These observations have subsequently been extended to other whitebait-waters in the Dominion, and spawning-places have been located as follows (number of different spawning grounds in brackets): Waikato River (10); Manawatu River (6); Waimea Stream (2); Waikanae River (2); Makara Stream (1); Hutt River (2); Waiwetu Stream (tributary of Hutt River) (1); Grey River (Punt Lagoon) (1); Arahura River (1); its tributaries, Ritchie's Creek (2) and Dumb Daly's Creek (2); Hokitika River (1), its tributary Mahinapua Creek (2); Ashley River tributaries—Mullins (Salt Water) Creek (2) and Taranaki Creek (1); Waimakariri tributaries—Cam River (2) and Styx River (2); Rakaia River tributaries—Matthias Creek (2) and Boat Creek (2); Porangahau River, Hawke's Bay (1).

Thus forty-eight different spawning-places on thirteen different river-systems have now been located. The water which flows over the different spawning-places shows considerable variation in salinity. On the Waikato it was found to be quite fresh to the taste.

Detailed reports on the various surveys have been written, which will be submitted for printing as a Fisheries Bulletin as soon as they can be prepared for publication.

The interest of the results which have been obtained arises largely from the revelation of a spawning habit which is entirely novel in comparison with all that has been previously known as to the life-histories of New Zealand fishes. Its very real importance, however, has to do with the practical lessons which it provides. Until these practical lessons are realized and acted upon, the material value of the work goes for naught. The observations on the Manawatu in 1931 showed how this habit of *Galaxias attenuatus* in spawning above ordinary high-water mark, while affording protection from its original aquatic enemies, rendered the embryos liable to considerable destruction under the conditions which now prevail. The danger from the trampling of grazing-stock and the annihilation of possible spawning-grounds as the result of grazing have been found to occur on practically all the localities investigated.

Another detrimental factor which has been pointed out as a consequence of European settlement is the occurrence of exotic deciduous trees which render the ground beneath them unsuitable for the herbage which is necessary to afford cover for the spawn. The effect of willows on the banks of streams may also change the contour of the bank and thus prevent it from affording suitable conditions for spawning.

The requisite action for obviating these detrimental conditions is obvious. Known spawning-areas should be fenced off so as to prevent the intrusion of cattle, &c., and the spreading limbs of exotic trees occurring on the sites used as spawning-grounds should be lopped so as to diminish the area of ground subject to injury from this source.

There would be no point in extending the possible spawning-areas for a stock of fish which was too small to make use of such facilities. Captain Hayes has emphasized the desirability of providing sanctuaries or feeding-grounds for the adult fishes. Such feeding-grounds have, of course, been greatly diminished in the course of civilized settlement by the drainage of swamps and lagoons and their conversion into agricultural lands. It would appear, however, that there are in many places areas of swamp which are of little or no value to agriculture, and in which permanent lagoons which would accommodate considerable numbers of inanga might be formed as the result of comparatively simple and inexpensive work.

Quinnat Salmon—Marking Experiment.

An understanding of the migrations of salmon is a question of more than scientific interest; it is a matter of considerable practical importance. The present distribution of quinnat salmon in various New Zealand rivers has come about mainly as a result of natural migration. While little or no result has accrued from attempts at the artificial stocking of such rivers as the Hokitika (west coast of South Island) and Wairau (north-east coast of South Island), all the larger rivers of Canterbury are now invaded by annual runs of these fish from the sea, and their waters are stocked by the progeny produced by natural spawning. The ancestors of all these Canterbury quinnat were undoubtedly the stock which was originally liberated in the Waitaki River system. It is a matter of practical interest to know to what extent this dispersal of quinnat bred in the Waitaki system to other rivers is still taking place. With a view to getting some information on this point, we have marked a number of parr reared in a pond at the Hakataramea Hatchery. The fish were marked by cutting off the adipose and one of the ventral fins, this method of marking having given satisfactory results in the case of quinnat marked at the same stage of growth in certain Californian rivers.

In 1930 smolts to the number of 3,211 were marked by removal of the adipose and right ventral fins; in 1931 a total of 6,042 young fish has been marked by removal of the left ventral and adipose fins. The marked fish were liberated in the Hakataramea River, whence they would find their way to the sea via the Waitaki. The earliest returns from the 1930 experiment may be expected in the fishing season of 1932.

The collection of scales from quinnat salmon for the determination of age is being continued. Casually collected samples have been forwarded by anglers, but more comprehensive collections are being made of scale-samples from the fish trapped for hatchery purposes. There is no one available of the staff of the Department to carry on a comprehensive study of this material, but there is a possibility that Mr. Parrott, Biologist to the Fresh-water Fishery Research Committee of the Acclimatization Societies Association may be able to make the necessary examination for a scientific report.

Atlantic Salmon in Lake Coleridge.

On the 20th November, 1928, forty thousand Atlantic-salmon fry, hatched out in the Christchurch hatchery of the North Canterbury Acclimatization Society from ova supplied by the Department from Te Anau, were liberated in two streams flowing into Lake Coleridge. This is a lake about twelve miles long and two miles wide situated among the hills in the back country about sixty or