

FRESHWATER FISHERIES ADVISORY SERVICE

MARINE DEPARTMENT

INVESTIGATION REPORT

Job. No. 45

ACCLIMATISATION SOCIETY DISTRICT: Waimate and Waitaki.

TITLE OF JOB: Limnological and Biological Survey of Lake Waitaki. Lake Waitaki is located 4 miles north-west of Kurow in Waitaki-Waimate Counties. The main Kurow-Otematata highway runs alongside the lake for almost its entire length, and accessibility to the water is good. The investigation was carried out in January 1964 by officers of the T.F.S. Marine Department.

A. PHYSICAL FEATURES.

Lake Waitaki is artificially formed by a hydro electric dam, built across the Waitaki River. The surrounding country is mainly tussock covered with a few rocky outcrops. Matagauri is present on the slopes, and there are a few patches of willow around the lake shore. The Waitaki river enters the lake at the north-west end, and being snow-fed carries a large load of glacial silt. The lake forms a settling pond for some of this silt, but there are large quantities always in suspension. The deposits are heaviest in the bays at the western end, where it has been distributed laterally to the main streams. Water fluctuations vary daily from 1 to 3 ft according to the draw-off for power, and the lake margins in the shallower bays can be temporarily exposed for several chains.

Apart from the Waitaki river there are no major inlets. The only other permanent inlet is the Awahokomo Creek about half way along the southern shore. The parameters of the lake are given below:

Spawning facilities are not good but a few fish are known to use them.

2. Wharekuri Creek.

A small irrigation diversion is taken from this creek from above the road bridge. In January the creek itself was nearly dry, all the water (approx. 1-2 cusecs) going through the diversion. No fish were seen in either.

3. Waitaki River.

The drainage area of the Waitaki river is 3,750 sq. miles. Max. flow - 160,000 cusecs, Min. flow - 3,000 cusecs, Mean flow - 12,530 cusecs.

During the visit the flow was around 7,000 cusecs. When the Benmore hydro lake is ready to be filled about November-December 1964, the flow will be considerably reduced between Benmore and the sea. This will last for about 6 weeks, until the new lake has filled. During this period a large amount of salvaging will be done by the Societies. The fish in Lake Waitaki will probably fall back into the old river bed in the centre of the lake, as the waters recede. At no time will the lake be completely dry.

Temperature Series.

Temperatures were taken using a resistance thermometer to a depth of 19 metres. These varied from 16.5°C at the surface to 15°C at 19 metres, with no thermocline present. The absence of a thermocline is probably due to the fact that the lake is subject to very strong N/W and S/E winds most of the year. These had been severe for months previous to the visit.

wave action has kept the bottom disturbed. Bottom fauna was found to be scarce.

The types in order of abundance were Oligochaeta, Pycnocentria (Caddis) Sphaeriids, Potamopyrgus and Chironomidae. Most of the Pycnocentria cases were empty on examination. This was found to be so in the previous survey.

Although only very few caddis larvae were found, some concentration of empty cases suggest that these animals are more common during the summer months. There was no evidence of their being really abundant (Boud and Eldon Job. 16 1959). The most prominent forms found in 1959 were Chironomidae, Oligochaeta and Potamopyrgus.

The silt and mud deposits are much heavier than in 1959, and this might account for the increase in Oligochaeta. The increase in Pycnocentria and the Mollusca indicate a partial recovery in bottom fauna since then, but these animals are known to be fairly tolerant to various types of pollution. There appears to have been an increase in the size of weed beds and possibly this accounts for the larger numbers of Mollusca.

Many Chironomid pupa cases were seen on the surface on different occasions.

Forage Fish

A tow net was used in an attempt to capture forage fish. Several runs were made through the weed beds using fine meshed nylon net, but no fish were caught. Some small fish, thought to be young bullies were seen in the bay by Awahakomo Creek outlet; none was captured. Fyke nets were also set for long periods at different positions, but no fish were trapped.

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3. Forage fish are scarce even though cover is plentiful.
4. Trout are in fair condition; there is little or no improvement since 1959.
5. In the near future spawning facilities will be very poor. The Aviemore project is well under way, and Deep Creek will be cut off from Lake Waitaki fish.

