NAMBUCCA SHIRE COUNCIL

Vegetation Mapping within the Nambucca Local Government Area

Coastal Lowland Vegetation Communities and Potential Threatened Ecological Communities
Volume 1 — Project Report

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Executive summary

Vegetation mapping and a field verification program were conducted, in two stages, for parts of the Nambucca Shire Council Local Government Area (Nambucca LGA) using high-resolution digital aerial imagery. The aim of the project was to map the vegetation and plant community types in the coastal and lowland areas of the Nambucca LGA outside National Park and State Forest Estate in order to:

- Define the extent of vegetation on the valley floors, to provide a refined and accurate layer of woody and non-woody vegetation cover for private land and coastal Crown Land within the Nambucca LGA.
- Delineate the potential occurrence of Threatened Ecological Communities (TECs) on freehold lands and coastal Crown Land in the Nambucca LGA (Stage 1).
- Map all coastal and lowland vegetation communities on freehold land and coastal Crown Land (Stage 2).
- Identify areas of the Stage 2 mapped vegetation to be used in habitat modelling for the Koala (*Phascolarctos cinereus*).

Since 2009, high-resolution digital aerial photography has become available for the Nambucca LGA and the NSW Office of Environment and Heritage (OEH) has completed a new vegetation classification for the Northern Rivers Catchment Management Area (NRCMA) (OEH 2012a). These developments provided the opportunity to upgrade the existing mapping and classification of vegetation in the Nambucca LGA to match current OEH standards.

Vegetation within the study areas was mapped using aerial photography interpretation (API). Stage 1 of the study, in which potential TECs were mapped, covered an area of 86 741 ha. The Stage 2 study area, within which all extant vegetation was mapped, covered 36 301 ha. The vegetation of the study area was attributed, where possible, to an existing Plant Community Type (PCT) within the new vegetation classification for the NRCMA.

The resultant draft maps were subject to a detailed, iterative validation process involving extensive field checking during which 30 full floristic sites and approximately 600 rapid floristic sites were surveyed to check vegetation type boundaries and attribution. Finally, data stitching, topology checking, checking of attribute consistency and any necessary map linework corrections were undertaken to finalise the map.

In total, 63 vegetation types, covering 15 335 ha, were mapped in the Nambucca Shire LGA study areas. These vegetation types equated to 58 PCTs, three of which were split into two local floristic variants and one of which was split into three local floristic variants. An additional 3898 ha of extant vegetation was mapped in the Stage 2 study area but not assigned to a PCT. This included 2302 ha mapped as native pioneers, rainforest pioneers or native remnant vegetation, with the rest mapped mainly as exotic and plantation vegetation. In Stage 1 of the project, 1769 ha of Rainforest vegetation, containing an additional two Nambucca vegetation communities and two PCTs, were mapped outside the Stage 2 study area.

Each PCT was assessed for equivalency to TECs listed under State or Federal legislation. A total area of 4688 ha was mapped as potential TEC. Overall, 33 PCTs were assessed as containing vegetation likely to be equivalent to one of nine (9) TECs (all of which are

Endangered Ecological Communities (EECs)) under the New South Wales *Threatened Species Conservation Act 1995* (TSC Act) and three TECs (1 Vulnerable and 2 Critically EECs) under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The TECs listed under the *TSC Act* were:

Threatened Ecological Community	Status	Area (ha)
Coastal Saltmarsh in the NSW North Coast, Sydney Basin and South East Corner bioregions	Endangered	257
Freshwater Wetlands on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions	Endangered	648
Littoral Rainforest in the NSW North Coast, Sydney Basin and South East Corner bioregions	Endangered	34
Lowland Rainforest in the NSW North Coast and Sydney Basin bioregions	Endangered	1801
Lowland Rainforest on Floodplain in the New South Wales North Coast bioregion	Endangered	342
Subtropical Coastal Floodplain Forest of the NSW North Coast bioregion	Endangered	13
Swamp Oak Floodplain Forest of the NSW North Coast Sydney Basin and South East Corner bioregions	Endangered	385
Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions	Endangered	1196
Themeda Grassland on Seacliffs and Coastal Headlands in the NSW North Coast, Sydney Basin and South East Corner bioregions	Endangered	12

The TECs listed under the *EPBC Act* were:

Threatened Ecological Community	Status	Area (ha)
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	Critically Endangered	35
Lowland Rainforest of Subtropical Australia	Critically Endangered	2177
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	257

This project extends, and is consistent with, fine scale mapping work completed for the Coffs Harbour LGA (OEH 2012b) and the Bellingen Shire LGA (OEH 2014).

The vegetation map is suitable for use at a scale of 1:5000 and will support environmental planning and assessment at the level of local government areas and regions. The map is indicative of the vegetation and threatened ecological communities occurring within an individual property or development land area. However, it is recommended that decision making be based on further flora surveys and expert-driven site assessment to meet the requirements of the *TSC Act* and other planning instruments on a case-by-case basis.

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Acknowledgements

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Project contributions including flora surveys, aerial photography interpretation (API), rapid surveys and ground-truthing surveys were conducted by botanical consultant Peter Richards and OEH staff Karen Caves, Bronwyn Ness, Brendan Rennison, Paul Sheringham, Kirsten Tuckey, John Turbill, Kyles Woodbury.

API of potential threatened ecological communities was done by Paul Sheringham, (OEH), with project management stage 1 by Ernst Kemmerer (formerly OEH), with stage 2 project management by John Turbill (OEH). All specialist technical GIS work, including topology and database management, was completed by Mark Cameron and Jill Smith (OEH).

Peter Higgins (Bronzewing Services, Sawtell) edited and formatted the final report.

Photographs were supplied by Ernst Kemmerer, Paul Sheringham, Karen Caves and Peter Richards.

This project would not have been possible without the support of Grant Nelson of Nambucca Shire Council, and Council's efforts in obtaining access to freehold lands for field verification and flora surveys.

List of abbreviations

ADS40	Airborne Digital Sensor (Leica Geosystems)
API	Aerial Photograph Interpretation
EEC	Endangered Ecological Community
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)
GIS	Geographic Information System
GPS	Global Positioning System
LEP	Local Environmental Plan
LGA	Local Government Area
LiDAR	Light Detecting and Ranging
LPI	NSW Land and Property Information
NPWS	NSW National Parks and Wildlife Service (within the Office of Environment and Heritage)
NRCMA	Northern Rivers Catchment Management Area (now known as North Coast Local Land Services)
NSW	New South Wales
OEH	Office of Environment and Heritage (NSW)
PCT	Plant Community Type
TEC	Threatened Ecological Community
TSC Act	*Threatened Species Conservation Act 1995* (New South Wales)
VCA	NSW Vegetation Classification and Assessment module of the VIS (as follows)
VIS	OEH NSW Vegetation Information System

Standard units and their abbreviations are used: ha, hectares; km, kilometres.

1 Introduction

The Nambucca Shire is a coastal local government area (LGA) known to have important wetlands, lowland rainforests and coastal headlands, all of which contain ecological communities of environmental significance that are protected under either the NSW *Threatened Species Conservation Act 1995* (*TSC Act*) or the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (*EPBC Act*) or both. Similarly, the Nambucca LGA supports large areas of native vegetation that provide important habitat for a suite of threatened flora and fauna species, including the Koala (*Phascolarctos cinereus*).

The *TSC Act* defines an ecological community as 'an assemblage of species occupying a particular area'. Ecological communities can be listed under the *TSC Act*, and the *EPBC Act*, as Critically Endangered, Endangered or Vulnerable, depending upon their risk of extinction (NSW Scientific Committee 2012; Threatened Species Scientific Committee 2013). A generic term that encompasses all of these different classes is 'threatened ecological community' (TEC). For example, under the Commonwealth *EPBC Act* 'Lowland Rainforest of Subtropical Australia' is listed as a Critically Endangered Ecological Community and 'Subtropical and Temperate Coastal Saltmarsh' is listed as a Vulnerable Ecological Community. Both of these communities occur in the Nambucca LGA, and are listed under the NSW *TSC Act* as Endangered Ecological Communities.

Local Environmental Plans (LEPs) provide standards for control and planning of development and are used to reserve land for open space, schools, transport or other public purposes and infrastructure, as well as for the protection of vegetation. For such planning purposes, Nambucca Shire Council requires more detailed information on the likely distribution and locations of any TECs. This is now readily achievable with current technology, including three-dimensional computer-based interpretation of high-resolution digital photography (collected by Land and Property Information in 2009). However, owing to the inclusion of geophysical attributes, such as elevation, aspect and substrate, in the State and Commonwealth legislative listings of TECs, further assessment and site inspection is required to confirm the presence of TECs. For example, lowland rainforests as described in the *EPBC Act* that occur in the Nambucca LGA may or may not represent the listed TEC depending upon local substrate and elevation.

This vegetation mapping project set out to identify the coastal lowland vegetation communities and potential threatened ecological communities within the Nambucca LGA, and was conducted in two stages.

Stage 1 of the project aimed to map native vegetation highly likely to be or contain TECs to guide consideration for local environmental planning purposes and to identify the potential occurrence of TECs and to identify areas that require further investigation for development or agricultural planning.

Stage 2 of the project aimed to delineate and map all native vegetation types within the coastal and lowland areas of the LGA outside National Park and State Forest Estate. The resultant vegetation mapping is then to be used as the basis to identify, rank and map koala habitat based on the dominance of preferred koala feed trees within each vegetation community coupled with the results of field surveys to determine the level of use of habitat by koalas across the study area. It is envisaged that this study may eventually contribute to

the preparation of a Comprehensive Koala Plan of Management for the coastal part of the Nambucca LGA.

This present study – summarised fully in this report – is timely, as the NSW Office of Environment and Heritage (OEH) has recently completed a new vegetation classification for the Northern Rivers Catchment Management Area (NRCMA) with funding from Catchment Action NSW (OEH 2012a, 2012b). Plant Community Types (PCTs) recognised and described in this new classification have been incorporated into the NSW Vegetation Classification and Assessment (VCA) module of the NSW Vegetation Information System (VIS), which underpins all native vegetation regulation and assessment in NSW (see http://www.environment.nsw.gov.au/research/Vegetationinformationsystem.htm [accessed 1 October 2015]). The opportunity now exists to upgrade both the linework and vegetation classification of previous vegetation mapping (Kendall & Kendall Ecological Services 2003) to match current OEH standards in mapping and classification.

1.1 Objectives of the study

The objectives of the project were to:

- Delineate potential occurrences of Threatened Ecological Communities (TECs) on freehold land and coastal Crown Land in the Nambucca LGA
- Define the extent of woody and non-woody vegetation cover on the valley floors to provide a refined and accurate vegetation mapping layer for private land and coastal Crown Land within the Nambucca LGA
- Map all coastal and lowland vegetation on freehold land and coastal Crown Land and attribute each to Plant Community Types (PCTs), and
- Identify areas of vegetation to be used in koala habitat modelling

The first three objectives are covered in this report; the fourth objective will be covered in a separate report (OEH 2015).

1.2 Nambucca LGA

The Nambucca LGA (Figure 1) is a coastal shire that covers 149 968 ha and rises from sea level to elevations of greater than 1500 metres above sea level in the far west of the LGA along the New England Escarpment. The area is located within the New South Wales North Coast Bioregion (Thackway and Cresswell 1995) and the Coffs Coast and Escarpment and Macleay Hastings Biogeographic Subregions (Department of Environment 2015).

The Nambucca LGA is characterised by generally flat, low-lying landscapes on the coast that rise gradually to steep, mountainous areas in the west. Four major alluvial systems – the Nambucca River, Warrell Creek, South Arm and Taylors Arm, and their respective tributaries – comprise a large proportion of the flatter, lower lying areas. The Nambucca River and Taylors Arm converge at Macksville, and the Nambucca River subsequently meets the ocean at Nambucca Heads. The floodplains of these two systems contain many freshwater and saltwater wetlands, whereas the tributaries of the Nambucca River and Warrell Creek contain extensive forested wetlands and patches of remnant lowland or littoral rainforest interspersed with River Oak (*Casuarina cunninghamiana*) forests.

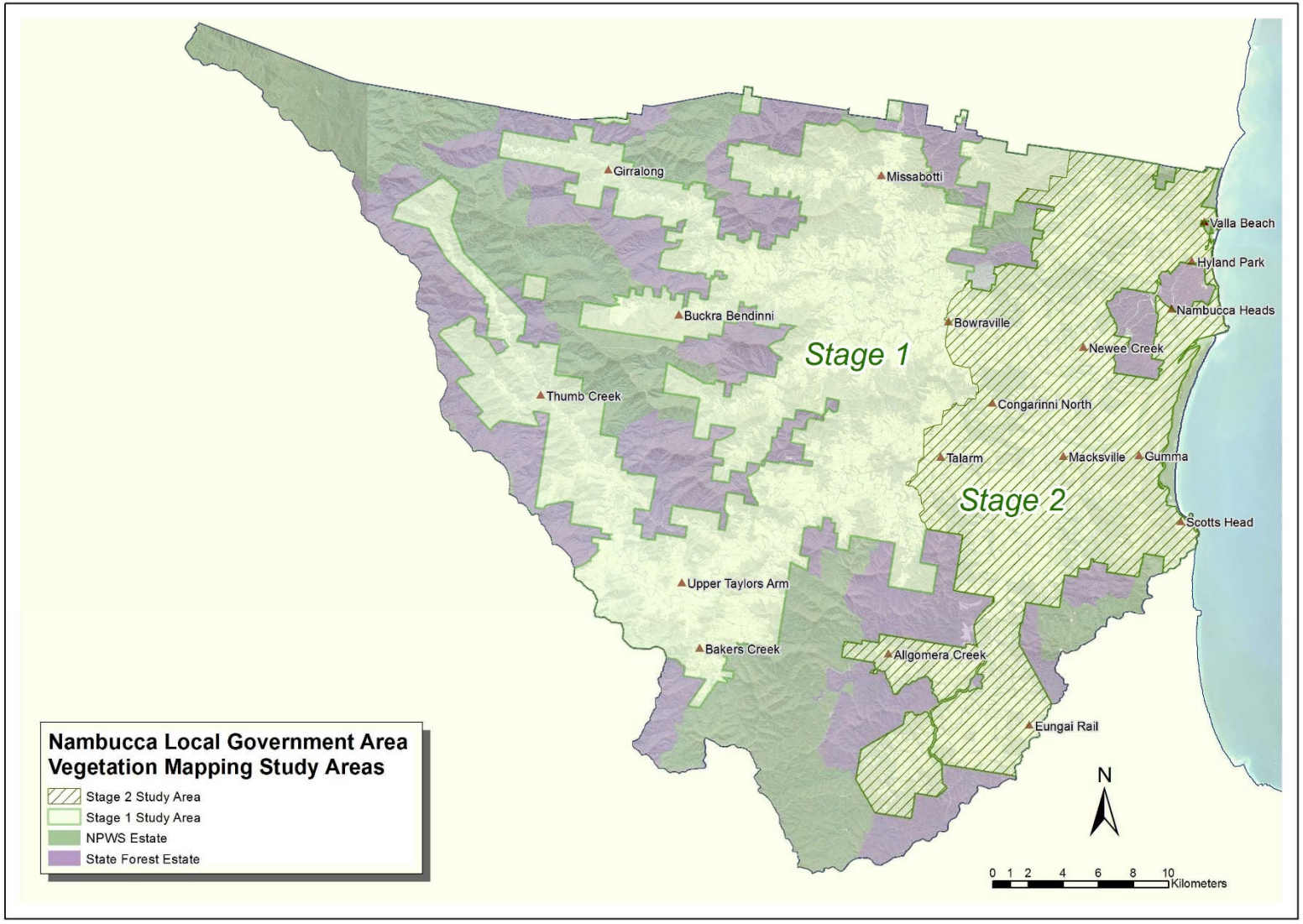

Figure 1 Nambucca LGA showing the study areas of Stage 1 and Stage 2 of the project (see Methods for details of these study areas), and the areas of National Park and State Forest Estate.

1.3 Landscapes

The Nambucca LGA consists of four topographical landscapes: the Coastal Plains, Midland Hills, Escarpment Ranges and Alluvial Plains (see Table 1, Figure 2).

Table 1 Landscapes of the Nambucca LGA, and their area and percentage of total area of the LGA (149 968 ha).

Landscape	Area (ha)	Percentage of total area of Nambucca LGA
Coastal Plains	4 306	2.9%
Midland Hills	53 696	36%
Escarpment Ranges	72 522	48%
Alluvial Plains	18 444	13%
Total	**148 968**	**100%**

The Coastal Plains form the smallest landscape in terms of overall area (3% of the LGA), contains the smallest area of vegetated land and supports most of the human population of the LGA. The Midland Hills and Escarpment Ranges landscapes support a much lower human population density than the Coastal Plains, within small town and rural landholdings surrounded by large areas of public land in state forests and national parks. These landscapes, particularly the Escarpment Ranges, contain the greatest extent of forested land within the study area (DECCW 2010).

The Coastal Plains comprise the North Coast Barrier Dunefields and Coastal Alluvial Plain physiographic regions (Eddie 2000). The Coastal Plains landscape unit contains low-relief beaches, dunes and strand plains and coastline, excluding the steeper and higher rocky headlands. The Coastal Plains also contain the alluvial floodplains and tidal estuaries of the Nambucca River, Deep Creek and Warrell Creek.

The Midland Hills landscape is a moderately undulating landform encompassing the foothills and low ranges between the Coastal Plains and the Escarpment Ranges. The Midland Hills landscape comprises the Bellbrook Hills, Nambucca–Bellingen Hills and Yarrahapinni Hills physiographic regions (Eddie 2000) and accounts for approximately 36% of the total area of the whole Nambucca LGA. The elevation of the Midland Hills landscape varies from 5–10 m above sea level (asl) along the coastline and headlands to 450 m asl in the escarpment areas.

The Escarpment Ranges extend west from the Midland Hills landscape to the far western boundary of the Nambucca LGA. The Escarpment Ranges landscape comprises the Horseshoe Ranges physiographic region (Eddie 2000). It is the most extensive landscape, occupying approximately 48% of the total area of the Nambucca LGA. This landscape is characterised by steep and very rugged terrain. It encompasses most of the mountainous topography within the LGA as well as the headwaters of the Taylors Arm and Nambucca River systems. The elevation of the Escarpment Ranges varies from about 75 m asl in the east to the highest elevation within the LGA, of just over 1500 m in New England National Park.

The Alluvial Plains landscape occupies 13% of the Nambucca LGA and traverses the Coastal Plains and Midland Hills landscapes. On the Coastal Plains, it comprises the alluvial floodplains of the Nambucca River, Deep Creek and Warrell Creek. Lower lying areas within the Midland Hills landscape constitute parts of the Alluvial Plains, including the alluvial landforms of the Taylors Arm, South Arm, Warrell Creek and Nambucca River floodplains.

1.4 Geology and Soils

The Nambucca LGA is located within the eastern zone of the New England fold belt geological province. The geology of the area (Figure 3) consists predominantly of ancient Carboniferous sediments of the Hastings Block (siltstone, sandstone, mudstone) in the south, or Permian metamorphic sedimentary rocks of the Nambucca Block in the Nambucca and Kempsey Beds (slate, phyllite and schist), in the north and west. Outcroppings of coarse-grained Valla and Yarrahapinni Adamellite occur at Picket Hill, Mount England and Bald Hill in the Yarrahapinni Hills physiographic region. Isolated occurrences of tertiary extrusive flows of basalt, trachyte and dolerite occur in the upper Taylors Arm and Nambucca River Valleys.

Along the coast are Holocene sand deposits associated with beaches, fore-dunes, hind-dunes and swales. Between Scotts Head and Nambucca is a strip of older, less-fertile Pleistocene backbarrier sands. In the tidal sections of coastal creeks and rivers are Holocene and Pleistocene muds, silts and sands deposited in bays, tidal channels, estuaries and swamps. The floodplains of the main creeks and rivers contain extensive alluvial landforms deposited in freshwater back-swamps, levees, lagoons and channels (Gilligan *et al.* 1992; Troedsen *et al.* 2004).

Soils within the Nambucca LGA consist mainly of lithosols and podzolics derived from slates, phyllites, clastic sediments and wind-blown sands. The soils of alluvial and saline swamp environments comprise kandosols, rudosols, hydrosols and organosols. Other soil-landscape groups that are present include Aeolian, beach and estuarine groups that exist as sand-dunes and tidal flats that have accumulated sand and sediment over time. A soil-landscape map and report for the Macksville and Nambucca 1:100 000 map sheets, which includes most of the Nambucca LGA, has been produced by the Department of Land and Water Conservation (Eddie 2000).

1.5 Climate

The Nambucca LGA is located in a subtropical region with predominantly summer rainfall. The average daily maximum temperature is 23.3°C and average daily minimum 14°C (Bureau of Meteorology monthly rainfall and temperature data for Nambucca Heads, Taylors Arm and Girralong, searched for at http://www.bom.gov.au/climate/data/index.shtml [verified 20 October 2015]). Although long-term site-based climatic data for the shire are poor, modelled data indicate an annual average temperature of 19°C along the coastline, which decreases to 12°C with increasing elevation and distance from the coast (Climate Risk 2010). Maximum average temperatures during the warmest part of the year average approximately 28°C along the coastal margins, decreasing to 21–22°C for elevated inland areas. Similarly, the average minimum temperatures of the coolest period of the year range from 7.5°C along the coast to approximately 1.5°C at the highest points of the LGA that adjoin the New England Tableland.

