Atlantic Salmon Rehabilitation Project

East River, Sheet Harbour

Nova Scotia

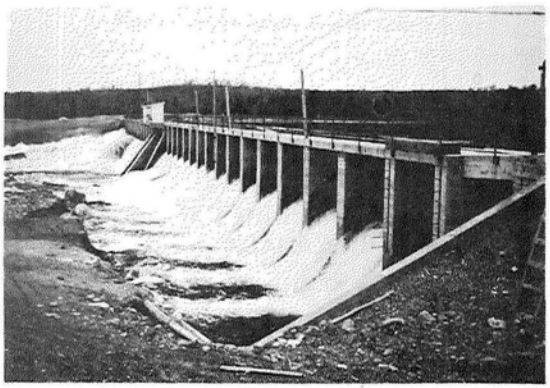
RESOURCE DEVELOPMENT BRANCH
FISHERIES SERVICE

DEPARTMENT OF FISHERIES AND FORESTRY
OF CANADA

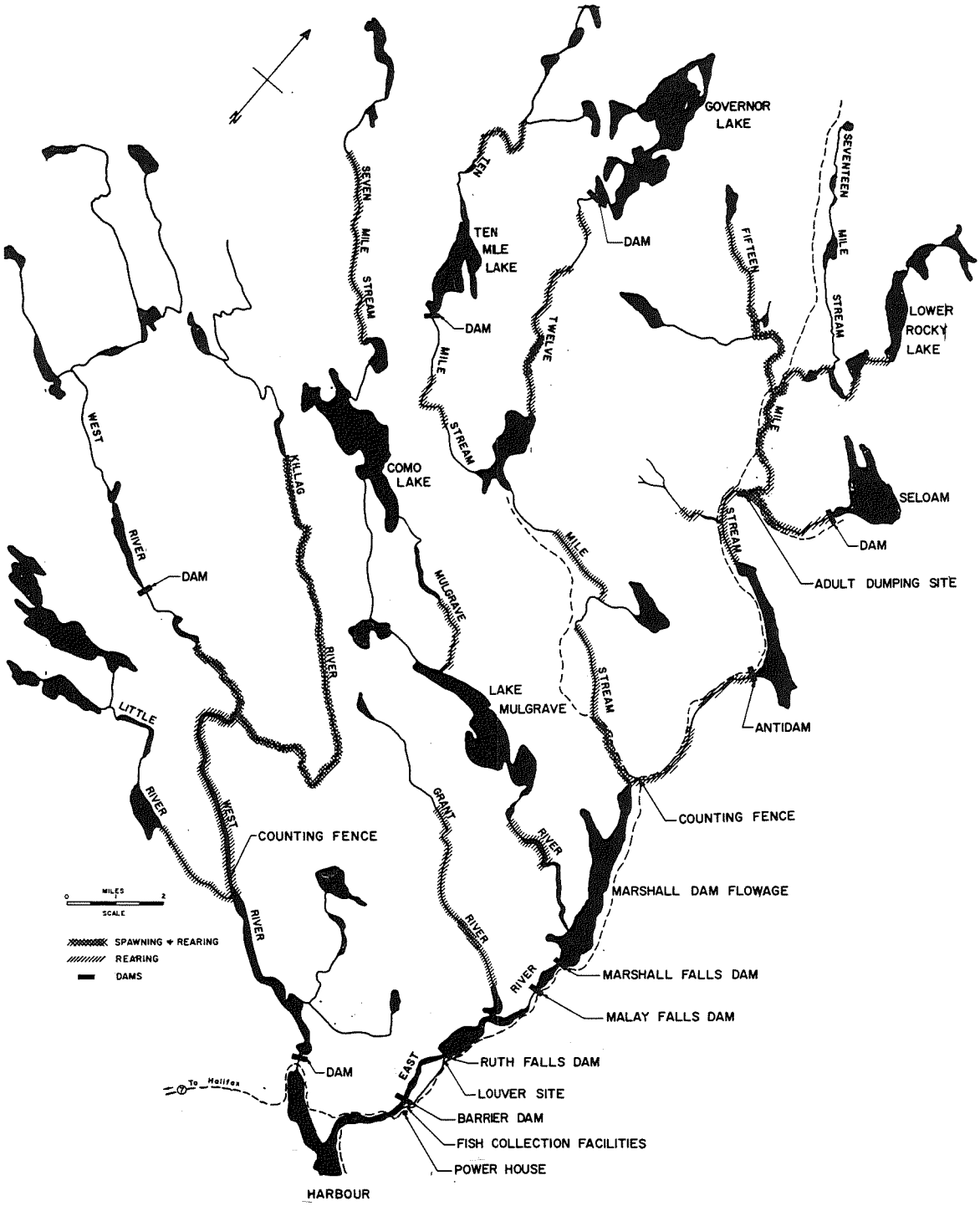
P.O. BOX 550
HALIFAX, NOVA SCOTIA

HISTORY

Depletion of the East River salmon runs began over a hundred years ago with water usage for log drives and saw mill operations. Two large dams, one at the head of tide and one twelve miles from saltwater on the Fifteen Mile Stream blocked upstream passage of Atlantic salmon migrants. After the removal of these dams, the salmon runs to the river revived, as access to the spawning grounds was re-acquired and according to older local residents East River became one of the best angling rivers in Nova Scotia. In the early 1920's, the Nova Scotia Power Commission began harnessing the East River for hydro-electric purposes. Two large water diversion dams were built on the lower reach of the river at Malay and Ruth Falls. In 1928, a third dam, strictly for water storage purposes, was built at Marshall Falls, less than one mile above Malay Falls dam. Fishways incorporated in both Malay and Ruth Falls dams failed to provide the answer to upstream migration due to the difficulty of providing an adequate water supply in the old river bed, particularly at Ruth Falls. By 1964 the East River salmon run had declined to approximately 70 spawners per year. In the absence of hydro development the total annual run to the river could be 1500-2000 salmon. In 1964 the Resource Development Branch of the Department of Fisheries and Forestry initiated a project to rehabilitate the salmon run in the East River.



