Soil name: Oughton

Overview

Oughton soils occupy about 300 ha on low river terraces of the east side of the Mataura River adjacent to Wyndham. They are formed into fine alluvium overlying gravels derived from both the Mataura River and streams draining nearby tuffaceous greywacke hills. Soils are moderately well to imperfectly drained, with moderately deep rooting depth, moderately high plant available water, and silty clay textures. Present use is sheep and dairy farming. Climate is cool temperate with regular rain throughout the year, so soils rarely dry out.

Soil classification

NZ Soil Classification (NZSC):	Acidic Orthic Brown; soils with stones; clayey over skeletal.
Previous NZ Genetic Classification:	Recent

Classification explanation

Oughton soils were previously classified as Recent soils, but were reclassified as Brown soils due to the presence of a weathered and well structured B horizon. They are moderately well drained soils, with no major rooting barrier in the subsoil, and are acidic with pH of <5.5. The soils typically have stones between 45 and 90cm depth and silty clay textures.

Soil phases and variants

Identified units in the Oughton soils are:

- Oughton undulating moderately deep (OgU2): has gravel beween 45 and 90cm depth; ocurs on slopes of 0–7°
- Oughton undulating moderately deep, imperfect drained variant (OgU2vi): is imperfectly drained; has gravel between 45 and 90cm depth; occurs on slopes of 0–7°
- Oughton undulating deep (OgU1): has no gravel within 90cm depth; occurs on slopes of 0–7°
- Oughton undulating deep, imperfectly drained variant (OGU1vi): is imperfectly drained ; has no gravel within 90cm depth; occurs on slopes of 0–7°

The soil properties described in this Technical Data Sheet are based on the most common phase, Oughton undulating moderately deep (OgU2). 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., Oughton undulating deep (OGU1).

Associated soils

Some soils that commonly occur in association with Oughton soils are:

- Gore: well drained shallow soil, with gravels within 45cm depth
- Fleming: deep, imperfectly to poorly drained soils with a fragipan
- Jacobstown: moderately deep to deep, poorly drained soil due to a high groundwater table

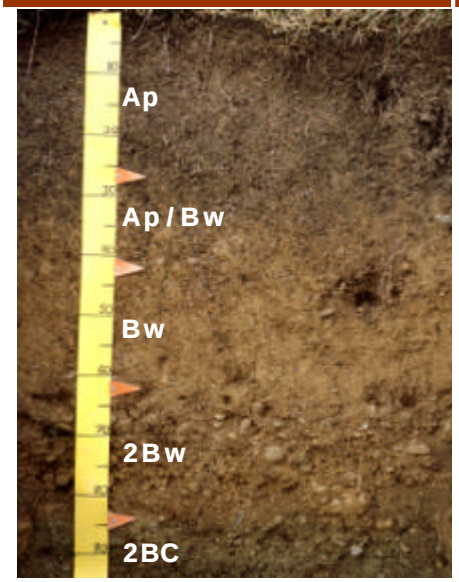
Similar soils

Some soils that have similar properties to Oughton soils are:

- Nithdale: formed in tuffaceous greywacke alluvium on low terraces; has dominantly silty textures
- Niagara: imperfectly drained equivalent of the Nithdale soil; has dominantly silty textures, but may have some silty clay layers.

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.

Oughton profile	Horizon	Depth (cm)	Description
	Ap	0–27	Greyish yellow-brown very slightly gravelly silty clay; weak soil strength; strongly developed fine to medium polyhedral structure; abundant roots.
	Ap/Bw	27–42	Dull brown slightly gravelly silty clay; abundant wormcasts; weak soil strength; strongly developed fine to medium polyhedral structure; gravels slightly weathered and subrounded; abundant roots.
	Bw	42–62	Dull brown slightly gravelly silty clay; few wormcasts; weak soil strength; strongly developed fine to medium polyhedral and prismatic structure; gravels slightly weathered and subrounded; many roots.
	2Bw	62–84	Dull brown very gravelly silt loam; weak soil strength; compact particle packing; moderately developed very fine polyhedral structure; gravels slightly weathered and subrounded; many roots.
	2BC	84–90+	Greyish olive extremely gravelly sand; weak soil strength; loose particle packing; single grain structure; gravels slightly weathered and subrounded; common roots.

Key profile features

Oughton soils have topsoils 20–30cm deep with a strongly developed structure. Subsoils also have a strongly developed structure above the gravels. Some profiles are imperfectly drained and have mottling throughout the subsoil.

