



QUINNAT SALMON IN NEW ZEALAND

Sporadic attempts by Acclimatisation Societies and Government were made between 1875-1880 to establish quinnat salmon in New Zealand rivers.

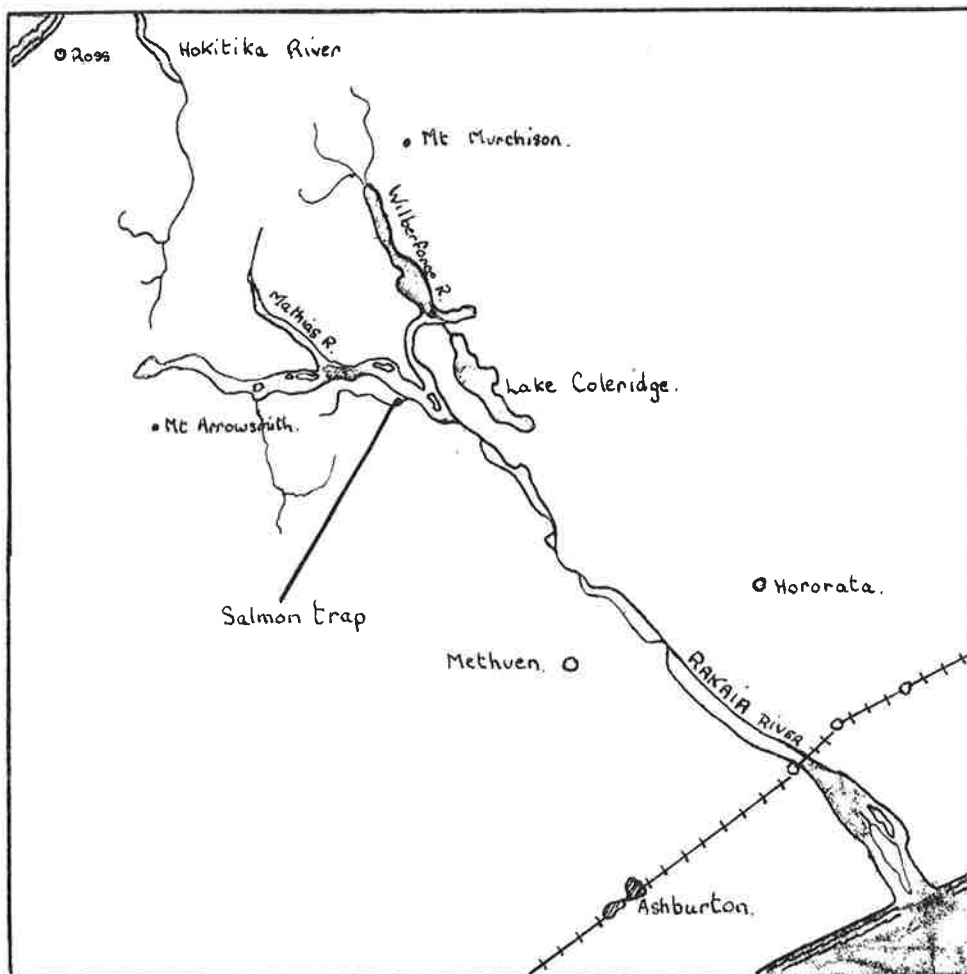
It was not until 1901, however, that regular stocking was undertaken by the New Zealand Government with the intention of establishing runs for commercial exploitation. The earlier attempts appear to have been unsuccessful, but later attempts based on releases from the hatchery at the Hakataramea River, a tributary of the Waitaki, did establish runs in several other rivers including the Rakaia River in Mid-Canterbury.

The original ova for these successful releases was obtained from Baird Station, on the McLeod River, a tributary of the Sacramento River (U.S.A.). This is the only verified instance of the successful acclimatisation of these fish so far recorded.

In January 1965 the Marine Department surveyed several areas to determine the most suitable site for a salmon trap. The Glenariffe Stream, a tributary of the Rakaia River, was chosen for the following reasons:

1. It is reasonably accessible, and close to the Marine Department's Christchurch laboratory.
2. It was a known, good spawning area.
3. It is not subject to violent flooding.

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This map shows the locality of the Marine Department's salmon trap in the Glenariffe Stream

Trap Completed

By February 1965 a trap for catching adults had been constructed in time to sample the 1965 run. During this year 2,120 fish were examined. This successful pilot scheme resulted in further plans for a more elaborate two-way adult and fry trap. The site was surveyed in July 1965 and the present trap was installed by February 1966. Subsequently modifications and improvements have been made to facilitate its operation. The trap is operated by the Marine Department Management Division, South Island Technical Field Service.

