0	0
8			0	2	3	20	0	0	0	0	2	1	0	0
9			0	7	13	52	1	0	1	1	8	7	0	0
10			0	13	3	6	2	0	0	0	4	2	0	0
11			0	1	0	1	0	0	0	0	1	0	0	0
12			0	3	3	2	0	0	0	0	0	1	0	0
13			0	1	0	1	0	0	2	0	0	1	-	-
14			0	8	0	2	0	0	5	0	1	0		
15			0	2	0	0	1	0	2	1	3	2		
16			0	10	0	0	12	0	7	0	3	0		
17			0	10	0	0	2	0	4	0	0	0		
18			0	6	0	0	3	0	0	0	1	1		
19			0	2	0	0	5	0	2	0	1	1		
20			0 <sup>1</sup>	0 <sup>1</sup>	0	0	4	0	5	2	1	2		
21			0 <sup>1</sup>	0 <sup>1</sup>	0	0	0	0	1	0	0	0		
22			0 <sup>1</sup>	0 <sup>1</sup>	0	0	4	0	3	1	0	0		
23			0	0	0	1	8	0	1	1	1	0		
24			2	5	0	0	10	1	5	2	0	2		
25			0	1	0	0	13	2	2	0	2	0		
26			0	2	0	0	5	0	11	1	0	1		
27			0	0	0	0	0	0	1	1	0	0		
28			0	0	2	0	1	0	1	1	1	0		
29			0	2	6	1	0	0	3	1	1	0		
30			0	0	1	0	0	0	4	1	0	0		
31			-	-	0	0	0	0	-	-	0	0		
Totals	-	-	2	78	36	107	89	4	62	14	62	30	0	0

<sup>1</sup>Fishway closed during installation of electronic counter.

TABLE B-7. Atlantic salmon counts, Beechwood fish pass facilities, 1963. (1963 totals - 7,204 grilse and 1,130 older salmon.)

Day	N u m b e r s o f f i s h													
	May		Jun		Jul		Aug		Sep		Oct		Nov	
	G	S	G	S	G	S	G	S	G	S	G	S	G	S
1			0	0	9	5	30	0	25	9	45	8	0	0
2			0	1	2	4	6	0	90	15	23	2	0	0
3			0	1	0	0	1	0	99	15	33	4	0	0
4			0	1	0	0	0	0	91	9	15	5	2	0
5			0	0	1	0	16	0	82	10	25	10	0	0
6			0	0	0	0	30	0	51	2	39	11	0	0
7			0	2	70	4	9	0	27	3	131	38	0	0
8			0	0	31	3	8	0	98	16	69	19	0	0
9			0	0	1	0	23	0	86	25	48	21	2	0
10			0	0	43	6	14	3	172	13	129	14	0	0
11			0	1	169	9	28	0	203	19	31	7	0	0
12			0	0	264	23	174	13	128	29	25	2	0	0
13			0	0	262	27	29	3	126	19	12	0	0	0
14			0	3	67	22	14	0	14	1	5	0	0	0
15			0	0	133	12	31	3	18	2	0	0	0	0
16			0	3	76	11	68	3	12	0	6	2	0	0
17			0	1	172	31	80	14	63	2	14	5	0	0
18			0	3	101	23	45	10	44	7	25	4	0	0
19			0	0	124	13	167	44	140	26	27	4	0	0
20			0	0	96	25	116	14	89	12	23	5	-	-
21			0	0	203	34	221	41	89	6	48	17		
22			0	0	94	15	68	27	221	52	27	8		
23			0	4	43	2	91	16	161	26	13	9		
24			0	0	2	0	54	3	28	7	23	2		
25			0	1	10	1	284	34	28	1	17	4		
26			0	1	14	0	24	8	32	3	10	3		
27			1	2	2	0	10	4	68	8	8	2		
28			4	0	15	0	15	6	58	10	5	1		
29	-	-	0	0	90	3	3	1	1	4	3	0		
30	0	0	7	2	26	1	25	1	66	13	0	1		
31	0	0	-	-	52	5	42	4	-	-	1	1		
Totals	0	0	12	26	1,172	279	1,726	252	2,410	364	880	209	4	0

TABLE B-8. Atlantic salmon counts, Beechwood fish pass facilities, 1964. (1964 totals - 5,935 grilse and 1,760 older salmon.)

Day	N u m b e r s o f f i s h													
	May		Jun		Jul		Aug		Sep		Oct		Nov	
	G	S	G	S	G	S	G	S	G	S	G	S	G	S
1			0	0	27	72	229	25	96	16	10	2	4	3
2			0	2	4	5	286	27	70	9	1	1	3	0
3			0	7	3	21	225	63	26	2	5	1	3	0
4			0	8	21	30	96	6	11	1	29	1	1	0
5			0	12	9	21	89	33	7	3	2	0	3	0
6			0	9	90	127	155	23	27	8	10	0	1	0
7			0	10	23	14	110	8	44	8	16	4	0	1
8			0	14	50	55	72	8	15	3	11	8	2	0
9			0	6	70	29	138	7	14	3	8	3	1	0
10			0	4	49	52	203	9	14	4	1	0	0	0
11			0	5	83	29	111	6	5	1	4	0	0	0
12			0	3	70	43	45	3	55	20	1	2	0	0
13			0	1	52	25	19	0	29	7	10	4	0	0
14			0	3	56	32	15	0	76	32	2	0	2	0
15			0	2	34	15	16	1	30	13	8	0	1	0
16			0	2	86	40	29	2	43	13	7	4	0	0
17			1	8	118	32	30	3	22	4	4	2	1	0
18			1	19	158	46	79	6	9	9	1	0	0	0
19			0	10	363	76	24	2	9	1	16	9	1	0
20	-	-	0	12	172	30	35	5	1	0	3	4	0	0
21	0	0	0	11	39	9	24	9	7	3	16	10	0	0
22	0	0	1	6	20	2	84	11	6	1	12	9	0	0
23	0	0	0	5	131	4	26	4	8	0	13	9	0	0
24	0	0	0	6	56	6	68	7	0	0	4	2	0	0
25	0	0	1	10	32	4	35	11	3	4	12	2	0	0
26	0	0	1	7	52	3	20	3	4	0	8	2	-	-
27	0	0	0	5	406	41	36	6	5	0	2	1		
28	0	0	1	12	142	17	42	7	18	2	23	10		
29	0	0	10	21	35	5	16	3	10	5	8	2		
30	0	1	12	55	60	4	31	5	6	1	5	7		
31	0	2	-	-	39	8	20	3	-	-	4	3		
Totals	0	3	28	275	2,550	897	2,408	306	670	173	256	102	23	4

TABLE B-9. Atlantic salmon counts, Beechwood fish pass facilities, 1965. (1965 totals - 3,052 grilse and 2,397 older salmon.)

Day	N u m b e r s   o f   f i s h													
	May		Jun		Jul		Aug		Sep		Oct		Nov	
	G	S	G	S	G	S	G	S	G	S	G	S	G	S
1			0	10	29	294	0	0	2	0	11	10	0	0
2			0	4	6	50	0	0	10	7	19	5	0	0
3			0	5	1	9	0	0	12	7	12	8	2	0
4			0	7	7	12	3	0	13	2	8	1	1	0
5			0	10	14	43	3	1	20	4	3	1	0	0
6			0	7	0	2	3	0	28	20	21	7	1	0
7			0	4	17	29	0	0	77	24	51	18	0	0
8			0	3	9	17	1	0	16	11	9	4	0	1
9			0	14	20	40	0	0	68	22	33	10	0	0
10			0	23	41	118	0	0	22	13	30	8	0	0
11			0	6	63	68	8	0	103	26	2	0	0	0
12			0	12	40	48	0	0	40	7	7	3	0	0
13			1	20	14	31	0	0	236	34	14	5	0	0
14			0	14	19	21	0	0	160	40	106	23	0	0
15			0	8	31	48	0	0	40	11	39	7	0	0
16	-	-	0	1	78	30	0	0	130	36	45	12	0	0
17	0	0	0	12	36	13	0	0	63	15	118	31	0	0
18	0	0	0	10	18	7	0	0	79	25	45	16	-	-
19	0	0	1	41	12	8	0	0	73	32	41	11		
20	0	0	0	19	21	5	0	0	37	9	55	11		
21	0	0	1	6	3	0	0	0	72	20	38	12		
22	0	0	0	12	0	0	0	0	13	4	35	11		
23	0	0	0	6	0	0	0	0	19	8	61	22		
24	0	0	1	16	9	1	0	0	33	10	43	12		
25	0	0	1	27	1	0	0	0	38	9	26	11		
26	0	0	3	26	21	4	2	1	29	6	20	5		
27	0	0	8	374	21	1	0	2	15	6	6	5		
28	0	0	0	13	1	1	0	1	52	8	3	0		
29	0	0	0	7	2	0	2	3	28	4	6	0		
30	0	2	2	69	0	0	3	0	25	9	2	0		
31	0	1	-	-	2	0	6	1	-	-	1	0		
Totals	0	3	18	786	536	900	31	9	1,553	429	910	269	4	1

