Soil name: Redcliff

Overview

Redcliff soils occupy about 2,000 ha on collapsed escarpments of high fans and terraces in the mid- Waiau. They are formed into predominantly gravels of greywacke and basic volcanic rock, but include unmapped variants that are formed onto non-calcareous soft siltstone and mudstone. Redcliff soils show significant influence of basic volcanic parent material and are well drained, with moderate water-holding capacity and a slightly deep rooting depth that is limited by gravelliness that occurs throughout the soil. Present use is pastoral farming with sheep, beef cattle and some deer. Climate is cool temperate with regular rainfall.

Redcliff profile

Physical properties

Redcliff soils have moderate available water and a slightly deep rooting depth that is restricted by the gravelliness of the subsoil. These soils are well drained, with good aeration and moderate permeability throughout the soil. Textures are typically silty clay to clay loam, with topsoil clay content of about 35%. The soils are gravelly throughout, and typically have at least 35% gravel within 45cm depth. Soft siltsone or mudstone bedrock may occur in the lower subsoil.

Fertility properties

Topsoil organic matter content is about 9%; P-retention 50–60%, and pH moderate (high5s to low 6s). Cation exchange is high and base saturation moderate. Available calcium, magnesium and potassium values are high. Soil reserve phosphorus levels are low. Micronutrient levels are generally adequate.

Associated and similar soils

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

- Mangapiri: poorly drained moderately deep to deep soil formed dominantly in fine colluvium from soft mudstone and siltstone
- Excelsior: well drained soil formed in moderately deep to deep loess
- Monowai: well drained shallow strongly leached soil formed in glacial outwash terrace gravels from Fiordland
- Sobig: poorly drained moderately deep soil formed into loess overlying terrace gravels

Some soils that have similar properties to Redcliff soils are:

- Wairaki: well drained shallow Brown soil; formed into thin loess overlying high terrace gravels from greywacke and basic volcanic rocks of the Takitimu Mountains; does not appear to have a significant influence of basic volcanic parent material, compared to Redcliff
- Oteramika: moderately well to imperfectly drained shallow Brown soil; formed into thin loess overlying weathered high terrace gravels from greywacke and basic volcanic rocks of the Southland Plain
- Kaweku: well drained shallow Brown soil; formed into thin loess overlying moderately weathered high terrace gravels from greywacke and schist gravels in the Waimea Plains

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
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 good drainage, moderate P-retention, organic matter levels, and clay content.
Nutrient leaching	severe	These soils have a very severe vulnerability to leaching to groundwater. This rating reflects the good drainage, moderate permeability, and moderate water-holding capacity.
Topsoil erodibility by water	slight	Due to the moderate 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	slight	These soils have a slight vulnerability to waterlogging during wet periods. This rating reflects the good drainage.

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.

ReH3 (Redcliff hilly shallow)

Versatility evaluation for soil ReH3		
Landuse	**Versatility rating**	**Main limitation**
Non-arable horticulture	Unsuitable	Hilly slope
Arable	Unsuitable	Hilly slope
Intensive pasture	Limited	Hilly slope; restricted rooting depth
Forestry	Limited	Restricted rooting depth

ReS3 (Redcliff steep shallow)

Versatility evaluation for soil ReS3		
Landuse	**Versatility rating**	**Main limitation**
Non-arable horticulture	Unsuitable	Steep slope
Arable	Unsuitable	Steep slope
Intensive pasture	Limited	Steep slopes; restricted rooting depth
Forestry	Limited	Steep slopes; restricted rooting depth

ReU3 (Redcliff undulating shallow) and ReR3 (Redcliff rolling shallow)

Versatility evaluation for soil ReU3, ReR3		
Landuse	**Versatility rating**	**Main limitation**
Non-arable horticulture	Limited	Restricted rooting depth
Arable	Limited	Restricted rooting depth; rolling slopes for Rolling phase
Intensive pasture	Limited	Restricted rooting depth
Forestry	Limited	Restricted rooting depth

Management practices that may improve soil versatility

- Management of nutrient applications so as to minimise leaching losses