

In order to save the fishery from continuing still further in the general decline that has been shown over the last twenty years it is essential that action should be taken of a more thorough-going kind than is represented by the additions and amendments to fishery regulations that have been the sum total of the Department's reactions up to the present. This is far from implying that the last word has been said on the subject of whitebait regulations of the conservation all kind, but in addition I would recommend that definite provision should be made—

- (a) For the further investigation of the life-history of the species, especially the location of spawning-places not yet determined :
- (b) For the protection of known spawning-places which have been shown to be subject to known and preventable causes of damage.
- (c) For the protection and, if possible, the extension of such waters as can be shown to be important feeding-places for the adult *inanga*, and for the prevention of the further reduction or destruction of such bodies of water :
- (d) For the more adequate " ranging " of whitebait-fishing waters.

All these measures would involve expenditure and necessitate additional appropriations from the public funds. To meet this, and also to facilitate administrative contacts with and control of the fishery, it is desirable that a licensing system should be set up for whitebait-fishing. This step is approved by the great majority of those who are seriously interested in both the catching and the commercial utilization of whitebait.

QUINNAT SALMON.

With a good run of salmon into the Waitaki River during the late summer months and access to the upper waters prevented by the dam at Waikino, there was no difficulty in getting all the ova required for the Hakataramea Hatchery for the winter of 1936. The rack across the lower Hakataramea was in position on 11th April, and the first fish came into it four days later. Only a portion of those which came into the trap were used for stripping, the rest being put over the rack to continue their progress and to spawn naturally. The numbers of fish trapped and of eggs taken each month were as follows :—

—				Males.	Females.	Ova.
April (1st to 30th)	..	..	..	256	142	306,000
May (1st to 5th)	..	..	..	157	107	309,000
				413	249	615,000

On 9th May the rack was opened and the fish allowed to go through. The run this season continued into July, which is very exceptional.

Of the fry that hatched out, 10,000 were retained for the ponds, 15,000 were shipped to Victoria, and the rest were planted in the Hakataramea at intervals between six and twenty-five miles above the hatchery. The salmon which passed the site of the rack (a few chains above the mouth of the Hakataramea River) spawned in considerable numbers in the lower two or three miles of its course. Many also spawned in the main Waitaki River below the dam and, according to reports, to within a relatively short distance of the sea. A number of female salmon were found dead, with ova unshed, between the dam and Kurow. It would appear that the presence of this obstruction must inevitably bring about a considerable reduction in the total salmon-propagation capacity of the Waitaki River system in the near future. The spawning potentialities of the Hakataramea, the only tributary now available, seem to be very limited. The planting with artificially hatched fry of its upper waters, which are not naturally " seeded " by quinnat salmon, may serve to maintain an adequate run each season into this river and provide a sufficient quota of parent fish for hatchery purposes. The extent of suitable bottom for spawning in the main river and the capacity of its waters for the sustenance of salmon fry are factors about which, with our present knowledge, we can only guess. All that can be said is that the construction of the Waitaki Dam has staged an experiment in salmon and trout ecology which, though unsought, will yield some valuable practical information when there has been time for the results of the physical change to be demonstrated in the biological conditions. If there should be shown a definite decline in the fish-producing capacity of the Waitaki system with regard to both salmon and trout, which for the present remains an open question, there will still be the further question as to whether it would be practicable to construct an effective fish-pass at the dam at a cost commensurate with the expected increase in the value of the fishery.

The usual inspection by Mr. Main, of Deep Creek, Mesopotamia, which was formerly a very productive quinnat-spawning tributary of the Rangitata River, again showed a sub-normal number of fish in the creek in the middle of May, 1936. The main river run had been better than usual and the deficiency of salmon in the creek may be ascribed to the shallowing of the mouth of the creek at its confluence with the Rangitata.

The fishing-season of 1937 showed unusual disparity in the runs in different rivers. For the Waimakariri River no anglers took out selling-licenses, and thus for the first time for many years there are no rod-fishing data for this river. The season was unquestionably a most disappointing one on this river. It is possible that the abnormal flooding in the headwaters during the spawning-season of 1933 had an appreciably depressing effect on the propagation of the year-class that would provide the majority of the 1937 run.