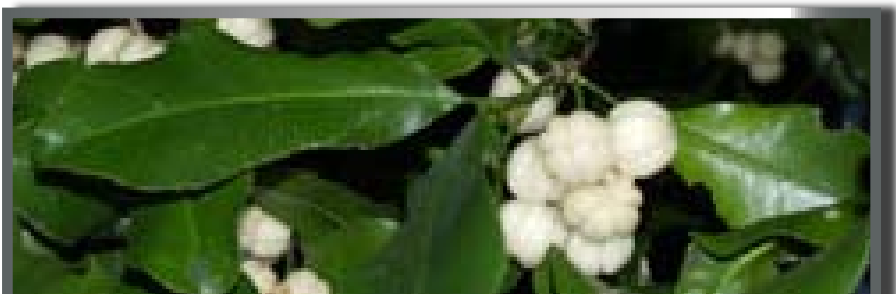




Targeted Vegetation Survey of Floodplains and Lower Slopes on the Far North Coast



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TARGETED VEGETATION SURVEY OF FLOODPLAINS AND LOWER SLOPES ON THE FAR NORTH COAST

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CCA08

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Credits

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Botanists responsible for field surveys were: Dr. Andrew Benwell (Ecos Environmental), Phil Gilmour (Ecological Australia), John Westaway, Lui Weber, Rob Price, Darren Bailey and Mark Graham (Buckombil Environmental Services). Thanks to all the botanists who braved mosquitoes and mud to access sites knee deep in water.

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Table of Contents

Executive Summary	1
1 Introduction	3
1.1 Background.....	3
1.2 Survey objectives	3
1.3 Study area	5
2. Methods	8
2.1 Use of Existing Flora survey data	8
2.2 Site Stratification	9
2.3 Site Sampling	10
2.4 Data Management	11
2.5 Data Analysis.....	11
3 Results	12
3.1 Floristics.....	12
3.2 Numerical analysis.....	15
3.3 Summary of assemblages and their communities	18
3.4 Endangered Ecological Communities.....	26
3.5 Taxa of conservation significance.....	26
3.6 Taxa of conservation significance.....	33
4 Discussion	42
4.1 Distribution of vegetation communities.....	42
4.2 Conservation status of plant communities.....	45
4.3 Areas of high conservation significance.....	49
4.4 Endangered Ecological Communities.....	50
4.5 Floristic variation within coarse scale mapping units	51
4.6 A detailed mapping program for the future	52
5 References.....	53
Appendix 1 - Vegetation community profiles.....	56
Group 1–Saline Wetlands	59
Community 1 Saltmarsh.....	59
Community 2 Blue Couch–Prickly Couch grasslands of the estuarine plain	61
Community 3 Broad-leaved Paperbark–Swamp Oak swamp sclerophyll Alluvial Plain Open Forest	63
Community 4 Swamp Oak–Broad-leaved Paperbark Estuarine and Alluvial Plain Swamp Sclerophyll Forest.....	66
Community 5 Milky Mangrove–Swamp Oak–Grey Mangrove King-Tide Forest.....	69
Community 6 Swamp Oak–Hoop Pine–Tuckeroo Swamp Sclerophyll/dry ‘gallery’ Floodplain Rainforest.....	72
Community 7 Prickly Couch–Sea Rush– <i>Schoenoplectus subulatus</i> saltmarsh	74
Community 8 Swamp Oak king-tide swamp sclerophyll forest.....	76
Community 9 Sea Rush–Mat Grass Saltmarsh	78

Group 2–Freshwater, seasonally/permanently inundated soils	80
Community 10 Broad-leaved Paperbark–Swamp Oak–fern/sedge Swamp Sclerophyll Forest.....	80
Community 11 Broad-leaved Paperbark–Pink-flowered Doughwood Swamp Sclerophyll Open Forest.....	83
Community 12 Broad-leaved Paperbark–Swamp Oak Ferny Swamp Sclerophyll Forest.....	86
Community 13 Alluvial plain Broad-leaved Paperbark–Swamp Mahogany–Saw Sedge/Swamp Water Fern Swamp Sclerophyll Forest.....	89
Community 14 Swamp Mahogany–Broad-leaved Paperbark–Bangalow Palm–sedge/fern Swamp Sclerophyll Forest.....	92
Community 15 Bangalow Palm–Swamp Box–Cabbage Tree Palm–Weeping Myrtle Alluvial Riparian Forest.....	95
Community 16 Tea-tree (<i>Leptospermum</i> spp.)– <i>Sporodanthus interruptus</i> Wet Heath	97
Community 17 <i>Leptospermum livsidgei</i> –Wallum Bottlebrush–Grass Tree–Heath-leaved Banksia Wallum Wet Heath Complex	100
Community 18 Coral Fern (<i>Gleichenia dicarpa</i>) Fernland	103
Community 19 Broad-leaved Paperbark–Coast Banksia–Red Ash Dunal Scrubland.....	105
Community 20 Swamp Box–Broad-leaved Paperbark–rush/fern Swamp Sclerophyll Forest.....	108
Community 21 Broad-leaved Paperbark–Swamp Oak–Rush Saline Swamp Sclerophyll Open Forest	111
Community 22 Common Reed–Black Bog–Rush Reedland/Rushland of Coastal Lagoons and Saline Swamps.....	113
Community 23 Swamp Box–Broad-leaved Paperbark–Swamp Mahogany Swamp Sclerophyll Forest.....	115
Community 24 Swamp Ricegrass (<i>Leersia hexandra</i>), <i>Lepironia articulata</i> –Smartweed– <i>Juncus usitatus</i> Swampy Meadow	118
Community 25 Swamp Ricegrass– <i>Bolboschoenus caldwellii</i> – <i>Schoenoplectus validus</i> – <i>Cyperus exaltatus</i> Freshwater Wetland	120
Community 26 Hinterland Narrow-leaved Paperbark–Tea-tree Backswamp Shrublands–Sedgelands of Alluvial Backswamps.....	122
Community 27 Weeping Myrtle–Water Gum Floodplain Riparian Forest.....	124
Community 28 Narrow-leaved Paperbark–Wallum Bottlebrush Swamp Sclerophyll Shrubland	126
Community 29 Swamp Box–Narrow-leaved Paperbark–Broad-leaved Paperbark Alluvial Swamp Sclerophyll Forest	128
Community 30 Middle Richmond Freshwater Wetlands	131
Group 3–Coastal barrier sand sites and headland sites	132
Community 31 Scribbly Gum–Red Mahogany–Brush Box dry sclerophyll Open to Closed Forest on Coastal Barrier Sands.....	132
Community 32 Blackbutt–Turpentine Open Forest Complex.....	135
Community 33 Coast Cypress Pine on Dunes and Ridges.....	138
Community 34 Coast Banksia Frontal Dune Open Forest on Holocene Dunes.....	141
Community 35 Brush Box Lowland Rainforest.....	144
Community 36 Coast Wattle–Coast Tea-tree–Coast Banksia Shrubland on Holocene Dunes and Ridges	148
Community 37 Kangaroo Grass headland Grassland.....	150
Community 38 Scribbly Gum–Old Man Banksia–Slender Tea-tree Heathy Low Open Sclerophyll Forest to Shrubland	152
Community 39 Wallum Banksia Dry Heath	155
Group 4–Forests on alluvium or fine-textured soils of coastal floodplains and foothills	158
Community 40. Lower Richmond Mesic Successional wet/swamp Sclerophyll Forest/Rainforest	158
Community 41 Lower Richmond Brush Box–Pink Bloodwood–Grey Ironbark Mesic Tall Open Forest.....	162
Community 42 Tweed–Brunswick Valley Brush Box–Blackbutt–Pink Bloodwood–Tallowwood Foothill Wet Sclerophyll Forest.....	165

Community 43 Brunswick–Tweed Brush Box Gully Rainforest on Meta-sediments.....	169
Community 44 Tweed–Brunswick Valley Blue Quandong Subtropical Rainforest.....	173
Community 45 Tweed–Brunswick Valleys Bangalow Palm–Lilly Pilly Subtropical Rainforest.....	178
Community 46 Stinging Tree–White Fig–Brush Bloodwood Subtropical Rainforest	182
Community 47 Tweed Valley Meta-sediment and Basalt Low-Elevation Subtropical Rainforest.....	184
Community 48 Flooded Gum–Pink-flowered Doughwood–Hard Quandong Alluvial Plain Wet Sclerophyll Forest.....	188
Community 49 Camphor Laurel–Forest Red Gum Open to Closed Forest.....	191
Community 50 Swamp Oak–Forest Red Gum–Broad-leaved Paperbark–Swamp Box Swamp Sclerophyll Woodland to Open Forest	194
Community 51 Forest Red Gum–Willow Bottlebrush–Camphor Laurel Dry Open Forest.....	198
Community 52 Small-leaved Fig–Hard Quandong–Bangalow Palm Subtropical/Littoral Rainforest on Pleistocene Dunes.....	201
Community 53 Patches Beach Broad-leaved Paperbark–Swamp Oak–Cabbage Tree Palm Swamp Sclerophyll Forest on the Alluvial Plain	204
Community 54 Whalebone Tree–Thorny Pea–Sweet Myrtle Dry Rainforest.....	207
Community 55 Grey Ironbark–Pink Bloodwood–White Mahogany Dry Grassy Open Forest	210
Community 56 Broad-leaved Paperbark–Swamp Box–Tuckeroo Swamp Sclerophyll Open Forest.....	213
Community 57 Red Mahogany–Pink Bloodwood–Swamp Mahogany–Swamp Box Dry Open Forest.....	216
Community 58 Pink Bloodwood–Grey Ironbark–Swamp Box–Forest Red Gum–Blackbutt Tall Dry Open Forest.....	219
Community 59 Large-fruited Spotted Gum–Grey Ironbark–Small-fruited Grey Gum Dry Grassy Open Forest.....	223
Community 60 Grey Ironbark–Thin-leaved Stringybark–Pink Bloodwood–Swamp Box Dry Open Grassy Forest.....	226
Community 61 Broad-leaved Paperbark–Narrow-leaved Rough-barked Apple–Swamp Box–Pink Bloodwood Dry Grassy Alluvial Open Forest	229
Community 62 River Mangrove–Grey Mangrove–Black Mangrove–Milky Mangrove–Spider Mangrove Forest to Shrubland	232
Appendix 2 - Vascular plant species recorded from survey sites in the Far North Coast.....	235
Fern Allies	235
Ferns	235
Cycads	237
Conifers.....	237
Dicots.....	237
Monocots	255
Appendix 3 - Full Dendogram	262
Appendix 4 - Species frequency by community.....	276
Appendix 5 - Equivalent ecological communities.....	305

Tables

Table 2(i) Compatible Data Sets	8
Table 2(ii) Supporting Information Data Sets.....	8
Table 2(iii) Vegetation Formations.....	9
Table 2(iv) Deposition Environment	9
Table 2(v) Sites by strata - geology	10
Table 2(vi) Landform Relief Class.....	10
Table 3(i) Most commonly recorded species of plant in the study area.	13
Table 3(ii) Most commonly recorded exotic species recorded in the study area.	13
Table 3(iii) Primary, secondary and tertiary floristic groups differentiated by hierarchical agglomerative clustering of full floristic data (species and relative abundance).	15
Table 3(iv) Summary of primary groups and the assemblages that fall within each resulting from expert assessment	18
Table 3(v) Vegetation communities.....	19
Table 3(vi) Endangered Ecological Communities represented in communities identified in this survey of the Far North Coast of NSW.	26
Table 3(vii) Plant species of conservation significance recorded in the FNC study area.	27
Table 3(viii) Species of Conservation Significance, the communities in which they were recorded, and the habitat in which they occur.	30
Table 4(i) Communities not known to be reserved.	45
Table 4(ii) Poorly conserved communities.	46
Table 4(iii) Communities with a fair level of conservation in reserves.	48
Table 4(iv) Communities that are adequately reserved in the study area.	49

Figures

Figure 1. The study area.	4
Figure 3.1. Location of study sites within the FNC study area.	14
Figure 3.2. Dendrogram of 62 vegetation groups from classification of 346 sites	17
Figure 3.3. Locations of records of species of conservation significance threatened species from the present survey of the FNC study area.	29

List of abbreviations

CCA	Comprehensive Coastal Assessment
CRA	Comprehensive Regional Assessment
DECC	NSW Department of Conservation and Climate Change
EPBC	Environmental Protection and Biodiversity Conservation Act 1999 (Commonwealth)
FNC	Far North Coast
GIS	Geographic Information System
LGAs	Local Government Areas
JANIS	Joint ANZECC/MCFFA National Forest Policy Statement Implementation Sub-committee
NEFBS	North East Forests Biodiversity Study
NP Estate	The land-holdings owned by the NSW NPWS, including national parks, nature reserves, state conservation areas, and aboriginal areas; also includes land purchased by NPWS but not yet gazetted.
NPWS	NSW National Parks and Wildlife Service (now falling within DECC)
NRAC	Natural Resources Audit Council (in reference to natural resources audit of Upper North Coast NSW in 1995)
NSW	New South Wales
RFA	Regional Forestry Agreement
ROTAP	Rare or Threatened Australian Plant
SF Estate	The land-holdings owned by State Forests of NSW, including state forests and flora reserves
SF NSW	State Forests of NSW
subsp.	subspecies
TSC Act	Threatened Species Conservation Act 1995 (NSW)
UPGMA	Unweighted pair group arithmetic averaging
var.	variety
WRA	Western Regional Assessment

Executive Summary

A targeted vegetation survey of floodplain and lowland vegetation on the Far North Coast of New South Wales was undertaken to fill gaps in knowledge of vascular plant biodiversity on the Far North Coast associated with specific environments or land tenures. A combination of vegetation formation, geology and landform was used to randomly stratify sites. The quaternary geology layer of the Comprehensive Coastal Assessment (CCA) was used to assist stratification in areas of Quaternary sand and alluvium. Sites were targeted towards the estuarine and alluvial plain and lower slopes on basalt and high and low sedimentary quartz geology.

A total of 346 sites were sampled and analysed using a hierarchical agglomerative clustering analysis, followed by analysis to compare the grouping of sites.

In total, 1027 plant taxa were recorded in the survey, and 62 vegetation communities were delineated following numerical analysis and expert review. The vegetation varied from structurally and floristically simple sedgeland and wetland communities to complex mosaics of wet sclerophyll, rainforest and brush box.

Vegetation communities were organised into four primary groups based on tidal influence, substrate and broad soil type. Group 1 – Saline wetlands; Group 2 – Freshwater, seasonally–permanently inundated soils; Group 3 – Coastal barrier sands and headlands; Group 4 – Forests on alluvium or finely textured soils of coastal floodplains and foothills. A secondary split identified 27 assemblages split between these primary groups, as follows:

Primary group	Assemblage
1 – Saline wetlands	1 (a) Mangroves
	1 (b) Saltmarsh
	1 (c) Swamp Oak
	1 (d) Saline grasslands and sedgelands
2 – Freshwater, seasonally–permanently inundated soils	2 (a) Broad-leaved Paperbark ferny swamp forest
	2 (b) Floodplain Riparian palm forest
	2 (c) Wet heath
	2 (d) Coral Fern fernland
	2 (e) Paperbark dunal scrubland
	2 (f) Sedge Paperbark Swamp Box
	2 (g) Reedland
	2 (h) Swampy meadow freshwater wetland
	2 (i) Middle Richmond swamp forest
	2 (j) Middle Richmond freshwater wetland
3 – Coastal barrier sands and headlands	3 (a) Open forests on Pleistocene Sands
	3 (b) Shrubland/rainforest on Holocene dunes
	3 (c) Headland grasslands
	3 (d) Heathy Scribbly Gum on Pleistocene sands
4 – Forests on alluvium or finely textured soils of coastal floodplains and foothills	4 (a) Richmond Valley Brush Box wet sclerophyll forest
	4 (b) Tweed-Brunswick Valley Brush Box/wet sclerophyll forest
	4 (c) Tweed Brunswick subtropical rainforests
	4 (d) Forest Red Gum swamp sclerophyll, wet sclerophyll open forests
	4 (e) Fig-Quandong rainforest on Pleistocene dunes
	4 (f) Palm rainforest on alluvium
	4 (g) Dry sclerophyll grassy open forests

The vegetation of the estuarine and alluvial plains is a complex continuum of floristic distribution and abundance with gradual replacement of species as salinity and inundation decreases, mixed with local differences in overstorey and understorey based on microhabitat variation in tidal influence and the input of sediment from adjoining lithologies. The vegetation of the coastal barrier sands was linked to topographic position, depth of the water-table, fire frequency and degree of exposure to coastal onshore winds. Vegetation of the lowlands was influenced by geological parent material, soil fertility, aspect and the influence of subsaline soils. The survey found that coarse-scale intuitive approaches used for mapping missed some of the variation delineated by floristic sampling.

An assessment of the distribution of communities in the study area found that most poorly reserved communities were located on the alluvial plain (16 communities), the estuarine plain (12), lower slopes on basalt and sedimentary geology (11), and coastal barrier sands (2). The reservation of alluvial, estuarine plain and lowland vegetation communities is particularly poor in the coastal lowlands of the Tweed, Brunswick and Richmond Rivers.

Thirty seven (37) of the 62 vegetation communities delineated have structural and floristic characteristics which relate to nine endangered ecological communities: Coastal saltmarsh; Freshwater wetlands on coastal floodplains; Swamp sclerophyll forest on coastal floodplains; Swamp Oak floodplain forest; Subtropical coastal floodplain forest; Lowland rainforest on floodplain; Themeda grassland on seacliffs and coastal headlands; and Littoral rainforest. The survey improved the knowledge of the floristic and structural composition and environmental influences on these endangered ecological communities.

Nearly 300 records of 50 significant taxa were made during the survey, including 39 threatened plants species, eleven ROTAP and a number of other rare species and those at the limit of their distribution:

Significant taxa recorded included (in alphabetical order by threat category): **Endangered:** *Acronychia littoralis*, *Cassia brewsteri* var. *marksiana*, *Davidsonia jerseyana*, *Dendrobium melaleucaphilum*, *Dendrocnide morioides*, *Diospyros mabacea*, *Diospyros major* var. *ebenus*, *Diploglottis campbellii*, *Elaeocarpus sedentarius*, *Elaeocarpus williamsianus*, *Eleocharis tetraquetra*, *Endiandra muelleri* subsp. *bracteata*, *Geodorum densiflorum*, *Gossia fragrantissima*, *Grevillea hilliana*, *Marsdenia longiloba*, *Oberonia complanata*, *Ochrosia moorei*, *Randia moorei*, *Xylosma terrae-reginae*.

Vulnerable: *Acacia bakeri*, *Archidendron hendersonii*, *Bosistoa transversa*, *Corokia whiteana*, *Cryptocarya foetida*, *Desmodium acanthocladum*, *Endiandra floydii*, *Endiandra hayesii*, *Fontainea australis*, *Hicksbeachia pinnatifolia*, *Lepiderema pulchella*, *Lindsaea brachypoda*, *Macadamia tetraphylla*, *Oberonia titani*, *Peristeranthus hillii*, *Persicaria elatior*, *Syzygium moorei*, *Tinospora tinosporoides*. **ROTAP:** *Acianthus amplexicaulis* (2RC-), *Acronychia baeuerlenii* (3RC-), *Archidendron muellerianum* (3RCa), *Argophyllum nullumense* (3RCa), *Arthrochilus prolixus* (2K), *Callerya australis* (3RC), *Cordyline congesta* (2RC-), *Cupaniopsis newmanii* (2RC-), *Endiandra globosa* (2RC-), *Gahnia isignis* (3RCa), *Hicksbeachia pinnatifolia* (3RC-), *Rhodamnia maideniana* (2RC-), *Trichosanthes subvelutina* (3RC-).

Other significant species: *Brunoniella spiciflora* (rare in NSW), *Dianella brevipedunculata* (rare in NSW), *Scleria levis* rare in NSW, *Sida cordifolia* (rare in NSW).

1 Introduction

Surveys and mapping of vegetation in the Far North Coast (FNC) study area, as elsewhere in south-eastern Australia, have largely been targeted towards forest environments and vegetation of Quaternary Sands, and have mainly been of public land (Griffith & Wilson, 2007; NPWS 1994, 1995, 1999; Keith and Scott 2005). Datasets that focus on public forests have been used to extrapolate across the landscape into coastal regions and lower slopes for land-use management initiatives at local scales and on private land, such as bioregional planning and bio-banking. Conservation planning and land-use decisions can be adversely influenced by the assumptions made using regional scale mapping and models based on remotely sampled data with insufficient site sampling and field checking.

The vegetation of large areas of the FNC study area has been mapped using fine- to broad-scale conventional aerial photo interpretation (API) mapping and modelling at regional scales, and often with little site sampling. The limitations of using broad-scale mapping units and classifications for conservation planning have been noted by Keith (1995). Significant variation within coarse-scale units can be overlooked without sufficient site sampling. Benson (2006) indicates that vegetation mapping rarely delineates all floristic groups derived in numerical analysis of sites or discerned through expert field observation.

Vegetation maps and classifications are often used to determine priorities for land-use decision-making and conservation planning (Keith 1995). The community unit concept of vegetation classification is often used in these mapping programs because of its usefulness in landscape management (Benson 2006). Classification and mapping of vegetation into communities is a means of representing and simplifying biodiversity, which is composed of populations, species and communities. In conservation planning it is assumed that protection of a proportion of each vegetation community or ecosystem will also protect sufficient proportions of these elements of biodiversity and their interactions with the environment (NPWS 1994; JANIS 1991).

An advantage of floristic site sampling to inform vegetation classifications and mapping is that it increases knowledge of the distributions of individual

plant species and their interactions with the environment. For example, Keith and Bedward (1999) found that, especially for understorey species, which made up a large proportion of the floristic diversity of the south east forest region 'site sampling offered greater accuracy and precision in the measurement of floristic composition than remote data combined with qualitative field reconnaissance.'

There had been little collection of vegetation data on the floodplains, estuaries and lower slopes of the FNC before the start of the current survey. The aim of this project was to target the vegetation of poorly sampled environments and detect variations in the distributions of individual species and in floristic groups that were not captured by remotely sensed mapping alone, to fill environmental, distributional and tenure gaps and to collect data in such a way as to complement vegetation data collection across the wider region.

1.1 Background

The project was funded by the Comprehensive Coastal Assessment (CCA), a process designed to assess the environmental, social and economic values of the coastline of New South Wales (NSW). Projects funded by the CCA were designed to focus on the audit and collection of data. The current project meets the objectives of the Vegetation Survey and Mapping project and follows on from the Vegetation Data Audit project (NPWS, 2003).

1.2 Survey objectives

The objectives of this project were to:

- Collect vegetation data in a standard way and of adequate detail across the northern coastal zone to input into regional planning strategies. This was done through collation of existing data, stratified random site sampling, full systematic floristic field surveys, and subsequent analysis of data.
- Target survey of poorly sampled environmental strata, and under-sampled coastal vegetation types and in particular coastal Quaternary estuarine and alluvial environments.

1.3 Study area

The study area is located on the far north coast of NSW, extending from the Queensland border south to the Evans River (Figure 1). It includes the FNC Planning Area, which comprises the Tweed, Byron, Ballina, Richmond Valley, Lismore and Kyogle local government areas. This survey focused on the coastal zone and adjoining areas of planning concern, and on gaps in existing environmental sampling. The study area lies within the South East Queensland and New South Wales North Coast Bioregions (Thackway and Cresswell 1995).

1.3.1 Land-use

The main land-uses in the study area are agriculture, forestry, tourism, conservation and urbanisation. Crops include sugar cane and bananas in the Richmond and Tweed Valleys, and regionally important macadamia and tea-tree industries also occur in the study area. The population of the study area is increasing rapidly. Major population centres are Lismore, Tweed Heads, Ballina and Byron Bay. Over two-thirds of the study area is in private ownership and more than half of the land has been cleared of native vegetation. Conservation and tourism land-uses are centred on the large national parks and nature reserves of the coast and escarpment.

1.3.2 Geology

The study area is located within the Clarence–Moreton Basin. The major geological types are Quaternary sand and alluvium, Jurassic and Triassic sedimentary rocks, and Tertiary volcanics, including extensive basalt flows and extrusions of trachyte and rhyolite. A deposition of older Carboniferous meta-sediments underlie coastal ranges in the Tweed and Brunswick River Valleys (RACAC 1996a).

Quaternary sand and alluvium. Coastal barrier sands of marine and Aeolian origin form a coastal strip of varying width. Beaches, dunes and hind-dunes of Holocene age occur adjacent to the ocean. Adjoining these sediments are older Pleistocene sands forming dunes, swales and back-barrier flats. Along the lower reaches of creeks and rivers, tidally influenced estuarine sediments have been deposited in swamps, tidal delta flats, basins and bays and coastal lagoons. Areas of Quaternary alluvium occur along the floodplains and backswamps of the Tweed, Richmond and Brunswick Rivers and of Bungawalbin Creek and other major drainage systems of the study area

(RACAC, 1996a).

Sedimentary rocks. Older Carboniferous meta-sediments of the Beenleigh Block have been deposited in an oceanic basin and then folded by subduction and sea-floor scraping off the oceanic plate. These rocks were then overlaid by the Jurassic and Cretaceous sediments formed in the Clarence–Moreton Basin. These sedimentary rocks include coarse-grained Kangaroo Creek sandstones and sediments of the Walloon Coal Measures, Bundamba Group and Grafton Formation (RACAC, 1996a).

Volcanic rocks. Extrusive basalt flows and tertiary volcanic outcroppings from eruptions of the Mount Warning volcano were triggered by tectonic activity associated with movement of the continental plate 23 million years ago. Basalt flows extend from Byron Bay to Kyogle and south to Lismore, and overlay the older meta-sedimentary and sedimentary rocks (RACAC, 1996a).

1.3.3 Soil landscapes

Soil landscapes have been mapped over the north coast of NSW (Department of Land and Water Conservation 1999). The study area is divided into a number of soil-landscape groups: residual (McKee, Yorklea, examples of soil landscapes), transferral (Disputed Plain, Dryaaba Arm), colluvial (Arthurs Gap, Burringbar, Coffee Camp), erosional (Afterlee, Bangalow, Billinudgel), alluvial (Leycester, Dungurubba, Empire Valley), stagnant alluvial (Physics Lagoon, Bungawalbin), Aeolian and barrier sand (Weapons Range, Illuka), beach/barrier (Black Rock, Wardell), estuarine/alluvial (Ukerabagh), swamp (Tuckean, Everlasting) and vestigial (Wollongbar). Residual soil landscapes are associated with soils formed from *in situ* weathering of parent material. Transferral soil landscapes are deep deposits of mostly eroded parent materials washed from areas upslope. Alluvial soil landscapes are formed by deposition from in-channel and bank overflows along river and streams. Aeolian soils are formed by the deposition of windblown sand particles. Swamp soil landscapes occur in areas where soils are at least seasonally waterlogged. Stagnant alluvial landscapes occur in parts of the alluvial plain where flows are reduced owing to stream migration. Deltaic and estuarine soil landscapes form where rivers and streams meet the sea. Beach/Barrier soil landscapes are formed from wave action or deposited during changes in sea level (Morand 2001).

1.3.4 Coastal Quaternary geology

A new classification of Quaternary deposits was undertaken for the coastal zone of NSW (Troedson *et al.* 2004). Quaternary deposits were divided into three depositional classes: alluvial, estuarine and coastal barrier sand. The depositional classes were also differentiated into Holocene and Pleistocene deposits. Holocene sediments are deposits in the active depositional coastal zone and have accumulated over the last 10,000 years following post-glacial marine transgression (Troedson *et al.* 2004). Pleistocene barrier sands were deposited during times of high sea-level before 10,000 years ago.

Alluvial plain depositional systems occur on the landward section of the coastal plain. They are most extensive in the estuarine deltaic plains of the main coastal rivers and extend into non-tidal narrow valleys of coastal catchments (Troedson *et al.* 2004). Estuarine depositional environments occur in waterbodies of brackish to marine salinity and under some tidal influence (Troedson *et al.* 2004). Coastal barrier systems are located on the seaward side of the coastal plain and comprise wind-blown and marine-deposition sands (Troedson *et al.* 2004).

1.3.5 Climate

Climatic patterns are controlled by the progression of high- and low-pressure systems across the continent. Seasonal patterns of temperature and rainfall are driven by the north–south migration of high-pressure systems. The effects of tropical cyclonic activity and landforms both also have an impact on the climate of the region. Longer term trends in rainfall and temperature are influenced by the El Niño–Southern Oscillation (ENSO), which determines the circulation and strength of trade winds directing moisture across eastern Australia (NRAC, 1996b).

Summers are hot and winters warm. Annual mean maximum temperatures vary from 26°C at Casino, which is inland, to 23.3°C at Yamba, on the coast. The mean summer maximum is 31°C at Casino, and the mean summer minimum is 25.9°C at Alstonville, close to but not on the coast. Cooler temperatures occur at higher altitudes along the Nightcap, McPherson and Border Ranges and at Mount Warning (NRAC, 1996b).

Rainfall is highest in summer–autumn and lowest in winter–spring. The northern coastal fringe and hinterland ranges receive high annual rainfall (mean

annual rainfall at Byron Bay is 1707 mm; at Ballina 1654 mm). Rainfall increases to over 2000 mm per annum on the McPherson, Nightcap, Burringbar and Border Ranges. The intensity of rainfall is extreme, and the potential for erosion is high. Annual rainfall decreases from north to south along the coast; it is 1456 mm at Yamba. There is a dry rainshadow, with average annual rainfall less than 800 mm, north and south of about Casino (which itself has a mean annual rainfall of 1098 mm) (Temperature and Rainfall data from Bureau of Meteorology website).

1.3.6 Vegetation

The vegetation of the study area has significant biodiversity values and many notable features. It is located in the McPherson Macleay Overlap, contains remnants of the Big Scrub rainforest, supports three areas of World Heritage Rainforest, and contains the Border Ranges, which is one of Australia's 15 National Biodiversity Hotspots.

The McPherson Macleay Overlap is an area of very high biodiversity. The overlap contains species of both temperate and tropical areas as a result of a combination of climatic and geographical influences. The study area is home to the Big Scrub, which was once the largest expanse of subtropical rainforest in Australia, but has been largely cleared and now less than 1% remains. The Big Scrub was a rich area for flora with a high level of species endemism. The study area contains the Focal Peak, Sheild Volcano and Main Range Groups of the World Heritage Gondwana Rainforests of Australia.

1.3.7 Previous studies

Previous regional surveys focusing on public land and forested environments include the North East Forest Biodiversity Survey (NEFBS) (NPWS 1994), the vegetation surveys of the Comprehensive Regional Assessments (CRA) (NPWS 1999), and the vegetation surveys of the Natural Resource Audit Council (NRAC) (NPWS 1995). The NRAC vegetation surveys targeted vacant and reserved Crown Land in the Clarence, Richmond and Tweed River Catchments (NPWS 1995). The NEFBS flora project surveyed and analysed the distribution of vascular plants throughout the forests of north-eastern NSW (NPWS 1994), and 205 sites sampled during the NEFBS lie within the study area of the present study. The CRA surveys were done as part of the data-collection component of a regional assessment of forests in north-eastern

NSW. Survey and analysis of forest-site data was done to produce the Forest Ecosystem classification that acted as a biodiversity surrogate for land-use decision-making and conservation planning in north-eastern forests (NPWS 1999). The Forestry Commission of New South Wales created the forest type classification of New South Wales which focused on commercial species of interest for timber harvesting in public land areas (Forestry Commission of New South Wales, 1989).

State Forests of New South Wales (SFNSW) completed flora surveys for Urbenville and Casino Management Areas (Binns 1995a, 1995b). Floyd (1990) conducted an inventory of rainforests in NSW identifying rainforest suballiances.

Vegetation mapping has been done for the Tweed Council Area (Kingston *et al.* 2004). Vegetation was mapped into 50 units, including rainforest, open forest, closed forest, heathland/shrublands, woodland, saltmarsh, sedgeland/rushland, fernland/forbland, wetland and grassland formations (Kingston *et al.* 2004). Within Byron Shire, 13 vegetation mapping units and 37 associations were recognised (Landmark Ecological Services 1999). Vegetation mapping has also commenced in Ballina and Richmond Valley Councils.

Coastal wetlands and associated vegetation types of the Tweed Shire were surveyed by Pressey and Griffith (1992). They identified 10 floodplain forest vegetation communities, three heathland/shrubland communities and three estuarine communities. Further, Pressey (1989) surveyed the wetlands of the Lower Clarence Floodplain. The vegetation of Broadwater National Park (Griffith 1985), Bundjalung National Park (Griffith 1983) and Newybar Swamp (Griffith 2007) has also been mapped and surveyed, using the classification known as NPWS NSW Coastal Vegetation (Griffith and Wilson 2007). Dunn's White Gum *Eucalyptus dunni* a rare tree species with a limited distribution on the north coast was also surveyed (Benson & Hager 1993).

Griffith (2002) studied the patterns and processes in wallum vegetation of north-eastern NSW. Approximately 500 sites were stratified on the basis of aerial-photo pattern and latitude. Wallum vegetation was defined for the purpose of his study as all vegetation occurring in dunefields, beach-ridge plains and sandy back-barrier flats (Griffith 2002). Floyd

(1988) listed the plant species of headlands from Coffs Harbour to Tweed Heads.

Keith and Scott (2005) used available vegetation data to construct a diagnosis of the major plant communities and document the flora of the coastal floodplains of NSW. Six major plant communities and 39 floristic groupings were identified through cluster analysis. The major groupings in the study area included: Saltmarsh, Swamp Oak floodplain forest, Swamp sclerophyll forest on coastal floodplains, Mangroves, Lowland rainforest on floodplain, Wet heath North Coast, Freshwater-lagoon on sand, Foredune scrub, Littoral rainforest, Beach grassy heath, Swamp sclerophyll forest on coastal sandplains, and Subtropical coastal floodplain forest.

2. Methods

2.1 Use of Existing Flora survey data

Only data that was collected during the current survey was analysed to minimise the influence of observer variability in the delineation of communities. It has been found that incorporating site data from a range of past surveys can lead to problems in the interpretation of the results of numerical analysis, where groupings of sites can be an artefact of observer variability (Bell, 2007, DEC, 2004).

Data sets within the study area were reviewed to assess their use as supporting information and to help identify gaps in sampling effort. A shape file was created in ARCVIEW from downloading all sites in the study area from the YETI database.

In total, 1260 survey sites have previously been sampled in the study area. This includes 501 quaternary sand and alluvium sites; 133 sites on the alluvial plain; 279 sites on coastal barrier sands; 46 sites on the estuarine plain; and 43 sites on undifferentiated sediments. A total of 842 were bedrock sites, comprising 224 sites sampled on steep topography, which was not a priority for sampling in this survey. 618 sites were located in more gentle relief classes.

Table 2(i) lists data sets that may be suitable for future use to numerically analyse in combination with new flora survey sites, subject to observer bias, seasonality, date of survey and reliability. Incompatible sites that can't be compared numerically with new sites because of non-comparable methods are shown in Table 2(ii).

Table 2(i) Compatible Data Sets

Survey	Plot size	Type of data	No. of sites	Reference
North East Forest Biodiversity Study (NEFBS)	20 x 50 nested	Full floristic, cover abundance	205	NPWS (1994)
Comprehensive Regional Assessment (CRA)	20 x 50 nested	Full floristic, cover abundance	96	NPWS (1999)
Natural Resources Audit Council (NRAC)	20 x 50 nested	Full floristic, cover abundance	115	NPWS (1995)
State Forest Flora Surveys	20 x 50 nested	Full floristic, cover abundance	219	Binns (1995)
Tweed Coastal Vegetation Surveys	20 x 20	Full floristic, cover abundance	51	Pressey and Griffith (1992)
North Coast Private Property	20 x 20	Full floristic, cover abundance	68	NSW Department of Lands
<i>Eucalyptus dunnii</i> Survey	20 x 20	Full floristic, cover abundance	12	Benson & Hager (1992)
Wallum Heath Surveys	10 x 10 random quadrats in 30 x 20	Braun Blanquet	70	Griffith <i>et al</i> (2003)

Table 2(ii) Supporting Information Data Sets

Survey	Plot size	Type of data	No. of sites	Reference
A.G. Floyd rainforest surveys	Irregular traverse	Relative abundance	193	Floyd (1990)
Broadwater National Park	20 x 20	Relative abundance	58	Griffith (1990)
Bundjalung National Park	20 x 20	Relative abundance	69	Griffith (1983)
Rapid Overstorey Sites	Plotless	Canopy taxa only	204	NPWS (1999)

2.2 Site Stratification

The project used random stratified site sampling, recognising the unique environmental influences on vegetation in the coastal zone. Strata used were a combination of vegetation formation, deposition environment/geology, and landform unit/landform process class.

A new approach to survey stratification was developed for the coast. Existing regional stratifications of forests and public land (NEFBS 1994; NRAC, 1995 and NPWS, 1999) used geology, slope, aspect, topography, climate and rainfall to stratify sites. In coastal vegetation, environmental influences operate at resolutions finer than coarse GIS layers. For example, in a coastal survey of Booti Booti National Park, Griffith *et al.* (2000) found that stratification using environmental variables (geology, slope, and aspect) was unsatisfactory due to the coarse resolution of the environmental layers available.

The most notable omission in previous regional survey stratifications was a subdivision of Quaternary sand and alluvium. The Coastal Quaternary Mapping Project funded by the Comprehensive Coastal Assessment provides a division of alluvial, estuarine, undifferentiated and coastal barrier sediments for the CCA study area (Troedson, *et al* 2004). It also distinguishes between Holocene and Pleistocene sands, which is an important determinant of vegetation pattern. The layer also defines a landform unit class, which is useful in stratifying different deposition landforms within the deposition units.

Vegetation Formation. All available vegetation mapping in the far north coast study area was collated and grouped into twelve vegetation formations. A vegetation shape file of these classes was created to overlay with other environmental strata (Table 2(iii)).

Table 2(iii) Vegetation Formations

Vegetation Formations
Rainforest
Riparian Forest
Saltmarsh
Sedgeland
Swamp Sclerophyll Forest and Woodland
Wet Sclerophyll Forest
Heathland and Shrubland
Dry Sclerophyll Forests and Woodlands
Mangrove Forests and Woodlands

Geology, deposition units and relief class. Vegetation formations were further stratified by geology. In areas of Quaternary sand and alluvium the CCA Coastal Quaternary mapping layer was used to assign sites to alluvial, estuarine, coastal barrier and undifferentiated deposition environments. In assigning sites first priority was given to estuarine, alluvial and undifferentiated strata, and then coastal barrier sands. Wallum vegetation on coastal barrier sands were well sampled by Griffith *et al.* (2003). The additional sites allocated to coastal barrier sands in this survey were done to provide context and to sample gaps outside the areas sampled by Griffith *et al* (2003). Within each deposition environment sites were allocated to associated landform units (Table 2(iv)).

Table 2(iv) Deposition Environment

Deposition environments	Landform units
Alluvial	Backswamp, levee, terrace, colluvial fan, valley fill, channel, channel fill and swale
Estuarine	Saline swamp, basin and bay, coastal lagoon, interbarrier creek deposits, tidal delta flat
Coastal Barrier	Ridge and strandplain, dune, swale, backbarrier flat
Undifferentiated	Undifferentiated, freshwater swamp

Sites allocated to bedrock sites were targeted towards lower slopes and gentle relief classes outside the areas already sampled during CRA forest surveys. The lithology codes in the soil landscape layer were used as surrogates for bedrock geology. Five classes occurred in the study area (Table 2(v)).

Table 2(v) Sites by strata - geology

Geology
Basalt (Lamington Volcanics - Lismore, Blue Knob Basalt)
Low sedimentary quartz (Beenleigh Block meta-sediments, Walloon Coal Measures, Grafton Formation)
High sedimentary quartz (Kangaroo Creek Sandstones,
Acid volcanic (not sampled)
Plutonic rocks (not sampled)

In bedrock areas landform relief classes were used to refine the study area based on the soil landscapes GIS layer (Department of Lands, 1999; Speight, 1990). Landform classes in the gently undulating, to rolling and undulating hills and slopes were identified as a priority for survey. Landform classes are indicated in Table 2(vi).

Table 2(vi) Landform Relief Class

Landform Relief Class
Rolling Low Hills
Undulating hills
Undulating low hills
Rolling Hills
Undulating Rises
Gentle Undulating Rises
Rises
Gently undulating Plain

Sites were allocated on the basis of the area occupied by each combination of vegetation formation by geology/deposition environment. 300 sites were allocated to sites on Quaternary Sand and alluvium. One hundred and fifty (150) sites were allocated to strata on bedrock geology.

Habitats of restricted extent or those of special interest were also sampled. These included headlands, Callitris woodlands, littoral rainforests, freshwater wetlands, Pleistocene dune vegetation, Milky Mangrove, fernlands, grasslands and saltmarsh.

2.3 Site Sampling

The field survey used site survey standards compatible with previous DECC and NPWS (Comprehensive Regional Assessments, NPWS (1999); North East Forests Biodiversity Study (NPWS 1994), and Nandewar WRA (DEC, 2004). It also followed standards recommended in *Guidelines for Mapping Native Vegetation* (DLWC 2000).

Floristic data were collected in 20 x 20m or 40 x 10 metre quadrats. Sampling was undertaken in April/May and September/November 2006. All vascular plant species occurring within the plot were listed and assigned a cover abundance score using a 6-point modified Braun-Blanquet scale (Poore, 1955). As far as possible, sites were placed in visually homogeneous vegetation to avoid sampling ecotones.

Structural, physical and disturbance data were also collected. Structural data included growth form, height range and percentage crown cover of the dominant taxa within all strata present. Physical site data included altitude, slope, aspect, horizon elevation, soil depth and type, field geology and landform element in accordance with Walker & Hopkins (1990). An assessment of the condition of the sites was made along with fire, grazing and weed disturbance. A digital photograph was taken at each site.

Sites were numbered using an eight-ten digit code. All sites were denoted by the survey ID prefix CCA, then the first three letters of the mapsheet, a site number for that mapsheet, a one or two digit geology code, and a landform unit code.

C	C	A	E	M	P	0	1	A	B
---	---	---	---	---	---	---	---	---	---

e.g.

Comprehensive Coastal Assessment

EMPIRE VALE 1:25 000 map sheet

Site number 1

Alluvial Plain

Backswamp

2.4 Data Management

Data was entered into the CCAFNCVEG vegetation survey database held in a Central YETI database. YETI is an access database, developed by Michael Bedward and Murray Ellis for the entry of floristic, structural, physical and disturbance data collected at flora sites. Database entry fields relate to the field proforma. Data can be readily exported into data analysis software.

2.5 Data Analysis

Vegetation communities were classified using quantitative data analysis of field data from 346 sites. Floristic data from the sites was analysed using PATN V3 (Blatant Fabrications Pty. Ltd.). The Bray-Curtis coefficient was generated to identify dissimilarity between sites. An association matrix displaying dissimilarity scores between all pairs of sites was produced. An unweighted pair group arithmetic averaging (UPGMA) clustering strategy was applied to the matrix to derive a hierarchical classification using a default beta of -0.1.

A dendrogram and two way table were produced to display the hierarchical relationships between individual sites and groups of sites. An initial broad grouping of sites provided the basis for further investigation. Groups of sites were examined using species that characterised the group, and other structural, physical and environmental variables. Each broad group was split to delineate finer scale floristic assemblages in a sequential manner. The number of groups was set at 60. An ALOC analysis of the data was done as a means of comparison with the original hierarchical agglomerative analysis. An analysis excluding exotic species was also done and it showed a good correlation between the groups identified in the analysis of all species. It was decided to run with full floristic analysis including all species. Weeds form a major component of the vegetation of the study area and their contribution to the vegetation of the far north coast can't be disregarded in a comprehensive numerical analysis of the area.

A FIDEL analysis (Keith and Bedward, 1999; Westhoff & van der Maarel, 1978) was done to indicate positive diagnostic taxa within each community. Positive diagnostic taxa are those that are more likely to be found in a community than in other communities. Diagnostic species are identified by calculating the group and non group frequency of each taxa. Only positive indicator species are included in each profile.

3 Results

Of the 346 sites surveyed, more than 40% were on private land or Crown leasehold, with the rest on Crown Land, National Parks, Nature Reserves, and State Forests. The locations of the survey sites are shown on Figure 3.1.

3.1 Floristics

In total, 1027 taxa (includes: species: subspecies and varieties), in 160 families, were recorded in the survey, comprising: two fern allies (in 2 families), 54 ferns (17), one cycad (1), four conifers (4), 706 dicotyledons (109), and 260 monocotyledons (27). The most common plant families by number of taxa were Myrtaceae (77), Poaceae (73), Fabaceae (72), Cyperaceae (61), Asteraceae (37), Orchidaceae (30), Lauraceae (29), Rutaceae (28), Sapindaceae (27), Euphorbiaceae (26), Proteaceae (25), Epacridaceae (21), Rubiaceae (17), Apiaceae (13), Moraceae (12), Asclepiadaceae (11), Solanaceae (11), Apocynaceae (10), and Dilleniaceae (10). A full list of taxa recorded from the surveys is given in Appendix 2.

The most common native plant species were climbing plants: Common Silkpod (*Parsonsia straminea*), Lawyer Vine (*Smilax australis*) and Scrambling Lily (*Geitonoplesium cymosum*). The trees Broad-leaved Paperbark (*Melaleuca quinquenervia*), Tuckeroo (*Cupaniopsis anarcardioides*) and *Guioa semiglauc* were recorded frequently, as were the ground covers *Ottocloa gracillima*, Spiny-headed Mat Rush (*Lomandra longifolia*) and Blue Flax-lily (*Dianella caerulea*) (see Table 3(i)).

Plant life-forms clustered into particular plant communities and assemblages. For example, subtropical rainforest communities had a profusion of mesic trees and shrubs, epiphytes and a large number of rainforest climbing plants. Swamp sclerophyll communities were typically dominated by sedges or ferns. Other swamp sclerophyll communities and some dry sclerophyll forest assemblages had a high proportion of grasses. Coastal barrier sand sites were characterised by dry heath and shrub species.

Weeds were a major component of the flora surveyed, particularly in the floodplain, lower slope and dunal environments of the study area. A total of 129 exotic taxa were recorded. The most common were Lantana (*Lantana camara*), Camphor Laurel (*Cinnamomum camphora*), *Senna pendula* var. *glabra*, *Ipomoea cairica*, *Ochna serrulata*, *Passiflora suberosa* and Umbrella Tree (*Schefflera actinophylla*) (see Table 3(ii)). Lantana and Camphor Laurel are among the most widespread and abundant of all species recorded in the survey.

Species richness varied greatly between communities, from floristically simple saline sedgeland communities (Communities 7, 8, 9), to mangrove (Community 62), freshwater wetlands (Communities 24, 25, 26) and shrubland communities (Community 28) to diverse subtropical rainforest communities (Communities 35, 44, 45, 47) and wet sclerophyll forest communities (Communities 40, 41, 43, 52).

The FNC, and especially the Tweed, Brunswick and Richmond lowlands, are a known hotspot for threatened plant species. A total of 39 threatened plants species were recorded in the survey. In addition, 11 Rare or Threatened Australian Plants (ROTAP) (Briggs and Leigh 1996) and a number of rare species or species at the southern limit of their distributions were recorded. Many species are endemic to the Tweed lowlands. Taxa of conservation significance are discussed in section 3.2.

Some species had not been previously recorded in systematic vegetation surveys on the north coast of New South Wales. New records included *Amyema mackayense* subsp. *mackayense* and *Asperula gemella*.

Species	Family	Freq
<i>Parsonsia straminea</i>	Apocynaceae	155
<i>Smilax australis</i>	Smilacaceae	146
<i>Geitonoplesium cymosum</i>	Luzuriagaceae	144
<i>Lantana camara</i> *	Verbenaceae	142
<i>Melaleuca quinquenervia</i>	Myrtaceae	136
<i>Cupaniopsis anacardioides</i>	Sapindaceae	116
<i>Ottocloa gracillima</i>	Poaceae	108
<i>Lomandra longifolia</i>	Lomandraceae	103
<i>Cinnamomum camphora</i> *	Lauraceae	101
<i>Dianella caerulea</i>	Phormiaceae	101
<i>Guioa semiglauc</i>	Sapindaceae	100
<i>Hibbertia scandens</i>	Dilleniaceae	98
<i>Jagera pseudorhus</i>	Sapindaceae	96
<i>Maclura cochinchinensis</i>	Moraceae	95
<i>Morinda jasminoides</i>	Rubiaceae	93
<i>Alphitonia excelsa</i>	Rhamnaceae	91
<i>Archontophoenix cunninghamiana</i>	Arecaceae	89
<i>Glochidion sumatranum</i>	Euphorbiaceae	88
<i>Glochidion ferdinandi</i>	Euphorbiaceae	87
<i>Marsdenia rostrata</i>	Asclepiadaceae	80
<i>Senna pendula</i> var. <i>glabrata</i> *	Fabaceae	80

Table 3(i) Most commonly recorded species of plant in the study area.

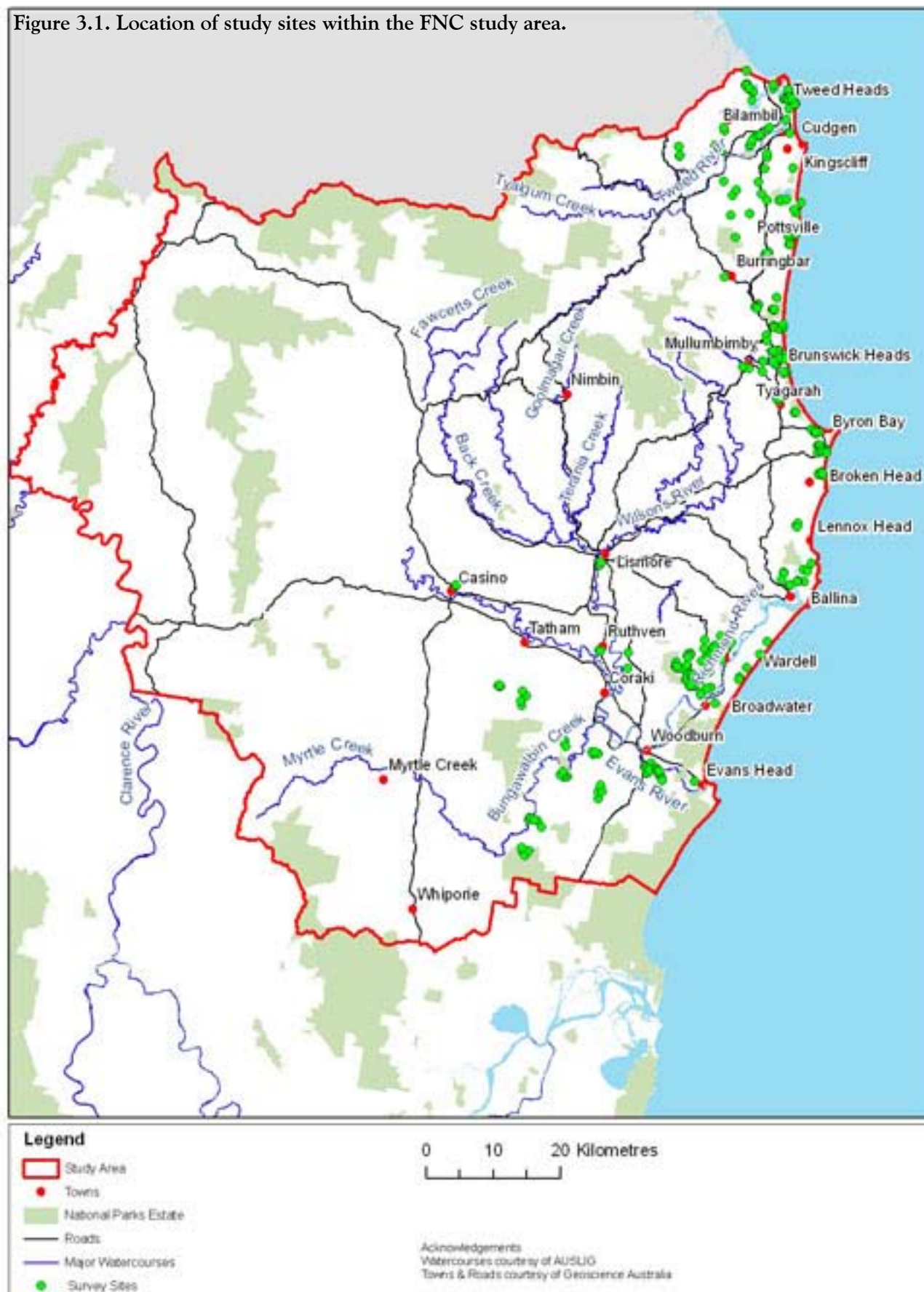
Species recorded at >80 sites are shown; Frequency is the number of sites a species was recorded from (total number of sites = 346). Species with an asterisk are exotic species.

Species	Family	Freq
<i>Lantana camara</i>	Verbenaceae	146
<i>Cinnamomum camphora</i>	Lauraceae	101
<i>Senna pendula</i> var. <i>glabrata</i>	Fabaceae	80
<i>Ipomoea cairica</i>	Convolvulaceae	61
<i>Ochna serrulata</i>	Ochnaceae	45
<i>Passiflora suberosa</i>	Passifloraceae	42
<i>Schefflera actinophylla</i>	Araliaceae	42
<i>Asparagus aethiopicus</i>	Asparagaceae	33
<i>Axonopus compressus</i>	Poaceae	30
<i>Ageratina riparia</i>	Asteraceae	28
<i>Ligustrum sinense</i>	Oleaceae	26
<i>Passiflora subpeltata</i>	Passifloraceae	21
<i>Passiflora edulis</i>	Passifloraceae	22
<i>Chrysanthemoides monilifera</i>	Asteraceae	21
<i>Ageratina adenophora</i>	Asteraceae	18
<i>Baccharis halimifolia</i>	Asteraceae	18
<i>Solanum seaforthianum</i>	Solanaceae	17
<i>Solanum mauritianum</i>	Solanaceae	16
<i>Asparagus plumosus</i>	Asparagaceae	16

Table 3(ii) Most commonly recorded exotic species recorded in the study area.

Frequency is the number of sites a species was recorded from (total number of sites = 346 >15 records).

Figure 3.1. Location of study sites within the FNC study area.



3.2 Numerical analysis

Four major vegetation groups were identified by expert interpretation at the 60 group level classification in the dendrogram which were correlated with tidal influence, substrate and broad soil type. These were Group 1 – Saline wetlands; Group 2 – Freshwater, seasonally–permanently inundated soils; Group 3 – Coastal barrier sand sites and headland sites; Group 4 – Forests on alluvium or finely textured soils of coastal floodplains

and foothills. A simplified dendrogram is shown in Figure 3.2 and a summary of group relationships is shown in Table 3(iii). A full dendrogram is in Appendix 3. A secondary split identified 27 ssemblages within the four primary groups, based on an expert assessment of dominant and associated species, environmental influences and geographic distribution. A decision to spilt and amalgamate the 60 groups in the dendrogram was made by expert assessment including the input of a expert workshop.

Table 3(iii) Primary, secondary and tertiary floristic groups differentiated by hierarchical agglomerative clustering of full floristic data (species and relative abundance).

The primary groups represent the four major soil environments present in the study area, as indicated by a cut-point of about 1.5 on the dendrogram. The secondary groups represent broad vegetation types found within each of the major soil environments and correspond to a dendrogram cut-point of about 1.2. The tertiary level groupings (assemblages) represents floristic groupings at the 60-group level. Closely similar groups may be merged at this level. Splits between the Brunswick–Tweed (BT) and Lower Richmond (LR) are common at the 60-group level but only a few are given below.

