



Takaka Catchment Soils and Land Use

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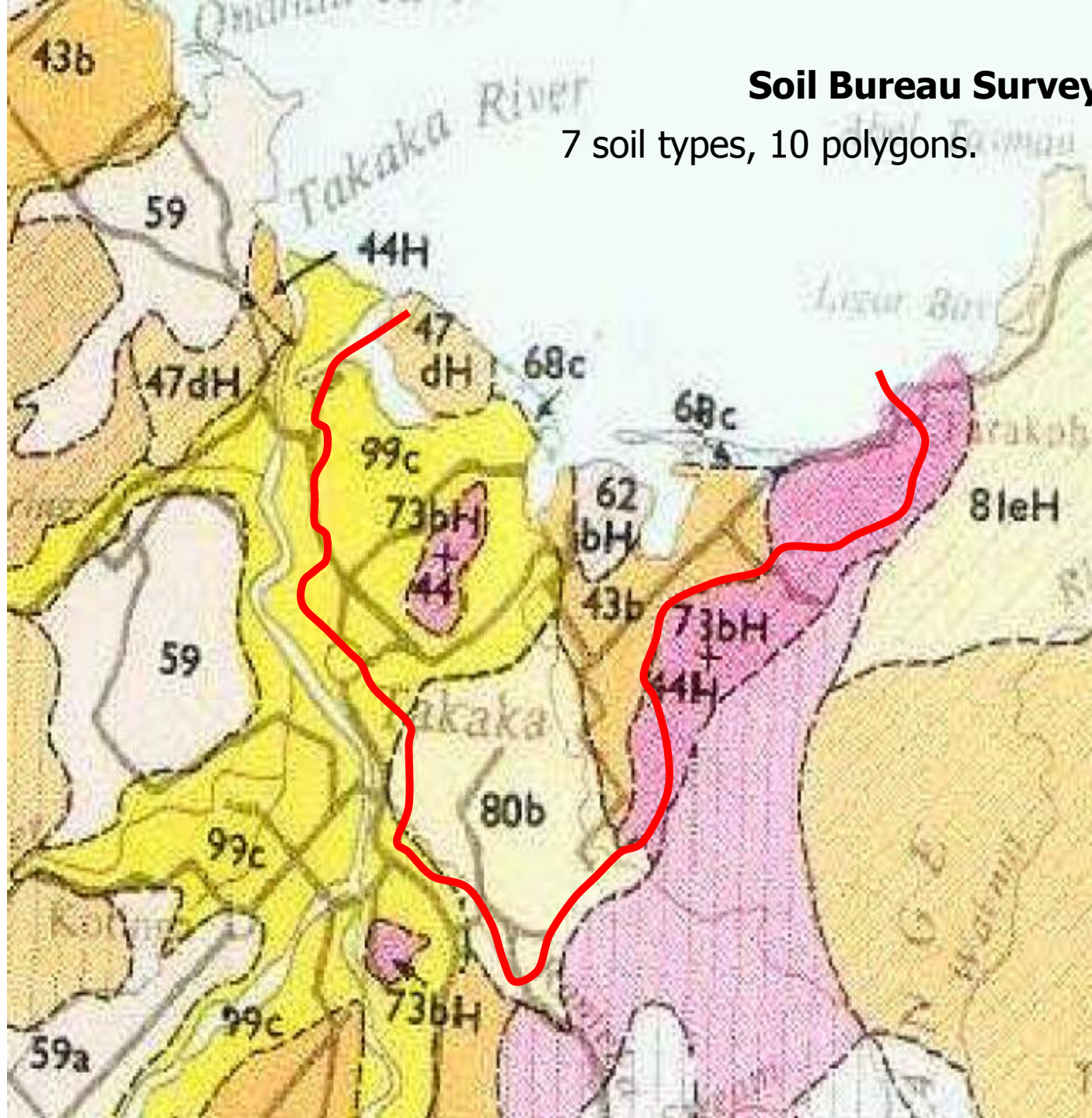
22 August 2014

Takaka Soils: Available Information

- Published information from the Fundamental Soils Layer based on Soil Bureau Bulletin 27 (1968),
- Updated 1977 with the NZLRI project.
- In 2005 Council began more detailed soil mapping for the Takaka Valley and Puramahoi Plains
 - New data is to a 1:10,000 scale more suitable for property level use
 - Allows for remapping of land productivity classifications and soil versatility mapping
 - Provides soil water holding capacity

