FRESHWATER FISHERIES ADVISORY SERVICE

MARINE DEPARTMENT

INVESTIGATION REPORT

JOB NO. 10

ACCLIMATISATION SOCIETY DISTRICT: Nelson

TITLE OF JOB: Investigation of the Motueka River system.

OBJECTIVES: To determine the spawning potential and the effect of floodoing on the trout stock in the Motueka system.

FINDINGS: This investigation was carried out between 4 September - 26th October 1958.

A. PHYSICAL FEATURES

Motueka River

The Motueka River rises on the Richmond Range and follows an approximately north east course towards the sea. It is joined by several tributaries (see map) the main ones being the Motupiko, Tadmor, Wangapeka, Baton, Dove, Pearse and Graham Rivers, in that order.

After leaving its source the Motueka flows through a narrow rocky gorge for several miles. The valley then widens out gradually until it is joined by the Wangapeka River below Tapawera. It then narrows again until it is within 4-5 miles of Motueka. Except for the gorge, the Motueka River has much the same physical characteristics throughout its length.

The bed is composed of large stones, shingle, and large areas of sand which occur mainly below the mouth of the Wangapeka. There are also numerous outcrops of rock. The banks are up to 10 ft in height and covered either with willows, wattle, scrub or mosses. The flood-bed varies greatly in width, areas with little or no floodbed alternating with places where the shingle of the floodbed is up to 50 yards wide. Little erosion of the banks is apparent and the banks are covered with willows, scrub, pasture and native bush.

The Motueka appears to be fairly stable, but the bed would probably shift during the more severe floods. The most unstable area appears to be between the mouths of the Wangapeka and Motupiko Rivers.

Baton River

The Baton River rises on the Mt Arthur range and joins the Motueka about 18 miles

above the town of Motueka. The river bed is composed of boulders and stones and shingle, with outcrops of rock in places, and is generally unstable. The stream flows swiftly for considerable distances between each pool. The banks are generally stable and covered in scrub, patches of bush and grass.

Above the junction with the Ellis River (see map) the Baton is entrenched in a deep and narrow gorge. The banks are approximately 20-30 ft in height and consist mainly of soft rock. The bed is mainly rock, loose shingle and sand. Above the bush edge the stream bed becomes wider and the banks lower and unstable. The bed consists entirely of boulders and stones and is unsuitable for trout.

Wangapeka River

The Wangapeka is the main tributary of the Motueka River and flows into it about half way between its source and the sea. It rises on the Lyall Range in the Tasman Mountains and flows through a narrow bush-clad valley until it reaches the Dart River, about 15 miles from its confluence with the Motueka. Below the Dart the valley widens gradually until about 5 miles from the confluence with the Motueka where it narrows again.

The bed of the Wangapeka is composed of rock, boulders, stones, shingle and granitic sand. It is generally loose and unstable and shifts during floods. According to a local source of information, severe floods over the last ten years have brought down debris dislodged during the 1929 Murchison earthquake. Prior to these floods the bed was of a more stable nature. The banks appear to be stable but from about 1½ miles above the Dart down to near the mouth, the flood-bed is often up to 50 yards wide. Bank vegetation consists mainly of scrub and pasture up to the Dart, but this gradually gives way to native beech forest. A considerable amount of pasture land near the Dart has been ruined by sand deposition.

Only about 13 trout were seen, and none of these were under 3 lb. The larger fish were estimated at 6-8 lb in weight. No small trout were seen and it is possible that periodic floods have destroyed any spawning areas. According to the informant mentioned above, shoals of small trout up to 1½ lb could once be seen, but they have not been seen for some years now. Also, the creeks where spawning was known to have taken place have been severely affected by floods and made unstable and less suitable for spawning.

The vegetation has not been changed in the headwaters of the Wangapeka, and apparently severe flooding, especially over the last three years has been caused by exceptionally heavy rainfall in the headwaters.

Sherry River - Wangapeka Tributary

The Sherry River rises in the low hills between the Tadmor River and the Wangapeka and flows in a northerly direction until it joins the Wangapeka a few miles from its confluence with the Motueka River.

The bed of the Sherry River is composed mainly of rough granite shingle, which is of a loose nature. Toward the headwaters, the bed is often covered in coarse granite sand, or is composed of papa. Bottom fauna appears to be scarce. The banks, however, are stable, and covered in scrub, patches of bush and pasture. No fish of any sort were noted.

Tadmor River

This stream rises a few miles south of the Sherry River and flows roughly parallel to it. Unlike the Sherry, the Tadmor flows directly into the Motueka, about 5-6 miles above the mouth of the Wangapeka.

The bed is generally unstable, except near the headwaters. The bed is composed of stones, shingle and a little sand, and except in a few isolated areas is too loose and fine for spawning. Near the headwaters the bed is mainly rock and large flat stones.

The banks are inclined to instability, but there are short stretches where they are very stable. Vegetation consists of areas of beech forest, scrub and grasses.

Only two trout were seen in this stream, a fingerling of approximately 6" and a larger fish of approximately 2 lb weight. A few bullies were also seen.

