1878. NEW ZEALAND.

DAMAGE DONE TO PUBLIC WORKS BY THE RECENT FLOOD IN THE CLUTHA RIVER

(REPORT ON THE).

Laid on the Table by the Hon. Mr. Macandrew, with the leave of the House.

Mr. Blair to the Hon. the Minister for Public Works.

Sir,— Wellington, 21st October, 1878.

In accordance with your instructions to procure a report on the damage done to public works by the recent flood in the Clutha River, I have the honor to submit the following, compiled from information telegraphed me by Mr. Ussher, Resident Engineer, Dunedin:—

information telegraphed me by Mr. Ussher, Resident Engineer, Dunedin:—
Immediately on receipt of your instruction Mr. Ussher proceeded to Clyde viá Naseby, then, as the road to Queenstown was impassable, he followed down the Clutha River and went to the Lake District viá Invercargill.

As information on the subject was wanted in the least possible time this report must not be taken as complete, or absolutely correct in every particular. With your permission I purpose to have a detailed report prepared, as a permanent record of this the greatest flood that has occurred since the settlement of Otago.

BRUCE COUNTY.

The following is an approximate estimate of the damage done to public works:—

	Roads	—including	Small	Bridges.			0
Road and street, Kaits	angata	•••				\pounds $1,150$	£
Kaitangata to Coal Po	oint			•••		200	
Road and streets, Stir.	ling					200	
Stirling to Balclutha	•••					700	
Total da	mage to re	ads	•••	•••	* • •		$2,\!250$
		Bridge	es.				
Matau Bridge (moiety	/)					100	
Balclutha "						6,000	
Total da	mage to b	ridges		•••	• • •		6,100
		River Wor	ks, &c.				
Flood channel and gat				•••		300	
Punt	•••			• • •		100	
Total da	mage to ri	iver works	***	•••			400
Total da	mage to p	ublic works	in Bru	ce County	•••		£8,750

The piers of the Matau Bridge only are injured; they will require to be strengthened. In the Balclutha Bridge two of the piers, the draw-bridge, and all the superstructure of the suspension spars, except one, are carried away. The end spars and the anchorages are however intact, and it is supposed that the remaining piers can be repaired.

CLUTHA COUNTY.

The following is an approximate esti	imate of th	e damage	edone to pr	iblic woi	'ks:	
•			-			£
Roads, including small bridges,	river-bank	road, Inc	ch Clutha			2,000
Interior roads, Inch Clutha				• • •		5,000
Streets in Balclutha	•••	•••		• • •		5,100
					-	
Total damage to r	oads				£	12.100

		£				
Matau Bridge (moiety)	•••	•••	•••	•••	•••	100
Balclutha Bridge (moiety)	•••		•••	•••	•••	6,000
Puerua Bridge and approaches	•••	•••	•••	•••	•••	750
Total damage to b	•••	£6,850				
	River Wor	rks.				£
Embankments on Inch Clutha		500				
Protective works at Balclutha, re	o d		6,000			
Total damage to ri	ver works	•••	•••	•••	•••	£6,500
	Buildi	ngs.				£
Post Office and Courthouse, Bal	clutha	• • • •	•••	•••	•••	200
Schoolhouse, Inch Clutha	•••	•••	•••	•••	•••	500
Total damage to be	uildings		•••	•••	•••	£700
Total damage to p	ublic works	in Clut	ha country	···	£	26,150

The second item above given, £5,000 for roads on Inch Clutha, is practically only a guess, as a large portion of the island is still under water, but from all appearances it is not too large.

The main bridges in this county connect it with the Bruce County, so they have already been

referred to under that head.

The sum for protective works at Balclutha does not represent the actual damage done, but the amount required to prevent further encroachments on the town by the river.

TUAPERA COUNTY.

