

Scenario 1. Business as usual

Overview

The ‘business as usual’ scenario, known as Scenario 1, brings together existing policy, practice and investment relevant to land and water management in the Ruamāhanga whaitua as of late 2016. Scenario 1 provides information on the outcome of existing practices if they were modelled out into the future. This provides a basis from which the outputs of any other scenario can be compared to see how much could be lost or gained by taking an alternative pathway in the future of land and water management in the Ruamāhanga whaitua.

The assumptions of Scenario 1 are detailed below. At times, the likely implementation of a management practice is uncertain or is based on limited information, in which case this is noted.

Assumptions

Model framework

Modelling timeframes

The model will be run to produce outputs at defined timeframes: 2025, 2040 and 2080.

Population and land use change

Using the medium projected population growth figures, the combined population of Masterton, Carterton and South Wairarapa districts is expected to grow by 4.2% over thirty years, from 42,390 in 2013 to 44,150 in 2043¹. This translates to annual growth rates of 0.6% in Carterton and 0.2% in South Wairarapa, in the period to 2043, with Masterton experiencing no growth.

No land use change associated with population growth has been factored into the baseline scenario. However, some land use change is likely to occur, in particular from farming to rural lifestyle. Typically conversion to rural lifestyle land use is associated with lower contaminant inputs, particularly of nutrients, and possibly higher water take and use – interpreting the scenario outputs should be considered in this light.

Current rural land use has been established through mapping by GWRC in 2014, based on data from a range of sources². Dairying is estimated to cover around 24 100ha of the whaitua (Parminter and Grinter, 2016). The effective area in dairy production has grown by approximately 1% since 1998/99, though the total milk solids in produced in the region has increase by 26% since 2007.³ Land use for exotic forestry is anticipated to remain static. The modelling assumes a sediment load from forestry land use that is averaged across whole planting to harvesting cycle.

In the absence of systemic pressures or drivers of land use change across the whaitua, current land uses are assumed to be static for the purposes of Scenario 1.

¹ From Estimated resident population figures for Masterton, Carterton and South Wairarapa districts from the Statistics New Zealand Local Population Trends tables, part of the Subnational Population Projections (2013(base)–2043): http://www.stats.govt.nz/browse_for_stats/Maps_and_geography/Geographic-areas/local-population-trends.aspx. Retrieved 12.09.2016

² See GWRC document [CMPRUAMAHANGA-9-53](#) (Environment_Sci_Whaitua_Land_Use_External_Data Description)

³ Based on data from the [Annual New Zealand Dairy Statistics](#) produced by Dairy New Zealand and LIC.

Resource management policy and practice

Water take and use

Minimum flows, minimum water levels and core allocation amounts in the proposed Plan determine how much water remains in rivers, lakes and groundwater and how much is taken and used. Numbers in the attachments relate to management units used in the proposed Plan. If comparison with other scenarios is needed, management units can be amended to be consistent with freshwater management units applied in other scenarios.

Minimum flows and water levels are a type of limit in the proposed Plan that determines when some water takes must cease or reduce. These “hands off” flows and levels and their locations are identified for the Ruamāhanga River and key tributaries (Attachment 1) and Lake Wairarapa (Attachment 2). The maximum operating level (i.e. the level at which the lake must be lowered) for Lake Wairarapa is 10.3m.⁴ In the proposed Plan taking water from rivers, lakes and groundwater directly connected to surface water must cease at minimum flows and lake levels with the following exceptions:

- group and community water supply
- groundwater
- an individual’s reasonable domestic needs and the reasonable needs of an individual’s animals
- permitted activities

The amount of water that can be taken by communities for water supply below minimum flows is given in Attachment 3. The amount of groundwater that can be taken below minimum flows is also given in Attachment 3.

Estimates of water taken for stock and domestic use and other permitted activities are given in Attachment 4 together with core allocations for consented water takes from rivers, Lake Wairarapa and groundwater directly connected to surface water. Core allocations (allocation limits) are the maximum amounts of water that can be taken by resource consents within a management unit Attachment 5 gives core allocation amounts for groundwater not directly connected to surface water currently available under the proposed Plan.

Two water takes not accounted for in the attachments are the general permitted activity rule and water for rootstock protection. No information is available on how much water is taken under the general permitted activity rule. Some water for rootstock protection can become available 5 days after minimum flows are reached. Amounts for this purpose can be allocated through resource consents and are likely to be small.