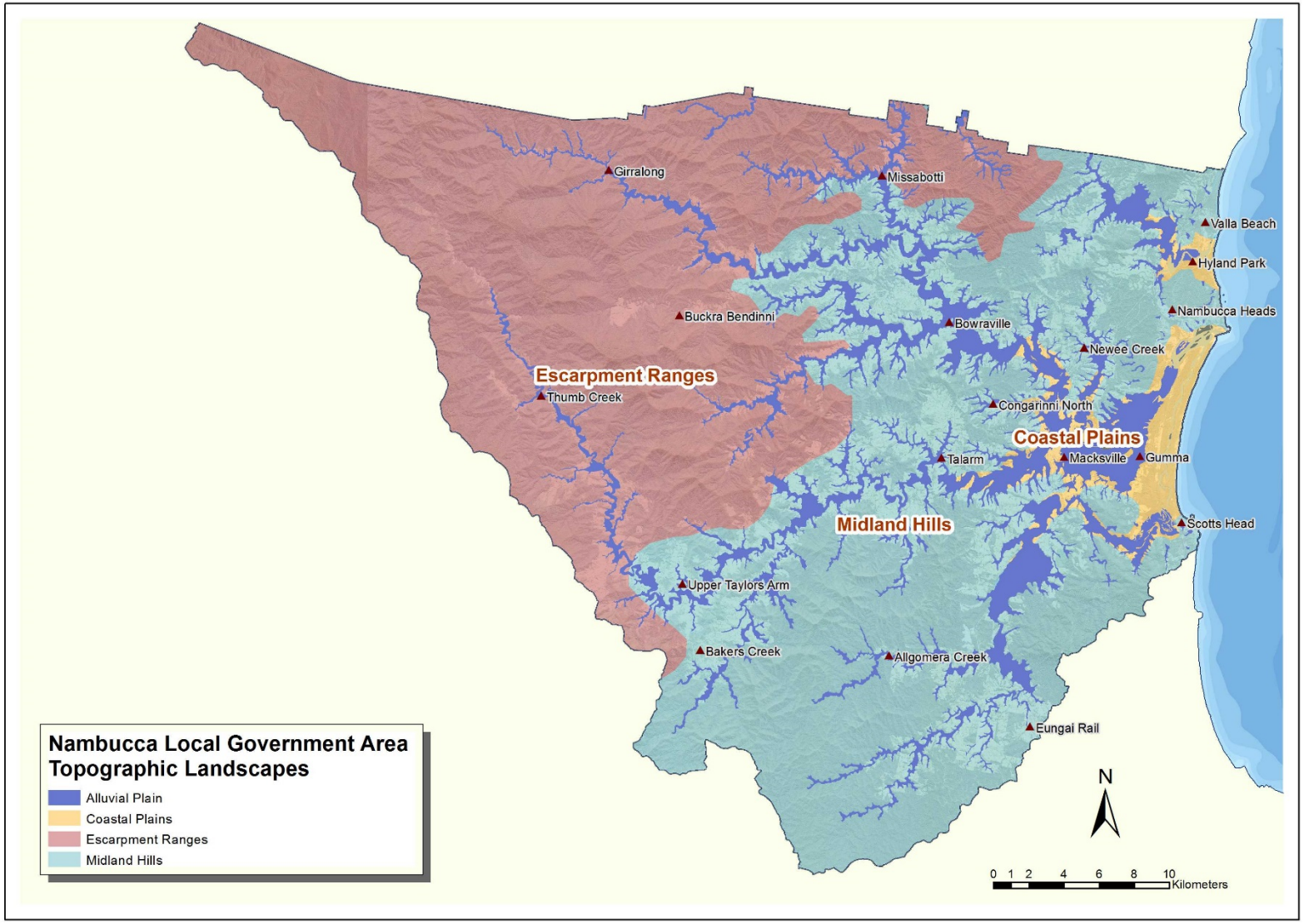

Figure 2 The topographical landscapes of the Nambucca LGA.

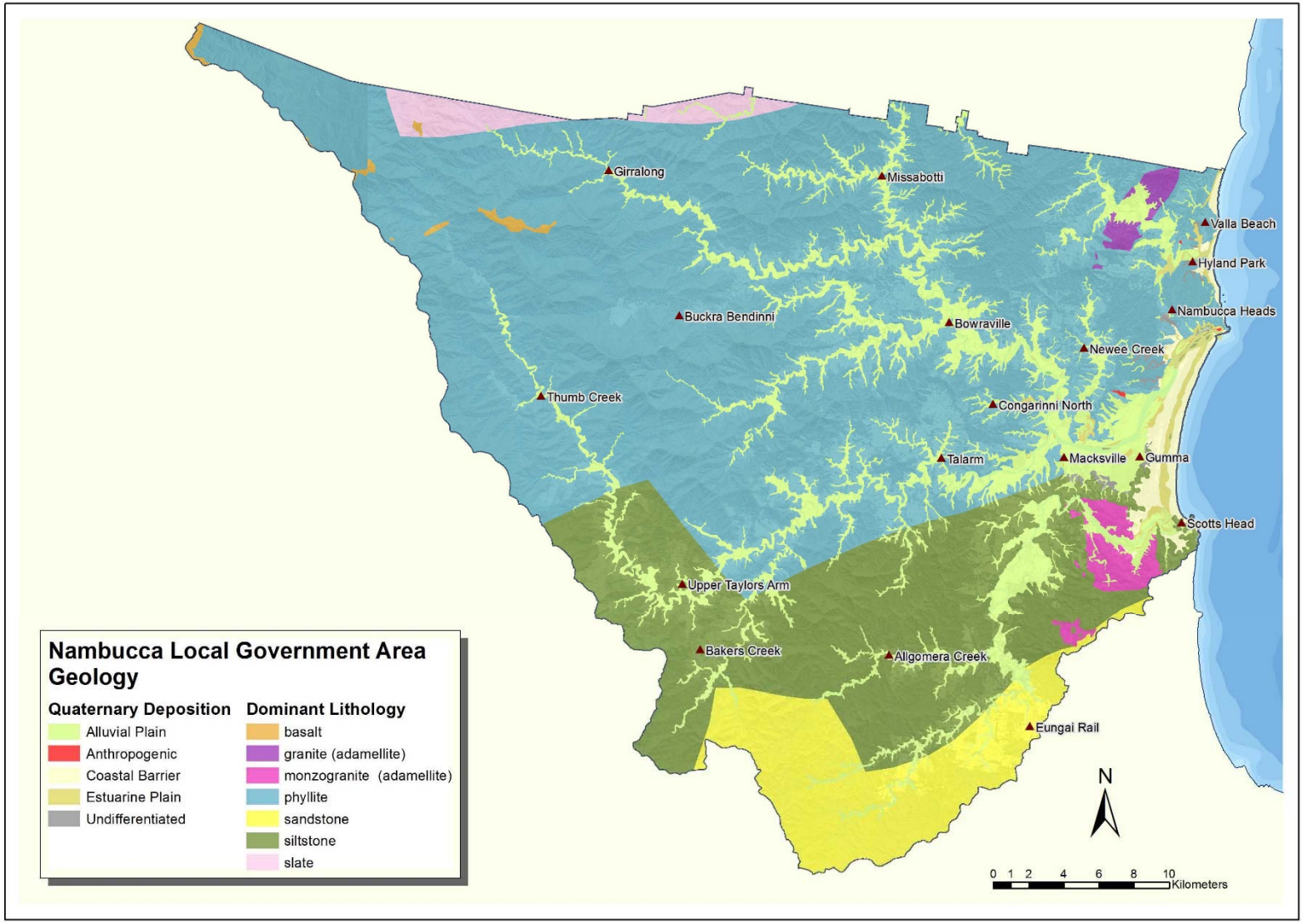

Figure 3 Geology of the Nambucca LGA.

Average annual rainfall over the coastal area of the Nambucca LGA is between 1300 and 1400 mm. In the period 1961–2001, annual rainfall across the LGA varied between 1100 and 1500 mm (Climate Risk 2010), with lower average rainfall recorded in the southern parts of the LGA and higher rainfall occurring in the northern parts of the LGA and on the Escarpment Ranges.

1.6 Land-use

Before European settlement, the area north of the Nambucca River was occupied by the Gumbaynggirr people, and south of there by the Ngambaa people. These peoples occupied the rich coastal and riverine areas that had the most abundant food and water resources (Eddie 2000). The first Europeans to enter the study area were cedar getters in the 1820s. Grazing and general forestry followed. The first permanent settlement in the study area was at Scotts Head, in 1841 (Eddie 2000). Land-use within the LGA varies across the four topographical landscapes (described above). The Alluvial Plains have been heavily cleared for agriculture, including livestock production. The primary land-uses of the Coastal Plains are urban and rural residential interspersed with areas of horticulture and grazing. The coastal strip has a large area of Crown Land and conservation tenure. The private land of the Midland Hills, Alluvial Plains and Escarpment Ranges landscapes are mostly rural, with grazing activity concentrated along the lower slopes of the alluvial valleys (Nambucca Shire Council 2004). There are also small areas of horticulture (primarily Macadamia nuts, Bananas, hothouse vegetables and Blueberries). The Midland Hills and Escarpment Ranges landscapes are used mainly for nature conservation or forestry as they contain significant areas of National Park and State Forest Estates.

2 Methods

The vegetation mapping for the Nambucca LGA project was carried out in two stages. Stage 1 involved the mapping of areas of vegetation that potentially qualified as a Threatened Ecological Community (TEC) as listed under the NSW *TSC Act* or the Commonwealth *EPBC Act* (subject of a draft report – Cameron *et al*. 2014). Stage 2 completed the mapping of the remaining vegetation within a subset of the Stage 1 study area (the Stage 2 study area). This current report summarises the combined results of the two stages of the project and provides a complete analysis of the vegetation of freehold lands within the Nambucca LGA study area. It supersedes the earlier draft report (Cameron *et al*. 2014).

The key steps are as follows and are described fully in subsequent sections of this chapter.

Stage 1
Flora surveys in Stage 1 study area (full floristic and rapid plots)
High-resolution mapping of vegetation extent in Stage 1 study area
Delineation of TECs: fine-scale mapping of Plant Community Types (PCTs) using aerial photography interpretation (API)
Field checking and refinement of mapping
Description of PCTs and attribution of likely TECs
Stage 2
Remaining vegetation mapping: fine-scale mapping of PCTs using API in Stage 2 study area
Field checking and refinement of mapping
Description and attribution of PCTs throughout the combined study areas

2.1 Study area

The study area of Stage 1 of the project, which encompassed the mapping of potential TECs only, covered an area of 86 741 ha and extended across the coastal lowlands and hinterland valleys of the Nambucca LGA, excluding National Park and State Forests Estate (Figure 1). The Stage 2 study area covered 36 301 ha of the eastern part of the Stage 1 study area, and encompassed the mapping of all remaining vegetation (that is vegetation not likely to have been TEC) on freehold lands of the coastal plains and midland hills (Figure 1). Thus, the study areas of the two stages overlap.

The study comprised only freehold land. Access to private lands was provided on a voluntary basis. This process was coordinated by the Nambucca Shire Council with a mailed invitation to landholders in rural areas having properties greater than 5 ha in area and supporting relevant vegetation types.

2.2 Existing flora surveys and vegetation data

At the start of this current study, 238 full floristic flora survey plots (see below for description of these methods) had been sampled in the Nambucca LGA as part of previous studies (Floyd 1990; NPWS 1994, 1999; Chapman and Binns 1995; Tweedie *et al.* 1995; Clarke *et*

al. 2000; Kendall & Kendall Ecological Services 2003). Of these, 91 were within the combined Stages 1 and 2 study areas.

Further, Kendall & Kendall Ecological Services (2003) had mapped vegetation for the valley areas of the Nambucca LGA using the Forest Ecosystems classification (NSW NPWS 1999) as the basis for delineation. The Kendall & Kendall mapping used colour aerial photography taken in 1997 at a scale of 1:25 000, and sampled 28 full-floristic survey sites and 63 rapid roadside sites (see below for description of methods) to support the mapping. The mapping covered an area of 46 224 ha of private property on the valley floors and excluded areas of State Forest and National Park Estate.

The Kendall & Kendall vegetation mapping for the Nambucca LGA described 36 vegetation types in the study area. Of these types, 15 were selected in Stage 1 of the current mapping exercise as likely to contain TECs and were used to guide the Stage 1 mapping survey. The Kendall & Kendall types are listed in Table 2.

Table 2 Vegetation types described by Kendall & Kendall Ecological Services (2003) and likely to contain TECs under the *TSC Act* or the *EPBC Act*.

Description	Area (ha)
Coastal Brushbox–Littoral rainforest	47.1
Escarpment Redgum	23.3
Heath	108.2
Lowland Red Gum	7.5
Melaleucas other than *Melaleuca quinquenervia*	21.7
Natural Grassland	10.7
Paperbark	637.3
Rainforest	1925.2
Rainforest Lowland	259.7
River Oak	237.0
Saltmarsh	220.5
Seagrass	43.3
Swamp	262.9
Swamp Mahogany	267.3
Swamp Oak	846.9
TOTAL	4918.6

2.3 Flora surveys

Full floristic and Rapid floristic surveys (see below) were conducted over spring and summer in 2012–13. Additional flora surveys, referred to as 'API Rapids' (see below), were undertaken during Stage 2 mapping over spring and summer in 2013–14. Within the freehold land of the study area, a stratified, targeted sampling technique, driven by the vegetation types mapped by Kendall & Kendall Ecological Services (2003), was used to allocate both Full floristic and Rapid floristic sites across the landscape. Full floristic sites

were allocated to vegetation types that were assessed as poorly sampled before the current surveys. This site allocation was then constrained within the accessible landholdings of the landholders that had volunteered to participate in the project (see Study area, above).

Full floristic plots

Full floristic surveys were conducted during Stage 1 of this study to improve the level of sampling and geographical spread of the surveys through the study area, but giving priority to potential TECs. A survey rate of at least one full floristic plot for each mapped vegetation type of less than 200 ha and two or more plots for areas of greater than 200 ha was planned.

At each survey site, floristic data were collected within a 20 × 20-m quadrat, nested within a 20 m × 50-m quadrat (or 10 × 40-m quadrat for linear environments such as along creeklines, where the targeted vegetation type occurs in strips less than 20 m wide). The 20 × 50-m quadrat was used in forested sites as it better captures the structure and composition of tall forest compared to the standard 20 × 20-m quadrat. Most of the previous floristic surveys in the LGA were recorded in this manner.

Data recorded at each site included: locality information; geophysical details, such as slope, aspect, soil and geology, and disturbance history (e.g. fire, logging, clearing, grazing). Floristic data collected included vegetation structure (height-range and projected foliage cover of major vegetation strata, dominant species in each stratum); and floristic composition, in which every plant species in the 20 × 20m quadrat was recorded and scored for cover-abundance using a scale of 1 (rare, <5% foliage cover) to 6 (>76% foliage cover). Any plant species that were absent from the 20 × 20-m quadrat but present in the rest of the 20 × 50-m quadrat were also recorded and allocated a cover-abundance score. An example of a completed data sheet is shown in Appendix 3.

Rapid floristic plots

Full floristic sampling was supplemented with rapid floristic surveys to provide reference points for the vegetation mapping and for descriptions of plant community types. Rapid floristic survey plots provided information on the dominant plant species in each vegetation stratum, including cover and abundance scores and structural information.

At each rapid floristic site, the three to five dominant, co-dominant and characteristic associate species within each discernible vegetation stratum were recorded, along with structural information including the height-range of each stratum and foliage cover of each recorded species and stratum. This assessment was made over an area of about 15 m radius within homogeneous vegetation (that is, ecotonal areas were avoided). An example of a completed data sheet is shown in Appendix 3.

Additional field surveys – API Rapids

Following initial mapping, ground-truthing surveys were conducted, consisting of API-guided rapid site surveys – API Rapids – in which dominant species or the vegetation community type were recorded. API Rapids were in three forms: (1) Rapid API – floristic sites, which included collection of floristic data for either the dominant canopy species only or the dominant species in each structural stratum in the community; (2) Rapid API – community points, which were a more simple and efficient method of field checking in which the community was easily recognisable in the field, and a PCT allocated on-site; only the

vegetation community was recorded at these sites; (3) Rapid API with comments only, at which information to support the understanding of disturbance features, variations and specific or unique characteristics was collected. Data collection varied according to budget, time and the relative confidence of the interpreter. Often this was strongly influenced by the level of access available to the survey team.

These API Rapids were carried out in order to interpret the vegetation patterns for a particular locality. Sites were selected as needed by each mapper while undertaking API. Sites were mostly located in accessible areas, such as bordering or near public roads or tracks. Sites were assessed in much the same way as Rapid floristic plots (see above). Field information was collected, for the most part, using a GPS Pocket PC (Asus A696) on an ArcPad (ESRI, Redlands, CA, USA) platform at an accuracy of 5 m. At some sites, however, data were manually recorded and the results later transcribed into ArcGIS. The data from these points (viewed in the attribute table of an ArcGIS point-based shapefile) were viewed in the 3-D Stereo Analyst mapping environment to guide and refine mapping linework and attribution of PCTs.

Flora survey data management

All the information collected during Full floristic and Rapid floristic survey types was entered directly into the NSW Government central flora database (VIS Survey Module 2.0; OEH 2013).

2.4 Extent of vegetation

High-resolution airborne digital sensor aerial imagery (ADS40 Digital Image Acquisition System), supplied by NSW Land and Property Information (LPI; http://www.lpi.nsw.gov.au/, verified 20 October 2015), the primary provider of land information services in NSW, was used to map the areal extent of vegetation within the Nambucca LGA study area. The ADS40 sensors recorded land-surface information at 50-cm resolution in four bands, including near infrared, and was flown between April 2009 and July 2009.

Aerial photography interpretation (API) can be achieved using either a 2-dimensional (2-D) view or a 3-dimensional (3-D) view using PLANAR viewing technology and ERDAS Stereo Analyst software in an ESRI ArcGIS 10.0 environment (ESRI). Very slight positional boundary displacement can occur between the 2-D and 3-D views. The more informative 3-D view was not required for simple vegetation extent mapping and, since most end users will only have access to a 2-D view, this was adopted as the preferred technique for this stage of the project. The mapping of the more complex attributes such as vegetation communities and disturbance was conducted using 3-D mapping.

2.5 Plant community type mapping

Plant Community Types (PCT) for the Northern Rivers Catchment Management Area (NRCMA) have already been analysed, described and published (OEH 2012a, 2012b). These PCTs were used as the initial basis for mapping of vegetation types in this study. However, like the vegetation studies for the Coffs Harbour and Bellingen LGAs (OEH 2012c, 2014), local variations of PCTs are known to occur. Such variations identified in the course of this project are noted below and described in detail in *Volume 2* of this report (*Nambucca LGA Vegetation Community Profiles*).

Vegetation mapping using API is conventionally undertaken in the following steps:

- Development of a draft vegetation map using ERDAS Stereo Analyst and PLANAR 3-D viewer (as above), with preliminary attribution of a PCT
- Additional field surveys or ground investigation and recording of data from site surveys
- Re-examination of vegetation attribution and refinement of vegetation boundaries
- Polygon checking, error correction, blank polygon corrections
- Data stitching, topology checking and checking of the consistency attribute table and corrections

This is generally an iterative process, involving progressive improvement of mapping accuracy through a cycle of regular field-based checking and development of screen-based linework and finalisation of attribution of polygons.

Develop a draft vegetation community map

Vegetation within the Stage 1 and Stage 2 study areas was mapped using stereo API techniques, with PLANAR and ERDAS Stereo Analyst software on an ArcGIS 10.0 platform, as described above (section 2.4). All existing information from previous floristic studies was considered during the interpretation phase, including flora data and the previous mapping by Kendall and Kendall Ecological Services (2003). The API decision pathway and specifications were designed to facilitate a one-to-one match with the PCTs. Mapping specifications are provided in Appendix 1 and a metadata statement in Appendix 2.

Ancillary support data

Several additional data layers were utilised to better interpret PCTs at the fine scale required for this study. A map of near-surface Quaternary geology and soils (Troedson *et al.* 2004) was used to provide detail of the soil-landscape features of mapped entities. This was particularly helpful in determining the alluvial plains, the estuarine plain and the coastal barrier and dune-sand areas, which are all important characteristics for the delineation of floodplain TECs. Additionally, LiDAR (light imaging detecting and radar) data, which shows ground relief at high resolution, was used where it was available (mostly coastal areas) and was extremely useful because many of the target communities strongly correlate to fine-scale topographical features in the terrain.

In areas adjacent to public land, and where data were available, Forests NSW 'Research Note 17' forest-type mapping (Forestry Commission of NSW 1989) was also used to guide interpretation. This was particularly helpful in identification of the dry rainforests found in the escarpment country and the deeper gullies and gorges.

Completion of linework and attribution

Once linework was complete, a suitable PCT label from the OEH vegetation classification (OEH 2012a, 2012b) was assigned to polygons. In some cases, a dual category was assigned where vegetation types formed a close mosaic. Additional attributes recorded for each polygon included a reliability score (range of 1 to 4, with 1 = field survey confirmation, 2 = high confidence, 3 = moderate confidence, and 4 = low confidence), an indication of dominant species (where required), presence of weeds, and disturbance. Some additional attributes

were noted as a mapping aid or to describe structural differences including a comments field and a variant field. Full details of the mapping attributes and specifications are provided in Appendix 1 and a metadata statement in Appendix 2.

