

VAST-2 - Site-based recording of use and land management and their effects on native vegetation over time

Citation: Thackway, R (2012). Big Scrub Rocky Creek Dam, NSW. Ver. 1. VAST-2: tracking the transformation of vegetated landscapes. Australian Centre for Ecological Analysis and Synthesis, University of Queensland, Brisbane.

1. Name of the site/area

Site Information: Rocky Creek Dam - Big Scrub Regeneration Area, NSW (25 ha assisted regeneration, conversion of lantana thickets to rainforest).

2. Last modified (version no. 1)

Minor changes July 2013

3. Location of Site

State: NSW

IBRAv7 Classification:

REG_NAME_7:	REG_CODE_7:	SUB_NAME_7:	SUB_CODE_7:
South Eastern Queensland	SEQ	Scenic Rim	SEQ10

Co-ordinates

Pre clearing community-(analogue): Big Scrub Flora Reserve 28°38'24.39"S, 153°20'3.93"E

Vegetation transformation site: Rocky Creek Dam - planted rainforest 28°38'8.54"S, 153°20'32.58"E

4. Area of the site

25 hectares

5. Brief description of the natural undisturbed ecosystem of the site/area

Lowland Subtropical Rainforest on basalt-derived and alluvial soils below 250m asl and further than 2km from the coast in N.E. NSW.

The forest is distinguished by its dense, uneven canopy comprised of typically two to three tall tree layers. Leaves are relatively large and species with compound leaves are common. Eucalypts and Brushbox *Lophostemon confertus* may be present as sparse emergent. Height and structural complexity, including leaf size, decrease from the wetter to the drier end of the moisture gradient of community occurrence. Species diversity is very high. Characteristic life-forms include buttressed trees, strangler figs, stands of Bangalow Palms *Archontophoenix cunninghamiana*, woody vines and large epiphytes.

A relatively high diversity of frugivorous, epiphyte and litter-foraging vertebrate species characterise the community, particularly birds and mega-chiropteran bats. Invertebrate groups associated with the decomposer cycle are strongly represented, especially insects and snails. Source: Parkes E.A. (2009).

Restoration Lowland Subtropical Rainforest on Basalt (CNVF Floyd 1981) on former thickets of lantana established following land use change from dairy cow pasture to public reserve.

The reference or analogue for the 25 ha of assisted regeneration is the Rocky Creek Flora Reserve (172 ha) now part of Nightcap Range NP (Woodford 2000)



VAST-2 - Site-based recording of use and land management and their effects on native vegetation over time

6. Current purpose (2010) of the site/area

A public reserve on the foreshores of Rocky Creek Dam utilised as catchment protection for Rous Water.

7. Reference or benchmark vegetation description: pre-clearing or pre-European community

Community type = CNVF White booyong, rosewood, black bean association (Floyd 1981).

Dominants = Booyong

Total overstorey spp. (200m²) = 14

Total species (Holmes) = 236

Trees and shrubs = 181

Lianes (Holmes) = 56

Total species exotics and edge = 177

Overstorey FPC = 72%

Basal area (cm²) = 28,557

Height (m) = 27.5

Infiltration rate (sec⁻¹) = 64

Fertility = mixed

Elevation = 170-220 m

Source: Specht A (1988).

Reference site (average of three sites):

Canopy cover (%) = 91

Basal area (m²/ha) = 77

Leaf litter cover (%) = 76

Special life form Index (%) = 76

Stem density (stems / ha) (<2.5 cm) = 7000

Stem density (stems / ha) (2.5-10 cm) = 200

Stem density (stems / ha) (10-50 cm) = 700

Stem density (stems / ha) (>50 cm) = 90

Multivariate distance index = 1.5

No. native species trees, shrubs, vines = 51

Exotic woody plants = 0

Understorey trees, shrubs, seedlings = 1.6

Forest structure index = 100%

Ground cover index = 100%

Canopy Height (m) = 27

Source: Sanger, JC, Kanowski, J, Catterall, CP, Woodford, R. (2008) and Sanger, JC, Kanowski, J, Catterall, CP, Woodford, R. (unpublished).



