

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

Citation: Thackway, R. (2012). Big Scrub Tintenbar site, 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

Big Scrub, Tintenbar, NSW.

2. Last modified (version no. 1)

Document last edited 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: 28°48'0.01"S, 153°30'32.48"E

Spatial precision re Attachment 1: Code = 1

4. Area of the site

70 ha

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.

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 emergents. 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 and epiphyte and litter-foraging vertebrate species characterise the community, particularly birds and megachiropteran bats. Invertebrate groups associated with the decomposer cycle are strongly represented, especially insects and snails.

Source: Parkes, E.A. (2009).

Infiltration rate (l sec⁻¹) = 132

Fertility = medium



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Elevation = 130-150 m

Source: A. Specht pers. comm. 2012.

6. Current purpose (2011) of the site/area

Lifestyle, residential and farm infrastructure.

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

Area of the plot: n/a

Component	Attributes	Description and values
Overstorey	Dominant life forms (tree, shrub, other)	Total overstorey spp. = 5, Total species (Holmes) = 152, Trees and shrubs= 121, Lianes (Connolly and Specht, 1989) = 31. Dominants = Strangler fig and Giant stinging tree.
	Species richness (#)	152
	Average top height (m)	25.3
	Foliage projective cover (%)	76
	Structural/age class (stem density sizes)	Mixed age. Basal area (cm ²) = 51,807

Community type: Complex Notophyll Vine Forest (CNVF) (Floyd 1981) White booyong assoc. (Flyod 1977).

The analogue for Tintenbar is Victoria Park Nature Reserve (A Specht pers comm). Victoria Park Nature Reserve an 18-hectare remnant of the 'Big Scrub'. : <http://www.smh.com.au/travel/travel-factsheet/lismore--places-to-see-20081124-6f8p.html#ixzz1ZzsNrz5z>

8. Brief history of the site/area

- 1788 Indigenous land management - Goori people
- 1823-25 Explorers Oxley followed by Rous traversed the area
- 1842 Cedar getters 'moved in'
- 1870 Portion of survey plan prepared for the Tintenbar property
- 1880 Camphor was planted as a shade tree in Lismore 1880s along streets
- 1885 Brush had been largely selected and slightly cleared
- 1900 Clearing done with brush hooks. Small trees were cut down with an axe and large trees were cut down using a cross-cut saw. Brush and fallen timber was burnt.
- 1900 Basalt rock removed from paddocks and placed around borders as field stone fencing. Paddock cleared of floaters so it could be ploughed
- 1901 Aggressive pasture grasses established. Initially this was paspalum



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1901-1978	Dairying and pasture improvement – mainly Kikuyu and fertiliser added
1968	Observed incursions of Camphor in creeks and gullies but not removed or controlled
1979	Changed from dairying to beef cattle production
1980-87	Cattle removed - destocked
1981-87	Observed incursions of weeds into the former dairy pasture including lantana, barna or elephant (<i>Pennisetum purpureum</i>) grass and tobacco bush and some Camphor but not removed or controlled
1988	Commenced agisting cattle
1990-93	Agisted horses and cattle
1993	Ceased agisting cattle and horses
1994-2011	Dense stands of camphor left unchecked