Primary group	Secondary group	Tertiary Group	Dendrogram groups
1 – Soils in tidal zone or with saline influence	1 (i) Mangroves	1(a) Mangroves	62
	1 (ii) Saltmarsh	1(b) Saltmarsh, saline grassland	1–2
	1 (iii) <i>Casuarina glauca</i>	1(c) <i>C. glauca</i> with grass or <i>Carex appressa</i> (often disturbed by clearing and grazing; floodplain further from estuaries)	3–4
		1(d) <i>C. glauca</i> – <i>Excoecaria agallocha</i> (close to estuaries)	5–6
		1(e) <i>C. glauca</i> – <i>Juncus kraussii</i> (close to estuaries)	7–9C
2 – Freshwater, seasonally–permanently inundated soils (swamp forest, wet heath, freshwater swamp)	2(i) Coastal <i>M. quinquenervia</i> ± <i>C. glauca</i> ± <i>L. suaveolens</i> with ferny understorey	2(a) Broad-leaved Paperbark swamp forests	10–15D
	2(ii) Coastal <i>M. quinquenervia</i> ± <i>C. glauca</i> ± <i>E. robusta</i> with herb–graminoid (sedge, grass, or reed) understorey; wet heath, freshwater wetland, Coral Fern	2(b) Wet heath	16–17
		2(c) Coral Fern	18
		Assemblage 2(e) Paperbark dunal scrubland	19
		Assemblage 2(f) Sedge paperbark swamp box	20–21, 23
		Assemblage 2(g) Reedland	22, 24

Primary group	Secondary group	Tertiary Group	Dendogram groups
		Assemblage 2(h) Freshwater wetland/swamp meadow	
	2(iii) Middle Richmond swamp forest and freshwater wetlands	2(i) Middle Richmond swamp forest and 2d	25–30
		2(j) Middle Richmond freshwater wetland	
3 – Freely draining, sandy soils	3(i) Open forest on back barrier (Pleistocene) sands	Assemblage 3(a) Open Forests on Pleistocene sands	31–33
		Assemblage 3(b) Vegetation on Holocene dunes	
	3(ii) Frontal (Holocene) dunes open forest and littoral rainforest	Assemblage 3(c) Headland grasslands	33–38
		Assemblage 3(d) Community 38: Heathy Scribbly Gum	
4 – Soils on alluvium or bedrock (finely textured soils of coastal floodplains and foothills)	4(i)	4(a) Lower Richmond Brush Box	40–41
		Assemblage 4(b) Brunswick–Tweed Brush Box	42–43
	4(ii) Rainforest	Assemblage 4(c) Tweed–Brunswick subtropical: (i) rainforest on meta-sediment–subtropical/dry subtropical	44
		Assemblage 4(c) Tweed Brunswick subtropical (rainforest ecotone/disturbed, often with sclerophyll emergents)	45
		Assemblage 4(c) Tweed Brunswick subtropical (rainforest on basalt – Subtropical Rainforest White Booyong type)	47
	4(iii) Wet sclerophyll/moist open forest (with rainforest component in understorey)	Assemblage 4(d) Forest Red Gum swamp sclerophyll/wet sclerophyll open forests	48–54
		Assemblage 4(e) Fig/Quandong rainforest on Holocene dunes (Community 52)	
		Assemblage 4(f) Patches Beach alluvial palm forest (Community 53)	
	4(iv) Dry, grassy/layered open forest	Assemblage 4(g) Dry sclerophyll grassy open forests	55–59

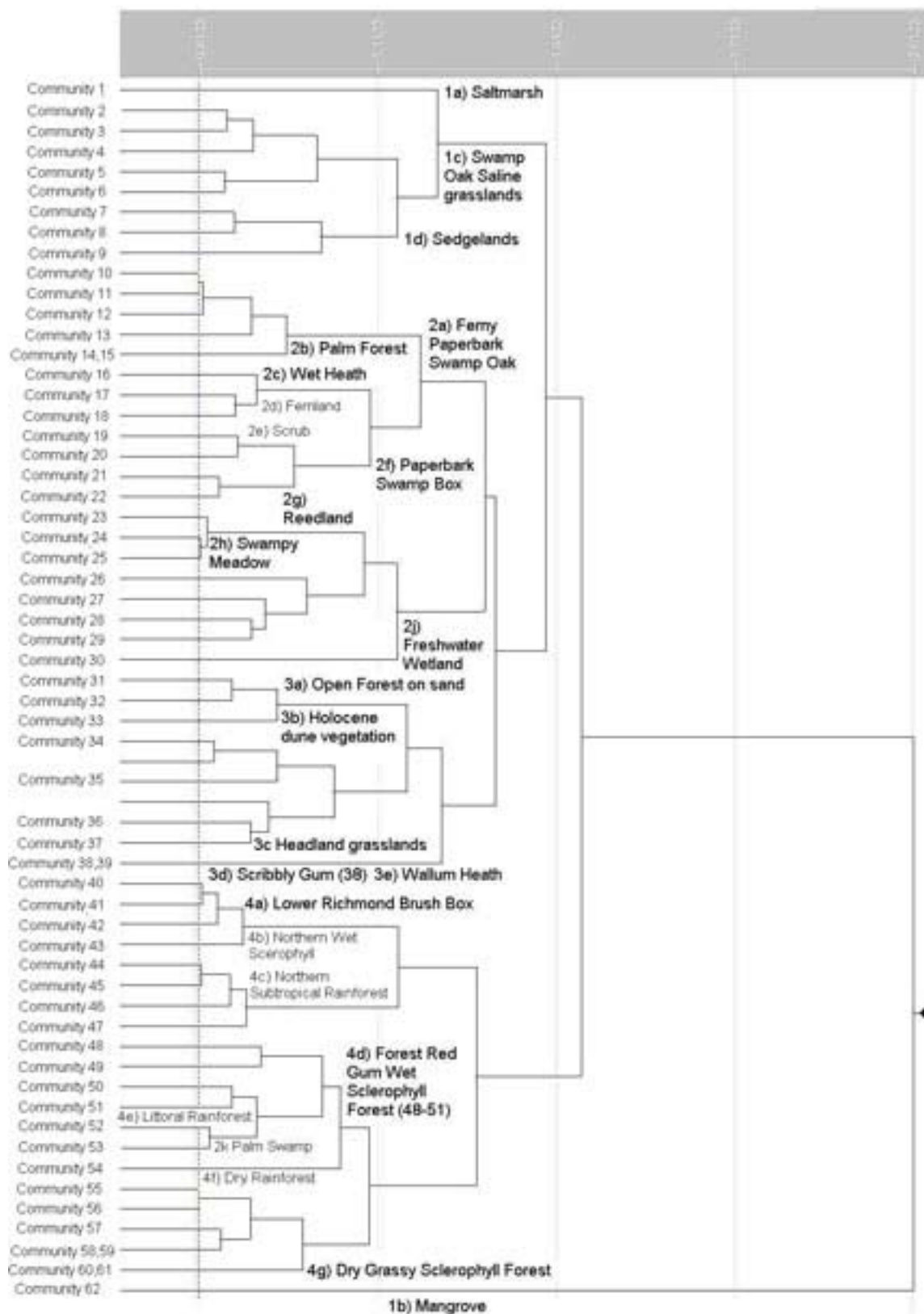


Figure 3.2. Dendrogram of 62 vegetation groups from classification of 346 sites

(UPGMA, Bray_Curtis association measure, Beta=-0.1). Vegetation group 1_ Saline influence; Vegetation Group 2- Group 2 Freshwater, seasonally/ permanently inundated soils; Group 3 Coastal barrier sand and headland; Group 4 Forests on alluvium or fine-textured soils of coastal floodplains and foothills

3.3 Summary of assemblages and their communities

In total, 27 assemblages were derived by grouping floristic communities derived by numerical into groupings of similar floristic composition, structure and environmental relationships (Four assemblages

within Primary Group 1, 11 in Primary Group 2, five in Primary Group 3 and seven in Primary Group 4). The 27 assemblages comprise a total of 62 communities. Table 3(iii) provides a summary of the assemblages within each primary group, and Table 3(iv) lists the 62 communities identified in the FNC study area.

Table 3(iv) Summary of primary groups and the assemblages that fall within each resulting from expert assessment

Group 1 – Saline wetlands (Communities 1–9, 62)	
1(a)	Mangroves (Communities 5, 62)
1(b)	Saltmarsh/saline grasslands (Communities 1, 2)
1(c)	Swamp Oak forests, sedgelands and rushlands (Community 3, 4, 6)
1(d)	Sedgeland/Rushland (Communities 7–9)
Group 2 – Freshwater, seasonally–permanently inundated soils (Communities 10–30)	
2(a)	Broad-leaved Paperbark swamp forests varying from a sedge to ferny understory (Communities 10–14)
2(b)	Floodplain palm forest (Community 15)
2(c)	Wet heath (Communities 16, 17)
2(d)	Coral Fern fernland (Community 18)
2(e)	Paperbark dunal scrubland (Community 19)
2(f)	Broad-leaved Paperbark–Swamp Box with a sedge understorey (Communities 20, 21, 23)
2(g)	Reedland (Community 22)
2(h)	Freshwater wetland/swampy meadow (Communities 24, 25)
2(i)	Bungawalbin swamp forest (Communities 26–29)
2(j)	Middle Richmond freshwater wetland (Community 30)
2(k)	Alluvial palm forest (Community 53)
Group 3 – Coastal barrier sands and headlands (Communities 31–39)	
3(a)	Open forests on Pleistocene Sands (Communities 31–33)
3(b)	Vegetation of Holocene sands (Communities 34, 36)
3(c)	Headland grassland (Community 37)
3(d)	Scribbly Gum community on Pleistocene sands (Community 38)
3(e)	Wallum Banksia (Community 39)
Group 4 – Forests on alluvium or finely textured soils of coastal floodplains and foothills (Communities 40–61)	
4(a)	Tweed Brunswick Brush Box wet sclerophyll forest (Communities 40–41)
4(b)	Richmond Valley Brush Box wet sclerophyll forest (42, 43)
4(c)	Subtropical rainforest (Communities 44–47), Brush Box littoral rainforest (Community 35)
4(d)	Forest Red Gum swamp sclerophyll/dry open forests (Communities 48–51)
4(e)	Fig–Quandong rainforest on Pleistocene dunes (Community 52)
4(f)	Whalebone Tree dry rainforest (Community 54)
4(g)	Dry sclerophyll grassy open forests (Communities 55–61)

Table 3(v) Vegetation communities

Community	Name
Community 1	Saltmarsh
Community 2	Blue Couch–Prickly Couch grasslands of the estuarine plain
Community 3	Broad-leaved Paperbark–Swamp Oak swamp sclerophyll alluvial plain open forest
Community 4	Swamp Oak–Broad-leaved Paperbark estuarine and alluvial plain swamp sclerophyll forest
Community 5	Milky Mangrove–Swamp Oak– Grey Mangrove king-tide forest
Community 6	Swamp Oak–Hoop Pine–Tuckeroo swamp sclerophyll/dry 'gallery' floodplain rainforest
Community 7	Prickly Couch–Sea Rush– <i>Schoenoplectus subulatus</i> saltmarsh
Community 8	Swamp Oak king-tide swamp sclerophyll forest
Community 9	Sea Rush–Matgrass saltmarsh
Community 10	Broad-leaved Paperbark–Swamp Oak–fern/sedge swamp sclerophyll forest
Community 11	Broad-leaved Paperbark–Pink-flowered Doughwood swamp sclerophyll open forest
Community 12	Broad-leaved Paperbark–Swamp Oak ferny swamp sclerophyll forest
Community 13	Alluvial plain Broad-leaved Paperbark–Swamp Mahogany–Bangalow Palm/ Saw sedge–water fern swamp sclerophyll forest
Community 14	Swamp Mahogany–Broad-leaved Paperbark/sedge/fern swamp sclerophyll forest
Community 15	Bangalow Palm–Swamp Box–Cabbage Tree Palm–Weeping Myrtle alluvial riparian forest
Community 16	Tea-tree (<i>Leptospermum</i> spp.)– <i>Sporodanthus interruptus</i> wet heath
Community 17	<i>Leptospermum liversidgei</i> –Wallum Bottlebrush–Grass Tree–Heath-leaved Banksia wallum wet heath complex
Community 18	Coral Fern fernland
Community 19	Broad-leaved Paperbark–Coast Banksia–Red Ash dunal woodland
Community 20	Swamp Box–Broad-leaved Paperbark–rush/fern swamp sclerophyll forest
Community 21	Broad-leaved Paperbark–Swamp Oak–rush saline swamp sclerophyll open forest
Community 22	Common Reed–Black Bog-rush reedland/rushland
Community 23	Swamp Box–Broad-leaved Paperbark–Swamp Mahogany swamp sclerophyll forest
Community 24	Swamp Ricegrass (<i>Leersia hexandra</i>) <i>Lepironia articulata</i> , Smartweed (<i>Persicaria strigosa</i>) and <i>Juncus usitatus</i> Swampy Meadow.
Community 25	Swamp Ricegrass– <i>Bolboschoenus caldwellii</i> – <i>Schoenoplectus validus</i> – <i>Cyperus exaltatus</i> freshwater wetland
Community 26	Hinterland Narrow-leaved Paperbark–tea-tree backswamp shrublands-sedgeland
Community 27	Weeping Myrtle–Water Gum floodplain riparian forest
Community 28	Narrow-leaved Paperbark–Wallum Bottlebrush swamp sclerophyll shrubland
Community 29	Swamp Box–Narrow-leaved Paperbark–Broad-leaved Paperbark alluvial swamp sclerophyll forest
Community 30	Middle Richmond freshwater wetlands
Community 31	Scribbly Gum–Red Mahogany–Brush Box dry sclerophyll open to closed forest on coastal barrier sands
Community 32	Blackbutt–Turpentine open forest complex
Community 33	Coast Cypress Pine on dunes and ridges
Community 34	Coast Banksia frontal dune open forest on Holocene dunes

Community	Name
Community 35	Brush Box lowland rainforest
Community 36	Coast Wattle–Coast Tea-tree–Coast Banksia shrubland on Holocene dunes and ridges
Community 37	Kangaroo Grass headland grassland
Community 38	Scribbly Gum–Old Man Banksia–tea-tree heathy low open sclerophyll forest/shrubland
Community 39	Wallum Banksia dry heath
Community 40	Lower Richmond floodplain mesic successional wet sclerophyll forest/rainforest
Community 41	Lower Richmond Brushbox–Pink Bloodwood–Grey Ironbark mesic tall open forest
Community 42	Tweed–Brunswick Valley Brush Box–Blackbutt–Pink Bloodwood–Tallowwood foothill wet sclerophyll forest
Community 43	Brunswick–Tweed Brush Box gully rainforest on meta-sediments
Community 44	Tweed–Brunswick Valley Blue Quandong subtropical rainforest
Community 45	Tweed–Brunswick Valley Bangalow Palm–Lilly Pilly subtropical rainforest
Community 46	Stinging Tree–White Fig–Brush Bloodwood subtropical rainforest
Community 47	Tweed Valley meta-sediment and basalt low-elevation subtropical rainforest
Community 48	Flooded Gum–Pink-flowered Doughwood–Hard Quandong alluvial plain wet sclerophyll forest
Community 49	Camphor Laurel–Forest Red Gum open to closed forest
Community 50	Swamp Oak–Forest Red Gum–Broad-leaved Paperbark–Swamp Box swamp sclerophyll woodland to open forest
Community 51	Forest Red Gum–Willow Bottlebrush–Camphor Laurel dry open forest
Community 52	Small-leaved Fig–Hard Quandong–Bangalow Pine subtropical/littoral rainforest on Pleistocene dunes
Community 53	Patches Beach Broad-leaved Paperbark–Swamp Oak–Cabbage-tree Palm swamp sclerophyll forest on the alluvial plain
Community 54	Whalebone Tree–Thorny Pea– <i>Gossia fragrantissima</i> gallery dry rainforest
Community 55	Grey Ironbark–Pink Bloodwood–Thick-leaved Mahogany dry grassy open forest
Community 56	Broad-leaved Paperbark–Swamp Box–Tuckeroo swamp sclerophyll open forest
Community 57	Red Mahogany–Pink Bloodwood–Swamp Mahogany–Swamp Box dry open forest
Community 58	Pink Bloodwood–Grey Ironbark–Swamp Box–Forest Red Gum–Blackbutt tall dry open forest
Community 59	Large-fruited Spotted Gum–Grey Ironbark–Small-fruited Grey Gum dry grassy open forest
Community 60	Grey Ironbark–Thin-leaved Stringybark–Pink Bloodwood–Swamp Box dry open grassy forest
Community 61	Broad-leaved Paperbark–Narrow-leaved Rough-barked Apple–Swamp Box–Pink Bloodwood dry grassy alluvial open forest
Community 62	River Mangrove–Grey Mangrove–Black Mangrove–Milky Mangrove–Spider Mangrove forest to woodland

3.3.1 Primary Group 1 – Saline wetlands

Assemblage 1(a) Mangroves (Communities 5, 62): This assemblage consists of an open to closed shrubland or low open forest of Grey Mangrove (*Avicennia marina* subsp. *australasica*), Black Mangrove (*Bruguiera gymnorhiza*), Milky Mangrove (*Excoecaria agallocha*) and Cottonwood Hibiscus (*Hibiscus tilaceus*), associated with Spider Mangrove (*Rhizophora stylosa*) and River Mangrove (*Aegiceras corniculatum*). The distribution of mangrove species occurs in orderly zones and is controlled by the frequency and duration of tidal inundation (Dr. A. Benwell, pers.comm.). COMMUNITY 62 is found in sites subject to regular tidal influence fringing coastal lagoons, estuarine or alluvial tidal deltas and low-level tidal flats on Quaternary marine and fluvial sediments. COMMUNITY 5 is a swamp forest located in the king-tide zone on the floodplain of the Tweed River and with an outlying occurrence at Tuckean Broadwater. It consists of an open forest community dominated by Milky Mangrove (*Excoecaria agallocha*), Grey Mangrove and Swamp Oak (*Casuarina glauca*), with the dominance of Mangrove Fern (*Acrostichum speciosum*) a key feature of the understorey.

Assemblage 1(b) Saltmarsh and saline grasslands (Communities 1, 2): COMMUNITY 1 is a saltmarsh complex with zonations of *Sporobolus virginicus* var. *minor* and an outer zone of *Juncus kraussii* subsp. *australiensis*. The saltmarsh at Pottsville and Ballina includes abundant *Sarcocornia quinqueflora* subsp. *quinqueflora*. COMMUNITY 2 is a saline grassland of Blue Couch (*Cynodon dactylon*), Swamp Millet (*Ischaemum australe*), Swamp Ricegrass (*Leersia hexandra*) and Prickly Couch (*Zoysia macrantha*), as well as sedges, rushes and herbs. These grassland are possibly derived from cleared/regrowth Swamp Oak (*Casuarina glauca*) or occur on the upper fringe of saltmarsh.

Assemblage 1(c) Swamp Oak forests on the alluvial and estuarine plains (Communities 3, 4, 6): This assemblage is a swamp sclerophyll forest dominated by Swamp Oak (*Casuarina glauca*) and Broad-leaved Paperbark (*Melaleuca quinquenervia*). COMMUNITY 3 is commonly found in large, estuarine or alluvial backswamps of the Evans River and stagnant alluvial backswamps of Bungawalbin Creek. COMMUNITY 4 has a higher abundance of Swamp Oak than community 3 and is found on a range of low-lying waterlogged alluvial, estuarine plain and barrier sand substrates with considerable variation in tidal and saline

influences at local scales. COMMUNITY 6 is riparian swamp sclerophyll gallery rainforest type dominated by Swamp Oak, Hoop Pine (*Araucaria cunninghamii*) and Tuckeroo (*Cupaniopsis anacardioides*) that fringes Community 5.

Assemblage 1(d) Saline sedgeland or saltmarsh (Communities 7–9): An assemblage that occurs in saline vegetation complexes and occasionally fringing saline coastal lagoons. The assemblage consists of low grassland, sedgeland or saltmarsh communities with *Schoenoplectus subulatus*, Prickly Couch (*Zoysia macrantha*), Sea Rush (*Juncus kraussii*) or *Hemarthria uncinata*, and saltmarsh species such as *Sarcocornia quinqueflora* subsp. *quinqueflora* and Sand Couch (*Sporobolus virginicus*) as abundant species.

3.3.2 Primary Group 2 – Freshwater, seasonally–permanently inundated soils on alluvium and coastal barrier sands

Assemblage 2(a) Broad-leaved Paperbark ferny swamp forest (Communities 10–14): This assemblage consists of tall to low and open to closed forest dominated by Broad-leaved Paperbark (*Melaleuca quinquenervia*) and Swamp Oak (*Casuarina glauca*), with Swamp Mahogany (*Eucalyptus robusta*) and Swamp Box (*Lophostemon suaveolens*) occasionally present. It is characterised by decreasing abundance of Swamp Oak as compared to Group 3. The assemblage occurs in many situations on the estuarine and alluvial plains, coastal barrier sand deposits, and also on waterlogged sedimentary soils on lower slopes. Sites range from frequently inundated (COMMUNITY 10, 12, 13), where the understorey is dominated by sedges, rushes and grasses, to more elevated, where development of shrubs and trees is more evident (COMMUNITY 11).

Assemblage 2(b) Alluvial palm–lilly pilly riparian forest (Community 15): This assemblage comprises a single community, consisting of an open to closed palm forest with an overstorey of abundant Bangalow Palm (*Archontophoenix cunninghamiana*), Weeping Lilly Pilly (*Waterhousea floribunda*), Swamp Box (*Lophostemon suaveolens*), and many Cabbage Tree Palms (*Livistona australis*) and Broad-leaved Paperbark (*Melaleuca quinquenervia*). A middle layer of Pink-flowered Doughwood (*Melicope elleryana*) is present. The assemblage is found along alluvial channels of flat lowland plains at Tuckean and Wardell on deep soils formed by input of basalt sediments from the nearby Blackwall Range and also Pleistocene sands from the

Wardell Sandplain.

Assemblage 2(c) Wet heath (Communities 16, 17). COMMUNITY 16 is a wet heathland with a dense canopy of shrubs tolerant of waterlogged soils, including *Leptospermum liversidgei*, Tautoon (*Leptospermum polygalifolium*) and *Baeckea frutescens*. A diversity of wet heathy shrubs is sometimes present, but a dense lower layer of the sedge *Sporadanthus interruptus* is always present. COMMUNITY 17 is a wet shrubland complex with considerable variation in dominant species, but associations include Heath-leaved Banksia (*Banksia ericifolia* subsp. *macrantha*) shrubland; Broad-leaved Paperbark (*Melaleuca quinquenervia*) swamp sclerophyll shrubland; and *Baeckea frutescens* and *Leptospermum liversidgei* shrubland. Wallum bottlebrush (*Callistemon pachyphyllus*) is frequent in the middle layer, and the lower layer is characterised by sedges and shrubs. The assemblage is found within swales and open freshwater depressions on Pleistocene barrier sands.

Assemblage 2(d) Coral Fern fernland (Community 18): A single community of Coral Fern (*Gleichenia dicarpa*) in association with Saw Sedge (*Gahnia sieberiana*). *Empodisma minus* is common in the lower layer. One site (BYR36estcd) has an upper layer comprising an open shrubland of Broad-leaved Paperbark (*Melaleuca quinquenervia*) with a dense lower layer of Coral Fern. Griffith (1999) indicates the habitat of such fernlands as dune scarps and narrow drainage lines in deep, acid peat soils kept moist by groundwater seepage.

Assemblage 2(e) Paperbark dunal scrubland (Community 19): A single community, usually with an open forest structure in which Broad-leaved Paperbark (*Melaleuca quinquenervia*) is sometimes associated with Coast Banksia (*Banksia integrifolia* subsp. *integrifolia*) and Red Ash (*Alphitonia excelsa*). However, two sites (POT23cbdne, POT02cbrdg) have an open shrubland structure. A shrubby middle layer is usually present, consisting of Coastal Wattle (*Acacia longifolia* subsp. *sophorae*), Lantana (*Lantana camara*) and Tree Broom-heath (*Monotoca elliptica*). The lower layer consists of Midgen Berry (*Austromyrtus dulcis*), Climbing Guinea Flower (*Hibbertia scandens*), Spiny-headed Mat Rush (*Lomandra longifolia*) and Black Bog-rush (*Schoenus brevifolius*). Weeds are prevalent in this assemblage (community), and Whisky Grass (*Andropogon virginicus*) is an abundant weed species of the lower layer. The assemblage occurs on coastal barrier sands

dunes and ridges.

Assemblage 2(f) Sedge Paperbark Swamp Box (Communities 20, 21, 23): A complex of swamp sclerophyll sites, most commonly located on the estuarine plain, but also occurring on waterlogged sites on coastal barrier sands and, rarely, alluvium. The assemblage consists of a low to tall, open to closed swamp sclerophyll forest with Swamp Box (*Lophostemon suaveolens*) or Broad-leaved Paperbark (*Melaleuca quinquenervia*), or both, occasionally associated with Pink Bloodwood (*Corymbia intermedia*) and Swamp Oak and Broad-leaved Paperbark in more saline sites. The ground layer consists of sedges and rushes. There is an open mid-layer in which Swamp Box (*Lophostemon suaveolens*) and Broad-leaved Paperbark (*Melaleuca quinquenervia*) occasionally occurs with Willow Bottlebrush (*Callistemon salignus*).

Assemblage 2(g) Reedland (Community 22): A single community, comprising a reedland or rushland with a dense cover of Common Reed (*Phragmites australis*) and Black Bog-rush (*Schoenus brevifolius*). The assemblage (community) occurs on the fringe of saline swamp areas and adjoining a coastal barrier lagoon.

Assemblage 2(h) Swamp Ricegrass/Swampy Meadow (Communities 24, 25): COMMUNITY 24 represents a wetland west of Cudgen Lake in organic muds in a freshwater swamp and also on saline muds of the estuarine plain. The vegetation is dominated by Swamp Ricegrass (*Leersia hexandra*), *Lepironia articulata*, *Juncus usitatus*, Smartweed (*Persicaria strigosa*), *Bolboschoenus caldwellii*, *Schoenoplectus validus* and *Cyperus exaltatus*. Community 24 may be a derived freshwater wetland, an artefact of clearing. COMMUNITY 25 is on the floodplain of Clothiers Creek where it colonises drains and channels.

Assemblage 2(i) Lower Richmond Valley Swamp Forest/Shrublands/Sedgeland (Communities 26–29): A structurally variable assemblage of sedgelands, shrublands and riparian open forests found on stagnant alluvial backswamps and riparian channels of the meander plain of Bungawalbin Creek. COMMUNITY 26 consists of *Lepironia articulata* sedgeland communities with emergent or dominant Narrow-leaved Paperbark (*Melaleuca alternifolia*), Broad-leaved Paperbark (*Melaleuca quinquenervia*), *Leptospermum brachyandrum* and Swamp Box (*Lophostemon suaveolens*). All sites are located on backswamps of Bungawalbin Creek. COMMUNITY 27 is a riparian open forest with emergent

Swamp Box and a canopy of Weeping Myrtle (*Waterhousea floribunda*) and Water Gum (*Tristaniaopsis laurina*). It is found on the floodplain of Sandy Creek. COMMUNITY 28 is an open shrubland of Narrow-leaved Paperbark, *Melaleuca sieberi* and Wallum Bottlebrush (*Callistemon pachyphyllus*) growing on waterlogged alluvial flats. COMMUNITY 29 is an open swamp sclerophyll forest of Swamp Box, Narrow-leaved Paperbark and Broad-leaved Paperbark located on an alluvial backswamp.

Assemblage 2(j) Middle Richmond freshwater wetland (Community 30): This assemblage, represented by a single community, is a freshwater wetland community of *Azolla pinnata*, Water Primrose (*Ludwigia peploides* subsp. *montevidensis*), Lesser Canary Grass (*Phalaris minor*), *Hygrophila angustifolia* and *Juncus mollis*. The invasive weed Chinese Tallow (*Triadica sebifera*) occurs as a common emergent tree. Water weeds are prevalent in the lower strata, including *Phalaris minor* and Parrots Feather (*Myriophyllum aquaticum*). The assemblage is on the alluvial floodplain in backswamps.

Assemblage 2(k) Patches Beach Alluvial Palm Forest (Community 53): This assemblage is an open swamp sclerophyll forest/palm forest of Bangalow Palm (*Archontophoenix cunninghamiana*), Broad-leaved Paperbark (*Melaleuca quinquenervia*) and Swamp Oak (*Casuarina glauca*). All sites are on alluvial backswamps in the Patches Beach area south of the Richmond River.

3.3.3 Primary Group 3- Coastal Barrier Sands and headlands

Assemblage 3(a) Open forests on Pleistocene sands (Communities 31–33): COMMUNITY 31 is an open to closed forest dominated by Scribbly Gum (*Eucalyptus signata*), Red Mahogany (*Eucalyptus resinifera* subsp. *hemilampra*) and Brush Box (*Lophostemon confertus*). COMMUNITY 32 is a complex tall open forest mosaic commonly found on sandy soils on ridges and backbarrier flats, and also on the fringe of the estuarine plain. Overstorey variation includes: (a) tall open forest of Flooded Gum (*Eucalyptus grandis*) and Pink Bloodwood (*Corymbia intermedia*) on Pleistocene sand ridges; (b) swamp sclerophyll open forest with Swamp Mahogany (*Eucalyptus robusta*) and Swamp Box (*Lophostemon suaveolens*) in backbarrier flats; (c) Blackbutt (*Eucalyptus pilularis*) open forest; (d) open forest of Turpentine and Brush Box on a sandy ridge. COMMUNITY 33 is a closed forest dominated by

Coast Cypress Pine (*Callitris collumellaris*) occurring on Pleistocene beach ridges and hind dunes.

Assemblage 3(b) Vegetation on Holocene dunes (Communities 34–36): COMMUNITY 34 is an open to closed forest on sand dunes, in which Coast Banksia (*Banksia integrifolia* subsp. *integrifolia*) dominates. The community has a closed mid-strata of littoral rainforest species, such as Logan Apple (*Acronychia imperforata*), and Tuckeroo (*Cupaniopsis anacardioides*). COMMUNITY 35 is a closed littoral forest with abundant Brush Box (*Lophostemon confertus*) often associated with Bennett's Ash (*Flindersia bennettiana*), Logan Apple, Bangalow Palm (*Archontophoenix cunninghamiana*), Rose Walnut (*Endiandra discolor*), Hard Corkwood (*Endiandra sieberi*), Three-veined Cryptocarya (*Cryptocarya triplinervis*), Cheese Tree (*Glochidion ferdinandi*) and Pear-fruited Tamarind (*Mischocarpus pyramidalis* subsp. *pyramidalis*). It occurs in the Tweed River area on coastal dunes and low-lying sandy tidal delta flats. COMMUNITY 36 is a foredune scrubland located on Holocene dunes, and dominated by Coast Wattle (*Acacia longifolia* var. *sophorae*), Coast Tea-tree (*Leptospermum laevigatum*) and Coast Banksia (*Banksia integrifolia* subsp. *integrifolia*), Horse-tail Sheoak (*Casuarina equisetifolia* subsp. *incana*) and Bitou Bush (*Chrysanthemoides monilifera* subsp. *rotundata*).

Assemblage 3(c) Headland grasslands (Community 37): This assemblage is a headland grassland with a closed cover of Kangaroo Grass (*Themeda australis*) and a low cover of emergent Coast Banksia (*Banksia integrifolia* subsp. *integrifolia*), Tuckeroo (*Cupaniopsis anacardioides*) and Screw Pine (*Pandanus tectorius* var. *australianus*). Associated vegetation includes the shrubs *Aotus ericoides* and *Scaevola calendulacea*, herbs *Wollastonia biflora* and *Xerochrysum bracteatum*, and the grasses *Cynodon dactylon* and *Eragrostis interrupta*.

Assemblage 3(d) Heathy Scribbly Gum on Pleistocene sands (Community 38): This assemblage is a low open forest of Scribbly Gum (*Eucalyptus signata*), Old-man Banksia (*Banksia serrata*) and Slender Tea-tree (*Leptospermum trinervium*) on elevated drier sites on a backbarrier flat. Heathy shrubs form the open mid-strata and include Old Man Banksia, Slender Tea-tree, Grass Tree (*Xanthorrhoea johnsonii*), *Homoranthus virgatus*, *Agiortia pedicellata*, Smooth Zieria (*Zieria laevigata*) and *Dillwynia retorta*. The ground layer consists of Grass Tree, *Dillwynia retorta*, Tootoon (*Leptospermum polygalifolium*), *Caustis recurvata*, Leafy-wedge Pea (*Gompholobium virgatum*) and *Coleocarya*

gracilis.

Assemblage 3(e) Wallum Banksia heath (Community 39): This assemblage, comprising a single community, is a heath or shrubland dominated by Wallum Banksia (*Banksia aemula*), *Homoranthus virgatus* and *Leptospermum trinervium*. It occurs on coastal barrier sands on Pleistocene dunes.

3.3.4 Primary Group 4 – Forests on alluvium or finely textured soils on coastal floodplains and foothills

Assemblage 4(a) Richmond Valley Brush Box wet sclerophyll forest (Communities 40, 41): This assemblage comprises two communities. COMMUNITY 40 has an open to closed forest structure with a wide variety of sclerophyllous emergents and mesic species, including Broad-leaved Paperbark (*Melaleuca quinquenervia*), Swamp Box (*Lophostemon suaveolens*), Red Ash (*Alphitonia excelsa*), Flooded Gum (*Eucalyptus grandis*) and Blackbutt (*Eucalyptus pilularis*). It is recorded from a range of sites on lower slope bedrock, coastal barrier sands and floodplains. COMMUNITY 41 is a tall moist open forest in which Brush Box (*Lophostemon confertus*) is frequently abundant and often occurs with Pink Bloodwood (*Corymbia intermedia*) and Grey Ironbark (*Eucalyptus siderophloia*). It is mostly found on high sedimentary quartz substrates of lower slopes.

Assemblage 4(b) Tweed–Brunswick Brush Box wet sclerophyll forest (Communities 42, 43): An assemblage of mesic open forest to rainforest with a mix of overstory emergents and found on lower slopes and floodplains in the Tweed and Brunswick River catchments. COMMUNITY 42 is closed tall mesic forest to rainforest with Brush Box (*Lophostemon confertus*), Blackbutt (*Eucalyptus pilularis*), Pink Bloodwood (*Corymbia intermedia*), Tallowwood (*Eucalyptus microcorys*), Grey Ironbark (*Eucalyptus siderophloia*) and, occasionally, Flooded Gum (*Eucalyptus grandis*). It mostly occurs in low and high sedimentary quartz sites and is also located on the alluvial plain (fan, backswamp, levee). Occasionally it occurs on coastal barrier sands and the estuarine plain. COMMUNITY 43 consists mostly of closed forest sites with abundant Brush Box, Camphor Laurel (*Cinnamomum camphora*) and *Guioa semiglauca*. *Eucalyptus* and bloodwood (*Corymbia*) species occur in the canopy, including Tallowwood, White Mahogany (*Eucalyptus acmenoides*), Flooded Gum and Pink Bloodwood. It is most commonly found on lower slopes and valley floors on

low sedimentary quartz substrates and, occasionally, on the alluvial plain (on valley flats and fans).

Assemblage 4(c) Tweed–Brunswick subtropical rainforests (Communities 44–47): This is an assemblage of species-rich subtropical rainforests. COMMUNITIES 44, 45 and 47 comprise emergent rainforest and eucalypt species, with the closed tallest strata including Bangalow Palm (*Archontophoenix cunninghamiana*), Hoop Pine (*Araucaria cunninghamii*), Red Bean (*Dysoxylum mollissimum* subsp. *molle*), Strangler Fig (*Ficus watkinsiana*), Moreton Bay Fig (*Ficus macrophylla*), White Booyong (*Heritiera trifoliata*) and Yellow Carabeen (*Sloanea australis*). These communities occur on lower slopes and floodplains on finely grained sedimentary rocks, basalt soils, alluvial plains and backbarrier flats on sands. COMMUNITY 46 is a Stinging Tree subtropical rainforest, consisting of a closed forest community of Brush Bloodwood (*Baloghia inophylla*), White Fig (*Ficus virens* var. *sublanceolata*) and Stinging Tree (*Dendrocnide excelsa*). It is found on basalts soils on low rolling hills.

Assemblage 4(d) Forest Red Gum swamp sclerophyll/ wet sclerophyll open forests

(Community 48–51): This is a mixed assemblage of wet sclerophyll forests of lower slopes. COMMUNITY 48 is a wet sclerophyll forest of Blackwood (*Acacia melanoxylon*), Flooded Gum (*Eucalyptus grandis*), Hard Quandong (*Elaeocarpus obovatus*) and Pink-flowered Doughwood (*Melicope elleryana*), found on alluvial plains (floodplain, channels and fans) and undifferentiated sediments (freshwater swamps). COMMUNITY 49 is an open forest of Camphor Laurel (*Cinnamomum camphora*) associated with Forest Red Gum (*Eucalyptus tereticornis*), Brush Box (*Lophostemon confertus*) and Pink Bloodwood (*Corymbia intermedia*). It occurs on basalt and low sedimentary quartz geology on rolling hills. COMMUNITY 50 is an open swamp sclerophyll forest community dominated by Forest Red Gum, Swamp Oak (*Casuarina glauca*), Swamp Box (*Lophostemon suaveolens*), Pink Bloodwood, Broad-leaved Paperbark (*Melaleuca quinquenervia*), Swamp Mahogany (*Eucalyptus robusta*) and Willow Bottlebrush (*Callistemon salignus*). It is located in backswamps, levees and valley flats on the alluvial plain, and wetter sites on coastal barrier sands. COMMUNITY 51 is an open forest community with Forest Red Gum, Broad-leaved Paperbark and Willow Bottlebrush, on the alluvial plain (floodplains) and estuarine plain (saline swamps).

Assemblage 4(e) Fig–quandong rainforest on

Pleistocene dunes (Community 52): A closed forest dominated by Small-leaved Fig (*Ficus obliqua*), White Fig (*Ficus virens*), Hard Quandong (*Elaeocarpus obovatus*) and Pepperberry (*Cryptocarya obovata*). It occurs on coastal barrier sand on a Pleistocene dune.

Assemblage 4(f) Whalebone Tree dry rainforest (Community 54). Riparian dry rainforest sites dominated by Whalebone Tree (*Streblus brunonianus*), Rough-leaved Elm (*Aphananthe philippinensis*) and Small-leaved Tuckeroo (*Cupaniopsis parvifolia*), with a middle strata of Whalebone Tree, Green Native Cascarilla (*Croton verreauxii*), Thorny Pea (*Desmodium acanthocladum*), Sweet Myrtle (*Gossia fragrantissima*), Cockspur Thorn (*Maclura cochinchinensis*) and Orange Thorn (*Pittosporum multiflorum*).

Assemblage 4(g) Dry sclerophyll grassy open forests (Communities 55–61): An assemblage of six lower slope dry open forest communities with a grassy or ferny lower layer located on sediments, basalt and coastal barrier sands. COMMUNITY 55 consists of Grey Ironbark (*Eucalyptus siderophloia*) associated with Thick-leaved Mahogany (*Eucalyptus carnea*), Pink Bloodwood (*Corymbia intermedia*), Blackbutt (*Eucalyptus pilularis*) and, occasionally, Brush Box (*Lophostemon confertus*) and Swamp Box (*Lophostemon suaveolens*) or, rarely, Small-fruited Grey Gum (*Eucalyptus propinqua*). This community is found on drier sites on sedimentary low-elevation coastal hills and, rarely, on coastal barrier sands and basalt soils. COMMUNITY 56 is a swamp sclerophyll forest of Broad-leaved Paperbark (*Melaleuca quinquenervia*), Tuckeroo (*Cupaniopsis anacardioides*), Swamp Oak (*Casuarina glauca*) and Swamp Box with a lower layer of shrubs or ferns. It is found on the alluvial plain, coastal barrier sands and sedimentary soils on rolling hills. COMMUNITY 57 is a dry open forest of Red Mahogany (*Eucalyptus resinifera*) associated with Pink Bloodwood, Swamp Mahogany (*Eucalyptus robusta*), Swamp Box and Willow Bottlebrush (*Callistemon salignus*). It occurs on wet transferral soils in alluvial backswamps and valley flats, and low sedimentary quartz soils on rolling low hills. COMMUNITY 58 is a tall dry open forest of Pink Bloodwood, Grey Ironbark, Swamp Box, Forest Red Gum (*Eucalyptus tereticornis*) and Blackbutt. Occasional canopy species include Narrow-leaved Red Gum (*Eucalyptus seeana*), White Mahogany (*Eucalyptus acmenoides*), Thick-leaved Mahogany, Tallowwood (*Eucalyptus micorcorys*) and Broad-leaved Rough-barked Apple (*Angophora subvelutina*). Community 58 is found on the stagnant alluvial plain in the

Bungawalbin catchment, on undulating low hills, gently undulating rises on low sedimentary quartz geology in the Tabbimoble Lowlands, and also on basalt soils on the Blackwall Range. COMMUNITY 59 is a dry grassy open forest growing on sedimentary soils of low hills and undulating rises, with Large-fruited Spotted Gum (*Corymbia henryi*), Small-fruited Grey Gum, Forest Red Gum and Tindale's Stringybark (*Eucalyptus tindaliae*). There is a middle stratum of shrubs and small trees, including Salwood (*Acacia disparrima* subsp. *disparrima*) and Red Ash (*Alphitonia excelsa*). COMMUNITY 60 is a dry grassy open forest in which Grey Ironbark occurs with or without Thin-leaved Stringybark (*Eucalyptus eugeniodes*). It is found on the alluvial plains and gently undulating rises on high sedimentary quartz parent material in the Tabbimoble Lowlands. COMMUNITY 61 is a grassy, dry alluvial open forest of Broad-Leaved Paperbark, Narrow-leaved Rough-barked Apple (*Angophora paludosa*), Swamp Box, Pink Bloodwood and Forest Red Gum. It occurs on a wide alluvial drainage plain on gently undulating rises on Sandy Creek in the Bungawalbin Catchment.

Table 3(vi) Endangered Ecological Communities represented in communities identified in this survey of the Far North Coast of NSW.

NSW Endangered Ecological Community	FNC Vegetation Community
Coastal Saltmarsh in the NSW North Coast, Sydney Basin and South East Corner bioregions	Communities 1, 2, 7, 9
Freshwater wetlands on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions	Communities 2, 25, 26, 30
Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions	Communities 3, 4, 10, 11, 12, 13, 14, 15, 23, 26, 28, 40, 53
Swamp oak floodplain forest of the NSW North Coast, Sydney Basin and South East Corner bioregions	Communities 5, 7, 8
Sub-tropical Coastal Floodplain Forest of the NSW North Coast bioregion	Communities 20, 29, 50, 51, 61
Lowland rainforest on floodplain in the NSW North Coast Bioregion	Communities 6, 27, 44, 45, 46, 47, 54, 56
Themeda Grassland on seacliffs and coastal headlands in the NSW North Coast, Sydney Basin and South East Corner bioregions	Communities 38
Littoral rainforest in the NSW North Coast, Sydney Basin and South East Corner Bioregions	Communities 35, 52
Lowland Rainforest in NSW North Coast and Sydney Basin Bioregion	Communities 40, 44, 45, 46, 47, 56

3.4 Endangered Ecological Communities

Of the 62 vegetation communities delineated in this survey, 37 are equivalent to nine Endangered Ecological Communities (EEC) listed under the *Threatened Species Conservation Act 1995* (TSC) (Table 3(vi)). The data collected in this survey improves the knowledge of the floristic variation, structure and distribution of these EECs on the FNC of New South Wales. These EECs are much more diverse in terms of species composition and community types than currently documented in the final determinations by the NSW Scientific Committee (established under the NSW Threatened Species Conservation Act 1995). The present survey also improves the knowledge of the variation in, and the floristic composition and environmental relationships of many floodplain and lowland EECs, and will assist in the further delineation and field identification of the EECs on the FNC.

Table 3(vi) lists Endangered Ecological Communities represented in communities identified in this survey of the Far North Coast of NSW.

3.5 Taxa of conservation significance

Of the 1027 taxa recorded during these surveys, 21 are listed as endangered species, and 18 as vulnerable species, under the TSC; 11 are ROTAP species (Briggs & Leigh 1996); and five regionally rare taxa were recorded (Sheringham & Westaway, 1995). A total of 20 species are listed under the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth) (EPBC). The most frequently recorded rare plant in the survey was *Cordyline congesta*, which was recorded at 35 sites and from 11 communities. *Endiandra globosa* (22 sites) and *Cupaniopsis newmanii* (17 sites) were also commonly recorded.

Within the four primary vegetation groups identified, no threatened plant species were recorded in Primary Group 1 – Saline wetlands. Nine threatened or significant plant species were recorded in Primary Group 2 – Freshwater, seasonally–permanently inundated soils: *Cladium procerum*, *Cordyline congesta*, *Trichosanthes subvelutina*, *Acronychia littoralis* (Scented Acronychia), *Arthrochilus prolixus*, *Scleria levis*, *Eleocharis tetraquetra*, *Scleria rugosa* and *Persicaria*

elator. Within Primary Group 3 – Coastal barrier sand sites and headland sites, several species were recorded: *Geodorum densiflorum* (Shepherd's Crook Orchid), *Corokia whiteana*, *Arthrochilus prolixus*, *Cordyline congesta*, and *Cryptocarya foetida* (Stinking Laurel).

Primary Group 4 – Forests on alluvium or finely textured soils of coastal floodplains and foothills, had the highest number of significant plant species records. Subtropical rainforest communities 43, 44, 45 and 47 contained the largest number of threatened and rare plant taxa. There was a higher richness of threatened species in the Tweed–Brunswick rainforests compared to wet sclerophyll forests and Richmond River rainforests. Ruthven dry gallery rainforest community

(54) was the locality for *Desmodium acanthocladum* (Thorny Pea) and *Gossia fragrantissima* (Sweet Myrtle). A large proportion of significant taxa were rainforest or wet sclerophyll forest trees and shrubs that were primarily located in the Tweed–Brunswick River catchments.

Dry sclerophyll communities 55–61 supported populations of the the significant species, *Scleria rugosa*, *Arthrochilus prolixus* and *Cordyline congesta*. Interesting records of some endangered orchid species (*Dendrobium melaleucaphilum*, *Oberonia complanata*, *Oberonia titania*) were made in wet and dry sclerophyll forest (Communities 48–55). Profiles for all threatened plant species are listed below (section 3.6).

Table 3(vii) Plant species of conservation significance recorded in the FNC study area.

TSC, Threatened Species Conservation Act 1995; EPBC, Environment Protection and Biodiversity Conservation Act 1999; ROTAP, Rare or Threatened Australian Plants.

Taxon	TSC Act	EPBC Act	ROTAP	Rare
<i>Acacia bakeri</i>	Vulnerable			
<i>Acianthus amplexicaulis</i>			2RC-	
<i>Acronychia baeuerlenii</i>			3RC-	
<i>Acronychia littoralis</i>	Endangered	Endangered		
<i>Archidendron hendersonii</i>	Vulnerable			
<i>Archidendron muellerianum</i>			3RCa	
<i>Argophyllum nullumense</i>			3RCa	
<i>Arthrochilus prolixus</i>			2K	
<i>Bosistoa transversa</i>	Vulnerable	Vulnerable		
<i>Brunoniella spiciflora</i>				Rare
<i>Callerya australis</i>			3RC	
<i>Cassia brewsteri</i> var. <i>marksiana</i>	Endangered			
<i>Cordyline congesta</i>			2RC-	
<i>Corokia whiteana</i>	Vulnerable	Vulnerable		
<i>Cryptocarya foetida</i>	Vulnerable	Vulnerable		
<i>Cupaniopsis newmanii</i>			2RC-	
<i>Davidsonia jerseyana</i>	Endangered	Endangered		
<i>Dendrobium melaleucaphilum</i>	Endangered			
<i>Dendrocnide morioides</i>	Endangered			
<i>Desmodium acanthocladum</i>	Vulnerable	Vulnerable		
<i>Dianella brevipedunculata</i>				Rare

Taxon	TSC Act	EPBC Act	ROTAP	Rare
<i>Diospyros mabacea</i>	Endangered	Endangered		
<i>Diospyros major</i> var. <i>ebenus</i>	Endangered			
<i>Diploglottis campbellii</i>	Endangered	Endangered		
<i>Elaeocarpus</i> sp. Rocky Creek	Endangered	Endangered		
<i>Elaeocarpus williamsianus</i>	Endangered	Endangered		
<i>Eleocharis tetraquetra</i>	Endangered			
<i>Endiandra floydii</i>	Vulnerable			
<i>Endiandra globosa</i>			2RC-	
<i>Endiandra hayesii</i>	Vulnerable	Vulnerable		
<i>Endiandra muelleri</i> subsp. <i>bracteata</i>	Endangered			
<i>Fontainea australis</i>	Vulnerable	Vulnerable		
<i>Gahnia isignis</i>			3RCa	
<i>Geodorum densiflorum</i>	Endangered			
<i>Gossia fragrantissima</i>	Endangered	Endangered		
<i>Grevillea hilliana</i>	Endangered			
<i>Hicksbeachia pinnatifolia</i>		Vulnerable	3RC-	
<i>Lepiderema pulchella</i>	Vulnerable			
<i>Lindsaea brachypoda</i>	Vulnerable			
<i>Macadamia tetraphylla</i>	Vulnerable	Vulnerable		
<i>Marsdenia longiloba</i>	Endangered			
<i>Oberonia complanata</i>	Endangered			
<i>Oberonia titania</i>	Vulnerable			
<i>Ochrosia moorei</i>	Endangered	Endangered		
<i>Peristeranthus hillii</i>	Vulnerable			
<i>Persicaria elatior</i>	Vulnerable	Vulnerable		
<i>Polygala linariifolia</i>	Endangered			
<i>Randia moorei</i>	Endangered	Endangered		
<i>Rhodamnia maideniana</i>			2RC-	
<i>Scleria levis</i>				Rare
<i>Sida cordifolia</i>				Rare
<i>Syzygium hodgkinsoniae</i>	Vulnerable	Vulnerable		
<i>Syzygium moorei</i>	Vulnerable	Vulnerable		
<i>Tinospora tinosporoides</i>	Vulnerable	Vulnerable		
<i>Trichosanthes subvelutina</i>			3RC-	
<i>Xylosma terrae-reginae</i>	Endangered			

Figure 3.3. Locations of records of species of conservation significance threatened species from the present survey of the FNC study area.

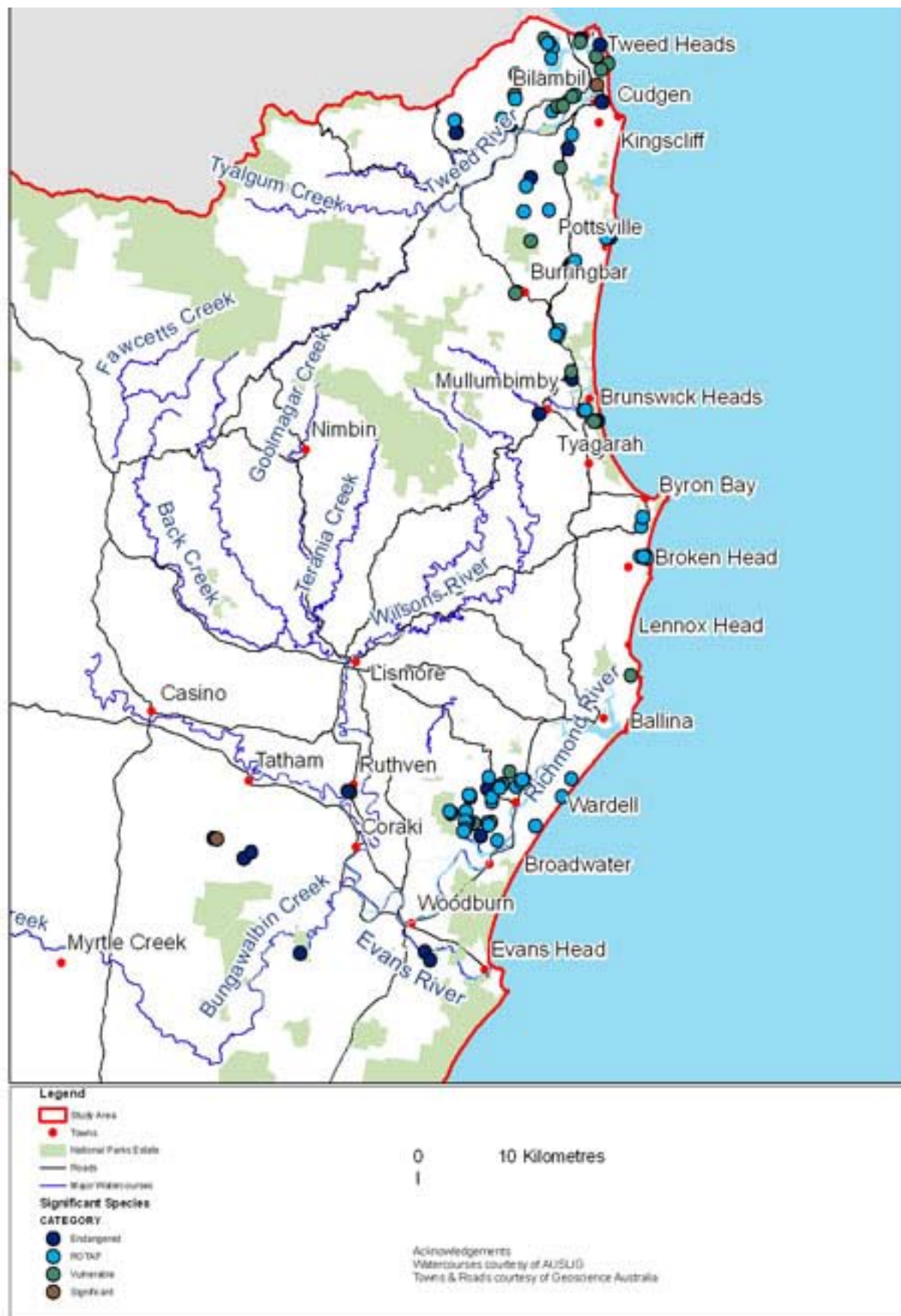


Table 3(viii) Species of Conservation Significance, the communities in which they were recorded, and the habitat in which they occur.

Taxon	Communities	Habitat
<i>Acacia bakeri</i>	43, 44, 45	Subtropical rainforest on rolling hills on meta-sedimentary soils and less commonly on the alluvial plain
<i>Acianthus amplexicaulis</i>	43	Brush Box rainforest on meta-sediments
<i>Acronychia baeuerlenii</i>	41, 44, 45	Lower Richmond Brush Box and Tweed/Brunswick Valley subtropical rainforest on the floodplain and also meta-sedimentary soils
<i>Acronychia littoralis</i>	19, 42	Dunal paperbark woodland and brush box forest on Pleistocene dunes
<i>Archidendron hendersonii</i>	35, 43, 44, 45, 47	Brush Box rainforest and subtropical rainforest on basalt, meta-sediments and also moist sites on sand and the floodplain
<i>Archidendron muellerianum</i>	41, 43, 44, 45	Brush Box wet sclerophyll forest and subtropical rainforest on low-elevation meta-sedimentary coastal hills
<i>Argophyllum nullumense</i>	44	Brush Box foothill wet sclerophyll forest and subtropical rainforest on meta-sedimentary hills
<i>Arthrochilus prolixus</i>	20, 32, 55, 57	Swamp Box open forest and dry sclerophyll forest on high sedimentary quartz soils and coastal sandplains
<i>Bosistoa transversa</i>	44, 47	Subtropical rainforest on basalt and meta-sedimentary low-elevation rolling hills
<i>Brunoniella spiciflora</i>	43, 44	Subtropical rainforest on meta-sedimentary lower slopes
<i>Callerya australis</i>	43, 44, 45	Subtropical rainforest on meta-sedimentary rolling hills
<i>Cassia brewsteri</i> var. <i>marksiana</i>	35, 44	Subtropical rainforest on basalt and meta-sedimentary low-elevation rolling hills
<i>Cordyline congesta</i>	11, 12, 14, 32, 35, 40, 41, 44, 47, 53, 57	Swamp sclerophyll forests, subtropical rainforest, littoral rainforest, Brush Box forests and dry open forests on the alluvial plain, coastal sandplains and dunes and high sedimentary quartz soils
<i>Corokia whiteana</i>	31	Scribbly Gum open forest on Pleistocene sands
<i>Cryptocarya foetida</i>	34, 35, 40, 45, 48, 52	Coast Banksia dunal shrubland, Brush Box littoral rainforest, Lower Richmond floodplain mesic wet sclerophyll forests and subtropical rainforest on basalt, coastal barrier sands, and meta-sediments
<i>Cupaniopsis newmanii</i>	43, 44, 45, 47	Subtropical rainforest on meta-sedimentary rolling hills and occasionally on basalt and alluvium
<i>Davidsonia jerseyana</i>	43, 44, 49	Subtropical rainforest on meta-sedimentary rolling hills and occasionally on alluvium
<i>Dendrobium melaleucaphilum</i>	50	Swamp Oak swamp forest on undifferentiated soils with a saline influence
<i>Dendrocnide morioides</i>	45	Subtropical rainforest
<i>Desmodium acanthocladum</i>	56	Subtropical rainforest on meta-sedimentary soils on rolling hills
<i>Dianella brevipedunculata</i>	61	Narrow-leaved–Rough-barked Apple-Swamp Box dry open forest on the floodplain of Myrtle Creek
<i>Diospyros mabacea</i>	47	Subtropical rainforest on meta-sedimentary lower slopes
<i>Diospyros major</i> var. <i>ebenus</i>	44, 45, 47	Subtropical rainforest on basalt and meta-sediment mid and lower slopes

Taxon	Communities	Habitat
<i>Diploglottis campbellii</i>	47	Subtropical rainforest on basalt and meta-sediment low-elevation coastal hills
<i>Elaeocarpus</i> sp. Rocky Creek	43	Subtropical rainforest on meta-sedimentary mid-slopes
<i>Elaeocarpus williamsianus</i>	43	Subtropical rainforest on footslopes on meta-sediments
<i>Eleocharis tetraquetra</i>	23	Riparian alluvial swamp sclerophyll forest
<i>Endiandra floydii</i>	43, 44, 45	Subtropical rainforest on meta-sediment rolling hills and also on alluvium
<i>Endiandra globosa</i>	43, 44, 45	Subtropical rainforest on low-elevation coastal hills on meta-sediments
<i>Endiandra hayesii</i>	42, 44, 45, 47	Subtropical rainforest and Lower Richmond Brush Box forest on meta-sediment rolling hills and also on alluvium backswamps
<i>Endiandra muelleri</i> subsp. <i>bracteata</i>	41, 43, 44 45	Subtropical rainforest and Lower Richmond Brush Box mesic on lower slope, meta-sedimentary and also on alluvial terraces
<i>Fontainea australis</i>	43	Lower slope, low sedimentary quartz soils in subtropical rainforest
<i>Gahnia isignis</i>	43	Lower slope, low sedimentary quartz soils in subtropical rainforest
<i>Geodorum densiflorum</i>	36	Coastal scrubland on a Holocene dune
<i>Gossia fragrantissima</i>	54	Riparian dry rainforest
<i>Grevillea hilliana</i>	35, 44, 47	Lowland subtropical rainforest and Brush Box littoral rainforest on basalt and meta-sediments
<i>Hicksbeachia pinnatifolia</i>	44	Subtropical rainforest on metamorphic sedimentary on rolling hills
<i>Lepiderema pulchella</i>	42, 44, 45 47	Subtropical rainforest and Tweed–Brunswick Brush Box foothill wet sclerophyll mostly on meta-sediments but also on basalt rolling hills and backswamp on alluvium
<i>Lindsaea brachypoda</i>	41, 43	Subtropical rainforest Lower Richmond Brush Box mesic tall open forest in gully sites
<i>Macadamia tetraphylla</i>	43, 44, 47	Subtropical rainforest on low-elevation rolling coastal hills on meta-sediments and basalt
<i>Marsdenia longiloba</i>	42, 43	Brush Box forest, Brush Box gully rainforest on coarse grained sediments of the Woogaroo Subgroup and also meta-sediments
<i>Oberonia complanata</i>	58	Forest Red Gum–Swamp Box with a saline influence
<i>Oberonia titania</i>	58	Blackbutt–Brush Box wet sclerophyll forest on lower slopes on coarse grained sediments
<i>Ochrosia moorei</i>	44, 45	Subtropical rainforest on fluvial sands and also on alluvial terrace
<i>Peristeranthus hillii</i>	45	Subtropical rainforest growing on meta-sediments near Terranora
<i>Persicaria elatior</i>	13	Swamp sclerophyll forest site on coastal sandplains
<i>Polygala linariifolia</i>	61	Alluvial plain in swamp sclerophyll forest with a grassy lower layer
<i>Randia moorei</i>	43, 44 47	Brush Box gully rainforest and subtropical rainforest growing on meta-sediments, basalt and alluvium
<i>Rhodamnia maideniana</i>	43, 44, 45 47	Subtropical rainforest commonly on low-elevation meta-sedimentary coastal hills and also on basalt

Taxon	Communities	Habitat
<i>Scleria levis</i>	20	Swamp sclerophyll forest on coastal sandplains
<i>Sida cordifolia</i>	33	Closed forest of <i>Callitris collumellaris</i> on coastal barrier sands near Simpsons Creek
<i>Syzygium hodgkinsoniae</i>	43, 44, 47, 54	Gallery 'dry' rainforest on alluvium, and subtropical rainforest on alluvial terrace and meta-sedimentary soils
<i>Syzygium moorei</i>	35, 44, 45, 47	Brush Box littoral rainforest and subtropical rainforest communities on low-elevation meta-sediment and basalt coastal hills
<i>Tinospora tinoporoides</i>	45	Subtropical rainforest on coastal sandplains
<i>Trichosanthes subvelutina</i>	14	Swamp Mahogany with a mid-storey of palms and lilly pilly
<i>Xylosma terrae-reginae</i>	45	Subtropical rainforest on a coastal barrier sands

3.6 Taxa of conservation significance

The following discussion lists all taxa of conservation significance recorded in the FNC study area, identifying the distribution of the species in the study area in terms of the sites from which each was recorded and in which of the 62 vegetation communities it is found. The status is also given: species identified as vulnerable and endangered species are those identified as such under the NSW TSC; species identified as rare are those plants listed by Sheringham and Westaway (1995), the remaining coded, species are ROTAP species (Briggs and Leigh, 1996).