The mapping was done by five aerial photo interpreters. The study area was divided into manageable portions referred to as 'API tiles' (Figure 4). Each API tile was assigned to an individual mapping interpreter. Consistency was achieved by having interpreters work in pairs during field surveys, by regular calibration during the mapping exercise, and by having an independent botanist undertake field checking across all tiles.

Once all API tiles were completed, they were 'stitched' together and effectively edge-matched through manual digital editing in the 2-D mapping environment with reference to the patterns in the 3-D mapping environment.

2.6 Description of vegetation communities

Vegetation communities were described based on the PCT profile provided in the NRCMA vegetation classification (OEH 2012a, 2012b). Additional information was collected from field surveys, including Full and Rapid floristic surveys, API Rapid data collection and use of data from previous surveys. An evaluation of the existing PCT description was made following completion of site sampling and collation of the draft vegetation map and, where necessary, the description and floristic information were refined to reflect the plant community within the LGA, especially where local variants of existing PCTs were recognised (see section 2.5 above).

Firstly, a quick spreadsheet reference guide was collated using brief descriptions. Secondly, floristic data were collated for review and full vegetation profiles were compiled to describe the communities, equivalencies and any other additional information useful to the interpretation and understanding of the final vegetation map. This detailed information is presented in the accompanying Volume 2 of this report (*Nambucca LGA Vegetation Community Profiles*).

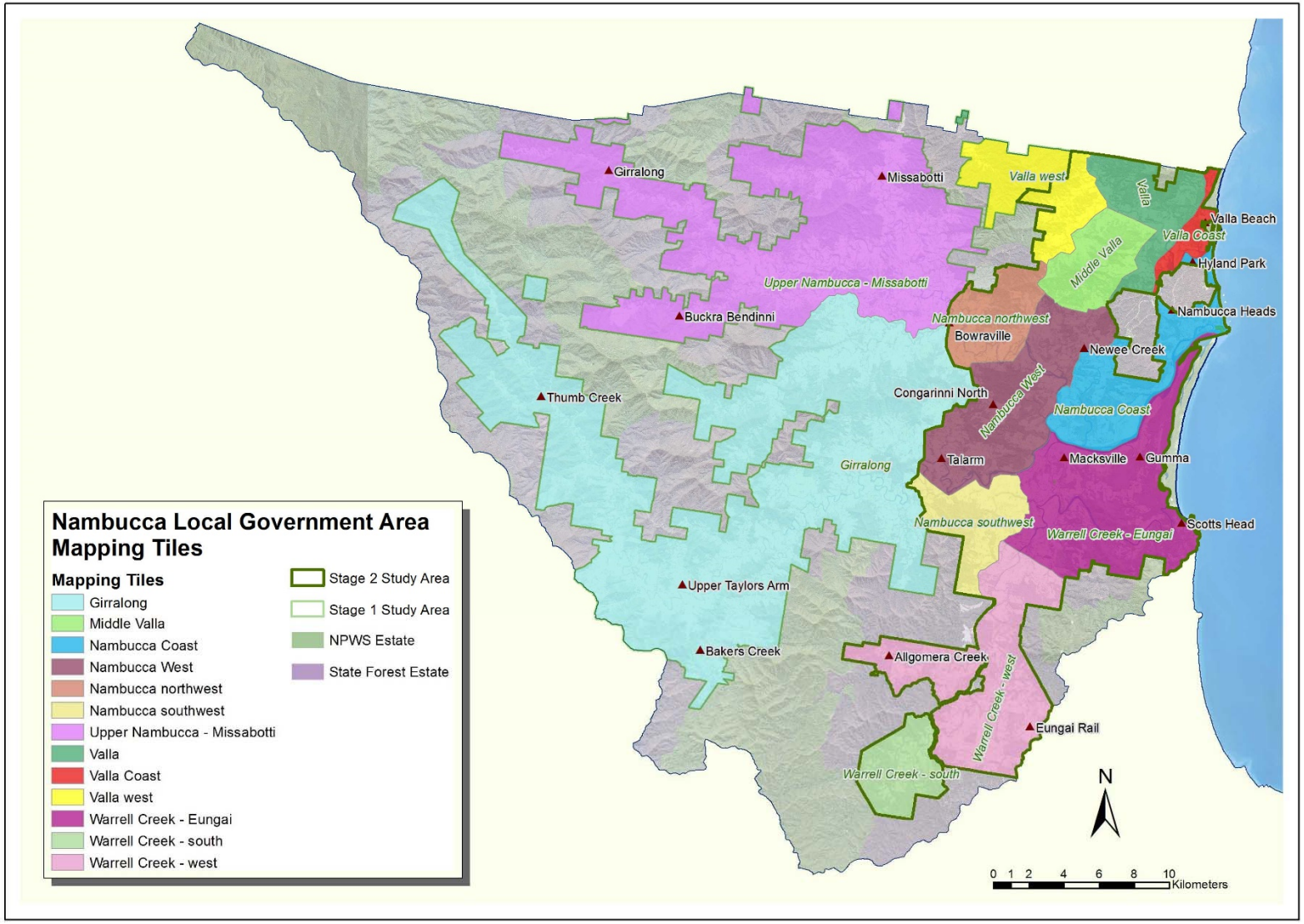

Figure 4 API Tiles in study areas.

3 Results

3.1 Flora surveys

More than 50 landowners voluntarily allowed access to their land for flora surveys, giving access to approximately 80 properties. Some properties, however, were not visited, due mostly to access and time constraints. Despite the survey effort being confined to these properties, it resulted in an even spatial distribution of sites across the study area, thereby greatly facilitating and supporting the interpolation and attribution of vegetation types (Figure 5). The total field survey effort is summarised in Table 3.

Full floristic and Rapid floristic plots

A total of 30 Full floristic survey sites additional to the 91 pre-existing Full floristic survey sites in the study areas were surveyed for this study, bringing the total for the Nambucca LGA to 268 Full floristic plots (Figure 5). A total of 81 Rapid floristic survey sites were also surveyed to assist with mapping vegetation types.

A PCT was allocated to each of the Full floristic and Rapid floristic plots.

Additional field surveys – API rapid sites

In addition to the Full and Rapid floristic survey sites, approximately 600 API Rapid sites were collected by the mapping interpreters over the duration of the mapping exercise (Figure 5). Note, however, that the final number of API Rapid sites is approximate as some data were not collected digitally and have not yet been added to a database. Three types of Rapid API points were surveyed: floristic sites (floristic data for dominant species collected), community sites (recognisable communities and PCT allocated on-site), and sites with comments only (see Methods for details).

Table 3 Survey effort during the study.

Data collection during the study	**Number of sites**		
	This study	**Pre-existing**	**Total**
Full floristic plots	30	238	268
Rapid floristic sites	81	0	81
Rapid API – floristic sites	~210	0	~210
Rapid API – community sites	~350	0	~350
Rapid API – sites with comments only	~40	0	~40
TOTAL	**~711**	**238**	**949**

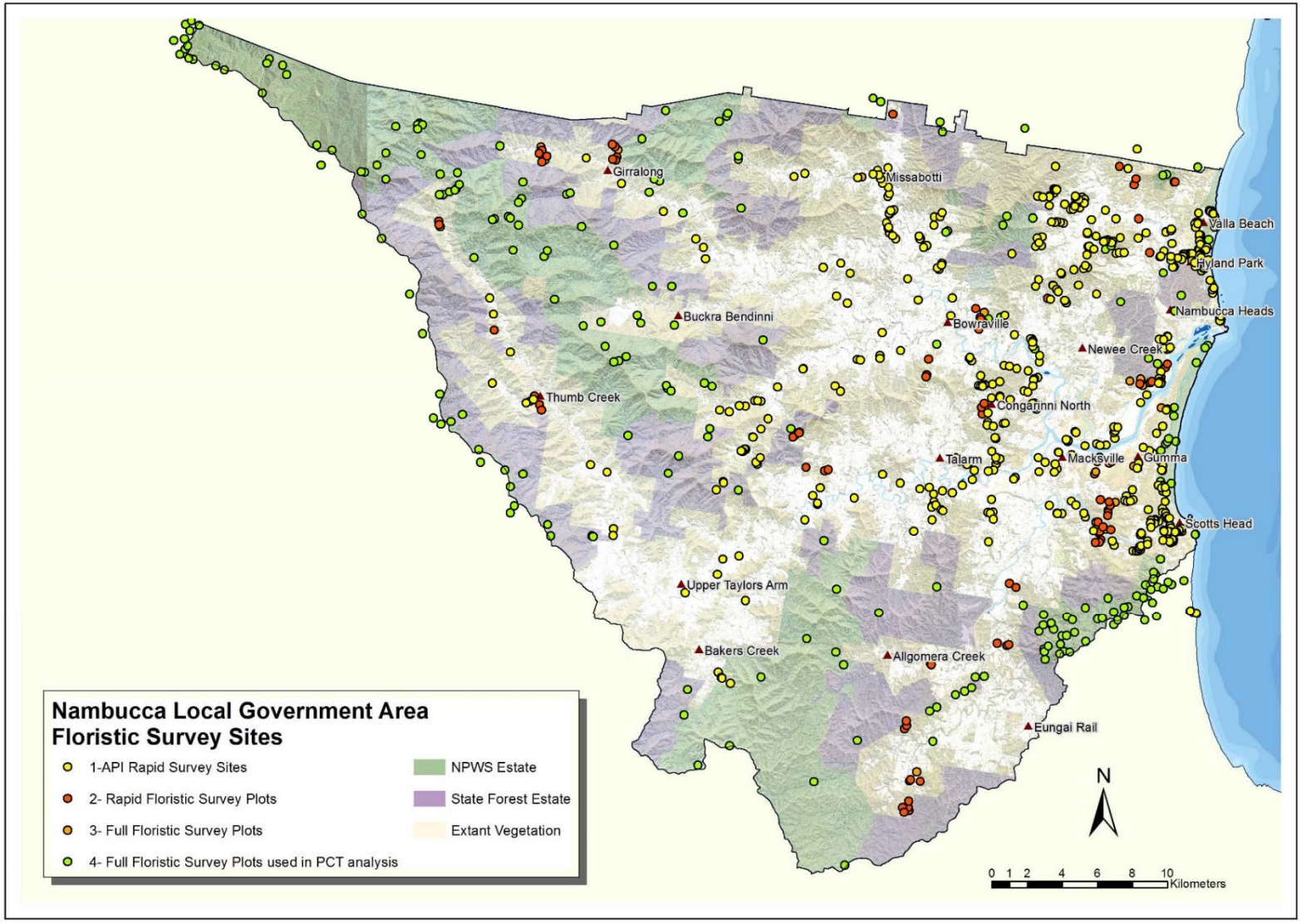

Figure 5 Floristic survey sites in the Nambucca LGA.

3.2 Extent of vegetation

A summary of vegetation extent by tenure within the Nambucca LGA is given in Table 4. The gross area of private freehold lands in the study area is 86 735 ha of which 38 557 ha (25.8% of Nambucca LGA) has been cleared, resulting in a net vegetation extent of 48 178 ha (32.3% of Nambucca LGA).

Table 4 Vegetation extent by tenure.

Tenure	Area (ha)	Proportion of area of Nambucca LGA (%)
Public land		
NPWS Estate	29 664	19.9 %
SF Estate	32 055	21.5 %
Crown Land	721	0.5 %
Total public land	62 440	41.9 %
Freehold land		
Vegetated	48 178	32.3 %
Cleared	38 557	25.8 %
Total freehold land	86 735	58.1 %

The net area of vegetation recorded in this study (48 178 ha) is 1954 ha greater than the 46 224 ha reported by Kendall & Kendall Ecological Services (2003). This is a result of the higher resolution of the imagery available in the current study enabling more detailed linework and mapping of smaller remnants of vegetation than previously.

3.3 Mapping of plant community types (PCTs)

PCTs in the Nambucca LGA study areas

A total of 63 vegetation types, covering 15 335 ha, was mapped in the combined Stage 1 and 2 Nambucca LGA study areas, with 13 565 ha mapped in the Stage 2 study area (as described previously, only potential TECs were mapped across the Stage 1 study area). All but one of these vegetation types equated to 58 existing PCTs, three of which were split into two local floristic variants and one of which was split into three local floristic variants. One montane heathland type of vegetation (NAM_H08: Tea-tree rock outcrop shrubland), mapped on Mount England and in the Bald Hill area, could not be allocated to an existing PCT and will be proposed as an addition to the existing Northern Rivers Catchment Management Area (NRCMA) vegetation classification. All vegetation types and their variations have been allocated map units specific to this study and their equivalence to PCTs is described and discussed in the accompanying Volume 2 of this report (*Nambucca LGA Vegetation Community Profiles*).

A total of 1769 ha of rainforest vegetation containing an additional two Nambucca vegetation communities and two PCTs was mapped outside of the Stage 2 study area in Stage 1 of the project.

Further, an additional 3898 ha of extant vegetation cover was mapped in the Stage 2 study area but not assigned to a PCT. This vegetation included 2302 ha mapped as native pioneers, rainforest pioneers or native remnant vegetation, with the rest mapped mainly as exotic and plantation vegetation. The total area of vegetation mapped in the Stage 2 study area, by vegetation formation (Keith 2004), is summarised in Table 5.

Table 5 Areal extent of each of the Keith (2004) vegetation formations recorded in the Stage 2 study area and number of Nambucca vegetation types and number of PCTs and local variants within each vegetation formation.

Keith (2004) vegetation formation	Number of Nambucca vegetation types	Number of PCTs and PCT variants (in parentheses) mapped in each vegetation formation	Area mapped (ha)
Dry sclerophyll forests	9	5 (5)	1 490
Forested wetlands	11	11	1 720
Freshwater wetlands	11	11	674
Heathlands	6	6	87
Rainforests	9	9	408
Saline wetlands	5	5	397
Wet sclerophyll forests	9	7 (5)	8 777
Grasslands	1	1	12
Total	61	56 (10)	13 565

PCT variants

As mentioned above, in the course of field survey and ground-truthing of vegetation types, it was deemed necessary to split four existing PCTs into local variants, based principally on variation in floristic composition. Table 6 summarises these PCTs and their local variants, which are described in detail in Volume 2 of this report.

Threatened Ecological Communities (TECs) in the Nambucca LGA

A total area of 4688 ha was mapped as potential TEC. Overall, 33 PCTs were assessed as containing vegetation likely to be equivalent to one of nine TECs under the NSW *TSC Act*, all of which are Endangered Ecological Communities (EECs;

Table 7) and three TECs under the Commonwealth *EPBC Act*, one of which is considered Vulnerable and two Critically Endangered Ecological Communities (Table 8).

Table 9 lists every Nambucca Vegetation Community recognised during this study, its allocated Keith (2004) Vegetation Formation and Class, its areal extent, and, where relevant, equivalence to a NSW or Commonwealth-listed TEC.

Table 6 Nambucca vegetation community types that vary from the assigned PCT and a variant code developed to identify them. The vegetation formations and classes are those of Keith (2004).

NAM_CODE	Nambucca vegetation community name	PCT	Variant code	Vegetation formation	Vegetation class
NAM_DOF11	Tallowwood – Small-fruited Grey Gum – Ironbark – Forest Oak dry sclerophyll forest	2171	1000–1071a	Wet Sclerophyll Forests	Northern Hinterland Wet Sclerophyll Forests
NAM_WSF05	Tallowwood – Small-fruited Grey Gum – Ironbark – Forest Oak wet sclerophyll forest	2171	1000–1071b	Wet Sclerophyll Forests	Northern Hinterland Wet Sclerophyll Forests
NAM_DOF04	Blackbutt – Red Mahogany – Bloodwood dry open forest on infertile sandy soils of low coastal rises and hills	2160	1000–1448a	Dry Sclerophyll Forests	North Coast Dry Sclerophyll Forests
NAM_DOF10	Scribbly Gum dry open grassy forest on coastal hills on metasediments and granite	2160	1000–1448b	Dry Sclerophyll Forests	North Coast Dry Sclerophyll Forests
NAM_DOF08	Pink Bloodwood – Red Mahogany – Swamp Box shrub/grass open forest at low altitudes	2248	1000–1449a	Dry Sclerophyll Forests	Clarence Dry Sclerophyll Forests
NAM_DOF09	Red Bloodwood – Thick-leaved Mahogany heathy dry open forest on granite	2248	1000–1449b	Dry Sclerophyll Forests	Clarence Dry Sclerophyll Forests
NAM_WSF08	Bloodwood – Tallowwood wet sclerophyll forest on sand	2248	1000–1449c	Dry Sclerophyll Forests	Clarence Dry Sclerophyll Forests
NAM_WSF09	Spotted Gum – Tallowwood – Thick-leaved Mahogany – Small-fruited Grey Gum – Grey Ironbark wet shrubby open forest on sheltered slopes	2174	1500–124a	Wet Sclerophyll Forests	Northern Hinterland Wet Sclerophyll Forests
NAM_DOF12	Spotted Gum – Tallowwood – Thick-leaved Mahogany – Small-fruited Grey Gum – Grey Ironbark grassy open forest on shallow sedimentary soils	2174	1500–124b	Wet Sclerophyll Forests	Northern Hinterland Wet Sclerophyll Forests

Table 7 TECs listed under the NSW *TSC Act* and their areal extent within the Nambucca LGA combined Stage 1 and 2 study areas.

TEC	Status	Area (ha)
Coastal Saltmarsh in the NSW North Coast, Sydney Basin and South East Corner bioregions	Endangered	257
Freshwater Wetlands on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions	Endangered	648
Littoral Rainforest in the NSW North Coast, Sydney Basin and South East Corner bioregions	Endangered	34
Lowland Rainforest in the NSW North Coast and Sydney Basin bioregions	Endangered	1801
Lowland Rainforest on Floodplain in the New South Wales North Coast bioregion	Endangered	342
Subtropical Coastal Floodplain Forest of the NSW North Coast bioregion	Endangered	13
Swamp Oak Floodplain Forest of the NSW North Coast Sydney Basin and South East Corner bioregions	Endangered	385
Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions	Endangered	1196
Themeda Grassland on Seacliffs and Coastal Headlands in the NSW North Coast, Sydney Basin and South East Corner bioregions	Endangered	12
		4688

Table 8 TECs listed under the Commonwealth *EPBC Act* and their areal extent within the Nambucca LGA combined Stage 1 and 2 study areas.

TEC	Status	Area (ha)
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	Critically Endangered	35
Lowland Rainforest of Subtropical Australia	Critically Endangered	2177
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	257
		2469

Table 9 Nambucca LGA Vegetation Communities in combined Stage 1 and 2 study areas, arranged by the vegetation formation and vegetation class of Keith (2004), and showing the areal extent of each and equivalence to a NSW or Commonwealth-listed TEC.