TABLE B-10. Atlantic salmon counts, Beechwood fish pass facilities, 1966. (1966 totals - 743 grilse and 467 older salmon.)

Day	N u m b e r s o f f i s h													
	May		Jun		Jul		Aug		Sep		Oct		Nov	
	G	S	G	S	G	S	G	S	G	S	G	S	G	S
1			0	0	2	31	1	0	0	0	0	0	0	0
2			0	0	6	23	0	0	0	0	4	2	0	0
3			0	0	0	7	0	0	0	0	26	8	0	0
4			1	0	11	39	0	0	0	0	31	4	0	0
5			1	0	0	0	0	0	0	0	119	19	0	0
6			1	8	1	2	0	0	0	0	36	5	0	0
7			0	8	0	0	0	0	0	0	46	6	0	0
8			0	6	0	0	0	0	0	0	68	19	0	0
9			0	1	0	0	0	0	0	0	70	14	0	0
10			0	2	0	0	0	0	0	0	50	8	0	0
11			0	1	0	0	0	0	0	1	19	5	0	0
12			1	5	1	0	0	0	0	0	6	1	0	0
13			0	9	0	0	0	0	0	0	20	3	0	0
14			0	4	1	0	0	0	0	0	17	6	0	0
15			0	12	3	0	0	0	0	0	19	3	-	-
16			0	8	5	3	0	0	0	0	13	2		
17			0	4	2	0	0	0	0	0	14	0		
18			0	2	0	0	0	0	0	0	1	1		
19			0	1	0	1	0	0	0	0	6	2		
20			0	11	0	0	0	0	0	0	3	0		
21			0	4	0	0	0	0	0	0	0	0		
22			0	23	0	0	0	0	0	0	1	0		
23			2	13	0	0	0	0	0	0	0	0		
24			1	15	0	0	0	0	7	0	0	0		
25	-	-	0	8	0	0	0	0	1	0	1	0		
26	0	0	2	35	0	0	0	0	51	17	0	0		
27	0	0	1	21	13	1	0	0	25	3	4	0		
28	0	0	1	7	13	1	0	0	1	0	1	0		
29	0	0	0	12	3	0	0	0	0	0	0	0		
30	0	0	1	7	2	2	0	0	0	0	0	0		
31	0	0	-	-	5	0	0	0	-	-	2	1		
Totals	0	0	12	227	68	110	1	0	85	21	577	109	0	0

TABLE B-11. Atlantic salmon counts, Beechwood fish pass facilities, 1967. (1967 totals - 12 grilse and 31 older salmon.)

Day	N u m b e r s o f f i s h													
	May		Jun		Jul		Aug		Sep		Oct		Nov	
	G	S	G	S	G	S	G	S	G	S	G	S	G	S
1			-	-	0	0	0	0	0	0	0	0	0	0
2			0	0	0	0	0	0	0	0	0	0	0	0
3			0	0	0	0	0	0	0	0	0	0	0	0
4			0	0	0	0	0	0	0	0	0	0	0	0
5			0	0	0	0	0	0	0	0	0	0	0	1
6			0	0	0	0	0	0	0	0	0	0	1	1
7			0	0	0	0	0	0	0	0	0	0	0	1
8			0	0	0	0	0	0	0	0	0	0	0	2
9			0	0	0	0	0	0	0	0	0	0	0	1
10			0	0	0	0	0	0	0	0	0	0	3	1
11			0	0	0	0	0	0	0	0	0	0	0	0
12			0	0	0	0	0	0	1	4	0	0	0	0
13			0	0	0	0	0	0	2	2	0	0	0	0
14			0	0	0	1	0	0	1	0	0	0	0	0
15			0	0	0	0	0	0	0	0	0	0	0	0
16			0	0	0	3	0	0	1	0	0	0	0	0
17			0	0	0	0	0	0	0	5	0	0	0	0
18			0	0	0	0	0	0	0	4	0	0	0	0
19			0	0	0	0	0	0	0	3	0	0	0	0
20			0	0	0	0	0	0	1	2	0	0	0	0
21			0	0	0	0	0	0	0	0	0	0	-	-
22			0	0	0	0	0	0	0	0	0	0		
23			0	0	0	0	0	0	0	0	0	0		
24			0	0	0	0	0	0	0	0	0	0		
25			0	0	0	0	0	0	0	0	0	0		
26			0	0	0	0	0	0	0	0	0	0		
27			0	0	0	0	0	0	0	0	1	0		
28			0	0	0	0	0	0	0	0	1	0		
29			0	0	0	0	0	0	0	0	0	0		
30			0	0	0	0	0	0	0	0	0	0		
31			-	-	0	0	0	0	-	-	0	0		
Totals			0	0	0	4	0	0	6	20	2	0	4	7

TABLE B-12. Atlantic salmon counts, Beechwood fish pass facilities, 1968. (1968 totals - 39 grilse and 25 older salmon.)

Day	N u m b e r s o f f i s h													
	May		Jun		Jul		Aug		Sep		Oct		Nov	
	G	S	G	S	G	S	G	S	G	S	G	S	G	S
1			0	0	0	0	0	0	0	0	0	0	0	0
2			0	0	0	0	0	0	0	0	0	0	0	0
3			0	0	0	0	0	0	1	0	0	0	0	0
4			0	0	0	1	0	0	0	0	0	0	0	0
5			0	0	0	0	0	0	0	0	0	0	0	0
6			0	0	0	0	0	0	0	0	0	0	0	0
7			0	0	0	0	0	0	0	0	0	0	0	0
8			0	0	0	0	0	0	0	0	0	0	0	0
9			0	0	0	0	0	0	0	0	0	0	0	0
10			0	0	0	0	0	0	0	0	0	0	0	0
11			0	0	2	0	0	0	0	0	0	0	0	0
12			0	0	1	1	0	0	0	0	0	0	0	0
13			0	0	0	0	0	0	0	0	0	0	0	0
14	-	-	0	0	1	3	1	0	0	0	0	0	0	0
15	0	0	0	0	1	2	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	1	1	0	1	0	0	0	0	0	-	-
20	0	0	0	0	0	0	0	0	0	0	0	0		
21	0	0	0	0	0	0	0	0	0	0	0	0		
22	0	0	0	0	0	0	0	0	0	0	6	12		
23	0	0	0	0	0	0	1	0	0	0	13	5		
24	0	0	0	0	0	0	0	0	0	0	2	0		
25	0	0	0	0	0	0	0	0	0	0	2	0		
26	0	0	0	0	0	0	0	0	0	0	2	0		
27	0	0	0	0	0	0	0	0	0	0	3	0		
28	0	0	0	0	0	0	0	0	0	0	1	0		
29	0	0	0	0	0	0	0	0	0	0	0	0		
30	0	0	0	0	0	0	0	0	0	0	0	0		
31	0	0	-	-	0	0	0	0	-	-	0	0		
Totals	0	0	0	1	6	7	3	0	1	0	29	17	0	0

TABLE B-13. Atlantic salmon counts, Beechwood fish pass facilities, 1969. (1969 totals - 125 grilse and 55 older salmon.)