Schedule R of the proposed Plan provides for stepdown allocations in specified rivers. Stepdown allocations may require water takes to cease or be reduced as flows approach the minimum flow. For modelling purposes it is appropriate to follow the guideline for stepdown allocations in Table R1 of Schedule R (Attachment 6).

⁴ See the Lake Wairarapa Wetlands Management Guidelines 1991 http://www.gw.govt.nz/assets/council-reports/Report_PDFs/2005_617_2_Attachment.pdf

Wastewater discharges

PNRP policy directs that discharges from wastewater treatment plants (WWTPs) are progressively moved to land over time. The percentage volume of discharges that go to land from each of the five major WWTPs in the whaitua is shown in Table 1 below – the remaining volumes are discharged directly to water. The small wastewater treatment system at Lake Ferry is not taken into account in the BAU scenario on the assumption that it is only be a very small contributor to overall catchment contaminant loads.

Under existing resource consents, the Masterton and Carterton WWTPs currently discharge partially to land (see Table 1).⁵ For the Masterton WWTP, an identified \$37 million investment for 2030-35 in the Masterton District Council 30 year Asset Management Plan 2015-2045 provides for a further upgrade to the plant allowing for near complete discharge to land before 2040.⁶ For Carterton, the discharge regime is assumed to reach 35% of volume by 2025, and 60% of volume by 2080.

Under resource consents granted till 2051, the Martinborough and Greytown WWTPs currently discharge only to water, but the discharge is progressively moved to land by 2035 and 2039 respectively (except for when flows in the Ruamāhanga River are above 3x median flow). For the purposes of the modelling, it is assumed this means the full volume of wastewater is discharged to land. Proportions of the volume discharged to land are shown in Table 1.⁷ For all three WWTPs owned by the South Wairarapa District Council, anticipated capital expenditure on upgrades to the plants is shown in their Infrastructure Strategy.⁸ The Featherston WWTP currently discharges to water; it is assumed that this continues over the full course of the model.

Table 1. Percentage volume of discharges from WWTP to land

WWTP Consent number	% volume to land by			Notes
	2025	2040	2080	
Masterton WAR090066	Summer: 60 Winter: 5	Summer: 100 Winter: 80	Summer: 100 Winter: 97	Discharge to water only when only when river flow is >12.3m ³ /s (1 Nov-30 Apr) and greater than 6.15m ³ /s (1 May - 31 Oct), at Wardell's Bridge
Carterton WAR090120	35	35	60	No discharge to water unless receiving water is above 3x median ⁹ . No discharge to water 1 Jan and 31 Mar
Greytown WAR080254	20	100	100	After 2039, no discharge to water ¹⁰
Martinborough WAR120258	24	100	100	After 2035, no discharge to water ¹⁰
Featherston WAR970080	0	0	0	

⁵ See email from Philip Evans, 14.10.2016 ([ENPL-6-1135](#)); Dave Grittings, 17.10.2016 ([ENPL-6-1137](#)).

⁶ See <http://www.mstn.govt.nz/planning/ltp/WasteWaterAMPPartB2015Final.pdf>

⁷ See email from Lawrence Stephenson, 17.10.2016 ([ENPL-6-1136](#)).

⁸ See http://www.swdc.govt.nz/sites/default/files/LTP%202015_2025%20SWDC.pdf, page 131-166

⁹ There are some narrow exceptions to this under the current consent WAR090120 [27252] condition 2.

However, these are anticipated to cater for emergencies only.

¹⁰ Consent conditions allow discharge to water at flows >3x median in the Ruamāhanga River. However, for the BAU scenario, it is assumed there is no discharge to water after 2039 and 2035 respectively.

On-farm practice

On-farm practice is assumed to currently be a basic level of good management practice (GMP) for all land users in the whaitua. GMP is encouraged by the PNRP (Policy P65) but is not regulated by a regional rule (with the exception of stock exclusion, see below). For dairy, dairy support and sheep and beef farming operations, GMP is bundled and described as 'Tier 1' practices in Muirhead (in press). Information from GWRC Land Management staff indicate that activities identified as medium (Tier 2) and hard (Tier 3) in Muirhead (in press) are currently not widely undertaken within the catchment, confirming that Tier 1 is a fair representation of current practice.