Acacia bakeri Vulnerable (TSC)

Baker's Wattle, Marblewood, Scrub Wattle, White Marblewood.

This species was recorded from seven sites, including Sleepy Hollow and Charles Bay, Terranora. The species was found growing in subtropical rainforest on rolling hills on meta-sedimentary soils and, less commonly, on the alluvial plain and alluvial soils.



Acacia bakeri

Acianthus amplexicaulis 2RC-

An autumn flowering orchid occurring in coastal and escarpment habitats. It was recorded near Ocean Shores on meta-sedimentary derived soils in Brush Box (*Lophostemon confertus*) littoral rainforest. It is also known from Broken Head, Bundjalung National Park, Iluka and Bagotville, and in Queensland.

Acronychia baeuerlenii 3RC

Byron Bay Acronychia.

The Byron Bay Acronychia is recorded from Lismore to Byron Bay and from the McPherson Range. It

was recorded from three sites in the present survey, at Terranora and Buckombil Mountain, in Lower Richmond Brush Box and Tweed–Brunswick Valley subtropical rainforest communities, on the floodplain and on meta-sedimentary soils.

Acronychia littoralis Endangered (TSC)

Scented Acronychia.

Scented Acronychia is distributed from Fraser Island in Queensland to Port Macquarie, NSW. It was recorded in two sites in the current survey, near Chinderah and at North Pottsville, in dunal paperbark woodland and Brush Box on Pleistocene dunes.



Acronychia littoralis

Archidendron hendersonii Vulnerable (TSC)

White Lace Flower, Tulip Siris.

Recorded from 12 sites, including at Ukerebagh, Terranora, Tandys Lane, and from north of Brunswick Heads and as far south as Tuckean Broadwater. It was recorded in Brush Box littoral rainforest, Brunswick–Tweed Brush Box forest and subtropical rainforest communities, on basalt and meta-sediments and also in moist sites on sands and on the floodplain.

Archidendron muellerianum 3RCa

Veiny Laceflower, Small-flower Laceflower.

Recorded from 11 sites, including Buckombil Mountain and Sleepy Hollow. It was recorded in Lower Richmond Brush Box/wet sclerophyll forest and Tweed–Brunswick Valley subtropical rainforest communities on low elevation meta-sedimentary coastal hills.

Argophyllum nullumense 3RCa

Silver Leaf.

Recorded from two sites, including Clothiers Creek Road, in Tweed–Brunswick Brush Box foothill wet sclerophyll forest and Tweed–Brunswick Valley subtropical rainforest communities on meta-sedimentary hills.

Arthrochilus prolixus 2K

A poorly known orchid species, it was recorded at four sites, including Wardell, Tweed Environmental Park near Pottsville, and near Brunswick Heads. The species is also found in Queensland. It was recorded on Quaternary sands, high sedimentary quartz soils, and estuarine soils, in Swamp Box (*Lophostemon suaveolens*) open forest and dry sclerophyll forest on high sedimentary quartz soils and coastal sandplains.

Bosistoa transversa Vulnerable (TSC)

Three-leaved Bosistoa.

Recorded in two sites in subtropical rainforest at Terranora and Tweed River. It was in subtropical rainforest on basalt and meta-sedimentary low-elevation rolling hills.

Brunoniella spiciflora Rare (NSW)

This species is apparently rare in NSW, where it has a southern limit on the FNC. The species extends into Queensland. In the present survey, *B. spiciflora* was found in two sites, at Reserve Creek and Palmdale, on lower slope subtropical rainforests on sedimentary soils

Callerya australis 3RC

Native Wisteria.

Recorded in three sites, Taggets Hill, Sleepy Hollow and Terranora, in subtropical rainforest on meta-sedimentary rolling hills.

Cassia brewsteri* var. *marksiana Endangered (TSC)

Native Laburnum.

Recorded in two sites, on the Terranora Plateau and Barneys Point, in subtropical rainforest and Brush Box lowland rainforest.



Cassia brewsteri var. *marksiana*

Cordyline congesta 2RC-

Palm Lily.

This species was common and widespread in the study area. It was recorded in 35 sites, from Wardell, Ballina and Tweed Heads. It was a dominant species in some sites. It was frequently recorded in the Wardell–Tuckean area, often on alluvial soils and coastal barrier sands, but also on high sedimentary quartz soils and, infrequently, on estuarine soils. It was found in 11 communities, including swamp sclerophyll forests, subtropical rainforest, littoral rainforest, Brush Box forests and dry open forests.



Cordyline congesta

Corokia whiteana Vulnerable (TSC)

There was a single record of this species, in Scribbly Gum (*Eucalyptus signata*) dry open forest on Pleistocene sands, at Tandys Lane, near Byron Bay.

Cryptocarya foetida Vulnerable (TSC)

Stinking Cryptocarya.

Recorded in nine sites, including at Terranora Broadwater, Tweed River, Tweed Heads, Fingal, Chinderah, Cudgera Creek Nature Reserve, Sleepy Hollow, Broken Head and Lennox Head. The species had high cover-abundance in several sites. It was found in rainforest on Holocene and Pleistocene dunes and also on sedimentary and basalt soils. It was recorded in Coast Banksia (*Banksia integrifolia* subsp. *integrifolia*) dunal shrubland, Brush Box littoral rainforest, Lower Richmond floodplain mesic wet sclerophyll forests, and subtropical rainforest on basalt, coastal barrier sands, and meta-sediments.

Cupaniopsis newmanii 2RC-

Long-leaved Tuckeroo.

This species was recorded in 17 sites, most of which were in the Tweed River Valley (Cobaki, Terranora, Urliup, Terranora Broadwater and Durobby Creek), with others further south, near Mooball and the Brunswick Heads Bypass. It was recorded in subtropical rainforest.



Cupaniopsis newmanii

Davidsonia jerseyana Endangered (TSC)

Davidson's Plum.

Recorded in five sites in rainforest, including Sleepy Hollow, Mullumbimby, Brunswick Heads Bypass and Mooball village. It was found in subtropical rainforest and Camphor Laurel (*Cinnamomum camphora*) open forest.

Dendrobium melaleucaphilum Endangered (TSC)

Spider Orchid.

This sensitive and endangered orchid was recorded at only a single site, the location of which is not provided for the security of the species. Its habitat was a Swamp Oak (*Casuarina glauca*) swamp forest on undifferentiated soils with a saline influence.



Dendrobium melaleucaphilum

Dendrocnide moroides Endangered (TSC)

Gympie Stinger.

Recorded at only one site, at Urliup in the Upper Tweed River valley, in Brush Box open forest, on rolling hills on meta-sedimentary soils. On the FNC, Gympie Stinger has also been found at Cudgen and on the Burringbar Range, where it is reserved in Mooball National Park. Gympie Stinger is endangered in NSW, but is more common in Queensland.



Dendrocnide moroides

Desmodium acanthocladum Vulnerable (TSC)

Thorny Pea.

Recorded in two sites at Ruthven Recreation Reserve, in Riparian rainforest on an alluvial backswamp with emergent Swamp Oak. Elsewhere on the FNC the species is recorded at Lismore, Wilsons Creek, Wanganui and Coraki. It was recorded in dry rainforest.

Dianella brevipedunculata Rare (NSW)

There was only one record of this species, near Tatham, in Narrow-leaved Rough-barked Apple Swamp Box dry open forest on the floodplain of Myrtle Creek. The species is apparently rare in NSW, where it is also known from the Tweed Heads area on the FNC. The record in the present survey is a possible southern limit for the species. The species also occurs in south-eastern Queensland.

Diospyros mabacea Endangered (TSC)

Red-fruited Ebony.

The species was recorded at only one site, in subtropical rainforest on meta-sedimentary lower slopes.



Diospyros mabacea

Diospyros major* var. *ebenus Endangered (TSC)

Ebony.

Recorded in three sites, all in the Terranora area. The habitat was subtropical rainforest on basalt and meta-sediments on mid- and lower slopes.



Diospyros ebenus var. *ebenus*

Diploglottis campbellii Endangered (TSC)

Small-leaved Tamarind.

Recorded in three sites, at Farrants Hill and Terranora, in subtropical rainforest on basalt and meta-sediments on low-elevation coastal hills.



Diploglottis campbellii

Elaeocarpus sedentarius (sp. Rocky Creek)
Endangered (TSC)

Minyon Quandong.

This record, from the Tweed Lowlands, at Urliup, represents a significant range extension for the species. The species is endemic to the FNC, with its main occurrence in the Minyon Falls area. It was recorded in subtropical rainforest on meta-sedimentary mid-slopes.



Elaeocarpus sedentarius (sp. Rocky Creek.)

Elaeocarpus williamsianus Endangered (TSC)

Hairy Quandong.

There was one record of this species, at Ocean Shores East, in Brush Box–Guoia rainforest on meta-sedimentary footslopes.



Elaeocarpus williamsianus

Eleocharis tetraquetra Endangered (TSC)

This species was recorded once, in a riparian Swamp sclerophyll forest on an alluvial fan.

Endiandra floydii Vulnerable (TSC)

There were seven records, including at Sleepy Hollow, Urliup, Brunswick Heads and Cudgera Creek Road. It was recorded in subtropical rainforest on meta-sediments on rolling hills and on alluvium.

Endiandra globosa 2RC-

There were 22 records, with locations including Terranorra, Tumbulgum, Urliup, Taggarts Hills, Sleepy Hollow, Billinudgel Nature Reserve and Ocean Shores. It was recorded in subtropical rainforest on low-elevation coastal hills on meta-sediments.



Endiandra globosa

Endiandra hayesii Vulnerable (TSC)

Rusty Rose Walnut.

The species was recorded in seven sites, including Terranorra, Urliup, Coolgardie Road and Tuckean. It was found in subtropical rainforest and Lower Richmond Brush Box forest on meta-sedimentary rolling hills and on alluvium backswamps.



Endiandra hayesii

Endiandra muelleri* subsp. *bracteata Endangered (TSC)

Green-leaved Rose Walnut.

The species was recorded in subtropical rainforest and Lower Richmond Brush Box mesic wet sclerophyll forest on lower slope, meta-sediments and also on alluvial terraces from near Buckombil Mountain north to the Tweed Valley.

Fontainea australis Vulnerable (TSC)

Southern Fontainea.

The species was recorded in one site, on lower slope, low sedimentary quartz soils in subtropical rainforest.



Fontainea australis

Gahnia isignis 3RCa

Gahnia isignis was recorded in one site west of Mooball, in rainforest on rolling hills on sediments. It is elsewhere known from Mount Jerusalem and the Nightcap Range in subtropical rainforest.

Geodorum densiflorum Endangered (TSC)

Shepherd's Crook Orchid.

This orchid was recorded at a single site, on a Holocene dune swale, in coastal scrubland.



Geodorum densiflorum

Gossia fragrantissima Endangered (TSC)

Sweet Myrtle.

Sweet Myrtle was recorded in two riparian sites, in riparian dry rainforest on alluvium, at Ruthven Recreation Reserve.

Grevillea hilliana Endangered (TSC)

White Yiel Yiel, White Silky Oak.

This endangered grevillea was recorded in nine sites on lower slope basalt and sedimentary soils in the Tweed Lowlands. It was found in subtropical rainforest and Brush Box littoral rainforest.



Grevillea hilliana

Hicksbeachia pinnatifolia 3RC-

Red Bopple Nut.

This species was recorded in one site in subtropical rainforest.

Lepiderema pulchella Vulnerable (TSC)

Fine-leaved Tuckeroo.

This Tuckeroo was found in 12 sites, in Wet Sclerophyll forest, and Subtropical Rainforest at low elevations on metas-sedimentary and basalt hillslopes in the Tweed and Brunswick River Valleys.



Lepiderema pulchella

Lindsaea brachypoda Vulnerable (TSC)

The species was recorded at two sites. It has not previously been recorded in systematic surveys on the FNC, and occurs at its southern limit in the study area. It was found in subtropical rainforest and Lower Richmond Brush Box mesic forest.



Lindsaea brachypoda

Macadamia tetraphylla Vulnerable (TSC)

There were a total of nine records of this species during the surveys, at Terranorra, Pottsville and Mooball. It was recorded in subtropical rainforest.



Macadamia tetraphylla

Marsdenia longiloba Endangered (TSC)

Marsdenia longiloba was found in three sites, at Bagotville, Yelgun, in Billinudgel Nature Reserve, and at Wardell. Habitats in which the species was found were Tallowood Brush Box Wet Sclerophyll Forest, and Tweed–Brunswick Brush Box Gully Rainforest on meta-sediments.

Oberonia complanata Endangered (TSC)

This species was located at only one site, in Pink Bloodwood–Grey Ironbark–Swamp Box–Forest Red Gum–Blackbutt tall dry open forest.



Oberonia complanata

Oberonia titania Vulnerable (TSC)

This *Oberonia* was recorded at only one site in Pink Bloodwood–Grey Ironbark–Swamp Box–Forest Red Gum–Blackbutt tall dry open forest.

Ochrosia moorei Endangered (TSC)

Southern Ochrosia.

This species was found at two sites, at Tuckean Broadwater and Brunswick Heads, in subtropical rainforest.

Peristeranthus hillii Vulnerable (TSC)

The species was found in one site, near Terranora, in subtropical rainforest on sedimentary soils.



Peristeranthus hillii

Persicaria elatior Vulnerable (TSC)

This vulnerable species was recorded once, near Bagotville, on coastal barrier sands in a swamp sclerophyll forest with a ferny understorey.

Randia moorei Endangered (TSC)

Spiny Gardenia.

Randia moorei was found at 13 sites, from Tweed Heads, Terranora Broadwater, Sleepy Hollow and Cudgera Creek, in subtropical rainforest.



Randia moorei

Rhodamnia maideniana 2RC-

Smooth Scrub Turpentine.

The species was recorded in 14 sites, in several subtropical rainforest communities.

Scleria levis Rare

Scleria levis was found in one site, at Round Mountain Road, Cudgen. It is also known from Yuraygir National Park and from near Woodburn. It was recorded from Swamp Box–Broad-leaved Paperbark–rush/fern swamp sclerophyll forest.

Sida cordifolia Rare

This species was recorded only once, at Brunswick Heads. The habitat was a closed forest of *Callitris collumellaris* on coastal barrier sands near Simpsons Creek.

Syzygium hodgkinsoniae Vulnerable (TSC)

Smooth-barked Rose Apple.

This *Syzygium* was recorded in five sites, at Ruthven, North Tumbulgum and Terranora in several subtropical rainforest communities and in dry rainforest.



Syzygium hodgkinsoniae

Syzygium moorei Vulnerable (TSC)

Coolamon, Durobby.

This species was recorded in 10 sites, mainly in the Tweed Lowlands but also at Mooball, Cudgera Creek Nature Reserve and Brunswick Heads. Habitat was Brush Box lowland rainforest (Community 35) and several subtropical rainforest communities.



Syzygium moorei

Tinospora tinosporoides Vulnerable (TSC)

Arrow-head Vine.

This vine was found at two sites in the Byron Shire, in subtropical rainforest.

Trichosanthes subvelutina 3RC-

The species was recorded only once in the survey, on private land at Tuckean. Habitat was dominated by Swamp Mahogany (*Eucalyptus robusta*).

Xylosma terrae-reginae Endangered (TSC)

Xylosma.

There was only one record of the species, at Brunswick Heads, in subtropical rainforest.

4 Discussion

4.1 Distribution of vegetation communities

4.1.1 Estuarine and alluvial plain

The following is a discussion of the floristic communities and their relationship to environmental factors. The discussion is divided into the three main environmental groupings.

The unvegetated mudflat zone occupies the lowest level of inundation of the estuarine plain. With increasing elevation the mangrove zone (Communities 5, 62) is replaced by the saltmarsh zone (Communities 1, 2, 7, 9) and the littoral forest zone (Community 8), which is dominated by Swamp Oak (*Casuarina glauca*) (Morand 2001). Milky Mangrove (*Excoecaria agallocha*) occurs at the inland margin of the mangrove zone.

For floodplain types, the distribution of communities delineated in the survey closely follow a proposed model for the distribution of the major coastal floodplain plant communities of Keith and Scott (2005). The vegetation of the estuarine–alluvial plain is a complex continuum of floristic distribution and abundance with gradual replacement of species as salinity and inundation decreases, mixed with local-scale differences in overstorey and understorey based on microhabitat variation in tidal influence and the input of sediment from adjoining lithologies.

The transition from the estuarine plain to the alluvial plain sees a gradual replacement of Swamp Oak with Broad-leaved Paperbark (*Melaleuca quinquenervia*), Swamp Box (*Lophostemon suaveolens*), and Swamp Mahogany (*Eucalyptus robusta*) as overstorey dominants. The wettest, most saline microhabitats are located in estuarine channels and basins and tidally influenced alluvial backswamps. Near the coast these are often influenced by the deposition of sand from Pleistocene barrier sands (Communities 4, 10, 12, 21). These communities often have a simple understorey of species tolerant of inundation and salinity, such as Common Reed (*Phragmites australis*), Swamp Water Fern (*Blechnum indicum*), *Baumea juncea*, Sea Rush (*Juncus kraussii* subsp. *australiensis*) and Prickly Couch (*Zoysia macrantha*). Occasionally, *Azolla pinnata* and *Azolla* (*Azolla filiculoides*) occur in areas of open water. Reedlands/Rushlands (Community 22) are located on the littoral zone fringing the channels of estuarine

creek channels and coastal lagoons with a brackish influence.

Freshwater wetlands and meadows occupying channels and low-lying swampy depressions, derived from fine-grained sedimentary rocks and basalt, occur on the lowest elevations on the alluvial plain (Communities 25, 30). Undifferentiated freshwater and estuarine saline swamps on the floodplain of Cudgen Creek support a derived wetland resulting from the clearing of swamp sclerophyll vegetation (Community 24). The vegetation of much of the estuarine–alluvial plain in the study area has been subjected to extensive clearing, drainage and disturbance. Very little of the intact original floodplain vegetation remains and what is left is often derived and heavily impacted by weeds. Many of the remaining wetlands are small in size (Pressey 1987; Pressey and Griffith 1992).

Swamp sclerophyll communities, with a dense ground layer of sedge, rush, ferns and a sparse cover of trees and shrubs, are located in low-lying but less waterlogged sites on stagnant alluvial meander plains and backswamps of Bungawalbin Creek and Tuckean Swamp (Communities 3, 13, 29, 53). On the least inundated, more elevated sites in backswamps, alluvial fans and channels of coastal creeks, mesophyllus trees and shrubs, such as Pink-flowered Doughwood (*Melicope elleryana*), Willow Bottlebrush (*Callistemon salignus*), Bangalow Palm (*Archontophoenix cunninghamiana*), Blue Lilly Pilly (*Syzygium oleosum*), Tuckeroo (*Cupaniopsis anacardioides*) and Blueberry Ash (*Elaeocarpus reticulatus*) are able to establish (Communities 11, 14, 23, 40, 56). Harsh Ground Fern (*Hypolepis muelleri*) and King Fern (*Todea barbara*) can form a dense cover in these drier microhabitats. Low-lying moist sites located on the alluvial plain in riparian zones and creek channels support forests of Flooded Gum (*Eucalyptus grandis*), Pink-flowered Doughwood and Hard Quandong (*Elaeocarpus obovatus*) (Community 48). As fertility increases and on deep sandy soils on creeklines formed by the deposition of basalt and barrier sediments, riparian rainforests occur (Communities 6, 15, 27, 54). These sites can contain species from adjoining swamp sclerophyll vegetation communities suggestive of subsaline and freshwater site influences on the soil. Near the coast, the alluvial swamp forests are influenced by the input of sandy soil

from Pleistocene barrier sands. On the Tweed Lowlands Brush Box (*Lophostemon confertus*) – rainforest sites occur on low-lying sites adjoining estuarine sediments of the Tweed River (Community 35).

In hinterland areas of the alluvial plain Narrow-Leaved Paperbark (*Melaleuca alternifolia*) becomes dominant. These sites occur on backswamps and levees of the drainage plain of Bungawalbin Creek and are influenced by the input of sediment from the erosion of the Kangaroo Creek Sandstones. The most waterlogged sites are sedgelands dominated by *Lepironia articulata* and low shrublands of Narrow-leaved Paperbark, tea-tree (*Leptospermum brachyandrum*) and *Melaleuca sieberi* (Communities 26, 28).

Subtropical coastal floodplain forest dominated by Forest Red Gum (*Eucalyptus tereticornis*), Broad-leaved Paperbark, Swamp Box (*Lophostemon suaveolens*), Swamp Oak and Willow Bottlebrush are distributed at the upper limits of the alluvial plain on levees, alluvial filled valley heads and on more elevated sites on backswamps and floodplains. The floristics of these sites may be influenced by mixing with transferral soils from adjoining meta-sedimentary and basalt lithologies (Communities 50, 51).

Across the transition from floodplain to sandplain there is a trend in species composition reflecting a decline in the abundance of mesophyllous understorey species and increasing abundance of sclerophyllous plants (Communities 20, 23). Shrub species, such as Tootoon (*Leptospermum polygalifolium* subsp. *polygalifolium*), *Melastoma affine*, Swamp Banksia (*Banksia robur*), *Xanthorrhoea fulva*, and *Leucopogon lanceolatus* var. *gracilis* mix with sedges, rushes and ferns.

4.1.2 Coastal barrier sands

For wallum vegetation, Griffith (2002) found a strong correlation between floristic composition and topographic position. An investigation of soil-moisture relations confirmed that spatial and temporal variations in watertable depth followed a pattern related to topography. A detailed description and phytosociological analysis of wallum and related vegetation is documented in Griffith *et al.* (2003).

4.1.3 Holocene Sands and headland clay heaths

Nearest the coast are sand heathlands and shrublands occurring on Holocene dunes. On seawards aspects of Holocene dunes, an open forest community dominated by Coast Banksia (*Banksia integrifolia* subsp. *integrifolia*)

occurred. The presence of littoral rainforest species in this community suggests sites where fire has been absent for long periods (Community 34). On the most exposed seaward aspects of dunes, just above the level influence of high seas (Griffith 1999) a shrubland–heathland of Coast Wattle (*Acacia longifolia* var. *sophorae*), Coast Tea-tree (*Leptospermum laevigatum*) and Coast Banksia is distributed (Community 36). These dunal sites had a high proportion of weeds, such as Bitou Bush (*Chrysanthemoides monilifera* subsp. *rotundata*), and naturalised species, such as Horse-tailed She Oak (*Casuarina equisetifolia* subsp. *incana*), indicating a long history of disturbance from sand mining. Headland clay heath–grassland community dominated by Kangaroo Grass (*Themeda australis*) occurs on outcropping meta-sedimentary rocks at Norries Headland (Community 37). The Byron Bay Clay Heathland Endangered Ecological Community (EEC) is located in the study area, but was not surveyed.

4.1.4 Pleistocene sands

Open forests of Coast Cypress Pine (*Callitris collumellaris*) occur on well-drained sandy sites of Pleistocene barrier strandplains and dunes (Community 33). Griffith (1999) reports that shell material often occurs in coastal *Callitris* communities associated with a midden material in at least one location. Less well-drained sites on strandplains and lower slope bedrock soils support Scribbly Gum (*Eucalyptus signata*)–Red Mahogany (*Eucalyptus resinifera* subsp. *hemilampra*)–Brush Box dry sclerophyll open to closed forest (Community 31). Community 32 is located on the transition from sheltered to inundated sandplain sites on backbarrier flats and contains a mix of overstorey dominants, but shares in common a sclerophyllous ground strata. Wallum banksia dry heathlands and heathy Scribbly Gum–banksia open forests/shrublands were distributed on low beach ridges on Pleistocene dunes sheltered from onshore winds (Communities 38, 39). Subtropical/littoral rainforest Community 52 occurred on an old Pleistocene dune near Chinderah. On coastal barrier sand soils on gentle relief coastal plains influenced by adjoining finely grained sedimentary rocks wet sclerophyll forests with a mesic understorey develop on deep sandy soils (Community 40).

Within the coastal sandplains is a group of communities (Communities 16, 17, 18) occupying wetter sites with shallow standing water. The moisture gradient of these sites is strongly linked to topographic

position (Griffith 2002). These communities are wet heaths, shrublands and fernland/sedgelands located in swales, open depressions, and poorly drained sandy freshwater swamps on Pleistocene barrier sands at Tyagarah, Wardell and Evans River (Communities 16, 17, 18). Community 19 was located in tidally influenced sections of Cudgera, Tallow and Belongil Creeks in swampy sites within the transition from the estuarine plain to Pleistocene coastal sandplains.

4.1.5 Lower slopes sites on sediments and basalt

The transition from the alluvial plain to bedrock geology is evidenced by the replacement of Swamp Box, Red Mahogany and Forest Red Gum with Pink Bloodwood (*Corymbia intermedia*) and Thick-leaved Mahogany (*Eucalyptus carnea*) on low quartz sedimentary soils. Grey Ironbark (*Eucalyptus siderophloia*) is often common on both alluvial and sedimentary soils. Salwood (*Acacia disparrima* subsp. *disparrima*) is also abundant in sites with alluvial and sedimentary soils in Communities 57 and 58. Basalt slopes of the Blackwall Range support wet sclerophyll forest of Blackbutt (*Eucalyptus pilularis*), Brush Box, Tallowood (*Eucalyptus microcorys*) and White Mahogany (*Eucalyptus acmenoides*) (Community 58). Lowland rainforest on basalts occurred at Lennox Head and Tuckarimba and also on high sedimentary quartz soils and coastal barrier sands on gentle relief coastal plains influenced by adjoining finely grained sedimentary rocks (Community 40).

Dry sclerophyll communities occurred on low and high sedimentary quartz soil and also on basalt (Communities 55, 59). Community 55 occurred on low rolling hills mainly on sedimentary rocks of the Tuckean lowlands and Burringbar Range and also on basalt hills of the Blackwall Range near Wardell. Community 59 occurred on undulating low hills and undulating rises on sediments of the Grafton Formation and Walloon Coal measures.

In the Richmond, Brunswick and Tweed River valleys a number of wet sclerophyll and rainforest communities occur on meta-sedimentary rocks of the Neranleigh–Fernvale beds and Tertiary basalts. In the Richmond River Valley along the Blackwall Range meta-sedimentary derived soils in sheltered aspects support mesic successional wet sclerophyll forests and Brush Box–Pink Bloodwood and Grey Ironbark mesic tall open forests (Communities 40, 41).

In the Tweed Valley, Burringbar Range and on Marshalls Ridge, lower slopes on metamorphic

sedimentary rocks and basalts support complex mosaics of wet sclerophyll and subtropical rainforest communities with a great deal of variation in overstorey and emergent species occurs (Communities 42–47). On foothills of the Burringbar Range, on mid-slopes and intermediate and exposed aspects, Brush Box, Blackbutt, Pink Bloodwood, Tallowood (Community 42) is found. Brush Box (*Lophostemon confertus*) gully rainforest on metasedimentary soils (Community 43) was found in more sheltered sites on lower slopes and in gullies. The most diverse subtropical rainforest communities (Communities 44–47) were distributed on the most sheltered, lower slope and riparian sites on meta-sediments and basalt.

Blue Quandong (*Elaeocarpus obovatus*) subtropical rainforest (Community 44) was found on metamorphic sedimentary and basalt derived soils on lower slope rolling hills. Bangalow Palm (*Archontophoenix cunninghamiana*)–Lilly Pilly (*Acmena smithii*) subtropical rainforest (Community 45) occurred on gently undulating coastal barrier sandplains near Tyagarah, on lower slopes on metamorphic rocks in the Tweed Valley, and on mid-slopes near Urliup. The occurrences of Bangalow Palm suggest sites subjected to periodic waterlogging. Stinging Tree (*Dendrocnide excelsa*) – White Fig (*Ficus virens* var. *sublanceolata*) – Brush Bloodwood (*Baloghia inophylla*) subtropical rainforest (Community 46) was found on a lower slope basalt site on rolling hills. Moreton Bay Fig (*Ficus macrophylla*) – White Booyong (*Heritiera trifoliata*) subtropical rainforest (Community 47) was found on sheltered lower slopes growing on metamorphic sedimentary rocks and basalt at Terranorra, Duroby Creek, Razorback and the Condong Range.

Vegetation dominated by the exotic Camphor Laurel (*Cinnamomum camphora*) occurs in disturbed sites on basalts flows and, to a lesser extent, on gently undulating land on meta-sediments across the Lismore and Tweed Valleys (Community 49). This community was sampled at Lismore and Mullumbimby, but is widespread across parts of the Tweed, Byron and Ballina Local Government Areas (LGA). This community has varying levels of native rainforest and wet sclerophyll species present. In some cases a structurally and floristic diverse rainforest understorey is present (Landmark Ecological Services 1999) and rainforest taxa present include threatened plant species. The endangered Davidson's Plum (*Davidsonia jerseyana*) was found growing in Community 49.

4.2 Conservation status of plant communities

Griffith (2005) indicates that many coastal wetland plant communities are likely to be poorly represented in conservation reserves in northern NSW. The results of this survey support this assessment for wetlands

of the alluvial and estuarine plains, and also finds vegetation of the lower slopes on basalt and meta-sedimentary parent material, particularly in the Tweed, Brunswick and Richmond River coastal lowlands are also poorly represented in reserves in northern NSW.

Table 4(i) Communities not known to be reserved.

Community
Community 2 Blue Couch–Prickly Couch grasslands of the estuarine plain
Community 5. Milky Mangrove–Swamp Oak–Grey Mangrove king-tide forest
Community 6. Swamp Oak–Hoop Pine–Tuckeroo swamp sclerophyll /dry ‘gallery’ floodplain rainforest
Community 15. Bangalow Palm–Swamp Box–Cabbage Tree Palm–Weeping Myrtle alluvial riparian forest
Community 22. Common Reed–Black Bog-rush reedland/rushland
Community 25. Swamp Ricegrass– <i>Bolboschoenus caldwelli</i> – <i>Schoenoplectus validus</i> – <i>Cyperus exaltatus</i> freshwater wetland
Community 27. Weeping Myrtle–Water Gum floodplain riparian forest
Community 28. Narrow-leaved Paperbark–Wallum Bottlebrush swamp sclerophyll shrubland
Community 46. Stinging Tree–White Fig–Brush Bloodwood subtropical rainforest
Community 47. Tweed Valley meta-sediment and basalt low-elevation subtropical rainforest
Community 53. Patches Beach Broad-leaved Paperbark–Swamp Oak–Cabbage Tree Palm swamp sclerophyll forest on the alluvial plain
Community 54. Whalebone Tree–Thorny Pea– <i>Gossia fragrantissima</i> dry rainforest

Of the 62 communities assessed, 41 were assessed as not reserved or only poorly reserved, 12 had fair representation in reserves, and nine communities were assessed as having an adequate reservation status. An assessment of the distribution of communities in the study area found that the poorly reserved communities were found on the alluvial plain (16 communities), the estuarine plain (12), lower slopes on basalt and sedimentary geology (11), and coastal barrier sands (2). Coastal barrier sand and the estuarine plain contained the largest number of communities considered as fair to adequately reserved (Tables 4.1–4.4). Several communities occurred across the transition from the alluvial and estuarine plain to coastal barrier sands and transferral on lower slope bedrock geology. It is considered that the conservation status of alluvial occurrences of these communities is particularly poor.

The reservation of alluvial plain vegetation communities is particularly poor in the coastal areas of the Tweed, Brunswick and Richmond River coastal lowlands. The largest area for conservation of alluvial environments in these catchments is Stotts Island Nature Reserve and few options for reservation

remain. Griffith and Pressey (1992) found that a large proportion of wetlands in the Tweed Lowlands were grazed and had been directly affected by drainage. Remaining wetlands on the broad alluvial flats were restricted to channels that could not be completely drained or converted to agriculture. The reservation of the vegetation of hinterland alluvial plain communities have improved in recent times in the catchments of Bungawalbin Creek and Tuckean.

The largest areas protecting estuarine vegetation include the Tweed Estuary Nature Reserve, Ukerebagh Nature Reserve, Cudgen Nature Reserve, Billinudgel Nature Reserve, Cumbebin Swamp Nature Reserve and Ballina Nature Reserve. The Tweed Estuary is a highly significant area for the protection of estuarine vegetation. It is the only known estuary in NSW which contains all five species of mangrove known to occur in NSW (Pressey and Griffith, 1992). Other reserves sampling some estuarine plain vegetation include Wooyung Nature Reserve, Marshalls Creek Nature Reserve, Richmond River Nature Reserve, Broadwater National Park and Budjalung National Park.

Table 4(ii) Poorly conserved communities.

NR, Nature Reserve; NP, National Park; SCA, State Conservation Area.

Community	Conservation reserves	Comment
Community 1 Saltmarsh	Small areas reserved in Tweed Estuary NR, Ukerebagh Island NR, Cudgen NR, Wooyung NR, Marshalls Creek NR, Tyagarah NR, Richmond River NR	
Community 3 Swamp Oak Broad-leaved Paperbark with Tall Sedge and Blue Couch Swamp Sclerophyll Alluvial Plain Open Forest.	Stotts Island NR, Tuckean NR, Bungawalbyn NR, Yarringully SCA, Broadwater NP	
Community 4 Swamp Oak-Broad-leaved Paperbark Estuarine and Alluvial Plain Swamp Sclerophyll Forest.	Stott's Island NR, Tuckean NR, Bungawalbyn NR, Yarringully SCA, Broadwater NP, Billinudgel NR, Marshalls Creek NR, Tyagarah NR	
Community 7 Prickly Couch-Sea Rush- <i>Schoenoplectus subulatus</i> Saltmarsh	Broadwater NP, Bundjalung NP, Yuraygir NP	Fair to poor
Community 10 Broad-leaved Paperbark-Swamp Oak Fern/sedge Swamp Sclerophyll Forest.	Stotts Island NR, Tuckean NR, Bungawalbyn NR, Yarringully SCA, Ballina NR, Broadwater NP, Bundjalung NP, Illuka NR, Cudgen NR	Alluvial occurrences poor, estuarine, barrier sand occurrences fair
Community 11 Broad-leaved Paperbark-Pink-flowered Doughwood Swamp Sclerophyll Open forest.	Ballina NR, Richmond River NR, Broadwater NP, Bundjalung NP, Iluka NR, Yuraygir NP	Alluvial occurrences poor, barrier sand occurrences fair/good
Community 12 Broad-leaved Paperbark- Swamp Oak Ferny Swamp Sclerophyll Forest.	Stotts Island NR, Tuckean NR, Bungawalbyn NR, Yarringully SCA, Ballina NR, Broadwater NP, Bundjalung NP, Illuka NR, Cudgen NR, Marshalls Creek NR, Cumbebin Swamp NR	Alluvial occurrences poor, estuarine, barrier sand occurrences fair
Community 13 Alluvial Plain Broad-leaved Paperbark-Swamp Mahogany-Bangalow Palm/Saw Sedge/Water Fern Swamp Sclerophyll forest.	<i>Swamp Sclerophyll Forest</i> - Ballina NR, Richmond River NR, Broadwater NP, Bundjalung NP, Iluka NR, Yuraygir NP <i>Lepironia articulata/ Eleocharis equisetina</i> Sedgeland	Alluvial occurrences poor Not reserved
Community 14 Swamp Mahogany-Broad-leaved Paperbark-Bangalow Palm-sedge/fern Swamp Sclerophyll Forest.	Broadwater NP, Bundjalung NP, Yuraygir NP	Alluvial occurrences poor, estuarine, barrier sand occurrences fair
Community 18 Coral Fern (<i>Gleichenia dicarpa</i>) Fernland	Arakwal NP	
Community 20 Swamp Box-Broad-leaved Paperbark-rush/fern Swamp Sclerophyll Forest.	Broadwater NP, Bundjalung NP, Yuraygir NP, Cudgen NR	Alluvial occurrences poor, estuarine, barrier sand occurrences fair

Community	Conservation reserves	Comment
Community 23 Swamp Box-Broad-leaved Paperbark-Swamp Mahogany Swamp Sclerophyll Forest.	Bundjalung NP, Yuraygir NP	Alluvial occurrences poor, estuarine, barrier sand occurrences fair
Community 24 Swamp Ricegrass-Smartweed- <i>Juncus usitatus</i> Swampy Meadow.	Possibly reserved in Cudgen NR	
Community 26 Hinterland Narrow-leaved Paperbark-Tea tree backswamp shrublands-sedgelands.	Yarrigully NR	
Community 29 Swamp Box-Narrow-leaved Paperbark-Broad-leaved Paperbark Alluvial Swamp Sclerophyll Forest	Bungawalbyn SCA	Alluvial occurrences poor
Community 30 Middle Richmond Freshwater wetlands	Poorly reserved	
Community 37 Kangaroo Grass (<i>Themeda australis</i>) Headland Grassland	Bundjalung NP	
Community 40 Lower Richmond floodplain mesic successional wet sclerophyll forest,	Poorly known	Probably poor
Community 41 Lower Richmond Brushbox-Pink Bloodwood and Grey Ironbark mesic tall open forest	Broadwater NP, Iluka NR	
Community 42 Tweed/Brunswick Valley, Brush Box, Blackbutt, Pink Bloodwood-Tallowwood foothill wet sclerophyll	Cudgera Creek NR, Marshalls Creek NR	Poor
Community 43 Brunswick/Tweed Brush Box gully rainforest on sediments	Cudgera Creek NR, Billinudgel NR, Marshalls Creek NR	Poor
Community 44 Tweed/Brunswick Valley Blue Quandong Subtropical Rainforest.	Cudgera Creek NR, Billinudgel NR	Poor
Community 45 Tweed/Brunswick Valley Bangalow Palm-Lily Pily Subtropical Rainforest	Tyagarah NR	Poor
Community 48 Flooded Gum-Pink Flowered Doughwood-Hard Quandong Alluvial Plain Wet Sclerophyll Forest.	Billinudgel NR	Poor
Community 50 Swamp Oak-Forest Red Gum-Broad-leaved Paperbark-Swamp Box Swamp Sclerophyll Woodland to Open Forest	Yarrigully NR, Marshalls Creek NR	Poor
Community 51 Forest Red Gum-Willow Bottlebrush-Camphor Laurel Dry Open Forest	Poorly known	Probably poor
Community 52 Small-leaved Fig-Hard Quandong-Bangalow Pine Subtropical/Littoral Rainforest on Pleistocene Dunes.	Poorly known	Probably poor
Community 56 Broad-leaved Paperbark-Swamp Box-Tuckeroo Swamp Sclerophyll Open Forest.	Stotts Island NR, Tuckean NR, Bungawalbyn NR, Yarrigully SCA, Broadwater NP	Poor
Community 57 Red Mahogany-Pink Bloodwood-Swamp Mahogany-Swamp Box Dry Open Forest	Broadwater NP, Yuraygir NP	Poor
Community 58 Pink Bloodwood-Grey Ironbark-Swamp Box-Forest Red Gum-Blackbutt Tall Dry Open Forest	Bundjalung SCA, Bundjalung NP	Poor

Community	Conservation reserves	Comment
Community 59 Large-fruited Spotted Gum-Grey Ironbark-Small Fruited Grey Gum Dry Grassy Open Forest.	Poorly known	Poor
Community 61 Broad-leaved Paperbark-Swamp Box Narrow-leaved Rough-barked Apple-Swamp Box-Pink Bloodwood Dry Grassy Alluvial Open Forest.	Poorly known	Poor

Vegetation communities of coastal barrier sands are more adequately reserved throughout the study area, in Cudgen Nature Reserve, Wooyung Nature Reserve, Billinudgel Nature Reserve, Tyagarah Nature Reserve, Arakwal National Park, Richmond River Nature Reserve, Broadwater National Park and Bundjalung National Park. Opportunities for the protection of unreserved areas on the coast do occur such as the Fingal peninsula, Cudgera Creek, Pottsville, Brunswick Heads, Belongil Creek/Tallow Creek, near Byron, Newrybar sandplain and around Ballina.

Table 4(iii) Communities with a fair level of conservation in reserves.

NR, Nature Reserve; NP, National Park; SCA, State Conservation Area.

Community	Conservation reserves	Reservation status
Community 62 River Mangrove-Grey Mangrove-Black Mangrove-Milky Mangrove and Spider Mangrove Forest/Shrubland	Tweed Estuary NR, Ukerebagh NR, Cudgen NR, Wooyung NR, Billinudgel NR, Brunswick Heads NR, Bundjalung NP, Marshalls Creek NR, Tyagarah NR, Ballina NR, Richmond River NR	Fair
Community 60 Grey Ironbark-Thin-leaved Stringybark-Pink Bloodwood-Swamp Box Dry Open Grassy Forest.	Bundjalung Creek SCA, Bundjalung NP	Fair
Community 8. Swamp Oak-River Mangrove King Tide Swamp Sclerophyll Forest.	Tweed Estuary NR, Ukerebagh NR, Cudgen NR, Billinudgel NR, Brunswick Heads NR, Cumbebin Swamp NR, Ballina NR, Richmond River NR	Fair
Community 9 Sea Rush-Mat Grass Saltmarsh.	Broadwater NP, Bundjalung NP, Yuraygir NP, Ukerebagh NR	Fair
Community 55 Grey Ironbark-Pink Bloodwood-Mahogany Dry Grassy Open Forest.	Cudgen NR, Cudgera Creek NR	Lower slopes occurrences probably fair
Community 35 Brush Box Lowland Rainforest.	Ukerebagh NR, Cudgen NR, Cape Byron SCA	fair
Community 33 Coast Cypress Pine on dunes and ridges.	Broadwater NP, Arakwal NP, Billinudgel NR	Fair
Community 21 Broad-leaved Paperbark-Swamp Oak-Rush Saline Swamp Sclerophyll Open Forest	Arakwal NP, Cudgen NR	estuarine, barrier sand occurrences fair

Table 4(iv) Communities that are adequately reserved in the study area.

NR, Nature Reserve; NP, National Park; SCA, State Conservation Area. Reserves where the community is recorded in the literature to be reserved are listed

Community	Conservation reserves
Community 16 Tea tree <i>Sporodanthus interruptus</i> Wet Heath	Tyagarah NR, Broadwater NP, Bundjalung NP
Community 17 <i>Leptospermum liversidgei</i> -Wallum Bottlebrush-Grass Tree-Heath-leaved Banksia Wallum Wet Heath complex	Tyagarah NR, Broadwater NP, Bundjalung NP
Community 19 Broad-leaved Paperbark-Coast Banksia-Red Ash dunal scrubland.	Richmond River NR, Broadwater NP, Bundjalung NP
Community 31 Scribbly Gum-Red Mahogany-Brush Box Dry Sclerophyll Open to Closed Forest on coastal barrier sands.	Ukerebagh NR, Broadwater NP, Billinudgel NR, Cudgen NR, Nightcap NP, Bundjalung NP
Community 32 Blackbutt-Turpentine Open Forest complex	Bundjalung NP, Brunswick Head NR
Community 34 Coast Banksia Frontal Dune Open Forest on Holocene dunes.	Richmond River NR, Bundjalung NP, Ukerebagh NR, Wooyung NR, Arakwal NP, Cape Byron SCA, Broken Head NR
Community 36 Coast Wattle-Coast Tea tree-Coast Banksia Shrubland on Holocene dunes and ridges.	Richmond River NR, Bundjalung NP, Ukerebagh NR, Wooyung NR, Arakwal NP, Cape Byron SCA, Broken Head NR
Community 38 Scribbly Gum-Old Man Banksia-Tea Tree Heathy Low open Sclerophyll Forest/Shrubland.	Broadwater NP, Bundjalung NP
Community 39 Wallum Banksia (<i>Banksia aemula</i>) Dry Heath	Arakwal NP, Tyagarah NR, Broadwater NP, Bundjalung NP

4.3 Areas of high conservation significance

A number of the sites sampled in the study area contained vegetation with highly significant conservation values, including Endangered Ecological communities and Threatened Species listed on the NSW Threatened Species Conservation 1995. A few of the more significant areas are discussed below.

4.3.1 Wardell–Coolgardie

The survey data highlighted the very high conservation significance of the area of vegetation centred around Wardell, Coolgardie and the Blackwall Range. The area is a rare contiguous sample of the transition from alluvial floodplain to extensive coastal barrier sandplains and ranges of meta-sedimentary and basalt bedrock. This area contained superb examples of undisturbed old-growth swamp sclerophyll forest, lowland floodplain and riparian rainforest, dry and wet sclerophyll forests and diverse wallum wet and dry heaths. Twelve vegetation communities were recorded here (Communities 4, 10, 14, 15, 17, 32, 40, 41, 42, 55, 57, 58), including three EEC: Swamp Sclerophyll Forest, Lowland Rainforest on Floodplains and Subtropical Coastal Floodplain Forest. Records of numerous threatened plant species were made

during the survey in this area, including: *Oberonia titania* (Vulnerable), *Marsdenia longiloba* (Endangered), *Trichosanthes subvelutina* (Vulnerable), *Persicaria elatior* (Vulnerable), Palm Lily (*Cordyline congesta*) (Rare), and *Arthrochilus prolixus* (Poorly Known).

4.3.2 Tuckean Swamp–Tuckean Broadwater

Eleven vegetation communities were recorded in this area (Communities 4, 5, 14, 15, 31, 32, 41, 42, 45, 55, 58). The area contained old-growth mangrove and swamp sclerophyll communities across the littoral zone to the upper limits of tidal influence and onto backswamps of the alluvial plain. Important samples of Milky Mangrove–Swamp Oak–Grey Mangrove king-tide forest (Community 5) were present, a rare estuarine community that occurs at the upper limit of tidal influence. Parts of the Tuckean Broadwater contained abundant Mangrove Fern (*Acrosticum speciosum*), which is uncommon outside the Tweed and Brunswick River Valleys. Samples of Swamp Sclerophyll Forest and Subtropical Coastal Floodplain Forest EEC are also found in a relatively undisturbed state. Threatened and rare plant species recorded in this area during the current survey include: Rusty Rose Walnut (*Endiandra hayesii*) (Vulnerable) and Palm Lily (*Cordyline congesta*) (Rare).

4.3.3 Brandy Arm Creek

There was a highly significant area of wetland vegetation located on Brandy Arm Creek, a tributary of the lower Evans River. The area contains important samples of estuarine and alluvial plain vegetation types, and four vegetation communities were recorded (4, 7, 50, 58). EEC recorded included Saltmarsh, Swamp Oak Floodplain Forest, Subtropical Coastal Floodplain Forest, and Swamp Sclerophyll Floodplain Forest. This area includes the locations of very significant records of the endangered *Dendrobium melaleucaphyllum* and *Oberonia complanata*.

4.3.4 Tuckean rainforest remnant

This was a small remnant of lowland rainforest on freehold property. This diverse remnant is an important sample of rich floodplain rainforest near its southern limit. The threatened plants Onion Cedar (*Ochrosia moorei*) and White Lace Flower (*Archidendron hendersonii*) were recorded. It is an example of the Lowland Rainforest EEC. Existing mapped vegetation layers did not record this rainforest remnant as extant vegetation. It is a clear example of how mapping programs can miss significant areas of vegetation at inappropriate scales.

4.3.5 Terranora

The area centred around Terranora, Charles Bay and the Terranora Country Club is a known hotspot for threatened plant taxa. These sites are outstanding examples of species-rich lowland subtropical rainforest on meta-sediments, which have been heavily cleared in the Tweed coastal lowlands. Three subtropical rainforest communities were identified at these sites (44, 45, 47), which are examples of Lowland Subtropical Rainforest EEC. Threatened plant species recorded in the surveys at Terranora include: *Acalypha eremorum* (Endangered), Red-fruited Ebony (*Diospyros mabacea*) (Endangered), Ebony (*Diospyros major* var. *ebenus*) (Endangered), Small-leaved Tamarind (*Diploglottis campbellii*) (Endangered), White Yiel Yiel (*Grevillea hilliana*) (Endangered), Spiny Gardenia (*Randia moorei*) (Endangered), Marblewood (*Acacia bakeri*) (Vulnerable), White Lace Flower (*Archidendron hendersonii*) (Vulnerable), Three-leaved Bosistoa (*Bosistoa transversa*) (Vulnerable), Rusty Rose Walnut (*Endiandra hayesii*) (Vulnerable), Fine-leaved Tuckeroo (*Lepiderema pulchella*) (Vulnerable), Rough-shelled Bush Nut (*Macadamia tetraphylla*) (Vulnerable), *Peristeranthus hillii* (Vulnerable), Smooth-barked Rose Apple (*Syzygium hodgkinsoniae*) (Vulnerable),

Coolamon (*Syzygium moorei*) (Vulnerable), Veiny Lace Flower (*Archidendron muellerianum*) (3RCa), Byron Bay Acronychia (*Acronychia baeuerlenii*) (3RC-), Long-leaved Tuckeroo (*Cupaniopsis newmanii*) (2RC-), Black Walnut (*Endiandra globosa*) (2RC-), Smooth Scrub Turpentine (*Rhodamnia maideniana*) (2RC-), and Native Laburnum (*Cassia brewsteri* var. *marksiana*) (Rare). Additional threatened species recorded at the Terranora Country Club are Stinking Laurel (*Cryptocarya foetida*) (Vulnerable), Sweet Myrtle (*Gossia fragrantissima*) (Endangered), and Axe-Breaker (*Geijera paniculata*) (Endangered).

4.4 Endangered Ecological Communities

This survey has improved the knowledge of the floristic and structural composition and environmental relationships of floodplain communities, many of which are listed as Endangered Ecological Communities (EEC). Of the 62 communities delineated, 35 relate to nine EECs listed under the TSC. The data indicate that the vegetation of the floodplain and coastal lowlands, and qualifying as EECs is more complex than currently documented in the final determinations of the NSW Scientific Committee.

The survey identified some floodplain communities that do not fall well within current scientific determinations of NSW Scientific Committee and may warrant further investigation to see if they warrant nomination to the NSW Scientific Committee as potential new EECs. The following alluvial and estuarine plain communities do not equate well to existing EEC descriptions: **Community 5** Milky Mangrove–Swamp Oak–Grey Mangrove king-tide forest, **Community 6** Swamp Oak–Hoop Pine–Tuckeroo swamp sclerophyll/dry ‘gallery’ floodplain rainforest, **Community 15** Bangalow Palm–Swamp Box–Cabbage Tree Palm–Weeping Myrtle alluvial riparian forest, **Community 18** Coral Fern fernland, **Community 22** Common Reed–Black Bog-rush reedland/rushland, **Community 26** Hinterland Narrow-leaved Paperbark–tea-tree backswamp shrublands–sedgelands, and **Community 53** Patches Beach Broad-leaved Paperbark–Swamp Oak–Cabbage Tree Palm swamp sclerophyll forest on the alluvial plain.

The results of the present survey may prove useful in providing feedback to preliminary determinations to the Scientific Committee regarding coastal lowland communities. For example, Community 33 is a Coast Cypress Pine Forest community, for which there is

a preliminary determination currently before the Scientific Committee. The three sites sampled in this survey revealed an additional 40 plant taxa that were not listed in the preliminary determination, three of which were exotic taxa. The survey also shows that the community occurs on Holocene as well as Pleistocene sands. The preliminary determination indicated the community was restricted to Pleistocene sands.

Freshwater wetland sites sampled in this survey (Communities 3, 25, 26, 30) are threatened by weeds. For example sites sampled at freshwater wetlands near Casino are threatened by the spread of weeds such as Chinese Tallow (*Triadica sebifera*), *Myriophyllum aquaticum*, *Pseudoraphis paradoxa* and *Hygrophila angustifolia*. These weeds are not listed in the final determination of the NSW Scientific Committee.

In this survey, 12 vegetation communities (3, 4, 10–15, 23, 26, 28, 40, 53) were equivalent to the swamp sclerophyll forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions endangered ecological community.

Community 26 comprised an association of Narrow-leaved Paperbark and *Leptospermum brachyandrum* with a dense sedgeland ground cover of *Lepironia articulata*. Narrow-leaved Paperbark and *Leptospermum brachyandrum* are north coast species and are not documented in the survey literature as a community. This floristics of this community, which occurs on the floodplain, does not relate well to floodplain communities listed on the NSW Threatened Species Conservation Act 1995.

The information collected on EECs during this survey will assist with their field identification in the future, and also assist to identify threats.

4.5 Floristic variation within coarse scale mapping units

The results of this survey show that floristic and structural variation in coastal wetland and lowland vegetation communities are more complex than described in some existing mapping layers and vegetation classifications. A comprehensive, representative and adequate reserve network in these areas would need to represent this variation to adequately protect vascular plant diversity.

Mangrove and saltmarsh is example of a variable in many vegetation complex that is treated as one unit mapping programs (e.g. Kingston *et al.* 2004; NPWS

1999; Young and Dillewaard 1999). In this study, five species of mangrove and two mangrove communities were delineated. Community 62 contained significant variation in the distribution and abundance of these five mangrove species, some associations of which are assessed as uncommon or rare (Robinson and Benson 1990).

Four saltmarsh communities were delineated in the survey. Saltmarsh occurs across a range of tidal influence from the littoral zone to the upper limits of the king-tide zone. There is an associated complex zonation of species and structural formations from grasslands to chenopod shrublands, rushlands and sedgeland.

The diversity of wetland vegetation of the alluvial–estuarine floodplain is even more complex. For example, the Forest Ecosystem Classification system (NPWS, 1999) recognises only one Paperbark ecosystem (Forest Ecosystem 112), one Swamp Oak Community (Forest Ecosystem 143) and one Swamp Mahogany ecosystem (Forest Ecosystem 142). In this survey, these three swamp sclerophyll forest ecosystems were floristically equivalent to 12 vegetation communities (3, 4, 10–15, 23, 26, 28, 40, 53) with considerable variation in the floristic and structural composition linked to tidal influence, salinity, elevation and soil fertility.

Other finer scale classifications provide a division based on overstorey dominant combinations of Broad-leaved Paperbark, Swamp Oak, Swamp Mahogany and Swamp Box as dominant overstorey species (Landmark Ecological Services 1999) with some information on associated species. However, detailed floristic site sampling revealed a diversity of floristic and structural variation in swamp sclerophyll vegetation types that is overlooked by approaches to vegetation classification based primarily on remote sensing with some field checking.

In particular, wetland vegetation communities are often superficially treated by coarsely scaled or intuitive approaches to vegetation classification. For instance, the Forest Ecosystem Classification includes a swamp unit that covers all wetland vegetation across the coast and onto the northern tablelands (NPWS 1999). The Byron Flora and Fauna survey (Landmark Ecological Services, 1999) recognises one sedgeland–fernland–grassland unit occurring primarily on Aeolian sands. The current survey recognised two saltmarsh communities (Communities 7, 9), one reedland

community (Community 22), one fernland community (Community 18) and a headland grassland community (Community 37) occurring across a range of substrates in the Byron LGA. In the Tweed LGA, three wetland vegetation communities (Community 22, 24, 25) were delineated, but which were encompassed within Wetland Unit 703 of Kingston *et al.* (2004). Similar issues in vegetation classification and mapping exist for wet and dry heathlands, wet sclerophyll forests and rainforest vegetation. There are some discrepancies between the delineation of rainforest vegetation communities in the study area and the description of rainforest suballiances by Floyd (1990).

Griffith and Wilson (2007) provide an excellent hierarchical floristic and structural classification of coastal vegetation across the range of vegetation formations, including saltmarsh, sedgelands, rushlands and grasslands. The classification was focussed on national parks and nature reserves, and mainly on the vegetation of coastal sand barriers. It is possibly an example of an appropriate fine-scale classification that could be expanded and adopted across the north coast.

Where it is possible to map communities that are not recognised in existing classifications (Communities 5, 15, 26, 27, 28) this should be done to revise and improve the comprehensiveness of existing vegetation classification and associated mapped layers. In other cases, where it is not possible to represent the floristic and structural variation spatially, information can be stored within vegetation classification databases.