The damage done to public works in the Tuapeka County is estimated approximately as follows:—

							æ
Roads and small bridges							3,800
Teviot (Roxburgh) Bridge					•••		7,200
Beaumont Bridge				• • •			8,000
						_	
Total damage	to p	ubli c wor ks	in Tuap	eka Coun	ty	$\mathbf{\pounds}$	19,000

The Teviot Bridge, which was one of the finest looking structures in Otago, had masonry abutments and a laminated timber arch of 174 feet span. The superstructure is all gone, and the abutments are very much injured.

The Beaumont Bridge was erected by private enterprize, under an arrangement with the Provincial Government of Otago. It was a timber truss, resting on masonry abutments and piers.

Not a vestage of it remains.

£5,000 was voted by Parliament last year for the purchase of the Beaumont Bridge, and negotiations thereon were pending between the County Council and the proprietors, Mr. Kitchen, at the time of the flood, but I understand the purchase was not completed.

VINCENT COUNTY.

The following is an approximate estimate of the damage done to the public works, roads, and tracks, including small bridges:—

•							æ
Cromwell to Kirtleburn			***	***			1,500
Kirtleburn to Cardrona	(track)			•••			250
Bendigo to Lindis		•••	•••	***			3,000
Cromwell to Alberton		•••	•••	•••	•••		1,000
Clyde to Lauder Creek					• • •		200
Cromwell to Nevis			•••			• • • •	300
Nevis to Upper Nevis					•••		500
Tinkers to Drybread							100
Alexandra to Boundary	Creek	•••	•••	•••	•••		300
Cameron's to Clyde	•••	•••		•••	•••		200
Clyde to Nevis		•••	•••	•••	•••		500
Watson's to Roughridge	·		***	•••	•••		200
Bendigo to Logan Town							50
Rocky Point to Hawea			•••	•••	•••	•••	250
Alberton to Hawea		•••	***	•••	***	•••	200
Total dame	age to ro	ads	•••		•••	•••	£8,550

				Bria	lges.				£
Clyde Brid	ge								8,000
Bannockbu	rn E	Bridge							2,000
$\operatorname{Tinkers}$									100
Thompson's	s foo	tbridge							25
Nevis							•••		70
Fraser's				•••					45
Rocky Poin	ıt Br	idge, app:	roach	es					200
Cromwell I	3 ri \deg	e, abutme	ents	•••			•••		250
	\mathbf{T}	otal dama	ge to	bridges		, 	•••	£	10,690
				Pun	ts.				£
Alexandra j	punt			•••	•••				150
${f Bendigo}$	- ,,			•• -	•••		•••		150
Alberton	,,	•••					•••	•••	150
	To	otal dama	ge to	punts		•••		•••	£450
				Miscell	aneous.				£
Removing a	nd r	e-erecting	Clyd	le Hospital		•••	•••	• • •	300
	To	otal dama;	ge to	public work	s in Vin	cent Cour	ıt y	£	19,990

The damage to roads consists chiefly in slips that have buried or carried away the roads in the steep sidlings along which they are made.

The smaller bridges have been almost entirely carried away, but the abutments of the Clyde Bridge remain. The original structure of the Cromwell Bridge is uninjured, the damage done being to the anchorage for the suspension ropes built a few years ago. The river at the Rocky Point Bridge seems to have a tendency to make a new channel for itself clear of the bridge. If this takes place it will entail an extra expenditure of £2,000 or £3,000 in lengthening the bridge or constructing protective works.

LAKE COUNTY.

An approximate estimate of the damage done to public works in the Lake County is as follows:—

Roads and	Tracks,	including	Bridges.			£
Kirtleburn to Morven Ferry	•••					7,000
Morven Ferry to Arrowtown, with		ver Arrow	River			1,570
Arrow to Lower Shotover, with be			•••			2,000
Shotover Hill Road						500
Frankton to Queenstown						600
Queenstown to Arrow viâ Arthur'	s Point					$1,\!450$
Queenstown to Shotover Bridge						3,500
Queenstown to Moke Creek and I	Moonlight					80 0
Queenstown to Head of Lake						500
Frankton to Kingston						550
Road to Arrowtown Reefs						3,000
Arrow Valley tracks						400
Arrow to Cardrona and Pembroke		•••				950
Pembroke to head of Lake Wanal	ra					5 50
Arrow to Matatapu						100
Greenstone to Kinlock						70
Greenstone to Hollyford					• • •	500
Hollyford to Jamestown						900
Kingston to Athol						500
Dart Valley Road and Tracks						500
Streets in Queenstown						1,000
Total damage to	o public w	orks in La	ake Coun	t y		26,940

