

# Discharge Gauging Data for the Manuherekia Catchment

Prepared for the Otago Regional Council, July 2020.

*Prepared By*

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As part of a review of the available flow gauging data in the Manuherekia catchment, main stakeholders and known organisations who may possess gauging data in the main stem, headwaters, or tributaries of the catchment were approached. Preliminary enquiries identified gauging data was held by NIWA (Appendix 1 and 2), Otago Regional Council (Appendix 3), and Landpro Ltd (the latter in part overlaps with gaugings commissioned by the ORC; Appendix 4). Enquires were made to other potential providers, with approaches made to Boraman Consulting, and Water Resource Ltd/University of Otago (Appendix 5).

Of the flow gauging data that has been sourced, it has been identified that:

1. Gauging data held by NIWA is easily accessible if it is collected for a continuous flow measuring site. If not, it is classed as miscellaneous and each gauging is entered into a gauging register and the gauging details are often not included (see: Appendix 1). NIWA has this register based in Alexandra from at least 1992 and possibly earlier. If gauging data was required and it is not in the register, then the options are to go to NIWA in Christchurch and hunt through the boxes of miscellaneous gauging cards or they may be in the NIWA Alexandra office in boxes of miscellaneous gauging cards. Appendix 2 is likely taken from that register in the year 2000 by Mike Butler;
2. Acquisition of all the data held by NIWA is not feasible within a short time frame, as the index data provided does not indicate reach numbers or flow site numbers and will require considerable time and cost to recover;
3. There have been 6 longitudinal runs down the main stem of the Manuherekia collected in late spring to late summer (Table 1; Appendix 3);
4. There are longitudinal runs down the main tributaries of Thompsons Creek, Lauder Creek, and the Poolburn (Table 1);
5. Discrete data and longitudinal runs (< 5) exist for Chatto Creek (Appendix 3);
6. There are limited data collected during the non-irrigation season, so data collected during the austral spring and summer are affected by takes, by-wash, and return flows.

Of the data that has been identified in this preliminary survey, it is recommended that the use of any flow data should be directed to gauging sites with at least 5 discrete surveys as there is limited applicability of time-instantaneous flow data at discrete points of time, when index metadata is not available to determine the conditions of data collection, season of data collection, or the reliability of data collection. Of the data available, the locations with at least 5 discrete flow gaugings are summarised in Table 1, and spatial distribution illustrated in Figure 1.

Table 1: Gauging Locations in the Manuherekia Catchment from known sources where more than 4 gaugings have been identified. Data sources: ORC, Landpro, NIWA, University of Otago.

Location	Easting	Northing	Dates	No.
<b>Thomsons Crk</b>				
u/s Diversion Weir	1329270	5012619	2018–2020	8
d/s Diversion Weir	1330093	5012029	2018–2020	10
Glassford Road Bridge	1332108	5010192	2018–2020	8
Mawhinney Road	1332108	5010192	2019–2020	8
Ophir	1331783	4999382	< 2000	27
<b>Lauder Crk</b>				
Cattle Yards	1332396	5016576	2016–2020	31
Lauder Crk at Weir	1333968	5015308	2018–2020	16
Glassford Rd Paddock	1337625	5013626	2017–2020	23
Glassford Road Bridge	1338874	5012855	2017–2020	27
Lauder Flat Rd	1340599	5011087	2017–2019	18
SH85	1339968	5008117	2018–2019	19
U/s Manuherekia Confluence	1338380	5005404	2018–2019	15
At Rail Trail	1338994	5006341	2018–2019	18
Gravel Pit	1340677	5010997	< 2000	22
<b>Chatto Creek</b>				
Chatto Pub SH85	1325515	4995376	< 2000 2018,	29
<b>Manuherekia Main Stem</b>				
Manuherekia Longitudinal Gaugings (23 Sites)			2018, 2019 2020	6
Above Falls Dam	1355963	5037122	< 2000	13
Becks	1344878	5012401	< 2000	14
Galloway	1319759	4985668	< 2000	36
<b>Poolburn</b>				
Gorge	1341481	5007095	< 2000	19
Longitudinal Surveys (7 sites)			2016–2017	12
<b>Hopes Crk</b>	1328908	4974664	< 2000	5
<b>Scrub Creek</b>	1343059	5034611	< 2000	5
<b>Raggedy</b>	1332184	4998582	< 2000	5
<b>Scrubby Gully Crk</b>	1347993	4998097	< 2000	5
<b>Pass Crk</b>	1343160	5033410	< 2000	5