VAST–2 - Site-based recording of use and land management and their effects on native vegetation over time

8. Brief history of the site/area

1840	Intact rainforest
1862	Area opened-up for selection
1900	Cedar getters select large trees
1910	Rainforest cleared and converted to pasture for dairying
1911	1948 Area used for grazing dairy cattle
1948	Area acquired for public use (water storage)
1950-1989	Minimal management – land in transition (Open public space)
1950-1952	Rocky Creek Dam constructed
1983-1990	Commenced experiments using assisted regeneration on small test plots
1991-2000	Large scale assisted regeneration (25 ha) by converting lantana thickets to rainforest
2001-2011	Minimal management

9. Proximity to large area of intact and largely unmodified rainforest

<500 m

10. Sources of data and information used to complete description of use and management and their effects on native vegetation over time

- A. Stubbs, BJ (1996) A question of competing values: forest and timber conservation in New South Wales, 1838-1996, PhD Thesis, Southern Cross University, Lismore, NSW.
- B. Richard Thackway inferred
- C. Woodford R. (2000) Converting a dairy farm back to a rainforest water catchment: the Rocky Creek Dam story. *Ecological Management & Restoration* 1(2) 83-92
- D. Parkes E.A. 2009. <http://www.bigscrubrainforest.org.au/pdf/BSL%20nomination%20National%20Threatened%20Ecological%20Community.pdf>
<http://www.bigscrubrainforest.org.au/pdf/BSL%20nomination%20National%20Threatened%20Ecological%20Community.pdf>
- E. Connolly S. and Specht A. (1988). Big Scrub Conservation Strategy. Volumes 1, 2 and 3. Report prepared for the National Parks and Wildlife Service. Sydney.
- F. Bickford, Brayshaw and Proudfoot 1998 http://www.daff.gov.au/__data/assets/pdf_file/0016/50605/nsw_ne_na29eh.pdf
- G. Sanger, J.C., Kanowski, J., Catterall, C.P., Woodford, R. (2008). Restoration of forest structure in managed regrowth at Rocky Creek Dam, Australia. *Ecological Management & Restoration* 9(2) 143-5



COMPILER: Richard Thackway.

VAST-2 - Site-based recording of use and land management and their effects on native vegetation over time

H. Brett Stubbs (pers comm)

I. Sanger, J.C., Kanowski, J., Catterall, C.P., Woodford, R. (unpublished)

Description of use and management and their effects on vegetation over time (explanation of numbered codes in Attachment 1)

Year	Source year	Temporal Reliability	Land use (ALUM ¹)	List of LU ² and LMP ³	Source LMP	Spatial Reliability LMP	Reliability attribute LMP	Observed effect and impacts on ecological function and native vegetation	Source Effects	Spatial Reliability LMP	Reliability attribute LMP
1788	B	1	Other minimal use 1.3.0	Indigenous land management - Goori people	B	1	1	Lowland Subtropical Rainforest. No recorded history of fire in the Big Scrub	E	1	1
1823	A	1	Other minimal use 1.3.0	Explorer Oxley travers the area	A	3	1	Rocky Creek Dam area not affected	I	1	1
1825	A	1	Other minimal use 1.3.0	Explorer Rous travers the area	A	1	1	Rocky Creek Dam area not affected	I	1	1
1842 - 50	A	1	Other minimal use 1.3.0	Along the lower Richmond River cedar getters 'move in'. Snig out larger trees as logs. Trees cut down using cross cut saws	A	2	1	Rocky Creek Dam area not affected	I	1	1
1842	A	1	Other minimal use 1.3.0	Along the lower Richmond River graziers were the first in the Big Scrub. Majority of the Big Scrub considered useless for stock	A	2	1	Rocky Creek Dam area not affected	I	1	1
1841 - 1843	G	2	Other minimal use 1.3.0	Pastoralists arrived on the Richmond p33	G	2	1	Rocky Creek Dam area not affected	I	1	1
1843 - 63	G	2	Other minimal use 1.3.0	The Squatters established properties p60	G	2	1	Rocky Creek Dam area not affected	I	1	1