THE RUTH FALLS DIVERSION DAM


N
GOVERNOR LAKE
SEVENTEEN MILE STREAM
TEN MILE STREAM
TEN MILE LAKE
DAM
FIFTEEN MILE STREAM
LOWER ROCKY LAKE
TWELVE MILE STREAM
SEVEN MILE STREAM
COMO LAKE
WEST RIVER
KILLAG RIVER
SELOAM
DAM
ADULT DUMPING SITE
MULGRAVE
LAKE MULGRAVE
ANTIDAM
LITTLE RIVER
WEST RIVER
COUNTING FENCE
GRANT RIVER
MARSHALL DAM FLOWAGE
MARSHALL FALLS DAM
MALAY FALLS DAM
RUTH FALLS DAM
LOUVER SITE
BARRIER DAM
FISH COLLECTION FACILITIES
POWER HOUSE
EAST RIVER
HARBOUR
To Halifax
MILES
SCALE
SPAWNING + REARING
REARING
DAMS

DEVELOPMENT SCHEME

To reinstate Atlantic salmon in the East River system, it was necessary to (1) find a suitable source of live stocks to initiate a new run of salmon; (2) provide adult salmon access to the upriver spawning grounds; (3) protect the seaward smolt migration from the hazards of turbine wheels at two power stations.

Source of Seeding Stock

Adult salmon from the nearby West River have been planted in the East River's Fifteen Mile Stream. Because East and West Rivers present great similarities in their physical characteristics, West River salmon were considered best suited to survive and reproduce in the East River. The adult transplant method was a new approach to fish stocking in the Maritimes. It allowed the fish to spawn naturally and their progeny to be exposed immediately to the natural conditions of the stream. It was assumed that the surviving adults would accept the East River as their home water.