Executed by:

E. Cudby

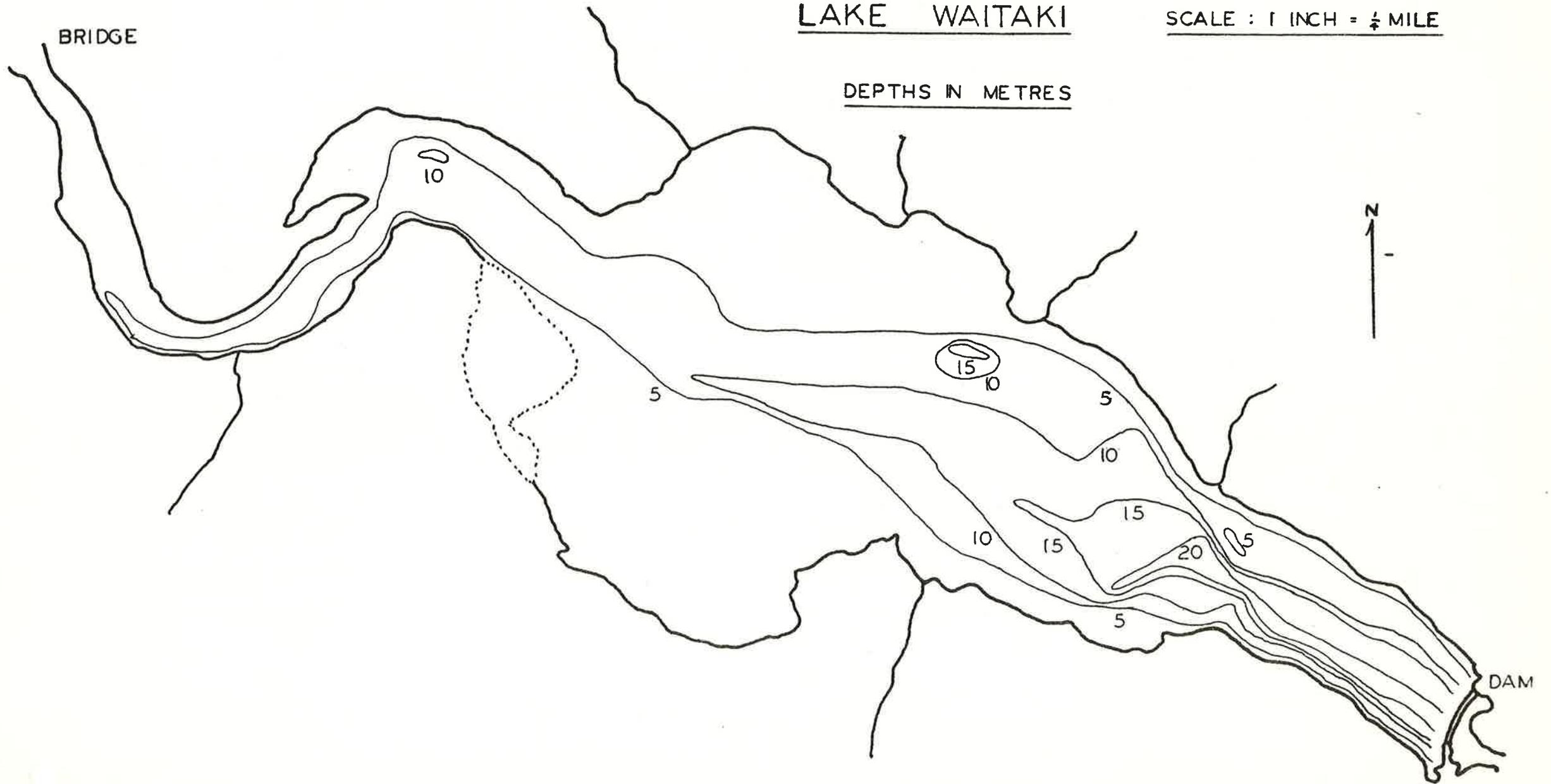
J. Galloway

Technical Field Officers.