The NSW Vegetation Classification Database (NSWVCA) (Benson, 2006) is an effective way of documenting information on vegetation and the full range of variation within communities. A database can contain a much wider range of information on vegetation than it is possible to include in a GIS map attribute table. A database can capture a range of information that is beyond the capacity of a GIS map or survey report. It can also be used in lieu of a map where evaluation at a local scale is necessary and available maps of the area are too coarse in scale to be useful predictors of vegetation occurring on the land.

4.6 A detailed mapping program for the future

There is a need to complement surveys gathering data and conducting numerical analysis, such as the current one, with surveys involving fine-scale vegetation mapping coupled with rigorous field verification involving expert ecologists and botanists. Significant floodplain wetland, rainforest and lower slope vegetation in the study area remains unmapped, primarily in areas covered by CRAFTI mapping, which was done during the Upper North East Forest Regional Forest Agreement (NPWS, 2001). This API layer and does not provide a complete extant vegetation coverage over the study area and in some parts erroneously records vegetation area as cleared, or labels vegetation types into the wrong formation.

At present regional scale vegetation information based on API mapping and predictive modelling of public land forest data does not provide accurate information on vegetation to assist land-use decision making and planning in coastal and lowland areas. A critical gap in vegetation mapping for the coast and lowlands and a fundamental step in any future mapping program is the provision of an extant vegetation layer for wetland and lowland vegetation. Important areas of lowland and wetland vegetation, including samples of EECs remain unmapped.

In coast and lowland areas of the north coast survey and mapping data needs to be collected at much finer scales of resolution in coastal areas than coarser scales (1:25 000/1:50 000 maps) used elsewhere in NSW. Mapping should take advantage of new powerful techniques such as object identified image analysis and utilise new finer scale remote sensing imagery that has become available in recent times.

A great deal of improvement in existing vegetation layers could be made with more targeted site sampling in gap areas, field verification and relabelling, splitting and amalgamation of questionably labelled vegetation polygons and GIS predictions.

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Appendix 1 - Vegetation community profiles

The following appendix provides a profile of each of the 62 communities delimited during the current surveys. A summary table of the equivalent ecological communities listed in each of the profiles is given in Appendix 5.

Throughout this Appendix, the following abbreviations or conventions are used:

NP, National Park; NR, Nature Reserve; SCA, State Conservation Area; SF, State Forest; TSR, Travelling Stock Route.

Under **Significant taxa**, species are listed with their status under the TSC (Vulnerable, Endangered), relevant ROTAP codes, or as Rare in NSW.

Under **Floristics**, species are arranged by decreasing summed cover abundance. The dominant species of structural layers recorded at sites are noted: E, emergent; T, tallest layer; M, mid-layer; L, lower layer; where two layers are recorded in a strata, the layers are recorded as M1 and M2 or L1 or L2; *, exotic species. Where there is no entry for groups of plants (e.g. Mistletoes, Ferns, etc.) there were no records in those groups in the sites of that community.

For **Number of taxa per plot**, figures in parentheses are means $\pm$ standard deviation. A range of the number of taxa from lowest to highest recorded in the community is shown.

The **Indicator native taxa** table provides the results of a fidelity analysis. Taxa with a positive diagnostic relationship to the community are listed. Positive diagnostic species are those that are more likely to be recorded in the target community than in other communities. For each taxa the median cover score and frequency % within the community and in all other sites is recorded.

Species	Group score median cover score	Frequency within community > 50%	Non-group score median cover score	Non-community frequency < 50%	Fidelity class
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Table A1. The 62 vegetation communities of the FNC identified in the current survey.

Community	Name
Community 1	Saltmarsh
Community 2	Blue Couch–Prickly Couch grasslands of the estuarine plain
Community 3	Broad-leaved Paperbark–Swamp Oak swamp sclerophyll alluvial plain open forest
Community 4	Swamp Oak–Broad-leaved Paperbark estuarine and alluvial plain swamp sclerophyll forest
Community 5	Milky Mangrove–Swamp Oak–Grey Mangrove king-tide forest
Community 6	Swamp Oak–Hoop Pine–Tuckeroo swamp sclerophyll/dry ‘gallery’ floodplain rainforest
Community 7	Prickly Couch–Sea Rush– <i>Schoenoplectus subulatus</i> saltmarsh
Community 8	Swamp Oak king-tide swamp sclerophyll forest
Community 9	Sea Rush–Matgrass saltmarsh
Community 10	Broad-leaved Paperbark–Swamp Oak–fern/sedge swamp sclerophyll forest
Community 11	Broad-leaved Paperbark–Pink-flowered Doughwood swamp sclerophyll open forest
Community 12	Broad-leaved Paperbark–Swamp Oak ferny swamp sclerophyll forest
Community 13	Alluvial plain Broad-leaved Paperbark–Swamp Mahogany–Bangalow Palm–Saw Sedge–Swamp Water Fern swamp sclerophyll forest

Community	Name
Community 14	Swamp Mahogany–Broad-leaved Paperbark–Bangalow Palm–sedge/fern swamp sclerophyll forest
Community 15	Bangalow Palm–Swamp Box–Cabbage Tree Palm–Weeping Myrtle alluvial riparian forest
Community 16	Tea-tree (<i>Leptospermum</i> spp.)– <i>Sporodanthus interruptus</i> wet heath
Community 17	<i>Leptospermum liversidgei</i> –Wallum Bottlebrush–Grass Tree–Heath-leaved Banksia wallum wet heath complex
Community 18	Coral Fern fernland
Community 19	Broad-leaved Paperbark–Coast Banksia–Red Ash dunal scrubland
Community 20	Swamp Box–Broad-leaved Paperbark–rush/fern swamp sclerophyll forest
Community 21	Broad-leaved Paperbark–Swamp Oak–rush saline swamp sclerophyll open forest
Community 22	Common Reed–Black Bog–rush reedland/rushland
Community 23	Swamp Box–Broad-leaved Paperbark–Swamp Mahogany swamp sclerophyll forest
Community 24	Swamp Ricegrass–Smartweed– <i>Juncus usitatus</i> swampy meadow
Community 25	Swamp Ricegrass– <i>Bolboschoenus caldwellii</i> – <i>Schoenoplectus validus</i> – <i>Cyperus exaltatus</i> freshwater wetland
Community 26	Hinterland Narrow-leaved Paperbark–tea-tree backswamp shrublands–sedgeland
Community 27	Weeping Myrtle–Water Gum floodplain riparian forest
Community 28	Narrow-leaved Paperbark–Wallum Bottlebrush swamp sclerophyll shrubland
Community 29	Swamp Box–Narrow-leaved Paperbark–Broad-leaved Paperbark alluvial swamp sclerophyll forest
Community 30	Middle Richmond freshwater wetlands
Community 31	Scribbly Gum–Red Mahogany–Brush Box dry sclerophyll open to closed forest on coastal barrier sands
Community 32	Blackbutt–Turpentine open forest complex
Community 33	Coast Cypress Pine on dunes and ridges
Community 34	Coast Banksia frontal dune open forest on Holocene dunes
Community 35	Brush Box lowland rainforest
Community 36	Coast Wattle–Coast Tea-tree–Coast Banksia shrubland on Holocene dunes and ridges
Community 37	Kangaroo Grass headland grassland
Community 38	Scribbly Gum–Old Man Banksia–Slender Tea-tree heathy low open sclerophyll forest/shrubland
Community 39	Wallum Banksia dry heath
Community 40	Lower Richmond mesic successional wet/swamp sclerophyll forest/rainforest
Community 41	Lower Richmond Brush Box–Pink Bloodwood–Grey Ironbark mesic tall open forest
Community 42	Tweed–Brunswick Valleys Brush Box–Blackbutt–Pink Bloodwood–Tallowwood foothill wet sclerophyll forest
Community 43	Brunswick–Tweed Brush Box gully rainforest on meta-sediments
Community 44	Tweed–Brunswick Valley Blue Quandong subtropical rainforest
Community 45	Tweed–Brunswick Valley Bangalow Palm–Lilly Pilly subtropical rainforest

Community	Name
Community 46	Stinging Tree–White Fig–Brush Bloodwood subtropical rainforest
Community 47	Tweed Valley meta-sediment and basalt low-elevation subtropical rainforest
Community 48	Flooded Gum–Pink-flowered Doughwood–Hard Quandong alluvial plain wet sclerophyll forest
Community 49	Camphor Laurel–Forest Red Gum open to closed forest
Community 50	Swamp Oak–Forest Red Gum–Broad-leaved Paperbark–Swamp Box swamp sclerophyll woodland to open forest
Community 51	Forest Red Gum–Willow Bottlebrush–Camphor Laurel dry open forest
Community 52	Small-leaved Fig–Hard Quandong–Bangalow Palm subtropical/littoral rainforest on Pleistocene dunes
Community 53	Patches Beach Broad-leaved Paperbark–Swamp Oak–Cabbage-tree Palm swamp sclerophyll forest on the alluvial plain
Community 54	Whalebone Tree–Thorny Pea–Sweet Myrtle dry rainforest
Community 55	Grey Ironbark–Pink Bloodwood–White Mahogany dry grassy open forest
Community 56	Broad-leaved Paperbark–Swamp Box–Tuckeroo swamp sclerophyll open forest
Community 57	Red Mahogany–Pink Bloodwood–Swamp Mahogany–Swamp Box dry open forest
Community 58	Pink Bloodwood–Grey Ironbark–Swamp Box–Forest Red Gum–Blackbutt tall dry open forest
Community 59	Large-fruited Spotted Gum–Grey Ironbark–Small-fruited Grey Gum dry grassy open forest
Community 60	Grey Ironbark–Thin-leaved Stringybark–Pink Bloodwood–Swamp Box dry open grassy forest
Community 61	Broad-leaved Paperbark–Narrow-leaved Rough-barked Apple–Swamp Box–Pink Bloodwood dry grassy alluvial open forest
Community 62	River Mangrove–Grey Mangrove–Black Mangrove–Milky Mangrove–Spider Mangrove forest to shrubland

Group 1–Saline Wetlands

Community 1 Saltmarsh

Scientific name: *Sarcocornia quinqueflora*, *Suaeda australis*, Saltwater Couch (*Sporobolus virginicus*) and Sea Rush (*Juncus kraussii* subsp. *kraussii*) Saltmarsh.

Sites: (5) BALL01esex, BRU01alch, POT07esticd, POT08esticd, TWE25esttdf.

Equivalent communities

Saline Wetlands–Saltmarshes (Keith 2006); Qld Regional Ecosystem 12.1.2 Saltpan vegetation (Young and Dillewaard 1999); 603 – Saltmarsh Communities (Kingston *et al.* 2004); 6102 – Chenopod Shrubland–Tussock Grassland NPWS NSW Coastal Vegetation mapping (Griffith *et al.* 2000); S1 – *Sporobolus virginicus*, *Sarcocornia quinqueflora* (Pressey and Griffith 1992); Forest Ecosystem 125 – Saltbush (NPWS 1999); 6. Sporobolium vignici. 1. sarcocornietosum, 3. sporobolium (Adam *et al.* 1988).

Description

Dominated by a dense cover of Saltwater Couch (*Sporobolus virginicus* var. *minor*), *Sarcocornia quinqueflora* subsp. *quinqueflora*, Sea Rush (*Juncus kraussii* subsp. *australiensis*) and other grasses, sedges, rushes and herbs. Rarely, emergent Swamp Oak (*Casuarina glauca*), River Mangrove (*Aegiceras corniculatum*), Grey Mangrove (*Avicennia marina* subsp. *australasica*) and *Myoporum acuminatum* present. The community has low species diversity.



Distribution and Habitat

Habitat: Very low-lying sites located in Quaternary estuarine alluvium mixed with Pleistocene sands, associated with Pottsville and Tyagarah soil landscapes.

Species composition within coastal saltmarsh varies with elevation: *Sarcocornia quinqueflora* dominates at lower, and hence more frequently flooded levels than *Sporobolus virginicus*, which dominates the mid-elevation saltmarsh, while *Juncus kraussii* and *Baumea juncea* are upper saltmarsh species (NSW Scientific Committee). Adam *et al.* (1988) states that stands dominated by *Sarcocornia quinqueflora* are often present adjacent to mangroves.

Disturbance: Weeds uncommon, grazing moderate.

Locations: Recorded at survey sites at Ballina, Brunswick Heads, Pottsville Environmental Park, Vallances Road and Fingal.

Conservation

Threats: Clearing and filling for coastal development, grazing, rubbish dumping, increased sedimentation and invasion by mangrove species, modified tidal flow and climate change.

Conservation status: Saltmarsh is an EEC listed under the TSC. In the study area, small areas are reserved in the Tweed Estuary NR, Ukerebagh Island NR, Cudgen NR, Wooyung NR, Marshalls Creek NR, Tyagarah NR and

Richmond River NR. West *et al.* (1985) estimated the approximate total area of coastal saltmarsh in NSW at 5700 ha distributed in fragmented patches, mostly <100 ha in area. In the intervening two decades further reduction and fragmentation have occurred.

Significant taxa: None recorded.

Structure

Layer	Height (m)	Cover (%)
Emergent	5–8	5
Tallest	0–4	10–90
Lower 1	0–1	50–100
Lower 2	0–0.5	40–90

Floristics

Emergent small tree and shrubs: *Avicennia marina* subsp. *australasica* (T), *Myoporum acuminatum* (T), *Aegiceras corniculatum* (E), *Casuarina glauca* (T), *Melaleuca styphelioides*, *Glochidion ferdinandi*, *Excoecaria agallocha*.

Grasses: *Sporobolus virginicus* var. *minor* (T), *Eriochloa procera*, *Paspalum vaginatum*, *Phragmites australis*.

Ferns: None recorded.

Sedges and rushes: *Juncus kraussii* subsp. *australiensis*, *Fimbristylis dichotoma*, *Baumea juncea*, *Triglochin striatum*, *Fimbristylis ferruginea*, *Cyperus polystachyos*, *Juncus cognatus**.

Herbs and shrubs: *Sarcocornia quinqueflora* subsp. *quinqueflora* (T), *Suaeda australis*, *Apium prostratum*, *Bacopa monnieri*, *Aster subulatus**, *Atriplex semibaccata*, *Asparagus aethiopicus**.

Climbers: *Cynanchum carnosum*, *Stephania japonica* var. *discolor*.

Number of native taxa: 25

Number of taxa per plot: 3–25 (mean 10 ± 10)

Number of exotic species: 4

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Atriplex semibaccata</i>	2	25%	0	0%	positive
<i>Juncus cognatus</i>	1	25%	0	0%	positive
<i>Juncus kraussii</i>	4	50%	3	6%	positive
<i>Sarcocornia quinqueflora</i>	4	75%	3	1%	positive
<i>Sporobolus virginicus</i>	6	100%	4	1%	positive

Community 2 Blue Couch–Prickly Couch grasslands of the estuarine plain

Scientific name: Blue Couch (*Cynodon dactylon*) and Prickly Couch (*Zoysia macrantha*) derived grasslands of the estuarine plain.

Sites: (2) BALL06ESTba, WOO13estss.

Equivalent communities

Saline Wetlands–Saltmarshes (Keith 2006); Qld Regional Ecosystem 12.1.2 Saltpan vegetation (Young and Dillewaard 1999); 902 – Native Grassland (Kingston *et al.* 2004); *Cynodon dactylon* sod grassland (Adam *et al.* 1988).

Description

This community was represented by two, possibly derived, grassland sites growing on saline clay soils of the estuarine plain. The community was dominated by a dense cover of Blue Couch (*Cynodon dactylon*), with Swamp Millet, (*Ischaemum australe*), Swamp Ricegrass (*Leersia hexandra*) and Prickly Couch (*Zoysia macrantha*), with sedges, rushes and herbs also present. Emergent Swamp Oak (*Casuarina glauca*) and Broad-leaved Paperbark (*Melaleuca quinquenervia*) were recorded in one site. The community has low species richness, and 30% of species are exotic. Griffith (2005) notes that Blue Couch often occurs as a community on the upper edge of saltmarsh.



Distribution and Habitat

Habitat: The tidal floodplain of the Evans River, in low-lying saline swamps, and on the upper limit of the estuarine basin of Roberts Creek, near Ballina. Blue Couch is recorded as an upper saltmarsh community (Adam *et al.* 1988). Griffith (2005) states 'that Blue Couch also occurs as a common pasture species on floodplains and extends into wet meadows.'

Disturbance: The site at Ballina Airport had been heavily cleared in the past and was severely disturbed by weeds. The Woodburn site had moderate weed and grazing disturbance.

Locations: Recorded at survey sites at Ballina Airport and Tuckombil Canal.

Conservation

Threats: Threatened by past and present clearing, grazing, modified tidal flows, and weed infestation.

Conservation status: Natural occurrences of Blue Couch grassland on the floodplain are part of the Freshwater Wetland of Coastal Floodplains EEC. Sites on the estuarine plain qualify as Coastal saltmarsh in the NSW North Coast, Sydney Basin and South East Corner bioregions EEC. Natural occurrences of these communities are probably very rare and poorly reserved. Griffith (2005) suggests a poor reservation status.

Significant taxa: None recorded. The fern *Marsilea mutica* was recorded at the Tuckombil Canal ; this species was only recorded at one other sites in the present survey.

Structure

Layer	Height (m)	Cover (%)
Tallest	0.1–4	3–70
Lower 1	0.5–1	10
Lower 2	0–0.3	75

Floristics

Small trees and shrubs: *Casuarina glauca* (T), *Melaleuca quinquenervia*, *Erythrina crista-galli**, *Baccharis halimifolia**.

Grasses: *Cynodon dactylon* (T), *Zoysia macrantha* (L2), *Ischaemum australe*, *Leersia hexandra*, *Paspalum dilatatum**, *Paspalum distichum*.

Climbers: *Parsonsia straminea*.

Ferns: *Marsilea mutica*.

Sedges and rushes: *Carex appressa* (L1), *Cyperus polystachyos*, *Juncus usitatus* (L1), *Baumea articulata*, *Cyperus haspan* subsp. *juncoides*, *Juncus mollis*, *Eleocharis acuta*, *Eleocharis equisetina*, *Eleocharis minuta**, *Fimbristylis dichotoma*, *Juncus kraussii* subsp. *australiensis*, *Juncus subsecundus*.

Herbs and shrubs: *Centella asiatica*, *Cuphea carthagenensis** (L1), *Persicaria hydropiper*, *Senecio madagascariensis** (L2), *Cirsium vulgare**, *Commelina cyanea*, *Persicaria decipiens*, *Cotula coronopifolia**, *Ludwigia octovalvis*, *Philydrum lanuginosum*, *Ranunculus inundatus*, *Eclipta prostrata*.

Number of native taxa: 31

Number of taxa per site: 17–29 (mean 23 ± 8)

Number of exotic species: 10

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Baumea articulata</i>	2	50%	1	3%	positive
<i>Carex appressa</i>	3	50%	2	6%	positive
<i>Centella asiatica</i>	2	100%	2	12%	positive
<i>Cynodon dactylon</i>	4	100%	2	5%	positive
<i>Cyperus haspan</i>	2	50%	2	1%	positive
<i>Cyperus polystachyos</i>	3	50%	1	3%	positive
<i>Ischaemum australe</i>	2	50%	2	6%	positive
<i>Juncus mollis</i>	2	50%	2	2%	positive
<i>Juncus subsecundus</i>	1	50%	0	0%	positive
<i>Juncus usitatus</i>	2	50%	1	4%	positive
<i>Leersia hexandra</i>	2	50%	2	3%	positive
<i>Marsilea mutica</i>	2	50%	2	0%	positive
<i>Persicaria decipiens</i>	2	50%	0	0%	positive
<i>Persicaria hydropiper</i>	2	100%	2	2%	positive
<i>Phragmites australis</i>	2	50%	2	8%	positive
<i>Zoysia macrantha</i>	4	50%	3	5%	positive

Community 3 Broad-leaved Paperbark–Swamp Oak swamp sclerophyll Alluvial Plain Open Forest

Scientific name: Swamp Oak (*Casuarina glauca*), Broad-leaved Paperbark (*Melaleuca quinquenervia*) with Tall Sedge (*Carex appressa*) and Blue Couch (*Cynodon dactylon*) Swamp Sclerophyll Alluvial Plain Open Forest.

Sites: (5) GIB01ALLV, WOO10ALBK, WOO11ALBK, WOO12ALBK, WOO16alvf.

Equivalent communities

Forested Wetlands–Coastal Floodplain Wetlands, Coastal Swamp Forests (Keith 2006); Qld Regional Ecosystem 12.3.5 *Melaleuca quinquenervia* on alluvium (Young and Dillewaard 1999); F8 *Melaleuca quinquenervia* tall to very tall open to closed forest and F10 *Casuarina glauca* tall to very tall open to closed forest (Pressey and Griffith 1992); 40031/2 *Melaleuca quinquenervia* swamp sclerophyll forest and woodland, 40051/2 *Casuarina glauca* forest and woodland, 40991/2 Mixed stands of *Melaleuca quinquenervia* – *Casuarina glauca* NPWS NSW Coastal Vegetation (Griffith & Wilson 2007); 402 – Broad-leaved Paperbark/Swamp She-Oak Closed Forest to Woodland (Kingston *et al.* 2004); Swamp Oak ± Paperbark (sOP) (Landmark Ecological Services 1999); Forest Ecosystem 112 and 143 (NPWS 1999).

Description

The community is mostly an open forest structure, with Broad-leaved Paperbark (*Melaleuca quinquenervia*) and Swamp Oak (*Casuarina glauca*). Site GIB01allv, however, is an open shrubland of Narrow-leaved Paperbark (*Melaleuca alternifolia*) and *Leptospermum brachyandrum*. Rarely, a sparse mid-layer of Swamp Oak is present. There is always a lower layer of grasses, sedges, rushes and herbs, including *Carex appressa*, Blue Couch (*Cynodon dactylon*), *Enydra fluctuans* and River Buttercup (*Ranunculus inundatus*). Ground ferns (*Hypolepis muelleri* and Swamp Ferns (*Blechnum* spp.) are present but less abundant than in Communities 10 and 11, where they dominate.



Distribution and Habitat

Habitat: Commonly found in large estuarine or alluvial backswamps of the Evans River and stagnant alluvial backswamps of Bungawalbin Creek. More rarely found on hinterland river levees where Narrow-leaved Paperbark is the dominant paperbark.

Disturbance: Moderate clearing, light to moderate grazing and weeds.

Example locations: Sites surveyed at Sandy Creek; Bungawalbyn; Boggy Creek, west of Woodburn; and on the Evans River.

Conservation

Threats: Clearing and grazing.

Conservation status: Occurrences of this community on the alluvial plain are examples of Swamp Sclerophyll Forest of New South Wales coastal floodplains EEC. The surveyed sites for Community 3 were not reserved. Griffith (2005) states that floodplain occurrences of both Broad-leaved Paperbark and Swamp Oak Forests communities are poorly reserved. Floodplain occurrences of Broad-leaved Paperbark are reserved at Stotts Island NR, Tuckean NR, Bungawalbyn NR, Yarrigully SCA and Broadwater NP.

Significant taxa: None recorded.



Structure

Layer	Height (m)	Cover (%)
Tallest	5–25	15–40
Middle 1	2–12	10–20
Middle 2	1–3	10
Lower 1	0–1	10–50
Lower 2	0–0.3	5–50

Floristics

Trees: *Melaleuca quinquenervia* (T), *Casuarina glauca* (T), *Melaleuca alternifolia* (T).

Shrubs and small trees: *Callistemon salignus*, *Cupaniopsis anacardioides*, *Leptospermum brachyandrum* (T), *Senna pendula* var. *glabrata**, *Myrsine howittiana*, *Maclura cochinchinensis*, *Duboisia myoporoides*, *Notelaea longifolia*, *Acacia disparrima* subsp. *disparrima*, *Ficus rubiginosa*, *Schefflera actinophylla**.

Climbers: *Ipomoea cairica**, *Parsonsia straminea*, *Marsdenia rostrata*, *Passiflora herbertiana*, *Passiflora suberosa**, *Solanum seafortianum**, *Stephania japonica* var. *discolor*

Epiphytes: *Platycerium superbum*, *Platycerium bifurcatum*, *Pyrrosia confluens* var. *confluens*.

Mistletoes: *Amyema congener* subsp. *congener*, *Benthamina alyxifolia*.

Grasses: *Ottocloa gracillima*, *Zoysia macrantha*, *Hemarthria uncinata*, *Lachnagrostis filiformis* (L2), *Paspalum wettsteinii**, *Cynodon dactylon* (L2), *Phragmites australis*, *Entolasia marginata*, *Oplismenus aemulus*, *Paspalum dilatatum**, *Eriochloa procera*, *Panicum simile*, *Pseudoraphis paradoxa*.

Ferns: *Hypolepis muelleri*, *Pteridium esculentum*, *Histiopteris incisa*.

Sedges/Rushes: *Carex appressa* (L1), *Gahnia clarkei*, *Juncus mollis* (L1), *Cyperus trinervis*, *Eleocharis acuta*, *Fimbristylis ferruginea*, *Lomandra longifolia*, *Lomandra hystrix* (L1), *Cyperus gunnii* subsp. *gunnii* (L1), *Cyperus lucidus*, *Carex maculata*.

Herbs and shrubs: *Enydra fluctuans* (L2), *Centella asiatica* (L2), *Ranunculus inundatus*, *Persicaria strigosa* (L2), *Alternanthera denticulata* (L2), *Persicaria hydropiper*, *Soliva anthemifolia**, *Viola banksii*, *Lobelia anceps*, *Crassocephalum crepidioides**, *Solanum capsicoides**, *Cotula coronopifolia** (L2), *Epaltes australis*, *Goodenia paniculata*, *Centipeda*

minima, *Hydrocotyle acutiloba*, *Lycopus australis*, *Plectranthus parviflorus*, *Pratia purpurascens*, *Ranunculus repens**, *Senecio madagascariensis**, *Dianella caerulea*, *Eclipta platyglossa*, *Homalanthus populifolius*.

Number of native taxa: 76

Number of taxa per site: 12–38 (mean 22 ± 11)

Number of exotic taxa: 24

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Alternanthera denticulata</i>	2	60%	1	5%	positive
<i>Benthamina alyxifolia</i>	1	20%	0	0%	positive
<i>Callitriche muelleri</i>	1	20%	0	0%	positive
<i>Carex appressa</i>	3	100%	1	5%	positive
<i>Casuarina glauca</i>	3	80%	3	21%	positive
<i>Centella asiatica</i>	2	80%	2	12%	positive
<i>Cyperus gunnii</i>	1	20%	0	0%	positive
<i>Enydra fluctuans</i>	2	100%	2	6%	positive
<i>Epaltes australis</i>	1	40%	0	0%	positive
<i>Lachnagrostis filiformis</i>	2	80%	2	2%	positive
<i>Melaleuca quinquenervia</i>	3	80%	3	39%	positive
<i>Persicaria hydropiper</i>	2	60%	2	2%	positive
<i>Persicaria strigosa</i>	2	60%	2	6%	positive
<i>Ranunculus inundatus</i>	2	100%	1	2%	positive

Community 4 Swamp Oak–Broad-leaved Paperbark Estuarine and Alluvial Plain Swamp Sclerophyll Forest

Scientific name: Swamp Oak (*Casuarina glauca*) and Broad-leaved Paperbark (*Melaleuca quinquenervia*) with Saw Sedge (*Gahnia clarkei*), Prickly Couch (*Zoysia macrantha*) and Common Reed (*Phragmites australis*) estuarine and alluvial plain swamp sclerophyll forest.

Sites: (9) BALL16estcbb, WOO15ALLV, BRU26ESTICD, BYR30estsswp, WAR14ALBK, WAR30CBRDG, WAR49albk, WAR50alun, WOO23estsswp.

Equivalent communities

Forested Wetlands–Coastal Floodplain Wetlands, Coastal Swamp Forests (Keith 2006); Qld Regional Ecosystem 12.1.1 *Casuarina glauca* ± *Melaleuca quinquenervia* open forest (Young and Dillewaard 1999); F8 *Melaleuca quinquenervia* tall to very tall open to closed forest, and F10 *Casuarina glauca* tall to very tall open to closed forest (Pressey and Griffith 1992); 40031/2 *Melaleuca quinquenervia* swamp sclerophyll forest and woodland, 40051/2 *Casuarina glauca* forest and woodland, and 40991/2 Mixed stands of *Melaleuca quinquenervia* – *Casuarina glauca* NPWS NSW Coastal Vegetation (Griffith and Wilson 2007); 402 – Broad-leaved Paperbark/Swamp She-Oak Closed Forest to Woodland (Kingston *et al.* 2004); Swamp Oak ± Paperbark (sOP) (Byron Shire Council 1999); Forest Ecosystems 112 and 143 (NPWS 1999).



Description

An open forest structure with Swamp Oak (*Casuarina glauca*) and Broad-leaved Paperbark (*Melaleuca quinquenervia*). The community has a well-developed open mid-layer of Tuckeroo (*Cupaniopsis anacardioides*), Milky Mangrove (*Excoecaria agallocha*) and Prickly Paperbark (*Melaleuca styphelioides*). The lower strata differ from community 3 in the presence of Saw Sedge (*Gahnia clarkei*), Prickly Couch (*Zoysia macrantha*) and Common Reed (*Phragmites australis*) as indicator taxa. River Lily (*Crinum pedunculatum*) is also abundant in some sites. A total of 20% of species recorded were exotic species.

Distribution and Habitat

Habitat: Found on a range of low-lying waterlogged alluvial, estuarine plain and barrier sand substrates with considerable variation in tidal and saline influence at local scales.

Disturbance: Infestation of weeds ranges from light to severe; light grazing.

Example locations: Sites at Tuckean Broadwater, Jali lands at Wardell, Chickiba Creek at North Ballina, Belongil Creek, and west of Brunswick Heads.

Conservation

Threats: Clearing, grazing and weed invasion.

Conservation status: Occurrences of this community on the alluvial plain are examples of Swamp Sclerophyll Forest of New South Wales coastal floodplain EEC. Griffith (2005) states that floodplain occurrences of both Broad-leaved Paperbark and Swamp Oak Forests communities are poorly reserved. Floodplain occurrences of Broad-leaved Paperbark are reserved at Stotts Island NR, Tuckean NR, Bungawalbyn NR, Yarringully SCA, Broadwater NP, Billinudgel NR, Marshalls Creek NR and Tyagarah NR. Estuarine occurrences of Broad-leaved Paperbark are better represented in reserves (e.g. Cudgen NR).

Significant taxa: None recorded.

Structure

Layer	Height (m)	Cover (%)
Tallest	8–25	20–40
Middle 1	0–10	5–60
Middle 2	1–3	10–20
Lower 1	0–1	10–60
Lower 2	0–0.5	40–90

Floristics

Trees: *Casuarina glauca* (T), *Melaleuca quinquenervia* (T), *Eucalyptus tereticornis* (T).

Shrubs and small trees: *Melaleuca quinquenervia* (M1), *Baccharis halimifolia** (M2), *Callistemon salignus* (T), (M1), *Excoecaria agallocha* (M1), *Cupaniopsis anacardioides* (M1), *Melaleuca styphelioides* (M1), *Lantana camara** (M1), *Maclura cochinchinensis*, *Duboisia myoporoides*, *Livistona australis* (M1), *Notelaea longifolia* (M1), *Cinnamomum camphora** (M1), *Melaleuca sieberi* (M1), *Myoporum acuminatum*, *Breynia oblongifolia*, *Schefflera actinophylla**, *Senna pendula* var. *glabrata**.

Climbers: *Parsonsia straminea*, *Ipomoea cairica**, *Marsdenia rostrata*, *Passiflora suberosa**, *Cardiospermum grandiflorum**, *Geitonoplesium cymosum*, *Passiflora herbertiana*, *Solanum seaforthianum**.

Epiphytes: *Platycerium bifurcatum*, *Platycerium superbum*, *Cymbidium madidum*.

Grasses: *Zoysia macrantha* (L1), *Hemarthria uncinata*, *Phragmites australis* (M1), *Paspalum wettsteinii** (L1), *Entolasia marginata*, *Ottochloa gracillima* (L2), *Lachnagrostis filiformis*, *Paspalum scrobiculatum**, *Ischaemum australe*, *Cynodon dactylon* (L2), *Eriochloa procer*, *Paspalum dilatatum**, *Paspalidium distans*, *Diplachne fusca*, *Oplismenus aemulus*, *Paspalidium gracile*, *Paspalum vaginatum*.

Ferns: *Acrostichum speciosum*, *Pteridium esculentum*, *Hypolepis muelleri* (L1), *Cyclosorus interruptus*.

Sedges and rushes: *Juncus kraussii* subsp. *australiensis* (L1), *Gahnia clarkei* (L1), *Eleocharis equisetina* (L1), *Cyperus polystachyos*, *Triglochin striatum*, *Cladium procerum* (M1), *Fimbristylis ferruginea*, *Carex appressa*, *Lomandra longifolia*, *Triglochin procerum*, *Carex maculata* (L1), *Cyperus trinervis*, *Baumea articulata*, *Cyperus stradbrokeensis*, *Fimbristylis tristachya*.

Herbs and shrubs: *Viola banksii* (L1), *Enydra fluctuans* (L1), *Asparagus aethiopicus** (L1), *Alternanthera denticulata*, *Bacopa monnieri* (L1), *Lobelia anceps*, *Crinum pedunculatum* (M1), *Commelina cyanea* (L1), *Leptinella longipes*, *Eclipta platyglossa*, *Goodenia paniculata*, *Hydrocotyle acutiloba*, *Oxalis radicata**, *Pratia purpurascens*, *Tetragonia tetragonioides*, *Apium prostratum* (L1), *Dianella caerulea*, *Emilia sonchifolia*, *Homalanthus populifolius*, *Rumex brownii**.

Number of native species: 82

Number of taxa per site: 16–45 (mean 23 ± 10)

Number of exotic taxa: 21

Indicator native taxa

Species	Group score	Group freq	Non-group score	Non-group freq	Fidelity class
<i>Casuarina glauca</i>	3	100%	3	20%	positive
<i>Melaleuca quinquenervia</i>	3	89%	3	38%	positive
<i>Parsonsia straminea</i>	2	89%	1	43%	positive
<i>Phragmites australis</i>	2	67%	2	6%	positive
<i>Enydra fluctuans</i>	2	56%	2	6%	positive
<i>Juncus kraussii</i>	2	56%	4	5%	positive
<i>Viola banksii</i>	2	56%	2	18%	positive
<i>Zoysia macrantha</i>	3	56%	4	4%	positive
<i>Leptinella longipes</i>	2	22%	0	0%	positive
<i>Diplachne fusca</i>	1	11%	0	0%	positive
<i>Emilia sonchifolia</i>	1	11%	0	0%	positive
<i>Fimbristylis tristachya</i>	1	11%	0	0%	positive

Community 5 Milky Mangrove–Swamp Oak–Grey Mangrove King-Tide Forest

Scientific name: Milky Mangrove (*Excoecaria agallocha*), Swamp Oak (*Casuarina glauca*), Grey Mangrove (*Avicennia marina* subsp. *australasica*) with Mangrove Fern (*Acrostichum speciosum*) and Common Reed (*Phragmites australis*) King-tide Forest.

Sites: (6) BIL03LSRH, TWE14estsswp, TWE26labk, MUR02allv, WAR16estch, MUR03albk.

Equivalent communities

Saline Wetlands-Mangrove (Keith 2006); Qld Regional Ecosystem 12.1.3 Mangrove Shrubland to low closed forest (Young and Dillewaard 1999); 602 – Mangrove Low Closed Forest (Kingston *et al.* 2004); MSO – Grey Mangrove–River Mangrove–Swamp Oak (Landmark Ecological Services 1999); 40151 – *Casuarina glauca*–*Avicennia marina* subsp. *australasica* NPWS NSW Coastal Vegetation (Griffith and Wilson 2007); Forest Ecosystem 77 – Mangrove (NPWS 1999).

Description

An open forest community dominated by Milky Mangrove (*Excoecaria agallocha*), Grey Mangrove (*Avicennia marina* subsp. *australasica*) and Swamp Oak (*Casuarina glauca*). River Mangrove (*Aegiceras corniculatum*) is an occasional associate. The mid-layer is an open to closed cover of Milky Mangrove, *Myoporum acuminatum*, and Mangrove Fern (*Acrostichum speciosum*). The lower layer is sparse to dense, and comprises Mangrove Fern, sedges (*Fimbristylis ferruginea*), Water Ribbons (*Triglochin striatum*), Common Reed (*Phragmites australis*) and herbs (*Apium prostratum*). *Sesuvium portulacastrum* was abundant in one site (TWE26labk), and was recorded at only one other site in the survey, with low cover abundance.



Distribution and Habitat

Habitat: Alluvial backswamps and levees of the Tweed River, with an outlying site on a swampy estuarine channel on the Tuckean Broadwater. Occurs at the inland limit of tidal influence within the mangrove zone.

Disturbance: Light to severe infestation by weeds, and light grazing.

Example locations: Sites at Piggabeen Road, Cobaki Broadwater; Charles Bay, Terranora Broadwater; Stotts River; and a disjunct site at Tuckean Broadwater.

Conservation

Threats: Clearing, grazing and weed invasion.

Conservation status: The conservation status of this community is poorly known. Milky Mangrove occurs sporadically in NSW (Keith 2006) and is uncommon on the north coast, occurring from about Warrell Creek

northwards. In Ballina Nature Reserve, Griffith (2005) recorded an association of Swamp Oak and Grey Mangrove, which included an undestorey of Milky Mangrove. The reservation status of this community is assessed as poor. Floodplain occurrences should be considered as an EEC. By broad definition, the community might be considered as a component of the Swamp Oak floodplain forest EEC.

Significant taxa: None recorded.

Structure

Layer	Height (m)	Cover (%)
Emergent	5–22	20
Tallest	2–25	20–70
Middle 1	0–12	10–80
Middle 2	0.5–2	20
Lower 1	0–2	5–80

Floristics

Trees: *Excoecaria agallocha* (T), *Casuarina glauca* (E), *Avicennia marina* subsp. *australasica* (E), *Aegiceras corniculatum* (T), *Bruguiera gymnorhiza*.

Shrubs and small trees: *Myoporum acuminatum* (T), *Hibiscus tiliaceus* (M1), *Cupaniopsis anacardioides* (M1), *Baccharis halimifolia**, *Lantana camara** (M1), *Callistemon salignus*, *Ficus macrophylla*, *Ficus virens* var. *sublanceolata*, *Senna pendula* var. *glabrata**.

Climbers: *Ipomoea cairica**, *Cynanchum carnosum*, *Parsonsia straminea*, *Passiflora suberosa**, *Solanum seaforthianum**.

Epiphytes: *Dendrobium linguiforme*, *Psilotum nudum*, *Pyrrosia rupestris*.

Mistletoes: *Amyema cambagei*, *Notothixos subaureus*.

Grasses: *Phragmites australis* (M1), *Sporobolus virginicus* var. *minor* (L1), *Oplismenus aemulus*, *Ottocloa gracillima* (L1), *Cynodon dactylon*.

Ferns: *Acrostichum speciosum*.

Sedges and rushes: *Fimbristylis ferruginea* (L1), *Triglochin striatum* (L1), *Bolboschoenus caldwellii*, *Eleocharis acuta*, *Carex appressa*, *Isolepis inundata*.

Herbs and shrubs: *Apium prostratum* (L1), *Triglochin striatum*, *Suaeda australis* (L1), *Einadia hastata* (L1), *Bacopa monnieri* (L1), *Enydra fluctuans*, *Tetragonia tetragonioides*, *Sesuvium portulacastrum* (L1), *Lilaeopsis polyantha* (L1), *Aster subulatus**, *Cotula coronopifolia**, *Commelina cyanea*, *Crinum pedunculatum*, *Dianella caerulea*.

Number of native taxa: 45

Number of taxa per site: 12–67 (mean 29 ± 20)

Number of exotic taxa: 9

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Acrostichum speciosum</i>	4	100%	2	5%	Positive
<i>Aegiceras corniculatum</i>	2	67%	4	5%	Positive
<i>Apium prostratum</i>	4	67%	2	1%	Positive
<i>Avicennia marina</i>	4	67%	4	5%	Positive
<i>Bacopa monnieri</i>	2	50%	2	2%	positive
<i>Casuarina glauca</i>	3	100%	3	21%	Positive
<i>Cynanchum carnosum</i>	2	50%	2	2%	positive
<i>Einadia hastata</i>	2	50%	2	1%	positive
<i>Excoecaria agallocha</i>	4	100%	3	3%	Positive
<i>Fimbristylis ferruginea</i>	3	83%	2	1%	Positive
<i>Lilaeopsis polyantha</i>	2	17%	0	0%	positive
<i>Myoporum acuminatum</i>	2	50%	2	2%	positive
<i>Phragmites australis</i>	2	67%	2	7%	positive
<i>Triglochin striatum</i>	2	67%	2	1%	positive

Community 6 Swamp Oak–Hoop Pine–Tuckeroo Swamp Sclerophyll/dry ‘gallery’ Floodplain Rainforest

Scientific name: Swamp Oak (*Casuarina glauca*), Hoop Pine (*Araucaria cunninghamii*) and Tuckeroo (*Cupaniopsis anacardioides*) Swamp Sclerophyll/Dry ‘Gallery’ Floodplain Rainforest.

Sites: (1) BIL09albk.

Equivalent communities

Forested Wetlands-Coastal Floodplain Wetlands, and Rainforest-Dry ‘Gallery’ Rainforest (Keith 2006); 101 – Littoral Rainforest, 104 – Lowland Rainforest on floodplain, and 601 – Swamp She-oak Forest to Woodland (Kingston *et al.* 2004); Suballiance 3 – *Cryptocarya obovata*–*Dendrocnide excelsa*–*Ficus* spp. *Araucaria*, and Suballiance 17 – *Cupaniopsis anacardioides* (Floyd 1990); FE168 – Rainforest (NPWS 1999).

Description

This is a mesic community occurring on the upper edge of Community 5. It is an open forest community dominated by Swamp Oak (*Casuarina glauca*), Hoop Pine (*Araucaria cunninghamii*) and Tuckeroo (*Cupaniopsis anacardioides*), with a closed mid-storey including Tuckeroo, Cottonwood Hibiscus (*Hibiscus tiliaceus*) and *Myoporum acuminatum*. Associated small trees include Small-leaved Tuckeroo (*Cupaniopsis parvifolia*), Rusty Fig (*Ficus rubiginosa*) and Foambark Tree (*Jagera pseudorhus* var. *pseudorhus* forma *pseudorhus*). The lower layer consists of *Emadia hastata* and the exotic species *Asparagus plumosus* and Rhode’s Grass (*Chloris gayana*).

Distribution and Habitat

Habitat: A lower slope site with a mixture sedimentary derived and estuarine soil characteristics. The presence of Swamp Oak suggests a saline soil influence.

Disturbance: The site is disturbed by weeds and had been lightly burnt 20–50 years previously.

Location: Recorded at mouth of Cobaki Creek, Cobaki Broadwater.

Conservation

Threats: Weed infestation and land clearing.

Conservation status: Contains components of both Swamp Oak Floodplain Forest and Dry ‘Gallery’ Rainforest/Subtropical coastal floodplain forest EECs. Probably poorly reserved and under considerable threat on the alluvial plain.

Significant taxa: None recorded.

Structure

Layer	Height (m)	Cover (%)
Tallest	15–20	60
Middle 1	2–8	70
Lower 1	0–1	50

Floristics

Trees: *Araucaria cunninghamii* (T), *Casuarina glauca* (T).

Shrubs and small trees: *Cupaniopsis anacardioides* (M1), *Hibiscus tiliaceus* (M1), *Cupaniopsis parvifolia*, *Myoporum acuminatum* (M1), *Ficus rubiginosa*, *Jagera pseudorhus* var. *pseudorhus* forma *pseudorhus*, *Lantana camara**, *Sida rhombifolia**.

Climbers: *Parsonsia straminea*, *Passiflora suberosa**, *Cynanchum carnosum*, *Ipomoea cairica**.

Epiphytes: *Pyrrosia rupestris*, *Platynerium superbum*.

Grasses *Chloris gayana** (L1), *Sporobolus virginicus*.

Herbs and shrubs: *Einadia hastata* (L1), *Asparagus plumosus** (L1), *Sonchus oleraceus**, *Tetragonia tetragonioides*.

Number of native species: 17

Number of taxa per site: 17

Number of exotic taxa: 6

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Araucaria cunninghamii</i>	3	100%	2	6%	positive
<i>Casuarina glauca</i>	3	100%	3	22%	positive
<i>Cupaniopsis anacardiodes</i>	4	100%	1	34%	positive
<i>Cupaniopsis parvifolia</i>	2	100%	1	5%	positive
<i>Cynanchum carnosum</i>	2	100%	2	3%	positive
<i>Einadia hastata</i>	3	100%	2	1%	positive
<i>Ficus rubiginosa</i>	2	100%	1	1%	positive
<i>Hibiscus tiliaceus</i>	4	100%	2	3%	positive
<i>Myoporum acuminatum</i>	2	100%	2	2%	positive
<i>Parsonsia straminea</i>	2	100%	1	44%	positive
<i>Pyrrosia rupestris</i>	2	100%	2	3%	positive
<i>Tetragonia tetragonioides</i>	2	100%	2	1%	positive

Community 7 Prickly Couch–Sea Rush–*Schoenoplectus subulatus* saltmarsh

Scientific name: Prickly Couch (*Zoysia macrantha*), Sea Rush (*Juncus kraussii* subsp. *australiensis*) and *Schoenoplectus subulatus* Open to Closed Tussock Grassland/Sedgeland/Rushland

Sites: (5) BALL14estcbb, WOO20estcbb, WOO02estss, WOO25estch, WOO14estss.

Equivalent communities

Saline Wetlands-Saltmarshes (Keith 2006); Qld Regional Ecosystem 12.1.2 Saltpan Vegetation (Young and Dillewaard 1999); S2 – *Juncus kraussii* tall to very tall closed Rushland (Pressey and Griffith 1992); 603 – Saltmarsh Communities (Kingston *et al.* 2004); Sedgeland (S) *Schoenoplectus subulatus* (Griffith 2007); *Zoysia macrantha* tussock grassland (Adam *et al.* 1988). Combinations of *Juncus kraussii*, *Zoysia macrantha* with *Schoenoplectus subulatus* are rarely documented in the literature.

Description

Four of the five sites of this community (WOO02estss, WOO14estss, WOO20estcbb, WOO25estch) are low grassland–sedgeland communities with trees absent or emergent; *Schoenoplectus subulatus* is abundant and Prickly Couch (*Zoysia macrantha*) is always present. These sites are geographically separated from the remaining site (BALL14estcbb), which may be more appropriately classified into Community 62. This site has a tall, emergent layer of River Mangrove (*Aegiceras corniculatum*), Black Mangrove (*Bruguiera gymnorhiza*) and Grey Mangrove (*Avicennia marina* subsp. *australasica*).



Distribution and Habitat

Habitat: Very low-lying sites subject to saline tidal influences in estuarine channels and saline swamps on the floodplain of Evans River and North Creek. Griffith (2007) records a sedgeland unit with a component dominated by *Schoenoplectus subulatus* in the Wallis Lake Catchment.

Disturbance: Light to moderate grazing.

Example locations: Tuckombil, South Bank on the Evans River, and Sawpit Creek on the Evans River.

Conservation

Conservation status: The reservation status of *Zoysia macrantha* tussock grasslands and *Juncus kraussii* subsp. *australiensis* rushland on the north coast of NSW has been assessed as fair (Griffith 2005). The reservation status of *Schoenoplectus litoralis* (= *S. subulatus*) sedgeland was assessed as poor (Griffith 2005). *Juncus kraussii* rushlands are reserved in Broadwater NP, Bundjalung NP and Yuraygir NP.

Threats: Grazing, draining, clearing.

Significant taxa: None recorded.

Structure

Layer	Height (m)	Cover (%)
Emergent	1–2	2
Tallest	3–5	3
Lower 1	0–1	40–75
Lower 2	0–0.3	25–40

Floristics

Trees: *Casuarina glauca* (E), *Aegiceras corniculatum* (E), *Bruguiera gymnorhiza* (T).

Shrubs and small trees:

Climbers: *Cynanchum carnosum*

Mistletoes: *Amyema cambagei*.

Ground Cover:

Grasses *Zoysia macrantha* (L1).

Sedges and rushes: *Juncus kraussii* subsp. *australiensis* (L1), *Schoenoplectus subulatus*.

Herbs and shrubs: None recorded.

Number of native species: 9

Number of taxa per plot: 2–4 (mean 3 ± 1)

Number of exotic taxa: 0

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Juncus kraussii</i>	6	100%	3	5%	positive
<i>Samolus repens</i>	2	20%	0	0%	positive

Community 8 Swamp Oak king-tide swamp sclerophyll forest

Scientific name: Swamp Oak (*Casuarina glauca*) with Sea Rush (*Juncus kraussii*), Prickly Couch (*Zoysia macrantha*) and Mat Grass (*Hemarthria uncinata*) Swamp Sclerophyll King Tide Forest.

Sites: (4) BYR03cbrdg, BYR39cbdne, BYR26estsswp, TWE09estsswp.

Equivalent communities

Forested Wetlands-Coastal Swamp Forests, and Saline Wetlands-Mangroves (Keith 2006); Qld Regional Ecosystem 12.1.1 *Casuarina glauca* ± *Melaleuca quinquenervia* open forest on estuarine deposits (Young and Dillewaard 1999); 601 – Swamp She-oak Closed Forest to Woodland (Kingston *et al.* 2004); F10 – *Casuarina glauca* tall to very tall open to closed forest (Pressey and Griffith 1992); 4005 – *Casuarina glauca* Swamp Sclerophyll Forest and Woodland (Griffith & Wilson 2007); Grey Mangrove–River Mangrove–Swamp Oak (MSO) (Landmark Ecological Services 1999); North-east NSW Forest Ecosystem 143 – Swamp Oak (NPWS 1999).

Description

An open to closed forest of Swamp Oak (*Casuarina glauca*), with a mid- to lower layer of Common Reed (*Phragmites australis*), Sea Rush (*Juncus kraussii* subsp. *australiensis*), Mangrove Fern (*Acrostichum speciosum*) and Prickly Couch (*Sporobolus virginicus*) and Matgrass (*Hemarthria uncinata*).

Distribution and Habitat

Habitat: The littoral zone inland of the mangrove and saltmarsh zone on saline inter-barrier creek deposits mixed with adjoining Pleistocene sands.

Disturbance: Little evidence of disturbance, though one site had been lightly burnt and some weeds were present.

Locations: Sites at Skinners Shoot; Belongil Swamp in Tyagarah NR; Brunswick Heads; and Ukerebagh NR.

Conservation

Conservation status: Reserved in Tweed Estuary NR, Ukerebagh NR, Cudgen NR, Billinudgel NR, Brunswick Heads NR, Cumbebin Swamp NR, Ballina NR and Richmond River NR.

Threats: Burning, grazing and clearing.

Significant taxa: None recorded.



Structure

Layer	Height (m)	Cover (%)
Tallest	5–40	30–70
Middle 1	0.5–2	30
Lower 1	0–1	90–100
Lower 2	0–0.5	20

Floristics

Trees: *Casuarina glauca* (T), *Aegiceras corniculatum* (T).

Shrubs and small trees: *Senna pendula* var. *glabrata** (M1).

Climbers: *Parsonsia straminea*, *Cynanchum carnosum*, *Marsdenia rostrata*.

Mistletoes: *Notothixos subaureus*.

Grasses: *Hemarthria uncinata* (L1), *Phragmites australis* (M1), *Ischaemum australe*.

Ferns: *Acrostichum speciosum* (L1).

Sedges and rushes: *Juncus kraussii* subsp. *australiensis* (L1), *Baumea juncea* (L1).

Herbs and shrubs: *Sarcocornia quinqueflora* subsp. *quinqueflora* (L1), *Bacopa monnieri*, *Mitrasacme alsinoides*.

Number of native species: 21 **No of taxa per plot:** 9–13 (mean 9 ± 3)

Number of exotic taxa: 2

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Acrostichum speciosum</i>	3	80%	2	5%	positive
<i>Casuarina glauca</i>	4	100%	3	21%	positive
<i>Hemarthria uncinata</i>	3	100%	2	3%	positive
<i>Juncus kraussii</i>	6	100%	3	5%	positive
<i>Mitrasacme alsinoides</i>	1	20%	0	0%	positive
<i>Samolus repens</i>	2	20%	0	0%	positive

Community 9 Sea Rush–Mat Grass Saltmarsh

Scientific Name: Sea Rush (*Juncus kraussii*) and Mat Grass (*Hemarthria uncinata*) Saltmarsh.

Sites: (3) BYR27estsswp, BYR28estsswp, TWE20esttdf.

Equivalent communities

Saline Wetlands-Saltmarshes (Keith 2006); Qld Regional Ecosystem 12.1.2 Saltpan Vegetation (Young and Dillewaard 1999); S2 – *Juncus kraussii* tall to very tall closed Rushland (Pressey and Griffith 1992); 603 – Saltmarsh Communities (Kingston *et al.* 2004); *Juncus kraussii*–*Sporobolus virginicus* community (Adam *et al.* 1988). An association between *Juncus kraussii* and *Hemarthria uncinata* was recorded in a *Baumea juncea*–*Juncus kraussii* community from the Lane Cove River (Adam *et al.* 1988).

Description

A community with a dense ground layer of Sea Rush (*Juncus kraussii*), Mat Grass (*Hemarthria uncinata*) and saltmarsh species such as *Sarcocornia quinqueflora* subsp. *quinqueflora* and Saltwater Couch (*Sporobolus virginicus*).

Distribution and Habitat

Habitat: Low-lying estuarine saline swamps fringing a tidal delta flat adjacent to mangroves on the Tweed River.

Disturbance: There was no evidence of disturbance at these sites.

Example Locations: Belongil Creek and Ukerebagh NR.



Conservation

Conservation status: Reserved in Ukerebagh NR. Saline grasslands and saltmarshes are often of restricted occurrence and have been heavily affected by filling and coastal development.

Threats: Clearing, sedimentation and grazing.

Significant taxa: None recorded.

Structure

Layer	Height (m)	Cover (%)
Emergent	2–8	5
Lower 1	0–1.5	100

Floristics

Trees: *Casuarina glauca* (E), *Aegiceras corniculatum* (E).

Grasses *Sporobolus virginicus* (L1), *Hemarthria uncinata* (L1).

Sedges and rushes: *Juncus kraussii* subsp. *australiensis*.

Herbs and shrubs: *Sarcocornia quinqueflora* subsp. *quinqueflora* (L1).

Number of native species: 20 **No of taxa per plot:** 2–8 (mean 5 ± 3)

Number of exotic taxa: 0

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Acrostichum speciosum</i>	3	80%	2	5%	positive
<i>Casuarina glauca</i>	4	100%	3	21%	positive
<i>Hemarthria uncinata</i>	3	100%	2	3%	positive
<i>Juncus kraussii</i>	6	100%	3	5%	positive
<i>Mitrasacme alsinoides</i>	1	20%	0	0%	positive
<i>Samolus repens</i>	2	20%	0	0%	positive

Group 2–Freshwater, seasonally/permanently inundated soils

Community 10 Broad-leaved Paperbark–Swamp Oak–fern/sedge Swamp Sclerophyll Forest

Scientific name: Broad-leaved Paperbark (*Melaleuca quinquenervia*) and Swamp Oak (*Casuarina glauca*) with Swamp Water Fern (*Blechnum indicum*) and *Carex apressa* Swamp Sclerophyll Forest.

Sites: (5) BALL03ESBB, BALL04ESTSS, BALL05ESTB, WOO06albk, WAR37cbrdg.

Equivalent communities

Forested Wetlands-Coastal Swamp Forests, and Coastal Floodplain Wetlands (Keith 2006); Qld Regional Ecosystem 12.1.1 *Casuarina glauca* ± *Melaleuca quinquenervia* open forest on estuarine deposits (Young and Dillewaard 1999); F8 – *Melaleuca quinquenervia* tall to very tall open to closed forest, and F10 – *Casuarina glauca* tall to very tall open to closed forest (Pressey and Griffith 1992); NPWS Coastal Vegetation 40031/2 *Melaleuca quinquenervia* swamp sclerophyll forest and woodland, 40051/2 *Casuarina glauca* forest and woodland, and 40991/2 Mixed stands of *Melaleuca quinquenervia*–*Casuarina glauca* NPWS NSW Coastal Vegetation (Griffith and Wilson 2007); 402 – Broad-leaved Paperbark/Swamp She-Oak Closed Forest to Woodland (Kingston *et al.* 2004); North-east NSW Forest Ecosystems 112 Paperbark, and 143 Swamp Oak (NPWS 1999).

Description

A tall open forest dominated by Broad-leaved Paperbark (*Melaleuca quinquenervia*) and Swamp Oak (*Casuarina glauca*). A sparse middle layer of small trees, including Blue Lilly Pilly (*Syzygium oleosum*), Camphor Laurel (*Cinnamomum camphora*) and *Guioa semiglauc* was present at only one site (BALL04ESTSS). The lower layer consists of an open to dense layer of Swamp Water Fern (*Blechnum indicum*) and River Lily (*Crinum pedunculatum*). Sites BALL03ESSW and BALL05ESTB had a dense cover of *Azolla filiculoides*.

Distribution and Habitat

Habitat: Located on the estuarine plain in low-lying, very wet saline sites around Ballina; one site was located on an alluvial backswamp.

Disturbance: Light disturbance from weeds in all sites and from fire at one (BALL05ESTB).

Example locations: Tuckombil, Ballina Airport, Ballina sewage treatment plant, and south of Lennox Head.



Conservation

Threats: Clearing, grazing and weed invasion.

Conservation status: Occurrences of this community on the alluvial plain are examples of the 'Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions' EEC. The surveyed sites for Community 10 were not reserved. Floodplain occurrences of both Broad-leaved Paperbark and Swamp Oak Forests communities are poorly reserved (Griffith 2005). In the study area, floodplain occurrences of Broad-leaved Paperbark are reserved at Stotts Island NR, Tuckean NR, Bungawalbyn NR, Yarrigully SCA and Broadwater NP. Estuarine occurrences of Broad-leaved Paperbark are better represented in reserves, for example at Ballina NR, Bundjalung NP, Iluka NR, and Cudgen NR.