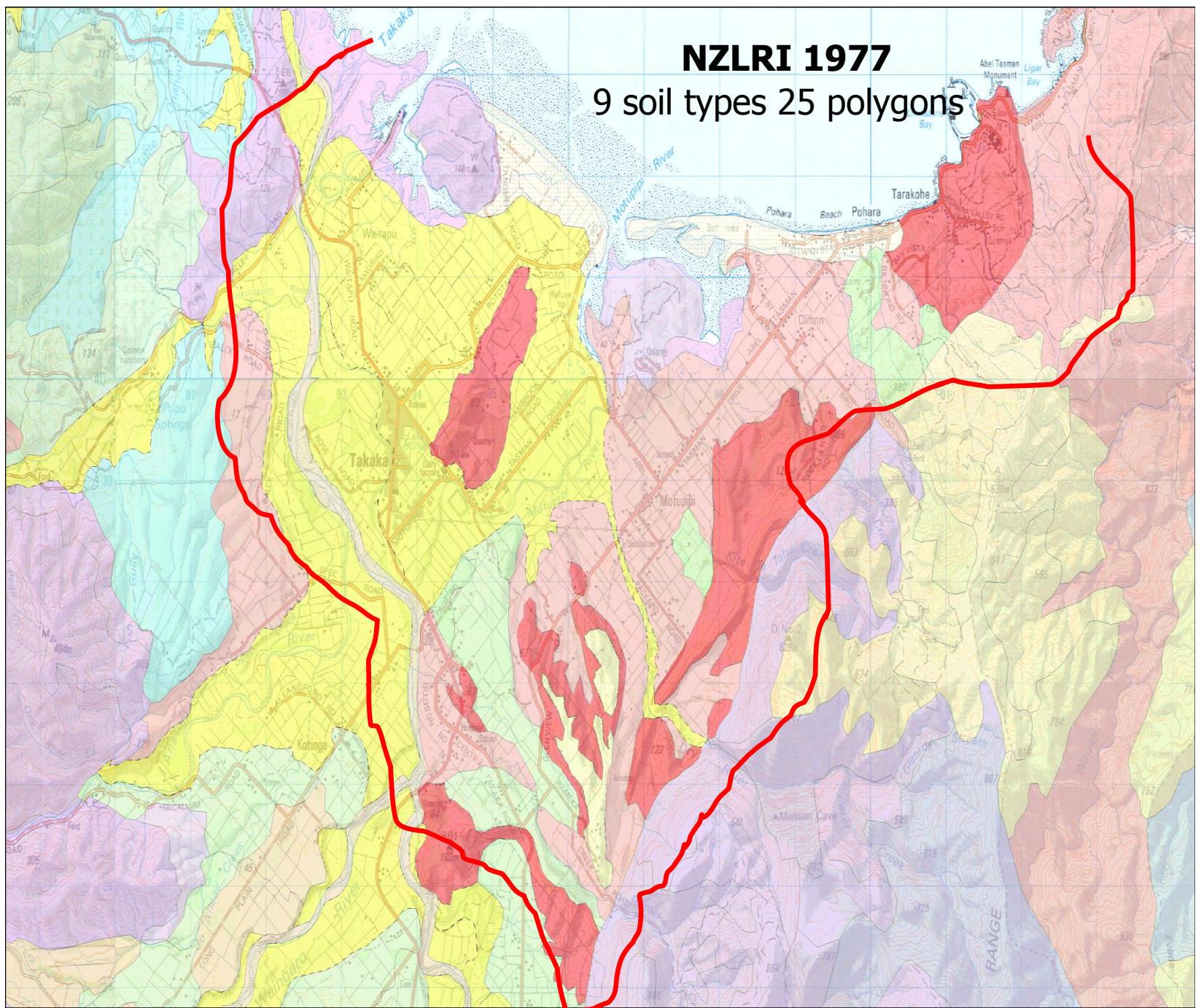
Soil Bureau Survey 1953

7 soil types, 10 polygons.



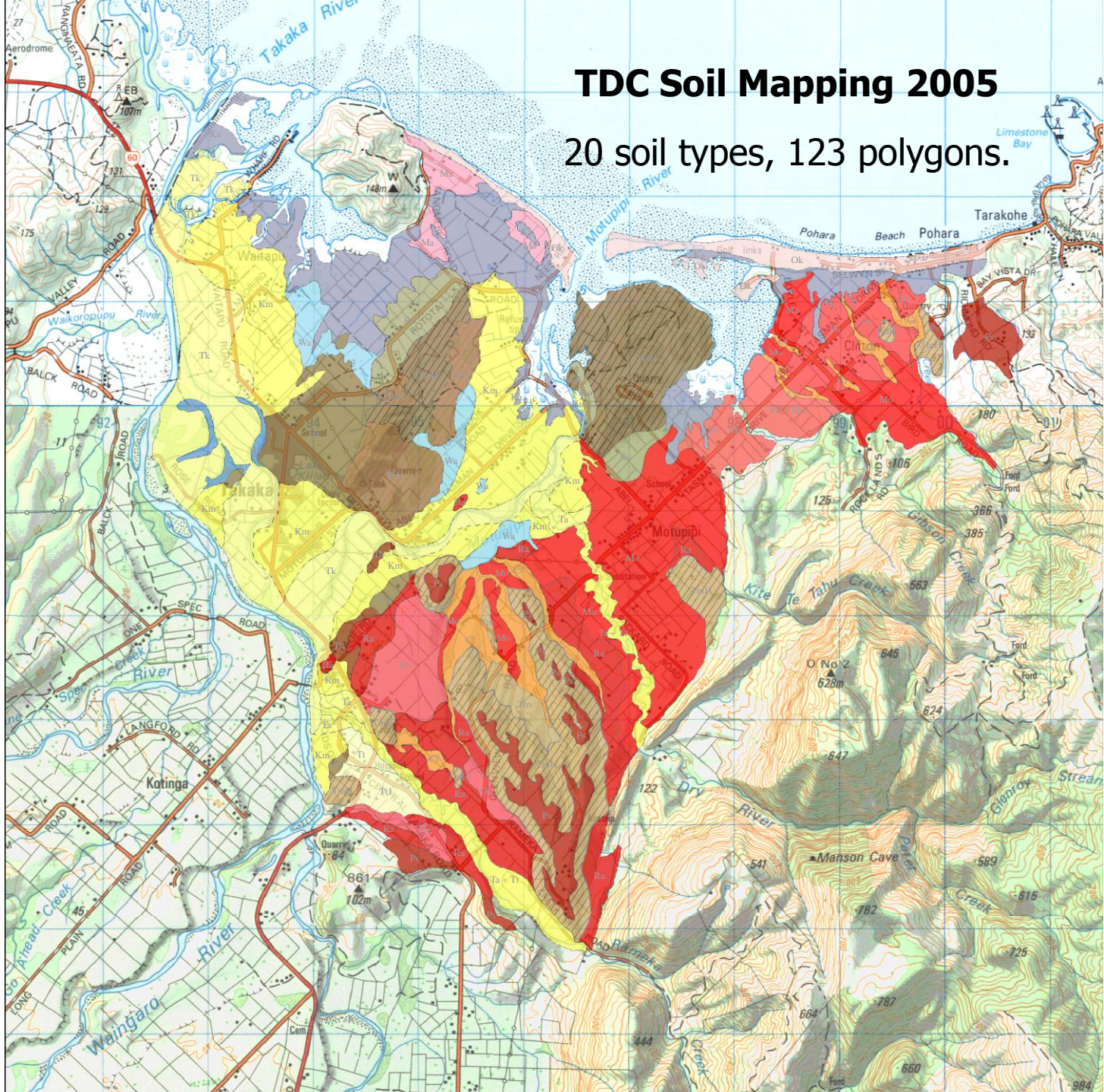
NZLRI 1977

9 soil types 25 polygons



TDC Soil Mapping 2005

20 soil types, 123 polygons.