¹ ALUM = Australian Land Use and Management classification

² LU = Land Use

³ LMP = Land or vegetation Management Practice



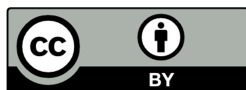
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1860s	A	1	Other minimal use 1.3.0	The Crown Lands Alienation Act 1861 (NSW), commonly referred to as the Robertson Land Act, passed resulting in closer settlement and intensive farming by small area farmers. p33	A	2	1	Rocky Creek Dam area not affected	I	1	1
1862	A	1	Other minimal use 1.3.0	Big Scrub thrown open to selection. Crown Land Alienation Act allows people to appropriate or select crown land before the block is surveyed. Small areas cleared for farming and houses	A	2	1	Rocky Creek Dam area not affected	A	1	1
1900	A	2	Production forestry 2.2.0	Likely that cedar getters 'moved in' to the upper reaches of the Richmond River. Snig out larger trees as logs. Trees cut down using cross cut saws	A	2	1	Large cedar trees selected and removed. Forest structure largely unmodified.	A	1	1
1910	I	2	Land in transition - Treed 2.3.0	Start of land clearing of the previously logged (cedar) lowland subtropical rainforest.	I	2	1			1	1
1910	B	1	Land in transition - Treed 2.3.0	Clearing done with brush hooks to clear the dense undergrowth. Small shrubs, vines and trees were cut down and large trees were left. Dried brush was burnt, killing the rainforest trees. Clearing and veg was burnt in Oct/Nov/Dec.	B	2	1	100% removal of understorey. Killed trees were left standing. Degraded rainforest left in creeks and gullies	B	1	1
1910	B	1	Land in transition - Treed 2.3.0	Soil not ploughed. Paspalum grass seed spread by hand into the	B	2	1	Spp composition reduced to 0%. Structure was 0%. Regen potential – 100%. Grass growth very vigorous. Grass prevented regrowth. Degraded	B	1	1



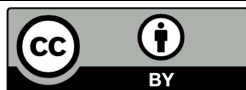
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				ashes. Unburnt logs still present along with large standing dead trees and stumps.				rainforest left in creeks and gullies			
1911	B	1	Grazing modified pastures 3.2.0	Start of grazing pasture for dairying	B	1	1	Grass growth vigorous and created a dense matt –soil erosion not a problem. Degraded rainforest left in creeks and gullies unchecked	B	1	1
1911 - 1948	B	1	Grazing modified pastures 3.2.0	Site used for grazing dairy cows	B	1	1				
1949	B	1	Land in transition 3.6.0	End of grazing pasture for dairying		1	1				
1949	B	1	Land in transition 3.6.0	the site [a dairy farm] was acquired ... by Rous County Council (now renamed Rous Water) as a site for constructing a public water supply dam for Lismore and the surrounding district p83	C	1	1				
1950-90	B	2	Land in transition 3.6.0	Former dairy pasture abandoned. 25 ha site minimally managed as a public reserve. No weed management.		1	1				
1950	B	1	Land in transition 3.6.0	Nearby dam construction commenced	B	1	1				
1952	B	1	Land in transition 3.6.0	soil was heavily disturbed by bulldozing for the dam wall p83	C	1	1	Blackwoods (<i>Acacia melanoxylon</i>) ... germinated from soilstored seed p83	C	1	1
1952	C	1	Land in transition 3.6.0	... dam construction was completed p83	C	1	1				



