

Thumbs soil – sandy over clayey soil on mixed sandstone-dolerite colluvium under dry forest

Site description

Occurrence: Mainly on east coast below 500 m altitude where mean annual rainfall is in the 500-800 mm range

Parent Material: On mixed sandstone-dolerite colluvium

Landform: Rolling and hilly footslopes

Drainage Class: Poorly drained

Vegetation: Dry sclerophyll forest with *Eucalyptus globulus*, *E. amygdalina*, *Acacia verticillata*, *Leptospermum scoparium* and heath species.



Distinguishing Soil Properties

Profile Features:

- Texture-contrast profile - sandy loam and sandy horizons overlying mottled clayey subsoil horizons with dolerite stones
- Prominent A2 horizon

Chemical and physical features

- Low total C, total N and total P in topsoil (0-30 cm)
- Low aggregate stability – high erodibility in subsoils
- Permeability slow – limited by clayey B2 horizon



Similar soils

- Soil 15.1, Forest Soils of Tasmania (Eastfield soil) - loamy textures over clayey subsoils (soil is formed predominantly in dolerite)
- Soil 15.3, Forest Soils of Tasmania - clayey textures throughout; under wet forest
- Eastfield soil (Spanswick et al. 2000) - in dolerite with thin quartzose silt or sand cover

Soil Degradation Potential

FACTOR	RATING OF DEGRADATION POTENTIAL
Erodibility:	High
Compaction and puddling:	High
Mixing:	High
Nutrient depletion:	High
Landslides:	Moderate
Flooding:	Negligible

Site Productivity

Low to very low productivity, limited by subsoil pan, low nutrients and low moisture availability

Soil Management

Topsoil provides essential protection against erosion and should not be cultivated except by spot methods.
Surface horizons, with higher organic and nutrient levels, should be left intact – matting and/or cording on snig tracks is essential.
Avoid sidecutting on roads – A2 horizon will flow when saturated.
Soil disturbance or burning is likely to reduce productivity, and to increase susceptibility of soils to gully erosion.

Native Forest Logging and Regeneration

LOGGING AND CLEARING:
Nutrient levels are low and almost entirely concentrated in the surface horizon. The soils are prone to degradation by erosion.

PREPARATION FOR REGENERATION:
Minimal seedbed preparation is required. Topsoil disturbance or very light scarification during logging should be sufficient. Burning will reduce the already low levels of nutrients in this soil, so only low-intensity burning should be used.

SILVICULTURAL CONSIDERATIONS:
Very low nutrient status and high erodibility limit long-term productivity and cultivation options. Long-term management as a strictly controlled low wood-production forest is likely to be the most viable economic option.

Suitability for Plantations

Marginally suitable to Unsuitable for plantations because of low to very low site productivity



Profile

Authors: PDM and MDL

Date: 21.9.00

Location: West side of Wielangta Road, in eroded drainage line 150 m north of turn-off to Thumbs lookout

Map reference: Sheet 5628 (Orford) 726 832

Landform: Concave footslope of hillside

Vegetation: *Eucalyptus globulus*, *E. amygdalina*, *Acacia verticillata*, *Leptospermum scoparium*, *Epacris impressa*

Parent material: Mixed colluvium from dolerite and Triassic sandstone

Drainage: Poorly drained

Slope: 10°

Aspect: East

Altitude: 240 m

Photographs: PDM 10-00-15 (site); PDM 10-00-12 (profile)

Australian Soil Classification: **Eutrophic mottled-subnatric Brown Sodosol**

A1	0-12 cm	Very dark grey (10YR3/1) (moist) fine sandy loam; very weak strength; weak 5-10 mm subangular blocky structure breaking to 2-5 mm subangular blocky; many fine and medium roots; NaF 0/5.
A2e	12-38 cm	Light yellowish brown (2.5Y6/3) (moist) loamy medium sand; 5% subrounded sandstone and dolerite gravels 30-60 mm diameter; very weak strength; very weak 50-100 mm blocky structure; common fine and medium roots; NaF 0/5.
B21	38-55 cm	Strong brown (7.5YR4/6) (moist) light to medium clay sandy (35% clay, estimate); 20% greyish brown (2.5Y5/2) mottles 2-10 mm diameter; very strong when dry, firm when moist; strong 30-50 mm blocky structure breaking to 10-20 mm blocky structure; light yellowish brown (2.5Y6/3) loamy fine sand (loose) in 10-50 mm vertical veins at c. 30 cm spacing; greyish brown (2.5Y5/2) silty loam in narrower veins (2-10 mm); 5% sandstone and dolerite gravels 30-80 mm diameter, in veins; abundant dark greyish brown (2.5Y4/2) prominent clay cutans on ped surfaces; common fine roots between peds, few within; NaF 0/5.
B22	55-100 cm	Light olive grey (5Y6/2) (moist) strong brown (7.5YR5/6) (moist) medium to heavy clay; 30% strong brown (7.5YR5/8) mottles 10-20 mm diameter; very hard strength; strong 50-100 mm blocky structure breaking to 20-40 mm blocky; light yellowish brown (2.5Y6/3) loamy fine sand (loose) in 10-50 mm vertical veins at c. 30 cm spacing; greyish brown (2.5Y5/2) silty loam in narrower veins (2-10 mm); 5% sandstone and dolerite gravels 30-80 mm diameter, in veins; abundant dark greyish brown (2.5Y4/2) prominent clay cutans on block surfaces; common fine roots between peds, few within; NaF 0/5.

Laboratory Analyses

Horizon	Depth (cm)	pH (H ₂ O)	Total C (%)	Total N (%)	C/N	Colwell P (mg/kg)	Total P (mg/kg)	P retn. (%)	SO ₄ -S (mg/kg)	Water-stable aggreg. (%)
	0-30	6.3	0.80	0.05	17	4	45	7	2	<i>n.d.</i>
A1	0-12	6.3	3.08	0.16	20	4	108	18	4	31
A2e	12-38	6.5	0.13	0.01	10	1	23	3	1	14
B21	38-55	5.8	0.38	0.03	13	<i>n.d.</i>	38	19	14	27
B22	55-100	5.7	0.12	0.01	11	<i>n.d.</i>	30	12	9	18

Horizon	Depth (cm)	Exch. Ca (cmol(+)/kg)	Exch. Mg (cmol(+)/kg)	Exch. K (cmol(+)/kg)	Exch. Na (cmol(+)/kg)	CEC (cmol(+)/kg)	BS (%)
	0-30	<i>3.61</i>	<i>2.57</i>	<i>0.10</i>	<i>0.25</i>	<i>5.9</i>	<i>112</i>
A1	0-12	9.74	8.02	0.22	0.52	17.7	104
A2e	12-38	0.93	0.77	0.03	0.12	1.3	137
B21	38-55	3.41	10.13	0.04	0.86	14.3	101
B22	55-100	3.06	9.82	0.03	0.97	12.5	111

Analytical methods were those of Blakemore et al. (1987), Laffan et al. (1996) and Rayment and Higginson (1992), with variation of methods for C, N and SO₄-S (details available from P. D. McIntosh, Forest Practices Board).

References

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Acknowledgements

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McIntosh, P.D.; Laffan, M.D.; Wong, L.; Miller, M. Holz, G. 2001. Thumbs soil. *Tasmanian forest soil fact sheet no. 4*. Forest Practices Board, Hobart, Gunns Ltd, Launceston and Forestry Tasmania, Hobart. 4 p.

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