TDC Soil Mapping:

Takaka Valley

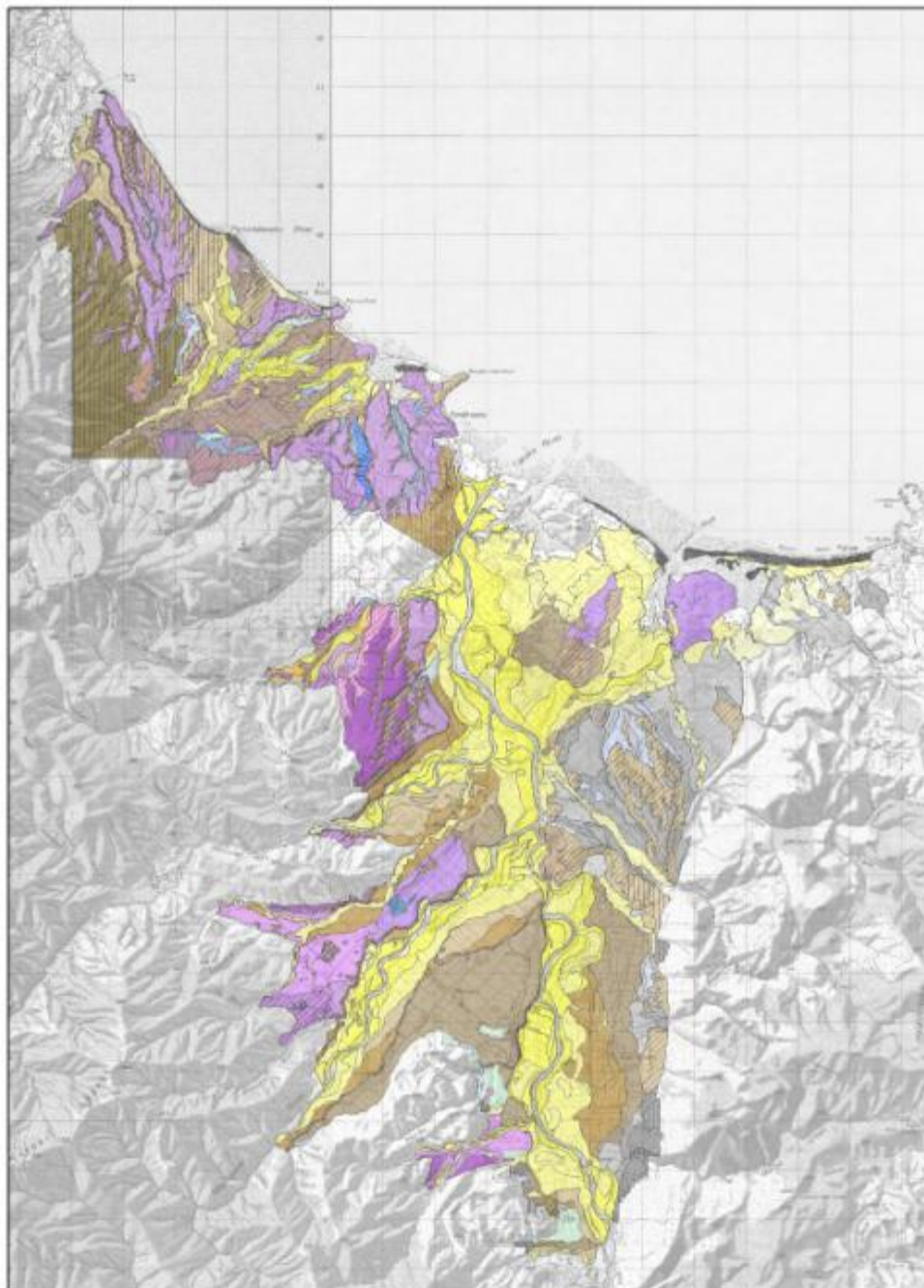
1:10000

12800 hectares

From Pigville gully in the south.