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1953	B	1	Other minimal use 1.3.0	Former dairy pasture abandoned. 25 ha site minimally managed as a public reserve. No weed management. Lawn mowing commenced in nearby high use visitor picnic areas	B	1	1	scattered rainforest trees in a ... Kikuyu (<i>Pennisetum clandestinum</i>) lawn. P83	C	1	1
1954 - 1989	B	2	Other minimal use 1.3.0	Former dairy pasture abandoned. 25 ha site minimally managed as a public reserve. No weed management. .	B	1	1	weed trees and shrubs [became established and] act as regeneration 'starters' by providing perching and feeding resources resulting in a seed 'sink' (McDonald 1999) P91	C	1	1
1970	C	1	Other minimal use 1.3.0	Survey of the Big Scrub Flora Reserve (analogue site) p91	C	1	1	71 [species of] trees and shrubs recorded	C	1	1
1983-1987	B	1	Other minimal use 1.3.0	Experimental restoration nearby the 25 ha site. ...-rainforest trees [seedlings] were subsequently planted in circular beds around the existing remnant trees in the expanse of lawn p83-4	C	1	1				
1983	B	2	Other minimal use 1.3.0	Experimental restoration nearby the 25 ha site.	B	1	1	Blackwoods (<i>Acacia melanoxylon</i>), itself smothered in the exotic shrub Lantana (<i>Lantana camara</i>) ... [observed] a good diversity of rainforest seedlings coming up under the Lantana,p83	C	1	1
1983	B	2	Other minimal use 1.3.0	Experimental restoration nearby the 25 ha site. ... a lot of the dead [Blackwoods] 2trees had been pushed into 1piles P83	C	1	1				
1984	B	2	Other minimal use 1.3.0	Experimental restoration nearby the 25 ha site. ... over the approximately 1 ha Blackwood grove: pulling	C	1	1	Germination of weeds was occurring, but strong germination of pioneer rainforest species was clearly evident, including species such as Kangaroo Apple (<i>Solanum aviculare</i>), Bleeding	C	1	1



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				Lantana and cutting larger specimens of Small-leaved Privet (<i>Ligustrum sinense</i>) and Camphor Laurel (<i>Cinnamomum camphora</i>) low to the ground and painting the cut stump with glyphosate. P83				Heart (<i>Omalanthus nutans</i>) and Poison Peach (<i>Trema aspera</i>). The faster-growing species of the next successional phase, the 'early secondary' species, were also germinating, including Corkwood (<i>Duboisia myoporoides</i>), Celery Wood (<i>Polyscias elegans</i>) and Pencil Cedar (<i>Polyscias murrayi</i>). The best regeneration was occurring in the areas that had received the most soil disturbance (i.e. the bulldozed sites) but which were neither excessively exposed to high temperatures and desiccation nor completely smothered by Lantana mulch.p83-4			
1985	B	2	Other minimal use 1.3.0	Experimental restoration nearby the 25 ha site.	B	1	1	Acacias and Pencil Cedars (which naturally regenerated on the site within the first 2-3 years after planting) p84	C	1	1
1985	B	2	Other minimal use 1.3.0	Experimental restoration nearby the 25 ha site. ... [survey] in a 0.5-ha section of the Blackwood grove p84	C	1	1	40 native species developing ... of which 15 species were 'early successional' species (a combination of four pioneer species and 11 early secondary species) and 25 species were 'late-successional' species (10 later secondary and 15 mature-phase species). p84	C	1	1
1985	B	2	Other minimal use 1.3.0	Experimental restoration nearby the 25 ha site.	B	1	1	It was not until some years later that we fully appreciated the fact that planting rainforest trees under isolated remnant trees was unnecessary at this site, given that so many species regenerated naturally over the years from either the soil seed bank or from seed freshly dispersed under perches by birds and bats p83	C	1	1
1985	B	2	Other minimal use 1.3.0	Experimental restoration nearby the 25 ha site. Circular beds	B	1	1	dominant Acacias and Pencil Cedars ... now overtopped the planted specimens p84	C	1	1
1986	B	2	Other minimal use 1.3.0	Experimental restoration nearby the 25 ha site.	B	1	1	assume, however, that much of the more diverse regeneration is likely to have arisen from seed recently dispersed from the nearby rainforest remnant by fauna, because the longer-lived species do not usually form a	C	1	1



