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PROTECTION OF MULLET

(REPORT BY SIR JAMES HECTOR, K.C.M.G., AND EVIDENCE TAKEN BY HIM).

Presented to both Houses of the General Assembly by Command of His Excellency.

SIR JAMES HECTOR, K.C.M.G., to SECRETARY, Marine Department.

Memorandum re Close Season for Mullet.

HAVING, by observation and correspondence, continued to study the mullet question, at your request, throughout the entire year, I have come to the conclusion (from the evidence I submit with this) that no close season for mullet-fishing is required, and that all restrictions should be withdrawn. At the same time, I must admit there is a great want of accurate information still required on the subject; but it is most difficult to collect, and, as the variation in the time of spawning in different years, which is controlled by the weather, is undoubted, and also that the migrations of the mullet shoals are dependent on the supply of suitable food, which also is contingent on the weather, only one year's study of the subject will not have much avail.

The chief reasons that can be urged for protective legislation in regard to the mullet-fishing are as follows: (1) To prevent the fish, while reproducing, being disturbed by fishing operations; (2) to protect the fry during development; (3) to prevent the market being supplied with "spent" fish that are unfit for food.

Observers have hitherto been misled by a supposed analogy to the salmon in the spawning habits of the mullet. The evidence I have collected shows this is quite incorrect, and that the spawning takes place in the open sea at two seasons in the year—summer and winter; and that this difference probably represents two distinct species of mullet that frequent the coast of New Zealand. Captain Hutton, twenty-five years ago, expressed the view that the mullet in the Waikato went down to the sea in November to spawn, and returned in March ("Fishes of New Zealand," page 36). The evidence I have collected quite supports this statement, at Whangarei, Bay of Islands, Hokianga, Kaipara, and Auckland, at which places the only roe-fish obtained in January were from the outside deep water, and all fish caught inside were undeveloped and in prime condition. That large shoals of fish rush up the tidal inlets in the summer months is undoubted, but these also are mostly three-year-old fish, with undeveloped sexual organs.

I have obtained no evidence of a shoal of ripe female fish having made a rush in any tidal water; indeed, within the harbours the male and female fish and those of different ages appear to keep in separate schools, but in the outside open sea they appear to follow the same habit only to some extent. The shoals of mullet make their rushes up the creeks in pursuit of the small crustaceans and animalculæ, which swarm in tidal waters under certain conditions of season and weather.

As the ripe ova of the mullet was found by experiment to sink in the dense sea-water, and thus belong to the "demersal" class of ova, the spawning-grounds are probably in shallow bays, where there is a moderate depth of water.

The only measures to be recommended for the conservation of mullet and other fishes that spawn in the sea is artificial propagation, in the same manner as is largely followed in Europe and America; but, for the present, in New Zealand, there is no permanent decrease in the number of fish, nor have the very limited fisheries which are in operation any sensible effect on the supply. I append a very important paper on this subject by Mr. G. M. Thomson, F.L.S., Dunedin, and several important letters that have appeared in the *New Zealand Herald*.

Some arrangement might be made for effectually inspecting the fish offered for sale in Auckland and other large towns, so as to prevent the public being supplied with fish that is out of condition and unfit for food. As far as the canneries are concerned any such inspection would not be required, as it is clearly against their interests to purchase and preserve any fish that are not in prime condition. I attach the evidence I collected on the subject, and also an abstract of the previous file of correspondence.

JAMES HECTOR.

Colonial Museum, Wellington, New Zealand, 12th November, 1896.