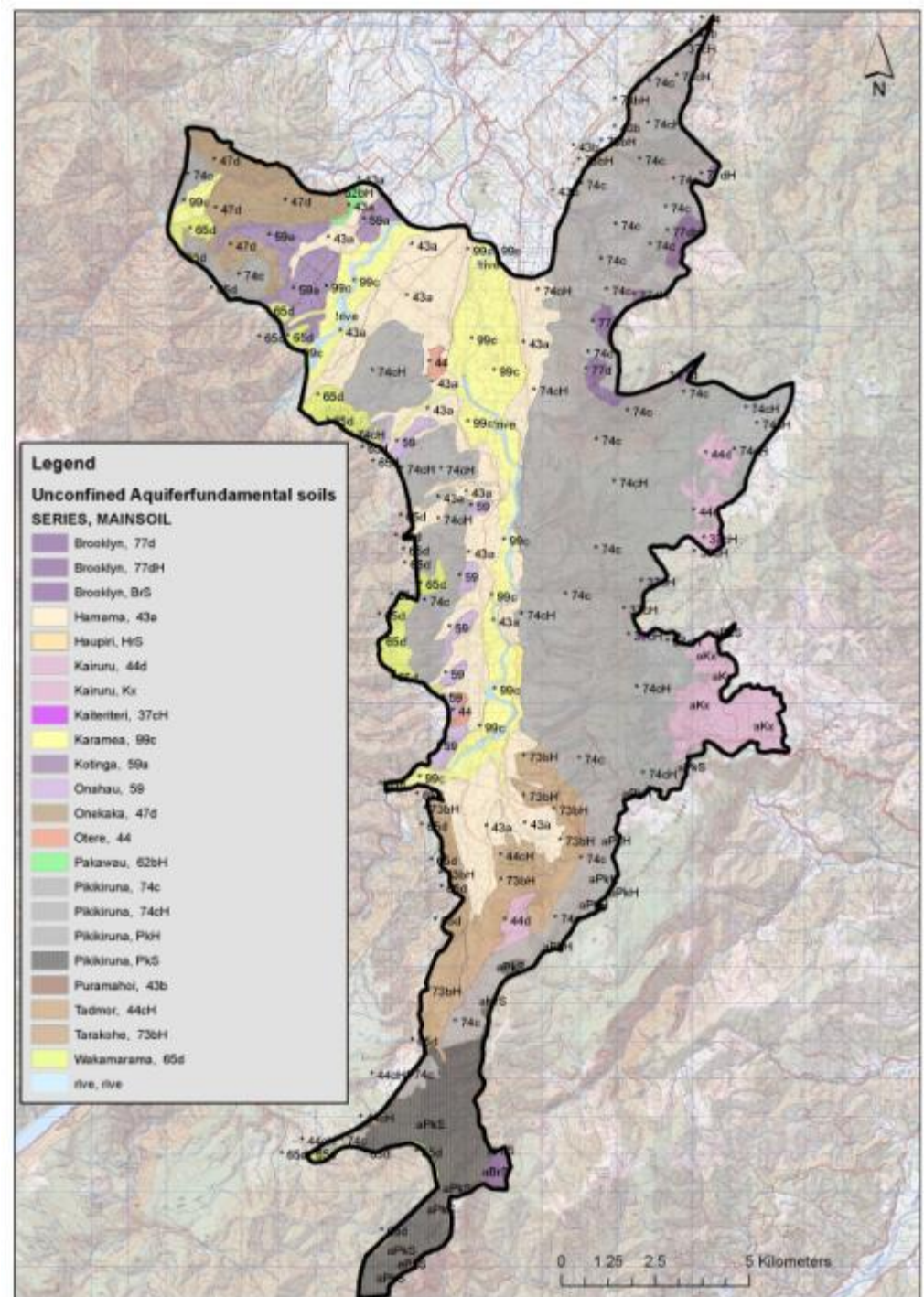
Onekaka in the west

and Pohara to the east



Outside the TDC soil mapping area we are reliant on the Fundamental soils layer for information.