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								persistent soil seed bank p84			
1986	B	2	Other minimal use 1.3.0	Experimental restoration nearby ... hand-weeding was limiting the area I could manage. [subsequently] herbicide [was used] judiciously p84.	C	1	1				
1986 - 1987	B	2	Other minimal use 1.3.0	Experimental restoration nearby the 25 ha site.	B	1	1	Released from weed competition, the rainforest species in the Blackwood grove put on rapid growth, soon out-competing further weed regeneration p84	C	1	1
1989-1999	C	1	Land in transition 3.6.0	Commenced work on the 25 ha site. Assisted regrowth p85 started weeding a new 25 ha area beyond the Blackwood grove that contained patches of rainforest regrowth struggling in competition with Lantana, Camphor Laurel and Small-Leaved Privet (<i>Ligustrum sinense</i>).p84 [The same approach that was adopted in the Blackwood grove {was used in this new area} ...pulling Lantana and cutting larger specimens of Small-leaved Privet (<i>Ligustrum sinense</i>) and Camphor Laurel (<i>Cinnamomum camphora</i>) low to the ground and painting the cut stump with glyphosate. P83] a small amount of follow-up weeding p86	C	1	1	In this site, Blackwood was also the major pioneer species and because the level of Lantana germination under the consolidating canopy was low, Lantana did not persist on this site after a small amount of follow-up weeding p86	C	1	1



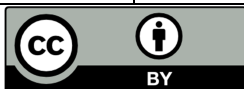
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1989-1999	C	1	Land in transition 3.6.0	Commenced work on the 25 ha site. Lantana is progressively over the 25 ha site. Initially Lantana is reduced to the ground by driving over it with the tractor during the driest part of the year, late winter/early spring, when Lantana is at its weakest. I use a tractor to initially flatten the Lantana and then undertake several slashings over approximately a month, during which time most of the Lantana is killed, leaving a fairly coarse mulch 2-5 cm deep over the ground. Depending on time, I pull the remaining live Lantana stumps to create disturbed patches and bring some of the buried pioneer seed bank to the surface. Lantana found to be climbing trees is cut with a brush cutter and pulled out. When the wet season begins in summer, increasing soil moisture levels initiate fungal activity and the decomposition of mulch. The resulting bare soil warms up and creates conditions suitable for the germination of annual weeds. These are sprayed	C	1	1	In late summer and early autumn, the days are often cloudy and getting cooler. A mass germination of pioneers occurs, particularly under the dripline of any residual trees left in the cleared area. By mid-winter, the pioneers are 1-2 m high and already forming a closed canopy, suppressing the weed problem and releasing my time and labour for other work in other areas, with regular, but diminishing, revisits to the original areas for follow-up weed control. P87	C	1	1



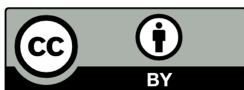
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				with dilute glyphosate before they set seed, thereby allowing a competition-free seed bed in which the rainforest pioneers can germinate. By then, the mulch layer and weeds have diminished considerably and, in good years, soil moisture levels are high and constant. In late summer and early autumn, the days are often cloudy and getting cooler. Hand-weeding among these pioneers (rather than spraying) then becomes the major task. P86-7							
1989	C	1	Land in transition 3.6.0	3 months after clearing the Lantana ... P88	C	1	1	Regrowth after 3 months: Lantana mulch has all but decomposed and seedlings of pioneers and early secondary species have germinated. 23 native species had regenerated in high densities. The height of the regenerating canopy ... had reached 50 cm. P87-8	C	1	1
1991	H	1	Land in transition 3.6.0	Monitoring time for space substitute	H	1	1	Regrowth after 7 years: Canopy cover (%) = 68 Basal area (m ² /ha) = 11 Leaf litter cover (%) = 63 Special life form Index (%) = 40 Stem density (log no. / ha) (<2.5 cm) = 35000 Stem density (log no. / ha) (2.5-10 cm) = 7000 Stem density (log no. / ha) (10-50 cm) = 300 Stem density (log no. / ha) (>50 cm) = 0 Multivariate distance index = 3.5	H	1	1
1991	J	1	Other minimal use	Monitoring time for space substitute	J	1	1	Number of native trees, shrubs, vines = 25 Height = 12	J	1	1



