Cascade soil – uniform soil in sediments derived from Tertiary granitic sediments under wet forest

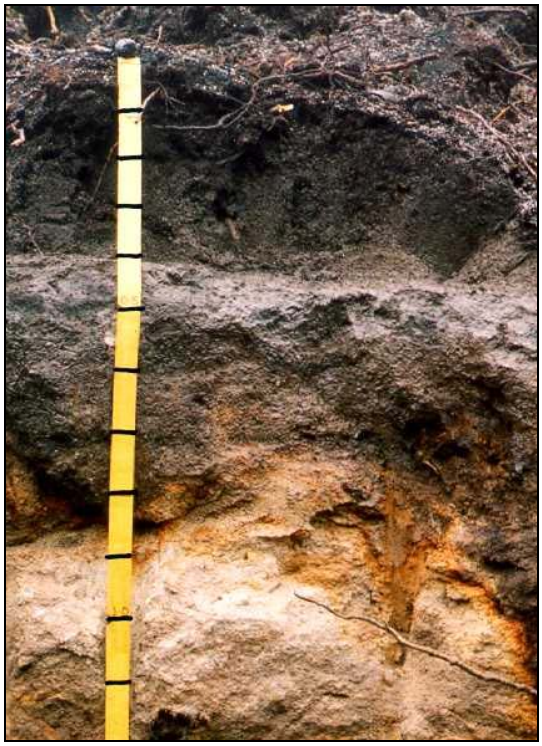
Site description

Occurrence: At medium altitudes in northeastern lowland Tasmania where mean annual rainfall is 1000-1200 mm
Parent Material: Tertiary sediments derived from granite
Landform: Undulating and rolling dissected fans
Drainage Class: Poorly drained
Vegetation: *Leptospermum scoparium*, *L. lanigerum*, *Melaleuca* sp., *Eucalyptus obliqua, E. delegatensis*, and *Gahnia grandis*

Distinguishing Soil Properties

Profile Features:

- Sandy textures throughout
- Cemented A2 horizon and iron pan
- Poor drainage



Chemical and physical features

- Low total C, total N and very low total P in surface layer (0-30 cm)
- SO_4-S very low throughout
- Extremely low ability to hold added phosphate (very low P retention)
- Very low levels of all nutrients in subsoils
- Permeability – very slow

Similar soils

- Soil 11.1, Forest Soils of Tasmania (Duncraggen soil) – A2 horizon is thicker and pan is deeper in the profile; under dry forest
- Tebrakunna soil (Tasmanian Forest Soil Fact Sheet in preparation) – similar soil under dry forest

Soil Degradation Potential

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

Site Productivity

Very low productivity due to very low nutrients (both available and in reserves), very low ability to retain added nutrients, poor drainage and susceptibility to drought

Soil Management

These soils are prone to degradation. Surface layers where organic matter and nutrients are concentrated should be left undisturbed as much as possible. Excessive disturbance and burning will reduce productivity. Because of the extremely low actual and potential productivity of these soils they should be considered for reserve status.

Native Forest Logging and Regeneration

LOGGING AND CLEARING:
Suitable for dry weather logging only – but see note above under "Soil Management".
PREPARATION FOR REGENERATION:
Preparation of a seedbed by surface scarification or burning is required. Because of very low nutrient status hot burns should be avoided if possible.
SILVICULTURAL CONSIDERATIONS:
Very low nutrient status will limit long-term productivity and will require long rotations.

Suitability for Plantations

Unsuitable for plantations

Profile

Authors: M.D. Laffan, P.D. McIntosh and S. Rees
Date: 9 August 2001
Location: West of road to Mt Paris dam, in plantation coupe Cascade 126A
Map reference: Sheet 56434 (Ringarooma) 565800 5439800
Landform: Toe of fan
Vegetation: *Leptospermum scoparium*, *L. lanigerum*, *Melaleuca* sp., *Eucalyptus obliqua, E. delegatensis* and *Gahnia grandis*
Parent material: Tertiary sediments derived from granite
Drainage: Poorly drained
Slope: 6°
Aspect: East
Altitude: 120 m
Photographs: PDM 8(2)-01-25 (site); 8(2)-01-30 (profile)
Australian Soil Classification: **Densic-Placic Humic/Sesquic Semiaquic Podosol**

A1	0-10 cm	Black (10YR2/1) loamy medium sand; weak strength; single grain; 10-20% quartz gravels 2-4 mm diameter; many fine roots.
A2e	10-35 cm	Greyish brown (2.5Y5/2) (moist) coarse sand; weak strength; loose; very few roots.
A2h	35-41 cm	Dark greyish brown (2.5Y4/2) coarse sand; weak strength; loose; no roots.
A2hm	41-70 (-120) cm	Grey (2.5Y6/1) (moist) loamy medium sand; strongly cemented (duripan); sharp boundary.
Bsm	70 – 74 (124) cm	Yellowish brown (7.5YR5/8) (moist) cemented iron pan.
Cm	74+cm	White (2.5Y8/1) coarse sand; strongly cemented.

Laboratory Analyses

Horizon	Depth (cm)	pH (H_2O)	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	*4.5*	*1.99*	*0.08*	*24*	*1*	*35*	*1*	*3.2*	*n.d.*
A1	0-10	4.3	7.75	0.33	23	6	87	0	0.4	76
A2e	10-35	4.7	0.52	0.03	18	n.d.	27	1	3.1	54
A2h	35-41	4.4	0.48	0.04	13	n.d.	28	0	2.9	25
A2hm	41-70	4.8	0.31	0.02	15	n.d.	25	1	3.1	81

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	*0.19*	*0.55*	*0.12*	*0.09*	*5.8*	*16*
A1	0-10	1.32	1.69	0.49	0.27	22.4	17
A2e	10-35	0.01	0.22	0.03	0.04	2.0	15
A2h	35-41	0.01	0.08	0.04	0.03	1.2	13
A2hm	41-70	0.03	0.10	0.04	0.02	1.3	14

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 SO_4-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.; Grant, J. 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.

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