Day	N u m b e r s o f f i s h													
	May		Jun		Jul		Aug		Sep		Oct		Nov	
	G	S	G	S	G	S	G	S	G	S	G	S	G	S
1					0	0	0	0	0	0	3	0	1	0
2					0	0	0	0	0	0	4	0	0	0
3					0	1	0	0	0	0	0	0	0	0
4			-	-	1	0	0	0	0	0	0	2	2 <sup>1</sup>	0
5			0	0	0	0	0	0	0	0	2	1	-	-
6			0	0	0	0	0	0	0	0	18	6		
7			0	0	0	0	0	0	0	0	3	0		
8			0	0	1	1	0	0	0	0	1	0		
9			0	0	1	1	0	0	0	0	1	1		
10			0	0	0	0	0	0	0	0	10	4		
11			0	0	0	1	0	0	0	0	6	0		
12			0	0	0	0	0	0	0	0	5	0		
13			0	0	1	1	0	0	0	0	3	2		
14			0	0	0	1	0	0	0	0	1	1		
15			0	0	0	0	0	0	0	0	4	0		
16			0	0	0	0	0	0	0	0	1	0		
17			0	0	1	0	0	0	1	1	3	0		
18			0	0	0	0	0	0	3	1	2	0		
19			0	0	0	0	0	0	0	0	0	0		
20			0	1	0	1	0	0	1	1	2	0		
21			0	2	0	0	0	0	5	1	1	3		
22			0	0	0	0	0	0	2	1	0	2		
23			0	1	0	0	0	1	2	0	2	0		
24			0	0	0	0	0	0	3	0	0	1		
25			2	1	0	0	0	0	6	3	0	0		
26			0	0	0	0	2	0	6	3	0	0		
27			0	0	0	0	1	0	3	1	0	0		
28			0	0	0	0	0	0	2	1	0	0		
29			0	0	0	0	0	1	0	0	0	1		
30			0	2	0	0	0	0	6	2	0	0		
31			-	-	0	0	0	0	-	-	0	0		
Totals			2	7	5	7	3	2	40	15	72	24	3	0

<sup>1</sup>Dipped from water supply pool after facilities were drained for winter.



TABLE B-14. Atlantic salmon counts, Beechwood fish pass facilities, 1970. (1970 totals - 166 grilse and 30 older salmon.)

Day	N u m b e r s o f f i s h													
	May		Jun		Jul		Aug		Sep		Oct		Nov	
	G	S	G	S	G	S	G	S	G	S	G	S	G	S
1			-	-	0	0	0	0	0	0	8	2	0	0
2			0	0	1	0	0	0	3	0	10	1	0	0
3			0	0	0	0	0	0	0	0	3	0	0	0
4			0	0	0	0	0	0	2	0	2	1	1	0
5			0	0	3	0	0	0	1	0	0	0	0	0
6			0	0	0	0	0	0	0	0	0	0	0	0
7			0	0	0	0	0	0	0	0	0	0	0	0
8			0	0	0	0	0	0	0	0	0	0	0	0
9			0	0	0	0	0	0	0	0	0	1	0	0
10			0	0	0	0	0	0	3	0	1	0	0	0
11			0	0	0	0	0	0	1	0	0	0	0	0
12			0	0	1	0	0	0	3	0	2	1	0	0
13			0	0	0	0	0	0	5	0	7	4	-	-
14			0	0	0	0	0	0	12	0	0	0		
15			0	0	0	0	0	0	2	0	6	3		
16			0	0	0	0	0	0	3	0	2	1		
17			0	0	0	0	0	0	7	0	1	0		
18			0	0	0	0	0	0	2	0	0	0		
19			0	0	0	0	0	0	3	0	3	2		
20			0	0	0	0	0	0	2	0	0	0		
21			0	0	0	0	0	0	6	4	1	0		
22			0	0	0	0	0	0	3	0	0	0		
23			0	0	0	0	0	0	10	1	0	0		
24			0	0	2	0	0	0	6	5	0	0		
25			1	0	0	0	0	0	4	1	0	0		
26			0	0	0	0	0	0	1	0	0	0		
27			0	0	1	0	0	0	1	0	0	0		
28			1	1	0	0	0	0	3	0	0	0		
29			0	0	1	0	0	0	12	1	0	0		
30			0	0	0	0	0	0	13	1	0	0		
31			-	-	0	0	0	0	-	-	0	0		
Totals			2	1	9	0	0	0	108	13	46	16	1	0

TABLE B-15. Atlantic salmon counts, Beechwood fish pass facilities, 1971. (1971 totals - 338 grilse and 116 older salmon.)

Day	N u m b e r s o f f i s h													
	May		Jun		Jul		Aug		Sep		Oct		Nov	
	G	S	G	S	G	S	G	S	G	S	G	S	G	S
1			0	0	0	0	1	0	0	0	6	5	2	0
2			0	0	0	0	5	0	0	0	5	1	0	0
3			0	0	0	0	1	0	0	0	7	3	0	0
4			0	0	0	0	1	0	1	1	10	3	1	0
5			0	0	0	0	1	0	5	0	2	1	0	0
6			0	0	0	0	1	0	7	5	1	3	0	0
7			0	0	0	0	0	0	3	2	3	2	0	1
8			0	0	0	0	0	0	4	0	2	1	0	0
9			0	0	0	0	0	0	3	2	2	5	-	-
10			0	0	0	0	0	0	4	3	5	2		
11			0	0	0	0	0	0	5	1	5	1		
12			0	0	0	1	2	0	2	1	2	1		
13			0	0	0	0	0	0	8	2	1	1		
14			0	0	0	1	0	0	3	0	0	0		
15			0	1	0	0	1	0	13	0	2	0		
16			0	0	0	0	0	0	6	2	0	0		
17			0	0	0	0	0	0	8	2	8	0		
18			0	0	0	0	0	0	6	2	2	0		
19			0	0	0	0	1	0	13	3	2	0		
20			0	0	0	0	0	0	16	4	2	1		
21			0	0	0	0	0	0	7	2	8	3		
22			0	0	0	0	4	1	20	3	2	0		
23			0	0	0	0	4	1	15	4	2	0		
24			0	0	0	0	0	0	9	4	4	3		
25			0	1	1	0	0	0	9	3	2	0		
26			0	0	2	0	0	0	19	8	0	0		
27			0	0	1	0	0	0	15	8	0	1		
28			0	0	0	0	0	0	0	0	0	0		
29			0	0	0	0	0	0	13	1	0	2		
30			0	0	2	0	2	0	1	4	1	3		
31	-	-	-	-	1	0	0	0	-	-	3	0		
Totals	-	-	0	2	7	2	24	2	215	67	89	42	3	1

## APPENDIX C

SEMI-MONTHLY TOTALS OF SPECIES OTHER THAN  
ATLANTIC SALMON ASCENDING BEECHWOOD FISH  
PASS FACILITIES, 1957-71

Timings of the runs of species other than Atlantic salmon are shown in the following tables. During some peak-run periods, total numbers of fish in the lift were too great to be counted without danger of heavy mortalities. At such times, estimates were usually made for the more important or more abundant species. Totals in italics indicate those composed partially of estimated sub-totals. In many instances, little effort was expended in counting or accurately estimating the numbers of other species of lesser importance. Totals shown for these are therefore often considered incomplete and are followed by a "+".

A zero in the tables indicates that none of a particular species was observed. A dash simply means that no count or estimate was recorded, although the species may have been present.

TABLE C-1. Counts of species other than Atlantic salmon, Beechwood fish pass facilities, 1957.