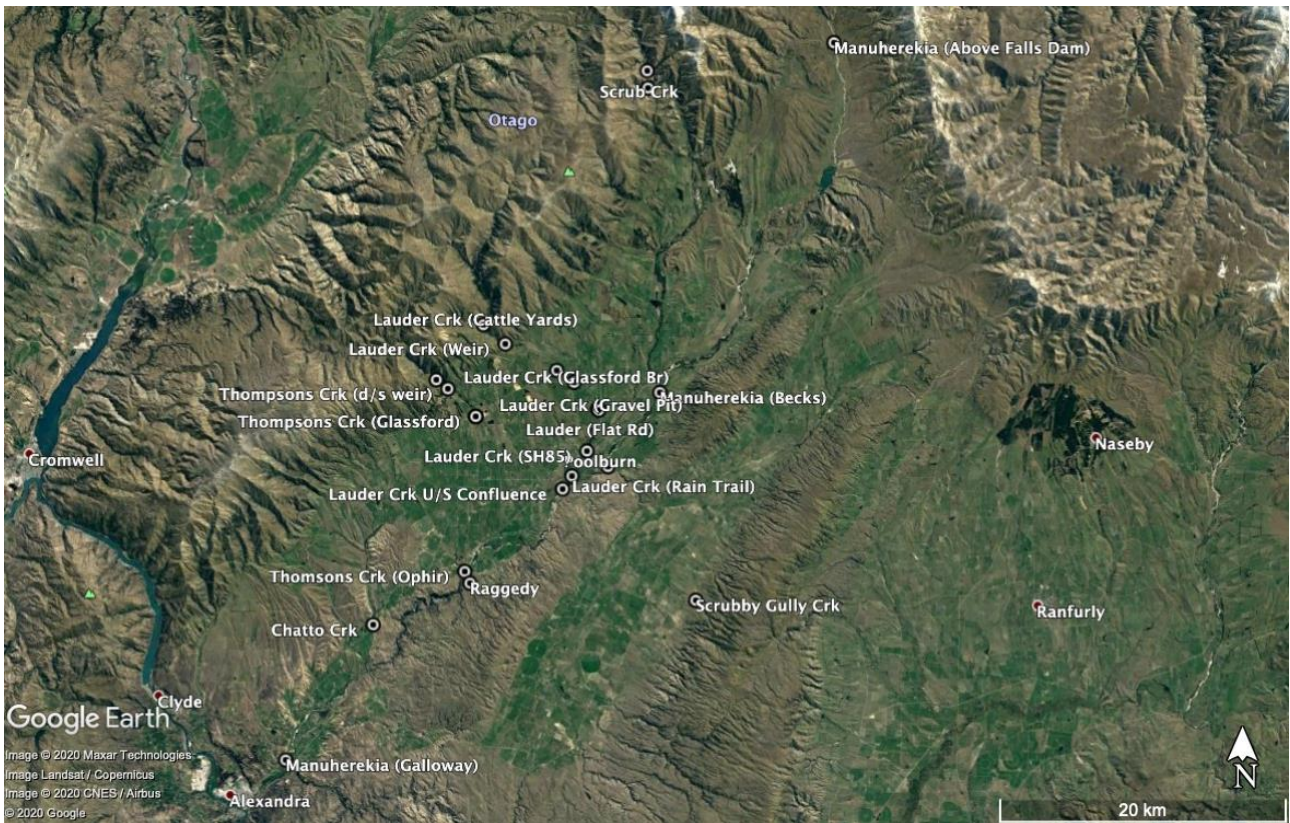


Figure 1 – Location of gauging locations with more than 4 repeated flow measurements in the Manuherekia catchment.