Example: Unconfined aquifer area

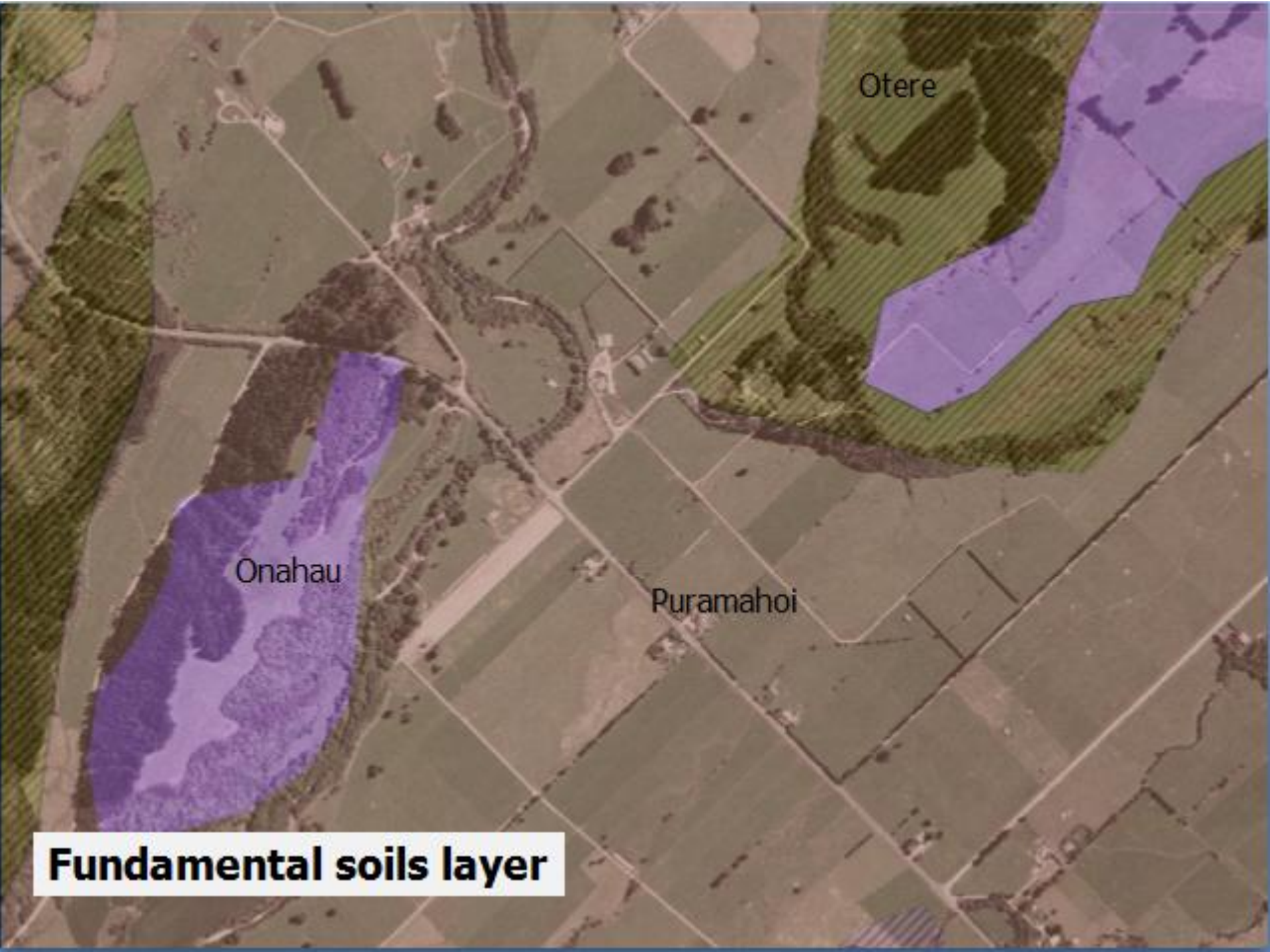




- **Puramahoi Soils**
- **Alluvial deposits on the Puramahoi Plains**
- **Well drained, to moderately deep soils**
- **Silt loam topsoil**
- **Versatile class A soils**



- **Ohanau Soils**
- **Older terraces**
- **Pakahi land**
- **Grey coloured layer with iron pan**
- **Severe limitations to intensive use**
- **Class E soils**