Species	Jun 14-15	Jun 16-30	Jul 1-15	Jul 16-31	Aug 1-15	Aug 16-31	Sep 1-15	Sep 16-30	Oct 1-15	Oct 16-31	Nov 1-15	Nov 16-30	Totals
Landlocked salmon	0	1	0	1	0	0	0	0	0	0	0	0	2
Brook trout	-	19+	21	0	1	0	15	11	17	3	1	0	88+
Rainbow trout	0	0	0	0	0	0	3	0	1	0	1	0	5
Lamprey	-	1,535+	151	21	0	0	0	0	0	0	0	0	1,707+
Gaspereau	0	0	0	0	0	0	0	0	0	0	0	0	0
Shad	0	0	0	0	0	0	0	0	0	0	0	0	0
Yellow perch	0	1	3	0	4	0	1	0	0	0	0	0	9
White perch	0	0	0	4	1	0	5	0	0	0	0	0	10
Chain pickerel	0	1	0	0	2	1	0	0	0	0	0	0	4
Sunfish	0	-	0	0	0	0	0	0	0	0	0	0	-
Striped bass	0	0	1	0	0	0	0	0	0	0	0	0	1
Suckers	-	90+	70+	267+	66+	-	85+	195	38	9	19	3	842+
Minnows, Stickle- backs, Killi- fishes, etc.	-	-	-	-	-	-	-	85	9	3	-	1	98+
Burbot	0	0	0	0	0	0	0	0	0	0	0	0	0
Smelt	0	0	0	0	0	0	0	0	0	0	0	0	0
Catfish	0	0	0	0	0	0	0	0	0	0	0	0	0
Whitefish	0	0	0	0	0	0	0	0	0	0	0	0	0

TABLE C-2. Counts of species other than Atlantic salmon, Beechwood fish pass facilities, 1958.

Species	Jun 1-15	Jun 16-30	Jul 1-15	Jul 16-31	Aug 1-15	Aug 16-31	Sep 1-15	Sep 16-30	Oct 1-15	Oct 16-31	Nov 1-15	Nov 16-21	Totals
Landlocked salmon	1	0	0	0	0	0	0	0	0	1	0	0	2
Brook trout	138	423	249	28	1	2	21	33	26	7	0	1	929
Rainbow trout	0	0	0	1	0	0	0	1	1	0	1	0	4
Lamprey	62	856	1,973	219	7	0	0	0	0	0	0	0	3,117
Gaspereau	33	7	7	0	0	0	0	0	0	0	0	0	47
Shad	0	4	31	13	7	0	0	0	0	0	0	0	55
Yellow perch	2	11	8	0	1	0	0	0	0	0	0	0	22
White perch	1	9	25	52	16	10	40	21	6	0	0	0	180
Chain pickerel	1	0	0	1	0	1	2	2	3	4	0	0	14
Sunfish	0	2	2	2	0	0	1	0	0	0	0	0	7
Striped bass	0	3	8	6	5	1	1	0	0	0	0	0	24
Suckers	3,350	1,920+	230	5	0	0	6	199	201	18	0	0	5,929
Minnows, Stickle- backs, Killi- fishes, etc.	23	51	40	23	4	6	10	18	32	0	0	0	207
Burbot	0	1	0	0	0	0	0	0	0	0	0	0	1
Smelt	0	0	0	0	0	0	0	0	0	0	3	0	3
Catfish	0	0	2	0	0	0	0	0	0	0	0	0	2
Whitefish	0	0	0	0	0	0	0	0	0	1	0	0	1

TABLE C-3. Counts of species other than Atlantic salmon, Beechwood fish pass facilities, 1959.

Species	May 20-31	Jun 1-15	Jun 16-30	Jul 1-15	Jul 16-31	Aug 1-15	Aug 16-31	Sep 1-15	Sep 16-30	Oct 1-15	Oct 16-31	Nov 1-15	Nov 16-23	Totals
Landlocked salmon	0	1	1	2	2	0	0	0	0	0	0	0	0	6
Brook trout	199	559	486	189	9	0	5	11	11	6	2	1	0	1,478
Rainbow trout	5	1	0	0	0	0	5	10	3	0	1	1	0	26
Lamprey	595	1,946	1,234	572	10	0	0	0	0	0	0	0	0	4,357
Gaspereau	63	34	23	24	1	0	0	0	0	0	0	0	0	145
Shad	1	10	4	1,128	5	1	1	3	0	0	2	0	0	1,155
Yellow perch	2	16	13	18	11	0	0	17	2	0	0	0	0	79
White perch	0	6	7	18	8	9	7	18	5	1	0	0	0	79
Chain pickerel	0	6	3	3	1	0	0	0	1	0	0	0	0	14
Sunfish	0	2	4	17	11	3	0	2	0	0	0	0	0	39
Striped bass	0	0	1	6	0	0	0	0	0	0	0	0	0	7
Suckers	16,930	4,431	359	92	0	1	44	119	457	752	180	3	1	23,369
Minnows, Stickle- backs, Killi- fishes, etc.	1,363	326	28	36	76	3	2	302	238	391	108	1	0	2,874+
Burbot	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Smelt	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Catfish	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Whitefish	2	0	0	0	0	0	0	0	0	0	0	0	0	2

TABLE C-4. Counts of species other than Atlantic salmon, Beechwood fish pass facilities, 1960.

Species	May 27-31	Jun 1-15	Jun 16-30	Jul 1-15	Jul 16-31	Aug 1-15	Aug 16-31	Sep 1-15	Sep 16-30	Oct 1-15	Oct 16-31	Nov 1-15	Nov 16-22	Totals
Landlocked salmon	0	3	10	8	3	1	0	0	0	0	2	0	1	28
Brook trout	14	199	73	5	1	1	1	0	4	2	4	1	0	305
Rainbow trout	0	9	1	0	0	0	0	0	0	0	0	0	2	12
Lamprey	44	850	580	14	0	0	1	0	0	0	0	0	0	1,489
Gaspereau	315	2,409	176	44	0	1	1	0	0	0	0	0	0	2,946
Shad	0	616	809	49	7	2	4	1	0	0	2	0	0	1,490
Yellow perch	0	40	68	16	0	0	0	3	11	12	1	0	0	151
White perch	0	15	17	7	2	9	4	14	30	10	0	0	0	108
Chain pickerel	0	3	4	3	4	2	1	1	1	2	0	0	0	21
Sunfish	0	17	28	14	11	5	7	0	40	8	0	0	0	130
Striped bass	0	7	2	0	0	0	0	0	0	0	0	0	0	9
Suckers	5,400	9,135	685	20	1	0	0	0	61	474	290	23	0	16,089
Minnows, Stickle- backs, Killi- fishes, etc.	21	323	169	24	10	13	-	-	18	51	12	1	0	642+
Burbot	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Smelt	0	2	0	0	0	0	0	0	0	0	0	0	0	2
Catfish	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Whitefish	0	0	0	0	0	0	0	0	0	0	1	2	0	3

TABLE C-5. Counts of species other than Atlantic salmon, Beechwood fish pass facilities, 1961.

Species	Jun 12-15	Jun 16-30	Jul 1-15	Jul 16-31	Aug 1-15	Aug 16-31	Sep 1-15	Sep 16-30	Oct 1-15	Oct 16-31	Nov 1-15	Nov 16-21	Totals
Landlocked salmon	1	8	49	10	3	0	0	1	1	0	1	0	74
Brook trout	14	250	45	10	0	0	1	1	4	1	1	0	327
Rainbow trout	1	4	1	0	0	0	0	0	1	0	0	0	7
Lamprey	0	229	150	7	0	0	0	0	0	0	0	0	386
Gaspereau	61	865	15	0	0	0	0	0	0	0	0	0	941
Shad	0	189	60	1	0	0	0	1	0	0	0	0	251
Yellow perch	1	91	42	5	2	2	1	0	1	0	0	0	145
White perch	5	15	13	44	116	3	98	31	3	0	0	0	328
Chain pickerel	0	3	13	2	5	0	1	0	0	0	0	0	24
Sunfish	0	7	58	34	14	2	2	1	0	0	0	0	118
Striped bass	0	6	18	7	11	4	2	2	0	0	0	0	50
Suckers	1,090	6,015	243	7	1	2	6	72	109	24	0	0	7,569
Minnnows, Stickle- backs, Killi- fish, etc.	10	60	107	9	1	-	-	-	-	-	-	0	187
Burbot	0	0	0	0	0	0	0	0	0	0	0	0	0
Smelt	0	0	0	0	0	0	0	0	0	0	0	0	0
Catfish	0	0	0	2	3	0	0	0	0	0	0	0	5
Whitefish	0	0	0	0	0	0	0	0	1	1	1	0	3

TABLE C-6. Counts of species other than Atlantic salmon, Beechwood fish pass facilities, 1962.