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

>1000m

10. Sources of data and information used to complete table below

- A. Brett Stubbs PhD Thesis
- B. Connolly S. and Specht A. (1989). Big Scrub Conservation Strategy. Volumes 1, 2 and 3. Report prepared for the National Parks and Wildlife Service. Sydney.
- C. Big Scrub Restoration: Onground Work and Challenges <https://www.bigscrubrainforest.org.au/online-articles/43-big-scrub-restoration-onground-work-and-challenges?format=pdf>
- D. Parkes, E.A. (2009) <http://www.bigscrubrainforest.org.au/pdf/BSL%20nomination%20National%20Threatened%20Ecological%20Community.pdf>
- E. Big Scrub Rainforest Landcare Group. (2005) Subtropical Rainforest Restoration 2nd edition. Big Scrub Rainforest Landcare Group, Bangalow, NSW
- F. Big Scrub Rainforest Landcare Group. (2008) Common Weeds of Subtropical Rainforests of Eastern Australia. 3rd edition. Big Scrub Rainforest Landcare Group, Bangalow, NSW
- G. Kanowski J., Kooyman R. and Catterall C.P. (2009) <http://www.rrrc.org.au/publications/downloads/495-GU-Kanowski-J-et-al-2009-Dynamics-and-Restoration.pdf>
- H. Neilan W., Catterall C.P., Kanowski J. and McKenna S. (2006) Do frugivorous birds assist rainforest succession in weed dominated oldfield regrowth of subtropical Australia? *Biological Conservation* 129:393–407.
- I. 1940 Aerial photo of the Tintenbar property
- J. NSW Geological records
- K. Alison Specht pers. comm. 2012



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- L. <http://www.bigscrubrainforest.org.au/pdf/BSL%20nomination%20National%20Threatened%20Ecological%20Community.pdf>
- M. Scott Stubbs pers. comm. 2012
- N. 2000 aerial photo
- O. Crown Plan C61.1834 (for Village Reserve 368). Gazetted 1878, surveyed 1881, Parishes of Teven and Ballina.
- P. Crown Plan R2177.1759 for conditional purchase portions 48 and 51 Parish of Teven.
- Q. Downturn at the Dairy (History) http://www.lismore.nsw.gov.au/cp_themes/default/page.asp?p=DOC-TZV-05-87-67
- R. Attiwill P.M. and Leeper G.W. (1987) *Forest soils and nutrient cycles*. Melbourne University Press. Page 33.
- S. Stubbs, B. J., Cameron, D. M., O'Neill, M. and O'Neill, R. (1999) 'From pest to profit: prospects for the commercial utilisation of camphor laurel (*Cinnamomum camphora*) in the Northern Rivers Region of New South Wales.' For Northern Rivers Regional Development Board and Northern Rivers Area Consultative Committee, 62 pp.
- T. Richard Thackway inferred.
- U. Catterall C. P., Kanowski J. and Wardell-Johnson J. (2008) Biodiversity and New Forests: Interacting Processes, Prospects and Pitfalls of Rainforest Restoration pp. 510–525 In: *Living in a Dynamic Tropical Forest Landscape* (eds N. Stork and S. Turton) Wiley-Blackwell, Oxford UK.

11. Description of use and management and their effects on native vegetation over time

Year	Source year	Reliability Year	Land use (ALUM)	List of LU and LMP	Source LMP	Reliability LMP	Observed effect and impacts on ecological function and native vegetation	Source Effects	Reliability Effects
1788	T	4	Other minimal use 1.3.0	Indigenous land management - Goori people	T	7	Lowland Subtropical Rainforest. No recorded history of fire in the Big Scrub	L	7
1823	A	4	Other minimal use 1.3.0	Explorer Oxley travers the area	A	7	Rainforest at Victoria Park is the closest benchmark for Tintenbar.	K	7
1825	A	4	Other minimal use 1.3.0	Explorer Rous travers the area	A	7			
1842	A	4	Other minimal use 1.3.0	Cedar getters 'move in'. Snig out larger trees as logs. Trees cut down using cross cut saws	A	7	Large cedar trees, <i>Toona ciliata</i> , selected and removed. Soil disturbance. Forest structure largely unmodified.	A	7
1842	A	4	Other minimal use 1.3.0	Graziers were the first in the Big Scrub Richmond River. Majority of the Big Scrub considered useless for stock	A	7	Under rainforest the soil litter layer i.e. A horizon varies in depth depending on season, for large parts of the year no litter layer is present at all.	K	7
1862	A	4	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.	A	7	Small areas cleared for farming and houses	A	7



