

## Summary report for Ruamāhanga Whaitua Committee

### Soils and Land Use Capability of the Ruamāhanga catchment

#### Soils

The Ruamāhanga catchment contains a range of soil types, reflecting variations in parent material composition and texture, age of soil development, climate, landscape position and drainage (Sorensen 2012). The soils of the Tararua Range are ‘steepland soils’: due to the steep slopes and high rainfall the soils are generally unstable, shallow loams. The soils of the eastern hill country are derived from soft marine sedimentary rock (mudstone, sandstone and limestone) and are generally very erodible and shallow, and are prone to severe soil moisture deficits during periods of low rainfall.

The soils of the Ruamāhanga valley (i.e., the Wairarapa plains) are mostly derived from the greywacke, mudstone, sandstone and limestone alluvium transported by the rivers. The New Zealand Land Resource Inventory (NZLRI) identifies 50 soil types within the central Wairarapa area. These are grouped into the general orders in Table 1 and Figure 1 as described in Sorensen (2012)<sup>1</sup>. The soil drainage properties, along with fertility and local climate conditions, have a large impact on land use capability and the extent the land can be irrigated.

**Table 1: Main soil orders of the Ruamāhanga valley and plains**

Soil order	Land area within the whaitua (ha)	Location	Description
Recent (well drained)	17,017	Recent alluvial floodplains – parallel to most of the Ruamāhanga River and its western tributaries	Derived from alluvium, comprises deep stony sands that are well to excessively-well drained
Recent (poorly drained)	29,706	River flats and terraces – where overbank deposits occur; particularly east of Lake Wairarapa in the lower Ruamāhanga floodplain	Slow-draining, silty soils representative of flood deposits
Pallic	96,028	Undulating land on the eastern side of the valley, and around Martinborough	Characteristic of areas which are very dry in summer. Drainage may be slow with potential for waterlogging during wet seasons
Brown	197,884	Low foothills of the Tararua Range and older alluvial terraces generally west of the Ruamāhanga River. Also includes the dune sand-derived soils immediately east of Lake Wairarapa	Silt loams, stony silt loams and hill soils; moderately well drained to well drained
Gley	8,146	Parkvale, Battersea – areas that were previously swampy depressions prior to artificial drainage	Organic rich, poorly drained and very poorly drained soils generally occurring where the

<sup>1</sup> The ‘recent’ soil order shown in Table 1 and Figure 1 has been divided into ‘well drained’ and ‘poorly drained’, based on Hawke et al. (2000).

			water table is/was high
Organic	828	Peaty areas that were once wetlands, mainly occur in localised pockets near Lake Wairarapa	Soil is dominated by organic matter and generally have slow drainage

Note that map in Figure 1 is based on the NZLRI and may differ slightly from S-map, which is the new national soils database. Soil mapping using the S-map system has been undertaken in the lowland parts of the Wairarapa Valley and was completed in about 2011 and so represents the most up to date soil information in the valley. S-map integrates existing reports and digital information and updates soil maps where existing data are of low quality.