LAKE WAITAKI

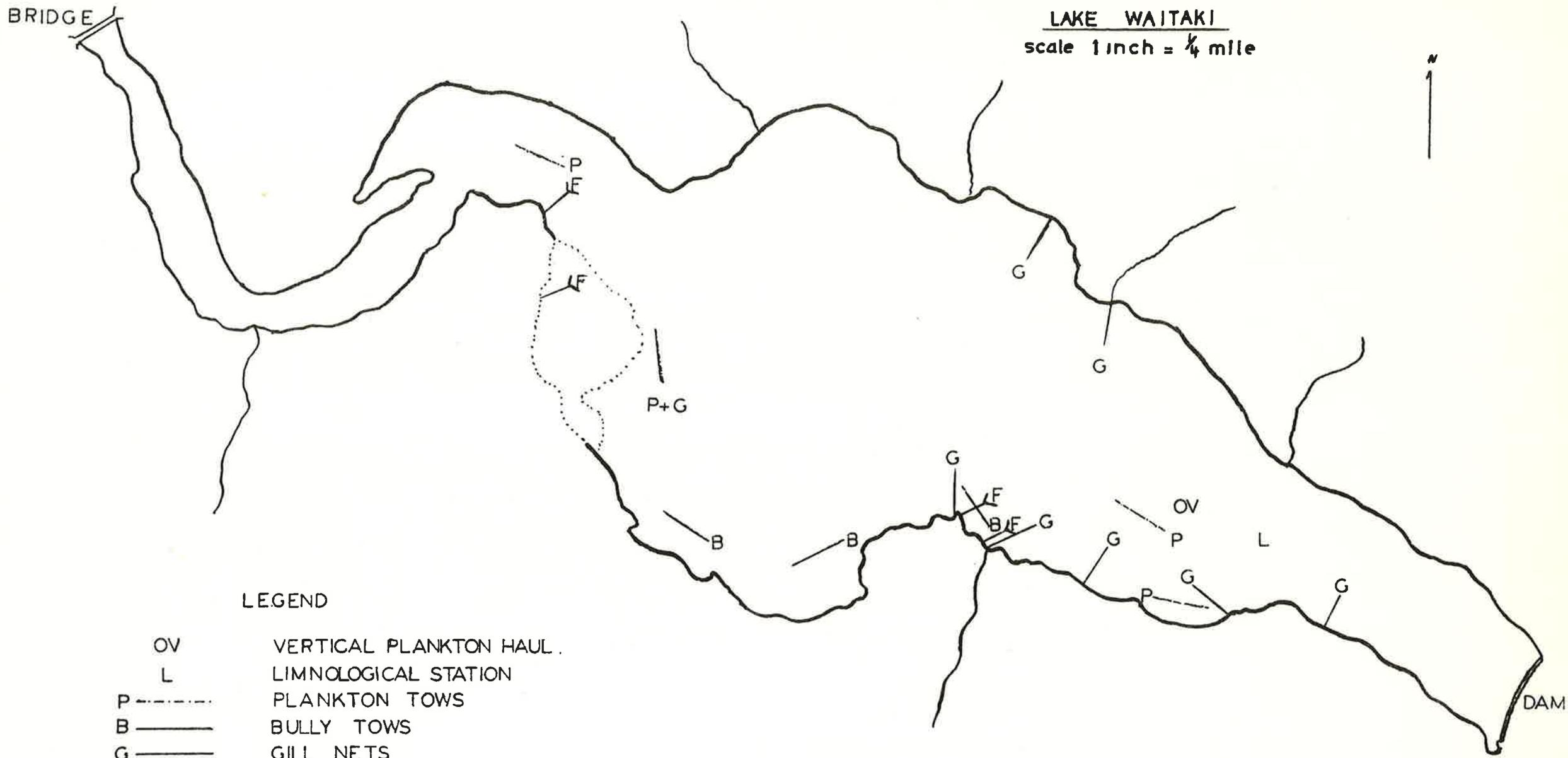
SCALE : 1 INCH = $\frac{1}{2}$ MILE

DEPTHS IN METRES



BRIDGE

LAKE WAITAKI
scale 1 inch = $\frac{1}{4}$ mile



LEGEND

- OV VERTICAL PLANKTON HAUL
- L LIMNOLOGICAL STATION
- P - - - - PLANKTON TOWS
- B ——— BULLY TOWS
- G ——— GILL NETS
- F >—— FYKE NETS