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1868	S	4	Other minimal use 1.3.0	From the 1860s in the coastal cities and towns of eastern Australia <i>Camphor laurel</i> was planted widely as a shade tree along streets and in parks and other public places.	S	8	Towns in the district of the Big Scrub	S	8
1880	S	4	Other minimal use 1.3.0	Camphor was planted as a shade tree in Lismore 1880s along streets	S	7	Towns in the district of the Big Scrub	S	7
1881	O	4	Other minimal use 1.3.0	Adjacent to property 480 acres surveyed as future site for the Tintenbar village. Road from Tintenbar to Lismore abandoned	O	7	Dense rainforest (brush) on undulating hills. Small cleared areas along creek.	O	7
1881	A	4	Other minimal use 1.3.0	Crown plan prepared for the Tintenbar property. T K Gray selected the Tintenbar property.	P	7			
1885	A	4	Land in transition - formerly treed 2.3.0	General area: brush had been largely selected and slightly cleared	A	7			
1900	S	4	Other minimal use 1.3.0	Planting of Camphor in the coastal cities and towns of eastern Australia as a shade tree along streets and in parks and other public places was accelerated	S	7	Towns in the district of the Big Scrub	S	8
1900	A	4	Land in transition - formerly treed 2.3.0	General area: start of extensive land clearing of the previously logged forest-i.e. cedar Clearing done with brush hooks to clear the dense undergrowth. Small trees were cut down with an axe and large trees were cut down using a cross-cut saw. Brush and fallen timber was burnt. Cleared and felled veg was burnt in Nov/Dec.	A	7	100% removal of understorey. Ringbarked and left standing. Degraded rainforest left in creeks and gullies. Litter destroyed by burning. The debris was destroyed by burning.	A	7
1900	A	4	Land in transition - formerly treed 2.3.0	General area: basalt rock removed from paddocks and placed around borders as field stone fencing. Paddock cleared of floaters so it could be ploughed	A	7	Soil structure altered as a result of ploughing. The boulders provide an impediment to topsoil erosion. Their removal hastens physical soil loss.	K	7



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1901	A	4	Grazing modified pastures 3.2.0	General area: aggressive pasture grasses established. Initially this was <i>paspalum</i> for Dairying	A	7	Infiltration of rain into soil is high. This increases once the soil using pasture grasses i.e. protected from rain drops and overland flow	K	7
1910	T	4	Grazing modified pastures 3.2.0	Dairying	A	7	Managing pasture on former rainforest soil lead to two things: erosion of topsoil into local rivers, something that is not always noticed because the soil is very deep and uniform, and (b) a rapid rundown in the organic matter and nutrients within 10-15 years (i.e. since clearing 1900). Nutrients leached through the surface below the root zone. Soil became very acidic i.e. pH 4.5-5 leading to manganese and aluminium toxicity in some areas.	K	7
1918	S	4	Grazing modified pastures 3.2.0	Camphor was planted as a shade tree along streets and in parks and other public places e.g. Rappville avenue of 1 st world war trees.	S	7	Towns in the district of the Big Scrub	S	8
1919	J	4	Grazing modified pastures 3.2.0	Prospecting for opals	J	7	Impacts assumed to be minimal	T	7
1920	A	4	Grazing modified pastures 3.2.0	Hinterland Big Scrub almost completely cleared and sown to exotic pastures – mainly Kikuyu. Dairying	A	7	Managing pasture on former rainforest soil leads to a rapid rundown in the nutrients 10-15 years. Leachate from kikuyu selectively suppresses or delays recruitment of rainforest species Exotic pastures – mainly Kikuyu very aggressive in competing for light and nutrients. Kikuyu physically smothers regenerating rainforest plants and killing them.	K	7
1930	C	4	Grazing modified pastures 3.2.0				Since clearing most of the soil carbon has been lost due to decomposition.	R	7
1948	I	4	Grazing modified pastures 3.2.0	Improved pasture managed for Dairying	I	7	Isolated and scattered paddock trees with large spreading crowns more than likely Morton Bay Figs, <i>Ficus macrophylla</i> .	I	7



