

This Technical Data Sheet describes the *typical average properties* of the specified soil.

It is essentially a summary of information obtained from one or more profiles of this soil that were examined and described during the Topoclimate survey or previous surveys. It has been prepared in good faith by trained staff within time and budgetary limits. However, no responsibility or liability can be taken for the accuracy of the information and interpretations. Advise should be sought from soil and landuse experts before making landuse decisions on individual farms and paddocks. The characteristics of the soil at a specific location may differ in some details from those described here.

No warranties are expressed or implied unless stated.

Soil name: Kaweku Scarp

Overview

Kaweku Scarp soils occupy about 900 ha on the Waimea plain in northern Southland. They occur on the scarps of high terraces associated with Kaweku soils on the terrace flats. They are formed into colluvium of greywacke and schist gravels, with varying thickness of loess that has accumulated in more stable sites. Soils are a variable complex of soil profiles depending on the localised erosion patterns. Typically, though, they are well drained shallow soils with stony subsoils and have silty textures. Present use is pastoral farming with sheep and deer and farm forestry. Climate is temperate with warm summers. Regular rain occurs but soils are seasonally dry, particularly those facing north.

Soil classification

NZ Soil Classification (NZSC):

Acidic Orthic Brown; rounded-stony, hard sandstone; silty.

Previous NZ Genetic Classification:

Yellow -grey earth.

Classification explanation

Kaweku Scarp soils have been reclassified from the previous classification based the soil properties being more similar to Brown soils than Pallic soils. This is reflected in the lack of firm subsoil, and P-retention of greater than 30% throughout the profile. Kaweku Scarp soils typically have a pH of less than 5.5 in the subsoil, and gravel occurs within 45cm depth. Because of the variability of the terrace scarps they are also likely to have Recent soils on the more recently eroded sites, and moderately deep soils (gravels below 45cm depth) where loess has accumulated.

Soil phases and variants

Identified units in the Kaweku Scarp soils are:

- Kaweku Scarp hilly (UKkH): has gravel within 45cm depth; occurs on slopes of 15–25°
- Kaweku Scarp steep (UKkS): has gravel within 45cm depth ; occurs on slopes of >25°

The soil properties described in this Technical Data Sheet are based on the most common phase, Kaweku Scarp hilly (UKkH). Values for other phases and variants can be taken as being similar. Where they differ significantly they are recorded with a separate versatility rating, e.g., Kaweku Scarp steep (UKkS).

Associated soils

Some soils that commonly occur in association with Kaweku Scarp soils are:

- Waikoikoi: poorly drained soil with a fragipan, formed in moderately deep to deep loess
- Dipton: poorly drained shallow soil, with gravels within 45cm depth

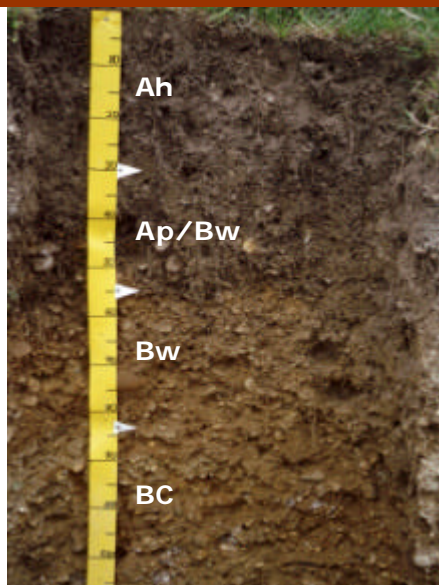
Similar soils

Some soils that have similar properties to Kaweku Scarp soils are:

- Oreti Scarp: occurs on terrace scarps of Intermediate terraces; gravels are less weathered
- Kaweku: occurs on the associated high terrace flats; more consistent soil profile

Typical profile features

The following is a 'generic' or composite profile description representing the most common combination of characteristics for this soil type. The actual profiles for which descriptions and data are available are listed at the end of this Technical Data Sheet.

Kaweku Scarp profile	Horizon	Depth (cm)	Description
	Ah	0–30	Brownish black moderately gravelly silt loam; weak soil strength; moderately developed fine polyhedral structure; gravels slightly weathered and subrounded; abundant roots.
	Ap/Bw	30–55	Brown very gravelly sandy loam; many wormcasts; weak soil strength; moderately developed fine polyhedral structure; gravels subrounded and moderately weathered; abundant roots.
	Bw	55–83	Dull yellowish brown very gravelly sandy loam; compact particle packing; weakly developed fine polyhedral structure; gravels subrounded and moderately weathered; many roots.
	BC	83–90+	Dull yellowish brown extremely gravelly loamy sand; dense particle packing; massive structure; gravels subrounded and moderately weathered; few roots.