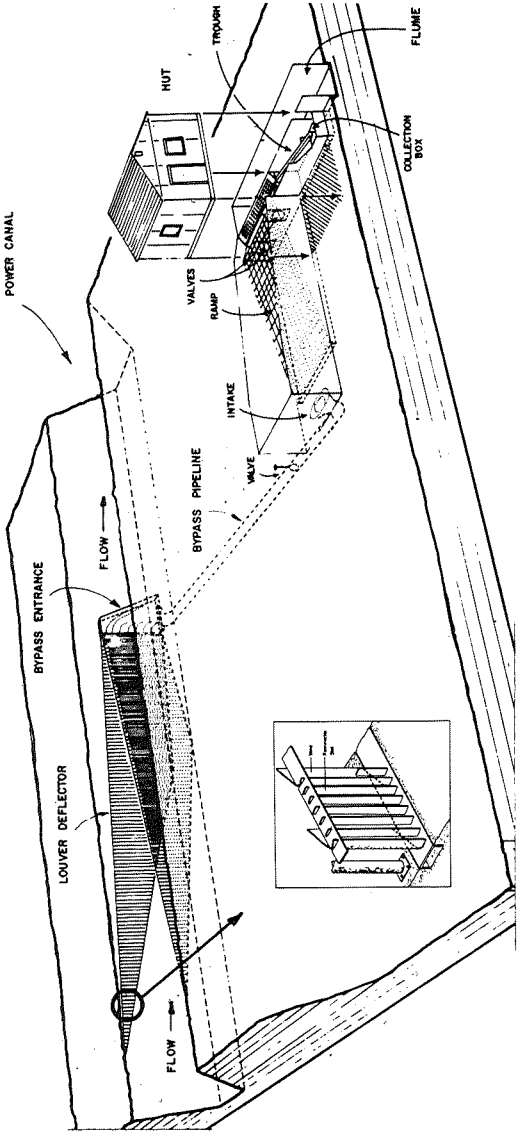
FISH TRAPPING FENCE ON WEST RIVER, N.S.

Downstream Migrant Protection

Young Atlantic salmon of the East River migrate seaward at 2 or 3 years of age (average 7 inches long) during the period May 15 to June 15. Since, after May 15, water is seldom released through the spillways at Ruth and Malay Falls, most migrating salmon juveniles (smolts) would be expected to enter the power canals and to pass through the turbines, where the run would suffer a mortality of 10-15%.

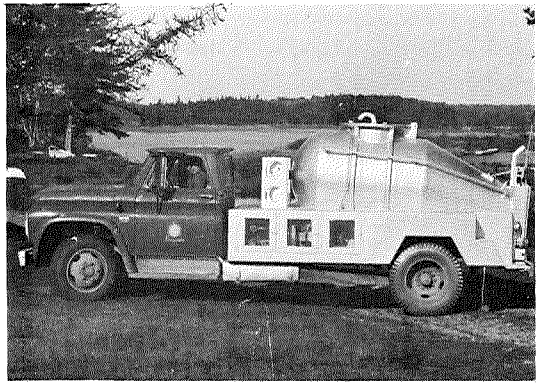
Louver deflectors were installed in 1967 at the upper end of the Ruth Falls power canal in order to guide salmon smolts around that station and thus prevent them from entering the turbines. Another louver installation was also planned for the Malay Falls station.