Significant taxa: *Cladium procerum*.

Structure

Layer	Height (m)	Cover (%)
Tallest	18–35	20–40
Middle 1	0.5–10	5–15
Lower 1	0–1	15–70
Lower 2	0–0.3	20

Floristics

Trees: *Melaleuca quinquenervia* (T), *Casuarina glauca* (T), *Archontophoenix cunninghamiana*, *Lophostemon suaveolens*, *Melaleuca alternifolia*, *Ficus macrophylla*, *Ficus watkinsiana*, *Litsea australis*.

Shrubs and small trees: *Cinnamomum camphora** (M1), *Glochidion ferdinandi*, *Callistemon salignus* (T), *Cupaniopsis anacardioides*, *Elaeocarpus obovatus*, *Guioa semiglauc* (M1), *Acacia melanoxylon*, *Syzygium oleosum* (M1), *Baccharis halimifolia**, *Commersonia bartramia*, *Duboisia myoporoides*, *Glochidion sumatranum*, *Jagera pseudorhus* var. *pseudorhus* forma *pseudorhus*, *Lantana camara**, *Myrsine howittiana*.

Climbers: *Parsonsia straminea* (T), *Ipomoea cairica**, *Lygodium microphyllum*, *Smilax australis*, *Hibbertia scandens*, *Marsdenia rostrata*, *Morinda jasminoides*.

Epiphytes: *Platycerium superbum*, *Platycerium bifurcatum*, *Psilotum nudum*, *Pyrrosia confluens* var. *confluens*.

Grasses: *Phragmites australis* (M1), *Paspalum conjugatum** (M1), *Cynodon dactylon*, *Imperata cylindrica* var. *major*, *Panicum bisulcatum*.

Ferns: *Blechnum indicum* (M1), *Azolla filiculoides* (L1), *Hypolepis muelleri*, *Asplenium australasicum* f. *australasicum*.

Sedges and rushes: *Carex appressa* (M1), *Baumea articulata*, *Cyperus lucidus* (L1), *Schoenoplectus subulatus*, *Bolboschoenus fluviatilis*, *Cladium procerum*, *Cyperus trinervis*, *Schoenoplectus mucronatus*.

Herbs and shrubs: *Enydra fluctuans*, *Persicaria dichotoma*, *Persicaria strigosa* (L1), *Crinum pedunculatum* (L1), *Commelina benghalensis**, *Commelina cyanea*, *Dianella caerulea*, *Hydrocotyle verticillata*, *Eclipta prostrata*, *Persicaria orientalis*, *Triglochin multifructum*.

Number of native taxa: 59

Number of taxa per site: 13–31 (mean 24 ± 8)

Number of exotic taxa: 8

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Azolla filiculoides</i>	4	50%	0	0%	positive
<i>Baumea articulata</i>	2	50%	1	3%	positive
<i>Blechnum indicum</i>	4	100%	2	16%	positive
<i>Bolboschoenus fluviatilis</i>	1	25%	0	0%	positive
<i>Carex appressa</i>	2	100%	2	5%	positive
<i>Casuarina glauca</i>	3	50%	3	22%	positive
<i>Enydra fluctuans</i>	3	100%	2	6%	positive
<i>Hypolepis muelleri</i>	2	50%	2	16%	positive
<i>Lygodium microphyllum</i>	2	50%	2	6%	positive
<i>Melaleuca quinquenervia</i>	3	100%	3	39%	positive
<i>Parsonsia straminea</i>	3	100%	1	44%	positive
<i>Persicaria dichotoma</i>	2	100%	2	3%	positive
<i>Persicaria strigosa</i>	2	75%	2	6%	positive
<i>Phragmites australis</i>	3	50%	2	7%	positive
<i>Platycerium superbum</i>	2	50%	1	8%	positive
<i>Schoenus mucronatus</i>	1	25%	0	0%	positive
<i>Triglochin multifructum</i>	1	25%	0	0%	positive

Community 11 Broad-leaved Paperbark–Pink-flowered Doughwood Swamp Sclerophyll Open Forest

Scientific name: Broad-leaved Paperbark (*Melaleuca quinquenervia*), Pink-flowered Doughwood (*Melicope elleryana*) and Harsh Ground Fern (*Hypolepis muelleri*) Swamp Sclerophyll Open forest.

Sites: (6) BRU33cbbbf, BRU34cbbbf, POT12alfan, CUD15esttdf, WAR01ALFL, WAR04alsw.

Equivalent communities

Wetlands-Coastal Swamp Forests, and Coastal Floodplain Wetlands (Keith 2006); Qld Regional Ecosystems 12.2.7 *Melaleuca quinquenervia* open forest to woodland on Quaternary sands, and 12.3.5 *Melaleuca quinquenervia* on alluvium (Young and Dillewaard 1999); 401 – Broad-leaved Paperbark Closed Forest to Woodland (Kingston *et al.* 2004); F8 – *Melaleuca quinquenervia* tall to very tall open to closed forest (Pressey and Griffith 1992); 40031/2 *Melaleuca quinquenervia* forest and woodland (Griffith and Wilson 2007); Paperbark(PB) (Landmark Ecological Services, 1999); North-east NSW Forest Ecosystem 112 Paperbark (NPWS 1999).

Description

A tall, open to closed forest structure dominated by Broad-leaved Paperbark (*Melaleuca quinquenervia*). The community has an open to dense mid-layer with Pink-flowered Doughwood (*Melicope elleryana*) being particularly abundant; associated trees include Cabbage Tree Palm (*Livistonia australis*), Lilly Pilly (*Acmena smithii*), Bangalow Palm (*Archontophoenix cunninghamiana*) and Willow Bottlebrush (*Callistemon salignus*). The open lower layer comprises a dense cover of Rough Ground Fern (*Hypolepis muelleri*), Swamp Water Fern (*Blechnum indicum*), River Lily (*Crinum pedunculatum*), *Cyperus lucidus* and *Viola banksii*. The climber Common Silkpod (*Parsonsia straminea*) is present and common in most sites. Smart Weed (*Persicaria strigosa*) is also frequent in the ground layer. In the overstorey, Community 11 differs from the closely related Community 12 in the high cover abundance of Pink-flowered Doughwood (*Melicope elleryana*), the presence of Cabbage Tree Palm and the low cover abundance of Swamp Oak (*Casuarina glauca*). Other differences between these two communities include the presence or higher cover abundances of the shrub *Acmena smithii*, the sedge *Cyperus lucidus*, Swamp Rice Grass (*Leersia hexandra*), the grass *Ischaemum australe* and species of climbing plants.



Distribution and Habitat

Habitat: A group of slightly more elevated sites with limited tidal influence, located on the alluvial floodplain of the Evans River and Bingal Creek and waterlogged sandy backbarrier flats on Simpsons Creek, at Tyagarah. The community is also found on the upper limit of the alluvial plain immediately downslope of sedimentary parent material. This community often occurs in association with Community 10 at slightly higher elevations with respect to the water table, enabling colonisation by rainforest species, such as Pink-flowered Doughwood and *Acmena smithii*.

Disturbance: There was no evidence of disturbance at three sites (BRU33cbbbf, BRU34cbbbf, WAR04alsw). One

site (WAR01ALFL) had been lightly grazed, and another two (POT12alfan, CUD15esttdf) had been subject to moderate levels of clearing and had a moderate degree of weed invasion.

Example locations: Simpsons Creek at Tyagarah, Bagotville, Lumleys Lane at Wardell, Cudgen NR and Billinudgel NR.

Conservation

Threats: Clearing, grazing and weed invasion.

Conservation status: Occurrences of this community on the alluvial plain are examples of 'Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions' EEC. Two of the sample sites were within Cudgen NR and Billinudgel NR. Floodplain occurrences of Broad-leaved Paperbark are poorly reserved (Griffith 2005). In the study area, floodplain occurrences of Broad-leaved Paperbark are reserved at Stotts Island NR, Tuckean NR, Bungawalbyn NR, Yarrungully SCA, and Broadwater NP. Estuarine and coastal barrier sand occurrences of Broad-leaved Paperbark are better represented in reserves.

Significant taxa: *Cladium procerum*, *Cordyline congesta* (ROTAP: 2RC-).

Structure

Layer	Height (m)	Cover (%)
Tallest	15–35	30–70
Middle 1	2–15	5–80
Lower 1	0–2	20–50
Lower 2	0–0.5	20–30

Floristics

Trees: *Melaleuca quinquenervia* (T), *Melicope elleryana* (T), *Livistona australis* (T), *Archontophoenix cunninghamiana*, *Eucalyptus propinqua* (T), *Lophostemon suaveolens*, *Glochidion sumatranum* (T), *Casuarina glauca* (T), *Symplocos thwaitesii* (M1), *Ficus watkinsiana*.

Shrubs and small trees: *Acmena smithii* (M1), *Callistemon salignus*, *Cupaniopsis anacardioides*, *Ficus coronata* (M1), *Myrsine howittiana* (M1), *Maclura cochinchinensis*, *Cinnamomum camphora**, *Glochidion ferdinandi*, *Acacia melanoxylon*, *Elaeocarpus reticulatus*, *Endiandra discolor*, *Glochidion sumatranum*, *Pittosporum revolutum*, *Senna pendula* var. *glabrata**, *Diploglottis cunninghamii*, *Psychotria loniceroides*, *Rhodamnia rubescens*, *Rhodomyrtus psidioides*, *Cryptocarya microneura*.

Climbers: *Parsonsia straminea*, *Morinda jasminoides*, *Marsdenia rostrata*, *Geitonoplesium cymosum*, *Lygodium microphyllum*, *Stephania japonica* var. *discolor*, *Passiflora suberosa**, *Smilax australis*, *Mucuna gigantea*, *Ipomoea cairica**.

Epiphytes: *Dendrobium linguiforme*.

Grasses: *Leersia hexandra* (L1), *Ottolochloa gracillima*, *Phragmites australis*, *Axonopus compressus**, *Entolasia marginata*, *Oplismenus aemulus*, *Oplismenus undulatifolius* var. *mollis*.

Ferns: *Hypolepis muelleri* (L1), *Blechnum indicum* (L1), *Christella dentata*, *Calochlaena dubia*.

Sedges and rushes: *Cyperus lucidus* (L1), *Gahnia clarkei* (L1), *Carex breviculmis* (L1), *Lomandra hystrix* (L1), *Lomandra longifolia*, *Carex appressa* (L1), *Baumea articulata*, *Cladium procerum*, *Carex maculata*.

Herbs and shrubs: *Crinum pedunculatum* (L1), *Viola banksii* (L2), *Persicaria strigosa*, *Cordyline congesta*, *Alocasia brisbanensis*, *Dianella caerulea*, *Drymaria cordata* subsp. *cordata*, *Alternanthera denticulata*, *Commelina cyanea*, *Philydrum lanuginosum*, *Persicaria dichotoma*, *Cordyline rubra*, *Erechtites valerianifolia**.

Number of native taxa: 79

Number of taxa per site: 27–47 (mean 34 ± 10)

Number of exotic taxa: 7

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Archontophoenix cunninghamiana</i>	2	50%	2	25%	positive
<i>Blechnum indicum</i>	2	83%	2	16%	positive
<i>Cordyline congesta</i>	2	50%	1	13%	positive
<i>Crinum pedunculatum</i>	3	83%	1	4%	positive
<i>Cyperus lucidus</i>	4	50%	1	1%	positive
<i>Ficus coronata</i>	2	67%	2	13%	positive
<i>Hypolepis muelleri</i>	4	100%	2	15%	positive
<i>Melaleuca quinquenervia</i>	5	100%	3	38%	positive
<i>Melicope elleryana</i>	3	100%	2	18%	positive
<i>Morinda jasminoides</i>	3	50%	2	26%	positive
<i>Parsonsia straminea</i>	2	100%	1	44%	positive
<i>Persicaria strigosa</i>	2	67%	2	6%	positive
<i>Viola banksii</i>	3	67%	2	19%	positive

Community 12 Broad-leaved Paperbark–Swamp Oak Ferny Swamp Sclerophyll Forest

Scientific Name: Broad-leaved Paperbark (*Melaleuca quinquenervia*) and Swamp Oak (*Casuarina glauca*) with Swamp Water Fern (*Blechnum indicum*) and Harsh Ground Fern (*Hypolepis muelleri*) Swamp Sclerophyll Open to Closed Forest.

Sites: (11) BALL07cbrdg, BALL08estsswp, BRU12cbdne, BYR23cbdne, BYR04estcl, BYR14lsrh, BYR22lsrh, BYR21alfan, BYR25estsswp, TWE31esttdf, BYR10estcl.

Equivalent communities

Forested Wetlands-Coastal Swamp Forests, and Coastal Floodplain Wetlands (Keith 2006); Qld Regional Ecosystems 12.3.5 *Melaleuca quinquenervia* open forest on alluvium, and 12.2.7 *Melaleuca quinquenervia* open forest to woodland on Quaternary sands (Young and Dillewaard 1999); 401 – Broad-leaved Paperbark Closed Forest to Woodland, and 402 – Broad-leaved Paperbark/Swamp Sheoak Closed Forest to Woodland (Kingston *et al.* 2004); F8 – *Melaleuca quinquenervia* tall to very tall open to closed forest, and F10 *Casuarina glauca* tall to very tall open to closed forest (Pressey and Griffith 1992); 40031/2 *Melaleuca quinquenervia* forest and woodland, 40051/2 *Casuarina glauca* forest and woodland, and 40991/2 Mixed stands of *Melaleuca quinquenervia*–*Casuarina glauca* NPWS NSW Coastal Vegetation (Griffith and Wilson 2007); North-east NSW Forest Ecosystems 112 Paperbark and 143 Swamp Oak (NPWS 1999).

Description

An open to closed forest structure in which Broad-leaved Paperbark (*Melaleuca quinquenervia*) clearly dominates but is frequently associated with Swamp Oak (*Casuarina glauca*) and occasionally associated with Swamp Mahogany (*Eucalyptus robusta*). A middle layer is characterised by Blackwood (*Acacia melanoxylon*), Pink-flowered Doughwood (*Melicope elleryana*) and Blueberry Ash (*Elaeocarpus reticulatus*). The climber *Parsonsia straminea* is very abundant in this community, as is the climbing fern *Lygodium microphyllum*. The lower layer has a high proportion of cover attributed to Swamp Water Fern (*Blechnum indicum*) and Harsh Ground Fern



(*Hypolepis muelleri*), and a number of common sedges and rushes including Twig Rush (*Baumea juncea*), *Baumea rubiginosa*, saw sedges (*Gahnia sieberiana*, *G. clarkei*), *Lepironia articulata* and Common Reed (*Phragmites australis*) and the grass *Entolasia marginata*. *Cladium procerum* was very abundant in the lower layer in site BYR10estcl. This community is closely related to Community 11. Overstorey differences between Communities 11 and 12 include the very high cover abundance of Broad-leaved Paperbark, the presence of Swamp Mahogany and the higher cover abundance of Swamp Oak in this community. Other differences include the presence or higher abundance of Blueberry Ash, Common Reed, the saw sedge *Gahnia sieberiana*, *Lepironia articulata*, *Entolasia marginata*, Swamp Millet (*Ischaemum australe*) and Climbing Fern (*Lygodium microphyllum*).

Distribution and Habitat

Habitat: Located on waterlogged dune swales, backbarrier flats on Pleistocene dunes, estuarine tidal flats, and an alluvial channel adjacent to the Wardell Sandplain. This community is less elevated than Community 11, with estuarine and Pleistocene barrier sand influences.

Disturbance: There is light to moderate weed disturbance at most sites, and moderate to light fire disturbance at TWE31esttd and BALL07cbrdg. There is no evidence of disturbance at sites BYR10estcl and BYR04estcl.

Example locations: Piggabeen Road, Tweed Heads; New Brighton; Cumbebin NR; Ti Tree Cemetery Road; Bangalow Road; and Tandys Lane, Newybar.

Conservation

Threats: Clearing, burning, grazing and weed infestation.

Conservation status: Occurrences of this community on the alluvial plain are examples of 'Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions' EEC. Site BRU12cbdne was within Marshalls Creek NR, and site BYR23cbdne was in Cumbebin Swamp NR. Floodplain occurrences of both Broad-leaved Paperbark and Swamp Oak Forests communities are poorly reserved (Griffith 2005). In the study area, floodplain occurrences of Broad-leaved Paperbark are reserved at Stotts Island NR, Tuckean NR, Bungawalbyn NR, Yarrungully SCA and Broadwater NP.

Significant taxa: *Cordyline congesta* (ROTAP: 2RC-).

Structure

Layer	Height (m)	Cover (%)
Tallest	6–30	50–80
Middle 1	1–20	15–50
Middle 2	0.5–2	40–60
Lower 1	0–2	10–90
Lower 2	0–1	40–70

Floristics

Trees: *Melaleuca quinquenervia* (T), *Melicope elleryana* (M1), *Casuarina glauca* (T), *Glochidion sumatranum* (T), *Eucalyptus robusta* (T), *Archontophoenix cunninghamiana* (M1).

Sub canopy trees: *Glochidion sumatranum*, *Elaeocarpus reticulatus* (M1), *Acacia melanoxylon* (M1), *Cupaniopsis anacardioides*, *Guioa semiglaucula*, *Cinnamomum camphora**, *Elaeocarpus obovatus*, *Ficus macrophylla*, *Acmena smithii*.

Shrubs: *Senna pendula* var. *glabrata**, *Hibiscus diversifolius*, *Lantana camara**, *Leptospermum polygalifolium* (M1), **Urena lobata*.

Climbers: *Parsonsia straminea* (T), *Lygodium microphyllum* (M1), *Marsdenia rostrata*, *Hibbertia scandens*, *Ipomoea cairica**, *Stephania japonica* var. *discolor*, *Eustrephus latifolius*.

Mistletoes: *Amyema congener* subsp. *congener*.

Grasses: *Entolasia marginata* (L1), *Phragmites australis* (L1), *Ischaemum australe* (L1), **Paspalum conjugatum* (L1), *Imperata cylindrica* var. *major* (L1), **Andropogon virginicus*, *Hemarthria uncinata*, *Ottocloa gracillima*.

Ferns: *Blechnum indicum* (L1), *Hypolepis muelleri* (L1), *Pteridium esculentum* (M2), *Cyclosorus interruptus*, *Histiopteris incisa*, *Christella dentata*, *Gleichenia dicarpa*.

Sedges and rushes: *Gahnia sieberiana* (M2), *Lepironia articulata*, *Gahnia clarkei* (M2), *Baumea teretifolia* (L1), *Baumea juncea*, *Baumea rubiginosa* (L1), *Cladium procerum* (L1), *Baloskion tetraphyllum* (L2), *Typha orientalis*, *Cyperus lucidus*.

Herbs and shrubs: *Viola banksii*, *Melastoma affine*, *Persicaria dichotoma*, *Persicaria strigosa*, *Centella asiatica*, *Persicaria hydropiper*, *Alternanthera denticulata*, *Enydra fluctuans*, *Goodenia paniculata*, *Lobelia anceps*.

Number of native species: 66

Number of taxa per site: 9–54 (mean 22 ± 11)

Number of exotic taxa: 11

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Blechnum indicum</i>	3	100%	2	14%	positive
<i>Entolasia marginata</i>	2	64%	2	10%	positive
<i>Entolasia stricta</i>	3	9%	0	0%	positive
<i>Gahnia sieberiana</i>	2	73%	3	4%	positive
<i>Hibiscus diversifolia</i>	1	36%	0	0%	positive
<i>Hypolepis muelleri</i>	3	55%	2	15%	positive
<i>Lepironia articulata</i>	2	55%	4	3%	positive
<i>Lygophyllum microphyllum</i>	3	64%	1	4%	positive
<i>Melaleuca quinquenervia</i>	5	100%	3	37%	positive
<i>Parsonsia straminea</i>	3	100%	1	43%	positive

Community 13 Alluvial plain Broad-leaved Paperbark–Swamp Mahogany–Saw Sedge/Swamp Water Fern Swamp Sclerophyll Forest

Scientific name: Broad-leaved Paperbark (*Melaleuca quinquenervia*), Swamp Mahogany (*Eucalyptus robusta*) and with Saw Sedge (*Gahnia clarkei*) and Swamp Water Fern (*Blechnum indicum*) Swamp Sclerophyll Low to Open Forest.

Sites: (5) WAR19albk, WAR45albk, WAR25albk, WAR44albk, WAR31cbrdg

Equivalent communities

Forested Wetlands-Coastal Floodplain Wetlands (Keith 2006); Qld Regional Ecosystems 12.3.5 *Melaleuca quinquenervia* open forest on alluvium, and 12.2.7 *Melaleuca quinquenervia* open forest to woodland on Quaternary sands (Young and Dillewaard 1999); 401 – Broad-leaved Paperbark Closed Forest to Woodland (Kingston *et al.* 2004); F8 – *Melaleuca quinquenervia* tall to very tall open to closed forest (Pressey and Griffith 1992); 40031/2 *Melaleuca quinquenervia* forest and woodland, 40981/2 Mixed stand of *Eucalyptus robusta*–*Melaleuca quinquenervia*, 64051 *Lepironia articulata* Sedgeland, and 64131 *Eleocharis equisetina* Sedgeland (Griffith and Wilson 2007); Swamp Mahogany/Swamp Box (SMB) (Landmark Ecological Services 1999); Forest Ecosystem 112 Paperbark (NPWS 1999).

Description

A low open forest dominated by Broad-leaved Paperbark (*Melaleuca quinquenervia*) and which, in one site, is associated with Swamp Mahogany (*Eucalyptus robusta*). A sparse middle layer comprises Pink-flowered Doughwood (*Melicope elleryana*), Umbrella Cheese Tree (*Glochidion sumatranum*), *Duboisia myoporoides* and Black Wattle (*Callicoma serratifolia*). An open to dense lower layer is present, including *Entolasia marginata*, Rough Ground Fern (*Hypolepis muelleri*), Swamp Water Fern (*Blechnum indicum*), Bat's Wing Fern (*Histiopteris incisa*), *Eleocharis equisetina*, Ditch Millet (*Paspalum orbiculare*), *Lepironia articulata*, Saltwater Couch (*Paspalum vaginatum*) and *Isolepis inundata*.



Site WAR25albk consists of a *Lepironia articulata*–*Eleocharis equisetina* sedgeland with emergent Broad-leaved Paperbark. Site WAR31cbrdg was an association of Broad-leaved Paperbark–Swamp Mahogany growing on coastal barrier sands with a sparse mid-story of Wallum Bottlebrush (*Callistemon pachyphyllus*) and a ground layer of sedges, including the vulnerable *Persicaria elatior*.

Distribution and Habitat

Habitat: Found in the stagnant alluvial backswamp of Tuckean Swamp and on watellogged sites on the Wardell Pleistocene barrier sand mass.

Disturbance: Site WAR25albk was severely burnt, and all other sites had been recently burnt. Weed disturbance was light to moderate. WAR19albk and WAR45albk were lightly grazed.

Example locations: Tuckean (four sites on alluvium), Jali Lands at Wardell (one site on coastal barrier sands).

Conservation

Threats: Clearing, burning, grazing and weed infestation.

Conservation status: Occurrences of this community on the alluvial plain are probably examples of 'Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions' EEC. Floodplain occurrences of Broad-leaved Paperbark are poorly reserved (Griffith 2005). Floodplain occurrences of Broad-leaved Paperbark are reserved at Tuckean NR, Bungawalbyn NR, Yarrungully SCA, and Broadwater NP.

Significant taxa: *Persicaria elatior* (TSC: Vulnerable).

Structure

Layer	Height (m)	Cover (%)
Tallest	10–25	5–35
Middle 1	1.5–6	10–20
Lower 1	0.2–1.5	20–90
Lower 2	0–0.3	10

Floristics

Trees: *Melaleuca quinquenervia* (T), *Eucalyptus robusta* (T), *Lophostemon suaveolens*.

Sub-canopy trees: *Glochidion sumatranum* (M1), *Callicoma serratifolia* (M1), *Melicope elleryana* (M1), *Duboisia myoporoides* (T).

Shrubs: *Callistemon pachyphyllus* (M1), *Acacia elongata*, *Baccharis halimifolia**, *Leptospermum speciosum*.

Climbers: *Marsdenia rostrata*, *Parsonsia straminea*, *Cassytha pubescens*, *Hibbertia scandens*.

Grasses: *Axonopus compressus**, *Paspalum orbiculare* (L1), *Pseudoraphis spinescens*, *Paspalum vaginatum* (L1), *Entolasia marginata* (L1), *Leersia hexandra*, *Lachnagrostis billardierei* subsp. *billardierei*.

Ferns: *Blechnum indicum* (L1), *Histiopteris incisa*, *Hypolepis muelleri* (L1), *Pteridium esculentum*.

Sedges and rushes: *Isolepis inundata* (L1), *Eleocharis equisetina* (L1), *Lepironia articulata* (L1), *Cyperus polystachyos*, *Baloskion tetraphyllum*, *Baumea rubiginosa*, *Carex appressa*, *Cyperus haspan* subsp. *juncoides*, *Gahnia clarkei*, *Juncus mollis*, *Baumea articulata*, *Carex maculata*.

Herbs and shrubs: *Alternanthera denticulata*, *Persicaria dichotoma*, *Persicaria elatior*, *Persicaria strigosa*, *Philydrum lanuginosum*, *Viminaria juncea*.

Number of native taxa: 61

Number of taxa per site: 9–43 (mean 28 ± 17)

Number of exotic taxa: 10

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Blechnum indicum</i>	3	80%	2	16%	positive
<i>Histiopteris incisa</i>	2	60%	1	4%	positive
<i>Hypolepis muelleri</i>	3	60%	2	16%	positive
<i>Isolepis inundata</i>	2	100%	1	1%	positive
<i>Leptospermum speciosum</i>	1	20%	0	0%	positive
<i>Melaleuca quinquenervia</i>	4	100%	3	38%	positive
<i>Persicaria elatior</i>	2	20%	0	0%	positive
<i>Persicaria strigosa</i>	2	80%	2	6%	positive
<i>Pseudoraphis spinescens</i>	2	40%	0	0%	positive
<i>Pteridium esculentum</i>	2	60%	2	20%	positive

Community 14 Swamp Mahogany–Broad-leaved Paperbark–Bangalow Palm–sedge/fern Swamp Sclerophyll Forest

Scientific name: Swamp Mahogany (*Eucalyptus robusta*), Broad-leaved Paperbark (*Melaleuca quinquenervia*) and Bangalow Palm (*Archontophoenix cunninghamiana*) with Saw Sedge (*Gahnia clarkei*) and Swamp Water Fern (*Blechnum indicum*) Swamp Sclerophyll Open to Closed Forest.

Sites: (12) BRU18cbbbf, WAR47alfan, WAR07alilsw, WAR08cbr, WAR17alfan, WAR32albk, BRU25estchf, BRU45cbrdg, BYR05cbsw, BYR19alfan, BYR16hsrh, WAR23alfan.

Equivalent communities

Forested Wetlands-Coastal Swamp Forests, and Coastal Floodplain Wetlands (Keith 2006); Qld Regional Ecosystem 12.3.5 *Melaleuca quinquenervia* on alluvium (Young and Dillewaard 1999); 305 – Coastal Swamp Mahogany Open Forest to Woodland (Kingston *et al.* 2004); F7 – *Eucalyptus robusta* mid high to very tall open forest (Pressey and Griffith 1992); 40021/2 *Eucalyptus robusta* forest and woodland, 40981/2 Mixed stand of *Eucalyptus robusta*–*Melaleuca quinquenervia*, NSW NPWS coastal vegetation (Griffith & Wilson 2007); Swamp Mahogany/Swamp Box (SMB) (Landmark Ecological Services 1999); North-East NSW Forest Ecosystem 112 Paperbark, and 142 Swamp Mahogany (NPWS 1999).

Description

An open to closed swamp sclerophyll forest dominated by Swamp Mahogany (*Eucalyptus robusta*) and Broad-leaved Paperbark (*Melaleuca quinquenervia*), with Swamp Box (*Lophostemon suaveolens*) occasionally present. An open middle layer of trees includes Bangalow Palm (*Archontophoenix cunninghamiana*), Pink-flowered Doughwood (*Melicope elleryana*), Blueberry Ash (*Elaeocarpus reticulatus*), Cabbage Tree Palm (*Livistona australis*), Lilly Pilly (*Acmena smithii*) and Maiden's Wattle (*Acacia maidenii*). An open to dense lower layer includes Swamp Water Fern (*Blechnum indicum*), Saw Sedge (*Gahnia clarkei*), *Baloskion tetraphyllum*, Palm Lily (*Cordyline congesta*), Bat's Wing Fern (*Histiopteris incisa*), Harsh Ground Fern (*Hypolepis mulleri*) and King Fern (*Todea barbara*). The climber *Parsonsia straminea* is common in a number of sites. This community differs from Communities 10–13 by the co-dominance of Swamp Mahogany, its association with Swamp Box and the absence of Swamp Oak (*Casuarina glauca*).



Distribution and Habitat

Habitat: Alluvial and colluvial fans and channels in narrow valleys and the along the tributaries of coastal creeks.

Disturbance: There is light to moderate disturbance by weeds and fire; site WAR17alfan has been severely logged.

Example locations: Brunswick Heads Bypass, Bangalow Road, Taylor's Lake Road, Coolgardie Road, Lumleys Lane at Wardell, Thurgates Lane at Wardell, Bagtoville–Alstonville Road, Jali Lands at Wardell, and Tuckean Broadwater.

Conservation

Threats: Clearing, burning, logging, grazing and weed infestation.

Conservation status: This community is a component of the 'Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions' EEC. The overall reservation status of Swamp Mahogany Forest in NSW is assessed as probably poor (Griffith 2005). Swamp Mahogany is listed as a rare forest ecosystem (NPWS1999). Equivalent communities are reserved in Broadwater NP, Bundjalung NP and Yuraygir NP (Griffith and Wilson 2007). One sample site was located in Brunswick Heads NR.

Significant taxa: *Trichosanthes subvelutina* (TSC: Vulnerable).

Structure

Layer	Height (m)	Cover (%)
Tallest	10–30	20–80
Middle 1	2–20	10–60
Middle 2	1–5	20–70
Lower 1	0–2	5–90

Floristics

Trees: *Lophostemon suaveolens* (T), *Melaleuca quinquenervia* (T), *Eucalyptus robusta* (T), *Eucalyptus pilularis* (T), *Eucalyptus microcorys*.

Sub-canopy trees: *Acacia maidenii* (T), *Elaeocarpus reticulatus* (T), *Melicope elleryana* (T), *Glochidion sumatranum* (T), *Archontophoenix cunninghamiana* (M1), *Acmena smithii* (M1), *Livistona australis* (M1), *Endiandra sieberi* (M1), *Cinnamomum camphora** (M1), *Allocasuarina torulosa* (M1), *Callicoma serratifolia* (M1), *Pittosporum undulatum* (M1), *Archirhodomyrtus beckleri*, *Cupaniopsis anacardioides*, *Duboisia myoporoides*, *Elaeocarpus obovatus*, *Endiandra sieberi*, *Endiandra virens*, *Ficus coronata*, *Guioa semiglaucula*, *Jagera pseudorhus* var. *pseudorhus* forma *pseudorhus*, *Litsea australis*.

Shrubs: *Lantana camara** (M1), *Myrsine howittiana* (M1), *Psychotria loniceroides* (M2), *Trochocarpa laurina* (M2), *Acacia longissima*, *Acacia melanoxylon*, *Alyxia ruscifolia*, *Callistemon salignus*, *Drypetes deplanchei*, *Embelia australiana*, *Pilidiostigma glabrum*, *Pittosporum multiflorum*, *Pittosporum undulatum*, *Rhodamnia rubescens*, *Sarcopteryx stipata*, *Syzygium oleosum*, *Trophis scandens*, *Wilkiea huegeliana*.

Climbers: *Calamus muelleri*, *Cissus hypoglauca*, *Desmodium gunnii*, *Desmodium nemorosum*, *Dioscorea transversa*, *Echinostephia aculeata*, *Flagellaria indica*, *Geitonoplesium cymosum*, *Hibbertia dentata*, *Hibbertia scandens*, *Lygodium microphyllum*, *Marsdenia rostrata*, *Mucuna gigantea*, *Pandorea pandorana*, *Ripogonum elseyanum*, *Ripogonum fawcettianum*, *Smilax australis*, *Smilax glycyphylla*, *Stephania japonica* var. *discolor*, *Tylophora paniculata*, *Trichosanthes subvelutina*.

Epiphytes: *Cymbidium madidum*, *Cymbidium suave*, *Platycerium bifurcatum*, *Platycerium superbum*, *Asplenium australasicum* f. *australasicum*.

Mistletoes: *Muellerina celastroides*.

Grasses: *Ottocloa gracillima* (L1), *Entolasia stricta*, *Oplismenus aemulus*.

Ferns: *Todea barbara* (M2), *Histiopteris incisa* (M2), *Pteridium esculentum* (L1), *Blechnum indicum* (L1), *Blechnum camfieldii* (L1), *Adiantum hispidulum*, *Asplenium australasicum* f. *australasicum*, *Calochlaena dubia*, *Davallia solida* var. *pyxidata*.

Sedges and rushes: *Gahnia clarkei* (M2), *Baloskion tetraphyllum* (L1), *Cyperus enervis*, *Gahnia sieberiana*.

Herbs and shrubs: *Ochna serrulata** (L1), *Cordyline congesta*, *Ageratina adenophora**, *Alocasia brisbanensis*, *Alpinia arundelliana*, *Alpinia caerulea*, *Breynia oblongifolia*, *Brunoniella australis*, *Commelina cyanea*, *Cordyline rubra*, *Crinum pedunculatum*, *Cryptostylis erecta*, *Homalanthus populifolius*, *Hydrocotyle peduncularis*, *Pomax umbellata*.

Number of native taxa: 141

Number of taxa per site: 15–90 (mean 37 ± 22)

Number of exotic taxa: 10

Indicator native taxa

Species	Group	Group frequency	Non-group	Non-group frequency	class
<i>Archontophoenix cunninghamiana</i>	2	94%	2	22%	positive
<i>Blechnum camfieldii</i>	2	6%	0	0%	positive
<i>Blechnum indicum</i>	2	88%	2	13%	positive
<i>Cordyline congesta</i>	2	71%	1	11%	positive
<i>Elaeocarpus reticulatus</i>	3	65%	1	16%	positive
<i>Eucalyptus robusta</i>	3	59%	3	5%	positive
<i>Ficus superba</i> var. <i>henneana</i>	1	6%	0	0%	positive
<i>Gahnia clarkei</i>	3	82%	2	14%	positive
<i>Hypolepis muelleri</i>	3	59%	2	14%	positive
<i>Lophostemon suaveolens</i>	3	53%	2	21%	positive
<i>Marsdenia rostrata</i>	2	82%	1	20%	positive
<i>Melaleuca quinquenervia</i>	3	88%	3	37%	positive
<i>Melicope elleryana</i>	3	100%	2	16%	positive
<i>Parsonsia straminea</i>	2	53%	1	44%	positive
<i>Trichosanthes subvelutina</i>	1	6%	0	0%	positive

Community 15 Bangalow Palm–Swamp Box–Cabbage Tree Palm–Weeping Myrtle Alluvial Riparian Forest

Scientific name: Bangalow Palm (*Archontophoenix cunninghamiana*), Swamp Box (*Lophostemon suaveolens*), Cabbage Tree Palm (*Livistona australis*), Weeping Myrtle (*Waterhousea floribunda*) alluvial riparian forest

Sites: (5) WAR09cbbbf, WAR33alch, WAR26albk, WAR27alfan, WAR43alfan.

Equivalent communities

Forested Wetlands-Coastal Floodplain Wetlands (Keith 2006); F9 – *Archontophoenix cunninghamiana*–*Melaleuca quinquenervia* very tall feather palm swamp forest (Pressey and Griffith 1992); possibly 40141 *Melaleuca quinquenervia*–*Livistona australis* Swamp sclerophyll forest & woodland (Griffith and Wilson 2007); 401 – Broad-leaved Paperbark Closed Forest to Woodland (Kingston *et al.* 2004); Suballiance 6 –*Archontophoenix*–*Livistonia* (Floyd 1990).

Description

An open to closed palm forest, with an overstory of abundant Bangalow Palm (*Archontophoenix cunninghamiana*), Weeping Lilly Pilly (*Waterhousea floribunda*), Swamp Box (*Lophostemon suaveolens*), and frequent Cabbage Tree Palms (*Livistona australis*) and Broad-leaved Paperbarks (*Melaleuca quinquenervia*). There is a middle layer of Pink-flowered Doughwood (*Melicope elleryana*) and a sparse lower layer of sedges, including *Carex maculata*, and Rough Ground Fern (*Hypolepis muelleri*).



Distribution and Habitat

Habitat: Alluvial channels of flat lowland plains at Tuckean and Wardell, on deep soils formed by the input of basalt sediments from the nearby Blackwall Range and also the Pleistocene sand beds of the Wardell Sandplain.

Disturbance: Light fire and light weed disturbance, though there is no evidence of disturbance at site. WAR26albk.

Example locations: Between Tuckean NR and Bagotville–Alstonville Road, at Tuckean, on Jali Lands at Wardell, and Thurgates Lane.

Conservation

Threats: Clearing, burning, grazing and weed infestation.

Conservation status: This community is a component of the 'Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions' EEC or the 'Sub-tropical Coastal Floodplain Forest of the NSW North Coast bioregion' EEC. Occurrences of communities dominated by Weeping Lilly Pilly on the floodplain are very rare.

Significant taxa: *Cordyline congesta* (ROTAP: 2RC-).

Structure

Layer	Height (m)	Cover (%)
Tallest	25–35	25–75
Middle 1	2–20	15–40
Middle 2	1–5	10–20
Lower 1	0–1	2–30

Floristics

Trees: *Archontophoenix cunninghamiana* (T), *Waterhousea floribunda* (T), *Lophostemon suaveolens* (T), *Melicope elleryana* (T), *Melaleuca quinquenervia* (T), *Livistona australis*, *Eucalyptus robusta*, *Ficus watkinsiana*.

Sub-canopy trees: *Livistona australis* (M1), *Callicoma serratifolia* (M1), *Glochidion sumatranum* (T), *Syzygium oleosum* (T), *Sarcopteryx stipata* (M1), *Croton verreauxii* (M1), *Alphitonia excelsa*, *Cinnamomum camphora**, *Acmena smithii*, *Cryptocarya glaucescens*, *Glochidion ferdinandi*, *Jagera pseudorhus* var. *pseudorhus* forma *pseudorhus*, *Symplocos thwaitesii*, *Cryptocarya microneura*, *Cryptocarya obovata*, *Diploglottis cunninghamii*, *Synoum glandulosum* subsp. *glandulosum*, *Syzygium luehmannii*.

Shrubs: *Syzygium oleosum*, *Croton verreauxii*, *Pilidiostigma glabrum*, *Endiandra sieberi*, *Lantana camara**, *Ochna serrulata**, *Solanum mauritianum**, *Duboisia myoporoides*, *Dysoxylum mollissimum* subsp. *molle*, *Myrsine variabilis*, *Elaeocarpus reticulatus*, *Pittosporum revolutum*, *Trochocarpa laurina*.

Climbers: *Marsdenia rostrata*, *Morinda jasminoides*, *Smilax australis*, *Flagellaria indica*, *Geitonoplesium cymosum*, *Ripogonum elseyanum* (M2), *Desmodium nemorosum*, *Cissus hypoglauca*, *Dioscorea transversa*, *Echinostephia aculeata*, *Pandorea pandorana*, *Parsonsia straminea*, *Passiflora edulis**, *Rubus moluccanus* var. *trilobus*, *Smilax glyciphylla*, *Stephania japonica* var. *discolor*.

Epiphytes: *Asplenium australasicum* f. *australasicum*, *Cymbidium madidum*, *Platynerium bifurcatum*.

Grasses: *Ottocloa gracillima* (L1), *Oplismenus aemulus*.

Ferns: *Hypolepis muelleri* (L1), *Blechnum indicum* (L1), *Todea barbara*, *Asplenium australasicum* f. *australasicum*, *Nephrolepis cordifolia**, *Calochlaena dubia*, *Cyathea australis*, *Cyathea leichhardtiana*, *Davallia solida* var. *pyxidata*, *Lastreopsis decomposita*, *Platynerium bifurcatum*.

Sedges and rushes: *Carex maculata*-L1, *Gahnia clarkei*-L1.

Herbs and shrubs: *Cordyline congesta* (M2), *Alpinia arundelliana*, *Alocasia brisbanensis*, *Cryptostylis subulata*, *Centella asiatica*, *Persicaria dichotoma*, *Commelina cyanea*, *Dianella caerulea*, *Hedychium gardnerianum**, *Viola banksii*, *Zieria smithii*.

Number of native taxa: 90

Number of taxa per site: 24–48 (mean 36 ± 12)

Number of exotic taxa: 6

Indicator native taxa

The indicator native taxa for Community 15 are a sub-group of those listed for Community 14, and no table is given here.

Community 16 Tea-tree (*Leptospermum* spp.)–*Sporodanthus interruptus* Wet Heath

Scientific name: Tautoon Tea-tree (*Leptospermum polygalifolium*), Slender Tea-tree (*Leptospermum livensidgei*), *Leptospermum whitei* and *Sporodanthus interruptus* Wallum Wet Heath.

Sites: (2) BALL09CBRDG, BRU38unfswp.

Equivalent communities

Freshwater Wetlands-Coastal Heath Swamps (Keith 2006); Qld Regional Ecosystem 12.2.12 Closed or wet heath on Quaternary sands (Young and Dillewaard 1990); H2 – *Banksia oblongifolia*–*Leptospermum livensidgei*–*Lepyrodia interrupta*–*Sprengelia sprengelioides*–*Xanthorrhoea fulva* (Pressey and Griffith 1992); 502 – Wet heathland to Shrubland (Kingston *et al.* 2004); 55111 *Leptospermum whitei*–*L. polygalifolium* Swamp Sclerophyll Shrubland, 60021 *Banksia oblongifolia*–*Leptospermum livensidgei*–*Lepyrodia interrupta*–*Sprengelia sprengelioides*–*Xanthorrhoea fulva* NPWS NSW coastal vegetation (Griffith & Wilson 2007); Community No. 24: *Sporodanthus interruptus*–*Xanthorrhoea fulva*–*Banksia ericifolia* subsp. *macrantha*–*Leptospermum livensidgei*–*Baeckea frutescens* wet heathland, Community No. 25: *Sporodanthus interruptus*–*Xanthorrhoea fulva* wet heathland, Community No. 26: *Banksia oblongifolia*–*Xanthorrhoea fulva* wet heathland, Community No. 27: *Xanthorrhoea fulva*–*Schoenus paludosus*–*Banksia ericifolia* subsp. *macrantha* wet heathland, Community No 28 : *Leptospermum livensidgei*–*Sporodanthus interruptus*–*Empodisma minus* wet heathland, and Community No. 34: *Banksia ericifolia* subsp. *macrantha* ± *Leptospermum whitei*–*L. polygalifolium* subsp. *cismontanum* swamp sclerophyll shrubland (Griffith *et al.* 2003); Teatree (TT) (Landmark Ecological Services 1999); North-east NSW Forest Ecosystem 64 Heath (NPWS 1999).

Description

A heathland community with a dense cover of tea-tree. *Leptospermum livensidgei* dominates one site (BALL09CBRDG) and either *Leptospermum whitei* or *Leptospermum polygalifolium* dominate the other (BRU38unfswp). *Baeckea frutescens* is common at both sites. A diversity of wet-heath shrubs are present at BALL09CBRDG, including *Boronia falcifolia*, *Banksia oblongifolia*, Heath-leaved Banksia (*Banksia ericifolia* subsp. *macrantha*), *Sprengelia sprengelioides* and Grass Tree (*Xanthorrhoea fulva*). A dense lower layer of the sedge *Sporodanthus interruptus* is present at both sites.



Distribution and Habitat

Habitat: The sites are located within swales and open freshwater depressions on Pleistocene barrier sands. Griffith *et al.* (2003) suggest that variation in distribution in these sites may be attributed to fire, particularly in areas where recruitment of obligate seeders is inhibited by fire.

Disturbance: There is no evidence of disturbance in site BRU38unfswp, but site BALL09CBRDG has been subject to an intense fire within the last 10–15 years.

Locations: Lennox Head, Belongil Swamp.

Conservation

Threats: Under limited threat

Conservation status: Similar wet heaths are well represented in a number of reserves on the north coast. In the study area this community is reserved in Tyagarah NR, Broadwater NP and Bundjalung NP. Site BRU38unfswp was located in Tyagarah NR.

Significant taxa: None recorded.

Structure

Layer	Height (m)	Cover (%)
Tallest	1–4	60–100
Middle 1	0.5–1.5	30
Lower 1	0–0.5	80

Floristics

Trees: *Eucalyptus robusta*.

Shrubs: *Leptospermum liversidgei* (T), *Boronia falcifolia* (T), *Xanthorrhoea johnsonii*-M1, *Leptospermum whitei* (T), *Banksia aemula* (T), *Leptospermum polygalifolium* (T), *Banksia oblongifolia* (M1), *Aotus ericoides*, *Banksia ericifolia* subsp. *macrantha*, *Sprengelia sprengelioides*, *Xanthorrhoea fulva*, *Baeckea frutescens* (M1), *Adrastaea salicifolia*, *Brachyloma scortechinii*, *Acacia elongata*, *Dillwynia floribunda*, *Epacris obtusifolia*, *Leptospermum juniperinum*, *Leucopogon leptospermoides*, *Melaleuca nodosa*, *Persoonia virgata*, *Pimelea linifolia*.

Climbers: *Cassytha pubescens*, *Cassytha glabella*.

Sedges and rushes: *Sporadanthus interruptus* (T), *Baumea muelleri*, *Caustis recurvata* (L1), *Ptilothrix deusta*

Herbs and shrubs: *Xyris gracilis*.

Number of native taxa: 31

Number of taxa per site: 14–21 (mean 18 ± 5)

Number of exotic taxa: 0

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Baekea frutescens</i>	3	100%	3	4%	positive
<i>Boronia falcifolia</i>	4	100%	2	1%	positive
<i>Sporadanthus interruptus</i>	6	100%	1	1%	positive
<i>Adraستاea salicifolia</i>	2	50%	1	1%	positive
<i>Aotus ericoides</i>	3	50%	1	2%	positive
<i>Banksia aemula</i>	3	50%	4	3%	positive
<i>Banksia ericifolia</i>	3	50%	3	2%	positive
<i>Banksia oblongifolia</i>	3	50%	2	3%	positive
<i>Baumea muelleri</i>	1	50%	0	0%	positive
<i>Brachyloma scortechinii</i>	2	50%	0	0%	positive
<i>Cassytha glabella</i>	2	50%	1	2%	positive
<i>Cassytha pubescens</i>	3	50%	2	4%	positive
<i>Caustis recurvata</i>	2	50%	2	3%	positive
<i>Dillwynia floribunda</i>	1	50%	0	0%	positive
<i>Epacris obtusifolia</i>	1	50%	0	0%	positive
<i>Leptospermum juniperinum</i>	1	50%	0	0%	positive
<i>Leptospermum liversidgei</i>	5	50%	3	2%	positive
<i>Leptospermum polygalifolium</i> subsp. <i>polygalifolium</i>	3	50%	3	2%	positive
<i>Leptospermum whitei</i>	4	50%	2	2%	positive
<i>Ptilothrix deusta</i>	2	50%	0	0%	positive
<i>Sprengelia sprengelioides</i>	3	50%	1	0%	positive
<i>Xanthorrhoea fulva</i>	3	50%	2	3%	positive
<i>Xanthorrhoea johnsonii</i>	4	50%	3	2%	positive
<i>Xyris gracilis</i>	2	50%	2	1%	positive

Community 17 *Leptospermum liversidgei*–Wallum Bottlebrush–Grass Tree–Heath-leaved Banksia Wallum Wet Heath Complex

Scientific name: *Leptospermum liversidgei*, Wallum Bottlebrush (*Callistemon pachyphyllus*), Grass Tree (*Xanthorrhoea fulva*) and Heath-leaved Banksia (*Banksia ericifolia* subsp. *macrantha*) Coastal Sand Barrier Wet Heath Complex.

Sites: (5) BRU39unfswp, BYR37unfswp, WOO09unfswp, WAR36cbrdg, WAR38cbrdg.

Equivalent communities

Freshwater Wetlands-Coastal Heath Swamps (Keith 2006); Qld Regional Ecosystem 12.2.12 Closed or wet heath on Quaternary sands (Young and Dillewaard 1999); 5503 – *Banksia ericifolia* subsp. *macrantha* ± *Leptospermum whitei*, *Leptospermum polygalifolium* subsp. *cismontanum*, and 5506 – *Melaleuca quinquenervia* Swamp sclerophyll shrubland (Griffith 2002); 502 – Wet Heathland to Shrubland (Kingston et al. 2004); Community No. 34: *Banksia ericifolia* subsp. *macrantha* ± *Leptospermum whitei*–*L. polygalifolium* subsp. *cismontanum* swamp sclerophyll shrubland (Griffith et al. 2003); Teatree (TT) (Landmark Ecological 1999).

Description

A variable grouping of wet heath and shrubland sites. Sites BRU39unfswp, WOO09unfswp, WAR36cbrdg are shrubland sites dominated by Heath-leaved Banksia (*Banksia ericifolia* subsp. *macrantha*). BYR37unfswp is a Broad-leaved Paperbark (*Melaleuca quinquenervia*) swamp sclerophyll shrubland. WAR38cbrdg is a shrubland of *Baeckea frutescens* and *Leptospermum liversidgei* with emergent Broad-leaved Paperbark (*Melaleuca quinquenervia*). Wallum Bottlebrush (*Callistemon pachyphyllus*) is a frequent species in the middle layer, and the lower layer is characterised by sedges and shrubs but with Grass Tree (*Xanthorrhoea fulva*) the most frequent lower layer taxa. *Schoenus brevifolius*, *Leptocarpus tenax* and *Baloskion pallens* are dominant in the ground strata.



Distribution and Habitat

Habitat: Wet sites on backbarrier flats and freshwater swamps in low-lying sites on Pleistocene barrier sands at Tygarah, Wardell and Evans River.

Disturbance: There was no evidence of disturbance at most sites, though WAR38cbrdg had been subject to a moderately intense fire.

Example locations: Between Tuckean NR and Bagotville, Alstonville Road, Tuckean, Jali Lands at Wardell, and Thurgates Lane.

Conservation

Threats: Too-frequent fire, clearing.

Conservation status: In the study area it is reserved in Tyagarah NR, Broadwater NP and Bundjalung NP.

Significant taxa: None recorded.

Structure

Layer	Height (m)	Cover (%)
Emergent	6–8	5
Tallest	3–18	10–50
Middle 1	1–10	40–50
Middle 2	2–5	20
Lower 1	0–1	5–90

Floristics

Trees: *Melaleuca quinquenervia* (T), *Eucalyptus robusta*

Shrubs: *Leptospermum liversidgei* (T), *Callistemon pachyphyllus* (M1), *Xanthorrhoea fulva* (L1), *Baeckea frutescens* (T), *Banksia ericifolia* subsp. *macrantha* (T), *Leucopogon lanceolatus* var. *gracilis* (M1), *Banksia oblongifolia* (M1), *Aotus ericoides* (M1), *Leptospermum trinervium* (T), *Melaleuca squamea*, *Ochrosperma lineare*, *Austromyrtus dulcis*, *Nematolepis squamea* subsp. *squamea*, *Boronia falcifolia*, *Elaeocarpus reticulatus*, *Adraستاea salicifolia*, *Leptospermum polygalifolium* subsp. *cismontanum*, *Leptospermum whitei*, *Melaleuca nodosa*, *Melaleuca sieberi*, *Monotoca elliptica*, *Persoonia linearis*.

Climbers: *Parsonsia straminea*, *Cassytha glabella*, *Cassytha pubescens*.

Mistletoes: *Dendrophthoe vitellina*.

Grasses: *Phragmites australis*, *Imperata cylindrica* var. *major*.

Ferns: *Blechnum indicum*, *Pteridium esculentum*, *Acrostichum speciosum*, *Gleichenia dicarpa*.

Sedges and rushes: *Gahnia sieberiana* (M1), *Schoenus brevifolius* (L1), *Leptocarpus tenax* (L1), *Baloskion tetraphyllum* (M1), *Baumea juncea* (L1), *Baumea rubiginosa* (L1), *Sporadanthus interruptus* (L1), *Caustis recurvata*, *Empodisma minus*, *Baloskion pallens* (L1), *Baumea articulata*.

Herbs and shrubs: *Burchardia umbellata*, *Cryptostylis subulata*, *Dianella caerulea*, *Epacris microphylla*, *Ottelia ovalifolia* subsp. *ovalifolia*.

Number of native taxa: 55

Number of taxa per site: 10–37 (mean 20 ± 9.6)

Number of exotic taxa: 0

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Baekea frutescens</i>	2	50%	3	4%	positive
<i>Baloskion pallens</i>	2	50%	2	1%	positive
<i>Baloskion tetraphyllum</i>	2	50%	2	6%	positive
<i>Banksia ericifolia</i>	3	83%	3	1%	positive
<i>Blechnum indicum</i>	2	50%	2	16%	positive
<i>Burchardia umbellata</i>	1	17%	0	0%	positive
<i>Callistemon pachyphyllum</i>	2	83%	1	2%	positive
<i>Epacris microphylla</i>	1	17%	0	0%	positive
<i>Gahnia siebieriana</i>	3	100%	2	5%	positive
<i>Leptocarpus tenax</i>	3	50%	2	1%	positive
<i>Leptospermum liversidgei</i>	3	83%	5	1%	positive
<i>Melaleuca quinquenervia</i>	3	83%	3	39%	positive
<i>Melaleuca squamea</i>	1	17%	0	0%	positive
<i>Ottelia ovalifolia</i> subsp. <i>ovalifolia</i>	1	17%	0	0%	positive
<i>Persoonia linearis</i>	1	17%	0	0%	positive
<i>Xantorrhoea fulva</i>	2	83%	2	2%	positive

Community 18 Coral Fern (*Gleichenia dicarpa*) Fernland

Scientific name: Coral Fern (*Gleichenia dicarpa*) Fernland.

Sites: (2) BYR08cbsw, BYR36estcd.

Equivalent communities

Freshwater Wetlands-Coastal Heath Swamps (Keith 2006); Qld Regional Ecosystem 12.2.12 Closed or wet heath on Quaternary sands (Young and Dillewaard 1999); 6418 – *Gahnia sieberiana*–*Gleichenia dicarpa* NPWS NSW Coastal vegetation (Griffith and Wilson 2007); 702 – Fernland/Forbland (Kingston *et al.* 2004); Sedgeland-Fernland/Grassland (SFG) (Landmark Ecological Services 1999).

Description

BYR08cbsw comprises a very dense layer of Coral Fern (*Gleichenia dicarpa*) in association with the saw sedge *Gahnia sieberiana*. *Empodisma minus* is common in the lower layer. BYR36estcd has an upper layer comprising an open shrubland of Broad-leaved Paperbark (*Melaleuca quinquenervia*) and a lower layer of dense Coral Fern.

Distribution and Habitat

Habitat: Dune scarps and narrow drainage lines in deep acid peat soils kept moist by groundwater seepage (Griffith Undated).

Disturbance: There was no evidence of disturbance.

Locations: Taylors Lake Road, Tallow Creek.



Conservation

Threats: Too frequent fire, clearing.

Conservation status: In the study area, the only known reserved occurrence of this community is in Arakwal NR (site BYR36estcd). The Conservation status of *Gahnia sieberiana* on the north coast is assessed as good (Griffith 2005).

Significant taxa: None recorded.

Structure

Layer	Height (m)	Cover (%)
Tallest	1–10	30–40
Lower 1	0–2	90–100

Floristics

Trees: *Melaleuca quinquenervia* (T).

Shrubs: *Leptospermum liversidgei* (T), *Elaeocarpus reticulatus*, *Austromyrtus dulcis*, *Banksia integrifolia* subsp. *integrifolia*, *Callistemon pachyphyllus*.

Climbers: *Parsonsia straminea* (T), *Cassytha pubescens*.

Ferns: *Gleichenia dicarpa* (T).

Sedges and rushes: *Gahnia sieberiana* (T), *Empodisma minus* (L1), *Schoenus brevifolius*.

Herbs and shrubs: *Villarsia exaltata*, *Drosera spatulata*, *Boronia falcifolia*, *Adrastaea salicifolia*, *Aotus ericoides*, *Sprengelia sprengelioides*.

Number of native taxa: 18

Number of taxa per site: 9–10 (mean 9.5 ± 1)

Number of exotic taxa: 0

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Cassytha pubescens</i>	2	50%	2	4%	positive
<i>Drosera spatulata</i>	1	50%	0	0%	positive
<i>Empodisma minus</i>	3	50%	2	0%	positive
<i>Gahnia sieberiana</i>	3	50%	2	6%	positive
<i>Gleichenia dicarpa</i>	6	100%	1	1%	positive
<i>Leptospermum liversidgei</i>	2	50%	3	2%	positive
<i>Melaleuca quinquenervia</i>	4	50%	3	39%	positive
<i>Parsonsia straminea</i>	3	50%	1	44%	positive

Community 19 Broad-leaved Paperbark–Coast Banksia–Red Ash Dunal Scrubland

Scientific name: Broad-leaved Paperbark (*Melaleuca quinquenervia*), Coast Banksia (*Banksia integrifolia* subsp. *integrifolia*) and Red Ash (*Alphitona excelsa*) dunal scrubland

Sites: (7) BYR01cbrdg, BYR15cbbbf, BYR38cbdne, BYR32estsswp, BYR33esticd, POT23cbdne, POT02cbrdg.

Equivalent communities

Qld Regional Ecosystem 12.2.14 Strand and foredune complex (Young and Dillewaard 1999); 310 – Banksia Dry Sclerophyll Open Forest to Shrubland (Kingston *et al.* 2004); 3523 – *Banksia integrifolia* subsp. *integrifolia* Dry sclerophyll forest and woodland (Griffith *et al.* 2000); Coast Banksia (CB1) (Landmark Ecological Services 1999).