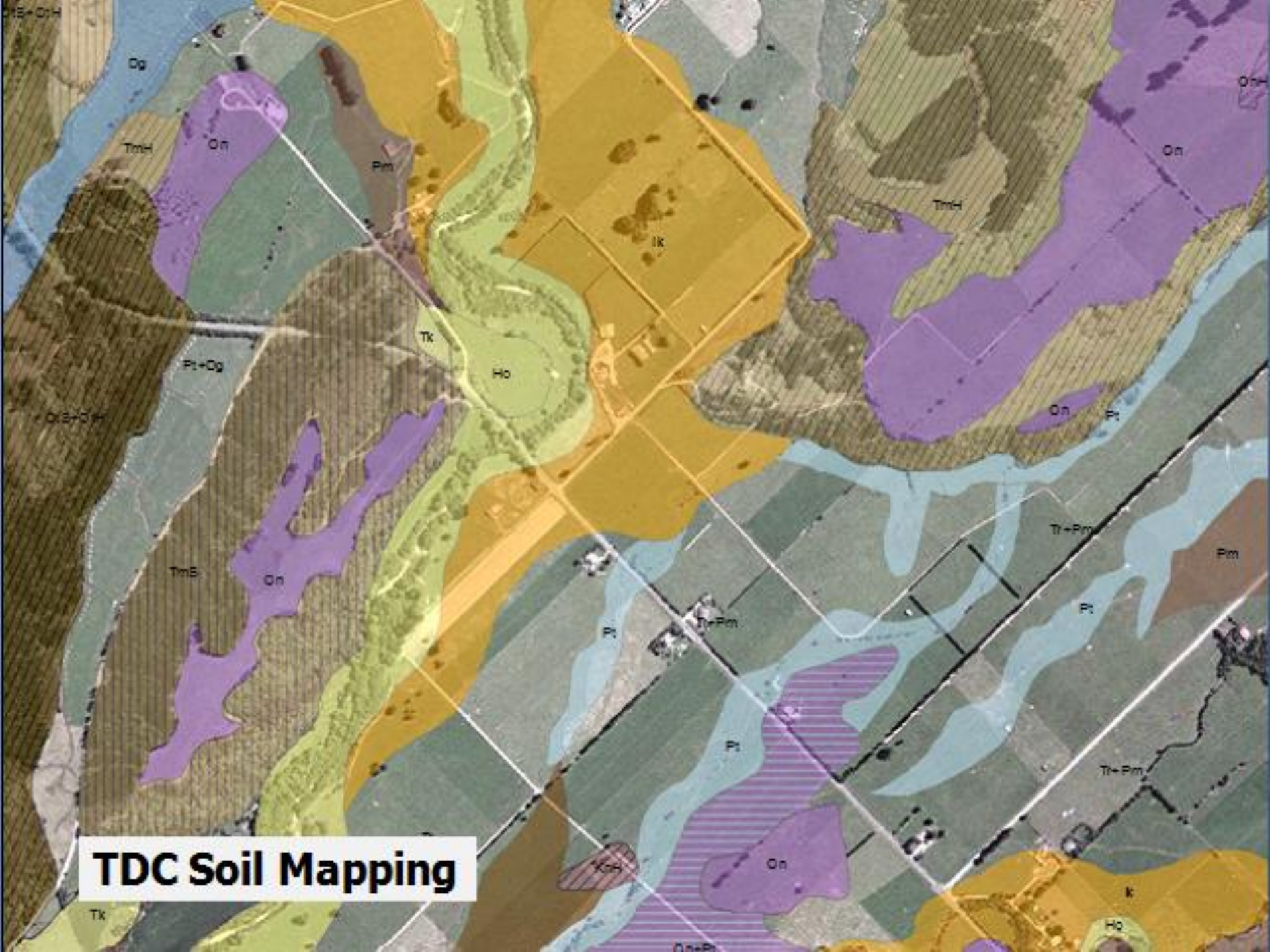


Otere

Onahau

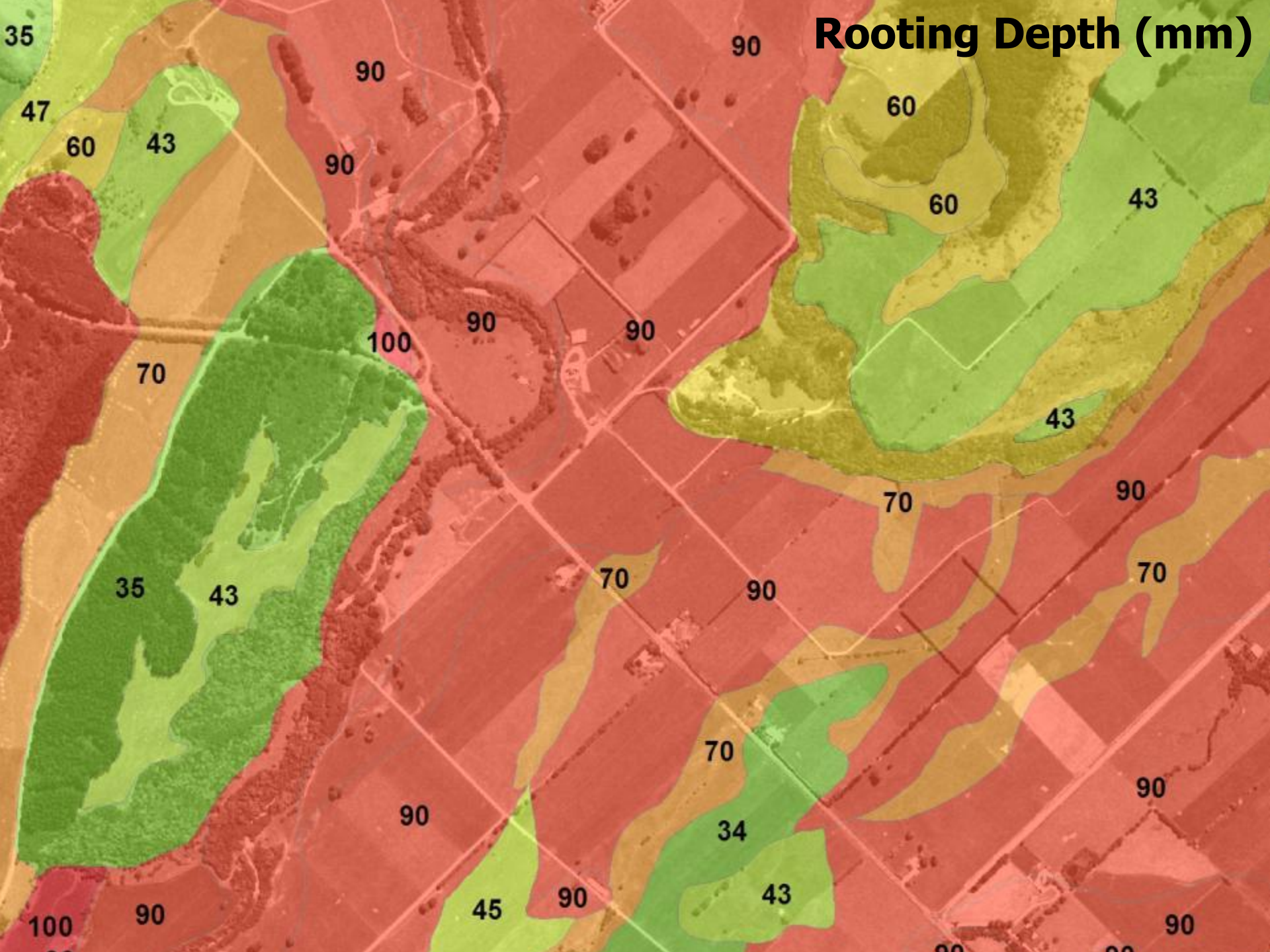
Puramahoi

Fundamental soils layer

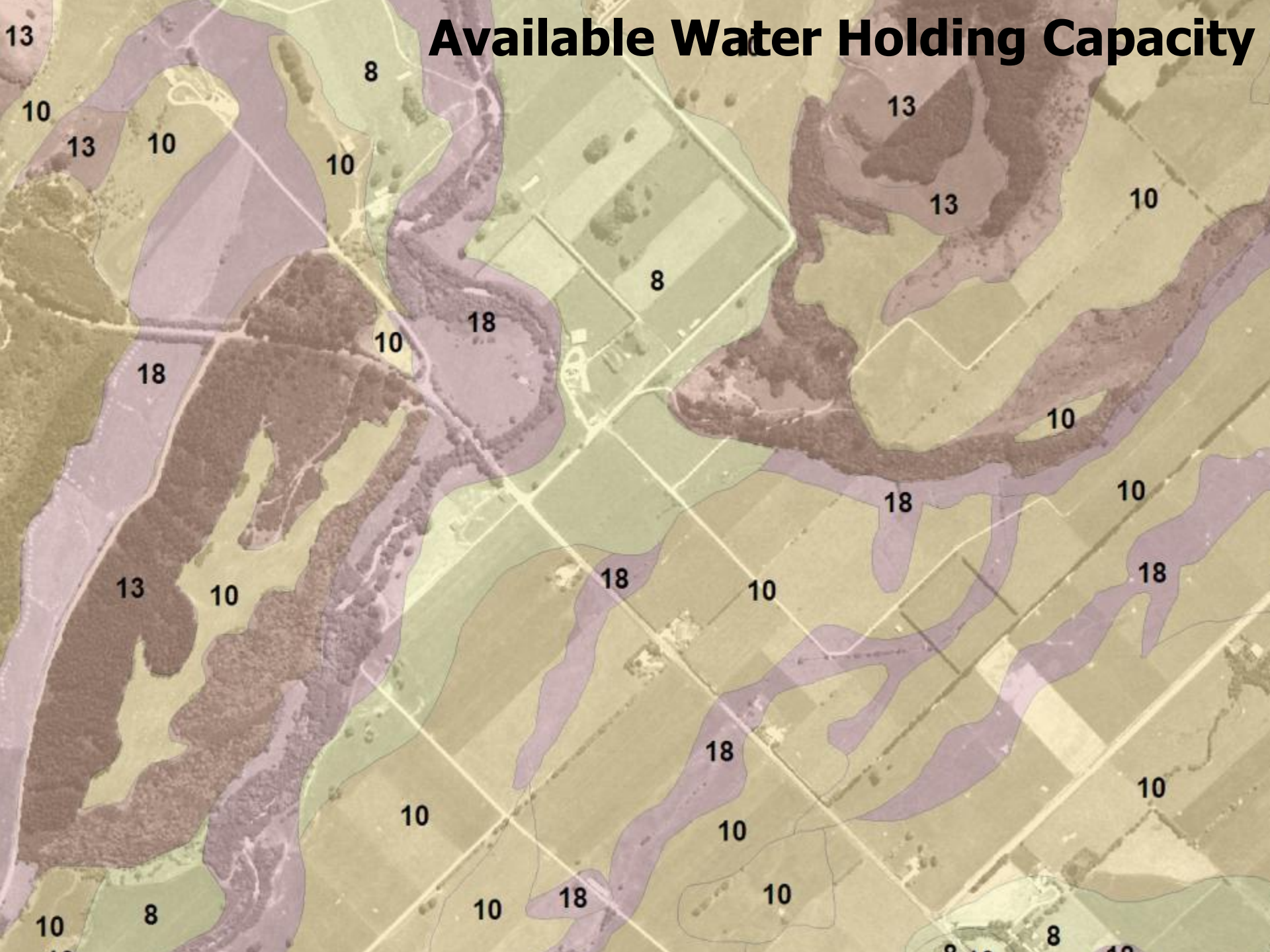


TDC Soil Mapping

Rooting Depth (mm)



Available Water Holding Capacity



"Smapp" soil information sheet example

Takaka (Selwyn_46.1)

Family: *f*

Key physical properties

Depth class (diggability)	Deep (> 1 m)
Texture profile	Silty Loam
Potential rooting depth	Unlimited
Rooting barrier	No significant barrier within 1 m
Topsoil stoniness	Stoneless
Topsoil clay range	20 - 35 %
Drainage class	Well drained
Aeration in root zone	Unlimited
Permeability profile	Moderate
Depth to slowly permeable horizon	No slowly permeable horizon
Permeability of slowest horizon	Moderate (4 - 72 mm/h)
Profile available water	(0 - 100cm or root barrier)
	(0 - 60cm or root barrier) High (106 mm)
	(0 - 30cm or root barrier) High (57 mm)
Dry bulk density, topsoil	1.09 (g/cm ³)
Dry bulk density, subsoil	1.30 (g/cm ³)
Depth to hard rock	No hard rock within 1 m
Depth to soft rock	No soft rock within 1 m
Depth to stony layer class	No significant stony layer within 1 m

Key chemical properties

Topsoil P retention	Low (19%)
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Additional factors to consider in choice of crop and irrigation management practices

Vulnerability classes relate to soil properties only and do not take into account climate or management