Typical physical properties

Note: values in Italics are estimates

Horizon	Depth (cm)	Bulk density	Permeability	Texture	Gravel content
Ap	0–27	Moderate	*Moderate*	Silty clay	Very slightly gravelly
Ap/Bw	27–42	Moderate – High	*Moderate*	Silty clay	Slightly gravelly
Bw	42–62	Moderate – High	*Slow*	Silty clay	Slightly gravelly
2Bw	62–84	Moderate – High	*Moderate*	Silt loam	Very gravelly
2BC	84–90+	—	*Rapid*	Sand	Extremely gravelly

Profile drainage: Moderately well
Plant readily available water: *Moderately high*
Potential rooting depth: Moderately deep
Rooting restriction: subsoil gravels

Key physical properties

Oughton soils have a moderately deep rooting depth, with moderately high plant available water, limited by the underlying gravels. The soils are moderately well to imperfectly drained, with moderate to slow subsoil permeability (above the gravels). Textures are silty clays, grading to silt loams and sands in the gravels. Topsoil clay content is about 40%. Deep soils are stone free but moderately deep soils contain gravel below 45cm depth.

Typical chemical properties

Horizon	Depth (cm)	pH	P retention	CEC	BS	Ca	Mg	K	Na
Ap	0–27	Low	Moderate	Moderate	Very low	Low	Moderate	Very low	Low
AP/Bw	27–42	Moderate	High	Moderate	Very low	Very low	Moderate	Very low	Moderate
Bw	42–62	Moderate	High	Moderate	Very low	Very low	Low	Very low	Moderate
2Bw	62–84	Low	High	Moderate	Very low	Very low	Very low	Very low	Low
2BC	84–90	—	—	—	—	—	—	—	—

Key chemical properties

Topsoil organic matter levels are 6–8%; P-retention 45–70% and pH low (low 5s). Cation exchange levels are moderate and base saturation low. Available calcium and potassium levels are low and magnesium moderate. Soil reserve phosphate levels are low. Micronutrient 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	minimal	These soils have a minimal vulnerability to structural degradation by long-term cultivation, or compaction by heavy stocking and vehicles. This rating reflects the moderate drainage, P-retention and high clay content.
Nutrient leaching	moderate	These soils have a moderate vulnerability to leaching to groundwater. This rating reflects the moderate drainage and moderately high water-holding capacity.
Topsoil erodibility by water	slight	Due to the high clay content, topsoil erodibility in these soils is slight. Erodibility is highly dependent on management, particularly when there is no vegetation cover.
Organic matter loss	minimal	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	slight	These soils have a slight to moderate vulnerability to waterlogging during wet periods. This rating reflects the moderate drainage and slow permeability.

General landuse versatility ratings for Oughton 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.

OgU2 (Oughton undulating moderately deep)

Versatility evaluation for soil OgU2		
Landuse	**Versatility rating**	**Main limitation**
Non-arable horticulture	Moderate	Risk of short-term waterlogging after heavy rain; restricted rooting depth
Arable	Moderate	Risk of short-term waterlogging after heavy rain
Intensive pasture	Moderate	Vulnerability to leaching to groundwater; risk of short-term waterlogging after heavy rain.
Forestry	Moderate	Restricted rooting depth

OgU2vi (Oughton undulating moderately deep, imperfectly drained variant)

Versatility evaluation for soil OgU2vi		
Landuse	**Versatility rating**	**Main limitation**
Non-arable horticulture	Moderate	Risk of short-term waterlogging after heavy rain
Arable	Moderate	Inadequate aeration during wet periods; risk of short-term waterlogging after heavy rain
Intensive pasture	Moderate	Inadequate aeration during wet periods; risk of short-term waterlogging after heavy rain
Forestry	Moderate	Vulnerability to sustained waterlogging; restricted rooting depth.

OgU1 (Oughton undulating deep)

Versatility evaluation for soil OgU1		
Landuse	**Versatility rating**	**Main limitation**
Non-arable horticulture	Moderate	Risk of short-term waterlogging after heavy rain
Arable	Moderate	Risk of short-term waterlogging after heavy rain
Intensive pasture	Moderate	Vulnerability to leaching to ground water; risk of short-term waterlogging after heavy rain.
Forestry	High	Few limitations

OgU1vi (Oughton undulating deep, imperfectly drained variant)

Versatility evaluation for soil OgU1vi		
Landuse	**Versatility rating**	**Main limitation**
Non-arable horticulture	Moderate	Inadequate aeration during wet periods; risk of short-term waterlogging after heavy rain
Arable	Moderate	Inadequate aeration during wet periods; risk of short-term waterlogging after heavy rain
Intensive pasture	Moderate	Inadequate aeration during wet periods; risk of short-term waterlogging after heavy rain
Forestry	Moderate	Vulnerability to sustained waterlogging; restricted rooting depth.

Management practices that may improve soil versatility

- Careful management after heavy rain and wet periods will reduce the impact of short-term waterlogging. Intensive stocking, cultivation and heavy vehicular fraffic use should be minimised during these periods.
- Installation and maintenance of subsurface mole and tile drains will reduce the risk of short-term waterlogging.
- If compaction occurs, aeration at the correct moisture condition and depth can be of benefit.

Soil profiles available for Oughton soils

Soil symbol	Profile ID	Topoclimate map sheet	Profile description available	Physical data available	Chemical data available	Profile photo available
OgU2	MWT3	28b	✓	✓	✓	✓
OgU1vi	MWT1	28b	✓	✓	✓	✓

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