



WHENUA  
LAND

## LAND 2022 – 2023

Over the last 150 years of New Zealand's history, people have made significant changes to our land – particularly in the Waikato region. Native forests have been cleared and wetlands drained to create opportunities for different land use activities. With increased pressure on land, it is imperative to understand the effects of activities on the land, and how these can be managed.



Our soils are considered to be a non-renewable resource, like fossil fuels. It takes thousands of years for rocks to become soil, and hundreds more years for the soil to build up organic matter. This organic matter is what allows soil to carry out its various functions. Depleting the soil quality and poor soil management can be detrimental. Therefore, making good decisions around our land and soil is critical to our wellbeing.

### **What's happening:**

The Government has released the National Policy Statement for Highly Productive Land (NPS-HPL) to protect highly productive land from inappropriate subdivision, use and development and to ensure its availability for food and fibre production. This National Policy Statement took effect on 17 October 2022.

The NPS-HPL responds to the 'Our Land 2018' report, which found that urban expansion and development is reducing the availability of Aotearoa's most fertile and versatile productive land. Its purpose is to direct subdivision and development away from highly productive land and to protect land used for food production.



The NPS-HPL relies on the Land Use Capability (LUC) system, which categorises land into eight classes. Land that is classed as LUC 1 is the most versatile, productive and has the fewest limitations, making it best suited to food and fibre production. Conversely, LUC 8 is the least versatile and productive and has the greatest number of limitations. LUC classes 1, 2 and 3 will be protected by the NPS-HPL.

In the Matamata-Piako district approximately 75% of our soils are very versatile soils (soil class 1- 3). These are also known as 'high-quality soils in the Matamata-Piako District Plan. These versatile soils have a large impact on the type of businesses in our district and also to our districts economy.

### **Soil Quality in our District**

Soil quality is incredibly important to our district as it plays a key role in many of our land use classifications. Agriculture and dairy products are considered part of the district's major economic base and are a big contributor to the district's GDP. Therefore, close monitoring and proper management of soils is critical. Good quality soils have properties that enable multiple

land uses. Ideally, soils should be able to hold water and nutrients where it will be made available for plant roots to use, suppress weeds and pests, perform carbon sequestration from the atmosphere, filter water that flows through it before reaching waterways, absorb heavy rainfall which prevents flooding and support biological activity/organisms.

This year, the Waikato Regional Council (WRC) carried out testing in two sites in our district. Below is the data collected at each site.

Site 1 was being used for 'Drystock', which is predominantly for grazing cattle, sheep and deer. Of the seven factors measured, the hot water extractable nitrogen (mg/kg) was below the target level of 225, at 205. This indicates that the level of nitrogen available for biological activity of organisms is less than ideal, and fertiliser will be needed to support biological activity of organisms. The other measure that did not reach target levels were the hot water extractable carbon, which was measured at 2045 mg/kg. This is above the target level of 1800 mg/kg, indicating that there is insufficient carbon available for microorganisms to use for food and metabolic processes. Otherwise, five of the seven factors measured for site 1 were within normal limits.



The second site sampled was being cultivated for crops. There were two measurements below target levels for this site. Hot water extractable nitrogen was measured at 80 mg/kg, which is well below the target of 225 mg/kg. This indicates that like site 1, there is not enough nitrogen available for organisms to survive. Anaerobically mineralised nitrogen was measured below 50 mg/kg indicating that the soil is deficient for pasture as there is not enough nitrogen available to plants through microbial activity. All other measurements were within acceptable limits for site 2.

	Land Use	pH  Soil fertility	Total Carbon % Organic matter content. Organic matter helps to store water, nutrients	Total Nitrogen %  Nitrogen reserves in soil. Below 0.2% is deficient for grass and crops	Hot water extractable Carbon (mg/kg) Biological activity and Carbon availability for microorganism to use as food. Soil structure degraded at <1800	Hot water extractable Nitrogen (mg/kg) Biological activity and amount of Nitrogen available for organisms. Less than 225 indicate Nitrogen fertiliser needed	Anaerobically mineralised Nitrogen (mg/kg)  Below 50 is considered deficient for pasture	Macroporosity  Soil compaction. Needs to have >10 for root growth and water infiltration
1	Drystock	5.7	5.1	0.43	2045	205	116	15.3
2	Being Cultivated	6.2	4.2	0.45	1033	80	43	18