Motupiko River

The Motupiko River rises on the northern end of the St Arnaud Range and flows in a northerly direction until it joins the Motueka River at Kohatu, on the Nelson-West Coast Road. It flows at first through a narrow gully which gradually widens out until it is approximately 1 mile wide at the confluence.

The stream banks are comparatively low, about 2-3 ft and are generally unstable. Bank vegetation is mainly willows, scrub and pasture grasses. The bed of the stream is composed of stones and shingle, mixed with a little sand. In places there are patches of suitable spawning gravel, but the bed is generally too loose. Heavy flooding has seriously affected the stream in this respect.

Only one trout of about 2 lb was seen in this stream and a few 2-3" fingerlings in a side channel. Although it has a moderate population of bottom animals, the Motupiko does not appear suitable for trout because of its general instability and lack of cover.

Rainy River - Motupiko Tributary

The Rainy River is one of the main tributaries of the Motupiko, which it joins some 14 miles above the confluence of the Motupiko and Motueka Rivers. For the four or five miles of which the Rainy was examined the river ran through partially cleared beech forest and grazing areas. There was an extensive flood-bed, but this was well grown over with scrub and grasses, which indicated that there had been no major flood for at least two years. The river bed is composed of stones and small boulders, but there are some small patches of good spawning gravel in some of the small tributary creeks.

Bottom fauna was scarce, and consisted mainly of *Deleatidium*. No fish were observed. According to local information there was usually a good run of spawning fish up the Rainy River, but none had been observed this year.

Pokororo River

The Pokororo River is a small stream flowing into the Motueka River at Ngatimoti. The first few miles are steep and rocky, but after leaving the bush, it flows through a fairly open valley until reaching the Motueka. The bed consists mainly of boulders and stones with small patches of shingle and seems fairly stable. The banks appear to be unstable but this may be due to scouring sustained during the severe flooding of two years ago.

Bottom fauna is abundant and it would appear that the Pokororo is a useful nursery stream.

Stanley Brook

This stream enters the Motueka approximately 6 miles above Baton Bridge. It flows through a wide valley, which narrows down near the mouth of the stream, so that it is confined in a small gorge. This section is about 3/4 mile long and good spawning gravel is present here. Above this area the banks and bed become more unstable, and it is generally unsuitable for spawning. Towards the headwaters the stream dries up in the summer.

Blue Glen Creek

This creek flows into the Motueka River about 1¼ miles below the gorge. It is approximately 6 ft in width and 10-12" deep, with pools up to 2 ft deep. The banks are fairly stable, and up to 3-4 ft in height. The bed consists of shingle and coarse sand, and stones. The creek provides intermittent patches of suitable spawning gravel for 2-3 miles, but the bed gradually becomes more unstable towards the headwaters.

No fry were seen, but a few fingerlings up to 6" in length were noted.

B. RAINFALL

The Climatological tables for Golden Downs, on the Motueka River, show that the mean annual rainfall is about 50 inches which is well spread throughout the year with slightly heavier falls in winter.

The headwaters of the Wangapeka River are several miles to the west of Golden Downs and it is presumed the rainfall would be much heavier in this catchment and the flooding more severe.

The rainfall records show that during 1958 the rainfall was much less than normal with a flood-free period when the trout would be spawning. However, during 1957 the rainfall was about 17 inches above normal and during the period March to May very heavy falls were recorded. This period of heavy rainfall may have made the river system unstable prior to the spawning and a further period of heavy rainfall during July may have affected the hatch of fry during the 1957 spawning season.

C. TROUT STOCK

The Motueka River itself appears to hold a fair number of trout, which are in all stages of growth, and fish from 5½" to 21", (4 lbs) were caught by experimental angling. The rate of catch of takeable fish was low at just over 0.25 fish per hour, but the total catch was about 0.46 per hour. The main river seems to be stocked with young fish. Several other fish were seen but not caught, ranging in size from fingerlings to about 5 lb.

The average condition factor of takeable fish was 35.5 with a minimum of 30, and a maximum of 44. The condition of the takeable fish was quite good for the time of year. Twelve undersized fish, which were not weighed, appeared healthy and in good condition.

The Wangapeka River appears to hold very few trout and during an examination of the river from the Dart confluence to past the Rolling River confluence, a distance of over five miles, only 12 trout were seen. These fish were all over 3 lbs in weight.

In the lower reaches, below the Dart, 3½ hours angling yielded one fish of 13½", with a condition factor of 42.

The Baton River also holds few fish, and from 6 hours angling, one fish of 16" - condition factor 38 - was caught. The general instability of the river and low fauna density makes the Baton unsuitable for trout.

The Motupiko River does not hold many trout despite the fact that the density

of the bottom fauna was found to be the highest in the system. The stream appears subject to floods and the bottom fauna population probably fluctuates considerably. Only one 2 lb fish was observed in this stream and a few fingerlings of 2-3" in a side channel.

The Tadmor River contains few resident trout. The number of bottom fauna is low and there is also a general lack of suitable cover and holding water.

