

Trewalla soil – fine gravelly gradational soil with subsoil pan in weathered granite under wet forest

Site description

Occurrence: In northern Tasmania on mid-altitude sites where mean annual rainfall is >1000 mm

Parent Material: Weathered granite and derived accumulations of quartz gravels

Landform: Rolling and hilly land

Drainage Class: Well drained and moderately well drained

Vegetation: Wet sclerophyll forest with *Eucalyptus regnans*, *Pomaderris apetala*, *Dicksonia antarctica*, *Olearia lirata*, *Prostanthera lasianthos*, *Coprosma quadrifida* and *Lomandra longifolia*

Distinguishing Soil Properties

Profile Features:

- Very gravelly throughout
- Bleached layer inconspicuous in moist soil
- Massive weakly cemented Bhs horizon (pan)

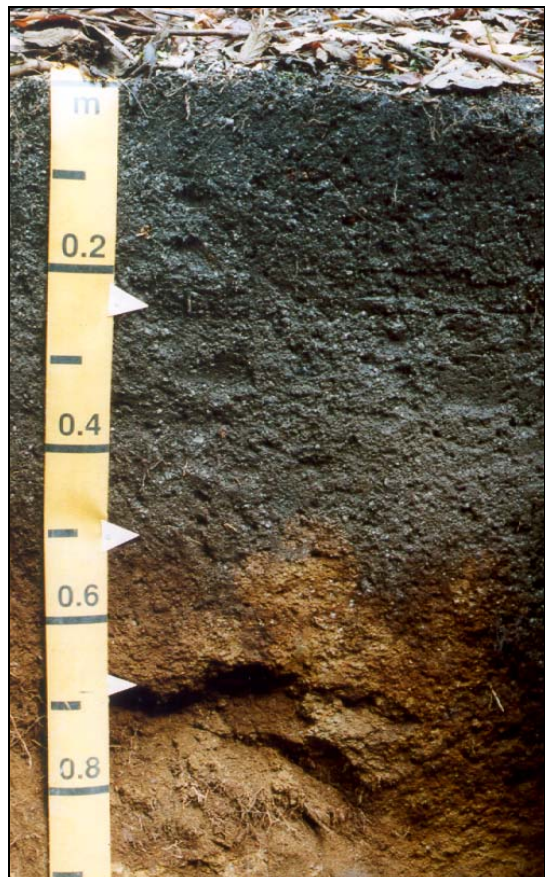
Chemical and physical features

- Medium total C, low P and high N in surface layer (0-30 cm)
- Strongly acid (pH <5.0) surface soil horizons (cf. Stronach soil, pH>5.5)
- Permeability – moderate to slow, limited by strong and coherent Bhs horizon

Similar soil

- Stronach soil (Forest Soils of Tasmania Soil 11.3) – gradational soil under wet forest; no pan; higher nutrient status.

(Trewalla soil occurs in association with Stronach soil – the Trewalla soil occurs mainly in local gravelly accumulations, derived from the surrounding granite)



Soil Degradation Potential

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

Site Productivity

Low productivity, limited by low to medium nutrients and restricted rooting depth. (The soils are less fertile than associated Stronach soils.)

Soil Management

Although these soils have moderate erodibility they may overlie highly erodible weathered granite at depth. Nutrients are concentrated in surface horizons which should be left intact as far as possible.

Native Forest Logging and Regeneration

LOGGING AND CLEARING:

Nutrient levels are concentrated in the surface horizon (0-24 cm). Cording and matting should be used.

PREPARATION FOR REGENERATION:

Scarification or burning is required to prepare a seedbed.

SILVICULTURAL CONSIDERATIONS:

Normal Code provisions for clearfell and burning apply.

Suitability for Plantations

Marginally suitable for plantations because of low site productivity.

CLEARING: Dozer clearing must be done using a rake blade.

CULTIVATION: Ripping to >50 cm depth is required so that roots can penetrate into and beneath the Bhs horizon (pan) and utilise the full profile for nutrients and water.

FERTILISER TREATMENT: Fertilising planted seedlings is required. Secondary fertilisation may be necessary.