It should also be noted that GWRC works with land owners to produce Intensive Farming Plans for farms across the valley floor (see Attachment 8). These plans are voluntary and identify environmental mitigation practices for activities specific to a farm to be carried out in timeframes specific to the farmer. As such, contaminant reductions from these plans are very difficult to estimate and have not been accounted for as part of Scenario 1.

For the purpose of Scenario 1, the practices defined in Muirhead's (2016) as Tier 1 have been applied from the start of the modelling timeframe. While some change in practice is reasonable to expect over the course of the model, it is uncertain and unclear what this might mean under the current environment, and no other practice is factored into the model.

Stock exclusion from water bodies

Rules for stock exclusion from fresh and coastal water bodies are directed by Rule R97 of PNRP. By 2018, all stock will be excluded from highly valued waterways (Category 1 water bodies), except that sheep may enter significant wetlands. By 2022, all cattle, farmed deer and farmed pigs will be excluded from lowland streams >1m, large drains, water races, estuaries, lakes and trout spawning areas (Category 2 water bodies), and dairy cattle may not enter any stream (lowland or hill country) of >1m width. Definitions of Category 1 and 2 waterbodies and indicative identifications of these are given in Attachment 7. The PNRP rules are further supported by non-regulatory programmes¹¹ to provide financial support to land owners to fence and undertake riparian planting Category 1 and 2 waterbodies within the timeframes in Rule R97.

For the purposes of the modelling, 100% compliance with these rules is assumed by 2025. While stock exclusion may be achieved through a number of methods, for the purposes of Scenario 1 it is assumed to be achieved through fencing. This may produce a scenario result with higher costs than could be expected in reality; results should be interpreted with this in mind.

Riparian planting

Riparian planting occurs in many areas across the whaitua as part of private, community and publically funded projects, including under the GWRC Riparian Programme.¹⁰ While this programme contains priorities for areas to receive support in riparian restoration, reductions in contaminant loads from these and other riparian planting efforts in the whaitua are too difficult to establish. Consequently, no riparian planting is modelled as part of the BAU scenario. However, it will be useful

¹¹ GWRC's Riparian Programme (2016 implementation programme [here](#)) and Wetland Programme (2016 implementation plan [here](#))

in interpreting the scenario modelling results to recognise that under the BAU some riparian planting will occur, and that the benefits of this will include increased stream shading, reduced bank erosion and improved ecosystem health.

Sediment management

Sediment mitigation works in the whitua are carried out by the GWRC's Land Management team through the WRECI programme and Afforestation Grant Scheme¹². A key part of these works is to help develop and assist in the implementation of Hill Country Plans for management of sediment on erosion prone areas, particularly in the Eastern Hills. Sediment treatment under these plans involves reversion, afforestation and space planting (typically of poplars). Once fully implemented, farm plans incorporating these treatments have an estimated sediment reduction factor of 70% (see Hawley and Dymond, 1988, Hicks 1995 – cited in Schierlitz et al 2006). The current rate of treatment of erodible land under Hill Country Plans in the Ruamāhanga whitua is 135ha/year of space planting and 18ha/year of afforestation or reversion. These rates are assumed to continue and not change for the length of the scenario run. Erosion prone country covered by a Hill Country Plan is shown in Attachment 8.

¹² See <http://www.gw.govt.nz/wreci-strategy/> and <http://www.gw.govt.nz/Afforestation-Grant-Scheme/>

References

Muirhead R. in press. *On farm mitigation modelling for the Ruamāhanga Whaitua Committee.*

Parminter T and Grinter J. 2016. *Farm-scale Modelling Report – Ruamāhanga Whaitua Collaborative Modelling Project.* MPI Report No: 2016/TBC. Prepared for the Ruamāhanga Whaitua Committee and Greater Wellington Regional Council by Terry Parminter (KapAg) and Jess Grinter (MPI), July 2016.

Schierlitz C, Dymond J and Shepherd J. 2006. *Erosion/sedimentation in the Manawatu catchment associated with scenarios of Whole Farm Plans.* Landcare Research Contract Report: 0607/02. Prepared for Horizons Regional Council, September 2006.