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			1.3.0					Special life form index = 40 Ground cover index = 86 Forest structure index = 36 Understorey trees, shrubs, seedlings = 1 Exotic woody plants = 3			
1992	H	1	Land in transition 3.6.0	Monitoring time for space substitute	H	1	1	Regrowth after 8 years: Canopy cover (%) = 62 Basal area (m-2/ha) = 16 Leaf litter cover (%) = 40 Special life form Index (%) = 35 Stem density (log no. / ha) (<2.5 cm) = 40500 Stem density (log no. / ha) (2.5-10 cm) = 6500 Stem density (log no. / ha) (10-50 cm) = 450 Stem density (log no. / ha) (>50 cm) = 0 Multivariate distance index = 3.5	H	1	1
1992	J	1	Land in transition 3.6.0	Monitoring time for space substitute	J	1	1	Number of native trees, shrubs, vines = 25 Height = 8 Special life form index = 34 Ground cover index = 52 Forest structure index = 40 Understorey trees, shrubs, seedlings = 0 Exotic woody plants = 3	J	1	1
1993	H	1	Land in transition 3.6.0	Monitoring time for space substitute	H	1	1	Regrowth after 9 years: Canopy cover (%) = 66 Basal area (m-2/ha) = 17 Leaf litter cover (%) = 45 Special life form Index (%) = 45 Stem density (log no. / ha) (<2.5 cm) = 18000 Stem density (log no. / ha) (2.5-10 cm) = 6500 Stem density (log no. / ha) (10-50 cm) = 600 Stem density (log no. / ha) (>50 cm) = 0 Multivariate distance index = 3.2 P144	H	1	1



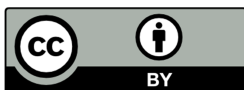
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1993	J	1	Land in transition 3.6.0	Monitoring time for space substitute	J	1	1	Number of native trees, shrubs, vines = 25 Height = 13 Special life form index = 44 Ground cover index = 60 Forest structure index = 58 Understorey trees, shrubs, seedlings = 0.3 Exotic woody plants = 2	J	1	1
1994	C	1	Land in transition 3.6.0	5 years after Lantana clearing the Lantana ... P88	C	1	1	Regrowth after 5 years: vigorous development of saplings around the base of the [remnant] tree[s] ... 71 species were recorded. The height of the regenerating canopy ... had reached 2.5–10 m site P88	C	1	1
1994	H	1	Land in transition 3.6.0	Monitoring time for space substitute	H	1	1	Regrowth after 10years: Canopy cover (%) = 74 Basal area (m-2/ha) = 40 Leaf litter cover (%) = 76 Special life form Index (%) = 35 Stem density (log no. / ha) (<2.5 cm) = 15000 Stem density (log no. / ha) (2.5-10 cm) = 6500 Stem density (log no. / ha) (10-50 cm) = 600H Stem density (log no. / ha) (>50 cm) = 0 Multivariate distance index = 2.5 P144	H	1	1
1994	J	1	Land in transition 3.6.0	Monitoring time for space substitute	J	1	1	Number of native trees, shrubs, vines = 25 Height = 16 Special life form index = 90 Ground cover index = 91 Forest structure index = 71 Understorey trees, shrubs, seedlings = 1.3 Exotic woody plants = 1	J	1	1
1995	H	1	Land in transition 3.6.0	Monitoring time for space substitute	H	1	1	Regrowth after 11years: Canopy cover (%) = 81 Basal area (m-2/ha) = 16	H	1	1