Originally the construction and subsequent running of the trap was carried out from a 3-berth caravan, but in May 1967 a house was constructed which considerably eased the problems of living on the site.

The trap has to be manned all the year in case of floods when, if necessary, the gates are opened on a flood diversion spillway to ease the strain on the trap. Technical Field Officers spend two-week periods at the trap except during peak periods when all the trap staff are required.

A large amount of the success of the trap operation is a result of the hard work and perseverance of the following technical field officers:

James Galloway; Errol Cudby; Jerry Wing; Ron Dougherty;
and William Johnson.

Quinnat Salmon Life History

The adult fish migrate to the mouths of their parent rivers about January and February. At the same time they cease feeding and they start to lose condition. Due to the internal changes occurring in their bodies they are now able to transfer from salt to freshwater, and at the same time their sex organs approach full development.

The salmon swim against the current; return to their parent stream, and commence spawning towards the end of April. The females dig nests (known as redds) out of the gravel and lay their eggs in pockets within the redd. The males participate only during the mating sequence. The female subsequently covers the eggs with coarse gravel in the same manner that she dug the original hole, i.e., by flexions of her body. Several redds may be dug by the one female and at the completion all the male and female adult fish die.

Depending on the temperature of the water the eggs hatch approximately two months later. The young fish spend varying times in freshwater, some leaving the parent stream at a very early age, while others spend up to one year in freshwater. Very little is known about the fish after they enter the sea, until they return to spawn.

The Operation and Aims of the Glenariffe Trap

The adult fish, as they migrate on to the spawning grounds at the end of April, are directed by a barrier "the lead in" to a holding pen with a narrow entrance. Once inside, the fish find difficulty in escaping. Here the fish are netted out, weighed, measured, sexed and tagged with a numbered tag. They are then passed down a chute into another "pen" which has direct access to the spawning water above.

The carcasses of the fish, which die after they have completed their spawning act, are collected and the otoliths (inner ear bones) are removed. These are sent along with the relevant information for age analysis at the Christchurch laboratory. Here they are stained with fluoresceine and can be read rather like the rings on a tree.

The fry (or young salmon), when they emerge, migrate downstream and encounter the downstream part of the trap. Initially they pass through the trash barrier and then through one of numerous flow control gates, and on to a stainless steel screen. By means of the flow control gate most of the water passes through the mesh, while a small amount washes across the screen carrying the small fish with it. The fry are washed into a trough leading into meshed stainless steel pens, where they are sampled and counted. After the fish are counted they are released to continue their migration.

One problem which occurred was the build-up of weed with the fish, causing mortalities. Modifications recently carried out, use self-cleaning rotary screens, which has overcome the problem and considerably reduced cleaning work at the trap. These are the main operations carried out at the trap.

However, as a water with known numbers of fish in it, it is used to check and develop sampling procedures for application to other spawning waters.

Surprising Results

The adults return to their parent streams at a younger age than the North American salmon although they grow at a similar rate. Three year old fish are predominant with the fourth as the second most important and on occasions the dominant group. As in the American runs, 2 year old "grilse" occur (precociously developed males); but unlike the North American runs, 2 year precocious females also occur in small numbers. Very few 5 year class fish occur and so far none older has been found.

The technique developed for ageing these fish enables us to look at other rivers without the necessity to build a trap. The fry trapping has presented the most difficult aspect of this work due to the enormous numbers involved, and the delicate nature of these small fish. The aim of this work is to determine the "maintenance level" required to ensure the continuance of a run. It may well prove that a proportion of a run can be removed for placement elsewhere without adversely affecting future runs.

Much of the biology of the quinnat salmon, with particular reference to New Zealand conditions, is unknown. The trap is the first continuous effort to find this out. New Zealand has had a resource for nearly 70 years of which little is known. The Glenariffe trap is the first tentative step to find out.

West Coast Rivers under Investigation

The Department of Internal Affairs in co-operation with South Island Acclimatisation Societies and the Marine Department is currently carrying out investigations into the potential of several South Westland rivers with the long-term aim to establish salmon runs.

The Haast River has been selected for the release of young salmon as it is considered most suitable due to excellent spawning areas within the upper reaches of the river. This work is about to commence.

Officers of Internal Affairs and Marine Departments are co-operating in an effort to gain information on the biology of West Coast salmon stocks. The stocking of South Westland rivers by the Department of Internal Affairs will continue over several years and, if successful, will provide an outstanding sports fishery in one of the most beautiful scenic areas in the world.