### Recommendation for Directing Future Work

- There is a considerable database of gauging data but the majority of it is likely to be of no value to the Manuherekia model. While considerable time could be spent on extracting these data, it is recommended that the modellers identify the likely useful data for use in the model so that the extraction of these data can be done in a timely manner, and useless data is not collated for no meaningful purpose.
- Part (b) of the gauging data part of this study requires “Collation, analysis and interpretation of the gauging data to develop an understanding of sub-catchment contributions, longitudinal changes and correlations between sites. Includes documentation”. This part cannot be done until the likely usable data have been identified. Therefore, a timely response from the modellers is needed.

Dave Stewart, Rain Effects Ltd

Sarah Mager, University of Otago

6 July 2020



**GAUGING REGISTER**

Form GR (9/2/07)

Number	Date	Time	River	Site	G.H. (mm)	Discharge (l/s)	Dev. (%)	Sedi. (y/m)	Plotted by	TRANSFER DISK Number	TRANSFER DISK Date	LOCAL ARCHIVE Filled by	LOCAL ARCHIVE Date
ORC A7223	22/1/04	1030	LINDIS	W/S PRESS BARRAGE	—	1421	—	—	—	—	—	—	—
ORC A7224	22/1/04	1915	LINDIS	LINDIS P/L	850	1559	-0.7	N	MJS	421	11/2	MJS	26/2
ORC A7225	22/1/04	1315	TIMBERN W/L	W/S SANDS RE DEC.	—	4	—	—	—	—	—	—	—
ORC A7226	22/1/04	1215	TIMBERN	WEST BRANCH	—	210	—	—	—	—	—	—	—
ORC A7227	22/1/04	1040	CARDRONA	MT BARK	238	1214	2.8	N	MJS	422	12/3	MJS	15/3
ORC A7228	26/1/04	1145	CARDRONA	LEICHO'S GYRAN.	—	—	—	—	—	—	—	—	—
ORC A7229	26/1/04	1345	CARDRONA	CALLAGHAN	—	—	—	—	—	—	—	—	—
ORC A7230	26/1/04	1500	CARDRONA	MAROU RD BR	—	—	—	—	—	—	—	—	—
ORC A7231	26/1/04	1025	CARDRONA	SNG & BR	—	—	—	—	—	—	—	—	—
ORC A7232	26/1/04	1138	CARDRONA	CLYDE CONFL.	—	—	—	—	—	—	—	—	—
ORC A7233	26/1/04	1330	CARDRONA	Meadowstone Ave	—	—	—	—	—	—	—	—	—
ORC A7234	26/1/04	1420	CARDRONA	SH89	—	—	—	—	—	—	—	—	—
ORC A7235	26/1/04	1510	CARDRONA	mt Hopping	—	—	—	—	—	—	—	—	—
ORC A7236	27/1/04	1200	NEVIS	Westcoast Stn	1603	5189	0.0	N	MJS	421	11/2	MJS	26/2
ORC A7237	28/1/04	1230	Manuherikia	Below Falls Dam	980	1357	-6.1	N	MJS	421	11/2	MJS	26/2
ORC A7238	28/1/04	1430	Manuherikia	D/S Forks	1079	3291	6.9	N	MJS	421	11/2	MJS	26/2
ORC A7239	29/1/04	1035	POMAHIA	HUKAREKE	—	808	—	—	—	—	—	—	—
ORC A7240	29/1/04	1050	POMAHIA	HUKAREKE RD BR	—	N/A	—	—	—	—	—	—	—
ORC A7241	29/1/04	1150	LEITHEN BURN	LEITHEN BR	—	157	—	—	—	—	—	—	—
ORC A7242	29/1/04	1255	HEBROT BURN	WADDSIE CUT RD	—	12	—	—	—	—	—	—	—
ORC A7243	29/1/04	1400	POMAHIA	POMAHIA	—	1412	—	—	—	—	—	—	—
ORC A7244	29/1/04	1500	WAIKIKIHI CK	POMAHIA	—	136	—	—	—	—	—	—	—
ORC A7245	29/1/04	1015	POMAHIA	BURKE BR	—	N/A	—	—	—	—	—	—	—
ORC A7246	29/1/04	1100	WAIWERA	SH1 BR	—	214	—	—	—	—	—	—	—
ORC A7247	29/1/04	1330	WAIWERA STM	CURTON RD	—	74	—	—	—	—	—	—	—