[https://www.horizons.govt.nz/HRC/media/Media/One%20Plan%20Documents/Schierlitz-C,-Dymond-J-and-Shepherd-J-\(2006\)-Erosion-sedimentation-in-the-Manawatu-Catchment-associated-with-scenarios-of-Whole-Farm-Plans.pdf?ext=.pdf](https://www.horizons.govt.nz/HRC/media/Media/One%20Plan%20Documents/Schierlitz-C,-Dymond-J-and-Shepherd-J-(2006)-Erosion-sedimentation-in-the-Manawatu-Catchment-associated-with-scenarios-of-Whole-Farm-Plans.pdf?ext=.pdf)

Attachment 1: Table 7.1 of the PNRP: Minimum flows for rivers in the Ruamāhanga River catchment

River		Management point	Minimum flow (L/s)
Kopuaranga River upstream of the confluence with the Ruamāhanga River		Palmers	270
Waipoua River upstream of the confluence with the Ruamāhanga River		Mikimiki Bridge	250
Waingawa River upstream of the confluence with the Ruamāhanga River		Kaituna	1100
Parkvale Stream upstream of the confluence with the Ruamāhanga River		Renalls Weir recorder	100
Mangatarere Stream	upstream of Belvedere Road Bridge	Gorge recorder	240
	Between the confluence with the Waiohine River and the Belvedere Road Bridge	Gorge recorder	200
Waiohine River upstream of the confluence with the Ruamāhanga River		Gorge recorder	2300
Papawai Stream upstream of the confluence with the Ruamāhanga River		Fabians Road recorder	180
Upper and Middle Ruamāhanga River upstream of the confluence with the Waiohine River		Wardells	2400
Otukura Stream upstream of the confluence with Dock/Stonestead Creek		Weir recorder	95
Tauherenikau River upstream of Lake Wairarapa		Gorge recorder	1100
Lower Ruamāhanga River between the boundary with the coastal marine area and the Waiohine River confluence		Waihenga recorder	8500

Attachment 2: Table 7.2 of the PNRP: Minimum lake levels and minimum water levels for Lake Wairarapa

Time period	Minimum Lake levels at Burlings recorder	Minimum water levels
1 December to 29 February	10.15 m	For the purpose of allocating water, minimum water levels in Lake Wairarapa shall be determined by: (i) minimum lake levels, and (ii) the minimum flow for the Tauherenikau River in Table 7.1 of the PNRP, and (iii) no net decline in lake level over the preceding five days.
1 March to 31 May	10.00 m	
1 June to 30 September	9.95 m	
1 October to 30 November	10.00 m	

Attachment 3: Water allocated in resource consents below minimum flows

Management sub-unit	Water allocated below minimum flow	
	Community water supply (L/s) ¹³	Category A groundwater (L/s) ¹⁴
Waipoua River and directly connected groundwater	NA	20
Waingawa River and directly connected groundwater	Masterton – 324 L/s when Waingawa @ Kaituna < 1900 L/s	76.4
Upper Ruamāhanga River and directly connected groundwater	NA	Summed below in row for Middle (and Upper) Ruamāhanga River and directly connected groundwater
Mangatarere Stream and directly connected groundwater	Carterton – 80 L/s	61.2
Waiohine River and directly connected groundwater	Greytown/Featherston – 100 L/sec when Waiohine @ Gorge <3040 L/s, max. 60 L/s) when Waiohine @ Gorge <2300 L/s	219.1
Papawai Stream and directly connected groundwater	Greytown – 60 L/s	78.5
Middle Ruamāhanga (and Upper) Ruamāhanga) and directly connected groundwater	NA	481.4
Huangularua River and directly connected groundwater	NA	21
Lower Ruamāhanga River and directly connected groundwater	Martinborough – 90 L/s	634
Otukura Stream and directly connected groundwater	NA	50.5
Tauherenikau River and directly connected groundwater	NA	157

¹³ Based on resource consent conditions for Masterton, Carterton, Greytown, Featherston and Martinborough water takes

¹⁴ See GWRC file document [ENPL-6-1005](#) (Water take data for Cat A at minimum flow)

Attachment 4: Core allocation and permitted activity allocation amounts for surface water and directly connected groundwater