Profile

Authors: M. D. Laffan and P.D. McIntosh

Date: 15 January 2002

Location: 9 km southeast of Scottsdale along Saltmarsh Road, about 200 m east of junction with Cuckoo Road

Map reference: Sheet 8415 (Forester) 548250 5435750

Landform: Lower hillslope

Vegetation: Wet sclerophyll forest with *Eucalyptus regnans*, *Pomaderris apetala*, *Dicksonia antarctica*, *Olearia lirata*, *Prostanthera lasianthos*, *Coprosma quadrifida* and *Lomandra longifolia*

Parent material: Gravelly and sandy colluvium derived from weathered granite

Drainage: Moderately well drained

Slope: 14°

Aspect: Northeast

Altitude: 220 m

Photographs: PDM 1-02-29 (site); 1-02-27 (profile)

Australian Soil Classification: **Melacic-Parapanic Humosesquic Semiaquic Podosol**

A1	0-24 cm	Black (2.5Y2.5/1) (moist) coarse sandy loam; 40% angular quartz gravels 2-6 mm diameter; very weak strength; very weak angular blocky structure 10-20 mm diameter; many fine and medium roots; NaF 1/5.
A2	24-50 cm	Very dark grey (10YR3/1) (moist) coarse sandy loam; 40% angular quartz gravels 2-6 mm diameter; 30% subangular quartz gravels 2-4 mm diameter; very weak strength; very weak angular blocky structure 10-20 mm diameter; few fine roots; NaF 1/5.
Bhs	50-68 (85) cm	Very dark brown (7.5YR2.5/3) (moist) coarse sandy clay loam; 40% dark yellowish brown (10YR4/4) mottles 10 cm diameter; very dark brown soil volumes have firm strength and moderately developed subangular 10-20 mm blocky structure and NaF 3/5; dark yellowish brown soil volumes are very strong and have massive structure (forming a pan) and NaF 4/5; 40% angular quartz gravels 2-6 mm diameter; few fine and medium roots; (horizon is a discontinuous pan).
B2	68 (85)-88 cm	Dark yellowish brown (10YR4/4) coarse sandy clay loam; 40% angular quartz gravels 2-6 mm diameter; loose strength; strong polyhedral structure; abundant fine to coarse roots; NaF 3/5; (horizon appears to be organic-rich infill of a large root cavity).
C	88-100+cm	Yellowish brown (10YR5/6) weathered granite.

Horizon	Depth (cm)	pH (H ₂ O)	Total C (%)	Total N (%)	C/N	Total P (mg/kg)	Colwell P (mg/kg)	P retn. (%)	SO ₄ -S (mg/kg)	Water-stable aggreg. (%)
	0-30	4.2	3.63	0.22	17	96	7	0	4.3	n.d.
A1	0-24	4.3	5.58	0.33	17	101	8	0	2.4	61
A2	24-50	4.3	1.26	0.07	18	52	3	4	0.9	46
Bhs	50-68	5.1	3.85	0.16	25	124	7	59	1.7	72
B2	68-88	5.0	7.55	0.39	20	292	13	86	5.9	n.d.

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	3.35	0.88	0.32	0.08	14.6	32
A1	0-24	4.30	1.05	0.37	0.06	18.1	32
A2	24-50	0.90	0.19	0.15	0.02	6.1	21
Bhs	50-68	1.31	0.48	0.13	0.07	20.0	10
B2	68-88	0.18	0.56	0.27	0.13	30.7	4

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

- Blakemore, L. C.; Searle, P. L. and Daly, B. K. 1987. Methods of chemical analysis of soils. *New Zealand Soil Bureau Scientific Report 80*.
- Laffan, M. D. and Hill, R. 1996. A method for assessing the erodibility of Tasmanian forest soils. *Australian Journal of Soil and Water Conservation* 9: 16 – 22.
- Rayment, G. E. and Higginson, F. R. 1992. Australian Laboratory Handbook of Soil and Water Chemical Methods. Incarta Press, Melbourne. 330 p.

Acknowledgements

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Citation

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