Of the other smaller tributaries, none appear suitable for carrying a good stock of resident trout. Most of these streams either lack suitable holding water and cover or contain little trout food.

D. SPAWNING CONDITIONS

The spawning conditions in the Motueka system are poor for a system of its size. However, certain streams do offer fair spawning conditions and one or two others have small sections of suitable gravel. The best spawning conditions appeared to be in Blue Glen Creek, and the lower parts of Stanley Brook and the Dove River. Several hundred fry were observed in Stanley Brook and the Dove, but only a few fingerlings in Blue Glen Creek.

The Dove River bed seems to be a little too loose to provide ideal spawning gravel, but spawning should be successful provided no heavy floods are experienced. The Pokororo River, although apparently totally unsuitable for spawning, contained large numbers of fry and several fingerlings were also noted. It would appear that spawning takes place in pockets of gravel between the boulders. Limited beds of spawning gravel (for the first quarter mile) occur in the Orinoco Stream, at Ngatimoti. Several creeks off the Rainy River and parts of the Rainy itself, provide limited amounts of spawning gravel.

Spawning conditions in the Wangapeka, Baton and Motupiko systems generally, are poor owing to the instability and unsuitable nature of their beds. The Sherry and Pearce Rivers offer little or nothing in the way of spawning gravel, but the Tadmor has a few suitable patches between unstable areas, and spawning could take place successfully provided there was no major flood.

E. BOTTOM FAUNA

Bottom fauna samples were taken with a square foot bottom sampler in the Motueka, Motupiko, Tadmor, Wangapeka and Baton Rivers. A total of 145 samples were taken, the bulk of them in the Motueka.

Results are as follows:

Motueka River

One hundred and two samples were taken from the Motueka, 53 from Ripples and 49 from Flats and the bottom fauna density is light, with an average of 194 per square foot in the Ripples and 206 in the Flats. However, there are areas of greater density, generally in short stretches of the river where the bed is more stable, where up to 1,000 animals per square foot were found.

Motupiko River

A total of 19 samples were taken in this stream, 10 from Ripples and 9 from Flats. The Motupiko has the highest average number of animals per square foot (384) of the streams sampled, and the population was classed as moderate. The average number for the Ripples is 371 per square foot and 390 per square foot in the Flats.

Tadmor River

Eight samples were taken from the Tadmor, four each from Ripple and Flat. Bottom fauna is light in this stream with an average density of 175 per square foot.

Wangapeka River

Eight samples were taken from the river, four each from Ripples and Flats. Of the five rivers sampled, the Wangapeka had the lowest number of bottom animals, and they were classed as scarce in this river. The average for Ripples was 79.5 animals per square foot and 66 per square foot in the Flats. The overall average is 72.5 per square foot.

Baton River

Eight samples were also taken in the Baton River, four from a Ripple and four from a Flat. Bottom animals are scarce in the Baton, with an average of 88.5 in the Ripple and 96.5 in the Flat. The total average is 92.5 per square foot.

The density of the bottom fauna was rather low but the composition of the bottom fauna shows that it is a caddis, mayfly, diptera larvae fauna. The percentage of each group for each river and the dominant food animal in each group is given in Table II.

CONCLUSIONS AND RECOMMENDATIONS:

From the foregoing data, the following conclusions have been drawn:

1. The Motueka River carries a reasonable number of fish, but stocks in the major tributaries are low.

2. The trout stocks are limited by unsuitable bed conditions, light populations of bottom animals on which the trout feed and insufficient and often poor spawning conditions.

3. Provided no major floods occur in the next 3-4 years, the trout stock in the Motueka itself should show an increase.

Executed by: R. Boud,
Technical Field Officer

G.A. Eldon
Technical Field Officer

Supervised by: B.T. Cunningham
Acting Senior Fishery Officer

TABLE 1. Motueka System - Average Number of Animals per Square Foot.

	Ripple	Flat	Ripple/Flat
Baton River	88.5	96.5	92.5
Motupiko River	371	390	384
Tadmor River	176	174	175
Wangapeka River	79.5	65.8	72.5
Motueka River	194	206	197

TABLE II. Motueka System. Approximate percentage of groups and dominant bottom fauna.

River	No. of Samples	Caddis	Mayflies	Stoneflies	Beetles	Diptera	Rest
Baton	8	18% Hydroptilidae	51% *Deleatidium*	7%	1%	19% Chironomidae	5%
Motupika	7	44% Pycnocentroids	50% *Deleatidium*	6%	1%	1%	1%
Upper Motupika	12	44% Pycnocentroids	47% *Deleatidium*	2%	1%	4%	1%
Tadmor	8	20% Pycnocentroids	62% *Deleatidium*	5%	7%	5%	1%
Whangapeka	8	7%	46% *Deleatidium*	10%	1%	36% Chironomidae	1%
Motueka	96	26% Pycnocentroids	52% *Deleatidium*	5%	2%	14% Chironomidae	1%
Upper Motueka	6	25% Pycnocentroids	67% *Deleatidium*	2%	1%	5%	1%

MOTUEKA RV. & TRIBUTARIES