*Appendix 1 – Low flow gaugings curated by Mike Butler (as known by March 2000); held by NIWA.*

<b>Site</b>	<b>Map Ref.</b>	<b>Number of Gaugings</b>
Thompsons Crk	S134:332778	4
Thompsons Crk	S125:299803	2
Thompsons Crk @ Ophir	S134:356632	27
Thompsons Crk @ MHBr	S23:336364	1
Manuherikia West Branch	S125:609071	3
Manuherikia East Branch	S125:610091	3
Manuherikia @ Above Falls Dam	S125:628040	13
Manuherikia @ Omarama Br	S23:363404	2
Manuherikia @ Becks	S134:502772	14
Manuherikia @ Galloway	Various (refer cards)	36
Poolburn @ Gorge	S134:464714	19
Poolburn @ U/S Confluence	Refer Cards	2
Lauder Crk @ Gravel Pit	S134:456757	22
Lauder Crk @ Hamilton Rd	S134:436777	3
Chatto Crk @ SH85	S134:287589	29
Dunstan Crk @ MHBr	S23:349379	1
Campbell Crk	S134:219654	4
Neds Crk	S134:250695	4
Hopes Crk	S144:320362	5
Scrub Crk	S125:487015	5
Little Valley Crk	S144:265330	4
Idaburn Crk	Various	7
Raggedy Crk	S134:361623	5
Scrubby Gully Crk	S134:533615	5
Pass Crk	S125:488002	5
Beggs Crk	S125:302810	2
Hut Crk	S126:673968	4
Rocks Crk	S125:597024	3
Devonshire Crk	S134:294729	4
Browns Crk	S125:512950	2
Maori Crk	S134:467511	3
Moa Crk	S144:410413	4
Big Bremner Crk	S125:647050	3
Cairnhill Crk	S134:512757	1
Woolshed Crk	Various	3
St Bathans Crk	S125:458083	1
Lauder Crk	S125:373811	4

Appendix 2 – Known gaugings data held by Otago Regional Council (as of July 2020)

Location	Easting	Northing	Dates	No.
Forks	1355062	5038922	2019	2
Delta 1	1356132	5028609	2019	2
Delta 2	1356491	5028487	2019	2
Loop Rd	1351615	5022364	2019	2
D/s Blackstone	1350042	5017482	2019	3
Manuherikia u/s of confluence	1344738	5012990	2019	2
Dunstan d/d of Omakau take	1344184	5021291	2019	2
Beattie Rd	1344701	5018551	2019	2
Dunstan Ck @ 150 u/s of confluence	1344597	5013037	2019	2
Manuherikia u/s of Lauder confluence	1338368	5005090	2019	2
Ophir	1331839	4999099	2019	3
d/s Chatto	1325200	4991984	2019	4
Keddell Rd	1321797	4989191	2019	4
Galloway	1319776	4985698	2019	4
Camping ground	1317653	4982994	2019	4
<b>Thomsons Crk</b>				
u/s Diversion Weir	1329270	5012619	2018–2020	8
d/s Diversion Weir	1330093	5012029	2018–2020	10
Glassford Road Bridge	1332108	5010192	2018–2020	8
Mawhinney Road	1332108	5010192	2019–2020	8
Omakau Race			2020	2
SH85	1331591	4999536	2018	1
<b>Lauder Crk</b>				
Cattle Yards	1332396	5016576	2017–2020	31
Lauder Crk at Weir			2018–2020	16
Glassford Rd Paddock	1337625	5013626	2018–2020	23
Glassfore Road Bridge	1338874	5012855	2017–2020	27
Lauder Flat Rd	1340599	5011087	2017–2019	18
SH85	1339968	5008117	2018–2019	19
U/s Manuherikia Confluence	1338380	5005404	2018–2019	15
At Rail Trail	1338994	5006341	2018	1
Below Omakau weir	1333875	5015285	2018	1
<b>Dunstan Creek</b>				
U/s Loop Rd	1346593	5026075	2018	1
D/s Dunstan Downs Take	134229	5021747	2018	1
D/s Omakau Irrigation Scheme	1344218	5021107	2018	1
Beattie Rd	1344763	5018664	2018	1
d/s Phil Smiths take	1344004	5014214	2018	1
SH85 U/s Confluence	1344587	5013000	2018	1
Browns Creek	1345456	5028723	2018	1
<b>Chatto Creek</b>				
Chatto Pub SH85	1325515	4995376	2018, 2020	4
Kinney Road	1324916	4998689	2018, 2020	4
u/s Manuherikia Confluence	1325168	4992124	2018, 2020	4