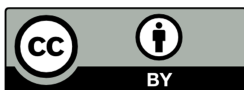
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Year	Source year	Temporal Reliability	Land use (ALUM ¹)	List of LU ² and LMP ³	Source LMP	Spatial Reliability LMP	Reliability attribute LMP	Observed effect and impacts on ecological function and native vegetation	Source Effects	Spatial Reliability LMP	Reliability attribute LMP
								Leaf litter cover (%) = 84 Special life form Index (%) = 42 Stem density (log no. / ha) (<2.5 cm) = 8500 Stem density (log no. / ha) (2.5-10 cm) = 3500 Stem density (log no. / ha) (10-50 cm) = 700 Stem density (log no. / ha) (>50 cm) = 0 Multivariate distance index = 2.55 P144			
1995	J	1	Land in transition 3.6.0	Monitoring time for space substitute	J	1	1	Number of native trees, shrubs, vines = 25 Height = 19 Special life form index = 41 Ground cover index = 86 Forest structure index = 60 Understorey trees, shrubs, seedlings = 0.3 Exotic woody plants = 2	J	1	1
1996-2011	B	1	Land in transition 3.6.0	Area minimally managed as a public reserve. Weed management as done as required.	B	1	1				
1996	H	1	Land in transition 3.6.0	Monitoring time for space substitute	H	1	1	Regrowth after 12years: Canopy cover (%) = 64 Basal area (m-2/ha) = 20 Leaf litter cover (%) = 62 Special life form Index (%) = 52 Stem density (log no. / ha) (<2.5 cm) = 7000 Stem density (log no. / ha) (2.5-10 cm) = 7000 Stem density (log no. / ha) (10-50 cm) = 700 Stem density (log no. / ha) (>50 cm) = 0 Multivariate distance index = 2.75 P144	H	1	1
1996	J	1	Land in transition 3.6.0	Monitoring time for space substitute	J	1	1	Number of native trees, shrubs, vines = 25 Height = 15 Special life form index = 52	J	1	1



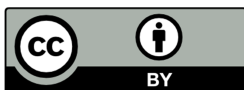
VAST-2 - Site-based recording of use and land management and their effects on native vegetation over time

Year	Source year	Temporal Reliability	Land use (ALUM ¹)	List of LU ² and LMP ³	Source LMP	Spatial Reliability LMP	Reliability attribute LMP	Observed effect and impacts on ecological function and native vegetation	Source Effects	Spatial Reliability LMP	Reliability attribute LMP
								Ground cover index = 77 Forest structure index = 58 Understorey trees, shrubs, seedlings = 0.5 Exotic woody plants = 2			
1997	H	1	Land in transition 3.6.0	Monitoring time for space substitute	H	1	1	Regrowth after 13 years: Canopy cover (%) = 81 Basal area (m-2/ha) = 50 Leaf litter cover (%) = 72 Special life form Index (%) = 47 Stem density (log no. / ha) (<2.5 cm) = 7000 Stem density (log no. / ha) (2.5-10 cm) = 5500 Stem density (log no. / ha) (10-50 cm) = 900 Stem density (log no. / ha) (>50 cm) = 22 Multivariate distance index = 2.25 P144	H	1	1
1997	J	1	Land in transition 3.6.0	Monitoring time for space substitute	J	1	1	Number of native trees, shrubs, vines = 25 Height = 25 Special life form index = 47 Ground cover index = 88 Forest structure index = 77 Understorey trees, shrubs, seedlings = 2.7 Exotic woody plants = 1	J	1	1
1998	H	1	Land in transition 3.6.0	Monitoring time for space substitute	H	1	1	Regrowth after 14 years: Canopy cover (%) = 81 Basal area (m-2/ha) = 35 Leaf litter cover (%) = 74 Special life form Index (%) = 45 Stem density (log no. / ha) (<2.5 cm) = 8500 Stem density (log no. / ha) (2.5-10 cm) = 4000 Stem density (log no. / ha) (10-50 cm) = 850 Stem density (log no. / ha) (>50 cm) = ~22 Multivariate distance index = 2.26 P144	H	1	1



VAST-2 - Site-based recording of use and land management and their effects on native vegetation over time