The damage above estimated consists chiefly of slips in sidling ground, as in Vincent County, the most serious one being at the Nevis Bluff, where an immense quantity of rock has come down. This will completely close up the road between Queenstown and Cromwell for dray-traffic for a long time. At present it is scarcely passable for foot passengers.

SUMMARY AND RECOMMENDATIONS.

The following is an abstract of damage done to public works in the various counties:—

					-	
Bruce-Roads				 	 $2,\!250$	
Bridges			•••	 	 6,100	
Various				 	 400	
	Total in	Bruce	County	 	 	8,750

Clutha—Roads			,				12,100	
Bridges							6,850	
Various					•••		$7,\!200$	
		Clutha (County	***				26,150
Tuapeka—Roads		***			***		3,800	
Bridge		···· .				• • • •	$15,\!200$	
		Tuapeka	County	•••				19,000
Vincent—Roads			•••	•••		· · · ·	8,550	
Bridge		• • •	•••	•••	• • •		10,690	
Variou	-	***	· · ·	•••	•••	• • •	700	
		Vincent	County	•••	• • •	• • •	20.010	19,990
Lake—Roads and				•••	•••	• • •	26,940	00010
	Total in	. Lake Co	unty	•••	***	•••		26,940
	Total da	ımage to p	public wo	rks	•••		£	100,830

Some of the damage above stated was liable to have occurred any year, so there is no necessity to make special provision for making it good. Leaving out these ordinary contingencies, the following will represent the amount of extraordinary damage which could not reasonably be foreseen or calculated on :-

								£
Bruce Co	unt	y	•••	 				8,000
Clutha	,,	•••		 		• • •		25,000
Tuapeka	,,			 		•••		18,500
Vincent	17			 ••	•••	•••		18,000
Lake	,,		•••	 	•••			23,500
						•		
		Total		 	•••		ة	£93,000

Before proceeding to restore the works that have been damaged it is necessary to consider whether any improvement can be made in their location or character, and whether some of them may not be dispensed with altogether.

The line of the roads and positions of most of the smaller bridges in all the counties cannot well be altered, but I think instead of rebuilding the Clyde Bridge in its old site a new bridge should be erected near Alexandra. A bridge at this place is much wanted, and there is no necessity for two within seven or eight miles of each other. The piers of the Clyde Bridge might be utilized for a foot or horse-bridge.

The district on the northern side of the Clutha at Roxburgh (Teviot) is not yet closely settled, and there are considerable facilities for crossing the river by ferries, so I do not think there is an

urgent necessity for the restoration of the bridge at present.

The unprecedented height of the flood in the Clutha and its tributaries show that the bridges crossing them must be built higher and stronger than has hitherto been considered necessary; the estimate of damage done cannot therefore be taken as the cost of restoration. Allowing for this, and leaving out the Teviot Bridge, I estimate the cost of making good the damage as follows:

									£
Bruce Co	unt	у	•••	•••		•••	•••	•••	11,000
Clutha	,,		•••	•••		•••		•••	29,000
Tuapeka	"	***	•••	•••	***	***	•••		15,000
Vincent	,,	•••	•••	•••	•••	•••	•••		24,000
\mathbf{L} ake	,,	•••	•••	•••	•••	•••	•••	•••	24,000
		Total	•••	•••	•••		•••	₺	103,000

I have, &c.,

The Hon. the Minister for Public Works.

C. W. BLAIR, Commissioner, Middle Island.

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