Description

This community is a shrubland to open forest structure in which Broad-leaved Paperbark (*Melaleuca quinquenervia*) is sometimes associated with Coast Banksia (*Banksia integrifolia* subsp. *integrifolia*) and Red Ash (*Alphitona excelsa*); Sites POT23cbdne and POT02cbrdg are an open shrubland structure. A shrubby middle layer is usually present, consisting of Coast Wattle (*Acacia longifolia* subsp. *sophorae*), Lantana (*Lantana camara*) and Tree Broom Heath (*Monotoca elliptica*). The lower layer consists of Midgen Berry (*Austromyrtus dulcis*), Climbing Guinea Flower (*Hibbertia scandens*), Spiny-headed Mat Rush (*Lomandra longifolia*) and Black Bog-rush (*Schoenus brevifolius*). Weeds are prevalent in this community, and Whisky Grass (*Andropogon virginicus*) is an abundant weed species of the lower layer.



Distribution and Habitat

Habitat: Located in tidally influenced coastal parts of Cudgera, Tallow and Belongil Creeks, in swampy sites within the transition from the estuarine plain to Pleistocene coastal sandplains.

Disturbance: There are moderate levels of weed invasion, and sites have been subject to light to moderate fires. There is also evidence of moderate levels of clearing at site POT23cbdne.

Example locations: Koala Beach at Pottsville, Byron Bay, Ti Tree, Belongil Creek, Tallow Creek and North Pottsville.

Conservation

Threats: Too-frequent fire, clearing, weed infestation.

Conservation status: Sites BYR32estsswp and BYR33esticd were in Arakwal NP. The Conservation status of this community is probably fair.

Significant taxa: *Acronychia littoralis* (TSC: Endangered).

Structure

Layer	Height (m)	Cover (%)
Tallest	4–20	20–60
Middle 1	2–8	20–70
Lower 1	0.5–1.5	30–90
Lower 2	0–0.5	10–45

Floristics

Trees: *Melaleuca quinquenervia* (T), *Banksia integrifolia* subsp. *integrifolia* (T), *Lophostemon suaveolens* (T), *Casuarina glauca* (T), *Archontophoenix cunninghamiana*, *Eucalyptus robusta*.

Sub-canopy trees: *Cupaniopsis anacardioides*, *Melicope elleryana* (M1), *Glochidion sumatranum* (M1), *Duboisia myoporoides* (T), *Alphitonia excelsa* (T), *Acronychia imperforata* (T), *Cinnamomum camphora**, *Schefflera actinophylla**, *Acronychia littoralis*, *Glochidion ferdinandi*, *Guioa semiglaucula*, *Litsea australis*, *Rhodamnia rubescens*, *Syagrus romanzoffiana**.

Shrubs: *Lantana camara** (M1), *Acacia longifolia* subsp. *sophorae* (M1), *Senna pendula* var. *glabrata**, *Monotoca elliptica* (M1), *Persoonia cornifolia* (M1), *Elaeocarpus reticulatus* (M1), *Notelaea longifolia*, *Banksia oblongifolia* (L1), *Chrysanthemoides monilifera* subsp. *rotundata**, *Platysace ericoides*, *Acacia concurrens* (T), *Leptospermum whitei* (L1), *Persoonia virgata*, *Leucopogon leptospermoides*, *Persoonia stradbrokeensis* (M1), *Pultenaea villosa*, *Xanthorrhoea fulva*, *Acacia ulicifolia*, *Aotus ericoides*, *Ardisia crenata**, *Baccharis halimifolia**, *Exocarpos cupressiformis*, *Homoranthus virgatus*, *Leptospermum semibaccatum*, *Leucopogon margarodes*, *Ligustrum sinense**, *Murraya paniculata**, *Myrsine variabilis*, *Pittosporum revolutum*, *Pittosporum undulatum*, *Psidium cattleianum* var. *cattleianum**, *Psychotria loniceroides*, *Solanum nigrum**.

Climbers: *Hibbertia scandens*, *Smilax australis*, *Geitonoplesium cymosum*, *Parsonia straminea* (M1), *Cassytha filiformis*, *Cassytha pubescens*, *Lygodium microphyllum*, *Marsdenia rostrata*, *Stephania japonica* var. *discolor*, *Rubus moluccanus* var. *trilobus*.

Grasses *Andropogon virginicus** (L1), *Paspalidium distans** (L2), *Paspalum wettsteinii** (L1), *Axonopus fissifolius**, *Ischaemum australe* (L1), *Imperata cylindrica* var. *major* (L1), *Eragrostis interrupta* (L1), *Hemarthria uncinata*, *Cynodon dactylon* (L1), *Entolasia marginata*, *Oplismenus imbecillis* (L2), *Digitaria ramularis*, *Microlaena stipoides* var. *stipoides*, *Ottocloa gracillima*, *Themeda australis*, *Zoysia macrantha*, *Cymbopogon refractus*, *Digitaria parviflora*, *Sacciolepis indica*.

Ferns: *Hypolepis muelleri* (L1), *Pteridium esculentum* (L1), *Blechnum indicum*, *Calochlaena dubia*, *Cyathea australis*, *Gleichenia dicarpa*, *Lygodium microphyllum*.

Sedges and rushes: *Schoenus brevifolius*, *Lomandra longifolia* (L2), *Baumea juncea* (L1), *Caustis recurvata*, *Baloskion pallens*, *Baloskion tenuiculme*, *Cyperus stradbrokeensis*, *Gahnia aspera*, *Gahnia clarkei*, *Gahnia sieberiana*.

Herbs and shrubs: *Austromyrtus dulcis* (L1), *Dianella caerulea*, *Pomax umbellata* (L1), *Monotoca elliptica*, *Viola banksii* (L2), *Breynia oblongifolia*, *Centella asiatica*, *Asparagus aethiopicus**, *Cryptostylis subulata*, *Hypericum japonicum*, *Hydrocotyle bonariensis**, *Selaginella uliginosa*, *Cuphea carthagenensis**, *Dampiera stricta*, *Epacris pulchella*, *Gonocarpus humilis*, *Goodenia paniculata*, *Hovea acutifolia*, *Hydrocotyle acutiloba*, *Melastoma affine*, *Stellaria flaccida*, *Xyris complanata*.

Number of native taxa: 109

Number of taxa per site: 21–51 (mean 31 ± 11)

Number of exotic taxa: 18

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Acacia longifolia</i>	3	57%	2	3%	positive
<i>Austromyrtus dulcis</i>	3	100%	2	14%	positive
<i>Banksia integrifolia</i>	3	86%	2	6%	positive
<i>Exocarpos cupressiformis</i>	1	14%	0	0%	positive
<i>Glochidion ferdinandi</i>	2	57%	1	24%	positive
<i>Gonocarpus humilis</i>	1	14%	0	0%	positive
<i>Melaleuca quinquenervia</i>	4	100%	3	38%	positive
<i>Paspalum distans</i>	2	57%	2	5%	positive
<i>Senna pendula</i> var. <i>glabrata</i>	2	71%	1	22%	positive
<i>Stellaria flaccida</i>	1	14%	0	0%	positive

Community 20 Swamp Box–Broad-leaved Paperbark–rush/fern Swamp Sclerophyll Forest

Scientific name: Swamp Box (*Lophostemon suaveolens*) and Broad-leaved Paperbark (*Melaleuca quinquenervia*) with Twig rush (*Baumea juncea*), Black Bog-rush (*Schoenoplectus brevifolius*) and Swamp Water Fern (*Blechnum indicum*) Swamp Sclerophyll Open to Closed Forest.

Sites: (5) CUD20cbdne, POT04estch, POT01estcd, POT05estch, POT06cbbbf.

Equivalent communities

Forested Wetlands-Coastal Swamp Forests (Keith 2006); Qld Regional Ecosystem 12.2.7 *Melaleuca quinquenervia* open forest to woodland on Quaternary sands, and 12.1.1 *Casuarina glauca* ± *Melaleuca quinquenervia* (Young and Dillewaard 1999); 309 – Coastal Swamp Box Open Forest to Woodland (Kingston *et al.* 2004); 4013 – *Melaleuca quinquenervia*–*Lophostemon suaveolens*/*Eucalyptus tereticornis* mid-high to very tall, open woodland to closed forest NPWS NSW Coastal Vegetation (Griffith and Wilson 2007); Swamp Mahogany/Swamp Box (SMB) (Landmark Ecological Services 1999).

Description

Most commonly a low, open to closed, swamp sclerophyll forest with Swamp Box (*Lophostemon suaveolens*) and Broad-leaved Paperbark (*Melaleuca quinquenervia*), occasionally associated with Pink Bloodwood (*Corymbia intermedia*) and, rarely, Swamp Oak (*Casuarina glauca*). Site CUD20cbdne is a very tall, open swamp sclerophyll forest. The community has an open mid-layer of Swamp Box and Broad-leaved Paperbark, occasionally with Willow Bottlebrush (*Callistemon salignus*). There is often a dense lower layer of sedges or rushes (including *Baumea juncea*, *Schoenus brevifolius*, *Baloskion pallens*), grasses (including *Imperata cylindrica* var. *major*, *Zoysia macrantha*, *Entolasia stricta* and *Ischaemum australe*), ferns (including *Blechnum indicum*) and shrubs (including *Melastoma affine*). Swamp Banksia (*Banksia robur*) was abundant in the lower strata of site POT05estch.

Distribution and Habitat

Habitat: Sites were located on coast barrier sands and estuarine plain. The community is also known from the alluvial plain.

Disturbance: There was evidence of light to moderate fire at all sites; site POT04estch showed evidence of severe past clearing, and site CUD20cbdne had been lightly logged and had moderate disturbance by weeds.

Example locations: Near Round Mountain at Cudgen, at Pottsville, Pottsville Environmental Park and Coronation Avenue in Pottsville.

Conservation

Threats: Clearing and logging.

Conservation status: The species composition of this community is consistent with that of the 'Sub-tropical Coastal Floodplain Forest of the NSW North Coast bioregion' EEC. Site CUD20cbdne was located in Cudgen NR.



The related NPWS NSW Coastal Vegetation Community 4013 – *Melaleuca quinquenervia*–*Lophostemon suaveolens*/ *Eucalyptus tereticornis* mid-high to very tall, open woodland to closed forest (Griffith & Wilson 2007) is reserved in Broadwater NP and Bundjalung NP.

Significant taxa: *Arthrochilus prolixus* (ROTAP: -3K), *Scleria levis*.

Structure

Layer	Height (m)	Cover (%)
Tallest	5–27	10–65
Middle 1	1–8	10–60
Middle 2	1–2	50
Lower 1	0–1	40–90
Lower 2	0–0.5	90

Floristics

Trees: *Lophostemon suaveolens* (T), *Melaleuca quinquenervia* (T), *Corymbia intermedia* (T), *Callistemon salignus* (T), *Casuarina glauca* (T), *Cupaniopsis anacardioides*, *Lophostemon confertus*, *Melicope elleryana*.

Sub-canopy trees: *Acronychia imperforata*, *Alphitonia excelsa*, *Archontophoenix cunninghamiana*, *Glochidion sumatranum*, *Glochidion ferdinandi*.

Shrubs: *Leptospermum polygalifolium* subsp. *polygalifolium* (M1), *Melastoma affine* (M1), *Banksia robur* (M1), *Xanthorrhoea fulva*, *Leucopogon lanceolatus* var. *gracilis*, *Elaeocarpus reticulatus*, *Allocasuarina littoralis*, *Dodonaea triquetra* (M2), *Leptomeria drupacea* (M1), *Acacia ulicifolia*, *Banksia integrifolia* subsp. *integrifolia* (M1), *Duboisia myoporoides*, *Leptospermum whitei*, *Persoonia stradbrokeensis*, *Acacia concurrens*, *Acacia maidenii*, *Commersonia bartramia*, *Lantana camara**, *Leucopogon margarodes*, *Notelaea longifolia*, *Pittosporum revolutum*.

Climbers: *Cassytha pubescens*, *Stephania japonica* var. *discolor*, *Hibbertia scandens*, *Cassytha filiformis*, *Passiflora suberosa**, *Smilax australis*, *Parsonsia straminea*.

Grasses: *Imperata cylindrica* var. *major* (L1), *Ischaemum australe* (L2), *Entolasia stricta* (L2), *Zoysia macrantha* (L1), *Paspalidium distans**, *Panicum simile*, *Sacciolepis indica**, *Andropogon virginicus**, *Oplismenus imbecillis*, *Ottlochloa gracillima*, *Themeda australis*, *Digitaria parviflora*, *Entolasia marginata*, *Leersia hexandra*, *Paspalum dilatatum**, *Phragmites australis*, *Eragrostis brownii*, *Eragrostis curvula**, *Eragrostis interrupta*, *Paspalum scrobiculatum**, *Setaria sphacelata**.

Ferns: *Pteridium esculentum* (M1), *Blechnum indicum* (L1), *Schizaea dichotoma*, *Lindsaea linearis*.

Sedges and rushes: *Schoenus brevifolius* (L1), *Lomandra longifolia* (L1), *Leptocarpus tenax*, *Baloskion pallens* (L1), *Cyperus haspan* subsp. *juncoides*, *Gahnia clarkei*, *Abildgaardia ovata*, *Carex breviculmis*, *Cyperus polystachyos*, *Gahnia sieberiana*, *Lomandra laxa*, *Scleria levis*, *Chorizandra cymbaria*, *Fimbristylis dichotoma*, *Gahnia aspera*.

Herbs and shrubs *Pultenaea villosa* (L1), *Austromyrtus dulcis* (L1), *Goodenia paniculata*, *Hovea acutifolia*, *Pratia purpurascens*, *Villarsia exaltata*, *Dodonaea triquetra*, *Chrysanthemoides monilifera* subsp. *rotundata** (L1), *Gonocarpus tetragynus*, *Xyris gracilis*, *Breynia oblongifolia*, *Callistemon pachyphyllus*, *Centella asiatica*, *Corybas aconitiflorus*, *Cryptostylis subulata*, *Dampiera stricta*, *Dianella caerulea*, *Hibbertia aspera*, *Hibbertia riparia*, *Hypericum gramineum*, *Murdannia graminea*, *Pultenaea retusa*, *Rhynchospora rubra*, *Selaginella uliginosa*, *Vernonia cinerea*, *Philydrum lanuginosum*, *Pimelea linifolia*, *Trachymene incisa*, *Arthrochilus prolixus*, *Banksia oblongifolia*, *Dianella longifolia* var. *longifolia*, *Gonocarpus chinensis* subsp. *verrucosus*, *Lobelia anceps*.

Number of native taxa: 116

Number of taxa per site: 29–65 (mean 41 ± 15)

Number of exotic taxa: 9

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Abildgaardia ovata</i>	2	20%	0	0%	positive
<i>Austromyrtus dulcis</i>	2	80%	2	14%	positive
<i>Banksia robur</i>	5	40%	0	0%	positive
<i>Baumea juncea</i>	4	80%	3	6%	positive
<i>Corybas aconitiflorus</i>	2	20%	0	0%	positive
<i>Entolasia stricta</i>	2	80%	2	12%	positive
<i>Eragrostis brownii</i>	1	20%	0	0%	positive
<i>Goodenia paniculata</i>	2	60%	2	4%	positive
<i>Imperata cylindrica</i>	5	80%	2	20%	positive
<i>Ischaemum australe</i>	2	100%	2	5%	positive
<i>Leptocarpus tenax</i>	2	60%	3	1%	positive
<i>Leptomeria drupacea</i>	2	40%	0	0%	positive
<i>Leptospermum polygalifolium</i> subsp. <i>polygalifolium</i>	3	80%	2	2%	positive
<i>Lindsaea linearis</i>	1	20%	0	0%	positive
<i>Lomandra laxa</i>	2	20%	0	0%	positive
<i>Lomandra longifolia</i>	3	60%	2	29%	positive
<i>Lophostemon suaveolens</i>	3	100%	2	22%	positive
<i>Melaleuca quinquenervia</i>	3	100%	3	38%	positive
<i>Melastoma affine</i>	2	100%	1	3%	positive
<i>Panicum simile</i>	2	60%	2	2%	positive
<i>Paspalidium distans</i>	2	80%	2	5%	positive
<i>Pteridium esculentum</i>	3	80%	2	20%	positive
<i>Pultenaea villosa</i>	2	100%	2	1%	positive
<i>Rhynchospora rubra</i>	2	20%	0	0%	positive
<i>Schoenus brevifolius</i>	3	80%	3	3%	positive
<i>Scleria levis</i>	2	20%	0	0%	positive
<i>Trachymene incisa</i>	1	20%	0	0%	positive
<i>Xanthorrhoea fulva</i>	2	60%	2	2%	positive
<i>Zoysia macrantha</i>	2	100%	4	4%	positive

Community 21 Broad-leaved Paperbark–Swamp Oak–Rush Saline Swamp Sclerophyll Open Forest

Scientific name: Broad-leaved Paperbark (*Melaleuca quinquenervia*), Swamp Oak (*Casuarina glauca*), Twig Rush (*Baumea juncea*) and Black Bog-rush (*Schoenus brevifolius*) Saline Swamp Sclerophyll Open Forest.

Sites: (5) BYR02estsswp, CUD05esticd, BYR29estsswp, BYR37estsswp, CUD07CBSW.

Equivalent communities

Forested Wetlands-Coastal Swamp Forests (Keith 2006); Qld Regional Ecosystems 12.2.7 *Melaleuca quinquenervia* open forest to woodland on Quaternary sands, and 12.1.1 *Casuarina glauca* ± *Melaleuca quinquenervia* (Young and Dillewaard 1999); F8 – *Melaleuca quinquenervia* tall to very tall open to closed forest, and F10 – *Casuarina glauca* tall to very tall open to closed forest (Pressey and Griffith 1992); 40031/2 *Melaleuca quinquenervia* swamp sclerophyll forest and woodland, 40051/2 *Casuarina glauca* forest and woodland, and 40991/2 Mixed stands of *Melaleuca quinquenervia*–*Casuarina glauca* NPWS NSW Coastal Vegetation (Griffith and Wilson 2007); 402 – Broad-leaved Paperbark/Swamp Sheoak Closed Forest to Woodland (Kingston *et al.* 2004); North-east NSW Forest Ecosystems 112 Paperbark and 143 Swamp Oak (NPWS 1999).

Description

A low, open swamp sclerophyll community with a dense ground layer of sedges and rushes, including Twig Rush (*Baumea juncea*), Sea Rush (*Juncus kraussii* subsp. *australiensis*) and Black Bog-rush (*Schoenus brevifolius*), and an overstorey dominated by Broad-leaved Paperbark (*Melaleuca quinquenervia*) and Swamp Oak (*Casuarina glauca*). A shrubby mid-layer comprises sedges (including *Gahnia sieberiana*), shrubs (including *Leptospermum liversidgei*) and Wallum Bottlebrush (*Callistemon pachyphyllus*). Prickly Couch (*Zoysia macrantha*) and *Lepidosperma laterale* were abundant in site CUD07cbsw and Prickly Couch (*Sporobolus virginicus*) is common in site CUD05esticd.



Distribution and Habitat

Habitat: A group of saline sites adjoining coastal barrier sand dunes and backbarrier flats. Some wallum shrubs influence the floristic composition of this group.

Disturbance: Includes moderate fire, and light infestation by weeds, and there is evidence of clearing at sites CUD05esticd and CUD07CBSW. There is no evidence of disturbance at BYR37estsswp.

Example locations: Belongil Creek, Cudgen Creek, Tallow Creek, and Cudgen.

Conservation

Threats: Clearing, grazing and fire.

Conservation status: Site BYR37estsswp was located in Arakwal NP; Estuarine occurrences of Broad-leaved

Paperbark are represented in reserves of the study area, for example Cudgen NR and Arakwal NP.

Significant taxa: None recorded.

Structure

Layer	Height (m)	Cover (%)
Tallest	2–15	20–60
Middle 1	1–2.5	20–50
Lower 1	0–1.5	90–100
Lower 2	0–0.4	20–95

Floristics

Trees: *Melaleuca quinquenervia* (T), *Casuarina glauca* (T).

Sub-canopy trees: *Cupaniopsis anacardioides*.

Shrubs: *Callistemon pachyphyllus* (M1), *Xanthorrhoea fulva* (L1), *Leptospermum polygalifolium* subsp. *polygalifolium*, *Leptospermum liversidgei* (M1), *Banksia ericifolia* subsp. *macrantha*, *Banksia integrifolia* subsp. *integrifolia*, *Exocarpos latifolius*, *Homoranthus virgatus*, *Leptospermum whitei*, *Persoonia stradbrokeensis*, *Senna pendula* var. *glabrata**.

Climbers: *Cynanchum carnosum*, *Parsonsia straminea*.

Mistletoes: *Dendrophthoe vitellina*.

Grasses *Ischaemum australe*, *Zoysia macrantha* (L1), *Sporobolus virginicus* (L1), *Cynodon dactylon* (L1), *Hemarthria uncinata*.

Ferns: *Blechnum indicum* (M1), *Acrostichum speciosum*, *Azolla pinnata*, *Pteridium esculentum*, *Gleichenia dicarpa*.

Sedges and rushes: *Baumea juncea* (L1), *Schoenus brevifolius* (L1), *Juncus kraussii* subsp. *australiensis* (L1), *Gahnia sieberiana* (M1), *Lepidosperma laterale* (M1), *Leptocarpus tenax* (L1), *Baumea articulata*, *Phragmites australis*, *Schoenus nitens*

Herbs and shrubs: *Dampiera stricta*, *Leucopogon lanceolatus* var. *gracilis*, *Lobelia anceps*, *Aotus ericoides*, *Austromyrtus dulcis*, *Baccharis halimifolia**, *Banksia oblongifolia*, *Dianella caerulea*, *Epacris pulchella*, *Goodenia paniculata*, *Pimelea linifolia*.

Number of native taxa: 45

Number of taxa per site: 8–22 (mean 15 ± 6)

Number of exotic taxa: 2

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Casuarina glauca</i>	3	60%	3	21%	positive
<i>Dendrophthoe vitellina</i>	2	20%	0	0%	positive
<i>Ischaemum australe</i>	2	60%	2	6%	positive
<i>Melaleuca quinquenervia</i>	4	100%	3	38%	positive
<i>Schoenus brevifolius</i>	3	80%	3	3%	positive
<i>Schoenus nitens</i>	1	20%	0	0%	positive

Community 22 Common Reed–Black Bog-Rush Reedland/Rushland of Coastal Lagoons and Saline Swamps

Scientific name: Common Reed (*Phragmites australis*) and Black Bog-rush (*Schoenoplectus brevifolius*)
Reedland/Rushland of Coastal Lagoons and Saline Swamps.

Sites: (2) BYR09cbcl, BYR31estsswp.

Equivalent communities

Freshwater Wetlands-Coastal Freshwater Lagoons (Keith 2006); Qld Regional Ecosystem 12.2.15 Coastal sedgeland wetland on Quaternary sands (Young and Dillewaard 1990); 65031 – *Phragmites australis* NPWS NSW Coastal Vegetation (Griffith and Wilson 2007); 703 – Freshwater Wetlands (Kingston *et al.* 2004).

Description

A reedland with a dense cover of Common Reed (*Phragmites australis*) and Black Bog-rush (*Schoenus brevifolius*). Associated species include Mangrove Fern (*Acrostichum speciosum*), Twig Rush (*Baumea juncea*) and *Schoenoplectus subulatus*.

Distribution and Habitat

Habitat: Fringing channels and the edges of coastal lagoons with an estuarine tidal or subaqueous influence.

Disturbance: Light infestation of weeds.

Locations: Taylors Lake and Tallow Creek.



Conservation

Threats: Clearing, draining and weed invasion.

Conservation status: The reservation status of *Phragmites australis* Rushland has been assessed as fair on the NSW north coast (Griffith 2005). The community is known to occur in reserves from Hat Head NP, Lake Innes NR and Limeburners Creek NR. No occurrences were mapped by Griffith and Wilson (2007) on the FNC. The sites sampled in the present study were outside reserves.

Significant taxa: None recorded.

Structure

Layer	Height (m)	Cover (%)
Lower 1	0–2	80–100

Floristics

Shrubs: *Baccharis halimifolia**, *Hibiscus tiliaceus*.

Climbers: *Cynanchum carnosum*.

Grasses *Phragmites australis* (L1).

Ferns: *Acrostichum speciosum*.

Sedges and rushes: *Baumea juncea* (L1), *Schoenoplectus subulatus* (L1), *Schoenus brevifolius* (L1), *Typha domingensis*, *Cyperus polystachyos*, *Juncus kraussii* subsp. *australiensis*.

Herbs and shrubs: *Alternanthera denticulata*, *Apium prostratum*, *Aster subulatus**, *Bacopa monnieri*, *Crinum pedunculatum*, *Hydrocotyle bonariensis**, *Rhagodia candolleana* subsp. *candolleana*, *Sesuvium portulacastrum*, *Tetragonia tetragonioides*.



Number of native taxa: 18

Number of taxa per site: 10–16(mean 13 ± 4)

Number of exotic taxa: 3

Indicator native taxa

Species name	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Phragmites australis</i>	6	100%	2	7%	positive
<i>Baumea juncea</i>	4	100%	3	6%	positive
<i>Acrostichum speciosum</i>	3	100%	2	6%	positive
<i>Alternanthera denticulata</i>	2	50%	1	6%	positive
<i>Schoenus brevifolius</i>	3	50%	3	4%	positive
<i>Cyperus polystachyos</i>	2	50%	1	3%	positive
<i>Cynanchum carnosum</i>	2	50%	2	3%	positive
<i>Schoenoplectus subulatus</i>	3	50%	4	1%	positive
<i>Rhagodia candolleana</i> subsp. <i>candolleana</i>	1	50%	0	0%	positive
<i>Typha domingensis</i>	3	50%	0	0%	positive

Community 23 Swamp Box–Broad-leaved Paperbark–Swamp Mahogany Swamp Sclerophyll Forest

Scientific name: Swamp Box (*Lophostemon suaveolens*), Broad-leaved Paperbark (*Melaleuca quinquenervia*) and Swamp Mahogany (*Eucalyptus robusta*) Swamp Sclerophyll Forest.

Sites: (2) BIL13cbrdg, CUD19alfan.

Equivalent communities

Forested Wetlands-Coastal Swamp Forests, and Coastal Floodplain Wetlands (Keith 2006); Qld Regional Ecosystems 12.3.5 *Melaleuca quinquenervia* open forest on alluvium, and 12.2.7 *Melaleuca quinquenervia* open forest to woodland on Quaternary sands (Young and Dillewaard 1999); 309 – Coastal Swamp Box Open Forest to Woodland (Kingston *et al.* 2004); 4013 – *Melaleuca quinquenervia*–*Lophostemon suaveolens*/*Eucalyptus tereticornis* mid-high to very tall, open woodland to closed forest NPWS NSW Coastal Vegetation (Griffith and Wilson 2007); North-east NSW Forest Ecosystems 142 and 143 (NPWS 1999).

Description

This community consists of two anomalous swamp sclerophyll forest sites linked by the presence of lower strata species. The community is a closed swamp sclerophyll forest with Swamp Box (*Lophostemon suaveolens*), Broad-leaved Paperbark (*Melaleuca quinquenervia*) and Swamp Mahogany (*Eucalyptus robusta*). Site CUD19alfan is an association of Broad-leaved Paperbark and Swamp Box, whereas site BIL13cbrdg is an association of Swamp Mahogany. The mid-layer of shrubs and small trees includes Swamp Mahogany, Broad-leaved Paperbark, Umbrella Cheese Tree (*Glochidion sumatranum*) and Willow Bottlebrush (*Callistemon salignus*). The sites have in common a dense lower layer of Swamp Ricegrass (*Leersia hexandra*) and *Persicaria strigosa*. Narrow-leaved Cumbungi (*Typha orientalis*) is abundant at site BIL13cbrdg; *Rhynchospora corymbosa* and Swamp Millet (*Isachne globosa*) are abundant in site CUD19alfan.

Distribution and Habitat

Habitat: Swamp sclerophyll forests with coastal sandplain and alluvial influences. Site BIL13cbrdg had ecotonal coastal barrier sand species recorded in the site. Site CUD19 was located on an alluvial fan and may be more appropriately reallocated to Community 11.

Disturbance: BIL13cbrdg had been severely burnt, and CUD19alfan had been moderately burnt and lightly cleared and grazed.

Locations: Cobaki Broadwater, and Cudgen Road

Conservation

Threats: Clearing, grazing, fire and logging.

Conservation status: Site CUD19alfan, on the alluvial floodplain, is an example of 'Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions' EEC. Neither survey site was reserved. Floodplain occurrences of this community are considered poorly reserved (Griffith 2005). Equivalent communities recorded in Bundjalung NP and Yuraygir NP (Griffith and Wilson 2007).

Significant taxa: *Eleocharis tetraquetra* (TSC: Endangered).

Structure

Layer	Height (m)	Cover (%)
Tallest	10–22	60–70
Middle 1	3–10	30–50
Middle 2	2–3	60
Lower 1	0–1	60

Floristics

Trees: *Eucalyptus robusta* (T), *Glochidion sumatranum* (T), *Melaleuca quinquenervia* (T), *Lophostemon suaveolens* (T).

Sub-canopy trees: *Callistemon salignus* (M1), *Cinnamomum camphora** (M1).

Climbers: *Parsonsia straminea*, *Lygodium microphyllum*.

Grasses *Isachne globosa*, *Leersia hexandra*, *Axonopus fissifolius**, *Echinochloa crusgalli**, *Entolasia marginata*, *Paspalum wettsteinii**, *Sacciolepis indica*.

Ferns: *Blechnum cartilagineum*, *Blechnum indicum*, *Hypolepis muelleri*, *Lygodium microphyllum*.

Sedges and rushes: *Typha orientalis* (M2), *Rhynchospora corymbosa*, *Baumea rubiginosa*, *Cyperus pilosus*, *Schoenoplectus validus*, *Eleocharis acuta*, *Eleocharis tetraquetra*, *Sparganium subglobosum*, *Carex appressa*, *Cyperus haspan*, *Isolepis inundata*.

Herbs and shrubs: *Persicaria strigosa*, *Ranunculus inundatus*, *Enydra fluctuans*, *Philydrum lanuginosum*.

Number of native taxa: 28

Number of taxa per site: 14 (mean 14)

Number of exotic taxa: 3

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Baumea rubiginosa</i>	3	50%	2	3%	positive
<i>Blechnum cartilagineum</i>	3	50%	3	13%	positive
<i>Blechnum indicum</i>	2	50%	2	17%	positive
<i>Cyperus haspan</i>	2	100%	0	0%	positive
<i>Cyperus pilolus</i>	3	50%	0	0%	positive
<i>Eleocharis acuta</i>	2	50%	3	1%	positive
<i>Eleocharis tetraquetra</i>	2	50%	0	0%	positive
<i>Entolasia marginata</i>	2	50%	2	11%	positive
<i>Eucalyptus robusta</i>	5	50%	3	8%	positive
<i>Glochidion sumatranum</i>	3	100%	1	21%	positive
<i>Hypolepis muelleri</i>	3	100%	2	16%	positive
<i>Isachne globosa</i>	4	50%	0	0%	positive
<i>Leersia hexandra</i>	4	100%	2	3%	positive
<i>Melaleuca quinquenervia</i>	3	50%	3	39%	positive
<i>Parsonsia straminea</i>	2	50%	1	44%	positive
<i>Persicaria strigosa</i>	4	100%	2	7%	positive
<i>Ranunculus inundatus</i>	2	50%	2	3%	positive
<i>Rhynchospora corymbosa</i>	4	50%	3	0%	positive
<i>Sacciolepis indica</i>	2	50%	1	1%	positive
<i>Schoenoplectus validus</i>	3	50%	4	0%	positive
<i>Sparganium subglobosum</i>	2	50%	0	0%	positive
<i>Typha orientalis</i>	5	50%	2	0%	positive

Community 24 Swamp Ricegrass (*Leersia hexandra*), *Lepironia articulata* – Smartweed–*Juncus usitatus* Swampy Meadow

Scientific name: Swamp Ricegrass (*Leersia hexandra*) *Lepironia articulata*, Smartweed (*Persicaria strigosa*) and *Juncus usitatus* Swampy Meadow.

Sites: (2) CUD13unfswp, CUD16estbb.

Equivalent communities

Freshwater Wetlands-Coastal Freshwater Lagoons (Keith 2006); Qld Regional Ecosystem 12.2.15 Coastal Sedgeland Wetland (Young and Dillewaard 1999); 64051 – *Lepironia articulata* sedgeland (Griffith and Wilson, 2007); *Persicaria strigosa* forbland, *Juncus usitatus* rushland (Griffith 2005); 703 – Freshwater Wetlands (Kingston *et al.* 2004).

Description

A derived wetland community dominated by *Lepironia articulata*, *Juncus usitatus* and Smartweed (*Persicaria strigosa*). Other associated species include Swamp Ricegrass (*Leersia hexandra*), *Eleocharis acuta* and Blue Couch (*Cynodon dactylon*).

Distribution and Habitat

Habitat: Low-lying sites on freshwater swamp and estuarine sedimentary muds, in areas where the existing swamp sclerophyll vegetation has been cleared.

Disturbance: Sites had been lightly to moderately grazed, and there is moderate infestation by weeds.

Locations: West of Cudgen Lake, in the catchments of Clothiers and Reserve Creeks.



Conservation

Threats: The community is an artefact of clearing (A. Benwell, pers. obs.). Other threats include draining, grazing and infestation by weeds.

Conservation status: This combination of species is not well recorded in the literature. Griffith (2005) assessed the reservation status of *Lepironia articulata* sedgeland community on the north coast of NSW as fair, and of *Juncus usitatus* rushlands and *Persicaria strigosa* forblands as poor. Survey sites were not in reserves.

Significant taxa: None recorded.

Structure

Layer	Height (m)	Cover (%)
Tallest	0.5–2.5	40–60
Lower 1	0–0.5	90–95

Floristics

Grasses: *Setaria sphacelata** (T), *Leersia hexandra* (L1), *Cynodon dactylon* (L1).

Sedges and rushes: *Lepironia articulata* (T), *Juncus usitatus* (T), *Eleocharis acuta* (L1), *Cyperus polystachyos*, *Juncus prismatocarpus*.

Herbs and shrubs: *Persicaria strigosa* (L1), *Ludwigia octovalvis*, *Persicaria dichotoma*, *Persicaria orientalis**, *Philydrum lanuginosum*, *Crassocephalum crepidioides**.

Number of native taxa: 13

Number of taxa per site: 8–11 (mean 10 ± 2)

Number of exotic taxa: 2

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Cynodon dactylon</i>	5	50%	3	5%	Positive
<i>Cyperus polystachyos</i>	2	50%	1	3%	Positive
<i>Eleocharis acuta</i>	5	50%	2	1%	Positive
<i>Juncus prismatocarpus</i>	2	50%	0	0%	Positive
<i>Juncus usitatus</i>	3	100%	1	3%	Positive
<i>Leersia hexandra</i>	4	100%	2	3%	Positive
<i>Lepironia articulata</i>	5	100%	2	4%	Positive
<i>Ludwigia octovalvis</i>	2	50%	1	0%	Positive
<i>Persicaria dichotoma</i>	2	50%	2	4%	Positive
<i>Persicaria orientalis</i>	2	50%	1	0%	Positive
<i>Persicaria strigosa</i>	4	100%	2	7%	Positive
<i>Philydrum lanuginosum</i>	2	50%	1	2%	Positive

Community 25 Swamp Ricegrass–*Bolboschoenus caldwellii*–*Schoenoplectus validus*–*Cyperus exaltatus* Freshwater Wetland

Scientific name: Swamp Ricegrass (*Leersia hexandra*), *Bolboschoenus caldwellii*, *Schoenoplectus validus* and *Cyperus exaltatus* Freshwater Wetland.

Sites: (1) CUD14alfl.

Equivalent communities

Freshwater Wetlands-Coastal Freshwater Lagoons (Keith 2006); Qld Regional Ecosystem 12.2.15 Coastal Sedgeland Wetland (Young and Dillewaard 1999); 703 – Freshwater Wetlands (Kingston *et al.* 2004).

Description

A freshwater wetland site dominated by Swamp Ricegrass (*Leersia hexandra*), *Bolboschoenus caldwellii*, *Schoenoplectus validus* and *Cyperus exaltatus*. This community is a floristic variation of Community 24 and is restricted to channels.

Distribution and Habitat

Habitat: Located on the alluvial floodplain in fluvial sands and mud. A freshwater wetland community that has colonised drains and channels (A. Benwell, pers. comm.).

Disturbance: The site has been lightly cleared and moderately grazed, and the water weed *Nymphaea caerulea* subsp. *zanzibarensis* was present in the site.

Location: Clothiers Creek Bridge.

Conservation

Threats: Clearing, draining and weeds.

Conservation status: Poor. The community is part of the 'Freshwater wetlands on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner' bioregions' EEC. Freshwater wetlands like this may have been more widespread on the floodplain in the past, but are now restricted to channels and drains over large areas of the alluvial plain owing to clearing and draining.

Significant taxa: None recorded.

Structure

Layer	Height (m)	Cover (%)
Tallest	0.7–2.3	40
Middle 1	0.1–0.7	50
Lower 1	0–0.1	60



Floristics

Grasses: *Leersia hexandra* (M1).

Sedges and rushes: *Schoenoplectus validus* (T), *Bolboschoenus caldwellii* (T), *Cyperus exaltatus*.

Herbs and shrubs: *Persicaria strigosa* (M1), *Ludwigia peploides* subsp. *montevidensis* (M1), *Nymphaea caerulea* subsp. *zanzibarensis** (L1).

Number of native taxa: 7

Number of taxa per site: 8

Number of exotic taxa: 1



Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Bolboschoenus caldwellii</i>	4	100%	3	0%	positive
<i>Cyperus exaltatus</i>	2	100%	0	0%	positive
<i>Juncus usitatus</i>	2	100%	1	4%	positive
<i>Leersia hexandra</i>	5	100%	2	3%	positive

Community 26 Hinterland Narrow-leaved Paperbark–Tea-tree Backswamp Shrublands–Sedgeland of Alluvial Backswamps

Scientific name: *Lepironia articulata* Sedgeland and Associated Narrow-leaved Paperbark (*Melaleuca alternifolia*) and Tea-tree (*Leptospermum brachyandrum*) Shrublands of Alluvial Backswamps.

Sites: (5) ELL04albk, ELL05albk, ELL11albk, ELL06albk, WOO17albk.

Equivalent communities

Freshwater Wetlands-Coastal Freshwater Lagoons, and Forested Wetlands-Coastal Floodplain Wetlands (Keith 2006); Qld Regional Ecosystem 12.2.15 Coastal Sedgeland Wetland (Young and Dillewaard 1999); in part 64051 – *Lepironia articulata* sedgelands, NPWS NSW Coastal Vegetation (Griffith & Wilson 2007) and *Melaleuca alternifolia* swamp sclerophyll forests (Griffith, 2005)

Description

A structurally variable freshwater wetland and swamp sclerophyll vegetation community. Sites ELL05albk, ELL11albk and WOO17albk are *Lepironia articulata* sedgeland communities with emergent Narrow-leaved Paperbark (*Melaleuca alternifolia*), Broad-leaved Paperbark (*Melaleuca quinquenervia*) and Swamp Box (*Lophostemon suaveolens*). Site ELL04albk is a low closed shrubland of *Leptospermum brachyandrum* and Narrow-leaved Paperbark, with a dense ground cover of *Lepironia articulata*, and emergent Swamp Box. Site ELL06albk is an open swamp sclerophyll forest of Broad-leaved Paperbark and *Leptospermum brachyandrum*.

Distribution and Habitat

Habitat: These sites occur on heavily waterlogged backswamps and levees of the drainage plain of Bungawalbin Creek and are influenced by the input of sediment from the erosion of the Kangaroo Creek Sandstones.

Disturbance: No disturbance was recorded at sites ELL04albk and ELL05albk. Site WOO17albk was being logged. There was evidence ELL11albk had been lightly cleared in the past.

Example locations: Yarringully Nature Reserve, Boggy Creek Road, and Reardon's Lane.



Conservation

Threats: Clearing, logging and weeds.

Conservation status: Four sample sites were located in Yarringully NR. This community qualifies as 'Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions' EEC. The reservation status of *Lepironia articulata* sedgelands is considered fair on the north coast (Griffith 2005). The reservation status of Narrow-leaved Paperbark (*Melaleuca alternifolia*)–*Leptospermum brachyandrum* shrublands is poorly known. Sedgeland sites dominated by *Lepironia articulata* equate to 'Freshwater wetlands on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions' EEC.

Significant taxa: None recorded.

Structure

Layer	Height (m)	Cover (%)
Emergent	10–15	5
Tallest	4–25	3–35
Middle 1	2–6	10–60
Lower 1	0–2	40–80
Lower 2	0–0.3	5–10

Floristics

Trees: *Melaleuca alternifolia*, *Lophostemon suaveolens* (E, T), *Melaleuca quinquenervia* (T), *Eucalyptus tereticornis*.

Shrubs: *Leptospermum brachyandrum* (M1), *Melaleuca alternifolia* (M1), *Callistemon pachyphyllus*.

Climbers: *Parsonsia straminea*.

Grasses: *Pseudoraphis paradoxa*, *Lachnagrostis filiformis*, *Panicum bisulcatum* (L1), *Cynodon dactylon*.

Sedges and rushes: *Lepironia articulata* (L1), *Baumea articulata* (L1), *Baumea rubiginosa* (L1), *Isolepis cernua*.

Herbs and shrubs: *Pseudoraphis paradoxa* (L1), *Lycopus australis* (L2), *Lycopus australis*, *Stylidium debile* var. *debile* (L2), *Centella asiatica* (L2), *Centipeda minima* var. *minima* (L2), *Persicaria strigosa* (L2), *Persicaria hydropiper*, *Hydrocotyle peduncularis*, *Hypericum japonicum*, *Ranunculus inundatus*, *Senecio madagascariensis**, *Viola banksii*.

Number of native taxa: 23

Number of taxa per site: 2–18 (mean 9 ± 6)

Number of exotic taxa: 6

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Lepironia articulata</i>	5	100%	2	3%	positive
<i>Pseudoraphis paradoxa</i>	2	80%	2	1%	positive
<i>Lachnagrostis filiformis</i>	2	80%	2	2%	positive
<i>Melaleuca alternifolia</i>	3	60%	1	3%	positive
<i>Centipeda minima</i>	2	20%	0	0%	positive

Community 27 Weeping Myrtle–Water Gum Floodplain Riparian Forest

Scientific name: Weeping Myrtle (*Waterhousea floribunda*) and Water Gum (*Tristaniopsis laurina*) Floodplain Riparian Forest.

Sites: (1) GIB04alfl.

Equivalent communities

Rainforest-Dry 'Gallery' Rainforests (Keith 2006); Qld Regional Ecosystems 12.3.1 Rainforest on alluvium (Young and Dillewaard 1999); Suballiance 26 – *Waterhousea floribunda*–*Tristaniopsis laurina* (Floyd 1990).

Description: A riparian open forest with emergent Swamp Box (*Lophostemon suaveolens*) and tallest layer of Weeping Myrtle (*Waterhousea floribunda*) and Water Gum (*Tristaniopsis laurina*). There is no mid-layer. The lower layer comprises a species depauperate cover of *Lomandra hystrix* and Palm Lily (*Cordlyine conegsta*).

Distribution and Habitat

Habitat: A riparian creekline site on the Sandy Creek floodplain.

Disturbance: There was no evidence of disturbance at this site.

Location: Sandy Crossing Travelling Stock Route (TSR), Bungawalbyn.

Conservation

Threats: Clearing, fragmentation and weed infestation.

Conservation status: This is a restricted and poorly reserved riparian rainforest community. Keith (2006) states that Gallery Dry Rainforests 'have suffered severely from the effects of clearing, fragmentation and weed invasion and that few of the remaining fragments are protected'. Floyd (1990) suggests that Suballiance 26 – *Waterhousea floribunda*–*Tristaniopsis laurina* is restricted to riparian strips and is unconserved. Occurrences of this community on the alluvial floodplain may qualify as Lowland Rainforest on floodplain of the NSW North Coast bioregion EEC.

Significant taxa: None recorded.

Structure

Layer	Height (m)	Cover (%)
Emergent	30–35	15
Tallest	15–25	40
Lower 1	0–1	60

Floristics

Trees: *Waterhousea floribunda* (T), *Lophostemon suaveolens* (E, T), *Tristaniopsis laurina* (T).

Sub-canopy trees: *Symplocos stawellii*.

Shrubs: *Acacia disparrima* subsp. *disparrima*, *Acmena smithii*, *Callistemon salignus*, *Myrsine variabilis*.

Climbers: *Morinda jasminoides*, *Parsonsia straminea*.

Grasses: *Ottobachloa gracillima*.

Ferns: *Pyrrosia confluens* var. *confluens*.

Sedges and rushes: *Lomandra hystrix* (L1), *Chorizandra cymbaria*.

Herbs and shrubs: *Cordyline stricta*, *Centella asiatica*.

Number of native taxa: 18

Number of taxa per site: 18

Number of exotic taxa: 0

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Lomandra hystrix</i>	5	100%	2	1%	positive
<i>Lophostemon suaveolens</i>	3	100%	2	23%	positive
<i>Morinda jasminoides</i>	2	100%	2	27%	positive
<i>Tristania laurina</i>	1	100%	0	0%	positive
<i>Watehousea floribunda</i>	4	100%	3	1%	positive

Community 28 Narrow-leaved Paperbark–Wallum Bottlebrush Swamp Sclerophyll Shrubland

Scientific name: Narrow-leaved Paperbark (*Melaleuca alternifolia*), *Melaleuca sieberi* and Wallum Bottlebrush (*Callistemon pachyphyllus*) Swamp Sclerophyll Shrubland of Alluvial Backswamps.

Sites: (1) GIB06albk.

Equivalent communities

Qld Regional Ecosystem 12.3.5 *Melaleuca quinquenervia* on alluvium (Young and Dillewaard 1999); Group 1 Swamp Sclerophyll Forest on coastal floodplains (Keith and Scott 2005). Possibly related to 4009 – *Melaleuca sieberi* swamp sclerophyll forest & woodland, and 5508 – *Melaleuca sieberi* tall sparse to closed shrubland NPWS NSW Coastal Vegetation (Griffith *et al.* 2000).

Description

An open shrubland characterised by an upper layer of Narrow-leaved Paperbark (*Melaleuca alternifolia*), *Melaleuca sieberi* and Wallum Bottlebrush (*Callistemon pachyphyllus*). The lower layer comprises a dense cover of *Chorizandra cymbaria*. Only four species of plant were recorded in the only site surveyed.

Distribution and Habitat

Habitat: An impeded drainage site found on stagnant alluvial backswamps of the meander plain of Bungawalbin Creek, with a possible influence of sandy soils.

Disturbance: The site has been subject to moderate levels of recent logging.

Location: Doubleduke State Forest (SF).

Conservation

Threats: Logging and weeds.

Conservation status: Griffith (2005) records a *Melaleuca sieberi* shrubland community and a *Melaleuca sieberi* forest and woodland community and assessed the reservation status of these as fair. Community 28 of the present survey occurs on alluvial soils and although limited by sites sampling is structurally and floristic different from known similar swamp sclerophyll shrublands and needs further survey investigation. The Conservation status of the community is probably poor.

Significant taxa: None recorded.



Structure

Layer	Height (m)	Cover (%)
Tallest	2–5	40
Lower 1	0–1	60

Floristics

Shrubs: *Melaleuca alternifolia* (T), *Callistemon pachyphyllus* (T), *Melaleuca sieberi* (T).

Herbs and shrubs: *Chorizandra cymbaria* (L1).

Number of native taxa: 4

Number of taxa per site: 4

Number of exotic taxa: 0

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Callistemon pachyphyllus</i>	3	100%	2	3%	positive
<i>Chorizandra cymbaria</i>	5	100%	1	1%	positive
<i>Melaleuca alternifolia</i>	4	100%	2	3%	positive
<i>Melaleuca sieberi</i>	2	100%	1	2%	positive

Community 29 Swamp Box–Narrow-leaved Paperbark–Broad-leaved Paperbark Alluvial Swamp Sclerophyll Forest

Scientific name: Swamp Box (*Lophostemon suaveolens*), Narrow-leaved Paperbark (*Melaleuca alternifolia*) and Broad-leaved Paperbark (*Melaleuca quinquenervia*) Swamp Sclerophyll Forest of Alluvial Backswamps.

Sites: (2) GIB08albk, GIB09albk.

Equivalent communities

Forested Wetlands-Coastal Floodplain Wetlands (Keith 2006); Qld Regional Ecosystem 12.3.5 *Melaleuca quinquenervia* on alluvium (Young and Dillewaard 1999); possibly related to 309 – Coastal Swamp Box Open Forest to Woodland (Kingston *et al.* 2004); 4013 – *Melaleuca quinquenervia*–*Lophostemon suaveolens*/*Eucalyptus tereticornis* mid-high to very tall, open woodland to closed forest NPWS NSW Coastal Vegetation (Griffith *et al.* 2000).

Note, however, that these equivalent communities do not record *Melaleuca alternifolia* as an associate taxon.

Description

An open, swamp sclerophyll forest of Swamp Box (*Lophostemon suaveolens*), Narrow-leaved Paperbark (*Melaleuca alternifolia*) and Broad-leaved Paperbark (*Melaleuca quinquenervia*), with an open mid-storey of Narrow-leaved Paperbark and Broad-leaved Paperbark. The lower layer consists of Spiny-headed Mat-rush (*Lomandra longifolia*), *Carex gaudichaudiana*, Woolly Waterlily (*Philydrum lanuginosum*) and Jointed Twig-rush (*Baumea articulata*).



Distribution and Habitat

Habitat: Both sites are found on stagnant alluvial backswamps of the meander plain of the Bungawalbin Creek, and derived from sediments from the adjoining Grafton Formation and Kangaroo Creek Sandstones.

Disturbance: Moderate to light fire effects, and moderate to light clearing.

Example locations: Bungawalbyn SCA.

Conservation

Threats: Clearing.

Conservation status: Both survey sites were in Bungawalbyn SCA. This community is a component of the 'Sub-tropical Coastal Floodplain Forest of the NSW North Coast bioregion' EEC. The NPWS NSW Coastal Vegetation Community 4013 – *Melaleuca quinquenervia*–*Lophostemon suaveolens*/*Eucalyptus tereticornis* mid-high to very tall, open woodland to closed forest (Griffith & Wilson 2007) is reserved in Broadwater NP and Bundjalung NP. The present community is possibly a sub-coastal variant of community 4013 in association with Narrow-leaved Paperbark.

Significant taxa: None recorded.

Structure

Layer	Height (m)	Cover (%)
Tallest	15–25	20–30
Middle 1	2–10	10–20
Lower 1	0–1	20–30
Lower 2	0–0.5	40

Floristics

Trees: *Lophostemon suaveolens* (T), *Melaleuca quinquenervia* (T), *Eucalyptus tereticornis* (T).

Shrubs: *Melaleuca alternifolia* (M1), *Baccharis halimifolia**, *Callistemon pachyphyllus*.

Climbers: *Parsonsia straminea*.

Grasses: *Imperata cylindrica* var. *major*, *Lachnagrostis filiformis*, *Entolasia marginata*.

Sedges and rushes: *Lomandra longifolia* (L1), *Baumea articulata* (L2), *Carex gaudichaudiana* (L1), *Baumea rubiginosa*, *Eleocharis dietrichiana*, *Baumea teretifolia*.

Herbs and shrubs: *Philydrum lanuginosum* (L1), *Alternanthera denticulata*, *Gonocarpus tetragynus*, *Goodenia paniculata*, *Philydrum lanuginosum*, *Stylidium debile* var. *debile*, *Triglochin procerum*, *Villarsia exaltata*, *Centella asiatica*, *Dianella longifolia*, *Enydra fluctuans*, *Haloragis heterophylla*, *Lobelia anceps*, *Ranunculus inundatus*.

Number of native taxa: 31

Number of taxa per site: 21–23 (mean 22 ± 1)

Number of exotic taxa: 1

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Alternanthera denticulata</i>	2	100%	1	6%	positive
<i>Baumea articulata</i>	2	100%	1	3%	positive
<i>Baumea rubiginosa</i>	2	100%	3	3%	positive
<i>Carex gaudichaudiana</i>	3	100%	0	0%	positive
<i>Eleocharis dietrichiana</i>	2	100%	0	0%	positive
<i>Goodenia paniculata</i>	2	100%	2	4%	positive
<i>Lophostemon suaveolens</i>	3	100%	2	22%	positive
<i>Melaleuca alternifolia</i>	3	100%	2	3%	positive
<i>Philydrum lanuginosum</i>	2	100%	1	2%	positive
<i>Stylidium debile</i>	2	100%	2	1%	positive
<i>Triglochin procerum</i>	2	100%	2	1%	positive
<i>Gonocarpus tetragynus</i>	2	50%	1	1%	positive
<i>Imperata cylindrica</i>	2	50%	2	21%	positive
<i>Lomandra longifolia</i>	3	50%	2	29%	positive
<i>Melaleuca quinquenervia</i>	3	50%	3	39%	positive
<i>Parsonsia straminea</i>	2	50%	1	44%	positive
<i>Villarsia exaltata</i>	2	50%	2	1%	positive
<i>Viola betonicifolia</i>	2	50%	1	1%	positive

Community 30 Middle Richmond Freshwater Wetlands

Scientific name: *Azolla pinnata*, *Ludwigia peploides* subsp. *montevidensis*, *Phalaris minor*, *Hygrophila angustifolia* and *Juncus mollis* Freshwater Wetland.

Sites: (3) CAS01albk, CAS02albk, CAS03albk.

Equivalent communities

Freshwater Wetlands-Coastal Freshwater Lagoons (Keith 2006); Qld Regional Ecosystems 12.3.8. Freshwater swamps (Young and Dillewaard 1999).

Description

A freshwater wetland with *Azolla pinnata*, *Ludwigia peploides* subsp. *montevidensis*, *Phalaris minor*, *Hygrophila angustifolia* and *Juncus mollis*. The invasive weed Chinese Tallow (*Triadica sebifera*) occurs as a common emergent tree, with up to 40% cover. Water weeds are prevalent in the lower strata, including *Phalaris minor* and *Myriophyllum aquaticum*.



Distribution and Habitat

Habitat: A backswamp on the fringe of a broad drainage depression on Barlings Creek, derived from fine-grained sediments from the deposition low sedimentary quartz soils of the Namoon Beds.

Disturbance: Light to severe weed infestation.

Example locations: Jabiru Geneenbinga wetland Casino.

Conservation

Threats: Weed infestation by Chinese Tallow.

Conservation status: Poor. The community is part of the 'Freshwater wetlands on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions' EEC. Griffith and Wilson (2007) record a *Ludwigia peploides* ssp. *montevidensis*–*Nymphaea capensis*–*Persicaria attenuata* low to tall closed forland in the Newybar Embayment.

Significant taxa: None recorded.

Structure

Layer	Height (m)	Cover (%)
Tallest	1–10	5–40
Middle 1	0.5–1.5	30
Lower 1	0.5–1	5–80
Lower 2	0–0.2	20–70

Group 3–Coastal barrier sand sites and headland sites

Community 31 Scribbly Gum–Red Mahogany–Brush Box dry sclerophyll Open to Closed Forest on Coastal Barrier Sands

Scientific name: Scribbly Gum (*Eucalyptus signata*), Red Mahogany (*Eucalyptus resinifera*) and Brush Box (*Lophostemon confertus*) Dry Sclerophyll Open to Closed Forest on Coastal Barrier Sands.

Sites: (9) BALL10cbrdg, BRU44cbrdg, BRU36estcd, BRU37estisw, BRU46estsswp, BIL12cbrdg, BRU41cbrdg, WAR10cbrdg, WAR46hsrlh.

Equivalent communities

Dry Sclerophyll Forests-Coastal Dune Dry Sclerophyll Forests (Keith 2006); Scribbly Gum (sG) (Landmark Ecological Services 1999); 306 – Coastal Scribbly Gum Open Forest to Woodland (Kingston *et al.* 2004); 3516: *Eucalyptus signata* tall to very tall, open woodland NPWS NSW Coastal Vegetation (Griffith *et al.* 2000); North-east NSW Forest Ecosystem 74 – Lowlands Scribbly Gum (NPWS 1999).

Description

An open to closed forest, with dominant overstorey trees including Scribbly Gum (*Eucalyptus signata*), Red Mahogany (*Eucalyptus resinifera* subsp. *hemilampra*) and Brush Box (*Lophostemon confertus*).

A mid-layer of shrubs is present, including *Baeckea frutescens*, Tree

Broom-heath (*Monotoca elliptica*), Wallum Banksia (*Banksia aemula*), Tootoon (*Leptospermum polygalifolium*), Satinwood (*Nematolepis squamea* subsp. *squamea*) and Slender Tea-tree (*Leptospermum trinervium*). The most frequently occurring lower strata species are Spiny-headed Mat-rush (*Lomandra longifolia*), Bracken Fern (*Pteridium esculentum*), Midgen Berry (*Austromyrtus dulcis*), Plume Rush (*Baloskion tetraphyllum*) and *Leucopogon lanceolatus* var. *gracilis*.



Distribution and Habitat

Habitat: Found on Pleistocene barrier strandplains and backbarrier flats and high sedimentary quartz substrates.

Disturbance: There is some evidence of moderate to severe fire (15–80 years previously) at several sites. There was no evidence of disturbance at sites BRU36estcd and BRU37estisw.

Example locations: Lennox Head, Tandys Lane, Tyagarah Airfield, Tallow Creek, Brunswick Road, Boyd Street Tugun, and Pine Street at Wardell.

Conservation

Threats: Not threatened.

