

SIR,—

Colonial Museum of New Zealand, Wellington, 5th November, 1895.

I have the honour to report that, in compliance with the request of the Hon. the Minister of Marine, conveyed in your memorandum of the 17th ultimo, I left for Kaipara on the 20th for the purpose of inquiring into and reporting on the most suitable time and period for a close season for the kanae, or mullet.

I visited nearly all the various fishing and canning stations in the Kaipara, but, finding that it was too early in the season to make personal observations as to the breeding habits of the fish, I had to accept hearsay evidence, which, on many important points, is very contradictory. I therefore returned to Wellington on the 2nd instant without visiting the other fishing-stations mentioned in your instructions, as no satisfactory information could be obtained until the end of December. I learnt sufficient, however, to enable me to make a recommendation by telegraph on the 30th of October to the Minister, which was joined in by Captain Christy Smith, Harbourmaster, as follows:—

“Helensville, 30th October, 1895.

“*Re Close Season for Mullet.*

“HAVE examined seventeen persons—fishermen, settlers, Maoris, and canners, including Messrs. Masfield, senior and junior—and the unanimous opinion is that from the 1st December to the 1st March is a sufficient close period, and the majority are in favour of restricting to the Otamatea and Oruawharo as formerly. We strongly recommend that the Order in Council of the 9th September be withdrawn, and that the previous order be reverted to.

“JAMES HECTOR.

“J. CHRISTY SMITH.”

I beg to enclose notes of the evidence taken, and on which I base the following provisional conclusions: The evidence that I have obtained clearly indicates that there are at least two different and distinct varieties of mullet, but whether these are distinct species, or seasonal, sexual, or only younger and older individuals has not yet been made clear. First, we have a mullet that feeds in the ocean, and congregates along the coast in enormous schools. These used to be captured in large quantities by the Maoris with seine-nets, which were dragged on the sandy beach. They are late in their sexual development, female fish in roe being caught up to April and May, corresponding in this respect with the grey mullet of the Australian coast. These fish sometimes enter Kaipara Harbour in large schools, following the clean salt-water of the flood-tide up the deepest channels, and returning again with the ebb; but in some seasons, especially in summer, they rush up the shallower channels and branches of the harbour, and disappear again suddenly. This variety of mullet is known to the fishermen and settlers as the “clean-gut,” “clean-run,” or “sea-mullet.” They are always of large size, and whenever caught, at whatever season of the year, they are in prime condition.

After a school of these fish has entered the harbour they are frequently caught on the banks and shallows along with the other variety, but the fishermen have never any difficulty in distinguishing them. Unfortunately, out of several large hauls they did not find one “clean-run” fish for my inspection. They all said it was too early, as the season is a month later than usual. It is generally supposed that the “clean-run” mullet breeds on the sea-coast outside the harbour.

The other variety is known to the fishermen as the “settler” or “muddy fish.” When opened they are not clean and bright, with the stomachs and intestines apparently empty, as in the case of sea-fish, but are full of slimy mud, the strong muscular pharyngeal stomach being distended with a mass of tough brown clay. This, when examined with the microscope, proved to consist of 90 per cent. of minute grains of volcanic sand similar to the mud along the banks of the rivers, and mixed with many microscopic organisms, such as diatom valves and crustacean fragments, the latter (chiefly Copepods) being very abundant, and evidently forming the favourite food of the fish. It is no doubt the relative abundance of the minute crustacea in the sea and brackish rivers at different seasons that regulates the movements of the fish, and not the direct influence of changes of temperature, which only act through affecting the food-supply. The muddy fish are caught inside the harbour only. In summer, on the banks especially off Komiti Point, they run up and down into the furthest extension of the tidal rivers and creeks, as is generally supposed, for the purpose of depositing the spawn. This opinion is chiefly based on the fact that the muddy fish are in full roe about the beginning of the year; but, so far as I learnt, no one has ever seen them actually spawning, nor has spawn been found imbedded in the mud. Another reason is that great swarms of young fish are seen in the tidal creeks in autumn and winter. There is, however, some room for doubt on this subject. It is difficult to conceive how the spawn can be deposited in the soft slimy mud which forms the banks of every stream in the Kaipara during the short time of flood-tide, as the process must, as in other fish, require a prolonged effort against a firm resisting surface to effect the extrusion of the ova. Nor is it possible to conjecture how the fertilisation of the ova by the male fish can be effected under such circumstances.

Then, again, these creeks are, for miles below where they are reached by the flood-tide, converted for many hours twice a day into mere muddy ditches, and any ova which had been deposited on the muddy bed would necessarily be exposed to desiccation by the air and hot sun. On the whole it seems not unlikely that the “muddy,” or “harbour fish,” if they really do spawn inside the estuary, spawn on those banks and shoals inside the harbour which have a surface of fine shelly sand and are never dry at low water, and that the rushing up the rivers and also the abundance on the top of the flood of young fish is merely due to the fish following an abundant food-supply. The permanent falling-off in the number of mullet in Kaipara has not been proved. It is true that there are not so many seen in the river as in former years, but, on the whole, on the banks they are still as plentiful as ever. Last season (1894) was an exceptionally good one for the canneries; but the influence of the canneries has been greatly exaggerated, as since the commencement of the factories, or about fifteen years, the total number of fish taken, allowing 10 per cent. for loss and