

FRESHWATER FISHERIES ADVISORY SERVICE

MARINE DEPARTMENT

INVESTIGATION REPORT

JOB NO. 46

ACCLIMATISATION SOCIETY DISTRICT : SOUTH CANTERBURY

TITLE OF JOB : Survey of Lake Tekapo

OBJECTIVES : To determine the suitability of Lake Tekapo  
for game fish.

INTRODUCTION

Lake Tekapo is one of a series of lakes having similar characteristics and with generally low fishing quality. In this instance a superficial survey was made to determine whether stocking the lake with game fish is worthy of consideration.

FINDINGS

PHYSICAL FEATURES

Lake Tekapo is situated approximately 65 miles northwest of Timaru in the foothills of the Southern Alps. It is a large glacial lake approximately 16 miles long by 3½ miles wide, the water containing much glacial silt in suspension which limits light penetration to a few inches.

The lake outlet has been dammed for hydro-electric purposes and consequently the water level varies considerably throughout the year.

Three large rivers enter Lake Tekapo, the Godley River entering at the head of the lake, the Coal River entering near the mouth of the Godley River, and the Cass River entering about seven miles south of the north end of the lake on the western

shore. Numerous small streams also enter the lake, most of them on the eastern margin. The outlet from Lakes Alexandrina and McGregor empties into the Lake four miles south of the Cass River mouth.

The water-shed is steep mountainous country, tussock covered, with bare shingle rock tops. Most of the surrounding peaks are between 3,000 and 6,000 feet, the highest being nearly 8,000 feet.

#### Bottom Fauna

Two series of bottom fauna samples were planned using a Petersen Grab in a bay near the outlet from Lakes McGregor and Alexandrina, each series to consist of a row of samples one chain apart on a line at right angles to the shore. The two series were not completed but sufficient data was obtained to indicate that the bottom fauna density was extremely low, almost non-existent by usual New Zealand lake standards.

This lack of an adequate food supply for trout is of the utmost importance when considering the establishment of a permanent population of game fish.

#### Native and Introduced Fish

A fyke net was set within the same bay as the bottom fauna sampling was carried out but no fish of any kind were caught. Experimental angling did not result in any catch either; The only fish seen were a few bullies in the shallow lake margin.

### Trout Spawning Facilities

An inclusive survey was made of all streams on the eastern shore and the southern half of the western shore of Lake Tekapo.

Spawning could take place in the Outlet to Lake McGregor, but suitable gravel is scarce and the lack of current during periods of high water in Lake Tekapo could make such areas as exist unproductive.

The Cass River is stoney, unstable, and carries a considerable amount of glacial silt. It is considered, therefore, to be unsuitable for trout spawning purposes.

The small streams that enter the eastern margin of Lake Tekapo do not carry much water, are fairly swift, and while they generally possess stable banks the stream bottoms, often of rather fine gravel, are inclined to be unstable.

The Coal and Godley Rivers are both similar to the Cass River in that they have unstable shingle beds. Some patches of good gravel were noted near the road bridge over the Coal River and the water is clear while the Godley carries an even greater silt load than the Cass River making it quite impracticable for spawning purposes.

### DISCUSSION

Although insufficient data were collected for an exhaustive study this preliminary survey of Lake Tekapo makes obvious the conclusion that it is completely unsuitable for an established sport fishery.

The extremely high glacial silt content of the water is of utmost importance. While some lakes having many solids in suspension do support an adequate trout population (i.e. some Canadian Lakes and Lake Benmore in New Zealand), none are so extreme in this regard as Lake Tekapo. Glacial silt reduces the light penetration and hence the basic productivity of the Lake. Phyto-plankton production is low, and of even more importance is the factor that the area of the productive littoral zone is restricted, e.g. the lake bottom being covered by silt which limits production of bottom fauna both directly by providing the wrong type of substrata, and indirectly by limiting the establishment and growth of weed beds.

One factor due to the high degree of suspended silt is of indeterminate importance. It is known that the gill filaments of various fish tend to join together under conditions such as exist in heavily silted rivers and thus reduce the gill area available for oxygen exchange. Fish so affected have reduced tolerance to any other adverse factor and often cannot compete satisfactorily within their environment. Whether such would be the case in Lake Tekapo is unknown, but definitely should be expected.

Another aspect of great importance is that the lake level fluctuates widely which augments and intensifies the curtailment of feeding areas due to low light penetration by removing the shallowest water completely from any utilisation.

Even supposing that a limited number of trout could gain sustenance in the lake and resist the corroding effect of the silt, the spawning facilities available are extremely limited by the nature of the entering streams and rivers. Except for minor exceptions they are either too unstable, are heavily silted, have unsuitable bed material, or are just too small to attract fish and possess insufficient water for effective spawning.

#### RECOMMENDATIONS

From the factors enumerated above it can be concluded that Lake Tekapo provides an unsuitable habitat for the establishment of a game fish population. While some fish can probably survive, the chances of a satisfactory fishery developing are extremely remote.

#### NOTE

It is planned that a full limnological survey of Lake Tekapo be conducted when it fits into the general lake survey programme for "back country lakes" and a further appraisal will then be made regarding the lake as a game fish habitat.

Meanwhile, the release of "extra" rainbow trout produced at the hatchery into a tributary of Lake Tekapo may provide some sport but serious consideration should be given to locating a more productive place elsewhere within the district.