Conservation status: In Byron Shire, a Scribbly Gum community was reported as being reserved in Mt Jerusalem NP and at Tyagarah NR (Landmark Ecological Services 1999). In the study area, small areas of Scribbly Gum forests are reserved in Ukerebagh NR, Broadwater NP, Billinudgel NR, Cudgen NR, Nightcap NP and Bundjalung NP. North-east NSW Forest Ecosystem 74 – Lowlands Scribbly Gum Forest was considered vulnerable (NPWS 1999).

Significant taxa: *Corokia whiteana* (TSC: Vulnerable).

Structure

Layer	Height (m)	Cover (%)
Tallest	4–18	15–80
Middle 1	2–10	20–100
Lower 1	0–1	30–80
Lower 2	0–0.2	100

Floristics

Trees: *Eucalyptus signata* (T), *Banksia aemula* (T), *Eucalyptus resinifera* subsp. *hemilampra* (T), *Lophostemon confertus* (T), *Melaleuca quinquenervia* (T), *Eucalyptus robusta*, *Cupaniopsis anacardioides*, *Callitris columellaris*, *Cinnamomum camphora**, *Corymbia gummifera*.

Shrubs: *Monotoca elliptica* (M1), *Leptospermum polygalifolium* (T), *Baeckea frutescens* (M1), *Leucopogon lanceolatus* var. *gracilis* (M1), *Nematolepis squamea* subsp. *squamea* (M1), *Leptospermum trinervium* (M1), *Leucopogon margarodes* (M1), *Elaeocarpus reticulatus*, *Xanthorrhoea macronema* (L1), *Leucopogon leptospermoides*, *Acrotriche aggregata* (M1), *Banksia serrata*, *Dodonaea triquetra*, *Endiandra sieberi*, *Leptospermum whitei*, *Acacia disparrima* subsp. *disparrima*, *Corokia whiteana*, *Melaleuca nodosa*, *Xanthorrhoea fulva*, *Acmena smithii*, *Aotus lanigera*, *Banksia oblongifolia*, *Duboisia myoporoides*, *Homoranthus virgatus*, *Agiortia pedicellata*, *Ochrosperma citriodorum*, *Ochrosperma lineare*, *Xanthorrhoea johnsonii*.

Climbers: *Hibbertia scandens*, *Pandorea pandorana*, *Cassytha filiformis*, *Kennedia rubicunda*, *Smilax glyciphylla*, *Stephania japonica*, *Cassytha glabella*, *Marsdenia rostrata*, *Smilax australis*.

Epiphytes: *Platynerium bifurcatum*.

Grasses: *Imperata cylindrica* var. *major*.

Ferns: *Pteridium esculentum* (L1), *Schizaea bifida*.

Sedges and rushes: *Baloskion tetraphyllum* (L1), *Lomandra longifolia* (L1), *Gahnia clarkei* (L1), *Caustis recurvata* (L1), *Hypolaena fastigiata*, *Lomandra elongata*, *Baloskion tenuiculme*.

Herbs and shrubs: *Austromyrtus dulcis* (L1), *Pomax umbellata* (L1), *Acacia ulicifolia* (L1), *Cryptostylis subulata*, *Dianella caerulea*, *Persoonia stradbokensis*, *Acianthus pusillus*, *Boronia rosmarinifolia*, *Bossiaea heterophylla*, *Patersonia sericea*, *Platysace ericoides*, *Pseudanthus orientalis*, *Dampiera stricta*, *Caleana major*, *Dipodium punctatum*, *Drosera auriculata*, *Epacris pulchella*, *Gonocarpus micranthus*, *Mitrasacme polymorpha*, *Patersonia fragilis*, *Pimelea linifolia*, *Strangea linearis*, *Styphelia viridis* subsp. *breviflora*, *Viminaria juncea*, *Xyris complanata*.

Number of native taxa: 84

Number of taxa per site: 17–40 (mean 24 ± 8)

Number of exotic taxa: 2

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Pteridium esculentum</i>	3	100%	2	19%	positive
<i>Austromyrtus dulcis</i>	3	88%	2	14%	positive
<i>Pomax umbellata</i>	2	88%	2	7%	positive
<i>Baeckea frutescens</i>	3	63%	2	4%	positive
<i>Eucalyptus signata</i>	5	63%	2	1%	positive
<i>Monotoca elliptica</i>	3	63%	2	4%	positive
<i>Acacia ulicifolia</i>	2	50%	1	4%	positive
<i>Baloskion tetraphyllum</i>	5	50%	2	6%	positive
<i>Banksia aemula</i>	3	50%	4	2%	positive
<i>Elaeocarpus reticulatus</i>	2	50%	2	18%	positive
<i>Leptospermum trinervium</i>	2	50%	3	2%	positive
<i>Lomandra longifolia</i>	4	50%	2	29%	positive
<i>Lophostemon confertus</i>	3	50%	3	18%	positive
<i>Melaleuca quinquenervia</i>	3	50%	3	39%	positive
<i>Nematolepis squamea</i> subsp. <i>squamea</i>	3	50%	1	3%	positive
<i>Hypolaena fastigiata</i>	2	25%	0	0%	positive
<i>Acianthus pusillus</i>	2	13%	0	0%	positive
<i>Aotus lanigera</i>	1	13%	0	0%	positive
<i>Boronia rosmarinifolia</i>	2	13%	0	0%	positive
<i>Caleana major</i>	1	13%	0	0%	positive
<i>Corokia whiteana</i>	2	13%	0	0%	positive
<i>Dipodium punctatum</i>	1	13%	0	0%	positive
<i>Mitrasacme polymorpha</i>	1	13%	0	0%	positive
<i>Ochrosperma citriodorum</i>	1	13%	0	0%	positive
<i>Patersonia fragilis</i>	1	13%	0	0%	positive

Community 32 Blackbutt–Turpentine Open Forest Complex

Scientific name: Blackbutt (*Eucalyptus pilularis*), Broad-leaved Paperbark (*Melaleuca quinquenervia*), Swamp Mahogany (*Eucalyptus robusta*) and Turpentine (*Syncarpia glomulifera*) Open Forest Complex.

Sites: (6) BRU15cbbbf, BRU16cbbbf, BRU23estchf, WAR13esttdf, WAR05cbrdg, WAR06cbr.

Equivalent communities

Dry Sclerophyll Forests-Coastal Dune Dry Sclerophyll Forests (Keith 2006); Qld Regional Ecosystem 12.2.8 *Eucalyptus pilularis*, *E. microcorys*, *E. resinifera* & *Syncarpia hillii* Tall Open Forest (Young and Dillewaard 1999); 206 – Flooded Gum Open Forest, 211 – Turpentine ± Pink Bloodwood Open Forest, 307 – Coastal Blackbutt Open Forest to Woodland, 303 – Coastal Brush Box Open Forest to Woodland, and 305 – Coastal Swamp Mahogany Open Forest to Woodland (Kingston *et al.* 2004); Wet Sclerophyll Forests: 30041 – *Eucalyptus grandis*, 30051 – *Corymbia intermedia*, 30031 – *Lophostemon suaveolens*, 30181 – *Eucalyptus pilularis* - *Corymbia intermedia* Swamp Sclerophyll Forests & Woodlands: 40021 – *Eucalyptus robusta* Swamp Sclerophyll Forest and Woodland. Dry Sclerophyll Forests and Woodlands: 35051 – *Eucalyptus pilularis* - *Corymbia gummifera*, 35061 – *Eucalyptus pilularis* - *Angophora costata*/*Corymbia gummifera*/*E. planchoniana*, 35281 – *Corymbia intermedia*, 35291 – *Eucalyptus pilularis* - *Corymbia intermedia*, 35501 – *Eucalyptus pilularis* - *Corymbia gummifera*/*E. planchoniana*, 35581 – *Eucalyptus pilularis* - *Corymbia intermedia*/*Angophora costata*, 35561 – *Syncarpia glomulifera*, 35711 – *Syncarpia glomulifera* subsp. *glomulifera* – *Corymbia intermedia* (Griffith and Wilson 2007); Flooded Gum (fG), Blackbutt (BB), Swamp Mahogany/Swamp Box (SMB) (Landmark Ecological Services 1999); North-east NSW Forest Ecosystem 32 – Dry Foothills Blackbutt–Turpentine (NPWS 1999).

Description

A complex mosaic of tall, moist open forest overstorey species. There is considerable variation in the tallest strata, which are recognised within several mapping classifications.

(1) Site WAR05cbrdg is a tall open forest of Flooded Gum (*Eucalyptus grandis*) and Pink Bloodwood (*Corymbia intermedia*). (2) Sites BRU16cbbbf and WAR13esttdf are swamp sclerophyll open forests with Swamp Mahogany (*Eucalyptus robusta*) and Swamp Box (*Lophostemon suaveolens*). (3) Blackbutt (*Eucalyptus pilularis*) is the dominant tree species in sites BRU15cbbbf and BRU23estchf. (4) Site WAR06cbr is an open forest of Turpentine (*Syncarpia glomulifera*) and Brush Box (*Lophostemon confertus*).

The sites appear to be grouped on the basis of species in the middle and lower strata. The mid-layer is an open to closed, tree or shrub layer with Hard Corkwood (*Endiandra sieberi*), Tree Heath (*Trochocarpa laurina*), Blueberry Ash (*Elaeocarpus reticulatus*) and *Baeckea frutescens*. A lower layer consists of Plume Rush (*Baloskion tetraphyllum*), Saw Sedge (*Gahnia clarkei*), Spiny-headed Mat-rush (*Lomandra longifolia*), Midgen Berry (*Austromyrtus dulcis*), Bracken Fern (*Pteridium esculentum*), and *Pomax umbellata*.

Distribution and Habitat

Habitat: Coastal sandplain sites transitional between wetter backbarrier flats and drier strandplain sites on



Pleistocene barrier sands.

Disturbance: There has been some moderate to light burning (20–50 years previously) and some incursions by weeds, and there is some evidence of light clearing at sites BRU15cbbbf and BRU16cbbbf. However, there is no evidence of disturbance at site WAR05cbrdg.

Example locations: Tuckean Broadwater, Brunswick Heads, and Lumleys Road at Wardell.

Conservation

Threats: Clearing.

Conservation status: Assessment of the Conservation status of such a disparate grouping of overstorey sites is problematic. Most of the overstorey associations listed above are represented in reserves in the study area, but as relatively small areas. Only overstorey association 35291 – *Eucalyptus pilularis* - *Corymbia intermedia*, 35501 – *Eucalyptus pilularis* - *Corymbia gummifera*/E. *planchoniana* appears well reserved in Bundjalung NP (Griffith and Wilson, 2007)

Significant taxa: *Arthrochilus prolixus* (ROTAP: 3K), *Cordyline congesta* (ROTAP: 2RC-).

Structure

Layer	Height (m)	Cover (%)
Tallest	15–40	15–60
Middle 1	3–25	10–70
Middle 2	1–5	15–40
Lower 1	0–1.5	5–90
Lower 2	0–0.5	40

Floristics

Trees: *Endiandra sieberi* (T), *Eucalyptus pilularis* (T), *Melaleuca quinquenervia* (T), *Eucalyptus robusta* (T), *Syncarpia glomulifera* (T), *Eucalyptus resinifera* subsp. *hemilampra* (T), *Lophostemon suaveolens* (T), *Corymbia intermedia* (T), *Eucalyptus grandis* (T), *Lophostemon confertus* (T), *Eucalyptus signata* (T), *Archontophoenix cunninghamiana*.

Sub canopy trees and saplings: *Livistona australis*, *Melicope elleryana*, *Cupaniopsis anacardioides*, *Jagera pseudorhus* var. *pseudorhus* forma *pseudorhus*, *Guioa semiglaucula*, *Cinnamomum camphora**, *Ficus watkinsiana*, *Sarcopteryx stipata*, *Syzygium oleosum*, *Commersonia bartramia*, *Dysoxylum mollissimum* subsp. *molle*, *Flindersia schottiana*, *Litsea australis*, *Pittosporum revolutum*.

Shrubs: *Baeckea frutescens* (M1), *Elaeocarpus reticulatus* (M1), *Trochocarpa laurina* (M1), *Nematolepis squamea* subsp. *squamea* (M1), *Pilidiostigma glabrum*, *Banksia serrata*, *Myrsine howittiana*, *Senna pendula* var. *glabrata**, *Tasmaniania insipida*, *Acacia concurrens*, *Alyxia ruscifolia*, *Ardisia crenata**, *Banksia oblongifolia*, *Callistemon salignus*, *Lantana camara**, *Leptospermum polygalifolium* subsp. *cismontanum*, *Myrsine variabilis*, *Oxylobium arborescens*.

Climbers: *Smilax glyciphylla* (L2), *Smilax australis* (M2), *Parsonsia straminea*, *Marsdenia rostrata* (L1), *Hibbertia scandens* (L2), *Marsdenia fraseri*, *Pandorea pandorana*, *Cissus hypoglauca*, *Cassytha glabella*, *Cissus antarctica*, *Echinostephia aculeata*, *Geitonoplesium cymosum*, *Kennedia rubicunda*, *Lygodium microphyllum*, *Morinda jasminoides*.

Epiphytes: *Platynerium bifurcatum*, *Cymbidium suave*, *Platynerium superbum*.

Grasses: *Paspalidium distans*, *Axonopus compressus**, *Ottocloa gracillima*, *Andropogon virginicus**, *Entolasia stricta*, *Ischaemum australe*.

Ferns: *Pteridium esculentum* (L1), *Todea barbara*, *Blechnum indicum*, *Hypolepis muelleri*, *Calochlaena dubia*, *Lygodium microphyllum*.

Sedges and rushes: *Baloskion tetraphyllum* (L1), *Gahnia clarkei* (L1), *Lomandra longifolia* (L1).

Herbs and shrubs: *Baeckea frutescens* (M1), *Austromyrtus dulcis* (L1), *Acrotriche aggregata* (M2), *Pomax umbellata* (L2), *Cryptostylis erecta*, *Cordyline congesta*, *Arthrochilus prolixus*, *Breynia oblongifolia*, *Chiloglottis diphylla*, *Cordyline rubra*, *Dianella caerulea*, *Alpinia arundelliana*, *Cordyline petiolaris*, *Desmodium rhytidophyllum*, *Gonocarpus tetragynus*, *Leucopogon lanceolatus* var. *gracilis*, *Melastoma affine*, *Platysace lanceolata*.

Number of native taxa: 89

Number of taxa per site: 26–42 (mean 33 ± 7)

Number of exotic taxa: 7

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Austromyrtus dulcis</i>	2	86%	2	14%	Positive
<i>Baeckea frutescens</i>	6	57%	2	4%	Positive
<i>Baloskion tetraphyllum</i>	4	86%	2	6%	Positive
<i>Chiloglottis diphylla</i>	2	14%	0	0%	Positive
<i>Elaeocarpus reticulatus</i>	2	100%	2	17%	Positive
<i>Endiandra sieberi</i>	3	100%	1	9%	Positive
<i>Eucalyptus pilularis</i>	5	57%	3	6%	Positive
<i>Gahnia clarkei</i>	3	86%	3	16%	Positive
<i>Livistona australis</i>	2	86%	1	14%	Positive
<i>Marsdenia fraseri</i>	1	43%	0	0%	Positive
<i>Melaleuca quinquenervia</i>	2	57%	3	39%	Positive
<i>Melicope elleryana</i>	2	57%	2	19%	Positive
<i>Nematolepis squamea</i> subsp. <i>squamea</i>	2	57%	3	3%	Positive
<i>Parsonsia straminea</i>	2	86%	1	44%	Positive
<i>Platysace lanceolata</i>	1	14%	0	0%	Positive
<i>Pomax umbellata</i>	2	86%	2	8%	Positive
<i>Pteridium esculentum</i>	2	86%	2	19%	Positive
<i>Smilax australis</i>	2	86%	2	41%	Positive
<i>Smilax glyciphylla</i>	2	100%	1	6%	Positive
<i>Trochocarpa laurina</i>	2	71%	2	12%	Positive

Community 33 Coast Cypress Pine on Dunes and Ridges

Scientific name: Coast Cypress Pine (*Callitris collumelaris*) on Dunes and Ridges.

Sites: (3) BRU19cbrdg, POT31cbrdg, WOO28cbdne.

Equivalent communities

Dry Sclerophyll Forests-Coastal Dune Dry Sclerophyll Forests (Keith 2006); Qld Regional Ecosystem 12.2.5 Open forest to low closed forest of Quaternary coastal dunes and beaches (Young and Dillewaard 1999); 313 – Cypress Pine Open Forest to Woodland (Kingston *et al.* 2004); Cypress Pine (CP) (Landmark Ecological Services 1999); 3502 – Dry sclerophyll forest & woodland NPWS NSW Coastal Vegetation (Griffith & Wilson 2007); North-east NSW Forest Ecosystem 22 – Coast Cypress Pine (NPWS 1999).

Description

A closed forest dominated by Coast Cypress Pine (*Callitris collumelaris*). An open middle strata comprises Coast Cypress Pine, Tootoon (*Leptospermum polygalifolium*), Salwood (*Acacia disparrima* subsp. *disparrima*) and Lancewood (*Acacia aulacocarpa*). An open to dense lower layer is present in which *Cyperus stradbrogensis*, *Pomax umbellata*, *Leucopogon leptospermoides* and Spiny-headed Mat-rush (*Lomandra longifolia*) are abundant.

Distribution and Habitat

Habitat: This community occurs on beach ridge and transgressive dunes of Pleistocene and Holocene age, and shell material is often obvious in *Callitris* communities with links to midden material at one confirmed location (Griffith 1999).

Disturbance: There have been light to moderately intense fires (30–60 years previously). Site WOO28cbdne had been lightly logged, and there was evidence of clearing at site POT31cbrdg. Steve Griffith (pers. comm.) observed virtually no seedling recruitment of *C. collumelaris* in extensive areas of *Eucalyptus pilularis* and *Callitris* that was severely burnt in Bundjalung NP, and suggests that the fire may have consumed the seed bank.

Example locations: Broadwater NP, Arakwal NP, and Tyagarah NR.

Conservation

Threats: Clearing.

Conservation status: Survey sites were located in Broadwater NP, Arakwal NP and Billinudgel NR. Griffith and Wilson (2007) record only 52 ha of Coast Cypress Pine in reserves on the north coast of NSW. In the study area, they recorded Coast Cypress Pine in Broadwater NP (16 ha) and Bundjalung NP (7 ha); and approximately 25 ha is mapped within Billinudgel NR. The North-east NSW Forest Ecosystem 22 – Coastal Cypress Pine was assessed as rare (NPWS 1999). The NSW Scientific Committee has made a preliminary determination to list Coastal Cypress Pine Forest in the NSW North Coast Bioregion as an EEC.



Significant taxa: None recorded.

Structure

Layer	Height (m)	Cover (%)
Emergent	15–20	15
Tallest	10–17	70
Middle 1	1–10	15–30
Lower 1	0–1	30–70

Floristics

Trees: *Callitris columellaris* (T), *Eucalyptus resinifera* subsp. *hemilampra* (E), *Euroschinus falcata* var. *falcata* (T), *Acronychia imperforata*, *Corymbia intermedia*, *Cupaniopsis anacardioides*, *Eucalyptus pilularis* (T), *Melicope elleryana*.

Sub-canopy trees: *Polyscias elegans*.

Shrubs: *Monotoca elliptica* (M1), *Leptospermum polygalifolium* subsp. *polygalifolium* (M1), *Acacia disparrima* subsp. *disparrima* (M1), *Acacia aulacocarpa* (M1), *Acacia longifolia* subsp. *sophorae*, *Leucopogon margarodes* (M1), *Zieria smithii*, *Persoonia stradbokensis* (M1), *Homoranthus virgatus*, *Oxylobium robustum*, *Pittosporum revolutum*.

Climbers: *Kennedia rubicunda*, *Marsdenia rostrata*, *Parsonsia straminea*, *Smilax australis*, *Solanum seaforthianum**.

Grasses: *Panicum maximum**, *Ottochloa gracillima*, *Oplismenus imbecillis*.

Ferns: *Pteridium esculentum* (L1), *Davallia solida* var. *pyxidata*, *Pyrrosia rupestris*, *Microsorium pustulatum*.

Sedges and rushes: *Cyperus stradbokensis* (L1), *Lomandra longifolia* (L1), *Coleocarya gracilis*, *Schoenus ericetorum*.

Herbs and shrubs: *Pomax umbellata* (L1), *Austromyrtus dulcis* (L1), *Leucopogon leptospermoides*, *Monotoca elliptica*, *Commelina cyanea*, *Acacia suaveolens*, *Acacia ulicifolia*, *Asparagus aethiopicus**, *Astroloma pinifolium*, *Bryophyllum delagoense**, *Dianella caerulea*, *Leucopogon margarodes*, *Sida cordifolia*, *Solanum nigrum**, *Acrotriche aggregata*, *Caladenia carnea*, *Jasminum didymum*, *Leucopogon ericoides*, *Platysace ericoides*, *Rhaphiolepis indica**, *Stylidium laricifolium*.

Number of native taxa: 59

Number of taxa per site: 17–50 (mean 29 ± 18)

Number of exotic taxa: 8

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Acacia aulacocarpa</i>	3	33%	0	0%	positive
<i>Acacia ulicifolia</i>	2	67%	1	4%	positive
<i>Astroloma pinifolium</i>	2	33%	0	0%	positive
<i>Austromyrtus dulcis</i>	3	67%	2	15%	positive
<i>Caladenia carnea</i>	1	33%	0	0%	positive
<i>Callitris columellaris</i>	6	100%	2	1%	positive
<i>Cyperus strabroakensis</i>	3	100%	2	5%	positive
<i>Dianella caerulea</i>	2	67%	1	29%	positive
<i>Euroschinus falcata</i> var. <i>falcata</i>	3	67%	2	5%	positive
<i>Leucopogon leptospermoides</i>	3	67%	1	4%	positive
<i>Lomandra longifolia</i>	4	67%	2	29%	positive
<i>Microsorium pustulatum</i>	1	33%	0	0%	positive
<i>Monotoca elliptica</i>	2	100%	3	5%	positive
<i>Oxylobium robustum</i>	1	33%	0	0%	positive
<i>Paspalidium distans</i>	2	67%	2	6%	positive
<i>Pomax umbellata</i>	3	100%	2	8%	positive
<i>Sida cordifolia</i>	1	33%	0	0%	positive
<i>Stylidium laricifolium</i>	1	33%	0	0%	positive

Community 34 Coast Banksia Frontal Dune Open Forest on Holocene Dunes

Scientific name: Coast Banksia (*Banksia integrifolia* subsp. *integrifolia*) Frontal Dune Open Forest on Holocene Dunes.

Sites: (6) BRU03cbdne, BRU27cbdne, BRU28cbdne, BYR12cbdne, BYR11cbdne, TWE19cbdne.

Equivalent communities

Qld Regional Ecosystem 12.2.5 Open forest to low closed forest of Quaternary coastal dunes and beaches (Young and Dillewaard 1999); 310 – Banksia Dry Sclerophyll Open Forest to Shrubland (Kingston *et al.* 2004); Coast Banksia (CB1) (Landmark Ecological Services 1999); 3523 – *Banksia integrifolia* subsp. *integrifolia* NPWS NSW Coastal Vegetation (Griffith & Wilson 2007); North-east NSW Forest Ecosystem 5 – Banksia (NPWS 1999).

Description

An open to closed forest in which Coast Banksia (*Banksia integrifolia* subsp. *integrifolia*) dominates the tallest strata. Horsetail Sheoak (*Casuarina equisetifolia* subsp. *incana*) is dominant in site TWE19cbdne. A closed mid-strata of littoral rainforest species, such as Logan Apple (*Acronychia imperforata*) and Tuckeroo (*Cupaniopsis anacardioides*) is present. Bitou Bush (*Chrysanthemoides monilifera* subsp. *rotundata*) is a frequent mid-strata species. The lower layer contains Spiny-headed Mat-rush (*Lomandra longifolia*) and *Cyperus strabroakensis*. Exotic species, such as Asparagus Fern (*Asparagus aethiopicus*) and Bitou Bush are often dominant lower strata species.



Distribution and Habitat

Habitat: All sites were located on seaward aspects of Holocene sand-dunes. Littoral rainforest trees may establish in sheltered sites or in senescent stand of the community or in those sites where fire has been absent for long periods (Griffith 1999).

Disturbance: There is evidence of severe clearing at sites BRU03cbdne, BRU27cbdne and BRU28cbdne as a result of mining, and there was moderate to severe invasions of weeds in all sites. Horse-tail Sheoak had been planted at TWE19cbdne for rehabilitation of the mining site. Moderate disturbance by fire was also evident at sites BRU27cbdne and BRU28cbdne.

Example locations: New Brighton, Broken Head NR, and Dreamtime Beach at Fingal.

Conservation

Threats: Clearing and infestation by exotic Bitou Bush.

Conservation status: Fairly undisturbed examples of this community are uncommon. This dunal community has been subject to considerable disturbance from sand-mining and clearing in the past, and Bitou Bush is invading this

community. On the FNC the community is mapped from Richmond River NR and Bundjalung NP (Griffith *et al.* 2000). It is also reserved in Ukerebagh NR and Wooyung NR (Kingston *et al.* 2004) Ecograph), Arakwal NP (Baker 2000), Cape Byron SCA and Broken Head NR (Landmark Ecological Services, 1999). The community is also found in Crown Reserves along the coast managed by the NSW Department of Lands (A. Benwell, pers. comm.).

Significant taxa: *Cordyline congesta* (ROTAP: 2RC-), *Cryptocarya foetida* (TSC: Vulnerable).

Structure

Layer	Height (m)	Cover (%)
Tallest	4–20	30–70
Middle 1	2–10	60–90
Middle 2	1–2	90
Lower 1	0–2	20–60
Lower 2	0–0.5	30

Floristics

Trees: *Banksia integrifolia* subsp. *integrifolia* (T), *Acronychia imperforata* (T), *Casuarina equisetifolia* subsp. *incana* (T), *Lophostemon confertus* (T), *Flindersia bennettiana* (T), *Eucalyptus robusta*, *Ficus watkinsiana*.

Sub-canopy trees: *Cupaniopsis anacardioides* (M1), *Alphitonia excelsa*, *Cryptocarya foetida*, *Syzygium luehmannii*.

Shrubs: *Acacia concurrens* (T), *Acacia disparrima* subsp. *disparrima* (T), *Euroschinus falcata* var. *falcata* (T), *Macaranga tanarius* (T), *Chrysanthemoides monilifera* subsp. *rotundata** (M1), *Litsea australis* (M1), *Syzygium oleosum* (M1), *Polyscias elegans* (M1), *Acacia melanoxylon*, *Backhousia myrtifolia*, *Elaeocarpus obovatus*, *Flindersia schottiana*, *Notelaea longifolia*, *Notelaea venosa*, *Rhodomyrtus psidioides*, *Senna pendula* var. *glabrata**, *Xanthorrhoea macronema*, *Cryptocarya triplinervis* var. *triplinervis* (M1), *Callistemon salignus* (M1), *Acmena hemilampra* subsp. *hemilampra* (M1), *Acmena smithii* (M1), *Acacia longifolia* subsp. *sophorae*, *Alectryon coriaceus*, *Denhamia celastroides*, *Guioa semiglaucula*, *Halfordia kendack*, *Lantana camara**, *Pittosporum revolutum*, *Pittosporum undulatum*.

Climbers: *Cissus hypoglauca* (M1), *Smilax australis* (L1), *Cassytha pubescens*, *Cayratia clematidea*, *Cissus antarctica*, *Coelospermum paniculatum*, *Flagellaria indica*, *Geitonoplesium cymosum*, *Hibbertia scandens*, *Ipomoea cairica**, *Marsdenia rostrata*, *Pandorea pandorana*, *Stephania japonica* var. *discolour*.

Epiphytes: *Asplenium australasicum* f. *australasicum*.

Grasses: *Oplismenus imbecillis* (L1), *Eragrostis interrupta*, *Oplismenus aemulus*, *Ottobachloa gracillima*.

Ferns: *Pteridium esculentum* (M2), *Asplenium australasicum* f. *australasicum*, *Davallia solida* var. *pyxidata*.

Sedges and rushes: *Lomandra longifolia* (L1), *Cyperus stradbrokeensis* (L1), *Cyperus gracilis*, *Ficinia nodosa*.

Herbs and shrubs: *Dianella congesta* (L1), *Alpinia arundelliana* (L2), *Alyxia ruscifolia*, *Cordyline congesta*, *Dianella caerulea* (L1), *Pomax umbellata* (L1), *Austromyrtus dulcis* (L2), *Acrotriche aggregata*, *Commelina cyanea*, *Dianella crinoides*, *Gloriosa superba**, *Monotoca elliptica* (M1), *Asparagus aethiopicus** (L1), *Breynia oblongifolia*, *Viola banksii*.

Number of native taxa: 88

Number of taxa per site: 21–43 (mean 30 ± 8)

Number of exotic taxa: 9

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Acronychia imperforata</i>	3	83%	2	4%	positive
<i>Alphitonia excelsa</i>	2	50%	2	26%	positive
<i>Austromyrtus dulcis</i>	2	50%	2	15%	positive
<i>Backhousia myrtifolia</i>	2	50%	0	0%	positive
<i>Banksia integrifolia</i>	4	100%	2	6%	positive
<i>Cupaniopsis anacardioides</i>	3	100%	1	33%	positive
<i>Cyperus stradbokensis</i>	2	100%	2	4%	positive
<i>Dianella caerulea</i>	2	50%	1	29%	positive
<i>Lomandra longifolia</i>	3	67%	2	29%	positive
<i>Lophostemon confertus</i>	3	50%	3	19%	positive
<i>Notelaea venosa</i>	2	17%	0	0%	positive
<i>Polyscias elegans</i>	2	67%	1	5%	positive
<i>Pteridium esculentum</i>	3	50%	2	20%	positive
<i>Smilax australis</i>	3	100%	2	41%	positive
<i>Syzygium oleosum</i>	3	67%	2	12%	positive

Community 35 Brush Box Lowland Rainforest

Scientific name: Brush Box (*Lophostemon confertus*), Bennett's Ash (*Flindersia bennettiana*) and Logan Apple (*Acronychia imperforata*) Lowland Rainforest.

Sites: (6) POT09alfan, TWE11esttdf, TWE12esttdf, TWE27cbtd, TWE28cbdne, TWE32vbrh.

Equivalent communities

Rainforest-Subtropical Rainforest (Keith 2006); F2 – *Lophostemon confertus* tall to very tall closed forest (Pressey and Griffith 1992); 303 – Coastal Brush Box Open Forest to Woodland (Kingston *et al.* 2004); Brush Box (Bb) (Landmark Ecological Services 1999); 3002 – *Lophostemon confertus* mid-high to very tall, open to closed forest (Griffith & Wilson 2007); Suballiance 18 – *Lophostemon confertus* (Floyd 1990); North-east NSW Forest Ecosystem 50 – Wet Bangalow–Brushbox (NPWS 1999).

Description

A closed forest community with abundant Brush Box (*Lophostemon confertus*), and often associated with Bennett's Ash (*Flindersia bennettiana*), Logan Apple (*Acronychia imperforata*), Bangalow Palm (*Archontophoenix cunninghamiana*), Rose Walnut (*Endiandra discolor*), Hard Corkwood (*Endiandra sieberi*), Three-veined Laurel (*Cryptocarya triplinervis*), Cheese Tree (*Glochidion ferdinandi*) and *Mischocarpus pyriformis* subsp. *pyriformis*. The mid-strata comprises species such as Blue Lilly Pilly (*Syzygium oleosum*), Stinking Laurel (*Cryptocarya foetida*), Pear-fruited Tamarind (*Mischocarpus pyriformis* subsp. *pyriformis*), Coogera (*Arytera divaricata*), Broad-leaved Native Cherry (*Exocarpos latifolius*) and Mock Olive (*Notelaea longifolia*). An open lower strata of Saw Sedge (*Gahnia clarkei*), Lawyer Vine (*Smilax australis*), Native Sarsparilla (*Smilax glyciphylla*), Palm Lily (*Cordyline congesta*), Canary Beech (*Polyalthia nitidissima*), Thin-leaved Coondoo (*Pouteria chartacea*) and Spiny-headed Mat-rush (*Lomandra longifolia*) is present.



Distribution and Habitat

Habitat: Lowland sites associated with the estaurine plain of the Tweed River and Pleistocene barrier dunes.

Disturbance: Sites show moderate levels of burning (fires 15–20 years previously); and infestation by weeds is light to severe (TWE32vbrh). There has been severe clearing at site POT09alfan, and there is evidence of light to moderate logging at sites TWE11esttdf and TWE32vbrh.

Example locations: Ukerebagh NR, Billinudgel NR, Barneys Point, Shallow Point and Fingal.

Conservation

Threats: Clearing, logging and weeds.

Conservation status: The Conservation status of Forest Ecosystem 50 – Wet Bangalow–Brushbox has been assessed as vulnerable (NPWS 1999). Floyd (1990) considered Suballiance 18 – *Lophostemon confertus* to be adequately reserved in the northern part of its range in NSW. Survey sites were located in reserves. In the coastal zone, Coastal

Brush Box is reserved in Ukerebagh NR and Cudgen NR and Cape Byron SCA.

Significant taxa: *Archidendron hendersonii* (TSC: Vulnerable), *Cordyline congesta* (ROTAP: 2RC-), *Syzygium moorei* (TSC: Vulnerable), *Cryptocarya foetida* (TSC: Vulnerable), *Cassia brewsteri* var. *marksiana* (TSC: Endangered), *Grevillea hilliana* (TSC: Endangered), *Randia moorei* (TSC: Endangered), *Niemeyera antiloga*.

Structure

Layer	Height (m)	Cover (%)
Tallest	8–28	65–90
Middle 1	1–15	40–80
Lower 1	0–2	50–90

Floristics

This community contains two groups identified in the dendrogram.

Trees: *Lophostemon confertus* (T), *Cryptocarya triplinervis* (T), *Cupaniopsis anacardioides* (T), *Flindersia bennettiana* (M1), *Pouteria chartacea* (L1), *Archontophoenix cunninghamiana* (M1), *Acronychia imperforata*, *Archidendron hendersonii*, *Mischocarpus pyriformis* subsp. *pyriformis* (T), *Schefflera actinophylla**, *Glochidion ferdinandi* (T), *Diospyros fasciculosa*, *Endiandra sieberi* (T), *Endiandra discolor* (T), *Alphitonia excelsa*, *Jagera pseudorhus* var. *pseudorhus* forma *pseudorhus*, *Mallotus philippensis* (T), *Syzygium luehmannii* (T), *Banksia integrifolia* subsp. *integrifolia* (T), *Ficus obliqua* (T), *Harpullia pendula*, *Ficus watkinsiana*, *Flindersia schottiana*, *Harpullia hillii*, *Polyscias elegans*, *Siphonodon australis*, *Acmena hemilampra* subsp. *hemilampra*, *Beilschmiedia obtusifolia*, *Commersonia bartramia*, *Corymbia intermedia*, *Gossia bidwillii*, *Litsea australis*, *Dysoxylum mollissimum* subsp. *molle*, *Sterculia quadrifida*.

Sub-canopy trees: *Drypetes deplanchei*, *Alphitonia excelsa* (M1), *Endiandra discolor* (M1), *Acmena smithii*.

Shrubs: *Exocarpos latifolius*, *Syzygium oleosum* (M1), *Polyalthia nitidissima*, *Psydrax lamprophylla* (T), *Arytera divaricata* (M1), *Cryptocarya foetida* (M1), *Drypetes deplanchei* (M1), *Notelaea longifolia* (M1), *Euroschinus falcata* var. *falcata* (T), *Pilidiostigma glabrum*, *Pittosporum revolutum*, *Celtis paniculata* (M1), *Jasminum volubile*, *Myrsine variabilis*, *Rivina humilis**, *Sarcomelicope simplicifolia* subsp. *simplicifolia*, *Trochocarpa laurina*, *Halfordia kendack* (M1), *Hibiscus tiliaceus*, *Maclura cochinchinensis*, *Psychotria loniceroides*, *Cyclophyllum longipetalum* (T), *Actephila lindleyi* (L1), *Alchornea ilicifolia*, *Alectryon coriaceus*, *Alectryon tomentosus*, *Alyxia ruscifolia*, *Auranticarpa rhombifolia*, *Elaeodendron australe*, *Niemeyera antiloga*, *Pouteria pohlmanniana* var. *pohlmanniana*, *Rhodomyrtus psidioides*, *Senna pendula* var. *glabrata**, *Lantana camara** (L1), *Symplocos stawellii*, *Triumfetta rhomboidea*.

Climbers: *Smilax australis* (L1), *Geitonoplesium cymosum*, *Smilax glycyphylla*, *Coelospermum paniculatum*, *Cissus antarctica*, *Cissus sterculiifolia*, *Hibbertia scandens*, *Hoya australis* subsp. *australis* (L1), *Ipomoea cairica**, *Marsdenia rostrata* (L1), *Derris involuta* (M1), *Cayratia acris*, *Dioscorea transversa*, *Hippocratea barbata*, *Morinda jasminoides*, *Parsonsia straminea*, *Solanum seaforthianum*, *Tragia novae-hollandiae*, *Tylophora benthamii*, *Cissus hypoglauca**, *Desmodium nemorosum*, *Eustrephus latifolius*, *Pandorea jasminoides*, *Passiflora suberosa**, *Rauwenhoffia leichhardtii*.

Epiphytes: *Asplenium australasicum* f. *australasicum*, *Platynerium bifurcatum*, *Platynerium superbum*.

Misteltoes: *Muellerina celastroides*, *Notothixos subaureus*.

Grasses: *Ottocloa gracillima*, *Imperata cylindrica* var. *major*.

Ferns: *Pteridium esculentum*, *Nephrolepis cordifolia* (L1), *Asplenium australasicum* f. *australasicum*, *Pyrrosia rupestris*, *Platynerium superbum*.

Sedges and rushes: *Gahnia clarkei* (L1), *Cyperus stradbrokeensis* (L1), *Lomandra longifolia* (L1), *Gahnia aspera*.

Herbs and shrubs: *Asparagus aethiopicus** (L1), *Ochna serrulata** (L1), *Polyalthia nitidissima* (L1), *Cordyline congesta*, *Alpinia caerulea*, *Acrotriche aggregata*, *Linospadix monostachya* (L1), *Dianella caerulea*, *Dodonaea triquetra*, *Persoonia stradbrokeensis*, *Jasminum didymum*, *Gloriosa superba**, *Aneilema acuminatum*, *Alpinia arundelliana*, *Capparis arborea*, *Commelina cyanea*, *Dianella congesta*, *Leucopogon margarodes*, *Peperomia blanda* var. *floribunda*.

Number of native taxa: 144

Number of taxa per site: 40–65 (mean 49 ± 9)

Number of exotic taxa: 13

Indicator native taxa

Sub-group 1

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Acronychia imperforata</i>	2	100%	2	5%	positive
<i>Acrotriche aggregata</i>	2	67%	2	2%	positive
<i>Alphitonia excelsa</i>	4	67%	2	26%	positive
<i>Alpinia caerulea</i>	3	67%	2	11%	positive
<i>Archidendron hendersonii</i>	3	67%	2	3%	positive
<i>Archontophoenix cunninghamiana</i>	3	100%	2	25%	positive
<i>Breynia oblongifolia</i>	2	67%	1	21%	positive
<i>Cissus sterculiifolia</i>	2	67%	1	2%	positive
<i>Cordyline congesta</i>	2	67%	1	13%	positive
<i>Dianella caerulea</i>	2	67%	1	29%	positive
<i>Drypetes deplanchei</i>	2	67%	2	4%	positive
<i>Endiandra discolor</i>	4	67%	1	8%	positive
<i>Endiandra sieberi</i>	4	67%	1	10%	positive
<i>Flagellaria indica</i>	2	67%	2	17%	positive
<i>Flindersia bennettiana</i>	4	100%	2	7%	positive
<i>Gahnia clarkei</i>	2	100%	3	16%	positive
<i>Geitonoplesium cymosum</i>	2	100%	2	41%	positive
<i>Glochidion ferdinandi</i>	3	100%	1	24%	positive
<i>Hibbertia scandens</i>	2	67%	1	28%	positive
<i>Jagera pseudorhus</i> var. <i>pseudorhus</i>	2	67%	1	27%	positive
<i>Jasminum volubile</i>	2	67%	1	2%	positive
<i>Lophostemon confertus</i>	5	100%	3	18%	positive
<i>Mischocarpus pyriformis</i> subsp. <i>pyriformis</i>	2	100%	1	5%	positive
<i>Notelaea longifolia</i>	2	100%	1	21%	positive
<i>Pilidiostigma glabrum</i>	2	100%	1	14%	positive
<i>Pittosporum revolutum</i>	2	67%	1	15%	positive
<i>Polyalthia nitidissima</i>	2	67%	3	1%	positive
<i>Pouteria chartacea</i>	3	67%	2	5%	positive
<i>Psydrax lamprophylla</i>	2	67%	1	2%	positive
<i>Pteridium esculentum</i>	2	67%	2	20%	positive
<i>Smilax australis</i>	2	100%	2	42%	positive
<i>Smilax glycyphylla</i>	3	67%	1	8%	positive
<i>Syzygium luehmannii</i>	4	67%	1	5%	positive
<i>Syzygium oleosum</i>	4	100%	2	13%	positive
<i>Trochocarpa laurina</i>	2	67%	2	13%	positive

Sub-group 2

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Acronychia imperforata</i>	3	67%	2	5%	positive
<i>Aphananthe philippinensis</i>	3	67%	2	8%	positive
<i>Archidendron hendersonii</i>	2	67%	3	3%	positive
<i>Arytera divaricata</i>	2	100%	2	3%	positive
<i>Celtis paniculata</i>	3	67%	2	2%	positive
<i>Cissus antarctica</i>	2	67%	2	10%	positive
<i>Coeleospermum paniculatum</i>	2	67%	1	3%	positive
<i>Cordyline congesta</i>	2	67%	1	13%	positive
<i>Cryptocarya foetida</i>	4	67%	2	2%	positive
<i>Cryptocarya triplinervis</i>	4	100%	2	6%	positive
<i>Cupaniopsis anacardioides</i>	2	100%	1	34%	positive
<i>Diospyros fasciculosa</i>	2	100%	2	2%	positive
<i>Drypetes deplanchei</i>	3	67%	2	4%	positive
<i>Euroschinus falcifolia</i>	3	67%	1	5%	positive
<i>Exocarpos latifolius</i>	3	100%	1	2%	positive
<i>Ficus obliqua</i>	3	67%	1	5%	positive
<i>Flagellaria indica</i>	2	67%	2	17%	positive
<i>Geitonoplesium cymosum</i>	2	100%	2	41%	positive
<i>Grevillea hilliana</i>	2	67%	3	2%	positive
<i>Hodgkinsonia ovatiflora</i>	2	67%	2	1%	positive
<i>Mallotus discolor</i>	3	67%	1	6%	positive
<i>Mallotus philippensis</i>	4	67%	2	16%	positive
<i>Morinda canthoides</i>	2	33%	0	0%	positive
<i>Polyalthia nitidissima</i>	4	67%	2	1%	positive
<i>Pouteria chartacea</i>	3	67%	2	5%	positive
<i>Sarcomelicope simplicifolia</i> subsp. <i>simplicifolia</i>	2	67%	1	1%	positive
<i>Smilax australis</i>	2	100%	2	42%	positive
<i>Streblus brunonianus</i>	2	67%	2	7%	positive
<i>Tylophora benthamii</i>	2	33%	0	0%	positive

Community 36 Coast Wattle–Coast Tea-tree–Coast Banksia Shrubland on Holocene Dunes and Ridges

Scientific name: Coast Wattle (*Acacia longifolia* var. *sophorae*), Coast Tea-tree (*Leptospermum laevigatum*) and Coast Banksia (*Banksia integrifolia* subsp. *integrifolia*) Shrubland on Holocene Dunes and Ridges.

Sites: (6) BRU04cbdne, BRU22cbdne, BRU21cbdne, TWE04assw, CUD09cbdne, POT03cbrdg.

Equivalent communities

Qld Regional Ecosystem 12.2.14 Strand and foredune complex (Young and Dillewaard 1999); 1008 – Post-mining Regeneration, 801 – Foredune Complex (Kingston *et al.* 2004); Horsetail She-oak–Coast Banksia–Bitou Bush (OcB) (Landmark Ecological Services 1999); 5411 *Chrysanthemoides monilifera* subsp. *rotundata* – *Acacia sophorae* mid-high to tall closed shrubland NPWS NSW Coastal Vegetation (Griffith & Wilson 2007).

Description

An open to closed shrubland of Coast Wattle (*Acacia longifolia* var. *sophorae*), Coast Tea-tree (*Leptospermum laevigatum*), Coast Banksia (*Banksia integrifolia* subsp. *integrifolia*), Horsetail Sheoak (*Casuarina equisetifolia* subsp. *incana*), and Bitou Bush (*Chrysanthemoides monilifera* subsp. *rotundata*). An open middle strata of Bitou Bush is sometimes present. A lower strata of Bitou Bush, Blue Couch (*Cynodon dactylon*), *Cyperus stradbokensis* and Blady Grass (*Imperata cylindrica* var. *major*) occurs.



Distribution and Habitat

Habitat: Coastal barrier sands on Holocene–Pleistocene dunes, ridges and strandplain. A derived community from rehabilitation after sand-mining.

Disturbance: All sites are dunal sites regenerating after sand-mining and have been severely infested by Bitou Bush. Some species, such as Horsetail Sheoak and Coast Tea-tree have been planted for mine rehabilitation.

Example locations: New Brighton, Brunswick Heads, Fingal and Hastings Point.

Conservation

Threats: Clearing, and infestation by weeds.

Conservation status: Reserved in Bundjalung NP and Iluka NR. This is a derived community.

Significant taxa: *Geodorum densiflorum* (TSC: Endangered).

Structure

Layer	Height (m)	Cover (%)
Emergent	3–8	5
Tallest	1–13	40–95
Middle 1	1–7	10–40
Lower 1	0–1.5	40–95

Floristics

Trees: *Banksia integrifolia* subsp. *integrifolia* (T), *Casuarina equisetifolia* subsp. *incana* (T), *Callitris columellaris* (T), *Rivina humilis**, *Glochidion ferdinandi*.

Shrubs: *Chrysanthemoides monilifera* subsp. *rotundata** (T), *Leptospermum laevigatum* (T), *Acacia disparrima* subsp. *disparrima* (T), *Acacia saligna** (T), *Acacia longifolia* subsp. *sophorae* (T), *Lantana camara** (T), *Macaranga tanarius*, *Senna pendula* var. *glabrata**.

Climbers: *Ipomoea cairica**, *Stephania japonica* var. *discolor**, *Lablab purpureus**, *Hibbertia scandens*, *Passiflora suberosa**.

Grasses: *Imperata cylindrica* var. *major* (L1), *Lomandra longifolia* (L1), *Eragrostis interrupta* (L1), *Melinis repens**, *Cynodon dactylon* (L1), *Cenchrus caliculatus*, *Panicum maximum**, *Panicum simile*, *Themeda australis*.

Sedges and rushes: *Cyperus strabroakensis* (L1), *Ficinia nodosa* (L1).

Herbs and shrubs: *Conyza bonariensis**, *Ambrosia artemisiifolia**, *Bryophyllum delagoense*, *Gloriosa superba**, *Asparagus aethiopicus*, *Bidens pilosa**, *Ochna serrulata**, *Crinum pedunculatum*, *Diplocyclos palmatus**, *Geodorum densiflorum*, *Ipomoea pes-caprae* subsp. *brasiliensis*, *Richardia brasiliensis**, *Solanum mauritianum**, *Triumfetta rhomboidea*.

Number of native taxa: 31

Number of taxa per site: 13–27 (mean 19 ± 6)

Number of exotic taxa: 19

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Acacia longifolia</i>	2	75%	2	3%	positive
<i>Acacia saligna</i>	3	25%	0	0%	positive
<i>Banksia integrifolia</i> subsp. <i>integrifolia</i>	4	75%	2	7%	positive
<i>Casuarina equisetifolia</i> subsp. <i>incana</i>	3	50%	3	0%	positive
<i>Cenchrus caliculatus</i>	2	25%	0	0%	positive
<i>Cupaniopsis anacardioides</i>	2	50%	1	34%	positive
<i>Cynodon dactylon</i>	5	50%	2	5%	positive
<i>Cyperus strabroakensis</i>	3	100%	2	5%	positive
<i>Eragrostis interrupta</i>	3	50%	2	2%	positive
<i>Geodorum densiflorum</i>	1	25%	0	0%	positive
<i>Imperata cylindrica</i>	5	75%	2	20%	positive
<i>Ipomoea pes-caprae</i> subsp. <i>brasiliensis</i>	1	25%	0	0%	positive
<i>Isolepis nodosa</i>	2	75%	1	0%	positive
<i>Leptospermum laevigatum</i>	4	75%	1	1%	positive

Community 37 Kangaroo Grass headland Grassland

Scientific name: Kangaroo Grass (*Themeda australis*) Headland Grassland.

Sites: (1) CUD18lsrh.

Equivalent communities

Heathlands-Coastal Headland Heaths (Keith 2006); 6302 – *Themeda australis* Sod Grassland NPWS NSW Coastal Vegetation (Griffith & Wilson 2007).

Description

A sod-tussock grassland with a closed cover of Kangaroo Grass (*Themeda australis*) and a low cover of emergent Coast Banksia (*Banksia integrifolia* subsp. *integrifolia*), Tuckeroo (*Cupaniopsis anacardioides*) and Screw Pine (*Pandanus tectorius* var. *australianus*). Associated vegetation includes shrubs (e.g. *Aotus ericoides*, *Scaevola calendulacea*), herbs (e.g. *Wollastonia biflora*, *Xerochrysum bracteatum*) and grasses (e.g. *Cynodon dactylon*, *Eragrostis interrupta*).



Distribution and Habitat

Habitat: Headlands on an outcropping of meta-sedimentary rock.

Disturbance: Light infestation by weeds.

Location: Norries Headland, Bogangar.

Conservation

Threats: Displacement of grassland with shrubs species.

Conservation status: Poorly reserved over parts of its range on the north coast. In the study area it is reserved in Bundjalung NP.

Significant taxa: None recorded.

Structure

Layer	Height (m)	Cover (%)
Emergent	1–3	10
Lower 1	0–0.7	100

Floristics

Emergent trees: *Banksia integrifolia* subsp. *integrifolia* (E), *Cupaniopsis anacardioides* (E).

Shrubs: *Myoporum boninense* subsp. *australe* (E), *Pandanus tectorius* var. *australianus* (E).

Climbers: *Canavalia rosea*, *Galactia tenuiflora*, *Hardenbergia violacea*.

Grasses: *Themeda australis* (L1), *Scaevola calendulacea* (L1), *Cynodon dactylon* (L1), *Eragrostis tenuifolia*, *Ischaemum triticeum*.

Sedges and rushes: *Lomandra longifolia*.

Herbs and shrubs: *Scaevola calendulacea*, *Aotus ericoides*, *Dianella crinoides*, *Pimelea linifolia*, *Wikstroemia indica*, *Melanthera biflora*, *Xerochrysum bracteatum*, *Zornia muriculata* subsp. *angustata*.

Number of native taxa: 21

Number of taxa per site: 21

Number of exotic taxa: 1

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Canavalia rosea</i>	2	100%	0	0%	positive
<i>Cynodon dactylon</i>	4	100%	3	5%	positive
<i>Dianella crinoides</i>	2	100%	2	1%	positive
<i>Eragrostis interrupta</i>	2	100%	2	2%	positive
<i>Galactia tenuiflora</i>	2	100%	0	0%	positive
<i>Hardenbergia violacea</i>	2	100%	1	1%	positive
<i>Ischaemum triticeum</i>	2	100%	0	0%	positive
<i>Lomandra longifolia</i>	3	100%	2	29%	positive
<i>Melanthera bliflora</i>	2	100%	0	0%	positive
<i>Myoporum bonariensis</i>	3	100%	0	0%	positive
<i>Pandanus tectorius</i> var. <i>australianus</i>	3	100%	0	0%	positive
<i>Pimelea linifolia</i>	2	100%	1	3%	positive
<i>Scaevola calendulacea</i>	4	100%	0	0%	positive
<i>Themeda australis</i>	5	100%	2	8%	positive
<i>Wikstroemia indica</i>	2	100%	1	5%	positive
<i>Xerochrysum bracteatum</i>	2	100%	0	0%	positive
<i>Zornia muriculata</i>	2	100%	0	0%	positive

Community 38 Scribbly Gum–Old Man Banksia–Slender Tea-tree Heathy Low Open Sclerophyll Forest to Shrubland

Scientific name: Scribbly Gum (*Eucalyptus signata*), Old Man Banksia (*Banksia serrata*), Slender Tea-tree (*Leptospermum trinervium*) Heathy Low Open Sclerophyll Forest to Shrubland.

Sites: (2) BYR06cbsw, BYR07estcl.

Equivalent communities

Dry Sclerophyll Forests-Coastal Dune Dry Sclerophyll Forest (Keith 2006); Qld Regional Ecosystem 12.2.6 Open forest on dunes (Young and Dillewaard 1999); F6 – *Eucalyptus signata* mid-high to tall open forest and woodland (Pressey and Griffith 1992); Wallum Banksia – Scribbly Gum (BsG), (Landmark Ecological Services 1999); 5003 – *Eucalyptus signata* very tall to extremely tall mallee woodland and open mallee forest NPWS NSW Coastal Vegetation (Griffith & Wilson 2007); North-east NSW Forest Ecosystem 65 – Heathy Scribbly Gum (NPWS 1999).

Description

A low open forest of Scribbly Gum (*Eucalyptus signata*), Old Man Banksia (*Banksia serrata*) and Slender Tea-tree (*Leptospermum trinervium*). Heathy shrubs form the open mid-strata and include Old Man Banksia, Slender Tea-tree, the grass tree (*Xanthorrhoea johnsonii*), *Homoranthus virgatus*, *Agiortia pedicellata*, *Zieria laevigata* and *Dillwynia retorta*. The ground layer consists of *Xanthorrhoea johnsonii*, *Dillwynia retorta*, Tautoon Tea-tree (*Leptospermum polygalifolium*), *Caustis recurvata*, *Gompholobium virgatum* and *Coleocarya gracilis*.



Distribution and Habitat

Habitat: Elevated drier sites on Pleistocene barrier sands.

Disturbance: Moderate fire (15 years).

Example locations: Taylors Lake.

Conservation

Threats: Inappropriate fire regimes.

Conservation status: Considered adequately reserved in Broadwater NP and Bundjalung NP (Griffith and Wilson 2007).

Significant taxa: None recorded.

Structure

Layer	Height (m)	Cover (%)
Tallest	5–10	30–50
Middle 1	1–5	50–60
Lower 1	0–1.5	30

Floristics

Trees: *Banksia serrata* (T), *Eucalyptus signata* (T).

Shrubs: *Leptospermum trinervium* (T), *Xanthorrhoea johnsonii* (M1), *Homoranthus virgatus* (M1), *Dillwynia retorta* (M1), *Leptospermum polygalifolium* (L1), *Persoonia virgata*, *Phyllota phyllicoides*, *Baeckea frutescens*, *Bossiaea heterophylla*, *Leptomeria acida*, *Leucopogon leptospermoides*, *Leucopogon margarodes*.

Climbers: *Cassytha glabella*, *Cassytha pubescens*.

Ferns: *Pteridium esculentum*, *Schizaea bifida*.

Sedges and rushes: *Coleocarya gracilis* (L1), *Caustis recurvata*.

Herbs and shrubs: *Zieria laevigata*, *Agiortia pedicellata*, *Gompholobium virgatum*, *Leucopogon lanceolatus* var. *gracilis*, *Acacia suaveolens*, *Austromyrtus dulcis*, *Hibbertia acicularis*, *Cryptostylis erecta*, *Pimelea linifolia*, *Acacia ulicifolia*, *Aotus ericoides*, *Baloskion tetraphyllum*, *Hibbertia linearis*, *Monotoca elliptica*, *Ochrosperma lineare*, *Strangea linearis*, *Styphelia viridis* subsp. *breviflora*, *Thelymitra purpurata*, *Xanthosia pilosa*.

Number of native taxa: 40

Number of taxa per site: 27–34 (mean 31 ± 5)

Number of exotic taxa: 0

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Banksia aemula</i>	4	71%	3	2%	positive
<i>Bossiaea ensata</i>	1	43%	0	0%	positive
<i>Cassytha pubescens</i>	2	71%	2	3%	positive
<i>Caustis recurvata</i>	2	100%	2	1%	positive
<i>Coleocarya gracilis</i>	4	71%	1	0%	positive
<i>Conospermum taxifolium</i>	1	14%	0	0%	positive
<i>Dillwynia retorta</i>	3	57%	0	0%	positive
<i>Epacris pulchella</i>	2	57%	1	1%	positive
<i>Gompholobium virgatum</i>	2	71%	0	0%	positive
<i>Hibbertia acicularis</i>	1	57%	0	0%	positive
<i>Hibbertia acicularis</i>	2	57%	0	0%	positive
<i>Homoranthus virgatus</i>	3	100%	1	2%	positive
<i>Laxmannia compacta</i>	1	14%	0	0%	positive
<i>Leptomeria acida</i>	1	43%	0	0%	positive
<i>Leptospermum trinervium</i>	3	71%	2	1%	positive
<i>Leucopogon deformis</i>	2	14%	0	0%	positive
<i>Leucopogon virgatus</i>	3	29%	0	0%	positive
<i>Ochrosperma lineare</i>	2	86%	3	1%	positive
<i>Petrophile canescens</i>	1	14%	0	0%	positive
<i>Phyllota phyllicoides</i>	1	29%	0	0%	positive
<i>Platysace ericoides</i>	2	57%	1	2%	positive
<i>Ricinocarpos pinifolius</i>	2	57%	1	0%	positive
<i>Schoenus ericetorum</i>	2	57%	1	0%	positive
<i>Stackhousia nuda</i>	1	29%	0	0%	positive
<i>Strangea linearis</i>	2	86%	1	0%	positive
<i>Tetralthea thymifolia</i>	2	57%	0	0%	positive
<i>Thelymitra purpurata</i>	1	14%	0	0%	positive
<i>Themeda australis</i>	2	57%	3	7%	positive
<i>Xanthorrhoea johnsonii</i>	3	71%	4	1%	positive
<i>Xanthorrhoea australis</i>	4	14%	0	0%	positive
<i>Zieria laevigata</i>	3	57%	0	0	positive

Community 39 Wallum Banksia Dry Heath

Scientific name: Wallum Banksia (*Banksia aemula*) Dry Heath

Sites: (5) BYR17cbdne, BYR34estcd, BYR35cbdne, CUD01cbdne, CUD06cbdne.

