

great in volume as the previous one. No doubt the practice of burning off the natural vegetable covering on the hills, together with the burrowing of rabbits, has tended to augment the quantity of shingle entering the river since the advent of the white settler.

At the mouth the river is largely obstructed by a bar thrown up by the waves ; this, by damming up the flood-waters, tends to flood all the adjacent low-lying country. It is only relieved when floods burst through the bar and for a time enable the river to maintain an open channel.

HISTORY AND CONDITION OF EXISTING WORKS.

Old maps made when the Canterbury Development Company first explored the country show that the Orari flowed through a depression which can still be traced near the Geraldine Racecourse, and had no defined channel where it now flows below that point.

In 1871 the river overflowed its banks and threatened all the land lying to the south of its present course between the railway and the sea. During the following year the South Orari River District was constituted, and remedial measures were carried out, which up to the present have kept the river within its proper channel. Unfortunately, however, as previously mentioned, the Board has entirely neglected the work of maintenance.

In 1902 the river again overflowed its banks some miles higher up, near the bridge approaching Geraldine, and flowed into the Waihi and thence into the Haetaemoana, flooding the Town of Temuka and the intervening country. This threatened district was constituted the Upper Orari River District in 1903, and protective works were constructed, the results of which have been satisfactory.

Other threatened spots about two miles above the railway have been protected, but with works which cannot be regarded as likely to safely withstand a heavy flood.

Works were constructed many years ago on the northern bank some miles above the railway-bridge, probably by the Geraldine County Council, though no proper record of this could be found. These works appear to have proved entirely successful.

Unfortunately, willows have been used extensively in connection with protective works, and have not been kept within proper control. The lopping of willows was done in such a way that branches were allowed to float down the river and take root wherever they might. This has resulted in the river-bed becoming choked, so that it is now in places in a shocking condition, and insufficient to carry the flood-waters. In a river with fine shingle and silt, willows allowed to run broadcast in this manner are particularly harmful, as they take root and increase so rapidly. As the shingle buried the stumps of the older trees small shoots have sprung up around them, so that now the willow-stumps with their offshoots cannot be pulled out without the most drastic means being adopted.

Unfortunately, the Government has leased the bed of the river for grazing, permitting the erection of fences across the river-beds, these fences being frequently constructed with willow posts and stakes, all of which grow. The presence of the willows, and the islands which they have formed, have caused the river to attack its natural banks, and have greatly widened the bed by this erosion. This has provided a still wider field for the growth of willows, and has brought about the deposit of more shingle.

The bridges at present crossing the river at Geraldine and at Orari (both road and railway) appear to provide sufficient waterway to pass any flood that need be expected.

FLOOD AND FLOOD-DISCHARGE.

Owing to the fact that neither the County Council nor either of the River Boards has any accurate data, your Commissioners have found it impossible to calculate the volume of the largest floods that have been experienced.

Evidence showed that heavy floods occurred in February, 1868 ; in 1892 ; December, 1902 ; and December, 1911. The flood of 1868 was probably the greatest that has ever been recorded, as, although there were then no willows or gorse in the river-bed, nor stop-banks erected, the flood-waters covered a large area of country. It is recorded that sheep from Rockapuka were deposited in the streets of Temuka.