Vegetation class	Nambucca code	Vegetation community name	Area (ha)	PCT code	TEC under NSW *TSC Act*	TEC under *EPBC Act*
Formation: Dry Sclerophyll Forests						
Clarence Dry Sclerophyll Forests	NAM_DOF08	Pink Bloodwood – Red Mahogany – Swamp Box shrub/grass open forest at low altitudes	82	2248		
Clarence Dry Sclerophyll Forests	NAM_DOF09	Red Bloodwood – Thick-leaved Mahogany heathy dry open forest on granite	211	2248		
Clarence Dry Sclerophyll Forests	NAM_WSF08	Bloodwood – Tallowwood wet sclerophyll forest on sand	8	2248		
Coastal Dune Dry Sclerophyll Forests	NAM_DOF03	Blackbutt – Smooth-barked Apple – Needlebark Stringybark open forest on coastal dunes and sandplains	377	2115		
Coastal Dune Dry Sclerophyll Forests	NAM_DOF07	Pink Bloodwood – Brush Box open forest on coastal dunes and sandplains	27	2116		
Coastal Dune Dry Sclerophyll Forests	NAM_DOF13	Coast Banksia woodland and open forest of coastal dunes	34	2155		
North Coast Dry Sclerophyll Forests	NAM_DOF04	Blackbutt – Red Mahogany – Bloodwood dry open forest on infertile sandy soils of low coastal rises and hills	607	2160		
North Coast Dry Sclerophyll Forests	NAM_DOF05	Forest Red Gum – Pink Bloodwood – Grey Ironbark open forest to woodland of near-coastal hills	41	2167		
North Coast Dry Sclerophyll Forests	NAM_DOF10	Scribbly Gum Dry Open Grassy Forest on coastal hills on metasediments and granite	104	2160		
Formation: Forested Wetlands						
Coastal Swamp Forests	NAM_ForW01	Swamp Oak forested wetland of saline areas of coastal estuaries	385	1917	Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	
Coastal Swamp Forests	NAM_ForW02	Swamp Oak – Broad-leaved Paperbark – Willow Bottlebrush floodplain forested wetland	246	1920	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	

Vegetation class	Nambucca code	Vegetation community name	Area (ha)	PCT code	TEC under NSW *TSC Act*	TEC under *EPBC Act*
Coastal Swamp Forests	NAM_ForW03	Milky Mangrove Woodland of tidal estuaries	<1	1921	Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	
Coastal Swamp Forests	NAM_ForW04	Broad-leaved Paperbark – Swamp Oak – Tall Sedge swamp forest on alluvial soils	758	1924	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	
Coastal Swamp Forests	NAM_ForW05	Broad-leaved Paperbark – Bare Twig Rush swamp sclerophyll open forest of coastal swamps	88	1925	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	
Coastal Swamp Forests	NAM_ForW06	Broad-leaved Paperbark – Willow Bottlebrush forested wetland of creek channels draining intermittent coastal lakes and lagoons	4	1929	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	
Coastal Swamp Forests	NAM_ForW08	Swamp Mahogany – Willow Bottlebrush – Broad-leaved Paperbark forested wetland	101	1935	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	
Coastal Swamp Forests	NAM_ForW12	Swamp Mahogany – *Melaleuca sieberi* shrub/sedge swamp forest on low lying sandy areas	2	1936		
Coastal Swamp Forests	NAM_ForW13	Swamp Mahogany – tea-tree – Tassell Rush forested wetland of waterlogged wallum soils	70	1937		
Coastal Swamp Forests	NAM_ForW14	Swamp Box – Forest Red Gum – Pink Bloodwood seasonal swamp forest on floodplains and low rises	13	1938	Subtropical Coastal Floodplain Forest of the New South Wales North Coast Bioregion	
Eastern Riverine Forests	NAM_ForW10	River Oak grassy open forest along larger rivers	53	1948		
Formation: Freshwater Wetlands						
Coastal Freshwater Lagoons	NAM_FW01	Lagoon forbland of permanent wetlands on the coastal floodplains	204	1951	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	

Vegetation class	Nambucca code	Vegetation community name	Area (ha)	PCT code	TEC under NSW *TSC Act*	TEC under *EPBC Act*
Coastal Freshwater Lagoons	NAM_FW02	Knotweed wet meadow forbland on alluvial soils of coastal floodplains	97	1952	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	
Coastal Freshwater Lagoons	NAM_FW03	Common Reed grassland of alluvial floodplain and brackish tidal creeks	14	1953	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	
Coastal Freshwater Lagoons	NAM_FW04	Water Couch – Mud Grass wet grassland meadow on alluvial soils of coastal floodplains	97	1955	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	
Coastal Freshwater Lagoons	NAM_FW05	*Juncus* rushlands on alluvial floodplains	97	1957	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	
Coastal Freshwater Lagoons	NAM_FW06	*Typha* freshwater wetland of the floodplain	26	1982	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	
Coastal Freshwater Lagoons	NAM_FW07	*Eleocharis equisetina* freshwater wetland of coastal floodplains	92	1959	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	
Coastal Freshwater Lagoons	NAM_FW08	Tall Spike Rush freshwater wetland of coastal floodplains and depressions in low hills	9	1960	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	
Coastal Freshwater Lagoons	NAM_FW10	Soft Twig Rush Sedgeland of North Coast wallum swamps	3	1000		
Coastal Heath Swamps	NAM_FW09	Jointed Twig Rush – Swamp Water Fern freshwater wetlands of the alluvial floodplain	12	1962	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	
Coastal Heath Swamps	NAM_FW11	Tea-tree tall shrubland of coastal freshwater sand swamp	24	1967		

Vegetation class	Nambucca code	Vegetation community name	Area (ha)	PCT code	TEC under NSW *TSC Act*	TEC under *EPBC Act*
Formation: Grasslands						
Maritime Grasslands	NAM_H01	Kangaroo Grass sod grassland of North Coast headlands	12	1016	Themeda grassland on seacliffs and coastal headlands in the NSW North Coast, Sydney Basin and South East Corner Bioregions	
Formation: Heathlands						
Coastal Headland Heaths	NAM_H03	Swamp Oak shrublands on coastal headlands	23	1985		
Northern Montane Heaths	NAM_H08	Tea-tree rock outcrop shrubland	8	999		
Wallum Sand Heaths	NAM_DOF02	Blackbutt – Needlebark Stringybark – Scribbly Gum – Slender Tea-tree dry sclerophyll mallee of North Coast wallum dunes and beach ridges	7	1060		
Wallum Sand Heaths	NAM_H04	Wallum Banksia – Prickly Moses – *Caustis recurvata* dry heathland on coastal sands	19	1989		
Wallum Sand Heaths	NAM_H05	Coast Wattle shrubland on coastal foredunes	27	1991		
Wallum Sand Heaths	NAM_H06	Wallum Banksia – Heath Phyllota dry sclerophyll shrubland of North Coast wallum dunes, beach ridges and sand plains	2	1041		
Formation: Rainforests						
Dry Rainforests	NAM_RF09	Weeping Lilly Pilly dry riparian rainforest	114	2077	Lowland Rainforest on Floodplain in the New South Wales North Coast Bioregion	Lowland Rainforest of Subtropical Australia
Dry Rainforests	NAM_RF10	Shatterwood – Whalebone Tree dry rainforests on metasediments	35	2082	Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions	Lowland Rainforest of Subtropical Australia
Dry Rainforests	NAM_RF11	Brush Box – Grey Myrtle – Water Gum dry rainforests of poorer soils of gorges and river valleys	189	2084	Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions	Lowland Rainforest of Subtropical Australia
Dry Rainforests	NAM_RF12	Grey Myrtle – Brush Box dry rainforest on metasediments and lower nutrient volcanics	36	2085	Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions	Lowland Rainforest of Subtropical Australia
Littoral Rainforests	NAM_RF02	Tuckeroo – Bird's Eye Alectryon – Beach Acronychia littoral rainforests	4	2039	Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	Littoral Rainforest and Coastal Vine Thickets of Eastern Australia

Vegetation class	Nambucca code	Vegetation community name	Area (ha)	PCT code	TEC under NSW *TSC Act*	TEC under *EPBC Act*
Littoral Rainforests	NAM_RF03	Brushbox headland littoral rainforest	23	2041	Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	Littoral Rainforest and Coastal Vine Thickets of Eastern Australia
Littoral Rainforests	NAM_RF04	Yellow Pear Fruit – Cabbage Tree Palm – Small-Leaved Lilly Pilly – Brown Pine littoral rainforest	8	2042	Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	Littoral Rainforest and Coastal Vine Thickets of Eastern Australia
Subtropical Rainforests	NAM_RF05	Riparian subtropical rainforest with River Oak emergents on lowland creek flats	171	2048	Lowland Rainforest on Floodplain in the New South Wales North Coast Bioregion	Lowland Rainforest of Subtropical Australia
Subtropical Rainforests	NAM_RF06	Giant Water Gum – Rough-leaved Elm – Small-leaved Fig – Hard Quandong subtropical rainforest on coastal floodplains	57	2059	Lowland Rainforest on Floodplain in the New South Wales North Coast Bioregion	Lowland Rainforest of Subtropical Australia
Subtropical Rainforests	NAM_RF07	Maiden's Blush – Yellow Carabeen – Native Tamarind – Bangalow Palm subtropical rainforest on metasediments of the southern coastal ranges and escarpment	612	2063	Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions	Lowland Rainforest of Subtropical Australia
Subtropical Rainforests	NAM_RF08	Green-leaved Rose-walnut – Sassafras – Black Booyong – Yellow Carabeen tall closed forest on sediments and metasediments of near coastal hills and escarpments	929	2065	Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions	Lowland Rainforest of Subtropical Australia
Formation: Saline Wetlands						
Mangrove Swamps	NAM_SW05	Grey Mangrove – River Mangrove low open or closed forest or shrubland of intertidal flats	140	2225		
Saltmarshes	NAM_SW01	Prickly Couch – Sea Rush – Saltwater Couch saltmarsh of saline coastal swamps and flats	88	2218	Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	Subtropical and Temperate Coastal Saltmarsh
Saltmarshes	NAM_SW02	Sea Rush saltmarsh of saline coastal swamps and flats	23	2219	Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	Subtropical and Temperate Coastal Saltmarsh
Saltmarshes	NAM_SW03	Twig Rush saltmarsh of estuaries	56	2220	Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	Subtropical and Temperate Coastal Saltmarsh
Saltmarshes	NAM_SW04	Saltwater Couch – Samphire saltmarsh of low-lying estuarine areas	90	2222	Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	Subtropical and Temperate Coastal Saltmarsh

Vegetation class	Nambucca code	Vegetation community name	Area (ha)	PCT code	TEC under NSW *TSC Act*	TEC under *EPBC Act*
Formation: Wet Sclerophyll Forests						
North Coast Wet Sclerophyll Forests	NAM_WSF01	Flooded Gum moist open forest of sheltered lower slopes and gullies	904	2257		
North Coast Wet Sclerophyll Forests	NAM_WSF02	Brush Box – Tallowwood – Sydney Blue Gum shrubby wet open forest of coastal hills and escarpment ranges	520	2227		
North Coast Wet Sclerophyll Forests	NAM_WSF04	Turpentine – Brush Box – Flooded Gum – Blackbutt shrubby moist forest of sub-coastal lowlands	1438	2229		
North Coast Wet Sclerophyll Forests	NAM_WSF06	Spotted Gum – Small-fruited Grey Gum tall open forest with dense Brown Myrtle mid-storey on coastal foothills	17	2197		
North Coast Wet Sclerophyll Forests	NAM_WSF07	Tallowwood – Blackbutt moist shrubby tall open forest of the hinterland ranges	2165	2226		
Northern Hinterland Wet Sclerophyll Forests	NAM_DOF11	Tallowwood – Small-fruited Grey Gum – Ironbark – Forest Oak dry sclerophyll forest	536	2171		
Northern Hinterland Wet Sclerophyll Forests	NAM_DOF12	Spotted Gum – Tallowwood –Thick-leaved Mahogany – Small-fruited Grey Gum – Grey Ironbark grassy open forest on shallow sedimentary soils	483	2174		
Northern Hinterland Wet Sclerophyll Forests	NAM_WSF05	Tallowwood – Small-fruited Grey Gum – Ironbark – Forest Oak wet sclerophyll forest	2600	2171		
Northern Hinterland Wet Sclerophyll Forests	NAM_WSF09	Spotted Gum – Tallowwood –Thick-leaved Mahogany – Small-fruited Grey Gum – Grey Ironbark wet shrubby open forest on sheltered slopes	115	2174		
Other types						
–	NAM_EX01	Bitou Bush	12	9999		
–	NAM_EX02	Camphor Laurel	108	9999		
–	NAM_EX03	Exotic Vegetation	620	9999		
–	NAM_EX04	Lantana	65	9999		
–	NAM_EX05	Privet	11	9999		

Vegetation class	Nambucca code	Vegetation community name	Area (ha)	PCT code	TEC under NSW *TSC Act*	TEC under *EPBC Act*
–	NAM_NP01	Native Pioneers	1283	9999		
–	NAM_NP02	Rainforest Pioneers	657	9999		
–	NAM_NRV01	Native remnant vegetation	1067	9999		
–	NAM_P01	Native Plantation	355	9999		
–	NAM_P02	Exotic Plantation	556	9999		
–	NAM_P03	Environmental Plantings	55	9999		
–	NAM_W01	Open Water	38	9999		
–	NAM_W02	Dam	7	9999		
TOTAL			**20 169**			

Dual codes

In the course of this study nine polygons, with a combined area of just under 35 ha, were each assigned to two different vegetation types and PCTs, as summarised in Table 10. These vegetation communities all occur on flat, low-lying estuaries or floodplains and often intergrade with each other, forming complex mosaics.

Table 10 Dual-coded polygons in the Stage 2 study area of the Nambucca LGA vegetation mapping.

Nambucca Code 1	Vegetation community name	Nambucca Code 2	Vegetation community name	Area (ha)	Number of polygons
NAM_ForW01	Swamp Oak forested wetland of saline areas of coastal estuaries	NAM_SW01	Prickly Couch – Sea Rush – Common Couch saltmarsh of saline coastal swamps and flats	1.27	2
NAM_ForW01	Swamp Oak forested wetland of saline areas of coastal estuaries	NAM_SW04	Saltwater Couch – Samphire saltmarsh of low-lying estuarine areas	1.42	1
NAM_ForW01	Swamp Oak forested wetland of saline areas of coastal estuaries	NAM_SW05	Grey Mangrove – River Mangrove low open or closed forest or shrubland of intertidal flats	1.16	1
NAM_FW03	Common Reed grassland of alluvial floodplain and brackish tidal creeks	NAM_SW03	Twig Rush saltmarsh of estuaries	1.80	1
NAM_FW07	*Eleocharis equisetina* freshwater wetland of coastal floodplains	NAM_FW01	Lagoon forbland of permanent wetlands on the coastal floodplains	0.27	1
NAM_SW05	Grey Mangrove – River Mangrove low open or closed forest or shrubland of intertidal flats	NAM_SW01	Prickly Couch – Sea Rush – Common Couch saltmarsh of saline coastal swamps and flats	28.02	3

Non-threatened PCTs similar to TECs

There are a number of PCTs in the NRCMA Vegetation Classification (OEH 2012a, 2012b) that occur in the study area that can be confused with, adjoin, or form mosaics with PCTs that are equivalent to TECs. These communities (with Nambucca code and PCT label) include:

- Estuarine Mangrove Forest (NAM_SW05; PCT 2225): A non-threatened community that often forms mosaics with or adjoins saltmarsh and saline forested wetland TECs.
- Wallum Banksia – Heath Phyllota dry sclerophyll shrubland of North Coast wallum dunes, beach ridges and sand plains (NAM_H06; PCT 1041): Non-threatened

headland heath that adjoins, and has a similar species composition to, PCT 1016: Kangaroo Grass sod grasslands of North Coast Headlands.

- Soft Twig Rush Sedgeland of North Coast Wallum Swamps (NAM_FW10; PCT 1000): A sedgeland that occurs on Pleistocene backbarrier sands and so does not meet TEC criteria.
- Tea-tree Tall Shrubland of coastal freshwater sand swamps (NAM_FW11; PCT 1967): A non-threatened shrubland that occurs in wet heathlands. It was mapped near Bellwood Swamp and near Gumma on sandsheets.
- Three River Oak communities were identified along creek and rivers and assigned to PCTs. One of these (NAM_RF05; PCT 2048) was identified as equivalent to the Lowland Rainforest TEC. Many occurrences of River Oak in the Nambucca LGA were found to be equivalent to River Oak – Weeping Bottlebrush layered woodland along drainage lines (PCT 1948), which is not equivalent to a TEC.

There are two non-threatened community types dominated by Swamp Mahogany that occur on sandsheets and which can be confused with PCT 1935 (NAM_ForW08: Swamp Mahogany – Willow Bottlebrush – Broad-leaved Paperbark forested wetland), which is a TEC. There is a transition from floodplain to sand-based forested wetlands between Nambucca Heads and Scotts Head, and the two non-threatened communities are:

- Swamp Mahogany – *Melaleuca sieberi* shrub/sedge swamp forest on low lying sandy areas (NAM_ForW12; PCT 1936).
- Swamp Mahogany – Tea tree – Tassell Rush forested wetland of waterlogged wallum soils (NAM_ForW13; PCT 1937).

3.4 Significant plants

In the course of floristic surveys, a number of plant species listed as threatened under the NSW *TSC Act* were recorded, including new records of Floyd's Grass (*Alexfloydia repens*), Slender Marsdenia (*Marsdenia longiloba*), Maundia (*Maundia triglochinoides*), Rusty Plum (*Niemeyera whitei*) and Milky Silkpod (*Parsonsia dorrigoensis*). There are at least 19 threatened plant species recorded in the Nambucca LGA (Table 11).

Table 11 Threatened plant species (*TSC Act*) recorded in the Nambucca LGA.

Species name	Common name	Status under *TSC Act*
Acacia chrysotricha	Newry Golden Wattle	Endangered
Acronychia littoralis	Scented Acronychia	Endangered
Alexfloydia repens	Floyd's Grass	Vulnerable
Chamaesyce psammogeton	Sand Spurge	Endangered
Dendrobium melaleucaphilum		Endangered
Gaultheria viridicarpa		Vulnerable
Gingidia montana		Endangered
Hicksbeachia pinnatifolia	Red Bopple Nut	Vulnerable
Marsdenia longiloba	Slender Marsdenia	Endangered
Niemeyera whitei	Rusty Plum, Plum Boxwood	Vulnerable
Maundia triglochinoides	Maundia	Vulnerable

Species name	Common name	Status under *TSC Act*
Melaleuca groveana	Grove's Paperbark	Vulnerable
Neoastelia spectabilis	Silver Sword Lily	Vulnerable
Parsonsia dorrigoensis	Milky Silkpod	Vulnerable
Phaius australis	Lesser Swamp Orchid	Endangered
Pomaderris queenslandica	Scant Pomaderris	Endangered
Senna acclinis	Rainforest Senna	Endangered
Tasmannia glaucifolia	Fragrant Pepperbush	Vulnerable
Tylophora woollsii		Endangered

4 Discussion and Recommendations

A fine-scale map of the extant vegetation on freehold lands and coastal Crown Lands of the coastal lowlands of the Nambucca Shire Local Government Area (Nambucca LGA) was produced at 1:5000 scale. Vegetation communities were mapped using Plant Community Types (PCTs) described in the Northern Rivers Catchment Management Area (NRCMA) Vegetation Classification (OEH 2012a, 2012b). PCTs that were likely to contain Threatened Ecological Communities (TECs) were delineated and likely equivalencies were attributed. Other land-use and landscape features, including native remnant vegetation, plantations, weed species such as Lantana (*Lantana camara*) and Camphor Laurel (*Cinnamomum camphora*) and other exotic vegetation were also delineated across the study area.

The existing PCT classification mostly formed a suitable basis for community delineation at the fine scale. However, one montane heathland community (NAM_H08: Tea-tree rock outcrop shrubland) could not be satisfactorily allocated to an existing PCT. This type will be proposed as an addition to the NRCMA Vegetation Classification (OEH 2012a, 2012b). PCT descriptions, in some cases, were refined and adjusted to reflect the local variations recorded within the study area. This process also provided valuable information for informing and building the Office of Environment and Heritage (OEH) NSW vegetation classification system (OEH 2012a, 2012b). Local studies are an important tool for improving information in existing datasets and informing floristic classifications.

The Nambucca LGA contains a highly diverse complex of lowland vegetation types, including wet and dry sclerophyll forests, heathlands, lowland, littoral, subtropical and dry rainforests, saline wetland communities, freshwater wetlands and forested wetlands. Some 33 of these communities represent examples of nine TECs listed under the NSW *TSC Act*, and three TECs listed under the Commonwealth *EPBC Act*. Its creeks, rivers and lowland floodplains contain many plant communities that are highly threatened. This includes 11 rainforest communities, nine forested wetland communities, nine freshwater wetlands and four saltmarsh plant communities that are equivalent to TECs. There was a strong correlation between the TEC and the PCT units from the NRCMA vegetation classification (OEH 2012a, 2012b).

The floodplains of the Nambucca River and Warrell, Newee and Blackbutt Creeks retain important remnant freshwater and saline wetlands that are threatened by industrial and suburban expansion. The floodplain rainforests of Taylors Arm and Nambucca River, once extensive, are now much reduced in area and severely affected by weeds and structural disturbance. Vegetation types such as Lowland Scribbly Gum forest and Flooded Gum wet forest have been greatly diminished in extent as a result of clearing.

Of special note is the lower catchment of Warrell Creek, which supports an impressive range and extensive coverage of vegetation and habitat types that are both important for flora and fauna as well as for environmental health and water quality. This area contains a highly important contiguous block of vegetation of significant environmental value.

In the course of this project, field-based observations revealed that, in many areas, native vegetation is adversely affected by a range of threats, including weeds, clearing, understorey removal, grazing of livestock, logging, quarrying and mining. Weeds often infest tracts of native vegetation that have been subject to one or more of the abovementioned threatening processes.

Lantana is generally abundant in the understorey of logged hinterland forests on better soils below about 600 m elevation. Camphor Laurel and Small-leaved Privet (*Ligustrum sinense*) have infested, or largely replaced, native riparian vegetation on alluvial drainage lines in farming country, where clearing and subsequent grazing of livestock is practiced. Wetland areas on alluvial floodplains are often heavily modified by the effects of artificial drains, livestock grazing, and influxes of weeds such as Groundsel (*Baccharis halimifolia*) and exotic pasture grasses such as Carpet Grass (*Axonopus fissifolius*) and Kikuyu (*Pennisetum clandestinum*). Coastal sand dune vegetation communities show the effects of past and current sand-mining, where large tracts of country are heavily infested by Bitou (*Chrysanthemoides monolifera* subsp*. rotundata*).

In many moist hinterland gullies of the Nambucca LGA, for example west of Valla, where heavy logging has occurred, the combined impact of overstorey removal and subsequent infestation by Lantana appears to have promoted the onset of Bell Miner Associated Dieback (BMAD). BMAD is a type of eucalypt forest dieback which is associated with the coincidence of outbreaks of sap-sucking insects known as psyllids and colonies of the Bell Miner (*Manorina melanophrys*), sometimes called the Bellbird, a medium-large honeyeater that feeds on psyllids. Significant tracts of forest eucalypts have died as a result of BMAD, and many affected areas show little sign of recovery, even after the Bell Miner colony has moved on (refer to Wardell-Johnson *et al.* 2006 for a detailed review of BMAD).

Clearing of native vegetation was also observed during field assessments. Examples of such clearing include: the clearing of a stand of Grey Myrtle Dry Rainforest on a property at Bald Hill, road construction and clearing of Swamp Sclerophyll Forest (a TEC) near Hyland Park, and the loss of saline and freshwater wetlands at Scotts Head. It was also noted that stands of lowland Scribbly Gum forest are being cleared or under-scrubbed in a number of coastal sites.