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1959	T	4	Grazing modified pastures 3.2.0	Dairying	A	7	Soil can slump on steeper slopes due to type of clay: moderately to high reactive clays do this with water load. Soain in NQ (excellent csiro soil scientist) has noted this within rainforest. I have seen it too in uncleared rainforest, just not as much of a problem there wrt soil loss because of the root impediments. Cattle with their hard hoofs make tracks and create sites vulnerable to slumping. Hill slopes terraces are formed. Soil erosion results in basalt rock 'working' their way onto the soil surface	K	7
1960	S	4	Grazing modified pastures 3.2.0	Changes in landuse in the Richmond-Tweed district since the 1960s led to the incursion of Camphor on to former dairy pastures.	S	7	District of the Big Scrub	K	7
1968	A	4	Grazing modified pastures 3.2.0	Incursion of Camphor observed and not removed	T	7	Camphor is an open-gap coloniser. From these fence trees, when the cattle were removed/became less abundant, the seedlings persisted in the paddocks (i.e. not eaten) believed to have established as seedlings in open paddocks Camphor grows at 1 m per year	K	7
1975	Q	4	Grazing modified pastures 3.2.0	Many dairy farmers in the district left the industry - 1975 quotas were reallocated and Norco was given a permanent quota	Q	7			
1979	T	4	Grazing modified pastures 3.2.0	Tintenbar owner turned to beef production	T	7			
1980	T	4	Land in transition 3.6.0	Cattle removed - destocked	T	7			
1986	M	4	Land in transition 3.6.0	Property purchased by PJ and J Stubbs, Brett Stubbs and Scott Stubbs. Property was destocked	M	7	Open pasture in paddocks with Camphor observed in the gullies and around the edges of paddocks	M	7



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1986		4	Residential and farm infrastructure 5.4.0	Commenced clearing 10 acres to plant an orchard. NB: 70 acres are in addition to these 10 acres.	M	7	Camphor and privet well established in the gullies and around the edges of paddocks due to lower grazing pressure. Site was weedy covered in lantana, barna or elephant (<i>Pennisetum purpureum</i>) grass and tobacco bush and some Camphor	M	7
1988	M	4	Residential and farm infrastructure 5.4.0	Commenced agisting cattle	M	7			
1990	M	4	Residential and farm infrastructure 5.4.0	Horses and cattle agisted over 70 acres.	M	7	Height of camphor on the site estimated at 10-15 m	M	7
1993	M	4	Residential and farm infrastructure 5.4.0	Ceased agisting cattle and horses	M	7			
1995	M	4	Residential and farm infrastructure 5.4.0	Land largely abandoned except for the house and orchard areas	M	7	Camphor canopy starting to close up. Height was observed around 12 m high. Native rainforest species observed to be regenerating in the understorey. Michael Fox, (MSc) recorded 12 species.	M	7
1998	M	4	Residential and farm infrastructure 5.4.0	Dense stands of camphor left unchecked.	M	7	Camphor can act as cover crop for selected rainforest species as it helps to shade out pasture grasses	G	7
2000	N	4	Residential and farm infrastructure 5.4.0	Dense stands of camphor left unchecked.	M	7	Dense cover of camphor observed in the gullies	N	7
2006	T	4	Residential and farm infrastructure 5.4.0	Dense stands of camphor left unchecked.	M	7	By creating a closed canopy which suppresses grasses and enhances the recruitment and survival of rainforest plants	U	7
2010	M	4	Land in transition 3.6.0	Mechanical harvesters used to commercially log Camphor forest for biomass generation.	M	7	Exposed soil leads to increased water penetration	M/K	7



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2011	M	4	Land in transition 3.6.0	Logged area left without restoration	M	7	Weed invasion occurred after logging of Camphor forest. Indeed, as illustrated on Southern Cross University campus, removal of camphor without a replacement program results in more camphor.	M/K	7

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Site-based template for recording land use and land management history and their effects on native vegetation over time

Attachment 1

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

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