

## Soil name: **Lumsden**

### Overview

Lumsden soils occupy about 2800 ha on the floodplains of major streams and rivers in northern and central Southland and in west Otago. They are formed in shallow fine alluvium overlying gravels from greywacke and schist rocks. They are shallow, silty, poorly drained soils that have a high water table. Present use is pastoral farming with sheep, deer, beef cattle and dairy, with some cropping. Climate is cool temperate with warm summers in northern Southland. Soils seldom dry out.

### Physical properties

Lumsden soils have a shallow rooting depth and moderate plant available water that is limited by the subsoil gravelliness. Permeability is slow, with poor aeration due to the high water table. Textures are silt loams grading to coarser loamy sands at depth. Topsoil clay content is 25–35%, with a slight to moderate gravel content. Subsoils are very to extremely gravelly.



*Lumsden profile*

### Fertility properties

Topsoil organic matter content is 6–7%; P-retention 20–45% and pH moderate (mid/high 5s). Cation exchange is high and base saturation low. Available calcium levels are moderate and magnesium and potassium levels low. Reserve phosphorus and sulphur levels are also low. Micronutrient levels are generally adequate although molybdenum responses in legumes and boron responses in brassicas can be expected.

### Associated and similar soils

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

- Jacobstown: moderately deep to deep Gley soil
- Riversdale: well drained, shallow Recent soil
- Howe: variable depth, well drained accumulating Recent soil of the active floodplain

Some soils that have similar properties to Lumsden soils are:

- Caroline: shallow to moderately deep, with a thick cemented ironpan
- McLeish: forming in tuffaceous greywacke alluvium, and has clayey textures

Otepuni: forming predominantly into quartz gravels on stream floodplains of the Southland Plain

## Sustainable management indicators

**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
<b>Structural compaction</b>	severe	These soils have a severe vulnerability to structural degradation by long-term cultivation, or compaction by heavy stocking and vehicles. This rating reflects the poor drainage and low P-retention.
<b>Nutrient leaching</b>	moderate	These soils have a moderate vulnerability to leaching to groundwater. This rating reflects the slow permeability and poor drainage, but only moderate water holding capacity.
<b>Topsoil erodibility by water</b>	slight	Due to the moderate organic matter and clay content, topsoil erodibility in these soils is slight. Erodibility is highly dependent on management, particularly when there is no vegetation cover.
<b>Organic matter loss</b>	severe	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).
<b>Waterlogging</b>	severe	These soils have a severe vulnerability to waterlogging during wet periods. This rating reflects the poor drainage and slow permeability.

## General landuse versatility ratings

**Note:** The versatility ratings in the table below are indicative of the major limitations for semi-intensive to intensive land use. 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.

### LmU3 (Lumsden undulating shallow)

Versatility evaluation for soil LmU3		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Limited	Inadequate aeration during wet periods; restricted rooting depth
Arable	Limited	Inadequate aeration during wet periods; short-term waterlogging after heavy rain
Intensive pasture	Limited	Short-term waterlogging after heavy rain
Forestry	Limited	Inadequate aeration during wet periods; flooding risk

### 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 vehicle use should be minimised during these periods.
- Installation of subsurface tile drains and ditches will reduce the risk of short-term waterlogging.
- If compaction occurs, aeration at the correct moisture condition and depth can be of benefit
- Organic matter levels should be carefully maintained and enhanced