Key profile features

Kaweku Scarp topsoils are variable in depth but up to 30cm deep with moderately developed structure. Subsoils have a weakly developed structure.

Typical physical properties

Note: values in *Italics* are estimates

Horizon	Depth (cm)	Bulk density	Permeability	Texture	Gravel content
Ah	0–30	—	<i>Rapid</i>	Silt loam	Moderately gravelly
Ap/Bw	30–55	—	<i>Rapid</i>	Sandy loam	Very gravelly
Bw	55–83	—	<i>Rapid</i>	Sandy loam	Extremely gravelly
BC	83–90+	—	<i>Rapid</i>	Loamy sand	Extremely gravelly

Profile drainage: Well
Plant readily available water: *Low*
Potential rooting depth: Shallow
Rooting restriction: Gravelly subsoil

Key physical properties

Kaweku Scarp soils have a shallow to moderately deep rooting depth, with low plant available water, that varies depending on the abundance of gravels in the subsoil. The soils are typically well drained, with good aeration, and rapid permeability. Textures vary from silt loam to sands, with a topsoil clay content of about 10–20%. Soils are generally stony throughout.

Typical chemical properties

Horizon	Depth (cm)	pH	P retention	CEC	BS	Ca	Mg	K	Na
Ah	0–30	Moderate	Low	Low	Moderate	Low	Moderate	Moderate	Low
Ap/Bw	30–55	Moderate	Low	Low	Low	Very low	Low	Moderate	Very low
Bw	55–83	Moderate	Low	Low	Low	Very low	Very low	Low	Very low
BC	83–90+	—	—	—	—	—	—	—	—

Key chemical properties

Topsoil organic matter content is about 5%, P-retention 20–40% and pH moderate (high 5s). Cation exchange values are low and base saturation values moderate to low. Available calcium levels are low and magnesium and potassium levels moderate. Soil reserve phosphorus levels are low. Micro-nutrient levels are generally adequate.

Vulnerability to environmental degradation

Note: the vulnerability ratings given in the table below are generalised and should not be taken as absolutes for this soil type in all situations. The actual risk depends on the environmental and management conditions prevailing at a particular place and time. Specialist advice should be sought before making management decisions that may have environmental impacts. Where vulnerability ratings of Moderate to Very severe are indicated, advice may be sought from Environment Southland or a farm management consultant.

Vulnerability factor	Rating	Vulnerability compared to other Southland soils
Structural compaction	moderate	These soils have a moderate vulnerability to structural degradation by long-term cultivation, or compaction by heavy stocking and vehicles. This rating reflects the well drained nature of the soil, but moderate to low clay, organic matter and P-retention.
Nutrient leaching	very severe	These soils have a very severe vulnerability to leaching to groundwater. This rating reflects the low to moderate water-holding capacity, with rapid permeability and well drained nature of the soil.
Topsoil erodibility by water	slight	Due to the moderate to low clay and organic matter content, topsoil erodibility in these soils is slight. Erodibility is highly dependent on management, particularly when there is no vegetation cover.
Organic matter loss	moderate	Vulnerability to long-term decline in soil organic matter levels is partly dependent on soil properties and highly dependent on management practices (e.g., crop residue management and cultivation practices).
Waterlogging	nil	These soils have a nil vulnerability to waterlogging during wet periods. This rating reflects the well drained nature of the soil and rapid permeability.

General landuse versatility ratings for Kaweku Scarp soils

Note: The versatility ratings in the table below are indicative of the major limitations for semi-intensive to intensive landuse. These ratings differ from those used in the past in that sustainability factors are incorporated in the classification.

Refer to the Topoclimate district soil map or property soil map to determine which of the soil symbols listed below are applicable, then check the versatility ratings for that symbol in the appropriate table.

UKkH (Kaweku Scarp hilly)

UKkS (Kaweku Scarp steep)

Versatility evaluation for soil UKkH, UKkS		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Unsuitable	Hilly and steep slopes
Arable	Unsuitable	Hilly and steep slopes
Intensive pasture	Limited	Vulnerability to leaching to groundwater: restricted rooting depth.
Forestry	Limited	Subsoil stoniness; restricted rooting depth.

Management practices that may improve soil versatility

- Careful management of nutrients to minimise leaching losses
- Careful management of topsoil organic matter levels

Soil profiles available for Kaweku Scarp soils

Soil symbol	Profile ID	Topoclimate map sheet	Profile description available	Physical data available	Chemical data available	Profile photo available
UKkH	VT12	2	✓	✓	✓	✓
UKkH	B4	12	✓	✓	✓	✓

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