The vegetation mapping of this project has greatly improved and updated the delineation of PCTs and TECS in the Nambucca LGA. The project methods, using fine-scale aerial photography interpretation (API), attribution of plant community types from the NRCMA Vegetation Classification (OEH 2012a), and intensive field survey and sampling, were found to be an efficient and accurate method to define PCTs and delineate equivalencies to TECs.

The project contributed significantly to the level and quality of field-based data and specific knowledge of the Nambucca LGA in relation to the current vegetation classification and local variation observed within some of the existing PCTs. It is recommended that these variants are further investigated to determine whether they should be proposed for addition as new PCTs to the NRCMA Vegetation Classification (OEH 2012a).

Despite the fine-scale of the mapping and the intensive field survey effort involved, the task of delineation and interpretation of TEC equivalency remains challenging. The problems of delineation arise from both interpreting the relevant determinations and reports of the NSW Scientific Committee – an independent committee of scientists that decides which species, populations and communities are threatened in NSW – and also gaining access to areas to enable on-ground verification of the communities. In many instances, PCTs, and subsequently TECs, cannot be reliably determined from remote sensing alone. Field assessment and on-ground investigation is often critical to verify whether a TEC is present in an area. Verification of the presence of a TEC requires not only full documentation of species composition, including the understorey, but also an assessment of soil and other geophysical characteristics.

Mapping programs such as that conducted for this project can fit into a broader hierarchy, providing a better mapping context at local government, regional and state-wide levels. The mapping in this project was designed to be consistent with previous fine-scale work carried out in the Coffs Harbour LGA (OEH 2012c) and Bellingen LGA (OEH 2014).

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Appendix 1 Mapping attributes and specifications — Nambucca LGA

Polygon size and dimensions	
Coastal lowland, alluvial plains, sands and estuaries	
Reference scale for review of linework	1:2000
Minimum remnant size for floristic group attribution	0.2 ha
Minimum size for delineation of community within larger patch in coastal lowland landscape	0.2 ha
Minimum width for linear feature in coastal lowland landscape	5 m
Coastal foothills, escarpment and plateau forests and woodlands	
Reference scale for review of linework	1:3 000
Minimum remnant size for floristic group attribution	0.2 ha
Minimum size for delineation of community within larger patch in forest landscape	0.5 ha
Minimum width for linear feature in forest landscape	10 m

Dual coding of floristic communities
Polygons can be coded with up to 2 vegetation codes where they occur as a mosaic. Code 1 is the Primary or dominant vegetation type and code 2 is the secondary or less dominant vegetation type. At least **30%** of each vegetation type should be present for a secondary vegetation code to be assigned

Polygon confidence	
Ground validation of polygon	1
High level of confidence (adjacent polygons within survey data or distinct photo pattern)	2
Moderate level of confidence (survey data in near vicinity)	3
Low level of confidence (lack of nearby survey data or indistinct photo pattern)	4

Coding of exotic and disturbance features	
Exotic dominated (>50% of polygon) features	**Code**
Exotic vegetation. Includes exotic dominated urban and rural residential vegetation which has been delineated as native vegetation in the land-cover layer. **Bitou** Ex01**, Camphor** Ex02**, Exotic** Ex03**, Lantana** Ex04**, Privet** Ex05	EX
Native pioneers – *Acacia* spp.	NP01
Native pioneers – Rainforest spp.	NP02
Pine – softwood – exotic plantations	P02
Environmental plantings (revegetation areas, windbreaks, roadside plantings etc.)	P03
Open water	W01
Dam	W02

Disturbance attribution
Native vegetation with significant occurrence (30–50%) of environmental weeds or significant disturbance defined as either: a. Loss or >50% disturbance to canopy; or b. Removal of >50% of understorey/ground cover c. Obvious disturbance/drainage to wetlands Logging, Exotics, Clearing, Regeneration, Dieback, Fire, Clearing Understory, Cropping Practices, Drainage, Mining, Scald, Dam, Other

Coding of environmental weeds	
Camphor Laurel	Cl
Privet and Camphor	PrCl
Bitou Bush	Bb
Privet	Pr
Lantana	Ln
Groundsel	Gs
Pine spp.	Pp
Other weeds	Other

Description of attributes

Field name	Data type	Length	Description
OBJECTID	Long	9	Object identification number
NUM_OF_COD	Integer	short	Indicates if only Primary vegetation map code (1) or if a Secondary vegetation code is also mapped (2)
NAM_CODE1	Text	10	Primary Nambucca vegetation map code
NAM_LABEL1	Text	300	Primary Nambucca vegetation map label
NAM_CODE2	Text	10	Secondary Nambucca vegetation map code
NAM_LABEL2	Text	300	Secondary Nambucca vegetation map label
LIKELY_TEC	Text	300	Indicates if vegetation type is a likely Threatened Ecological Community (TEC)
FORMATION	Text	200	Keith (2004) Vegetation formation
CLASS	Text	200	Keith (2004) Vegetation class
PCT1_ID	Integer	short	Primary NSW Plant Community Type (PCT) code
PCT1_DESC	Text	300	Primary NSW Plant Community Type (PCT) name
PCT2_ID	Integer	short	Secondary NSW Plant Community Type (PCT) code
PCT2_DESC	Text	300	Secondary NSW Plant Community Type (PCT) name
AG_ID1	Text	15	Primary vegetation Analysis-Group Identifier (AG-ID) from PATN analysis done for the *Vegetation Classification for the Northern Rivers CMA* (OEH 2012a). Numerals preceding the dash represent the number of groups in the PATN analysis; numerals after the dash the number assigned within that group (e.g. 700-686). In this project some vegetation types have also been assigned a letter (e.g. a, b or c) indicating a variation from the original AG-ID type
AG_ID2	Text	15	Secondary vegetation Analysis-Group Identifier (AG-ID) from PATN analysis done for the *Vegetation Classification for the Northern Rivers CMA* (OEH 2012b)
WEEDS	Text	10	Weeds present in polygon: Cl – Camphor Laurel; Ac – Acacia; Gs – Groundsel; Pr – Privet; PrCl – Privet and Camphor; Ln – Lantana; Other – Other weeds
DISTURBANCE	Text	10	Disturbance in polygon: Ac_Pioneer – *Acacia* pioneers; Logging – Logging; Exotics – Exotics; Clearing – Clearing; Regen – regeneration from past clearing; Rf_Pioneer – Rainforest pioneers; Dieback – crown dieback; ClearedUst – Clearing Understorey; Crop – Cropping practices; Other – Other; Drainage – often associated with wetlands that have been drained; Scald – often associated with saltmarsh communities; Dam – often associated with wetland communities, such as lagoon forbland which often establish and thrive in dam environments
VARIANT	Text	150	Any species that dominates a community, which at times creates either a structural or slight floristic variation to the community in that localised area represented by the polygon
RELIABILIT	Integer	short	Interpreter's reliability ranking. Range is 1–4: 1 = High confidence and 4 = Low confidence; usually 1 indicates a field site within polygon; 2 indicates field sites nearby; 3 indicates a generally good understanding of the patterns of the landscape in that area and a medium level of reliability; whereas 4 indicates there is a lack of field data and a best guess, or extrapolation has been made with low reliability
Study_area	Text	50	Identifies if a polygon is in the Stage 2 study area where all extant vegetation was assigned to a vegetation type; or in the Stage 1 study area where the boundary of all extant vegetation was mapped but only TECs were assigned vegetation types
Shape_Leng	Double	double	Shape length
Shape_Area	Double	double	Shape area
AreaHa	Double	double	Shape area in hectares

Nambucca mapping lookup table

NAM_CODE	NAM_LABEL	LIKELY_TEC	KEITH FORMATION	KEITH CLASS	PCT_ID	PCT COMMON NAME	AG_ID_CODE
NAM_DOF02	Blackbutt – Needlebark Stringybark – Scribbly Gum – Slender Tea-tree dry sclerophyll mallee of North Coast wallum dunes and beach ridges		Heathlands	Wallum Sand Heaths	1060	Blackbutt – Bastard Tallow-wood – Scribbly Gum – Slender Tea-tree dry sclerophyll mallee of North Coast wallum dunes and beach ridges	888-42
NAM_DOF03	Blackbutt – Smooth-barked Apple – Needlebark Stringybark open forest on coastal dunes and sandplains		Dry Sclerophyll Forests	Coastal Dune Dry Sclerophyll Forests	2115	Blackbutt – Smooth-barked Apple – Needlebark Stringybark open forest on coastal dunes and sandplains, South Eastern Queensland bioregion and NSW North Coast bioregion	70-49
NAM_DOF04	Blackbutt – Red Mahogany – Bloodwood dry open forest on infertile sandy soils of low coastal rises and hills		Dry Sclerophyll Forests	North Coast Dry Sclerophyll Forests	2160	Blackbutt – Red Mahogany – Bloodwood dry open forest on infertile sandy soils of low coastal rises and hills, NSW North Coast bioregion and South Eastern Queensland bioregion	1000-1448a
NAM_DOF05	Forest Red Gum – Pink Bloodwood – Grey Ironbark open forest to woodland near coastal hills		Dry Sclerophyll Forests	North Coast Dry Sclerophyll Forests	2167	Forest Red Gum – Pink Bloodwood – Grey Ironbark open forest to woodland on metasediment headlands, NSW North Coast bioregion	1000-1075

NAM_CODE	NAM_LABEL	LIKELY_TEC	KEITH FORMATION	KEITH CLASS	PCT_ID	PCT COMMON NAME	AG_ID_CODE
NAM_DOF07	Pink Bloodwood – Brush Box open forest on coastal dunes and sandplains		Dry Sclerophyll Forests	Coastal Dune Dry Sclerophyll Forests	1933	Swamp Box – Broad-leaved Paperbark – Pink Bloodwood tall woodland and open forest on metasediment footslopes of the Tweed coastal hills, South Eastern Queensland bioregion	700-467
NAM_DOF08	Pink Bloodwood – Red Mahogany – Swamp Box shrub/grass open forest at low altitudes		Dry Sclerophyll Forests	Clarence Dry Sclerophyll Forests	2248	Pink Bloodwood – Red Mahogany – Swamp Box shrub/grass open forest at low altitudes, South Eastern Queensland bioregion and northern NSW North Coast bioregion	1000-1449a
NAM_DOF09	Red Bloodwood – Thick-leaved Mahogany – heathy dry open forest on granite		Dry Sclerophyll Forests	Clarence Dry Sclerophyll Forests	2248	Pink Bloodwood – Red Mahogany – Swamp Box shrub/grass open forest at low altitudes, South Eastern Queensland bioregion and northern NSW North Coast bioregion	1000-1449b
NAM_DOF10	Scribbly Gum dry open grassy forest on coastal hills on metasediments and granite		Dry Sclerophyll Forests	North Coast Dry Sclerophyll Forests	2160	Blackbutt – Red Mahogany – Bloodwood dry open forest on infertile sandy soils of low coastal rises and hills, NSW North Coast bioregion and South Eastern Queensland bioregion	1000-1448b
NAM_DOF11	Tallowwood – Small-fruited Grey Gum – Ironbark – Forest Oak dry sclerophyll forest		Wet Sclerophyll Forests	Northern Hinterland Wet Sclerophyll Forests	2171	Tallowwood – Small-fruited Grey Gum – Forest Oak dry open forest, South Eastern Queensland bioregion and NSW North Coast bioregion	1000-1071a

NAM_CODE	NAM_LABEL	LIKELY_TEC	KEITH FORMATION	KEITH CLASS	PCT_ID	PCT COMMON NAME	AG_ID_CODE
NAM_DOF12	Spotted Gum – Tallowwood – Thick-leaved Mahogany – Small-fruited Grey Gum – Grey Ironbark grassy open forest on shallow sedimentary soils		Wet Sclerophyll Forests	Northern Hinterland Wet Sclerophyll Forests	2174	Tallowwood – Thick-leaved Mahogany – Small-fruited Grey Gum – Grey Ironbark grassy open forest on shallow sedimentary soils, NSW North Coast bioregion and South Eastern Queensland bioregion	1500-124b
NAM_DOF13	Coast Banksia woodland and open forest of coastal dunes		Dry Sclerophyll Forests	Coastal Dune Dry Sclerophyll Forests	2155	Coast Banksia woodland and open forest of coastal dunes, NSW North Coast bioregion and South Eastern Queensland bioregion	700-470
NAM_ForW01	Swamp Oak forested wetland of saline areas of coastal estuaries	Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner bioregions	Forested Wetlands	Coastal Swamp Forests	1917	Swamp Oak forested wetland of saline areas of coastal estuaries, NSW North Coast bioregion, South Eastern Queensland bioregion and Sydney Basin bioregion	1000-1979
NAM_ForW02	Swamp Oak – Broad-leaved Paperbark – Willow Bottlebrush floodplain forested wetland	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner bioregions	Forested Wetlands	Coastal Swamp Forests	1920	Swamp Oak – Broad-leaved Paperbark – Willow Bottlebrush floodplain forested wetland, NSW North Coast bioregion and South Eastern Queensland bioregion	700-621
NAM_ForW03	Milky Mangrove Woodland of tidal estuaries	Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner bioregions	Forested Wetlands	Coastal Swamp Forests	1921	Swamp Oak – Milky Mangrove – Broad-leaved Paperbark king tide forest and woodland of coastal estuaries, NSW North Coast bioregion and South Eastern Queensland bioregion	700-623

NAM_CODE	NAM_LABEL	LIKELY_TEC	KEITH FORMATION	KEITH CLASS	PCT_ID	PCT COMMON NAME	AG_ID_CODE
NAM_ForW04	Broad-leaved Paperbark – Swamp Oak – Tall Sedge swamp forest on alluvial soils	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner bioregions	Forested Wetlands	Coastal Swamp Forests	1924	Broad-leaved Paperbark – Swamp Oak – Tall Sedge swamp forest on alluvial soils, South Eastern Queensland bioregion and NSW North Coast bioregion	700-638
NAM_ForW05	Broad-leaved Paperbark – Bare Twig Rush swamp sclerophyll open forest of coastal swamps	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner bioregions	Forested Wetlands	Coastal Swamp Forests	1925	Broad-leaved Paperbark – Bare Twig Rush swamp sclerophyll open forest of coastal swamps, NSW North Coast bioregion and the South Eastern Queensland bioregion	1000-1936
NAM_ForW06	Broad-leaved Paperbark – Willow Bottlebrush forested wetland of creek channels draining intermittent coastal lakes and lagoons	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner bioregions	Forested Wetlands	Coastal Swamp Forests	1929	Broad-leaved Paperbark – Willow Bottlebrush forested wetland of creek channels draining intermittent coastal lakes and lagoons, NSW North Coast bioregion	700-636
NAM_ForW08	Swamp Mahogany – Willow Bottlebrush – Broad-leaved Paperbark forested wetland	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner bioregions	Forested Wetlands	Coastal Swamp Forests	1935	Swamp Mahogany – Willow Bottlebrush – Broad-leaved Paperbark forested wetland of the Coffs Harbour area, NSW North Coast bioregion	700-477
NAM_ForW10	River Oak grassy open forest along larger rivers		Forested Wetlands	Eastern Riverine Forests	1948	River Oak grassy open forest along larger rivers, NSW North Coast bioregion and South Eastern Queensland bioregion	700-222

NAM_CODE	NAM_LABEL	LIKELY_TEC	KEITH FORMATION	KEITH CLASS	PCT_ID	PCT COMMON NAME	AG_ID_CODE
NAM_ForW12	Swamp Mahogany – *Melaleuca sieberi* shrub/sedge swamp forest on low lying sandy areas		Forested Wetlands	Coastal Swamp Forests	1936	Swamp Mahogany – *Melaleuca sieberi* shrub/sedge swamp forest on low lying sandy areas, South Eastern Queensland bioregion and NSW North Coast bioregion	700-334
NAM_ForW13	Swamp Mahogany – tea-tree – Tassell Rush forested wetland of waterlogged wallum soils		Forested Wetlands	Coastal Swamp Forests	1937	Swamp Mahogany – tea-tree – Tassell Rush forested wetland of waterlogged wallum soils, NSW North Coast bioregion and South Eastern Queensland bioregion	700-614
NAM_ForW14	Swamp Box – Forest Red Gum – Pink Bloodwood seasonal swamp forest on floodplains and low rises	Subtropical Coastal Floodplain Forest of the New South Wales North Coast bioregion	Forested Wetlands	Coastal Swamp Forests	1938	Swamp Box – Forest Red Gum – Pink Bloodwood seasonal swamp forest on floodplains and low rises, NSW North Coast bioregion and the South Eastern Queensland bioregion	700-488
NAM_FW01	Lagoon forbland of permanent wetlands on the coastal floodplains	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner bioregions	Freshwater Wetlands	Coastal Freshwater Lagoons	1951	Lagoon forbland of permanent wetlands on the coastal floodplains, South Eastern Queensland bioregion and NSW North Coast bioregion	500-3
NAM_FW02	Knotweed wet meadow forbland on alluvial soils of coastal floodplains	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner bioregions	Freshwater Wetlands	Coastal Freshwater Lagoons	1952	Knotweed wet meadow forbland on alluvial soils of coastal floodplains, South Eastern Queensland bioregion and NSW North Coast bioregion	500-7

NAM_CODE	NAM_LABEL	LIKELY_TEC	KEITH FORMATION	KEITH CLASS	PCT_ID	PCT COMMON NAME	AG_ID_CODE
NAM_FW03	Common Reed grassland of alluvial floodplain and brackish tidal creeks	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner bioregions	Freshwater Wetlands	Coastal Freshwater Lagoons	1953	Common Reed grassland on alluvial floodplains, South Eastern Queensland bioregion and NSW North Coast bioregion	700-641
NAM_FW04	Water Couch – Mud Grass wet grassland meadow on alluvial soils of coastal floodplains	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner bioregions	Freshwater Wetlands	Coastal Freshwater Lagoons	1955	Mud Grass wet grassland meadow on alluvial soils of coastal floodplains, South Eastern Queensland bioregion and NSW North Coast bioregion	500-5
NAM_FW05	*Juncus* rushlands on alluvial floodplains	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner bioregions	Freshwater Wetlands	Coastal Freshwater Lagoons	1957	*Juncus* rushlands on alluvial floodplains, South Eastern Queensland bioregion and NSW North Coast bioregion	500-2
NAM_FW06	*Typha* freshwater wetland of the floodplain	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner bioregions	Freshwater Wetlands	Coastal Freshwater Lagoons	1982	*Eleocharis acuta* – Large leaf Cumbungi freshwater wetland of the floodplain, NSW North Coast bioregion and South Eastern Queensland bioregion	700-691
NAM_FW07	*Eleocharis equisetina* freshwater wetland of coastal floodplains	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and	Freshwater Wetlands	Coastal Freshwater Lagoons	1959	*Eleocharis equisetina* freshwater wetland of coastal floodplains, NSW North Coast bioregion and South Eastern Queensland bioregion	700-694

NAM_CODE	NAM_LABEL	LIKELY_TEC	KEITH FORMATION	KEITH CLASS	PCT_ID	PCT COMMON NAME	AG_ID_CODE
		South East Corner bioregions					
NAM_FW08	Tall Spike Rush freshwater wetland of coastal floodplains and depressions in low hills	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner bioregions	Freshwater Wetlands	Coastal Freshwater Lagoons	1960	Tall Spike Rush freshwater wetland of coastal floodplains and depressions in low hills, NSW North Coast bioregion and South Eastern Queensland bioregion	700-693
NAM_FW09	Jointed Twig Rush – Swamp Water Fern freshwater wetlands of the alluvial floodplain	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner bioregions	Freshwater Wetlands	Coastal Heath Swamps	1962	Soft Twig Rush – Swamp Water Fern – Common Reed swamp and marshland on coastal sand and alluvial floodplain, NSW North Coast bioregion	1000-1950
NAM_FW10	Soft Twig Rush sedgeland of North Coast wallum swamps		Freshwater Wetlands	Coastal Freshwater Lagoons	1000	Soft Twig Rush Sedgeland of North Coast Wallum Swamps	888-1
NAM_FW11	Tea-tree tall shrubland of coastal freshwater sand swamp		Freshwater Wetlands	Coastal Heath Swamps	1967	Tea-tree tall shrubland of coastal freshwater sand swamp, NSW North Coast bioregion and South Eastern Queensland bioregion	70-64

NAM_CODE	NAM_LABEL	LIKELY_TEC	KEITH FORMATION	KEITH CLASS	PCT_ID	PCT COMMON NAME	AG_ID_CODE
NAM_H01	Kangaroo Grass sod grassland of North Coast headlands	Themeda grassland on seacliffs and coastal headlands in the NSW North Coast, Sydney Basin and South East Corner bioregions	Grasslands	Maritime Grasslands	1016	Kangaroo Grass sod grassland of North Coast headlands, South Eastern Queensland bioregion and NSW North Coast bioregion	888-14
NAM_H03	Swamp Oak shrublands on coastal headlands		Heathlands	Coastal Headland Heaths	1985	Swamp Oak shrublands on coastal headlands, NSW North Coast bioregion	700-383
NAM_H04	Wallum Banksia – Prickly Moses – *Caustis recurvata* dry heathland on coastal sands		Heathlands	Wallum Sand Heaths	1989	Wallum Banksia – Prickly Moses – *Caustis recurvata* dry heathland on coastal sands, South Eastern Queensland bioregion and NSW North Coast bioregion	700-344
NAM_H05	Coast Wattle shrubland on coastal foredunes		Heathlands	Wallum Sand Heaths	1991	Coast Wattle shrubland on coastal foredunes, South Eastern Queensland bioregion and NSW North Coast bioregion	700-675
NAM_H06	Wallum Banksia – Heath Phyllota dry sclerophyll shrubland of North Coast wallum dunes, beach ridges and sand plains		Heathlands	Wallum Sand Heaths	1041	Wallum Banksia – Black She-oak – Old-man Banksia dry sclerophyll shrubland of North Coast wallum dunes	888-33
NAM_H08	Tea-tree rock outcrop shrubland		Heathlands	Northern Montane Heaths	999	Tea-tree rock outcrop shrubland	700-368