Chatto Creek at Moutere Road Bridge	1325838	5003938	2018	1
U/s Neds Creek			2020	3
U/S of Buster Creek Confluence			2020	3
At Moutere Disputed Spur Rd			2020	3
Young Hill Creek at Moutere Disputed Spur			2020	3
Young Hill Creek at Moutere Station Farm			2020	3
Young Hill Creek at SH85			2020	3
Young Hill Creek U/s Duck Pond			2020	2
Buster Creeek U/S of Confluence			2020	3
Manuherekia Longitudinal Gaugings Sites			2018, 2019, 2020	6

### *Appendix 3 – Summary of Gaugings held by Landpro Ltd*

#### Chatto Creek Catchment:

- Headwater gaugings (Younghill, Campbell, Laheys, Neds Creek, Buster Creek, Devonshire Creek) summer 19/20 focused on capturing low flows in key tribs of Chatto Creek Catchment. 3-4 rounds of spot gaugings. Landpro manages flow monitoring site on Ned's Creek for ORC.
- Devonshire Creek/Chatto Creek longitudinal assessment x2 (spring and summer) from u/s of upper most intake on Devonshire creek to Moutere-Disputed Spur Road bridge, 4-5 gaugings each run upstream/downstream of irrigation takes and key tribs.
- ORC longitudinal gaugings on Young Hill (d/s Moutere Station to Manuherikia confluence) and Chatto Creek (d/s Moutere-Disputed Spur Road to Manuherikia confluence). 3 runs 19/20 season to capture low flows.

#### Main stem Manuherikia:

- Set of longitudinal gaugings carried out 18/19 (17/18 ??) for OWRUG.

#### One-off gaugings (possible repeats) on the following waterways:

- Dunstan Creek Catchment
  - Dunstan Creek (Beattie Road)
  - Pleasant Valley Creek
  - Shepherds Creek
  - Unnamed trib Dunstan Creek
- Becks Creek
- Black Bush Creek
- Chandlers Creek
- Manor Burn
  - Hopes Creek (4 gaugings for rating development for temporary continuous flow monitoring site U/S of Manor Burn Confl on behalf of Manuherikia Catchment Group)
  - Little Valley Creek
  - Little Valley Creek (West Branch)
  - Bickerstaffe Creek
  - Speargrass Creek
  - Mt Campbell Creek



*Appendix 4 – Longitudinal Gaugings in Poolburn by University of Otago / Water Resource Management Ltd. Source: Jackson (2018).*

Flow Gauging Sites with continuous flow measurement from October 2016–Feb 2018, rated with monthly flow gaugings (14).

1. Webster Lane
2. Dundass Lane
3. Rutherford Land
4. Ida Valley/Omakau Rd
5. Noonies Rd
6. McNally Rd
7. Auripo Rd (also rated to Manuherekia at Ophir)