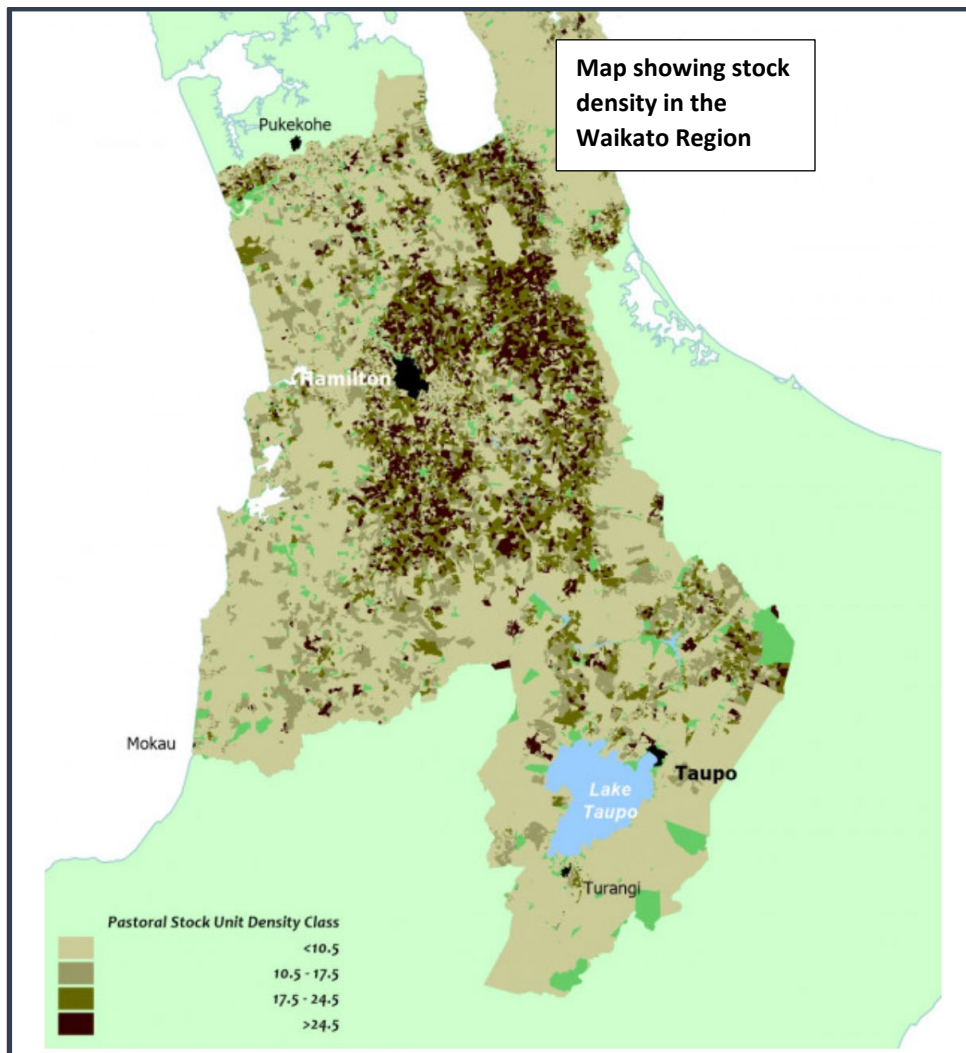
### Stock Density of our Soils

Stock density is one of the indicators to determine how tightly compacted the soils are as a result of livestock grazing and machinery related techniques. The soil structure becomes compromised when it is compacted, and this tight packing of soil and root systems also reduces the diversity and extent of biomatter. While both sites sampled this year indicate good macroporosity or adequate soil compaction for root growth and water infiltration, it



is important to examine all the data available from the Waikato Regional Council related to stock density as half the sites sampled last year (2021 – 2022) showed high levels of soil compaction.

The map below shows stock density (pastoral stock class) in the Waikato region. Waikato Regional Council monitor stock density to find out where livestock farming is likely to have the most effect on soil and water quality in the region. Correlations can be drawn to areas of high stock density, soil compaction and high levels of nitrogen in soils and waterways.



Information retrieved from Waikato Regional Council: <https://www.waikatoregion.govt.nz/environment/land-and-soil/land-use-in-the-waikato/regional-stock-density-map/>