NAM_CODE	NAM_LABEL	LIKELY_TEC	KEITH FORMATION	KEITH CLASS	PCT_ID	PCT COMMON NAME	AG_ID_CODE
NAM_RF02	Tuckeroo – Bird's Eye Alectryon – Beach Acronychia littoral rainforests	Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner bioregions	Rainforests	Littoral Rainforests	2039	Tuckeroo – Birds Eye Alectryon – Beach Acronychia littoral rainforests, NSW North Coast bioregion and South Eastern Queensland bioregion	75-49
NAM_RF03	Brushbox headland littoral rainforest	Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner bioregions	Rainforests	Littoral Rainforests	2041	Brushbox headland littoral rainforest, NSW North Coast bioregion and South Eastern Queensland bioregion	700-411
NAM_RF04	Yellow Pear Fruit – Cabbage Tree Palm – Small-Leaved Lilly Pilly – Brown Pine littoral rainforest	Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner bioregions	Rainforests	Littoral Rainforests	2042	Yellow Tulipwood – Yellow Wood – Red Olive Berry – Brown Pine littoral rainforest, NSW North Coast bioregion	150-100
NAM_RF05	Riparian subtropical rainforest with River Oak emergents on lowland creek flats	Lowland Rainforest on Floodplain in the New South Wales North Coast bioregion	Rainforests	Subtropical Rainforests	2048	Riparian subtropical rainforest with River Oak emergents on lowland creek flats, NSW North Coast bioregion and South Eastern Queensland bioregion	700-533
NAM_RF06	Giant Water Gum – Rough-leaved Elm – Small-leaved Fig – Hard Quandong subtropical rainforest on coastal floodplains	Lowland Rainforest on Floodplain in the New South Wales North Coast bioregion	Rainforests	Subtropical Rainforests	2059	Giant Water Gum – Rough-leaved Elm – Small-leaved Fig – Hard Quandong subtropical rainforest on coastal floodplains, South Eastern Queensland bioregion and NSW North Coast bioregion	75-38

NAM_CODE	NAM_LABEL	LIKELY_TEC	KEITH FORMATION	KEITH CLASS	PCT_ID	PCT COMMON NAME	AG_ID_CODE
NAM_RF07	Maiden's Blush – Yellow Carabeen – Native Tamarind – Bangalow Palm subtropical rainforest on metasediments of the southern coastal ranges and escarpment	Lowland Rainforest in the NSW North Coast and Sydney Basin bioregions	Rainforests	Subtropical Rainforests	2063	Maiden's Blush – Yellow Carabeen – Native Tamarind – Bangalow Palm subtropical rainforest on metasediments of the southern coastal ranges and escarpment, NSW North Coast bioregion	150-6
NAM_RF08	Green-leaved Rose-walnut – Sassafras – Black Booyong – Yellow Carabeen tall closed forest on sediments and metasediments of near coastal hills and escarpments	Lowland Rainforest in the NSW North Coast and Sydney Basin bioregions	Rainforests	Subtropical Rainforests	2065	Green-leaved Rose-walnut – Sassafras – Black Booyong – Yellow Carabeen tall closed forest on sediments and metasediments of near coastal hills and escarpments, South Eastern Queensland bioregion and NSW North Coast bioregion	1000-1586
NAM_RF09	Weeping Lilly Pilly dry riparian rainforest	Lowland Rainforest on Floodplain in the New South Wales North Coast bioregion	Rainforests	Dry Rainforests	2077	Weeping Lilly Pilly dry riparian rainforest, NSW North Coast bioregion and South Eastern Queensland bioregion	700-529
NAM_RF10	Shatterwood – Whalebone Tree dry rainforests on metasediments	Lowland Rainforest in the NSW North Coast and Sydney Basin bioregions	Rainforests	Dry Rainforests	2082	Shatterwood – Whalebone Tree dry rainforests on metasediments, NSW North Coast bioregion and South Eastern Queensland bioregion	700-435
NAM_RF11	Brush Box – Grey Myrtle – Water Gum dry rainforests of poorer soils of gorges and river valleys	Lowland Rainforest in the NSW North Coast and Sydney Basin bioregions	Rainforests	Dry Rainforests	2084	Brush Box – Grey Myrtle – Water Gum dry rainforests of poorer soils of gorges and river valleys, NSW North Coast bioregion and South Eastern Queensland bioregion	75-23

NAM_CODE	NAM_LABEL	LIKELY_TEC	KEITH FORMATION	KEITH CLASS	PCT_ID	PCT COMMON NAME	AG_ID_CODE
NAM_RF12	Grey Myrtle – Brush Box dry rainforest on metasediments and lower nutrient volcanics	Lowland Rainforest in the NSW North Coast and Sydney Basin bioregions	Rainforests	Dry Rainforests	2085	Grey Myrtle – Brush Box dry rainforest on metasediments and lower nutrient volcanics, NSW North Coast bioregion and South Eastern Queensland bioregion	700-431
NAM_SW01	Prickly Couch – Sea Rush – Saltwater Couch saltmarsh of saline coastal swamps and flats	Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner bioregions	Saline Wetlands	Saltmarshes	2218	Prickly Couch – Sea Rush – Common Couch saltmarsh of saline coastal swamps and flats, South Eastern Queensland bioregion and NSW North Coast bioregion	700-682
NAM_SW02	Sea Rush saltmarsh of saline coastal swamps and flats	Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner bioregions	Saline Wetlands	Saltmarshes	2219	Sea Rush saltmarsh of saline coastal swamps and flats, South Eastern Queensland bioregion and NSW North Coast bioregion	1000-1980
NAM_SW03	Twig Rush saltmarsh of estuaries	Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner bioregions	Saline Wetlands	Saltmarshes	2220	Twig Rush saltmarsh of estuaries, NSW North Coast bioregion and South Eastern Queensland bioregion	1000-1937
NAM_SW04	Saltwater Couch – Samphire saltmarsh of low-lying estuarine areas	Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner bioregions	Saline Wetlands	Saltmarshes	2222	Saltwater Couch – Samphire saltmarsh of low-lying estuarine areas, South Eastern Queensland bioregion and NSW North Coast bioregion	700-684

NAM_CODE	NAM_LABEL	LIKELY_TEC	KEITH FORMATION	KEITH CLASS	PCT_ID	PCT COMMON NAME	AG_ID_CODE
NAM_SW05	Grey Mangrove – River Mangrove low open or closed forest or shrubland of intertidal flats		Saline Wetlands	Mangrove Swamps	2225	Grey Mangrove – River Mangrove low open or closed forest or shrubland of intertidal flats, NSW North Coast bioregion and the South Eastern Queensland bioregion	700-686
NAM_WSF01	Flooded Gum moist open forest of sheltered lower slopes and gullies		Wet Sclerophyll Forests	North Coast Wet Sclerophyll Forests	2257	Flooded Gum moist open forest of sheltered lower slopes and gullies in the Clarence and Bellinger River valleys, NSW North Coast bioregion	700-399
NAM_WSF02	Brush Box – Tallowwood – Sydney Blue Gum shrubby wet open forest of coastal hills and escarpment ranges		Wet Sclerophyll Forests	North Coast Wet Sclerophyll Forests	2227	Brush Box – Tallowwood – Sydney Blue Gum shrubby wet open forest of coastal hills and escarpment ranges, NSW North Coast bioregion and the South Eastern Queensland bioregion	1500-933
NAM_WSF04	Turpentine – Brush Box – Flooded Gum – Blackbutt shrubby moist forest of sub-coastal lowlands		Wet Sclerophyll Forests	North Coast Wet Sclerophyll Forests	2229	Turpentine – Brush Box – Flooded Gum – Blackbutt shrubby moist forest of sub-coastal lowlands, NSW North Coast bioregion and South Eastern Queensland bioregion	1500-929
NAM_WSF05	Tallowwood – Small-fruited Grey Gum – Ironbark – Forest Oak wet sclerophyll forest		Wet Sclerophyll Forests	Northern Hinterland Wet Sclerophyll Forests	2171	Tallowwood – Small-fruited Grey Gum – Forest Oak dry open forest, South Eastern Queensland bioregion and NSW North Coast bioregion	1000-1071b

NAM_CODE	NAM_LABEL	LIKELY_TEC	KEITH FORMATION	KEITH CLASS	PCT_ID	PCT COMMON NAME	AG_ID_CODE
NAM_WSF06	Spotted Gum – Small-fruited Grey Gum tall open forest with dense Brown Myrtle mid-storey on coastal foothills		Wet Sclerophyll Forests	North Coast Wet Sclerophyll Forests	2197	Small-fruited Grey Gum – Steel Box tall open forest with dense Brown Myrtle mid-storey on coastal foothills between Coffs Harbour and Grafton, South Eastern Queensland bioregion and NSW North Coast bioregion	1000-1700
NAM_WSF07	Tallowwood – Blackbutt moist shrubby tall open forest of the hinterland ranges		Wet Sclerophyll Forests	North Coast Wet Sclerophyll Forests	2226	Tallowwood – Blackbutt moist shrubby tall open forest of the hinterland ranges of the Mid North Coast, NSW North Coast bioregion and South Eastern Queensland bioregion	1500-923
NAM_WSF08	Bloodwood – Tallowwood wet sclerophyll forests on sand		Dry Sclerophyll Forests	Clarence Dry Sclerophyll Forests	2248	Pink Bloodwood – Red Mahogany – Swamp Box shrub/grass open forest at low altitudes, South Eastern Queensland bioregion and northern NSW North Coast bioregion	1000-1449c
NAM_WSF09	Spotted Gum – Tallowwood – Thick-leaved Mahogany –Small-fruited Grey Gum – Grey Ironbark wet shrubby open forest on sheltered slopes		Wet Sclerophyll Forests	Northern Hinterland Wet Sclerophyll Forests	2174	Tallowwood – Thick-leaved Mahogany – Small-fruited Grey Gum – Grey Ironbark grassy open forest on shallow sedimentary soils, NSW North Coast bioregion and South Eastern Queensland bioregion	1500-124a
NAM_EX01	Bitou Bush				9999		9999
NAM_EX02	Camphor Laurel				9999		9999
NAM_EX03	Exotic vegetation				9999		9999

NAM_CODE	NAM_LABEL	LIKELY_TEC	KEITH FORMATION	KEITH CLASS	PCT_ID	PCT COMMON NAME	AG_ID_CODE
NAM_EX04	Lantana				9999		9999
NAM_EX05	Privet				9999		9999
NAM_NP01	Native pioneers				9999		9999
NAM_NP02	Rainforest pioneers				9999		9999
NAM_NRV01	Native remnant vegetation				9999		9999
NAM_P01	Native plantation				9999		9999
NAM_P02	Exotic plantation				9999		9999
NAM_P03	Environmental plantings				9999		9999
NAM_W01	Open water				9999		9999
NAM_W02	Dam				9999		9999

Appendix 2 Metadata statement

Nambucca LGA Vegetation 2015

File Geodatabase Feature Class

Thumbnail Not Available

Tags

Biosphere | Vegetation | Vegetation Species, Biosphere | Vegetation | Importance Value, Biosphere | Vegetation | Dominant Species, Biosphere | Vegetation | Vegetation Cover, Land Surface | Land Use/Land Cover | Land Cover

Summary

Vegetation mapping and a field verification program were conducted, in two stages, for parts of the Nambucca Shire Council Local Government Area (Nambucca LGA) using high-resolution digital aerial imagery. The aim of the project was to map the vegetation and plant community types in the coastal and lowland areas of the Nambucca LGA outside National Park and State Forest Estate in order to:

- Define the extent of vegetation on the valley floors, to provide a refined and accurate layer of woody and non-woody vegetation cover for private land and coastal Crown Land within the Nambucca LGA.
- Delineate the potential occurrence of Threatened Ecological Communities (TECs) on freehold lands and coastal Crown Land in the Nambucca LGA (Stage 1).
- Map all coastal and lowland vegetation communities on freehold land and coastal Crown Land (Stage 2).
- Identify areas of the Stage 2 mapped vegetation to be used in habitat modelling for the Koala (*Phascolarctos cinereus*).

The vegetation map is suitable for use at a scale of 1:5000 and will support environmental planning and assessment at the level of local government areas and regions. The map is indicative of the vegetation and threatened ecological communities occurring within an individual property or development land area. However, it is recommended that decision making be based on further flora surveys and expert-driven site assessment to meet the requirements of the *TSC Act* and other planning instruments on a case-by-case basis.

Description

This dataset represents fine-scale floristic vegetation mapping within eastern freehold lands of the Nambucca LGA and targeted mapping of Threatened Ecological Communities (TECs) outside public lands throughout the LGA. Vegetation has been classified into Plant Community Types (PCTs), classes and formations, with the composition of respective vegetation species identified. Mapping was conducted by vegetation mapping experts (NSW Office of Environment and Heritage (OEH)) between 2013 and 2015, and was based on three-dimensional (3-D) PLANAR modelling, aerial photography interpretation (API) and field

floristic assessment. Additionally, basic disturbance information is captured along with a selection of prominent weeds where identified by interpreters.

Credits

There are no credits for this item.

Use limitations

These data may require negotiation of a data licence agreement before supply. More detail will be provided when the dataset is requested. For further inquiries contact data.broker@environment.nsw.gov.au

Extent

West	152.521227	**East**	153.019687
North	-30.522024	**South**	-30.899727

Scale Range

Maximum (zoomed in)	1:5,000
Minimum (zoomed out)	1:50 000

ArcGIS Metadata ►

Topics and Keywords ►

THEMES OR CATEGORIES OF THE RESOURCE biota, environment

CONTENT TYPE Downloadable Data

OTHER KEYWORDS Biosphere | Vegetation | Vegetation Species, Biosphere | Vegetation | Importance Value, Biosphere | Vegetation | Dominant Species, Biosphere | Vegetation | Vegetation Cover, Land Surface | Land Use/Land Cover | Land Cover

Hide Topics and Keywords ▲

Citation ►

TITLE Nambucca LGA Vegetation 2015

ALTERNATE TITLES Nambucca Shire Local Government Area Plant Community Type Mapping

CREATION DATE 2015-06-30 00:00:00

PUBLICATION DATE 2015-06-30 00:00:00

EDITION DATE 2015-09-16

PRESENTATION FORMATS digital map

OTHER CITATION DETAILS Office of Environment and Heritage, 2015, *Vegetation Mapping within the Nambucca Local Government Area — Coastal Lowland Vegetation Communities and Potential Threatened Ecological Communities.* Volumes 1 and 2. NSW Office of Environment and Heritage, Sydney South.

Hide Citation ▲

Citation Contacts ►

RESPONSIBLE PARTY

INDIVIDUAL'S NAME Jill Smith

ORGANIZATION'S NAME NSW Office of Environment and Heritage (OEH)

CONTACT'S POSITION Conservation Assessment Data Officer

CONTACT'S ROLE point of contact

Hide Citation Contacts ▲

Resource Details ►

DATASET LANGUAGES English (AUSTRALIA)

DATASET CHARACTER SET utf8 - 8 bit UCS Transfer Format

STATUS completed

SPATIAL REPRESENTATION TYPE vector

SPATIAL RESOLUTION

DATASET'S SCALE

SCALE DENOMINATOR 5000

SUPPLEMENTAL INFORMATION

Plant Community Type Mapping (PCT) in the Nambucca Local Government Area. Office of Environment and Heritage, Coffs Harbour, NSW, Australia. These data supersede the 2013 Threatened Ecological Communities within the Nambucca Shire Local Government Area

PROCESSING ENVIRONMENT Microsoft Windows 7 Version 6.1 (Build 7601) Service Pack 1; Esri ArcGIS 10.1.1.3143

ARCGIS ITEM PROPERTIES

* NAME NambuccaLGA_2015_20151013

* LOCATION
file://\\coffsfp02.dec.int\Spatial\Work\ROG\Projects\Vegetation\Nambucca_Mapping\Data\Spatialdata\API_Mapping\API_Mapping_MASTER\API_Master_Nambucca.gdb

* ACCESS PROTOCOL Local Area Network

Hide Resource Details ▲

Extents ►

EXTENT

GEOGRAPHIC EXTENT

BOUNDING RECTANGLE

WEST LONGITUDE 152.521227

EAST LONGITUDE 153.019687

SOUTH LATITUDE -30.899727

NORTH LATITUDE -30.522024

EXTENT CONTAINS THE RESOURCE Yes

EXTENT

GEOGRAPHIC EXTENT

BOUNDING RECTANGLE

WEST LONGITUDE 152.521227

EAST LONGITUDE 153.019687

SOUTH LATITUDE -30.899727

NORTH LATITUDE -30.522024

EXTENT CONTAINS THE RESOURCE Yes

EXTENT

DESCRIPTION

Nambucca LGA

GEOGRAPHIC EXTENT

BOUNDING RECTANGLE

WEST LONGITUDE 152.522751

EAST LONGITUDE 153.019636

SOUTH LATITUDE -30.899617

NORTH LATITUDE -30.522621

EXTENT CONTAINS THE RESOURCE Yes

TEMPORAL EXTENT

BEGINNING DATE 2013-01-01 00:00:00

ENDING DATE 2015-09-30 00:00:00

VERTICAL EXTENT

MINIMUM VALUE -96.4

MAXIMUM VALUE 522.6

EXTENT

GEOGRAPHIC EXTENT

BOUNDING RECTANGLE

EXTENT TYPE Extent used for searching

* WEST LONGITUDE 152.521227

* EAST LONGITUDE 153.019687

* NORTH LATITUDE -30.522024

* SOUTH LATITUDE -30.899727

* EXTENT CONTAINS THE RESOURCE Yes

EXTENT IN THE ITEM'S COORDINATE SYSTEM

* WEST LONGITUDE 454245.000000

* EAST LONGITUDE 501881.400000

* SOUTH LATITUDE 6581510.700000

* NORTH LATITUDE 6623271.100000

* EXTENT CONTAINS THE RESOURCE Yes

Hide Extents ▲

Resource Points of Contact ►

POINT OF CONTACT

INDIVIDUAL'S NAME Jill Smith

ORGANIZATION'S NAME NSW Office of Environment and Heritage (OEH)

CONTACT'S POSITION Conservation Assessment Data Officer

CONTACT'S ROLE point of contact

CONTACT INFORMATION ►

ADDRESS

E-MAIL ADDRESS jill.smith@environment.nsw.gov.au

Hide Contact information ▲

Hide Resource Points of Contact ▲

Resource Maintenance ►

RESOURCE MAINTENANCE

UPDATE FREQUENCY not planned

Hide Resource Maintenance ▲

Resource Constraints ►

CONSTRAINTS

LIMITATIONS OF USE

These data may require negotiation of a data licence agreement before supply. More detail will be provided when the daytaset is requested. For further inquiries contact data.broker@environment.nsw.gov.au

Hide Resource Constraints ▲

Spatial Reference ►

ARCGIS COORDINATE SYSTEM

* TYPE Projected

* GEOGRAPHIC COORDINATE REFERENCE GCS_GDA_1994

* PROJECTION GDA_1994_MGA_Zone_56

* COORDINATE REFERENCE DETAILS

PROJECTED COORDINATE SYSTEM

WELL-KNOWN IDENTIFIER 28356

X ORIGIN -5120900

Y ORIGIN 1900

XY SCALE 10000

Z ORIGIN -100000

Z SCALE 10000

M ORIGIN -100000

M SCALE 10000

XY TOLERANCE 0.10000000000000001

Z TOLERANCE 0.10000000000000001

M TOLERANCE 0.001

HIGH PRECISION true

LATEST WELL-KNOWN IDENTIFIER 28356

WELL-KNOWN TEXT
PROJCS["GDA_1994_MGA_Zone_56",GEOGCS["GCS_GDA_1994",DATUM["D_GDA_1994",SPHEROID["GRS_1980",6378137.0,298.257222101]],PRIMEM["Greenwich",0.0],UNIT["Degree",0.0174532925199433]],PROJECTION["Transverse_Mercator"],PARAMETER["False_Easting",500000.0],PARAMETER["False_Northing",10000000.0],PARAMETER["Central_Meridian",153.0],PARAMETER["Scale_Factor",0.9996],PARAMETER["Latitude_Of_Origin",0.0],UNIT["Meter",1.0],AUTHORITY["EPSG",28356]]

REFERENCE SYSTEM IDENTIFIER

VALUE GDA94 / MGA zone 56

CODESPACE EPSG

VERSION 7.11.2

Hide Spatial Reference ▲

Spatial Data Properties ►

VECTOR ►

* LEVEL OF TOPOLOGY FOR THIS DATASET geometry only

GEOMETRIC OBJECTS

FEATURE CLASS NAME NambuccaLGA_2015_20151013

* OBJECT TYPE composite

* OBJECT COUNT 13285

Hide Vector ▲

ARCGIS FEATURE CLASS PROPERTIES ►

FEATURE CLASS NAME NambuccaLGA_2015_20151013

* FEATURE TYPE Simple

* GEOMETRY TYPE Polygon

* HAS TOPOLOGY FALSE

* FEATURE COUNT 13285

* SPATIAL INDEX TRUE

* LINEAR REFERENCING FALSE

Hide ArcGIS Feature Class Properties ▲

Hide Spatial Data Properties ▲

Data Quality ►

SCOPE OF QUALITY INFORMATION ►

RESOURCE LEVEL dataset

Hide Scope of quality information ▲

DATA QUALITY REPORT - ABSOLUTE EXTERNAL POSITIONAL ACCURACY ►

CONFORMANCE TEST RESULTS

TEST PASSED Yes

RESULT EXPLANATION Accuracy is determined by the spatial accuracies of both Level 1 Stereo and Level 2 orthorectified ADS40 imagery supplied by NSW Land and Property Information (LPI). Level 2 imagery is ± 2 metres and Level 1 is expected to be commensurate with Level 2.

