

The area of the whole river-basin is 1,600 square miles; the area of the basin above Mangaweka is 1,059 square miles, and the area of the bush in basin above Mangaweka is 390 square miles. Seeing that 669 square miles out of 1,059 square miles above Mangaweka are already open country, the felling of the bush will not greatly affect the floods in this river—not nearly so much as it will in the Wanganui and Wangaehu Rivers.

In the valley below Bull's there was a very high flood about 1847, but even the highest point it reached was below this one, and at that time the river-bed there was very much smaller than at present. The oldest Natives never heard of or saw any flood at all approaching this one. An old Native at Parawanui remembered a very high one when he was a boy, but its mark, with a smaller bed, was below this one. Mr. A. R. Mackay, county engineer, Rangitikei, before fixing upon the design for the Vinegar Hill Bridge, counted the rings on some totara on a flat above the site. From these he computed the age of the trees at about three hundred years. At the Easter flood all this flat, an area of about ten acres, was completely swept away. As the river here runs in a gorge, this is almost proof that no such flood has occurred on this river for three hundred years. At many places above that small flats have been scoured completely away, many of them being covered with bush containing trees of great size and age. Nearly all the lowest terraces were covered throughout the course of the river, and many of the sharp bends entirely scoured away—the river now running where forest stood, and the old channels being piled high with shingle.

From the pug-like appearance of the water at the height of the flood, and judging by the deposits of silt on the flats, especially near the mouth of the river, the quantity of solid material carried down by the river must have been enormous. Unfortunately, no samples of the water were kept, or it might have been computed approximately.

The quantity of timber brought down was also wonderful. The ocean-beach for many miles is piled high with stacks of timber; even on Kapiti many logs were stranded, and others travelled as far as Cook Strait. Many trees came down—branches, roots, and all—just as they grew. This is not at all extraordinary when it is considered that probably 100 acres of green forest were carried away. As an instance of the tremendous power of the water, a "monkey" weighing a ton was lost at the Mangaweka bridge-site on the 31st January by a sudden flood, and was found after the Easter flood, at a point fully 30 chains down the river. It was found perfectly bare, but some of the men think it was attached to a spar by a piece of chain.

The fall of the river-bed at the Mangaweka Bridge site is 20 ft. 6 in. a mile. The following table will give an approximate idea of the general inclines:—

Position.	Approximate Height above Sea-level.	Mileage from the Sea (scaled).	Fall per Mile in Feet.
Kakariki Bridge W.L.	198	20	9·9
Vinegar Hill	554	43	15·5
Makohine	630	48	15·2
Otara	700	51	23·3
Mangaweka	854	57	25·8
Hautapu Junction	1050	65	24·5

The discharge at height of flood at Mangaweka Bridge was about 232,000 cubic feet per second.

The heights of flood-level (taking the average surface of the water in flood) above the ordinary levels at the following places were:—

	Ft.	in.
Hautapu Bridge, Turangarere*	12	3
Hautapu Bridge, Taihape*	12	4
Moawhango wire-bridge*	28	0
Mangaweka Bridge, Rangitikei River*	28	0
Otara Bridge site*	20	5
Vinegar Hill Bridge	30	6
Kakariki	15	0
Bull's	15	0

* These are marked by posts, as per instructions 16,331 of 13th May, 1897.

In the gorge of the Moawhango flood-marks were noticed up to a height of 60 ft., heights of 40 ft. being frequent.

The Kawatau was also extremely high. As to the damage done by this flood, it will be advisable to deal separately with the special kinds of damage—(1) Damage in the way of loss of stock and property; (2) damage in the way of slips, washouts, &c.; and (3) damage in the way of loss and injuries to bridges.

Damage in the way of Loss of Stock and Property.

Above Mangaweka no damage of any consequence has been done except the washing-away of a wool-washing plant at Moawhango, and at Mr. Birch's on the Rangitikei River. From Mangaweka downwards there has been damage more or less all the way, increasing in intensity towards the mouth of the river. Many of the low-level flats have been washed away, and most of those remaining have been covered with a coating of silt up to 2 ft. in depth.

As near as I can estimate, there were about 1,200 acres covered with water from Bull's upwards, and about 13,000 acres from that point downwards. Most of the country below Parawanui was covered by a perfect sea of waters, there being very few points which were sufficiently above flood-level on which to secure the stock.