Species	Jun 2-15	Jun 16-30	Jul 1-15	Jul 16-31	Aug 1-15	Aug 16-31	Sep 1-15	Sep 16-30	Oct 1-15	Oct 16-31	Nov 1-12	Totals
Landlocked salmon	10	18	19	1	0	0	0	0	1	0	0	49
Brook trout	246	270	24	1	0	1	2	5	10	2	0	561
Rainbow trout	1	0	0	0	0	0	0	0	0	0	0	1
Lamprey	1,284	2,643	512	27	3	4	0	0	0	0	0	4,473
Gaspereau	85	21	1	0	0	0	0	0	0	0	0	107
Shad	0	208	0	0	0	1	0	0	0	0	0	209
Yellow perch	21	75	4	0	1	0	0	0	0	0	0	101
White perch	0	24	6	1	1	1	3	0	0	0	0	36
Chain pickerel	8	11	3	0	0	0	1	0	5	0	0	28
Sunfish	2	16	32	0	2	0	13	3	0	0	0	68
Striped bass	0	0	1	3	0	0	0	0	0	0	0	4
Suckers	4,050	1,215	18	3	0	0	3	1	91	87	0	5,468
Minnnows, Stickle- backs, Killi- fish, etc.	3	6	-	-	-	-	6	-	18	-	-	33+
Burbot	0	0	0	0	0	0	0	0	0	0	0	0
Smelt	1	0	0	0	0	0	0	0	0	0	0	1
Catfish	0	1	0	0	0	0	0	0	0	0	0	1
Whitefish	1	0	0	0	0	0	0	0	2	8	0	11

TABLE C-7. Counts of species other than Atlantic salmon, Beechwood fish pass facilities, 1963.

Species	May 30-31	Jun 1-15	Jun 16-30	Jul 1-15	Jul 16-31	Aug 1-15	Aug 16-31	Sep 1-15	Sep 16-30	Oct 1-15	Oct 16-31	Nov 1-15	Nov 16-19	Totals
Landlocked salmon	0	3	4	21	1	0	1	0	0	0	10	0	0	40
Brook trout	1	203	191	26	0	0	2	0	4	0	8	1	0	436
Rainbow trout	1	5	0	0	0	0	0	0	1	0	4	0	0	11
Lamprey	2	82	262	93	6	0	0	0	0	0	0	0	0	445
Gaspereau	38	2,576	39	1	0	0	4	0	0	0	0	0	0	2,658
Shad	0	11	19	12	1	0	0	0	0	0	0	0	0	43
Yellow perch	0	101	427	6	0	0	6	3	2	0	0	0	0	545
White perch	0	5	37	38	10	5	1	0	0	0	0	0	0	96
Chain pickerel	0	0	3	1	1	3	3	0	2	1	1	0	0	15
Sunfish	0	0	57	7	8	3	1	0	0	0	0	0	0	76
Striped bass	0	0	0	17	5	2	1	0	0	0	0	0	0	25
Suckers	88	2,600	923	24	18	4	31	32	26	21	192	3	0	3,962
Minnows, Stickle- backs, Killi- fishes, etc.	0	52	128	1	7	0	1	0	30	1	0	0	0	220+
Burbot	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Smelt	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Catfish	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Whitefish	0	2	0	0	0	0	0	0	0	1	1	0	0	4

TABLE C-8. Counts of species other than Atlantic salmon, Beechwood fish pass facilities, 1964.

Species	May 21-31	Jun 1-15	Jun 16-30	Jul 1-15	Jul 16-31	Aug 1-15	Aug 16-31	Sep 1-15	Sep 16-30	Oct 1-15	Oct 16-31	Nov 1-15	Nov 16-25	Totals
Landlocked salmon	0	1	4	58	21	2	0	0	2	5	0	1	0	94
Brook trout	15	282	315	68	0	0	1	4	24	12	1	1	0	723
Rainbow trout	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Lamprey	1	291	5,502	1,496	14	0	0	0	0	0	0	0	0	7,300
Gaspereau	47	8,892	2,923	90	75	0	0	0	1	0	0	0	0	12,028
Shad	0	36	47	18	0	2	0	0	0	0	0	0	0	103
Yellow perch	0	76	108	76	21	1	5	2	14	1	0	0	0	304
White perch	0	1	50	77	28	12	13	44	20	1	3	0	0	249
Chain pickerel	0	7	9	3	4	1	1	0	3	0	0	0	0	28
Sunfish	0	1	8	8	35	1	0	4	4	0	0	0	0	61
Striped bass	0	0	3	3	8	3	0	0	0	0	0	0	0	17
Suckers	429	9,752	1,608	38	3	1	5	12	109	220	77	1	0	12,255
Minnows, Stickle- backs, Killi- fishes, etc.	2	70	20	6	0	2	0	1	25	4	3	0	0	133+
Burbot	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Smelt	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Catfish	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Whitefish	0	1	2	0	0	0	0	1	7	6	0	0	0	17









TABLE C-15. Counts of species other than Atlantic salmon, Beechwood fish pass facilities, 1971.

Species	Jun 1-15	Jun 16-30	Jul 1-15	Jul 16-31	Aug 1-15	Aug 16-31	Sep 1-15	Sep 16-30	Oct 1-15	Oct 16-31	Nov 1-8	Totals
Landlocked salmon	3	8	3	2	1	1	2	4	3	2	0	29
Brook trout	106	55	1	2	0	5	6	13	6	0	0	194
Rainbow trout	2	2	0	1	0	1	2	1	1	0	0	10
Lamprey	0	0	0	0	0	0	0	0	0	0	0	0
Gaspereau	25,827	29,662	4,553	137	0	0	0	0	0	0	0	60,179
Shad	2	14	0	0	0	0	0	0	0	0	0	16
Yellow perch	21,985	12,836	1,199	443	388	200	781	346	31	9	2	38,220
White perch	52	77	66	153	32	20	26	0	0	0	0	426
Chain pickerel	56	22	0	1	1	0	0	0	0	1	0	81
Sunfish	68	162	20	27	22	6	15	2	2	0	0	324
Striped bass	2	1	0	0	0	0	0	0	0	0	0	3
Suckers	24,006	11,360	30	6	9	19	9	14	38	73	17	35,581
Minnows, Stickle- backs, Killi- fishes, etc.	6	160	190	133	797	731	227	84	26	9	2	2,635+
Burbot	0	1	1	0	0	0	0	0	0	0	0	2
Smelt	0	0	0	0	0	0	0	0	0	0	0	0
Catfish	0	1	4	0	0	0	0	0	0	0	0	5
Whitefish	0	0	0	0	0	1	2	0	0	0	0	3



## APPENDIX D

DAILY COUNTS OF GRILSE AND OLDER SALMON ASCENDING  
MACTAQUAC FISH COLLECTION FACILITIES, 1967-71

In 1967, all Atlantic salmon taken in the Mactaquac area were captured in trapnets, operating in the tailrace of the dam. For the years 1968-71 inclusive, most of the fish listed in the following tables were taken in the permanent collection facilities at the dam. Two exceptions, in 1968 and in 1971, are detailed in footnotes to the respective tables.

These daily counts show approximately the timing, intensity and composition of Atlantic salmon runs reaching Mactaquac Dam. These counts, as well as differentiation between grilse and older salmon, were usually conducted at the collection site or when unloading, after transportation to hatchery holding ponds. Since close observation of the fish was usually impossible at this stage, inaccuracies occasionally occurred. Later, during selection of broodstock fish, closer examination was possible and discrepancies were corrected in both total counts and grilse:salmon ratios. Corrected totals are shown on each annual-summary sheet.