PRODUCT SPECIFICATION ►

TITLE Land and Property Information ADS40 Aerial Photography

PUBLICATION DATE 2009-04-09 00:00:00

EDITION Macksville-Nambucca 1:100k

Hide Product specification ▲

Hide Data quality report - Absolute external positional accuracy ▲

Hide Data Quality ▲

Lineage ►

LINEAGE STATEMENT

LINEAGE

The vegetation of the Nambucca LGA was previously mapped by Kendall & Kendall Ecological Services (2003). The Kendall & Kendall mapping covered a net vegetation extent of 46 224 hectares of the Nambucca Shire, covering private property on the valley floors and excluded the tenures of State Forest and National Park Estate.

The current study, done in two stages, upgraded both the linework and classification of the Kendall & Kendall Ecological Services mapping to match current OEH standards in mapping and classification. Stage 1 of the study delineated all extant vegetation outside public land and mapped potential TECs; this covered an area of 86 741 ha. Stage 2 of the study covered 36 301 ha of the eastern coastal plains and midland hills in the Nambucca LGA. In Stage 2 all vegetation was attributed, where possible, to an existing Plant Community Type (PCT) within the new vegetation classification for the Northern Rivers Catchment Management Area (NRCMA) (OEH 2012a).

Source data for this layer has two components: the floristic field-based site data; and the high-resolution aerial photography and LiDAR.

SITE DATA. At the beginning of the mapping study, 91 flora survey plots from previous studies had been done in the study area. An additional 30 full floristic surveys and approximately 600 rapid floristic sites were surveyed as part of the current mapping study to check vegetation type boundaries and attribution.

AERIAL PHOTOGRAPHY and LiDAR. The NSW LPI captures airborne ADS40 four-band digital imagery at 50-cm resolution for most of NSW. The Macksville and Nambucca (April 2009) 1:100 000 tile covered the Nambucca LGA study area. Two levels of imagery were utilised for the project, the 4-band 2-dimensional (2-D) orthorectified images and the Level 1 Rectified stereo image pair-strips. The Level 1 data were used for 3-dimensional (3-D) mapping in a GIS stereo environment. LiDAR, also captured by LPI was used as 2-D contextual data to help guide mapping decisons and to convert mapping data to 3-D format. LiDAR only covered the eastern portion of the LGA and thus ADS40 derived elevation data were used where LiDAR was absent.

MAPPING PROCESS. Mapping was conducted by API/botanical experts in a stereo view workstation comprising of PLANAR monitors, ESRI ArcMap software and ERDAS Stereo Analyst software. The environment allows the direct delineation and attribution of polygons in 3-D stereo view (Level 1 imagery) while simultaneously having a 2-D context view and any number of additional datasets to guide mapping decisions. Interpreters had the detailed Nambucca LGA land-cover layer as the starting point for each tile as an efficiency for the process. Interpreters had at their disposal all site data in 3-D. Interpreters routinely collected field check-points with GPS to help extrapolate across areas of difficult interpretability. A total of 350 check-points were collected for the project where public access was possible. The mapping was conducted on screen at a range of scales but the final reference scale is deemed to be 1:5000. Linework was digitised using live streaming with a stream tolerance average of 5 metres, i.e. a vertex every 5 metres. The study area was divided into tiles for stereo mapping and the interpreters cross-referenced each other whenever possible to help guide their mapping decisions. The tiles were stitched together in GIS and interpreters then reviewed the edges and remapped any inconsistencies. A final quality review of the stitched map was conducted by examining each community in isolation and reviewing it for errors and ecological distribution anomalies. This review process fed back in further refinements. Overall, the linework is very accurate as it is based upon the Nambucca LGA land-cover layer. Minimal discrepencies were found between 3-D and 2-D spatial accuracies.

Hide Lineage ▲

Geoprocessing history ►

PROCESS

PROCESS NAME

DATE 2015-10-12 09:58:28

TOOL LOCATION c:\program files (x86)\arcgis\desktop10.1\ArcToolbox\Toolboxes\Data Management Tools.tbx\AddField

COMMAND ISSUED

AddField GPL0 AreaHa DOUBLE 11 12 3 # NULLABLE NON_REQUIRED #

INCLUDE IN LINEAGE WHEN EXPORTING METADATA No

PROCESS

PROCESS NAME

DATE 2015-10-12 09:58:37

TOOL LOCATION c:\program files (x86)\arcgis\desktop10.1\ArcToolbox\Toolboxes\Data Management Tools.tbx\CalculateField

COMMAND ISSUED

CalculateField GPL0 AreaHa !shape.area@hectares! PYTHON_9.3 #

INCLUDE IN LINEAGE WHEN EXPORTING METADATA No

PROCESS

PROCESS NAME

DATE 2015-10-12 11:09:30

TOOL LOCATION c:\program files (x86)\arcgis\desktop10.1\ArcToolbox\Toolboxes\Data Management Tools.tbx\CalculateField

COMMAND ISSUED

CalculateField NambuccaLGA_2015_reorder_rename FORMATION 'Forested Wetlands' PYTHON_9.3 #

INCLUDE IN LINEAGE WHEN EXPORTING METADATA No

PROCESS

PROCESS NAME

DATE 2015-10-12 16:27:16

TOOL LOCATION c:\program files (x86)\arcgis\desktop10.1\ArcToolbox\Toolboxes\Data Management Tools.tbx\CalculateField

COMMAND ISSUED

CalculateField NambuccaLGA_2015_reorder_rename AG1_VARIANT "None" PYTHON_9.3 #

INCLUDE IN LINEAGE WHEN EXPORTING METADATA No

PROCESS

PROCESS NAME

DATE 2015-10-12 16:27:35

TOOL LOCATION c:\program files (x86)\arcgis\desktop10.1\ArcToolbox\Toolboxes\Data Management Tools.tbx\CalculateField

COMMAND ISSUED

CalculateField NambuccaLGA_2015_reorder_rename AG1_VARIANT None PYTHON_9.3 #

INCLUDE IN LINEAGE WHEN EXPORTING METADATA No

PROCESS

PROCESS NAME

DATE 2015-10-19 11:17:31

TOOL LOCATION c:\program files (x86)\arcgis\desktop10.1\ArcToolbox\Toolboxes\Data Management Tools.tbx\CalculateField

COMMAND ISSUED

CalculateField NambuccaLGA_2015_20151013 AG1_ID [AG1_VARIANT] VB #

INCLUDE IN LINEAGE WHEN EXPORTING METADATA No

PROCESS

PROCESS NAME

DATE 2015-10-19 11:42:07

TOOL LOCATION c:\program files (x86)\arcgis\desktop10.1\ArcToolbox\Toolboxes\Data Management Tools.tbx\DeleteField

COMMAND ISSUED

DeleteField NambuccaLGA_2015_20151013 AG1_VARIAN;TEC;COMMENTS

INCLUDE IN LINEAGE WHEN EXPORTING METADATA No

PROCESS

PROCESS NAME

DATE 2015-10-28 10:26:00

TOOL LOCATION c:\program files (x86)\arcgis\desktop10.1\ArcToolbox\Toolboxes\Data Management Tools.tbx\CalculateField

COMMAND ISSUED

CalculateField NambuccaLGA_2015_20151013 FORMATION 'Dry Sclerophyll Forests' PYTHON_9.3 #

INCLUDE IN LINEAGE WHEN EXPORTING METADATA No

PROCESS

PROCESS NAME

DATE 2015-10-28 10:26:25

TOOL LOCATION c:\program files (x86)\arcgis\desktop10.1\ArcToolbox\Toolboxes\Data Management Tools.tbx\CalculateField

COMMAND ISSUED

CalculateField NambuccaLGA_2015_20151013 CLASS 'Coastal Dune Dry Sclerophyll Forests' PYTHON_9.3 #

INCLUDE IN LINEAGE WHEN EXPORTING METADATA No

PROCESS

PROCESS NAME

DATE 2015-10-28 12:05:24

TOOL LOCATION c:\program files (x86)\arcgis\desktop10.1\ArcToolbox\Toolboxes\Data Management Tools.tbx\CalculateField

COMMAND ISSUED

CalculateField NambuccaLGA_2015_20151013 NAM_LABEL1 !NAM_LABEL1!.replace("Twig-rush", "Twig Rush") PYTHON_9.3 #

INCLUDE IN LINEAGE WHEN EXPORTING METADATA No

PROCESS

PROCESS NAME

DATE 2015-10-28 12:06:05

TOOL LOCATION c:\program files (x86)\arcgis\desktop10.1\ArcToolbox\Toolboxes\Data Management Tools.tbx\CalculateField

COMMAND ISSUED

CalculateField NambuccaLGA_2015_20151013 PCT1_DESC !PCT1_DESC!.replace("Twig-rush", "Twig Rush") PYTHON_9.3 #

INCLUDE IN LINEAGE WHEN EXPORTING METADATA No

PROCESS

PROCESS NAME

DATE 2015-10-28 12:06:34

TOOL LOCATION c:\program files (x86)\arcgis\desktop10.1\ArcToolbox\Toolboxes\Data Management Tools.tbx\CalculateField

COMMAND ISSUED

CalculateField NambuccaLGA_2015_20151013 NAM_LABEL2 !NAM_LABEL2!.replace("Twig-rush", "Twig Rush") PYTHON_9.3 #

INCLUDE IN LINEAGE WHEN EXPORTING METADATA No

PROCESS

PROCESS NAME

DATE 2015-10-28 12:07:10

TOOL LOCATION c:\program files (x86)\arcgis\desktop10.1\ArcToolbox\Toolboxes\Data Management Tools.tbx\CalculateField

COMMAND ISSUED

CalculateField NambuccaLGA_2015_20151013 PCT2_DESC !PCT2_DESC!.replace("Twig-rush", "Twig Rush") PYTHON_9.3 #

INCLUDE IN LINEAGE WHEN EXPORTING METADATA No

PROCESS

PROCESS NAME

DATE 2015-11-05 12:35:36

TOOL LOCATION c:\program files (x86)\arcgis\desktop10.1\ArcToolbox\Toolboxes\Data Management Tools.tbx\CalculateField

COMMAND ISSUED

CalculateField NambuccaLGA_2015_20151013 Study_area 'Stage2 - TEC and all vegetation types identified' PYTHON_9.3 #

INCLUDE IN LINEAGE WHEN EXPORTING METADATA No

PROCESS

PROCESS NAME

DATE 2015-11-05 12:37:14

TOOL LOCATION c:\program files (x86)\arcgis\desktop10.1\ArcToolbox\Toolboxes\Data Management Tools.tbx\CalculateField

COMMAND ISSUED

CalculateField NambuccaLGA_2015_20151013 Study_area 'Stage 1 - TEC and extant vegetation boundary only' PYTHON_9.3 #

INCLUDE IN LINEAGE WHEN EXPORTING METADATA No

PROCESS

PROCESS NAME

DATE 2015-11-05 12:39:15

TOOL LOCATION c:\program files (x86)\arcgis\desktop10.1\ArcToolbox\Toolboxes\Data Management Tools.tbx\CalculateField

COMMAND ISSUED

CalculateField NambuccaLGA_2015_20151013 Study_area 'Stage 2 - TEC and all vegetation types identified' PYTHON_9.3 #

INCLUDE IN LINEAGE WHEN EXPORTING METADATA No

Hide Geoprocessing history ▲

Distribution ►

DISTRIBUTOR ►

CONTACT INFORMATION

ORGANIZATION'S NAME Office of Environment and Heritage (OEH)

CONTACT'S POSITION Data Broker

CONTACT'S ROLE distributor

CONTACT INFORMATION ►

PHONE

VOICE 131555

FAX 02 9995 5999

ADDRESS

DELIVERY POINT PO Box A290

CITY Sydney South

ADMINISTRATIVE AREA NSW

POSTAL CODE 1232

COUNTRY AU

E-MAIL ADDRESS data.broker@environment.nsw.gov.au

Hide Contact information ▲

AVAILABLE FORMAT

NAME SDE Feature Class

VERSION Version 1

Hide Distributor ▲

DISTRIBUTION FORMAT

NAME File Geodatabase Feature Class

VERSION Version 1

Hide Distribution ▲

Fields ►

DETAILS FOR OBJECT NambuccaLGA_2015_20151013 ►

* TYPE Feature Class

* ROW COUNT 13285

FIELD OBJECTID ►

* ALIAS OBJECTID

* DATA TYPE OID

* WIDTH 4

* PRECISION 0

* SCALE 0

FIELD DESCRIPTION

Internal feature number. Object identification number

* DESCRIPTION SOURCE

Esri

* DESCRIPTION OF VALUES Sequential unique whole numbers that are automatically generated.

Hide Field OBJECTID ▲

FIELD Shape ►

* ALIAS Shape

* DATA TYPE Geometry

* WIDTH 0

* PRECISION 0

* SCALE 0

* FIELD DESCRIPTION

Feature geometry.

* DESCRIPTION SOURCE

Esri

* DESCRIPTION OF VALUES Coordinates defining the features.

Hide Field Shape ▲

FIELD NUM_OF_CODES ►

* ALIAS NUM_OF_CODES

* DATA TYPE SmallInteger

* WIDTH 2

* PRECISION 0

* SCALE 0

FIELD DESCRIPTION

Indicates if only Primary vegetation map code (1) or if a Secondary vegetation code is also mapped (2)

DESCRIPTION SOURCE

OEH

RANGE OF VALUES

MINIMUM VALUE 1

MAXIMUM VALUE 4

Hide Field NUM_OF_CODES ▲

FIELD NAM_CODE1 ►

* ALIAS NAM_CODE1

* DATA TYPE String

* WIDTH 10

* PRECISION 0

* SCALE 0

FIELD DESCRIPTION

Primary Nambucca vegetation map code

DESCRIPTION SOURCE

OEH

Hide Field NAM_CODE1 ▲

FIELD NAM_LABEL1 ►

* ALIAS NAM_LABEL1

* DATA TYPE String

* WIDTH 300

* PRECISION 0

* SCALE 0

FIELD DESCRIPTION

Primary Nambucca vegetation map label

DESCRIPTION SOURCE

OEH

Hide Field NAM_LABEL1 ▲

FIELD NAM_CODE2 ►

* ALIAS NAM_CODE2

* DATA TYPE String

* WIDTH 10

* PRECISION 0

* SCALE 0

FIELD DESCRIPTION

Secondary Nambucca vegetation map code

DESCRIPTION SOURCE

OEH

Hide Field NAM_CODE2 ▲

FIELD NAM_LABEL2 ►

* ALIAS NAM_LABEL2

* DATA TYPE String

* WIDTH 300

* PRECISION 0

* SCALE 0

FIELD DESCRIPTION

Secondary Nambucca vegetation map label

DESCRIPTION SOURCE

OEH

Hide Field NAM_LABEL2 ▲

FIELD LIKELY_TEC ►

* ALIAS LIKELY_TEC

* DATA TYPE String

* WIDTH 300

* PRECISION 0

* SCALE 0

FIELD DESCRIPTION

Indicates if vegetation type is a likely Threatened Ecological Community (TEC)

DESCRIPTION SOURCE

OEH

Hide Field LIKELY_TEC ▲

FIELD FORMATION ►

* ALIAS FORMATION

* DATA TYPE String

* WIDTH 200

* PRECISION 0

* SCALE 0

FIELD DESCRIPTION

Keith (2004) vegetation formation

DESCRIPTION SOURCE

OEH

Hide Field FORMATION ▲

FIELD CLASS ►

* ALIAS CLASS

* DATA TYPE String

* WIDTH 200

* PRECISION 0

* SCALE 0

FIELD DESCRIPTION

Keith (2004) vegetation Class

DESCRIPTION SOURCE

OEH

Hide Field CLASS ▲

FIELD PCT1_ID ►

* ALIAS PCT1_ID

* DATA TYPE SmallInteger

* WIDTH 2

* PRECISION 0

* SCALE 0

FIELD DESCRIPTION

Primary NSW Plant Community Type (PCT) code

DESCRIPTION SOURCE

OEH

Hide Field PCT1_ID ▲

FIELD PCT1_DESC ►

* ALIAS PCT1_DESC

* DATA TYPE String

* WIDTH 300

* PRECISION 0

* SCALE 0

FIELD DESCRIPTION

Primary NSW Plant Community Type (PCT) name

DESCRIPTION SOURCE

OEH

Hide Field PCT1_DESC ▲

FIELD PCT2_ID ►

* ALIAS PCT2_ID

* DATA TYPE SmallInteger

* WIDTH 2

* PRECISION 0

* SCALE 0

FIELD DESCRIPTION

Secondary NSW Plant Community Type (PCT) code

DESCRIPTION SOURCE

OEH

Hide Field PCT2_ID ▲

FIELD PCT2_DESC ►

* ALIAS PCT2_DESC

* DATA TYPE String

* WIDTH 300

* PRECISION 0

* SCALE 0

FIELD DESCRIPTION

Secondary NSW Plant Community Type (PCT) name

DESCRIPTION SOURCE

OEH

Hide Field PCT2_DESC ▲

FIELD AG1_ID ►

* ALIAS AG1_ID

* DATA TYPE String

* WIDTH 15

* PRECISION 0

* SCALE 0

FIELD DESCRIPTION

Primary vegetation Analysis-Group Identifier (AG-ID) from PATN analysis done for the Northern Rivers Catchment Management Area Vegetation Classification (OEH 2012a). Numerals before the dash represent the number of groups in the PATN analysis; numerals after the dash represent the number assigned within that group (e.g. 700-686). In this project some vegetation types have also been assigned a letter (e.g. a, b or c) indicating a variation from the original AG-ID type.

DESCRIPTION SOURCE

OEH

Hide Field AG1_ID ▲

FIELD AG2_ID ►

* ALIAS AG2_ID

* DATA TYPE String

* WIDTH 15

* PRECISION 0

* SCALE 0

Hide Field AG2_ID ▲

FIELD WEEDS ►

* ALIAS WEEDS

* DATA TYPE String

* WIDTH 10

* PRECISION 0

* SCALE 0

FIELD DESCRIPTION

Weeds present in polygon. Cl – Camphor Laurel; Ac – Acacia; Gs – Groundsel; Pr – Privet; PrCl – Privet and Camphor; Ln – Lantana; Other – Other weeds

DESCRIPTION SOURCE

OEH

Hide Field WEEDS ▲

FIELD DISTURBANCE ►

* ALIAS DISTURBANCE

* DATA TYPE String

* WIDTH 10

* PRECISION 0

* SCALE 0

FIELD DESCRIPTION

Disturbance in polygon. Ac_Pioneer – *Acacia* pioneers; Logging – Logging; Exotics – Exotics; Clearing – Clearing; Regen – regeneration from past clearing; Rf_Pioneer – Rainforest pioneers; Dieback – crown dieback; ClearedUst – Clearing Understorey; Crop – Cropping practices; Other – Other; Drainage – often associated with wetlands that have been drained; Scald – often associated with saltmarsh communities; Dam – often associated with wetland communities, such as lagoon forbland, which often establish and thrive in dam environments.

DESCRIPTION SOURCE

OEH

Hide Field DISTURBANCE ▲

FIELD VARIANT ►

* ALIAS VARIANT

* DATA TYPE String

* WIDTH 150

* PRECISION 0

* SCALE 0

FIELD DESCRIPTION

Any species that dominates a community, which at times creates either a structural or slight floristic variation to the community in that localised area represented by the polygon.

DESCRIPTION SOURCE

OEH

Hide Field VARIANT ▲

FIELD RELIABILITY ►

* ALIAS RELIABILITY

* DATA TYPE SmallInteger

* WIDTH 2

* PRECISION 0

* SCALE 0

FIELD DESCRIPTION

Interpreter's reliability ranking. Range is 1–4: 1 = High confidence and 4 = Low confidence; usually, 1 indicates a field site within a polygon; 2 indicates field sites nearby; 3 indicates a generally good understanding of the patterns of the landscape in that area and a medium level of reliability; whereas 4 indicates there is a lack of field data and a best guess, or extrapolation has been made with low reliability.

DESCRIPTION SOURCE

OEH

Hide Field RELIABILITY ▲

FIELD Study_area ►

* ALIAS Study_area

* DATA TYPE String

* WIDTH 50

* PRECISION 0

* SCALE 0

FIELD DESCRIPTION

Identifies if a polygon is in the Stage 2 study area where all extant vegetation was assigned to a vegetation type; or in the Stage 1 study area where the boundary of all extant vegetation was mapped but only TECs were assigned vegetation types.