Management unit	Management sub-unit	Core allocation (consented) (L/s) ¹⁵	Permitted activities	
			Stock and domestic use (L/s) ¹⁶	Existing farm dairies for wash down (L/s) ¹⁷
Ruamāhanga River and directly connected groundwater	Kopuaranga River and directly connected groundwater	180	17	6.5
	Waipoua River and directly connected groundwater	145	10.5	
	Waingawa River and directly connected groundwater	1,197	0.5	
	Upper Ruamāhanga River and directly connected groundwater	1,200	15	
	Parkvale Stream and directly connected groundwater	151	10.5	18
	Booths Creek and directly connected groundwater	109		
	Mangatarere Stream and directly connected groundwater	473	19.5	
	Waiohine River and directly connected groundwater	1,590	1.5	
	Papawai Stream and directly connected groundwater	340	1.5	
	Middle Ruamāhanga River and directly connected groundwater	1,240	48.5	
	Huangarua River and directly connected groundwater	110	15.4	4.5
	Lower Ruamāhanga River and directly connected groundwater	2,447	22.2	
Lake Wairarapa, tributaries and directly connected groundwater	Otukura Stream and directly connected groundwater	140	9.9	12
	Tauherenikau River and directly connected groundwater	410	0.5	

¹⁵ Derived from GWRC Water Allocation Calculator, pers comm Stephen Thawley. At August 2016

¹⁶ See GWRC file document [ENPL-9-659](#) (Permitted activity analysis – stock and domestic takes below min flow)

¹⁷ See GWRC file document [ENPL-6-1334](#) (Estimating farm dairy water takes for the BAU)

Attachment 5: Core allocation for groundwater not directly connected to surface water

Upper Ruamāhanga management sub-units	Groundwater allocation amount (m³/year)
Te Ore Ore category B groundwater (groundwater not directly connected), Te Ore Ore category C groundwater	813,000
Waingawa category B groundwater (groundwater not directly connected), Waingawa category C groundwater	1,900,000
Ruamāhanga category B groundwater (groundwater not directly connected), Ruamāhanga category C groundwater	3,550,000
Middle Ruamāhanga management sub-units	Groundwater allocation amount (m³/year)
Fernhill-Tiffen category B groundwater (groundwater not directly connected)	1,200,000
Taratahi category B groundwater (groundwater not directly connected), Taratahi category C groundwater	1,400,000
Parkvale category B groundwater (groundwater not directly connected). Parkvale category C groundwater	350,000 [confined] 2,162,000 [unconfined]
Mangatarere category B groundwater (groundwater not directly connected), Mangatarere category C groundwater	2,548,000
Lower Ruamāhanga management sub-units	Groundwater allocation amount (m³/year)
Tauherenikau category B groundwater (groundwater not directly connected)	6,600,000
Lake Category B groundwater (groundwater not directly connected), Lake Category C groundwater	6,750,000
Huangularua category B groundwater (groundwater not directly connected)	650,000
Martinborough category C groundwater	980,000
Dry River category B groundwater (groundwater not directly connected)	650,000
Onoke category C groundwater	2,100,000

Attachment 6: Table R1, Schedule R of the PNRP: Stepdown allocations for rivers in the Ruamāhanga River catchment

River	Minimum flow (L/s)	Flow at which takes shall cease other than for the health needs of people or stock drinking water (water races) (L/s)	Flow at which takes shall reduce (L/s)	Management point
Waipoua River	250	NA	300	Mikimiki Bridge
Waingawa River	1100	1700	1900	Kaituna
Parkvale Stream	100	NA	120	Renalls Weir Recorder
Mangatarere Stream	[upper reach] 240	NA	[upper reach] 30	Gorge Recorder
	[lower reach] 200		[lower reach] 40	Gorge Recorder
Waiohine River	2300	3040	NA	Gorge Recorder
Upper Ruamāhanga River	2400	NA	2700	Wardells
Tauherenikau River	1100	1300	NA	Gorge Recorder
Lower Ruamāhanga River	8500	NA	9200	Waihenga Recorder