Soil structure integrity

Erodibility of soil material	Moderate
Structural vulnerability	
Pugging vulnerability	not available yet

Water management

Water logging vulnerability	Very low
Drought vulnerability - if not irrigated	Low
Bypass flow	Low
Hydrological soil group	A

Contaminant management

N leaching vulnerability	Low
P leaching vulnerability	High
Bypass flow	Low
Dairy effluent (FDE) risk category	C if slope > 7 deg otherwise D

Additional information

Soil classification	Typic Fluvial Recent Soils
Family	<i>f</i>
Sibling number	46
Profile texture group	Silty
Soil profile material	Stoneless soil
Rock class of stones/rocks	Not Applicable
Rock origin of fine earth	From Hard Sandstone Rock
Parent material origin	Alluvium

Takaka Soils: State

- Soil Health Monitoring Programme “500 Soils”
 - Monitoring of 8 sites in 2009 and 2 additional sites in 2010 in the Takaka Valley (dairy, beef and horticulture)
- Visual Soil Assessment (VSA)
 - “Glendale” Dairy Factory Farm from 2006 to 2011

“500 Soils” Sampling

- Total Carbon
- Total Nitrogen
- Mineralisable Nitrogen
- Soil pH
- Olsen P
- Bulk density
- Macroporosity
- Aggregate stability
- Trace elements
- Soil moisture measurements



Results

- Total C normal
- Total N normal to ample
- Min. N adequate to high
- Olsen P very low to ample
- pH optimal
- Bulk density adequate
- Macroporosity **very low** to adequate
- Aggregate stability ample