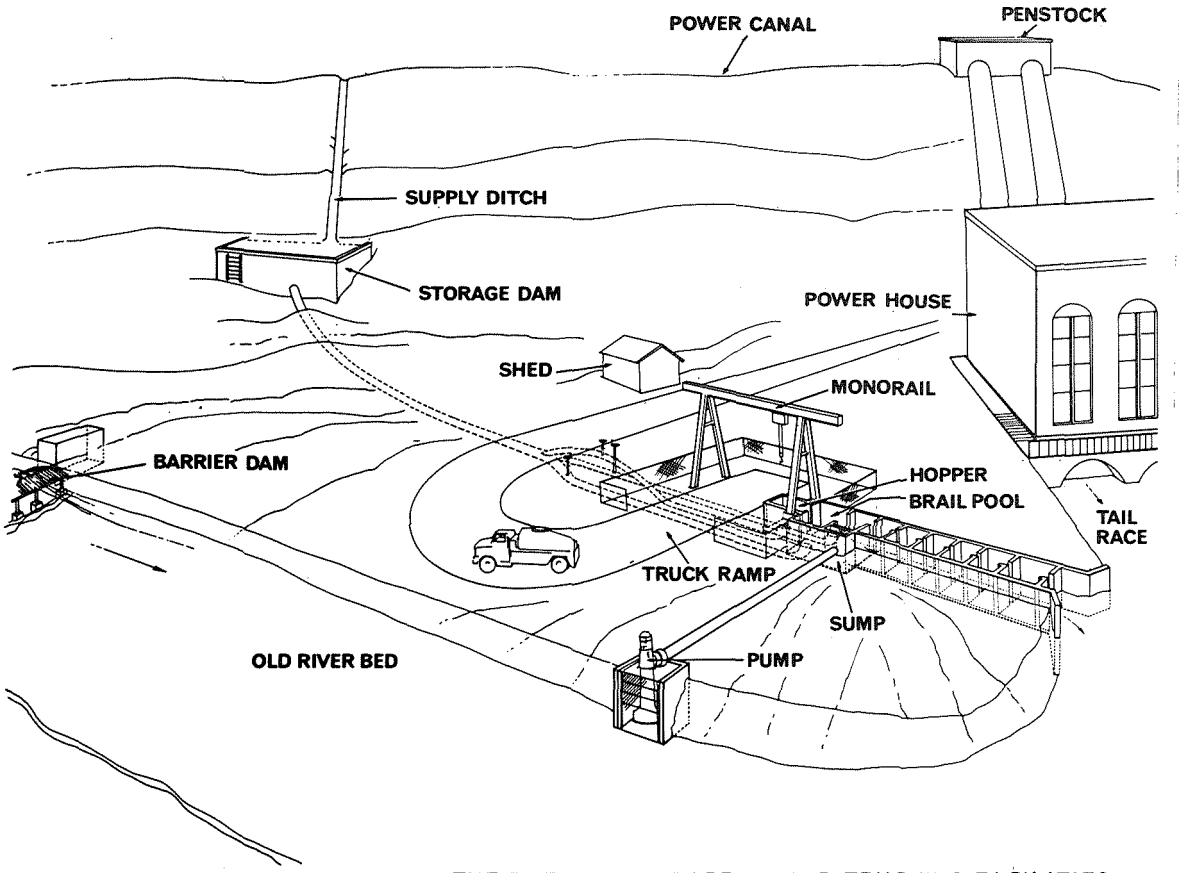
The louver guiding system consists of two converting lines of vertical bars, which are spaced 6 inches apart and set at 90° to the direction of flow (see diagram). Smolts descending in the power canal tend to avoid the louvers and thus are guided into the apex of the V-shaped louver lines, thence into a bypass and back to the old river bed.



Adult trapping and trucking facilities:

Conventional fishways are uneconomical at East River because of the multiplicity of obstructions (3 major dams within 5 miles of saltwater). A single trapping and trucking system was thus adopted. Fish collected at Ruth Falls will be transported overland to the Marshall Falls flowage, where they can resume their migration to any of the three major tributaries that form the East River. The Anti dam on Fifteen Mile Stream is negotiable by Atlantic salmon from August to October when the gate is open to allow the natural flow of the river through the dam. The collection facilities built in 1966 consist of a concrete vertical slot fishway made up of nine pools. The first seven pools serve to attract and convey the fish from the tailrace. The eighth pool is equipped with a brail or pivoting steel basket which herds the adult salmon into the "hopper pool". On entering this pool, the fish are forced into an aluminum cage (hopper) and can then be hoisted out of the pool and emptied with a safe volume of water into the fish transport truck. The water supply for the collection facilities is drawn from the downstream end of the power canal. As a precautionary measure to prevent adult salmon from migrating into a two mile long "cul-de-sac", a concrete barrier dam was built across the old river bed at the head of tide. Steel racks overhanging the downstream face of the dam prevent fish from leaping over the obstruction. *(see sketch)*





THE RUTH FALL TRAPPING AND TRUCKING FACILITIES

Assessment:

The ultimate measure of success of this project will be the establishment of a self sustaining run of Atlantic salmon. Survival of the young salmon through their various life stages in freshwater is being monitored by means of electric fishing for fry and parr and counting fences for smolt. Both methods provide valid estimates of population and population density. The neighbouring West River, with its well established salmon population, is also under study. The future East River salmon production will be gauged against that of the West River.