Attachment 7: Category 1 and 2 surface water bodies in the Ruamāhanga whaitua

Definitions in the Proposed Natural Resources Plan

<p>Category 1 surface water body</p>	<p>Category 1 surface water body includes, and is limited to:</p> <ul style="list-style-type: none"> (a) sites with significant mana whenua values identified in Schedule C (mana whenua), and (b) inanga spawning habitat identified in Schedule F1b (inanga spawning habitats), and (c) habitats for indigenous birds in rivers identified in Schedule F2a (birds-rivers) (d) estuaries identified in Schedule F4 (coastal sites), and (e) significant natural wetlands greater than 0.1ha identified in Schedule F3 (significant wetlands), and (f) outstanding water bodies identified in Schedule A (outstanding water bodies), and (g) within 1,000m upstream of a surface water abstraction site for a community drinking water supply shown on Map 26.
<p>Category 2 surface water body</p>	<p>Category 2 surface water body includes, and is limited to:</p> <ul style="list-style-type: none"> (h) estuaries other than those identified in Schedule F4 (coastal sites), and (i) within the mapped lowland areas shown on Map 29, rivers that have an active bed width of 1m or wider, and drains greater than 1m wide, and water races, and (j) rivers and streams important to trout spawning habitat identified in Schedule I (trout habitat), and (k) natural lakes, <p>but excludes any surface water body that meets the definition of a Category 1 surface water body.</p>

Locations of Category 1 and 2 water bodies in the Ruamāhanga whaitua

All schedules and maps referenced are those in the Proposed Natural Resources Plan.

Category 1 water bodies

(a) sites with significant mana whenua values

- Lake Onoke
- Papawai Stream
- Pukengaki, Waiohine-Ruamāhanga confluence
- Te Para, Te Para Stream
- Te Ahikouka, Ruamāhanga River
- Parakuiti, Ruamāhanga River
- Kourarau Stream and Reservoir
- Mangaakuta
- Waipoua-Ruamāhanga confluence
- Henley Lake
- Makoura Stream
- Makakaweka Stream
- Mangawhero Stream
- Matewera, Waipoua River
- Kohekutu pa and Kairangi Stream, Kopuaranga River confluence
- Tirohanga, Ruamāhanga River
- Te Tirohanga o Hineteorangi ke te motu ki a Kāpiti (Hidden Lakes)

- Hapua Korari (lost lake)

All sites identified in Schedule C5 and mapped in Map 7.

(b) inanga spawning habitat (river mouths)

- Lake Onoke
- Lake Pounui stream
- Whangamoana Stream

All sites identified in Schedule F1b and mapped in Map 14.

(c) river habitats with significant indigenous biodiversity values

- Ruamāhanga River in two sections (between Rathkeale College and Te Ore Ore Bridge, and between Wardell's bridge to Gladstone Bridge)
- Waingawa River (between Totara Park Drive to confluence with Ruamāhanga River)
- Waiohine River (between railway bridge and SH2 bridge)

All sites identified in Schedule F2a (birds-rivers) and mapped in Map 16.

(d) estuaries with significant indigenous biodiversity values in the coastal marine area

- Lake Onoke

All sites identified in Schedule F4 and mapped in Map 19.

(e) significant natural wetlands >0.1ha in Schedule F3

(f) outstanding water bodies (Schedule A)

- Lake Wairarapa
- Allen/Lowes Bush
- Eastern Lake Wairarapa wetland
- Lake Pounui wetlands

All sites identified in Schedule A and mapped in Map 1.

(g) 1km upstream surface water abstraction site for a community drinking water supply

- Waingawa Stream
- Kaipatangata Stream
- Huangarua River
- Waiohine River (Moroa Water Race)
- Boar Creek
- Tait's Stream

All sites listed in Schedule M1 and mapped in Map 26, including location of abstraction points.

Category 2 waterbodies in the Ruamāhanga whaitua

Category 2 water bodies exclude any water body already listed as a Category 1 water body. The list below has not removed these yet.

(a) Estuaries other than those in Schedule F4

None in the whitua

(b) Within the river valley (mapped as lowland areas in Map 29), all:

1. Rivers with active bed >1m

2. Drains of width >1m

3. Water races

- Carrington
- Longwood
- Moroa
- Opaki
- Taratahi
- Te Ore Ore

All water races mapped in Map 28.

(c) Rivers with important trout spawning habitat

- Ruamāhanga River
- Kopuaranga River
- Waipoua River
- Mikimiki Stream
- Te Mara Stream
- Kiriwhakapapa Stream
- Wakamoekau Creek
- Waingawa River
- Blakes Stream
- Atiwhakatu Stream
- Tauweru River
- Kourarau/Tupurupuru Stream
- Waiohine River
- Mangatarere Stream
- Enaki Stream
- Kaipatangata Stream
- Beef Creek
- Papawai Stream
- Huangarua River
- Whangaehu Stream
- Ruakokoputuna River

All sites identified in Schedule I and mapped in Map 22.

(d) Natural lakes

- Lake Pounui

Attachment 8 – Coverage of Hill Country Plans