TABLE D-1. Atlantic salmon counts, Mactaquac fish collection facilities, 1967. (1967 totals: from figures below - 1,181 grilse and 1,271 older salmon. Corrected totals - 1,181 grilse, 1,271 older salmon, plus 2 of undetermined sea age.)

Day	N u m b e r s o f f i s h													
	May		Jun		Jul <sup>1</sup>		Aug		Sep		Oct		Nov	
	G	S	G	S	G	S	G	S	G	S	G	S	G	S
1					0	0	14	3	14	8	0	0	6	1
2					0	0	16	7	0	0	0	0	4	12
3					0	0	19	7	0	0	0	0	12	8
4					0	0	4	1	0	0	5	3	6	16
5					12	32	0	0	0	0	6	9	9	32
6					11	21	0	0	0	0	13	12	5	7
7					12	34	26	14	0	0	0	0	37	25
8			-	-	0	0	16	6	0	0	0	0	41	45
9			0	5	0	0	7	4	0	0	0	0	15	10
10			0	0	13	24	15	2	0	0	0	0	7	23
11			0	10	9	21	1	4	0	0	11	5	7	7
12			0	0	3	6	0	0	0	0	6	4		
13			0	0	7	21	0	0	0	0	9	5	10	17
14			1	12	6	19	14	5	58	45	2	2	3	5
15			0	0	0	0	25	15	65	23	4	3	1	13
16			0	16	0	0	17	11	0	0	4	2	2	3
17			1	7	24	23	17	8	0	0	2	3	3	4
18			0	5	29	30	9	2	12	23	11	5	0	1
19			1	15	24	50	0	0	24	22	2	5	-	-
20			2	14	16	19	0	0	12	10	17	8		
21			1	9	9	14	12	1	18	20	9	9		
22			0	30	0	0	12	5	16	9	0	0		
23			4	12	0	0	19	8	0	0	7	10		
24			0	0	15	10	14	4	0	0	13	9		
25			0	0	11	7	7	2	31	32	7	13		
26			0	0	7	10	0	0	0	0	22	26		
27			3	18	13	18	0	0	0	0	9	9		
28			5	12	12	10	4	0	0	0	0	0		
29			2	10	13	8	2	0	0	0	0	0		
30			4	7	12	11	22	8	0	0	0	0		
31			-	-	17	17	8	4	-	-	5	0		
Totals			24	182	275	405	300	121	250	192	164	142	168	229

<sup>1</sup>In addition to numbers listed, one fish of undetermined sea age was taken on 18 Jul and one on 26 Jul.

TABLE D-2. Atlantic salmon counts, Mactaquac fish collection facilities, 1968. (1968 totals: from figures below - 1,202 grilse and 752 older salmon. Corrected totals - 1,265 grilse and 740 older salmon from Mactaquac Dam permanent collection facilities, plus 19 older salmon taken by trapnet below the dam, i.e., 1,265 grilse and 759 older salmon.)

Day	N u m b e r s o f f i s h													
	May		Jun		Jul		Aug		Sep		Oct		Nov	
	G	S	G	S	G	S	G	S	G	S	G	S	G	S
1			0	0	0	14	53	3	2	2	1	2	0	3
2			0	1	6	9	24	2	2	6	4	4	0	1
3			0	0	12	27	69	7	0	0	1	1	0	1
4			0	1	13	39	25	3	0	0	2	5	0	2
5			0	0	11	20	11	1	0	1	1	3	0	1
6			0	1	5	19	26	6	4	3	1	2	0	1
7			0	0	2	8	13	4	4	7	2	3	0	1
8			0	0	12	24	18	1	2	1	3	5	-	-
9			0	5	-	-	12	1	1	0	9	4		
10			0	0	33	15	10	4	0	1	6	7		
11			0	5	13	6	5	3	0	0	16	16		
12			0	11	3	2	0	0	0	1	5	1		
13			0	0	21	10	4	1	0	0	2	6		
14			0	8	25	10	5	0	0	2	6	12		
15			0	4	26	14	3	1	0	0	11	8		
16			1	9	24	8	5	4	0	0	7	9		
17			0	3	14	4	0	1	0	0	6	13		
18			0	14	33	3	3	0	0	0	3	5		
19			0	19	27	3	4	1	2	0	2	6		
20			-	-	20	6	5	0	0	0	2	3		
21	-	-	-	-	41	7	2	3	0	0	17	11		
22	0	0	0	1	22	2	3	3	0	0	8	12		
23	0	0	2	15	5	0	5	2	0	0	6	15		
24	0	1	0	2	45	3	9	5	1	1	8	7		
25	0	1	-	-	35	3	2	4	0	0	1	3		
26	0	1	4	25	54	9	3	1	2	1	2	2		
27	0	0	0	4	51	2	2	8	1	1	1	2		
28	0	0	0	3	21	1	0	3	3	1	7	16		
29	0	2	0	8	41	1	1	1	0	0	2	5		
30	0	1	3	25	49	3	-	-	0	0	0	1		
31	0	0	-	-	36	5	0	2	-	-	4	3		
Totals	0	6	10	164	700	277	322	75	24	28	146	192	0	10

TABLE D-3. Atlantic salmon counts, Mactaquac fish collection facilities, 1969. (1969 totals: from figures below - 2,540 grilse and 1,781 older salmon. Corrected totals - 2,569 grilse, 1,750 older salmon and 2 of undetermined sea age.)

Day	N u m b e r s o f f i s h													
	May		Jun		Jul		Aug		Sep		Oct		Nov	
	G	S	G	S	G	S	G	S	G	S	G	S	G	S
1			0	0	- <sup>1</sup>	- <sup>1</sup>	17	9	6	3	8	7	0	0
2			0	0			35	10	1	1	20	5	0	0
3			0	1			22	8	1	0	5	4	0	0
4			0	1			16	6	1	1	23	13	0	0
5			0	0			4	0	2	1	3	6	0	0
6			0	2			8	3	2	3	3	3	0	0
7			0	0			7	2	1	2	5	3	0	0
8			0	1			12	4	0	1	3	5	0	0
9			0	1			7	2	1	0	10	4	0	0
10			0	1			15	7	1	0	8	7	0	0
11			0	0			6	4	2	0	2	5	0	0
12			0	2			4	2	3	4	4	4	0	0
13			0	4			-	-	2	1	1	13	0	0
14			0	2			10	1	13	10	6	10	0	0
15	-	-	0	2			4	2	29	24	1	3	0	0
16	0	0	0	0	57	15	7	1	19	8	1	1	0	0
17	0	0	0	0	55	37	2	0	23	15	1	2	0	0
18	0	0	0	0	44	18	2	2	58	34	1	1	0	0
19	0	0	0	2	115	23	2	0	30	21	2	2	0	0
20	0	0	0	13	100	30	3	0	33	11	2	2	0	0
21	0	1	0	12	49	27	0	1	28	8	4	3	0	0
22	0	0	0	5	79	27	1	2	53	24	0	0	0	0
23	0	0	1	9	27	9	3	3	23	8	2	1	0	0
24	0	0	0	5	30	5	8	6	21	11	1	1	0	0
25	0	0	3	18	11	8	1	0	26	8	1	1	0	0
26	0	0	7	21	12	0	7	5	16	4	0	1	-	-
27	0	0	0	17	46	4	9	2	16	10	0	1		
28	0	0	13	42	-	-	3	2	12	6	0	1		
29	0	0	76	333	14	4	11	2	19	8	0	4		
30	0	0	14	54	11	10	2	4	8	8	0	0		
31	0	0	-	-	43	8	14	9	-	-	1	1		
Totals	0	1	114	548	1,616	784	242	99	450	235	118	114	0	0

<sup>1</sup>Daily breakdown not available for 923 grilse and 559 salmon, taken during 1-15 Jul.



TABLE D-4. Atlantic salmon counts, Mactaquac fish collection facilities, 1970. (1970 totals: from figures below - 2,952 grilse and 2,465 older salmon. Corrected totals - 2,968 grilse and 2,449 older salmon.)