VSA at Glendale

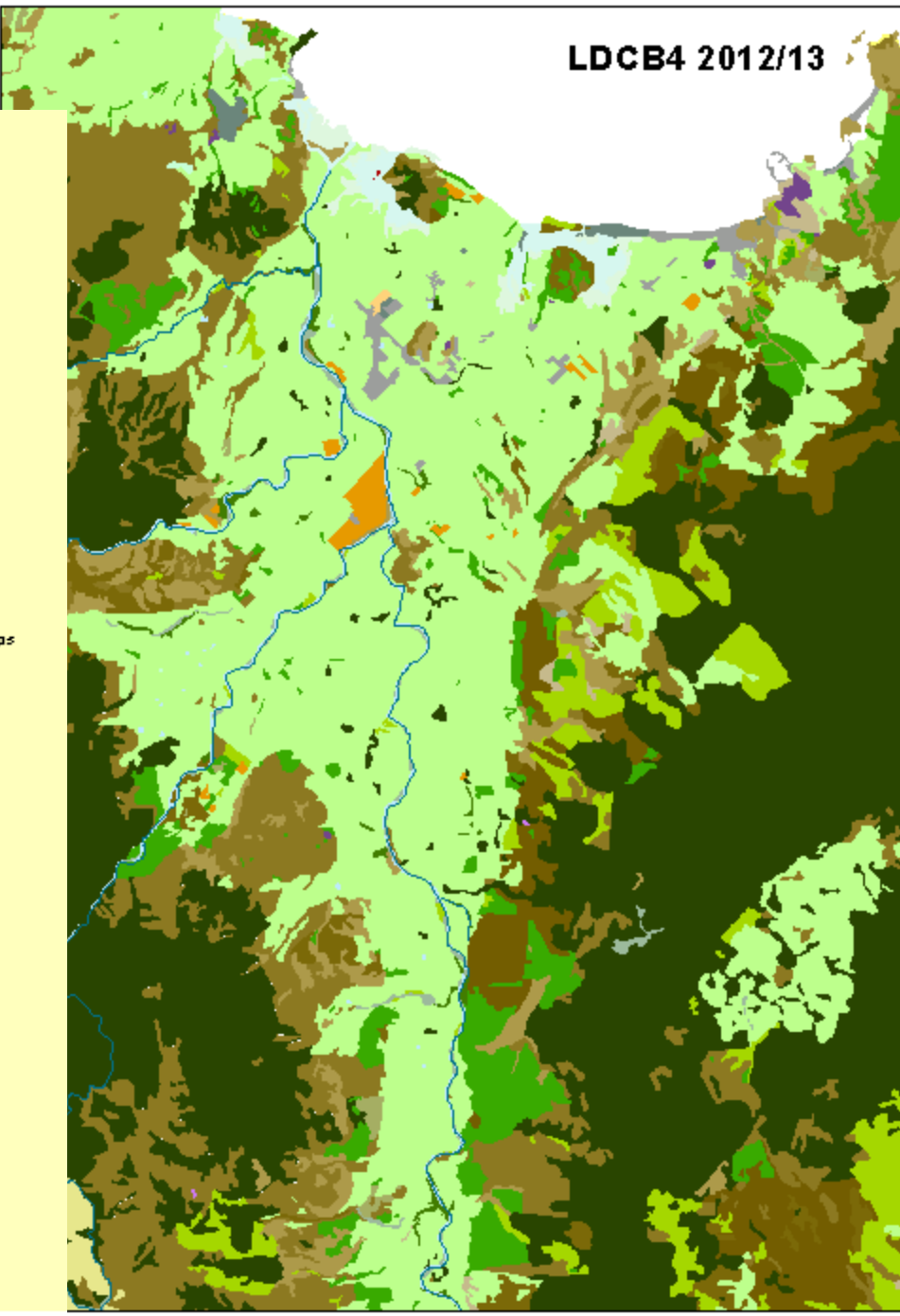
- 6 soil types monitored over six years
- Included dairy shed effluent application areas
- Results
 - All sites ranked “good”
 - No significant changes with time.

Land Use Information

New Zealand Land Cover Data Base LCDB

- LCDB 1: 1996/97
- LCDB 2: 2001/02
- LCDB 3: 2007/08
- LCDB 4: 2012/13

Artificial Surfaces	
[Grey]	Bull Run Area (Settlement)
[Purple]	Surface Mines and Dumps
[Red]	Transport Infrastructure
[Dark Grey]	Urban Parkland/Open Space
Bare or Lightly Vegetated Surfaces	
[Yellow]	Sand and Gravel
[Light Purple]	Landslide
[Light Green]	Alpine Grass/Herbfield
[Light Blue-Grey]	Gravel and Rock
[Light Blue]	Permanent Snow and Ice
Water Bodies	
[Light Blue]	Lake or Pond
[Blue]	River
[Light Blue]	Estuarine Open Water
Cropland	
[Light Orange]	Short Rotation Cropland
[Orange]	Orchard, Vineyard and Other Perennial Crops
Grassland, Sedge and Saltmarsh	
[Light Green]	High Producing Exotic Grassland
[Green]	Low Producing Grassland
[Yellow-Green]	Tall Tussock Grassland
[Yellow]	Depleted Grassland
[Light Green]	Herbaceous Freshwater Vegetation
[Light Blue-Green]	Herbaceous Saline Vegetation
[Light Blue]	Flaxland
Scrub and Shrubland	
[Dark Brown]	Fernland
[Brown]	Gorse and/or Broom
[Dark Brown]	Manuka and/or Karuka
[Brown]	Broadleaved Indigenous Hardwoods
[Light Brown]	Sub-Alpine Shrubland
[Light Brown]	Mixed Exotic Shrubland
[Light Brown]	Matagouri or Grey Scrub
Forest	
[Light Green]	Forest - Harvested
[Green]	Deciduous Hardwoods
[Dark Green]	Indigenous Forest
[Light Green]	Exotic Forest
[Blue-Green]	Mangrove



LCDB 4



Land Use Information

- **Statistics NZ**
- **Compliance Monitoring**
- **Resource Monitoring and assessment**
- **Industry data**

Dairy compliance work 2013 data

locality	Area (ha)	Number of cows	Herd size average	Cows/ha average
Takaka Valley	2665	7445	354	2.74
Kotinga/Anatoki	1132	3055	339	2.60
Motupipi	1029	2741	249	2.88
Puramahoi/Onekaka	1147	3055	235	2.74

Resource data: Irrigated area

Table 4 Consented water use (1000s m³/ week), estimated annual actual irrigated use and area irrigated (ha) in the AMA recharge zone by selected dates until 2012 (from TDC consent records).

Year	Pre 70	1982	1987	1992	1997	2002	2007	2012
Water supply ¹	3	6	9	9	7	7	10	10
Irrigated volume	0	0	32 ²	32	28	30	163	287
Total water consented	3	6	41	41	35	38	173	297
Est. annual irrigated use ³	0	0	111	111	99	106	572	1010
Irrigated area	0	0	91	91	181	196	655	1021

1. Domestic, stock and dairy washing
2. From 1983
3. Based on metered water returns over 4 growing seasons (mean 16% of weekly consented total use for 5 months)