Executed by: R. Boud. Technical  
Field Officer

B. Stephensen.  
Temporary Assistant

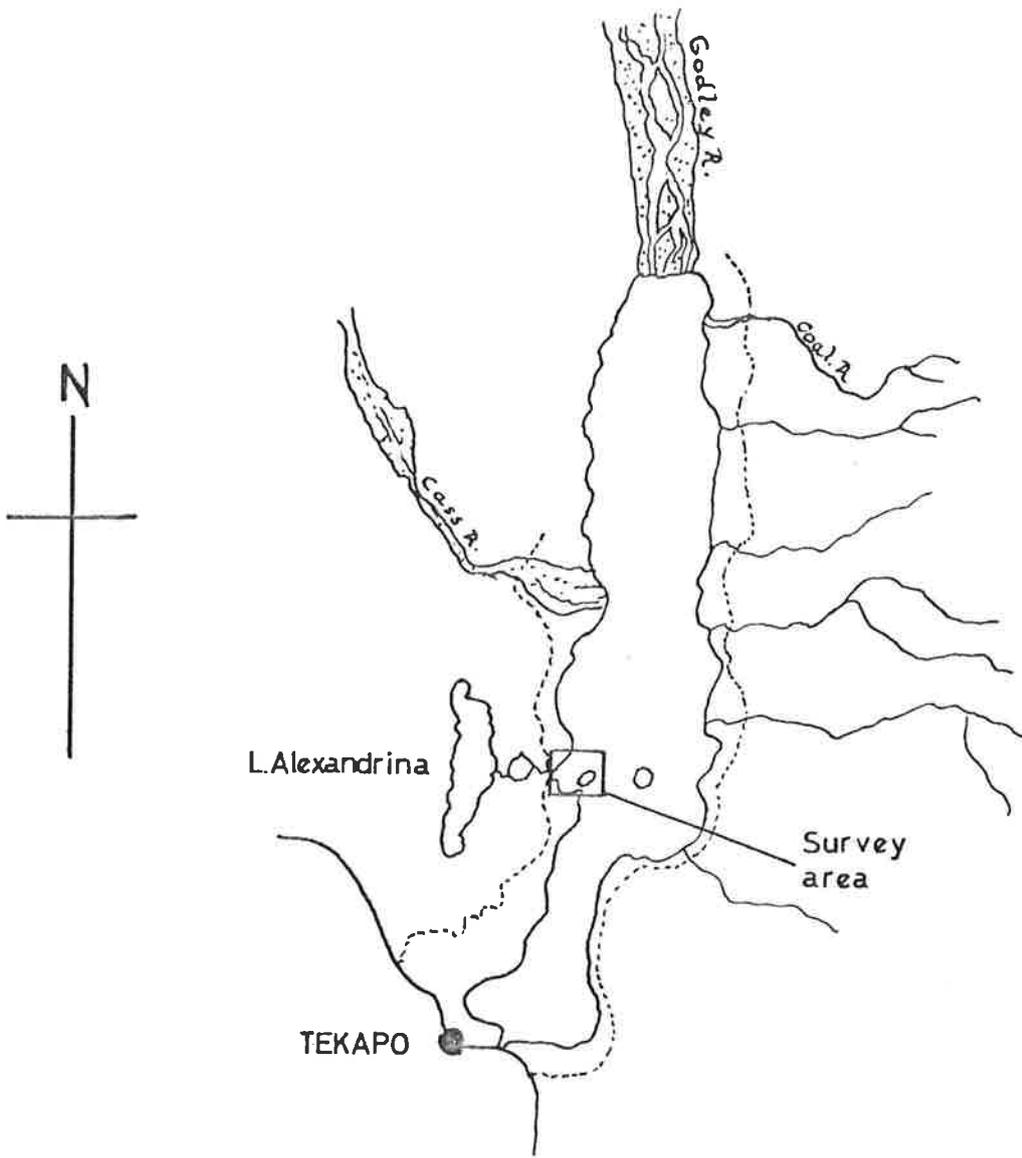
Supervised by: E.D. Lane.

Fisheries Investigating  
Officer

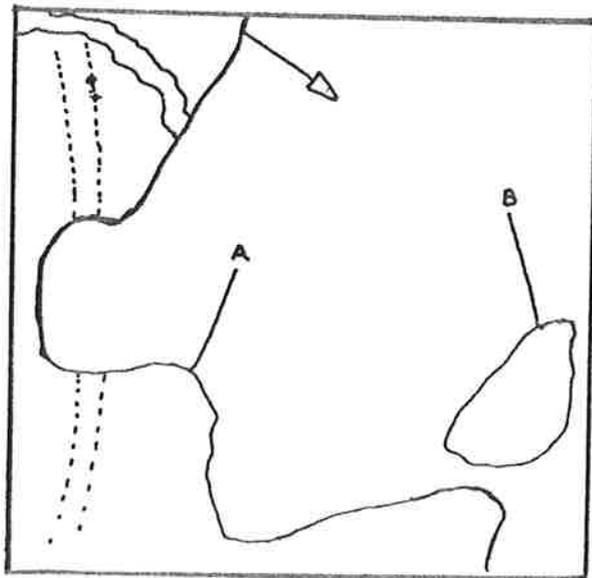
R.W. Little.  
Fisheries Scientist

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# LAKE TEKAPO



1 inch = 4 miles



fyke net   
petersen grab  A

SURVEY AREA