Day	N u m b e r s o f f i s h													
	May		Jun		Jul		Aug		Sep		Oct		Nov	
	G	S	G	S	G	S	G	S	G	S	G	S	G	S
1			0	0	61	109	17	5	1	2	8	1	0	0
2			0	0	96	103	15	5	3	2	2	0	0	0
3			0	1	44	48	32	9	2	5	6	3	1	1
4			0	1	24	39	10	1	2	14	16	10	0	1
5			0	0	135	274	25	2	0	3	7	4	0	0
6			0	0	72	94	14	2	4	5	2	2	0	0
7			0	0	15	22	5	6	3	11	5	3	0	0
8			0	1	86	47	6	2	11	25	3	12	0	2
9			0	0	69	45	13	1	21	41	11	6	0	0
10			0	4	92	62	6	2	37	42	23	24	0	0
11			0	2	15	8	5	3	33	47	17	14	0	0
12			0	3	22	15	1	1	41	25	20	15	0	0
13			0	2	40	16	6	0	24	21	18	9	0	0
14			0	2	154	72	5	3	28	29	8	4	0	0
15			0	4	65	47	4	1	19	7	7	4	0	0
16			0	2	52	45	2	1	26	21	5	2	0	0
17			1	5	62	41	1	1	29	10	1	2	0	0
18			0	1	38	18	2	1	31	16	4	2	0	0
19	-	-	0	1	82	12	3	2	7	9	2	2	-	-
20	0	0	1	21	89	24	1	0	16	8	8	3		
21	0	0	3	8	81	32	1	2	14	5	1	2		
22	0	0	6	28	113	60	4	0	8	5	2	0		
23	0	0	28	76	110	55	0	1	9	6	2	3		
24	0	0	6	7	82	32	2	0	14	3	0	2		
25	0	0	10	27	67	43	1	0	3	5	1	7		
26	0	0	21	39	104	41	1	1	4	1	3	0		
27	0	0	8	12	53	17	4	2	12	5	1	2		
28	0	0	27	37	36	19	1	6	2	0	1	2		
29	0	3	37	66	15	8	2	5	6	1	1	0		
30	0	2	19	64	12	4	0	6	8	1	1	1		
31	0	1	-	-	3	1	1	1	-	-	1	0		
Totals	0	6	167	414	1,989	1,453	190	72	418	375	187	141	1	4

TABLE D-5. Atlantic salmon counts, Mactaquac fish collection facilities, 1971. (1971 totals: from figures below - 1,897 grilse and 2,303 older salmon. Corrected totals - 1,928 grilse and 2,272 older salmon.)

Day	N u m b e r s o f f i s h <sup>1</sup>													
	May		Jun		Jul		Aug		Sep		Oct		Nov	
	G	S	G	S	G	S	G	S	G	S	G	S	G	S
1			0	6	1	23	35	10	6	3	13	2	0	0
2			0	8	6	55	33	3	5	3	9	2	1	0
3			0	4	13	128	8	1	20	23	3	1	0	0
4			0	1	6	20	20	0	20	22	14	4	1	1
5			0	1	4	13	16	3	23	29	10	2	0	0
6			0	0	3	21	15	1	19	16	14	5	0	0
7			0	0	2	1	18	1	12	5	8	2	0	1
8			0	0	4	5	16	2	33	11	2	1	0	0
9			0	4	16	8	13	2	26	19	12	2	0	0
10			0	11	29	20	18	1	37	20	15	9	0	0
11			0	6	105	121	4	1	43	23	20	4	0	0
12			0	30	33	42	5	0	9	11	8	2	0	0
13			1	9	101	51	7	1	25	20	2	2	0	0
14			0	8	29	32	0	0	9	6	-	-	0	0
15			0	3	16	7	2	2	9	5	-	-	0	0
16			0	4	23	10	9	9	15	10	8	0	-	-
17			0	16	50	26	7	4	16	13	8	8		
18			0	20	118	44	-	-	15	11	9	3		
19			0	68	31	16	2	-	24	8	2	1		
20			2	123	6	1	11	2	13	6	9	4		
21			0	21	11	7	9	4	15	5	4	2		
22	-	-	0	22	11	5	5	2	14	3	2	2		
23	0	1	1	26	16	3	2	0	14	8	1	2		
24	0	1	0	28	30	7	6	7	15	3	6	4		
25	0	0	1	21	56	12	7	2	12	5	7	8		
26	0	2	3	250	57	12	1	3	13	4	3	2		
27	0	1	1	126	48	10	0	0	6	4	2	2		
28	0	2	0	85	25	5	8	0	11	9	3	2		
29	0	7	2	121	31	13	0	4	7	3	2	1		
30	0	1	0	60	19	2	1	2	12	3	0	0		
31	0	17	-	-	7	8	2	2	-	-	3	0		
Totals	0	32	11	1,082	907	728	280	69	498	311	199	79	2	2

<sup>1</sup>The 1971 figures include 132 grilse and 4 older salmon taken throughout the season from the Mactaquac Hatchery smolt-release channel.

## APPENDIX E

CAPTURE AND DISTRIBUTION SUMMARY OF GRILSE AND OLDER SALMON  
 TAKEN AT MACTAQUAC, 1967-71  
 (G-grilse, S-older salmon, U-undetermined sea age, T-totals)

	Numbers of fish																	
	1967				1968				1969				1970			1971		
	G	S	U	T	G	S	T	G	S	U	T	G	S	T	G	S	T	
<b>FISH CAPTURE</b>																		
Totals	1,181	1,271	2	2,454	1,265	759	2,024	2,569	1,750	2	4,321	2,968	2,449	5,417	2,060	2,276	4,336	
Mactaquac fish collection facilities	0	0	0	0	1,265	740	2,005	2,569	1,750	2	4,321	2,968	2,449	5,417	1,928	2,272	4,200	
Tailrace trapnets	1,181	1,271	2	2,454	0	19	19	0	0	0	0	0	0	0	0	0	0	
Hatchery smolt-release channel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	132	4	136	
<b>FISH DISTRIBUTION</b>																		
<u>Broodstock collection</u>																		
Spring run - Collected	6	118	0	124	21	190	211	53	448	0	501	23	354	377	8	323	331	
- Tobique transfers <sup>1</sup>	0	0	0	0	0	0	0	11	165	10	186	0	0	0	0	0	0	
- Retained	6	118	0	124	21	190	211	42	283	-10	315	23	354	377	8	323	331	
Summer run - Collected	301	337	0	638	239	359	598	166	553	0	719	62	450	512	132	209	341	
- Tobique transfers <sup>1</sup>	0	0	0	0	0	0	0	15	6	0	21	0	0	0	0	0	0	
- Mortalities	0	0	0	0	0	0	0	11	23	0	34	0	0	0	0	0	0	
- Retained	301	337	0	638	239	359	598	140	524	0	664	62	450	512	132	209	341	
Fall run - Collected	121	190	0	311	12	68	80	23	105	2	130	23	95	118	93	88	181	
- Mortalities	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	
- Retained	121	190	0	311	12	68	80	23	105	0	128	23	95	118	93	88	181	
Totals - Collected	428	645	0	1,073	272	617	889	242	1,106	2	1,350	108	899	1,007	233	620	853	
- Tobique transfers	0	0	0	0	0	0	0	26	171	10	207	0	0	0	0	0	0	
- Mortalities	0	0	0	0	0	0	0	11	23	2	36	0	0	0	0	0	0	
- Retained	428	645	0	1,073	272	617	889	205	912	-10	1,107	108	899	1,007	233	620	853	
<u>Fish releases</u>																		
Tobique River system	413	199	0	612	344	62	406	1,844	677	10	2,531	2,061	1,184	3,245	802	1,317	2,119	
Saint John River																		
· 2 mi (3.2 km) below Perth	0	0	0	0	2	12	14	0	0	0	0	0	0	0	0	0	0	
· Woodstock-Hartland area	296	319	0	615	619	62	681	441	97	0	538	759	346	1,105	961	315	1,276	
· Mactaquac headpond	0	0	0	0	14	1	15	0	0	0	0	2	0	2	2	1	3	
· below Mactaquac Dam	38	92	2	132	0	0	0	0	0	0	0	18	14	32	34	2	36	
· Reduxnekeag River	0	0	0	0	0	0	0	56	19	0	75	0	0	0	0	0	0	
Mortalities & experimental	6	16	0	22	14	5	19	12	22	0	34 <sup>2</sup>	20	6	26	28	21	49	

<sup>1</sup>Included in Tobique River system releases, below.<sup>2</sup>This total is in addition to the 36 broodstock mortalities detailed above.