DESCRIPTION SOURCE

OEH

Hide Field Study_area ▲

FIELD Shape_Length ►

* ALIAS Shape_Length

* DATA TYPE Double

* WIDTH 8

* PRECISION 0

* SCALE 0

* FIELD DESCRIPTION

Length of feature in internal units.

* DESCRIPTION SOURCE

Esri

* DESCRIPTION OF VALUES Positive real numbers that are automatically generated.

Hide Field Shape_Length ▲

FIELD Shape_Area ►

* ALIAS Shape_Area

* DATA TYPE Double

* WIDTH 8

* PRECISION 0

* SCALE 0

* FIELD DESCRIPTION

Area of feature in internal units squared.

* DESCRIPTION SOURCE

Esri

* DESCRIPTION OF VALUES Positive real numbers that are automatically generated.

Hide Field Shape_Area ▲

FIELD AreaHa ►

* ALIAS AreaHa

* DATA TYPE Double

* WIDTH 8

* PRECISION 0

* SCALE 0

FIELD DESCRIPTION

Shape area in hectares

DESCRIPTION SOURCE

OEH

Hide Field AreaHa ▲

Hide Details for object NambuccaLGA_2015_20151013 ▲

Hide Fields ▲

Metadata Details ►

METADATA LANGUAGE English (AUSTRALIA)

METADATA CHARACTER SET utf8 - 8 bit UCS Transfer Format

METADATA IDENTIFIER CD331913-4E3D-4E74-8975-92466C6D7063

SCOPE OF THE DATA DESCRIBED BY THE METADATA dataset

SCOPE NAME dataset

LAST UPDATE 2015-09-30

ARCGIS METADATA PROPERTIES

METADATA FORMAT ArcGIS 1.0

METADATA STYLE ISO 19139 Metadata Implementation Specification

STANDARD OR PROFILE USED TO EDIT METADATA ISO19139

CREATED IN ARCGIS FOR THE ITEM 2015-10-12 09:58:28

LAST MODIFIED IN ARCGIS FOR THE ITEM 2015-11-09 09:42:26

AUTOMATIC UPDATES

HAVE BEEN PERFORMED Yes

LAST UPDATE 2015-11-09 09:42:26

Hide Metadata Details ▲

Metadata Contacts ►

METADATA CONTACT

INDIVIDUAL'S NAME Jill Smith

ORGANIZATION'S NAME NSW Office of Environment and Heritage (OEH)

CONTACT'S POSITION Conservation Assessment Data Officer

CONTACT'S ROLE point of contact

Hide Metadata Contacts ▲

Metadata Maintenance ►

MAINTENANCE

UPDATE FREQUENCY not planned

Hide Metadata Maintenance ▲

FGDC Metadata (read-only) ▼

DETAILED DESCRIPTION

ENTITY TYPE

ENTITY TYPE LABEL NambuccaLGA_2015

ATTRIBUTE

ATTRIBUTE LABEL OBJECTID

ATTRIBUTE DEFINITION

Internal feature number. Object identification number

ATTRIBUTE DEFINITION SOURCE Esri

ATTRIBUTE DOMAIN VALUES

UNREPRESENTABLE DOMAIN

Sequential unique whole numbers that are automatically generated.

ATTRIBUTE

ATTRIBUTE LABEL Shape

ATTRIBUTE DEFINITION

Feature geometry.

ATTRIBUTE DEFINITION SOURCE Esri

ATTRIBUTE DOMAIN VALUES

UNREPRESENTABLE DOMAIN

Coordinates defining the features.

ATTRIBUTE

ATTRIBUTE LABEL NUM_OF_CODES

ATTRIBUTE DEFINITION

Indicates if only Primary vegetation map code (1) or if a Secondary vegetation code is also mapped (2).

ATTRIBUTE DEFINITION SOURCE OEH

ATTRIBUTE DOMAIN VALUES

RANGE DOMAIN

RANGE DOMAIN MINIMUM 1

RANGE DOMAIN MAXIMUM 4

ATTRIBUTE

ATTRIBUTE LABEL NAM_CODE1

ATTRIBUTE DEFINITION

Primary Nambucca vegetation map code

ATTRIBUTE DEFINITION SOURCE OEH

ATTRIBUTE

ATTRIBUTE LABEL NAM_LABEL1

ATTRIBUTE DEFINITION

Primary Nambucca vegetation map label

ATTRIBUTE DEFINITION SOURCE OEH

ATTRIBUTE

ATTRIBUTE LABEL NAM_CODE2

ATTRIBUTE DEFINITION

Secondary Nambucca vegetation map code

ATTRIBUTE DEFINITION SOURCE OEH

ATTRIBUTE

ATTRIBUTE LABEL NAM_LABEL2

ATTRIBUTE DEFINITION

Secondary Nambucca vegetation map label

ATTRIBUTE DEFINITION SOURCE OEH

ATTRIBUTE

ATTRIBUTE LABEL LIKELY_TEC

ATTRIBUTE DEFINITION

Indicates if vegetation type is a likely Threatened Ecological Community (TEC)

ATTRIBUTE DEFINITION SOURCE OEH

ATTRIBUTE

ATTRIBUTE LABEL FORMATION

ATTRIBUTE DEFINITION

Keith (2004) vegetation formation

ATTRIBUTE DEFINITION SOURCE OEH

ATTRIBUTE

ATTRIBUTE LABEL CLASS

ATTRIBUTE DEFINITION

Keith (2004) vegetation Class

ATTRIBUTE DEFINITION SOURCE OEH

ATTRIBUTE

ATTRIBUTE LABEL PCT1_ID

ATTRIBUTE DEFINITION

Primary NSW Plant Community Type (PCT) code

ATTRIBUTE DEFINITION SOURCE OEH

ATTRIBUTE

ATTRIBUTE LABEL PCT1_DESC

ATTRIBUTE DEFINITION

Primary NSW Plant Community Type (PCT) name

ATTRIBUTE DEFINITION SOURCE OEH

ATTRIBUTE

ATTRIBUTE LABEL PCT2_ID

ATTRIBUTE DEFINITION

Secondary NSW Plant Community Type (PCT) code

ATTRIBUTE DEFINITION SOURCE OEH

ATTRIBUTE

ATTRIBUTE LABEL PCT2_DESC

ATTRIBUTE DEFINITION

Secondary NSW Plant Community Type (PCT) name

ATTRIBUTE DEFINITION SOURCE OEH

ATTRIBUTE

ATTRIBUTE LABEL AG1_ID

ATTRIBUTE DEFINITION

Primary vegetation Analysis-Group Identifier (AG-ID) from PATN analysis done for the Northern Rivers Catchment Management Area Vegetation Classification (OEH 2012a). Numerals before the dash represent the number of groups in the PATN analysis; numerals after the dash represent the number assigned within that group (e.g. 700-686). In this project some, vegetation types have also been assigned a letter (e.g. a, b or c) indicating a variation from the original AG-ID type.

ATTRIBUTE DEFINITION SOURCE OEH

ATTRIBUTE

ATTRIBUTE LABEL AG2_ID

ATTRIBUTE

ATTRIBUTE LABEL WEEDS

ATTRIBUTE DEFINITION

Weeds present in polygon. Cl – Camphor Laurel; Ac – Acacia; Gs – Groundsel; Pr – Privet; PrCl – Privet and Camphor; Ln – Lantana; Other – Other weeds

ATTRIBUTE DEFINITION SOURCE OEH

ATTRIBUTE

ATTRIBUTE LABEL DISTURBANCE

ATTRIBUTE DEFINITION

Disturbance in polygon. Ac_Pioneer – Acacia pioneers; Logging – Logging; Exotics – Exotics; Clearing – Clearing; Regen – regeneration from past clearing; Rf_Pioneer – Rainforest pioneers; Dieback – crown dieback; ClearedUst – Clearing Understorey; Crop – Cropping practices; Other – Other; Drainage – often associated with wetlands that have been drained; Scald – often associated with Saltmarsh communities; Dam – often associated with wetland communities, such as lagoon forbland, which often establish and thrive in dam environments.

ATTRIBUTE DEFINITION SOURCE OEH

ATTRIBUTE

ATTRIBUTE LABEL VARIANT

ATTRIBUTE DEFINITION

Any species that dominates a community, which at times creates either a structural or slight floristic variation to the community in that localised area represented by the polygon.

ATTRIBUTE DEFINITION SOURCE OEH

ATTRIBUTE

ATTRIBUTE LABEL RELIABILITY

ATTRIBUTE DEFINITION

Interpreter's reliability ranking. Range is 1–4: 1 = High confidence and 4 = Low confidence; usually 1 indicates a field site within a polygon; 2 indicates field sites nearby; 3 indicates a generally good understanding of the patterns of the landscape in that area and a medium level of reliability; whereas 4 indicates there is a lack of field data and a best guess, or extrapolation has been made with low reliability.

ATTRIBUTE DEFINITION SOURCE OEH

ATTRIBUTE

ATTRIBUTE LABEL Study_area

ATTRIBUTE DEFINITION

Identifies if a polygon is in the Stage 2 study area where all extant vegetation was assigned to a vegetation type; or in the Stage 1 study area where the boundary of all extant vegetation was mapped but only TECs were assigned vegetation types.

ATTRIBUTE DEFINITION SOURCE OEH

ATTRIBUTE

ATTRIBUTE LABEL Shape_Length

ATTRIBUTE DEFINITION

Length of feature in internal units.

ATTRIBUTE DEFINITION SOURCE Esri

ATTRIBUTE DOMAIN VALUES

UNREPRESENTABLE DOMAIN

Positive real numbers that are automatically generated.

ATTRIBUTE

ATTRIBUTE LABEL Shape_Area

ATTRIBUTE DEFINITION

Area of feature in internal units squared.

ATTRIBUTE DEFINITION SOURCE Esri

ATTRIBUTE DOMAIN VALUES

UNREPRESENTABLE DOMAIN

Positive real numbers that are automatically generated.

ATTRIBUTE

ATTRIBUTE LABEL AreaHa

ATTRIBUTE DEFINITION

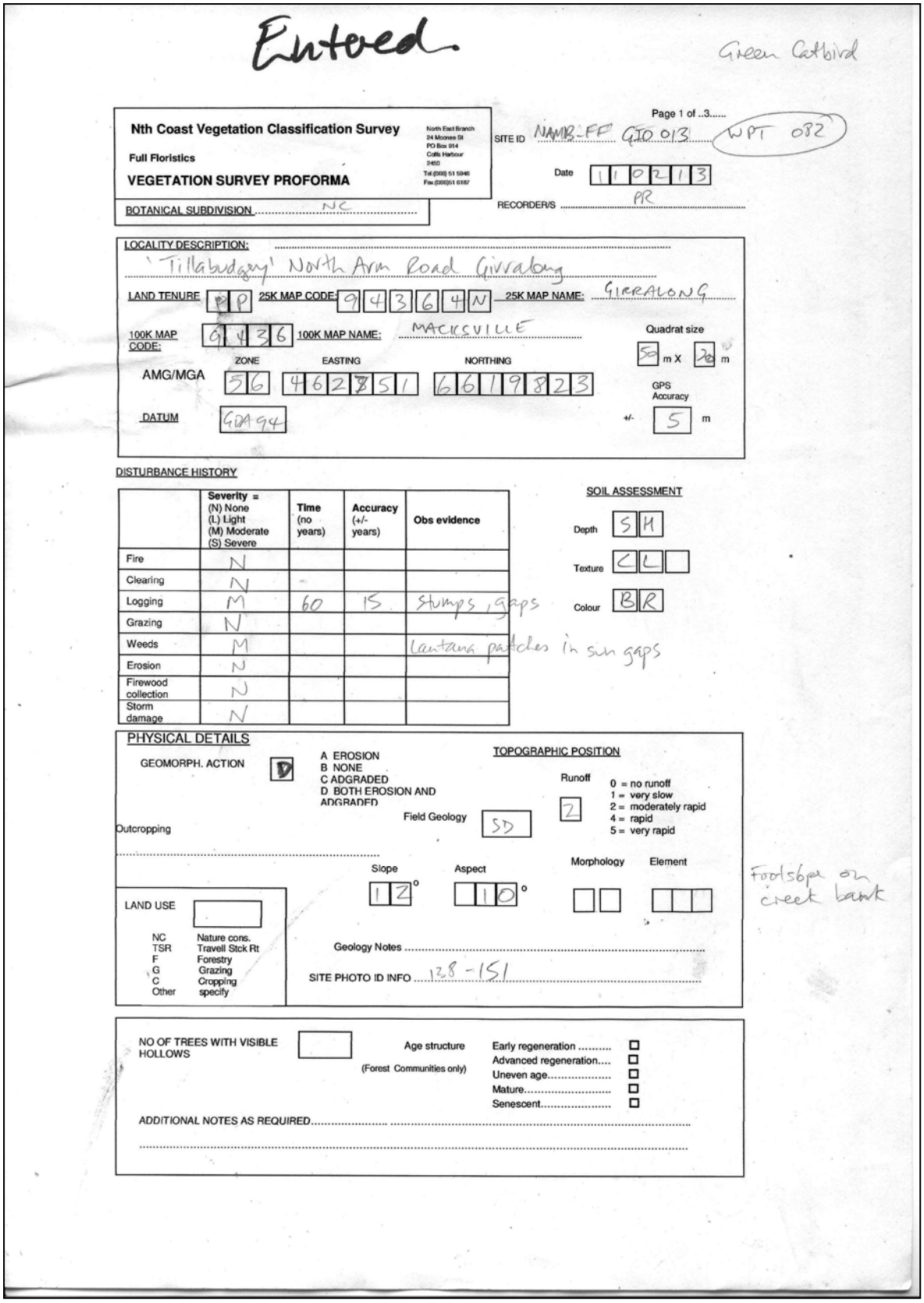
Shape area in hectares

ATTRIBUTE DEFINITION SOURCE OEH

Hide Entities and Attributes ▲

Appendix 3 Floristic survey datasheets

Examples of Full floristic (pages) and Rapid floristic data sheets, showing data recorded.



Entered

Green Catbird

Nth Coast Vegetation Classification Survey

North East Branch
24 Moores St
PO Box 914
Coffs Harbour
2450
Tel:(066) 51 5945
Fax:(066)51 6957

Full Floristics

VEGETATION SURVEY PROFORMA

Page 1 of ..3.....

SITE ID NAMB_FF GIO 013 WPT 082

Date 1 1 0 2 1 3

RECORDER/S PR

BOTANICAL SUBDIVISION NC

LOCALITY DESCRIPTION: 'Tillabudgary' North Arm Road Girralong

LAND TENURE P P 25K MAP CODE: 9 4 3 6 4 N 25K MAP NAME: GIRRALONG

100K MAP CODE: 9 4 3 6 100K MAP NAME: MACKSVILLE

Quadrat size 5 m X 20 m

AMG/MGA ZONE 5 6 EASTING 4 6 2 3 5 1 NORTHING 6 6 1 9 8 2 3

GPS Accuracy +/- 5 m

DATUM GDA 94

DISTURBANCE HISTORY

	Severity = (N) None (L) Light (M) Moderate (S) Severe	Time (no years)	Accuracy (+/- years)	Obs evidence
Fire	N			
Clearing	N			
Logging	M	60	15	stumps, gaps
Grazing	N			
Weeds	M			lantana patches in sm gaps
Erosion	N			
Firewood collection	N			
Storm damage	N			

SOIL ASSESSMENT

Depth S H

Texture C L

Colour B R

PHYSICAL DETAILS

GEOMORPH. ACTION D

A EROSION
B NONE
C ADGRADED
D BOTH EROSION AND ADGRADED

TOPOGRAPHIC POSITION

Runoff 2

0 = no runoff
1 = very slow
2 = moderately rapid
4 = rapid
5 = very rapid

Field Geology SD

Outcropping

Slope 12°

Aspect 10°

Morphology

Element

Footslope on creek bank

LAND USE

NC Nature cons.
TSR Travell Stck Rt
F Forestry
G Grazing
C Cropping
Other specify

Geology Notes .....

SITE PHOTO ID INFO 128 - 151

NO OF TREES WITH VISIBLE HOLLOWS

Age structure (Forest Communities only)

Early regeneration .....
Advanced regeneration....
Uneven age.....
Mature.....
Senescent.....

ADDITIONAL NOTES AS REQUIRED.....

Nth Coast Vegetation Classification Survey

Full Floristics

STRUCTURAL INFORMATION

EPRD
24 Moonee St
PO Box 914,
Coffs Harbour,
2450
Tel:(066) 51 5946
Fax:(066)51 6187

SITE ID G I 0 0 1 3

Date 1 1 0 2 1 3

Targeted Community Notes

Mapped Community

Field Community

Community Notes.....

COMMUNITY STRUCTURE

Strata	Height range (m)		% cover	Form	Species 1 (Highest % cover)	Form	Species 2 (2nd highest)	Form	Species 3 (3rd highest)
T	20	30	70		Geissois benthamiana		Schizomeria ovata		Dendrocnide excelsa
M_1	4	10	40		Ficus coronata		Sloanea woollsii		Polyosma woninghamii
M_2	15	3	40		Linospadix monostachya		Ripogonum elseyanum		Cyathea leichhardtiana
G	0	1	10		Lastreopsis microsora		Diplazium australe		Ripogonum elseyanum

Structure and compositions (within 0.04ha quadrat)

Keith class		Confidence: high mod low N.A
Other: (IVCL, Biometric etc.)	Floyd 33 VCA 366=75-14	Confidence: high mod low N.A

Interim Vegetation Community List (IVCL) version 1.4 communities are currently unpublished and are available from DECCW on request.

North Coast vegetation classification survey proforma

Floristic Composition

Site No. GIO013 11Feb 2013

No.	Species	C/A	Data	Caps Code	No.	Species	C/A	Data	Caps Code
1	Geissois benthamii	4			31	Adiantum hispidulum	2		
2	Schizomeria ovata	4			32	Sarcopteryx stipata	1		
3	Sloanea woollsii	3			33	Pseuderanthemum variabile	2		
4	Dendrocnide excelsa	3			34	Tabernaemontana pandacaqui	1		
5	Caldcluvia paniculosa	3			35	Lomandra spicata	2		
6	Diospyros pentamera	1			36	Cephalaralia cephalobotrys	2		
7	Tristaniopsis laurina	2			37	Endiandra muelleri	2		
8	Cissus antarctica	2			38	Akania bidwillii	1		
9	Cissus hypoglauca	2			39	Alocasia 'brisbanensis	2		
10	Ripogonum discolor	2			40	Flagellaria indica	1		
11	Ripogonum elseyanum	3			41	Ficus watkinsiana	1		
12	Microsorum scandens	2			42	Wilkiea hexaeliana	1		
13	Pothos longipes	2			43	Lantana camara	1		
14	Piper hederaceum	2			44	Petesmannia cimosa	1		
15	Asplenium australasicum	2			45	Cinnamomum oliveri	1		
16	Asplenium polyodon	2			46	Embelia australiana	2		
17	Platycerium superbum	2			47	Polyosma cunninghamii	3		
18	Platycerium bifurcatum	2			48	Heritiera actinophylla	2		
19	Diplaglottis australis	2			49	Rhodamnia rubescens	1		
20	Ficus coronata	4			50	Neolitsea dealbata	2		
21	Amyotheca dictyophlebia	1			51	Cordyline stricta	2		
22	Doryphora sassafras	1			52	Guilfoylia monostylis	2		
23	Daphnandra apatela	1			53	Rubus nebulosus	2		
24	Cryptocarya glaucescens	1			54	Elatostema stipitatum	1		
25	Archontophoenix cunninghamiana	2			55	Blechnum patersonii	2		
26	Cyathea leichhardtiana	2			56	Tasmannia insipida	1		
27	Linospadix monostachya	4			57	Archidendron grandiflorum	1		
28	Lepidozamia peroffskyana	2			58				
29	Diplazium australe	2			59				
30	Lastreopsis microsora	3			60				

Arachniodes aristata 2

↑ 20 x 20

↓ 50 x 20

Cover abundance Scale (Modified Braun Blanquet)

1= cover less than 5% of site and uncommon

2= cover less than 5% of site and common

3= cover of 6-20%

4= 21-50% of site

5= 51-75% of site

6= 76-100% of site

Entered.

WPT 055

Rapid Survey Site **Survey ID:** NAMB_RAPID **Site No.:** ENG012 **Date:** 5 Feb 2013 **Observer:** PR

[MGA GDA 94] Zone: **Easting:** 494674 **Northing:** 6597447 **Photo ref:** 33 - 35

Locality description: 530 Scotts Head Rd Warrell Creek.

Disturbance / management notes: Logged, frequently burnt DSF on midslope

Stratum	Height range		Total % cover	Species 1	%	Species 2	%	Species 3	%	Species 4	%	Species 5	%
U	27	30	30	E. microcorys	3	S. glomulifera	3	E. carnea	2	E. siderophloia	2	C. intermedia	1
M	3	10	15	S. glomulifera	3	Pittosporum undulatum	2	Allocasuarina littoralis	2				
L	0	1	70	Imperata cylindrica	5	Calochlaena dubia	3	Lomandra longifolia	2				

Score	Percentage foliage cover
1	<5% uncommon
2	<5% common
3	5-20%
4	20-50%
5	50-75%
6	75-100%

1000 - 1073