Year	Source year	Temporal Reliability	Land use (ALUM ¹)	List of LU ² and LMP ³	Source LMP	Spatial Reliability LMP	Reliability attribute LMP	Observed effect and impacts on ecological function and native vegetation	Source Effects	Spatial Reliability LMP	Reliability attribute LMP
1998	J	1	Land in transition 3.6.0	Monitoring time for space substitute	J	1	1	Number of native trees, shrubs, vines = 25 Height = 21 Special life form index = 43 Ground cover index = 91 Forest structure index = 71 Understorey trees, shrubs, seedlings = 1.3 Exotic woody plants = 0	J	1	1
1999	H	1	Land in transition 3.6.0	Monitoring time for space substitute	H	1	1	Regrowth after 15 years: Canopy cover (%) = 83 Basal area (m-2/ha) = 47 Leaf litter cover (%) = 94 Special life form Index (%) = 30 Stem density (log no. / ha) (<2.5 cm) = 10000 Stem density (log no. / ha)(2.5-10 cm) = 7000 Stem density (log no. / ha) (10-50 cm) = 1000 Stem density (log no. / ha) (>50 cm) = ~22 Multivariate distance index = 2.3 P144	H	1	1
1999	J	1	Land in transition 3.6.0	Monitoring time for space substitute	J	1	1	Number of native trees, shrubs, vines = 25 Height = 23 Special life form index = 32 Ground cover index = 84 Forest structure index = 77 Understorey trees, shrubs, seedlings = 0.7 Exotic woody plants = 1	J	1	1
2000	H	1	Land in transition 3.6.0	Monitoring time for space substitute	H	1	1	Regrowth after 16 years: Canopy cover (%) = 87 Basal area (m-2/ha) = 52 Leaf litter cover (%) = 86 Special life form Index (%) = 40 Stem density (log no. / ha) (<2.5 cm) = 8000 Stem density (log no. / ha)(2.5-10 cm) = 4500 Stem density (log no. / ha) (10-50 cm) = 900	H	1	1



VAST-2 - Site-based recording of use and land management and their effects on native vegetation over time

Year	Source year	Temporal Reliability	Land use (ALUM ¹)	List of LU ² and LMP ³	Source LMP	Spatial Reliability LMP	Reliability attribute LMP	Observed effect and impacts on ecological function and native vegetation	Source Effects	Spatial Reliability LMP	Reliability attribute LMP
								Stem density (log no. / ha) (>50 cm) = 50 Multivariate distance index = 2 P144			
2000	J	1	Other minimal use 1.3.0	Monitoring time for space substitute	J	1	1	Number of native trees, shrubs, vines = 25 Height = 26 Special life form index = 39 Ground cover index = 93 Forest structure index = 82 Understorey trees, shrubs, seedlings = 1.8 Exotic woody plants = 0	J	1	1
2000	C	1	Other minimal use 1.3.0	Monitoring	C	1	1	Today, these patches [of backwoods] have coalesced into large clusters of regrowth rainforest, surrounding declining Blackwoods. P86	C	1	1
2011	B	1	Other minimal use 1.3.0	Monitoring		1	1	Sites is on a trajectory back toward the pre European equivalent	C	1	1

11. Data Use and Accuracy Disclaimer

These data are compiled to the best of our knowledge and ability. The information contained in this document is subject to revision. The user accepts all risks and responsibility for loss, damages, costs and other consequences (direct or indirect) resulting directly or indirectly from using this information.

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VAST-2 - Site-based recording of use and land management and their effects on native vegetation over time

Attachment 1

Reliability standards used to compile historic and contemporary site-based chronologies.

Reliability level standards	Spatial precision (Scale)	Temporal precision (Year of observation)	Attribute accuracy (Land use, land management practices, effects on condition)
HIGH "Definite"	Reliable direct quantitative data. Examples: Site, plot and transect based records. Code: 1	Reliable direct quantitative data. Examples: Day-month-year, season-year and year. Code: 4	Reliable direct quantitative data. Examples: Inventory and counts, recorded observations from field survey and monitoring, farm records Code: 7
MEDIUM "Probable"	Direct (with qualifications) or strong indirect data. Examples: Land unit and soil-landscape reports. Code: 2	Direct (with qualifications) or strong indirect data. Examples: Mid 1850s Code: 5	Direct (with qualifications) or strong indirect data. Examples: Reconnaissance surveys, medium and moderate resolution remote sensing, regional mapping Code: 8
LOW "Possible"	Limited qualitative and possibly contradictory observations. More data needed. Examples: Land system, sub-bioregion and bioregion reports. Code: 3	Limited qualitative and possibly contradictory observations. More data needed. Examples: Early 1800s and first half of 19 th century. Code: 6	Limited qualitative and possibly contradictory observations. More data needed. Examples: Generalised descriptions and narratives, census-based surveys Code: 9