## APPENDIX F

SEMI-MONTHLY TOTALS OF SPECIES OTHER THAN ATLANTIC  
SALMON ASCENDING MACTAQUAC DAM FISH COLLECTION  
FACILITIES, 1968-71

The following tables indicate the timings and relative intensities of most species other than Atlantic salmon. As at Beechwood, fish were sometimes too numerous to be readily counted, and estimates were made of the more numerous and important species. Totals shown in italics indicate those composed of partially estimated sub-totals.

In some instances, daily counts or estimates were not recorded. Such totals are considered incomplete and are followed by a "+". A zero in the tables indicates that no fish were observed. A dash means that no count or estimate was recorded, although some may have been present.

TABLE F-1. Semi-monthly totals of fish other than Atlantic salmon ascending Mactaquac Dam fish collection facilities, 1968.

Species	May 14-15	May 16-31	Jun 1-15	Jun 16-30	Jul 1-15	Jul 16-31	Aug 1-15	Aug 16-31	Sep 1-15	Sep 16-30	Oct 1-15	Oct 16-31	Nov 1-15	Nov 16-21	Totals
Landlocked salmon	0	0	1	3	5	2	0	0	0	0	0	0	0	0	11
Brook trout	1	1	19	516	412	57	40	5	0	0	1	0	0	0	1,052
Lamprey	0	1	4,297	3,089	1,298	6	0	0	0	0	0	0	0	0	8,691
Gaspereau	0	2,435	5,372	10,715	2,886	714	0	0	0	0	0	0	0	0	22,122
Shad	0	417	14,868	18,077	5,315	160	1	0	0	0	0	0	0	0	38,838
Chain pickerel	2	17	6	2	0	0	0	0	0	0	0	0	0	0	27
Yellow perch	3	11	18	50	155	0	0	55	6	0	0	0	0	0	298+
White perch	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Striped bass	0	10	5	35	82	293	46	367	32	1	1	0	0	0	872+
Smallmouth black bass	0	0	0	0	0	5	1	0	0	0	0	0	0	0	6+
Suckers (common & longnose)	130	3,065	1,147	470	0	0	3	0	0	0	2	1	0	0	4,818+
Whitefish	0	0	0	0	0	0	1	1	0	16	304	960	1,067	91	2,440
Sturgeon	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1

TABLE F-2. Semi-monthly totals of fish other than Atlantic salmon ascending Mactaquac Dam fish collection facilities, 1969.

Species	May 16-31	Jun 1-15	Jun 16-30	Jul 1-15	Jul 16-31	Aug 1-15	Aug 16-31	Sep 1-15	Sep 16-30	Oct 1-15	Oct 16-31	Nov 1-15	Nov 16-25	Totals
Landlocked salmon	0	0	2	1	0	0	0	0	0	0	1	0	0	4
Brook trout	0	62	311	101	8	1	0	3	10	3	1	0	0	500
Lamprey	1	103	4,134	850	0	0	0	0	0	0	0	0	0	5,088
Gaspereau	15,755	75,185	15,253	95	0	0	0	0	0	0	0	0	0	106,288
Shad	21	9,444	27,084	900	0	0	0	0	0	0	0	0	0	37,449
Chain pickerel	14	85	1	1	1	0	0	0	0	1	4	14	2	123
Yellow perch	0	834	5,745	0	1	0	0	0	0	0	0	0	0	6,580+
White perch	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Striped bass	0	0	0	3	19	280 <sup>1</sup>	0	0	0	0	0	0	5 <sup>2</sup>	307
Smallmouth black bass	0	25	8	7	3	261 <sup>1</sup>	7	4	5	14	6	0	0	340
Suckers (common & longnose)	564	4,090	70	0	0	0	0	0	0	7	0	0	0	4,731+
Whitefish	0	0	0	0	0	0	0	0	1	54	265	842	6	1,160
Sturgeon	0	0	0	0	0	0	0	0	0	0	0	0	0	0

<sup>1</sup>Approximately 250 of each species were dipped from hopper pool No. 2 and released in the tailrace.

<sup>2</sup>Dead in fishway when drained for winter.

TABLE F-3. Semi-monthly totals of fish other than Atlantic salmon ascending Mactaquac Dam fish collection facilities, 1970.

Species	May 20-31	Jun 1-15	Jun 16-30	Jul 1-15	Jul 16-31	Aug 1-15	Aug 16-31	Sep 1-15	Sep 16-30	Oct 1-15	Oct 16-31	Nov 1-15	Nov 16-18	Totals
Landlocked salmon	0	1	19	10	5	0	0	0	0	0	0	0	0	35
Brook trout	4	20	93	10	0	0	0	1	0	0	0	0	0	128
Lamprey	0	310	721	15	0	0	0	0	0	0	0	0	0	1,046
Gaspereau	24,025	32,535	26,820	1,125	0	0	0	0	0	0	0	0	0	84,505
Shad	527	12,154	23,526	205	25	0	0	0	0	0	0	0	0	36,437
Chain pickerel	199	280	0	0	0	0	0	1	0	0	0	0	0	480
Yellow perch	2	130	930	150	0	0	0	0	0	0	0	0	0	1,212+
White perch	0	0	0	200	0	0	50	0	0	0	0	0	0	250+
Striped bass	0	0	0	3	0	3	54	67	0	0	0	0	0	127
Smallmouth black bass	0	29	6	0	0	4	1	0	0	0	0	0	0	40+
Suckers (common & longnose)	1,579	856	42	2	0	0	0	0	0	0	0	0	0	2,479+
Whitefish	0	0	0	0	0	0	0	0	0	15	424	136	0	575
Sturgeon	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TABLE F-4. Semi-monthly totals of fish other than Atlantic salmon ascending Mactaquac Dam fish collection facilities, 1971.

Species	May 22-31	Jun 1-15	Jun 16-30	Jul 1-15	Jul 16-31	Aug 1-15	Aug 16-31	Sep 1-15	Sep 16-30	Oct 1-15	Oct 16-31	Nov 1-15	Nov 16	Totals
Landlocked salmon	0	1	10	6	5	1	0	0	0	1	0	1	0	25
Brook trout	0	8	34	4	0	0	0	0	0	1	0	0	0	47
Lamprey	0	249	1,353	184	0	0	0	0	0	0	0	0	0	1,786
Gaspereau	22,050	120,165	103,525	141,900	8,425	0	0	0	0	0	0	0	0	396,065
Shad	1	7,396	7,233	638	25	0	0	0	1	0	0	0	0	15,834
Chain pickerel	88	158	26	3	1	0	1	4	0	0	1	0	0	282
Yellow perch	0	1,503	1,415	580	0	0	0	0	0	0	50	0	0	3,548+
White perch	0	50	0	50	0	0	0	0	0	0	300	0	100	500+
Striped bass	0	0	1	0	0	2	10	0	0	0	0	0	0	13
Smallmouth black bass	0	40	25	5	3	6	3	2	0	0	0	0	0	84
Suckers (common & longnose)	2,085	1,485	0	0	0	0	0	0	0	0	0	0	0	3,570+
Whitefish <sup>1</sup>	0	0	0	0	0	0	0	0	0	3	2	0	10	15+
Sturgeon	0	0	0	0	0	0	0	0	0	0	0	0	0	0

<sup>1</sup>Approximately 85 whitefish were found in the collection facilities when drained for the season on 16 Nov.





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