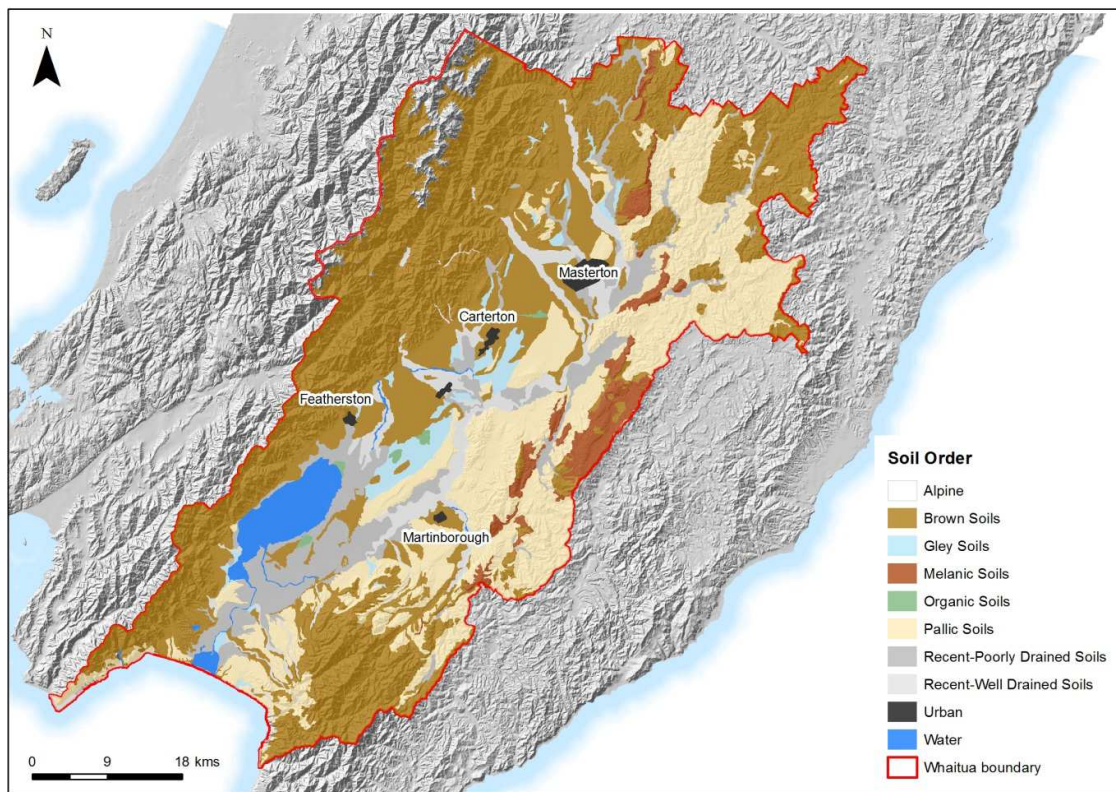


Figure 1: Soil orders of the Ruamāhanga catchment. Source: Sorensen (2012)

### Land use capability

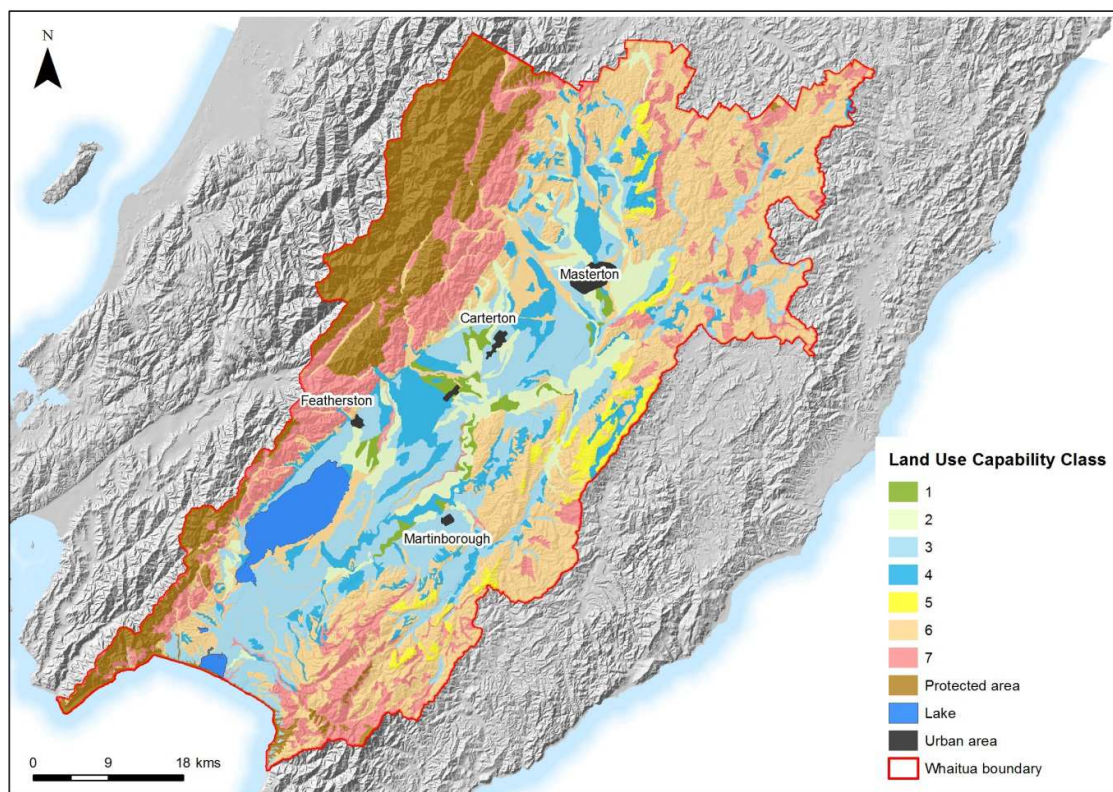
The NZLRI identifies the capacity of land for sustained agronomic production, referred to as land use capability (LUC). LUC classification is an assessment of the land's capacity for sustained productive use, while taking into account physical limitations, including climate, soil conservation needs and management requirements (Lynn et al. 2009, cited in Sorensen 2012). There are eight LUC classes, with Class 1 having the fewest limitations to use and the highest versatility of use (Table 2).

Figure 2 shows the LUC classification in the Ruamāhanga catchment. The catchment's most versatile soils occur in LUC classes 1 and 2 and tend to be located within the recent flood plains of the Waiohine River (in the vicinity of Greytown) and the middle reaches of the

Ruamāhanga River. The remainder of the Ruamāhanga valley is generally classed as LUC 3 and 4. The least versatile soils occur in LUC classes 5 to 8 and are found in the eastern hills and Tararua Range. As shown by Figure 2, the Ruamāhanga catchment contains the largest area of land under LUC classifications 1 to 3 in the Wellington region.

**Table 2: Increasing limitations to use and decreasing versatility of use from LUC Class 1 to LUC Class 8 (Lynn et al. 2009, sourced from Sorensen 2012)**

Increasing Limitations to Use ↓	LUC Class	Arable Cropping Suitability*	Pastoral Suitability	Production Forestry Suitability**	General Suitability	Decreasing Versatility of Use
	1	High	High	High	Multiple Use Land	
	2					
	3					
	4	Low	Low	Pastoral or Forestry Land		
	5					
	6	Unsuitable	Low	Low		
	7					
8	Unsuitable	Unsuitable	Catchment Protection			



**Figure 2: Distribution of soils by LUC Class in the Wellington region according to the NZLRI**

## More information

Greater Wellington Regional Council monitors soil quality at several sites in the Ruamāhanga catchment. The results are reported on annually and are available on the Greater Wellington Regional Council's website ([www.gw.govt.nz](http://www.gw.govt.nz)). The most recent report assessing long-term trends in soil quality throughout the region was completed in 2012 (Sorensen 2012) and can also be found on the website.

## References

Hawke R., McConchie J. and Watts L. 2000. *Wairarapa Irrigation Study: soil classification and characterisation*. Research Report 8. School of Earth Sciences, Victoria University of Wellington.

Heine J.C. 1975. *Interim report on soils of Wairarapa Valley, New Zealand*. New Zealand Soil Bureau Record 40. Department of Scientific and Industrial Research, Wellington, New Zealand.

Lynn I.H., Manderson A.K., Page M.J., Harmsworth G.R., Eyles G.O., Douglas G.B., Mackay A.D. and Newsome P.J.F. 2009. *Land use capability survey handbook: a New Zealand handbook for the classification of land*. 3rd ed. AgResearch, Hamilton. Landcare Research, Lincoln. GNS Science, Lower Hutt.

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