Equivalent communities

Heathlands-Wallum Sand Heaths (Keith 2006); Qld Regional Ecosystem 12.2.9 *Banksia aemula* low shrubby woodland on Quaternary coastal dunes (Young and Dillewaard 1999); 501 – Dry Heathland to Shrubland (Kingston *et al.* 2004); Wallum Banksia/Dwarf Banksia/Coast Banksia (BK), Sh. – mid high to tall closed heathland (Landmark Ecological Services 1999); 5802 – Dry heathland NPWS NSW Coastal Vegetation (Griffith & Wilson 2007).

Description

A heath or shrubland in which the shrubs Wallum Banksia (*Banksia aemula*), *Homoranthus virgatus*, and Slender Tea-tree (*Leptospermum trinervium*) are abundant. A mid-layer is present with grass trees (*Xanthorrhoea australis*), *Leptospermum semibaccatum*, *Leucopogon virgatus*, *Ochrosperma lineare*, *Leucopogon leptospermoides* and Wallum Banksia. Abundant species in the lower layer include *Coleocarya gracilis*, *Hibbertia fasciculata*, *Caustis recurvata* and *Platysace ericoides*.

Distribution and Habitat

Habitat: Low beach Pleistocene sand-ridges away from the influence of onshore winds.

Disturbance: Severe fire 5–20 years previously.

Example locations: Byron Bay High School, Broken Head Road, Hastings Point, Coast Road, and Cudgen.

Conservation

Threats:

Conservation status: Well reserved. Surveyed sites were in Arakwal NP.

Significant taxa: None recorded.



Structure

Layer	Height (m)	Cover (%)
Tallest	0.5–3	15–90
Middle 1	1.5–2	25
Lower 1	0–1	60–80
Lower 2	0–0.3	25

Floristics

Shrubs: *Banksia aemula* (T), *Homoranthus virgatus* (T), *Leptospermum trinervium* (T), *Xanthorrhoea johnsonii* (T), *Leucopogon leptospermoides*, *Acacia suaveolens*, *Leptospermum semibaccatum*, *Monotoca elliptica* (T), *Acacia longifolia* subsp. *sophorae*, *Xanthorrhoea australis*, *Corymbia intermedia* (T), *Lophostemon confertus* (T), *Xanthosia pilosa*, *Acronychia imperforata* (T), *Banksia integrifolia* subsp. *integrifolia* (T), *Baeckea frutescens*, *Persoonia cornifolia*, *Persoonia stradbokensis*, *Leptomeria acida*.

Climbers: *Cassytha glabella*, *Cassytha filiformis*, *Hibbertia scandens*, *Pandorea pandorana*.

Grasses: *Themeda australis* (L1), *Imperata cylindrica* var. *major*, *Eragrostis interrupta*, *Panicum simile*.

Ferns: *Pteridium esculentum*, *Schizaea dichotoma*.

Sedges and rushes: *Coleocarya gracilis* (L1), *Caustis recurvata* (L1), *Schoenus ericetorum*, *Lomandra elongata*, *Lomandra longifolia* (L2), *Leptocarpus tenax*.

Herbs and shrubs: *Strangea linearis* (L1), *Platysace ericoides* (L2), *Ochrosperma lineare* (L1), *Hibbertia fasciculata*, *Acacia ulicifolia*, *Gompholobium virgatum*, *Tetratheca thymifolia*, *Austromyrtus dulcis*, *Epacris pulchella*, *Leucopogon ericoides* (L1), *Pimelea linifolia*, *Ricinocarpus pinifolius*, *Leucopogon virgatus*, *Leptospermum semibaccatum* (L1), *Monotoca elliptica*, *Zieria laevigata*, *Banksia oblongifolia* (L1), *Brachyloma daphnoides*, *Styphelia viridis* subsp. *breviflora*, *Bossiaea ensata*, *Hibbertia linearis*, *Dianella caerulea*, *Agiortia pedicellata*, *Patersonia sericea* (L1), *Aotus ericoides*, *Hibbertia acicularis*, *Laxmannia gracilis*, *Leucopogon deformis*, *Monotoca scoparia*, *Pseudanthus orientalis*, *Stackhousia nuda*, *Zieria laxiflora*, *Dianella longifolia* var. *longifolia*, *Hibbertia riparia*, *Laxmannia compacta*, *Persoonia virgata*, *Petrophile canescens*, *Tricoryne elatior*.

Number of native taxa: 80

Number of taxa per site: 17–44 (mean 32 ± 11)

Number of exotic taxa: 0

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Banksia aemula</i>	4	71%	3	2%	positive
<i>Bossiaea ensata</i>	1	43%	0	0%	positive
<i>Cassytha pubesecens</i>	2	71%	2	3%	positive
<i>Caustis recurvata</i>	2	100%	2	1%	positive
<i>Coleocarya gracilis</i>	4	71%	1	0%	positive
<i>Conospermum taxifolium</i>	1	14%	0	0%	positive
<i>Dillwynia retorta</i>	3	57%	0	0%	positive
<i>Epacris pulchella</i>	2	57%	1	1%	positive
<i>Gompholobium virgatum</i>	2	71%	0	0%	positive
<i>Hibbertia acicularis</i>	2	57%	0	0%	positive
<i>Homoranthus virgatus</i>	3	100%	1	2%	positive
<i>Laxmannia compacta</i>	1	14%	0	0%	positive
<i>Leptomeria acida</i>	1	43%	0	0%	positive
<i>Leptospermum trinervium</i>	3	71%	2	1%	positive
<i>Leucopogon deformis</i>	2	14%	0	0%	positive
<i>Leucopogon virgatus</i>	3	29%	0	0%	positive
<i>Ochrosperma lineare</i>	2	86%	3	1%	positive
<i>Petrophile canescens</i>	1	14%	0	0%	positive
<i>Phyllota phyllicoides</i>	1	29%	0	0%	positive
<i>Platysace ericoides</i>	2	57%	1	2%	positive
<i>Ricinocarpos pinifolius</i>	2	57%	1	0%	positive
<i>Schoenus ericetorum</i>	2	57%	1	0%	positive
<i>Stackhousia nuda</i>	1	29%	0	0%	positive
<i>Strangea linearis</i>	2	86%	1	0%	positive
<i>Tetratheca thymifolia</i>	2	57%	0	0%	positive
<i>Thelymitra purpurata</i>	1	14%	0	0%	positive
<i>Themeda australis</i>	2	57%	3	7%	positive
<i>Xanthorrhoea australis</i>	4	14%	0	0%	positive
<i>Xanthorrhoea johnsonii</i>	3	71%	4	1%	positive
<i>Zieria laevigata</i>	3	57%	0	0%	positive

Group 4–Forests on alluvium or fine-textured soils of coastal floodplains and foothills

Community 40. Lower Richmond Mesic Successional wet/swamp Sclerophyll Forest/Rainforest

Scientific Name: Lower Richmond mesic successional swamp/wet sclerophyll forest, Tuckeroo (*Cupaniopsis anacardioides*) Guioa with sclerophyll emergents, Blackbutt (*Eucalyptus pilularis*), Swamp Mahogany (*Eucalyptus robusta*), Red Mahogany (*Eucalyptus resinifera*), Swamp Box (*Lophostemon suaveolens*) on basalt, sedimentary, coastal barrier sands and alluvial soils.

Sites: (10) BALL02VBRLH, WAR12cbrdg, WAR17hsrlh, BALL11esttdf, EMP03albk, WAR02cbbbf, WAR34cbws, WAR03cbr, WAR41vbgur, WAR42hsrlh

Equivalent communities

Wet Sclerophyll Forest-North Coast Wet Sclerophyll Forest (Keith, 2006); Community 4013: *Melaleuca quinquenervia*- *Lophostemon suaveolens*/*Eucalyptus tereticornis* mid-high to very tall, open woodland to closed forest, NPWS NSW Coastal Vegetation (Griffith & Wilson, 2007); 206-Flooded Gum Open Forest; 211- Turpentine +/- Pink Bloodwood Open Forest; 307-Coastal Blackbutt Open Forest to woodland; 303- Coastal Brush Box Open Forest to Woodland; 305-Coastal Swamp Mahogany Open Forest to Woodland, 309- Coastal Swamp Box Open Forest to Woodland (Kingston *et al.*, 2004); Flooded Gum (fG); Blackbutt (BB) Moist to dry sclerophyll Forest; Swamp Mahogany/Swamp Box (SMB) (Landmark Ecological Services, 1999); CASf17 *Eucalyptus resinifera* *Eucalyptus pilularis* *Lophostemon suaveolens* *Syncarpia glomulifera* *Corymbia intermedia* (Binns, 1995b).

Description

This community consists of wet sclerophyll, closed forest and Swamp Sclerophyll sites with a variety of sclerophyll emergents.

1) Sites BALL11esttdf, EMP03albk, WAR34cbws are of Broad-leaved Paperbark (*Melaleuca quinquenervia*) and Swamp Box (*Lophostemon suaveolens*) swamp sclerophyll sites with a mesic understorey with Blue Lily Pily (*Syzygium oleosum*), Buff Hazelwood (*Symplocos thwaitesii*) and Tuckeroo (*Cupaniopsis anacardioides*).

2) Sites BALL02vbrlh, WAR41vbgur, WAR42hsrlh have a closed forest structure and possess in common a tallest layer of Red Ash (*Alphitnoia excelsa*) and an abundance of Guioa *semiglauc*a and Tuckeroo (*Cupaniopsis anacardioides*).

3) WAR02 was dominated by Brush Box (*Lophostemon confertus*),

4) WAR03 Flooded Gum (*Eucalyptus grandis*)



5) Blackbutt (*Eucalyptus pilularis*) was a dominant species in both WAR12cbrdg and WAR17hsrlh.

Brown Bolly Gum (*Litsea australis*), Blue Lily Pily (*Syzygium oleosum*) and Bennett's Ash (*Flindersia bennettiana*) are conspicuous in the small tree layer in this community. The lower layer is variable with *Ottochloa gracillima* being particularly abundant in some sites and is often associated with Kangaroo Grass (*Themeda australis*), *Viola hederacea/banksii*, and *Carex maculata*.

Distribution and Habitat

Example locations: Lennox Head, Tuckean Broadwater, Bagotville/Alstonville Road; Ballina Industrial Estate; Beswick Beach, Coolgardie, Wyralla Woodburn Road; Tuckunrimea.

Habitat: This complex occurs on three habitats on low relief topography 1) Swamp Sclerophyll sites occur on slightly more elevated locations on the alluvial/estuarine and coastal sand plains allowing the development of a mesic understorey. 2) Lowland rainforest occurred on basalt and high sedimentary quartz soils at Tuckarimba and Lennox Head; high sedimentary quartz soils and coastal barrier sand soils on gentle relief coastal plains influenced by adjoining fine grained sedimentary rocks near Wardell 3) Lowland wet sclerophyll forest were found on wet sites on coastal sandplains and riparian areas adjoining high sedimentary quartz soils.

Disturbance: Weed disturbance light to severe. Site WAR42hsrlh has been heavily cleared. Evidence of light grazing.

Conservation

Threats: Clearing

Conservation status: Sites BALL02vbrlh, WAR41vbgur, WAR42hsrlh are samples of Lowland Rainforest in NSW North Coast and Sydney Basin Bioregion Endangered Ecological Community. BALL11estdf. EMP03albk, WAR34cbws are examples of Swamp sclerophyll forest on coastal floodplains Endangered Ecological Community. These lowland sites are clearly threatened by clearing and occur in environments where there are few reserves.

Significant taxa: *Cordyline congesta*, *Cryptocarya foetida*, TSC-V

Structure

Layer	Height (m)	Cover (%)
Tallest	15–30	20–60
Middle 1	1–20	10–50
Lower 1	0–0.8	5–80

Floristics

Trees: *Guioa semiglaucula* (T), *Cupaniopsis anacardioides* (T), *Melaleuca quinquenervia*-T, *Alphitonia excelsa* (T), *Schefflera actinophylla**, *Livistona australis* (M1), *Eucalyptus pilularis* (T), *Archontophoenix cunninghamiana* (M1), *Melicope elleryana*, *Lophostemon suaveolens* (T), *Callistemon salignus* (T), *Glochidion sumatranum* (T), *Cupaniopsis parvifolia* (T), *Elaeocarpus obovatus*, *Waterhousea floribunda* (T), *Rhodamnia rubescens* (T), *Lophostemon confertus* (T), *Cryptocarya obovata*, *Callitris columellaris* (T), *Banksia serrata* (T), *Casuarina glauca*, *Eucalyptus grandis*, *Eucalyptus robusta* (T), *Polyscias elegans*, *Synoum glandulosum* subsp. *glandulosum*, *Arytera divaricata*, *Diploglottis cunninghamii*, *Corymbia intermedia* (T), *Eucalyptus microcorys*, *Syagrus romanzoffiana**, *Eucalyptus resinifera* subsp. *hemilampra* (T), *Commersonia bartramia* (T), *Callicoma serratifolia*, *Cinnamomum oliveri*, *Cinnamomum virens*, *Cryptocarya foetida*, *Dysoxylum mollissimum* subsp. *molle*, *Endiandra discolor*, *Eriobotrya japonica*, *Ficus superba* var. *henneana*, *Ficus watkinsiana*, *Grevillea robusta*, *Olea paniculata*, *Podocarpus elatus*, *Syzygium luehmannii*

Sub canopy trees: *Cinnamomum camphora** (M1), *Syzygium oleosum* (M1), *Jagera pseudorhus* var. *pseudorhus* forma *pseudorhus* (M1), *Mallotus philippensis* (M1), *Rhodomyrtus psidioides*, *Litsea australis* (M1), *Melicope elleryana* (M1), *Mallotus discolor*, *Flindersia bennettiana* (M1), *Acacia maidenii*, *Acacia melanoxylon*, *Acmena smithii*, *Aphananthe*

philippinensis, *Cryptocarya obovata* (M2), *Glochidion ferdinandi*, *Neolitsea australiensis* (M1), *Symplocos thwaitesii* (M1), *Cryptocarya triplinervis* (M1), *Polyscias elegans* (M1), *Endiandra sieberi*, *Cryptocarya microneura*, *Sarcopteryx stipata*, *Symplocos thwaitesii*, *Streblus brunonianus*, *Symplocos stawellii*, *Alectryon coriaceus*, *Croton verreauxii*, *Cyclophyllum longipetalum* (M1), *Diospyros pentamera*, *Flindersia schottiana*, *Allocauarina torulosa* (M1), *Archirhodomertus beckeri*, *Cryptocarya laevigata*, *Euroschinus falcata* var. *falcata* (M1), *Acronychia imperforata* (M1), *Acronychia wilcoxiana*, *Mischocarpus pyriformis* subsp. *pyriformis*, *Pararchidendron pruinosum* var. *pruinosum*, *Toeckia dasyrrhache*

Shrubs: *Lantana camara** (M2), *Maclura cochinchinensis*, *Ochna serrulata** (M1), *Notelaea longifolia*, *Syzygium oleosum*, *Pittosporum undulatum* (M2), *Psychotria loniceroides* (M2), *Elaeocarpus reticulatus* (M2), *Ligustrum sinense**, *Mallotus discolor* (M2), *Pittosporum revolutum*, *Neolitsea australiensis*, *Pilidiostigma glabrum*, *Tabernaemontana pandacqui*, *Trochocarpa laurina* (M2), *Myrsine howittiana* (M2), *Trochocarpa laurina*, *Eupomatia laurina*, *Ficus coronata*, *Ligustrum lucidum**, *Myrsine variabilis*, *Murraya paniculata**, *Denhamia celastroides*, *Duboisia myoporoides*, *Elaeodendron australe*, *Endiandra virens*, *Exocarpos latifolius*, *Harpullia hillii*, *Hedraianthera porphyropetala*, *Jasminum volubile*, *Myrsine subsessilis*, *Nematolepis squamea* subsp. *squamea*, *Psydrax lamprophylla*, *Senna pendula* var. *glabrata**, *Syzygium australe*, *Wilkiea huegeliana*, *Zieria smithii*

Climbers: *Geitonoplesium cymosum*, *Marsdenia rostrata*, *Smilax australis* (L1), *Morinda jasminoides* (L1), *Pandorea pandorana*, *Trophis scandens*, *Asparagus plumosus** (M1), *Flagellaria indica*, *Stephania japonica* var. *discolor*, *Cissus antarctica*, *Parsonia straminea*, *Passiflora subpeltata**, *Melodinus australis*, *Hibbertia scandens*, *Cissus hypoglauca*, *Echinostephia aculeata*, *Passiflora edulis**, *Aphanopetalum resinum*, *Dioscorea transversa*, *Solanum seaforthianum**, *Derris involuta*, *Eustrephus latifolius*, *Passiflora suberosa**, *Senna septemtrionalis**, *Smilax glyciphylla*, *Austrosteenisia glabristyla*, *Caesalpinia subtropica*, *Calamus muelleri*, *Cardiospermum grandiflorum**, *Cayratia clematidea*, *Cissus sterculiifolia*, *Clematis glycinoides* var. *submutica*, *Embelia australiana*, *Glycine clandestina*, *Hibbertia dentata*, *Ipomoea cairica**, *Ripogonum album*, *Ripogonum discolor*, *Ripogonum elseyanum*, *Ripogonum fawcettianum*, *Rubus moluccanus* var. *trilobus*

Epiphytes: *Asplenium australasicum* f. *australasicum*, *Platynerium bifurcatum*, *Platynerium superbum*, *Psilotum nudum*

Mistletoes: *Amylothea dictyophleba*

Grasses *Ottocloa gracillima* (L1), *Oplismenus aemulus*, *Themeda australis* (L1), *Cymbopogon refractus* (L1), *Imperata cylindrica* var. *major*, *Digitaria parviflora*, *Paspalidium gracile*, *Paspalum wettsteinii**, *Entolasia marginata*, *Eragrostis pubescens*

Ferns: *Asplenium australasicum* f. *australasicum*, *Blechnum indicum* (L1), *Hypolepis muelleri* (L1), *Adiantum hispidulum*, *Pteridium esculentum* (L1), *Platynerium bifurcatum*, *Doodia aspera* (L1), *Blechnum cartilagineum* (L1), *Lastreopsis microsora* subsp. *microsora* (L1), *Oplismenus imbecillis* (L1), *Davallia solida* var. *pyxidata*, *Lastreopsis microsora* subsp. *microsora*, *Platynerium superbum*, *Pyrrosia confluens* var. *confluens*, *Lastreopsis decomposita*

Sedges/Rushes: *Carex maculata* (L1), *Gahnia clarkei* (L1), *Lomandra longifolia*, *Cyperus eglobosus* (L1), *Gahnia aspera*, *Lomandra multiflora* subsp. *multiflora*, *Baloskion tetrachyllum*, *Cyperus enervis*, *Cyperus tetrachyllum*

Herbs/Shrubs: *Ochna serrulata** (L1), *Cordyline congesta* (M2), *Breynia oblongifolia*, *Dianella caerulea*, *Alpinia caerulea*, *Commelina cyanea*, *Wikstroemia indica*, *Pratia purpurascens*, *Alyxia ruscifolia*, *Dichondra repens*, *Aneilema acuminatum*, *Viola banksii* (L1), *Ardisia crenata** (L1), *Cordyline rubra*, *Homalanthus populifolius*, *Pomax umbellata*, *Pseuderanthemum variabile*, *Asparagus aethiopicus** (L1), *Viola banksii*, *Austromyrtus dulcis*, *Desmodium gunnii*, *Gymnostachys anceps*, *Bidens pilosa**, *Cheirostylis notialis*, *Hydrocotyle peduncularis*, *Lobelia trigonocaulis*, *Veronica plebeia*, *Brunoniella australis*, *Carissa ovata*, *Cryptostylis erecta*, *Cryptostylis subulata*, *Hibiscus heterophyllus* subsp. *heterophyllus*, *Hypochaeris radicata**, *Alocasia brisbanensis*, *Persicaria dichotoma*, *Plectranthus parviflorus*, *Rhaphiolepis indica**, *Rivina humilis**, *Rubus parvifolius*, *Tripladenia cunninghamii*

Number of native taxa: 212

Number of taxa per site: 42-81 (mean 59, +/- 18)

Number of exotic taxa: 27

Indicator native taxa

Species	Group score	Group freq	Non-group score	Non-group freq	class
<i>Aphanopetalum resinosum</i>	1	10%	0	0%	positive
<i>Clematis glycinoides</i>	1	10%	0	0%	positive
<i>Cupaniopsis anacardioides</i>	2	70%	1	33%	positive
<i>Cyperus eglobulosus</i>	3	20%	0	0%	positive
<i>Eragrostis pubescens</i>	1	10%	0	0%	positive
<i>Ficus superba</i>	1	10%	0	0%	positive
<i>Geitonoplesium cymosum</i>	2	100%	2	39%	positive
<i>Grevillea robusta</i>	1	10%	0	0%	positive
<i>Guioa semiglauc</i>	2	100%	1	27%	positive
<i>Lobelia trigonocaulis</i>	2	10%	0	0%	positive
<i>Maclura cochinchinensis</i>	2	90%	2	26%	positive
<i>Morinda jasminoides</i>	2	60%	2	26%	positive
<i>Oplismenus aemulus</i>	2	60%	2	14%	positive
<i>Ottobachloa gracillima</i>	3	100%	2	30%	positive
<i>Pittosporum undulatum</i>	2	50%	2	9%	positive
<i>Pyrrosia confluens</i>	1	20%	0	0%	positive

Community 41 Lower Richmond Brush Box–Pink Bloodwood–Grey Ironbark Mesic Tall Open Forest

Scientific name: Lower Richmond Brush Box (*Lophostemon confertus*), Pink Bloodwood (*Corymbia intermedia*) and Grey Ironbark (*Eucalyptus siderophloia*) Mesic Tall Open Forest of Sedimentary Soils on Rolling Low Hills.

Sites: (6) WAR18hsrlh, WAR52hsrlh, WAR20hsrlh, WAR22hsrlh, WAR21albk, WAR24lsrh.

Equivalent communities

Wet Sclerophyll Forest-North Coast Wet Sclerophyll Forest (Keith 2006); Qld Regional Ecosystem 12.11.3 Tall open forest on sediments (Young and Dillewaard 1999); Brush Box (Bb) (Landmark Ecological Services 1999); 3002 – *Lophostemon confertus* mid-high to very tall, open to closed forest NPWS NSW Coastal Vegetation (Griffith & Wilson 2007); CASf 36 *Lophostemon confertus* *Syncarpia glomulifera* *Corymbia intermedia* (Binns 1995b).

Description

A tall moist open forest in which Brush Box (*Lophostemon confertus*) is frequently abundant and often occurs with Pink Bloodwood (*Corymbia intermedia*) and Grey Ironbark (*Eucalyptus siderophloia*). Mesic shrubs and small trees characterise the open mid-stratum; common species include Bangalow Palm (*Archontophoenix cunninghamiana*), Hoop Pine (*Araucaria cunninghamii*) and Bennett's Ash (*Flindersia bennettiana*). A lower stratum of shrubs, to 5 m tall, is present, including Cabbage Tree Palm (*Livistona australis*), Scentless Rosewood (*Synoum glandulosum* subsp. *glandulosum*) and Brown Kurrajong (*Commersonia bartramia*). Other common lower stratum species are Fishbone Fern (*Blechnum cartilagineum*), *Gahnia aspera*, *Ottochloa gracillima* and Prickly Rasp Fern (*Doodia aspera*), *Aneilema acuminatum* and Native Wandering Jew (*Commelina cyanea*) and Pastel Flower (*Pseuderanthemum variable*).



Distribution and Habitat

Habitat: Sheltered aspects on lower slopes, footslopes and riparian sites on finely grained sedimentary quartz soils of the Bundamba Group.

Disturbance: Site WAR52hsrlh showed no evidence of disturbance. Other sites showed light infestation by weeds. WAR21albk had been severely burnt (4 years previously), there was evidence of light grazing at WAR22hsrlh and WAR21albk, light logging was recorded at WAR18hsrlh and WAR24lsrh, and there was some evidence of clearing at WAR22hsrlh.

Example locations: Buckombil Mountain, Tuckean, Wardell Trig and Coolgardie Road.

Conservation

Threats: Logging and clearing.

Conservation status: A lower slope community that is probably not well represented in reserves and threatened by clearing and logging.

Significant taxa: *Archidendron muellerianum* (ROTAP: 3RCa), *Endiandra hayesii* (TSC: Vulnerable), *Endiandra muelleri* subsp. *bracteata* (TSC: Vulnerable), *Lindsaea brachypoda* (TSC: Vulnerable), *Acronychia baeuerlenii* (ROTAP: 3RC-), *Cordyline congesta* (ROTAP: 2RC).

Structure

Layer	Height (m)	Cover (%)
Tallest	20–40	25–45
Middle 1	4–25	15–50
Middle 2	1–5	10–40
Lower 1	0–2	2–60

Floristics

Trees: *Lophostemon confertus* (T), *Livistona australis* (L1), *Corymbia intermedia* (T), *Archontophoenix cunninghamiana* (M1), *Eucalyptus siderophloia* (T), *Araucaria cunninghamii*, *Elaeocarpus obovatus*, *Eucalyptus microcorys* (T), *Eucalyptus carnea* (T), *Melaleuca quinquenervia* (T), *Waterhousea floribunda* (M1), *Leptospermum petersonii* (M1), *Archidendron muellerianum*, *Eucalyptus acmenoides*, *Cinnamomum camphora**, *Endiandra discolor*, *Mallotus philippensis*, *Bridelia exaltata*, *Cryptocarya obovata*, *Lophostemon suaveolens*.

Sub-canopy trees: *Synoum glandulosum* subsp. *glandulosum*, *Commersonia bartramia* (M1), *Cryptocarya microneura* (M1), *Acronychia oblongifolia*, *Flindersia bennettiana* (M1), *Jagera pseudorhus* var. *pseudorhus* forma *pseudorhus*, *Alphitonia excelsa*, *Cupaniopsis parvifolia* (M1), *Callicoma serratifolia* (M1), *Syzygium oleosum* (M1), *Flindersia schottiana*, *Archidendron muellerianum* (M1), *Acacia melanoxylon*, *Allocasuarina torulosa*, *Acronychia baeuerlenii*, *Aphananthe philippinensis*, *Clerodendrum tomentosum*, *Cryptocarya triplinervis* var. *pubens*, *Endiandra pubens*, *Flindersia australis*, *Guioa semiglaucula*, *Litsea australis*, *Mischocarpus pyriformis* subsp. *pyriformis*, *Siphonodon australis*.

Small trees and shrubs: *Synoum glandulosum* subsp. *glandulosum* (M2), *Commersonia bartramia* (M2), *Wilkiea huegeliana* (M1), *Lantana camara** (M2), *Claoxylon australe* (M2), *Croton verreauxii*, *Rhodamnia rubescens*, *Ptilidostigma glabrum* (M2), *Acacia disparrima* subsp. *disparrima* (M1), *Trochocarpa laurina*, *Pittosporum multiflorum*, *Glochidion ferdinandi*, *Maclura cochinchinensis*, *Notelaea longifolia* (M1), *Pittosporum revolutum*, *Ficus coronata* (M1), *Leptospermum petersonii*, *Rhodomyrtus psidioides*, *Syzygium oleosum*, *Cyclophyllum longipetalum*, *Embelia australiana*, *Sarcopteryx stipata*, *Streblus brunonianus*, *Acmena smithii*, *Archirhodomyrtus beckleri*, *Atractocarpus chartaceus*, *Capparis arborea*, *Citrus australasica*, *Clerodendrum floribundum*, *Denhamia celastroides*, *Diospyros pentamera*, *Drypetes deplanchei*, *Duboisia myoporoides*, *Endiandra sieberi*, *Helicia ferruginea*, *Mischocarpus australis*, *Myrsine variabilis*, *Neolitsea dealbata*, *Pararchidendron pruinum* var. *pruinum*, *Scolopia braunii*, *Symplocos thwaitesii*, *Syzygium australe*, *Trema tomentosa* var. *viridis*.

Climbers: *Morinda jasminoides* (L1), *Smilax australis* (L1), *Dioscorea transversa*, *Geitonoplesium cymosum*, *Stephania japonica* var. *discolor* (L1), *Cissus hypoglauca*, *Cissus antarctica*, *Derris involuta*, *Trophis scandens*, *Calamus muelleri*, *Cayratia clematidea*, *Echinostephia aculeata*, *Flagellaria indica*, *Marsdenia rostrata*, *Melodinus australis*, *Zehneria cunninghamii*, *Eustrephus latifolius*, *Kennedia rubicunda*, *Parsonia straminea*, *Passiflora edulis**, *Ripogonum album*, *Ripogonum elseyanum*, *Ripogonum fawcettianum*, *Solanum seaforthianum**, *Callerya megasperma*, *Hibbertia scandens*, *Ipomoea cairica**, *Palmeria scandens*, *Pandorea pandorana*, *Passiflora suberosa**, *Tylophora paniculata*.

Epiphytes: *Platyserium bifurcatum*, *Cymbidium suave*, *Dendrobium aemulum*.

Mistletoes: *Amylotheca dictyophleba*.

Grasses: *Ottocloa gracillima* (L1), *Doodia aspera* (L1), *Oplismenus aemulus*, *Entolasia stricta*, *Imperata cylindrica* var. *major*, *Microlaena stipoides* var. *stipoides*, *Oplismenus imbecillis*, *Paspalum wettsteinii**.

Ferns: *Blechnum cartilagineum* (L1), *Hypolepis muelleri* (L1), *Cyathea leichhardtiana* (M2), *Adiantum hispidulum*,

Lastreopsis decomposita, *Davallia solida* var. *pyxidata*, *Histiopteris incisa*, *Lastreopsis marginans*, *Lindsaea brachypoda*, *Pellaea paradoxa*, *Pyrrosia confluens* var. *confluens*.

Sedges and rushes: *Gahnia aspera* (L1), *Cyperus enervis*, *Cyperus tetraphyllus*, *Lomandra longifolia*, *Exocarya scleroides*, *Lepidosperma laterale*, *Lomandra filiformis* subsp. *filiformis*, *Carex maculata*.

Herbs and shrubs: *Aneilema acuminatum*, *Commelina cyanea* (L1), *Pseuderanthemum variabile* (L1), *Dianella caerulea* (L1), *Cordyline petiolaris* (M1), *Cordyline congesta*, *Gymnostachys anceps*, *Alyxia ruscifolia*, *Breynia oblongifolia*, *Alpinia caerulea*, *Ageratina riparia**, *Bursaria spinosa*, *Hydrocotyle peduncularis*, *Tabernaemontana pandacaqui*, *Bidens pilosa**, *Cordyline stricta*, *Desmodium gunnii*, *Dodonaea triquetra*, *Hibiscus heterophyllus* subsp. *heterophyllus*, *Homalanthus populifolius*, *Pratia purpurascens*, *Vernonia cinerea*, *Alocasia brisbanensis*, *Alpinia arundelliana*, *Ageratina adenophora**, *Cheirostylis notialis*, *Cordyline rubra*, *Cuphea carthagenensis**, *Dichondra repens*, *Endiandra muelleri* subsp. *bracteata*, *Endiandra muelleri* subsp. *muelleri*, *Erechtites valerianifolia**, *Eupomatia bennettii*, *Eupomatia laurina*, *Geranium homeanum*, *Leucopogon juniperinus*, *Oxalis exilis*, *Ozothamnus diosmifolius*, *Phytolacca octandra**, *Plectranthus parviflorus*, *Psychotria loniceroides*, *Senna pendula* var. *glabrata**, *Solanum mauritianum**, *Tripladenia cunninghamii*, *Veronica plebeia*, *Viola banksii*.

Number of native taxa: 185

Number of taxa per site: 40–80 (mean 71 ± 16)

Number of exotic taxa: 16

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Acronychia oblongifolia</i>	2	50%	1	2%	positive
<i>Aneilema acuminatum</i>	2	67%	2	3%	positive
<i>Archontophoenix cunninghamiana</i>	3	67%	2	25%	positive
<i>Blechnum cartilagineum</i>	3	67%	3	12%	positive
<i>Cissus hypoglauca</i>	2	50%	2	11%	positive
<i>Commelina cyanea</i>	2	50%	1	16%	positive
<i>Commersonia bartramia</i>	2	83%	2	9%	positive
<i>Cordyline petiolaris</i>	2	50%	2	4%	positive
<i>Corymbia intermedia</i>	3	67%	3	16%	positive
<i>Croton verreauxii</i>	2	67%	2	8%	positive
<i>Dianella caerulea</i>	2	67%	1	29%	positive
<i>Dioscorea transversa</i>	2	100%	2	16%	positive
<i>Gahnia aspera</i>	2	50%	2	11%	positive
<i>Geitonoplesium cymosum</i>	2	83%	2	40%	positive
<i>Livistona australis</i>	3	100%	1	14%	positive
<i>Lophostemon confertus</i>	3	83%	3	18%	positive
<i>Morinda jasminoides</i>	2	100%	2	26%	positive
<i>Oplismenus aemulus</i>	2	50%	2	14%	positive
<i>Pseuderanthemum variabile</i>	2	83%	2	12%	positive
<i>Rhodmannia rubescens</i>	2	67%	2	8%	positive
<i>Ripogonum brevifolium</i>	1	17%	0	0%	positive
<i>Smilax australis</i>	2	100%	2	41%	positive
<i>Synoum glandulosum</i>	2	83%	2	13%	positive
<i>Wilkiea huegeliana</i>	2	100%	2	14%	positive
<i>Zehneria cunninghamii</i>	2	33%	0	0%	positive

Community 42 Tweed–Brunswick Valley Brush Box–Blackbutt–Pink Bloodwood–Tallowwood Foothill Wet Sclerophyll Forest

Scientific Name: Tweed–Brunswick Brush Box (*Lophostemon confertus*), Blackbutt (*Eucalyptus pilularis*), Pink Bloodwood (*Corymbia intermedia*) and Tallowwood (*Eucalyptus microcorys*) Foothill Wet Sclerophyll.

Sites: (19) BIL02lsrrh, WAR51hsrlh, BYR13hsrh, BYR18lsrh, BYR20alfan, TWE30lsrh, BIL07lsrh, BIL11albk, BRU09un, BRU10un, BRU11allv, TWE01cbdne, POT19esticd, POT20esticd, CUD08lsrh, CUD02lsrh, CUD11lsrh, POT29lsrh, MUR15lsrh.

Equivalent communities

Wet Sclerophyll Forest–North Coast Wet Sclerophyll Forest (Keith 2006); Qld Regional Ecosystems 12.11.3 Tall open forest on sediments (Young and Dillewaard 1999); 201 – Blackbutt Open Forest Complex, 202 – Grey Ironbark/White Mahogany/Grey Gum Open Forest Complex, and 207 – Brush Box Open Forest (Kingsford *et al.* 2004); F3 – *Eucalyptus pilularis* very tall open forest, and F2 – *Lophostemon confertus* tall to very tall closed forest (Pressey and Griffith 1992); Blackbutt (BB), and Grey Ironbark–Pink Bloodwood (gIB) (Landmark Ecological Services 1999).

Description

This community is a tall, mesic forest to rainforest with very abundant Brush Box (*Lophostemon confertus*) associated with Blackbutt (*Eucalyptus pilularis*), Pink Bloodwood (*Corymbia intermedia*), Tallowwood (*Eucalyptus microcorys*), Grey Ironbark (*Eucalyptus siderophloia*) and occasionally Flooded Gum (*Eucalyptus grandis*). There is a low, open to closed shrubland to open forest mid-stratum of rainforest species, including Guioa (*Guioa semiglauc*), Camphor Laurel (*Cinnamomum camphora*), and Tuckerroo (*Cupaniopsis anacardioides*). A second mid-layer of shrubs is occasionally present and includes Tree Heath (*Trochocarpa laurina*), Veiny Wilkiea (*Wilkiea huegeliana*), Lantana (*Lantana camara*) and Guioa. An open to dense lower stratum is present, including Gristle Fern (*Blechnum cartilagineum*), Blue Flax-lily (*Dianella caerulea*), *Ottochloa gracillima*, False Bracken (*Calochlaena dubia*), Spiny-headed Mat-rush (*Lomandra longifolia*) and Native Ginger (*Alpinia caerulea*).

Distribution and Habitat

Habitat: Mainly north of Byron Bay on mid-slopes and exposed aspects of the Condong Range and Tweed Valley on low meta-sedimentary substrates on rolling and low rolling hills.

Disturbance: Sites show evidence of light to moderate fire (10–60 years previously), light to severe logging, and light to moderate infestation by weeds. There has been severe clearing at sites CUD02lsrh and TWE01cbdne.

Example locations: Piggabeen Road, Tuckean Broadwater, Ti Tree Cemetery Road, Bangalow Road, Cobaki Broadwater, Marshalls Creek NR, Old New Brighton Road, Marshalls Creek, north of Chinderah Bypass, Pottsville Environment Park, Tweed Valley Way, Cudgen Road, Clothiers Creek, and Sleepy Hollow.



Conservation

Threats: Clearing; logging, and invasion by weeds.

Conservation status: Lower slope occurrences of this community are possibly not well reserved in the study area. Sites were located in Cudgera Creek NR and Marahsalls Creek NR.

Significant taxa: *Acronychia littoralis* (TSC: Endangered), *Cordyline congesta* (ROTAP: 2RC-), *Argophyllum nullumense* (ROTAP: 3RCa), *Lepiderema pulchella* (TSC: Vulnerable), *Marsdenia longiloba* (TSC: Endangered).

Structure

Layer	Height (m)	Cover (%)
Tallest	15–40	40–90
Middle 1	1–20	15–70
Middle 2	0.5–5	10–60
Lower 1	0–2	20–100
Lower 2	0–0.2	40

Floristics

Trees: *Lophostemon confertus* (T), *Eucalyptus pilularis* (T), *Guioa semiglaucula* (T), *Corymbia intermedia* (T), *Eucalyptus siderophloia* (T), *Callistemon salignus* (T), *Eucalyptus microcorys* (T), *Elaeocarpus obovatus*, *Alphitonia excelsa* (T), *Archontophoenix cunninghamiana*, *Livistona australis*, *Lophostemon suaveolens* (T), *Endiandra discolor*, *Eucalyptus robusta* (T), *Cryptocarya obovata*, *Eucalyptus resinifera* (T), *Eucalyptus grandis* (T), *Dysoxylum mollissimum* subsp. *molle*, *Eucalyptus acmenoides*, *Flindersia bennettiana*, *Syncarpia glomulifera* (T), *Araucaria cunninghamii*, *Beilschmiedia elliptica*, *Casuarina glauca*, *Melaleuca quinquenervia*, *Brachychiton acerifolius*, *Bridelia exaltata*, *Dysoxylum fraserianum*, *Ficus watkinsiana*.

Sub-canopy trees: *Cinnamomum camphora** (M1), *Cupaniopsis anacardioides* (M1), *Denhamia celastroides* (M1), *Synoum glandulosum* subsp. *glandulosum* (M1), *Mallotus philippensis* (M1), *Schefflera actinophylla**, *Elaeocarpus obovatus* (M1), *Allocasuarina torulosa* (M1), *Polyscias elegans* (M1), *Melicope elleryana* (M1), *Aphananthe philippinensis*, *Archirhodomyrtus beckleri*, *Sterculia quadrifida*, *Syagrus romanzoffiana**.

Small trees and shrubs: *Guioa semiglaucula* (M1), *Lantana camara** (M1), *Pittosporum revolutum*, *Jagera pseudorhus* var. *pseudorhus* forma *pseudorhus*, *Notelaea longifolia* (M1), *Maclura cochinchinensis*, *Denhamia celastroides* (M1), *Pittosporum undulatum* (M1, M2), *Psychotria loniceroides* (M2), *Myrsine variabilis* (M1), *Daviesia arborea* (M1), *Breynia oblongifolia*, *Mallotus discolor* (M1), *Ficus obliqua*, *Cryptocarya microneura*, *Ligustrum sinense**, *Trochocarpa laurina* (M1, M2), *Commersonia bartramia* (M1), *Wilkiea huegeliana* (M2), *Acmena smithii* (M2), *Ficus coronata*, *Glochidion ferdinandii*, *Endiandra sieberi* (M1), *Macaranga tanarius*, *Pouteria chartacea*, *Rhodomomyrtus psidioides* (M1), *Acacia disparrima* subsp. *disparrima*, *Acronychia imperforata* (M1), *Clerodendrum floribundum*, *Cyclophyllum longipetalum*, *Symplocos stawellii*, *Syzygium oleosum*, *Ardisia crenata**, *Cryptocarya rigida*, *Celtis paniculata* (M1), *Litsea australis* (M1), *Euroschinus falcata* var. *falcata* (M1), *Glochidion sumatranum*, *Murraya paniculata**, *Pomaderris discolor* (M1), *Psydrax lamprophylla*, *Abrophyllum ornans*, *Clerodendrum tomentosum*, *Cryptocarya triplinervis*, *Duranta erecta*, *Drypetes deplanchei*, *Jacaranda mimosifolia**, *Mischocarpus pyriformis* subsp. *pyriformis*, *Pilidiostigma glabrum*, *Argophyllum nullumense*, *Banksia integrifolia* subsp. *integrifolia*, *Citrus x taitensis**, *Decaspermum humile*, *Ficus fraseri*, *Lepiderema pulchella*, *Myrsine howittiana*, *Neolitsea dealbata*, *Pittosporum multiflorum**.

Climbers: *Smilax australis* (L1), *Geitonoplesium cymosum*, *Stephania japonica* var. *discolor*, *Flagellaria indica* (M1), *Parsonsia straminea*, *Morinda jasminoides*, *Echinostephia aculeata*, *Hibbertia scandens*, *Cissus hypoglaucula*, *Eustrephus latifolius*, *Trophis scandens*, *Cissus antarctica* (L1), *Smilax glyciphylla* (L1), *Marsdenia rostrata*, *Derris involuta*, *Passiflora subpeltata**, *Hibbertia dentata*, *Ipomoea cairica**, *Melodinus australis*, *Pandorea pandorana*, *Ripogonum album*, *Cayratia clematidea*, *Passiflora edulis**, *Asparagus plumosus**, *Hoya australis* subsp. *australis*, *Kennedia rubicunda*, *Mucuna gigantea**, *Cardiospermum grandiflorum**, *Clematis glycinoides*, *Coelospermum paniculatum*, *Hardenbergia violacea*,

Marsdenia longiloba, *Monstera deliciosa**, *Passiflora foetida* var. *hispida**, *Rubus parvifolius*, *Rubus rosifolius*.

Epiphytes: *Platycerium bifurcatum*, *Dendrobium kingianum*, *Platycerium superbum*, *Asplenium australasicum* f. *australasicum*, *Dendrobium monophyllum*.

Mistletoes: *Amylothea dictyophleba*.

Grasses: *Ottocloa gracillima* (L1), *Oplismenus imbecillis* (L1), *Imperata cylindrica* var. *major* (L1), *Entolasia stricta*, *Paspalum wettsteinii**, *Oplismenus undulatifolius* var. *mollis*, *Entolasia marginata*, *Themeda australis*, *Axonopus compressus**, *Digitaria ramularis*, *Melinis repens**, *Oplismenus aemulus*, *Paspalidium distans**.

Ferns: *Blechnum cartilagineum* (L1), *Calochlaena dubia* (L1), *Pteridium esculentum* (L1), *Doodia caudata* (L1), *Hypolepis muelleri*, *Pyrrosia rupestris*, *Adiantum hispidulum*, *Cheilanthes sieberi*, *Pellaea nana*, *Pellaea viridis* var. *viridis*, *Asplenium australasicum* f. *australasicum*, *Christella dentata*, *Davallia solida* var. *pyxidata*, *Lastreopsis munita*.

Sedges and rushes: *Lomandra longifolia* (L1), *Gahnia sieberiana* (L1), *Lomandra filiformis* (L1), *Gahnia aspera*, *Lepidozamia peroffskyana* (L1), *Lepidosperma laterale*, *Gahnia clarkei* (L1), *Lomandra confertifolia* subsp. *pallida*, *Cyperus stradbrokeensis*.

Herbs and shrubs: *Dianella caerulea* (L1), *Senna pendula* var. *glabrata** (M2), *Pseuderanthemum variabile* (L1), *Alpinia caerulea* (M2), *Eupomatia laurina* (M2), *Pratia purpurascens*, *Austromyrtus dulcis*, *Ageratina riparia**, *Ochna serrulata**, *Tripladenia cunninghamii*, *Asparagus aethiopicus**, *Commelina cyanea*, *Cordyline congesta* (L1), *Hovea acutifolia*, *Lepidozamia peroffskyana*, *Wikstroemia indica*, *Viola banksii* (L2), *Dichondra repens* (L2), *Xanthorrhoea macronema* (L1), *Ageratina adenophora**, *Atractocarpus chartaceus*, *Dodonaea triquetra*, *Chrysanthemoides monilifera* subsp. *rotundata**, *Cordyline rubra*, *Pomaderris discolor*, *Zieria smithii*, *Viola hederacea*, *Acacia viscidula* (M1), *Ageratum houstonianum**, *Cordyline petiolaris*, *Desmodium rhytidophyllum*, *Gymnostachys anceps*, *Hibiscus tiliaceus*, *Homalanthus populifolius*, *Hydrocotyle acutiloba*, *Leptospermum microcarpum*, *Oxalis chnoodes*, *Peperomia blanda* var. *floribunda*, *Persoonia media*, *Pomax umbellata*, *Poranthera microphylla*, *Pterostylis nutans*, *Crinum pedunculatum*, *Desmodium gunnii*, *Leucopogon margarodes*, *Phytolacca octandra**, *Pomaderris argyrophylla*, *Solanum mauritianum**, *Triumfetta rhomboidea*, *Vernonia cinerea*.

Number of native taxa: 207

Number of taxa per site: 32–71 (mean 45 ± 15)

Number of exotic taxa: 31

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Smilax australis</i>	2	95%	2	39%	positive
<i>Geitonoplesium cymosum</i>	2	89%	2	38%	positive
<i>Lophostemon confertus</i>	4	89%	3	15%	positive
<i>Guioa semiglaucula</i>	2	84%	1	26%	positive
<i>Cupaniopsis anacardioides</i>	2	79%	1	32%	positive
<i>Jagera pseudorhus</i> var. <i>pseudorhus</i> forma <i>pseudorhus</i>	2	79%	1	25%	positive
<i>Lomandra longifolia</i>	2	74%	2	27%	positive
<i>Ottolochloa gracillima</i>	3	74%	2	30%	positive
<i>Dianella caerulea</i>	2	68%	1	27%	positive
<i>Blechnum cartilagineum</i>	3	63%	2	10%	positive
<i>Dioscorea transversa</i>	2	63%	2	14%	positive
<i>Notelea longifolia</i>	2	63%	1	19%	positive
<i>Calochlaena dubia</i>	3	53%	2	8%	positive
<i>Maclura cochinchinensis</i>	2	53%	2	26%	positive
<i>Clematis glycinoides</i>	1	5%	0	0%	positive
<i>Dendrobium kingianum</i>	2	5%	0	0%	positive
<i>Dendrobium monophyllum</i>	1	5%	0	0%	positive
<i>Leptospermum microcarpum</i>	2	5%	0	0%	positive
<i>Pellaea viridis</i> var. <i>viridis</i>	2	5%	0	0%	positive
<i>Pomaderris argyrophylla</i>	1	5%	0	0%	positive
<i>Pomaderris discolor</i>	3	5%	0	0%	positive
<i>Prostanthera nivea</i>	2	5%	0	0%	positive

Community 43 Brunswick–Tweed Brush Box Gully Rainforest on Meta-sediments

Scientific name: Brunswick–Tweed Brush Box (*Lophostemon confertus*) Gully Rainforest on Meta-sedimentary Soils.

Sites: (20) BIL14lsrh, BUR01lsrh, CUD12lsrh, MUR14lsrh, POT33lsrh, MUR16lsrh, BRU06lsrh, MUR06lsrh, POT16alvf, MUR11lsrh, MUR12lsrh, BUR04lsrh, CUD03lsrh, POT30lsrh, BUR02lsrh, POT11alfan, BUR03lsfl, POT14lsrh, POT17lsrh, POT18lsrh.

Equivalent communities

Rainforest-Subtropical Rainforest (Keith 2006); Qld Regional Ecosystem 12.11.1 Brush Box closed forest in gullies (Young and Dillewaard 1999); 207 – Brush Box Open Forest (Kingston *et al.* 2004); Brush Box (Bb) (Landmark Ecological Services 1999); F2 – *Lophostemon confertus* tall to very tall closed forest (Pressey and Griffith 1992); Suballiance 18 – *Lophostemon confertus* (Floyd 1990).

Description

This community comprises mostly closed forest sites with abundant Brush Box (*Lophostemon confertus*), Camphor Laurel (*Cinnamomum camphora*) and Guioa (*Guioa semiglauc*). Eucalypt and *Corymbia* species occur in the canopy, including Tallowwood (*Eucalyptus microcorys*), White Mahogany (*Eucalyptus acmenoides*), Flooded Gum (*Eucalyptus grandis*) and Pink Bloodwood (*Corymbia intermedia*). A highly species-rich dense middle stratum of small trees and shrubs is present, including Blue Lilly Pilly (*Syzygium oleosum*), Rose Myrtle (*Archirhodomyrtus beckleri*), Black Walnut (*Endiandra globosa*), Murrogun (*Cryptocarya microneura*) and Scrub Turpentine (*Rhodamnia rubescens*). Fishbone Fern (*Blechnum cartilagineum*) is the most frequent lower stratum species, and often occurs with shrubs Rose Myrtle, Veiny Wilkiea (*Wilkiea huegliana*), Prickly Rasp Fern (*Doodia aspera*) and grasses (*Ottocloa gracillima*). This community contains populations of many rare, threatened and endangered plant species (28 taxa) and a rich diversity of climbing and twining plants (48 taxa).

Distribution and Habitat

Habitat: Most common on metamorphic sedimentary rocks on lower slopes and footslopes on low rolling hills, at Marhalls Ridge, Burringbar Range and in the Tweed Valley lowlands.

Disturbance: Includes moderate to severe levels of fire (15–45 years prior), moderate to severe logging, light to severe clearing, and light to severe invasion by weeds.

Example locations: Piggabeen Road, Tweed Valley Way, east of Round Mountain, Reserve Creek Road, Sleepy



Hollow, Environ Road, Ocean Shores Salad Bowl, Urliup, North Tumbulgum cemetery, New Brighton, Forest Hill, Billinudgel NR, and Jones Road.

Conservation

Threats: This is a low er slope community subject to significant threat from clearing, logging, inappropriate fire regimes and invasion by noxious weeds.

Conservation status: Lower slope examples of this community are possibly not well reserved in the FNC study area. The community described here is an example of 'Lowland Rainforest in NSW North Coast and Sydney Basin Bioregion' EEC. Sites in reserves include those in Cudgera Creek NR, Billinudgel NR and Marshalls Creek NR.

Significant taxa: *Endiandra muelleri* subsp. *bracteata* (TSC: Endangered), *Rhodamnia maideniana* (ROTAP: 2RC-), *Archidendron hendersonii* (TSC: Vulnerable), *Elaeocarpus williamsianus* (TSC: Endangered), *Elaeocarpus* sp. Rocky Creek (TSC: Endangered), *Acacia bakeri* (TSC: Vulnerable), *Endiandra globosa* (ROTAP: 2RC), *Acianthus amplexicaulis* (ROTAP: 3RC-), *Archidendron muellerianum* (ROTAP: 3RCa), *Cordyline congesta* (ROTAP: 2RC-), *Cupaniopsis newmanii* (ROTAP: 2RC-), *Davidsonia jerseyana* (TSC: Endangered), *Endiandra floydii* (TSC: Vulnerable), *Fontainea australis* (TSC: Vulnerable), *Gahnia insignis* (ROTAP: 3RCa), *Hicksbeachia pinnatifolia* (ROTAP: 3RC-), *Lindsaea brachypoda* (TSC: Vulnerable), *Macadamia tetraphylla* (TSC: Vulnerable), *Marsdenia longiloba* (TSC: Vulnerable), *Randia moorei* (TSC: Endangered), *Syzygium hodgkinsoniae* (TSC: Vulnerable), *Brunoniella spiciflora* rare in NSW).

Structure

Layer	Height (m)	Cover (%)
Tallest	5–30	25–90
Middle 1	2–20	15–80
Middle 2	1–10	50–70
Lower 1	0–2	30–90

Floristics

Trees: *Lophostemon confertus* (T), *Guioa semiglaucula* (T), *Cinnamomum camphora** (T), *Cryptocarya microneura* (T), *Araucaria cunninghamii* (T), *Archontophoenix cunninghamiana*, *Eucalyptus microcorys* (T), *Melicope elleryana* (T), *Glochidion sumatranum* (T), *Toeckia dasyrrhache* (M2), *Flindersia bennettiana* (T), *Alphitonia excelsa* (T), *Cryptocarya glaucescens* (T), *Glochidion ferdinandi* (T), *Ficus fraseri* (T), *Commersonia bartramia* (T), *Corymbia intermedia* (T), *Diploglottis cunninghamii*, *Elaeocarpus kirtonii* (T), *Flindersia schottiana* (T), *Cryptocarya obovata*, *Eucalyptus grandis* (T), *Euroschinus falcata* var. *falcata* (T), *Sloanea woollsii* (T), *Syzygium luehmannii*, *Gmelina leichhardtii*, *Polyscias murrayi* (T), *Acmena hemilampra* subsp. *hemilampra* (T), *Eucalyptus pilularis* (T), *Melaleuca quinquenervia* (T), *Polyscias elegans*, *Schefflera actinophylla**, *Sloanea australis*, *Eucalyptus acmenoides* (T), *Eucalyptus propinqua* (T), *Heritiera trifoliolata*, *Pouteria australis*, *Flindersia australis*, *Livistona australis*, *Brachychiton acerifolius*, *Doryphora sassafras*, *Ficus watkinsiana*, *Toona ciliata*.

Sub-canopy trees: *Melicope elleryana* (M1), *Dysoxylum mollissimum* subsp. *molle*, *Endiandra discolor*, *Heritiera trifoliolata* (M1), *Bridelia exaltata*.

Small trees and shrubs: *Archirhodomertus beckeri* (M1), *Archirhodomertus beckeri* (M1), *Synoum glandulosum* subsp. *glandulosum* (M1), *Guioa semiglaucula*, *Wilkiea huegeliana* (M2), *Lantana camara** (M2), *Syzygium oleosum* (M1), *Endiandra globosa* (M1), *Pilidiostigma glabrum* (M1), *Maclura cochinchinensis*, *Trochocarpa laurina* (M2), *Acmena smithii* (M1), *Elaeocarpus reticulatus* (M1), *Elaeocarpus reticulatus* (M1), *Rhodamnia rubescens* (M1), *Cyathea leichhardtiana*, *Rhodamnia maideniana* (M1), *Jagera pseudorhus* var. *pseudorhus* forma *pseudorhus*, *Toeckia dasyrrhache* (M1), *Croton verreauxii* (M2), *Mallotus philippensis*, *Notelaea longifolia*, *Cryptocarya glaucescens*, *Pittosporum revolutum*, *Tabernaemontana pandacacui*, *Ficus coronata* (M1), *Neolitsea dealbata*, *Gossia hillii*, *Myrsine variabilis*, *Elaeocarpus obovatus*, *Cupaniopsis anacardioides*, *Elaeocarpus kirtonii*, *Pittosporum undulatum*, *Acacia disparrima* subsp. *disparrima*,

Canarium australasicum (M1, M2), *Cryptocarya laevigata*, *Litsea australis*, *Endiandra pubens* (M1), *Arytera distylis* (M1), *Alchornea ilicifolia* (M1), *Abrophyllum ornans*, *Decaspermum humile*, *Hedraianthera porphyropetala*, *Pouteria chartacea*, *Sarcopteryx stipata*, *Symplocos stawellii*, *Aphananthe philippinensis*, *Archidendron hendersonii* (M1), *Elaeocarpus* sp. Rocky Creek, *Mallotus discolor*, *Psychotria loniceroides*, *Quintinia verdonii*, *Acacia bakeri*, *Acacia melanoxylon*, *Allocasuarina torulosa*, *Auranticarpa rhombifolia*, *Elaeocarpus williamsianus* (M1), *Cryptocarya rigida*, *Macadamia tetraphylla*, *Mischocarpus pyriformis* subsp. *pyriformis*, *Acronychia imperforata*, *Acronychia wilcoxiana*, *Actephila lindleyi*, *Allocasuarina littoralis* (T), *Atractocarpus benthamianus*, *Callistemon salignus*, *Daphnandra tenuipes*, *Daviesia arborea*, *Diospyros pentamera*, *Drypetes deplanchei*, *Duboisia myoporoides*, *Fontainea australis*, *Hicksbeachia pinnatifolia*, *Ligustrum sinense**, *Medicosma cunninghamii*, *Meiogyne stenopetala* subsp. *stenopetala*, *Melicope hayesii*, *Notelaea johnsonii*, *Olea paniculata*, *Polyosma cunninghamii*, *Randia moorei*, *Triunia youngiana*, *Cupaniopsis parvifolia*, *Elattostachys nervosa*, *Helicia ferruginea*, *Persoonia media*, *Syzygium hodgkinsoniae*.

Climbers: *Smilax australis*, *Morinda jasminoides* (L1), *Dioscorea transversa*, *Geitonoplesium cymosum*, *Hibbertia scandens*, *Echinostephia aculeata*, *Flagellaria indica*, *Trophis scandens*, *Pandorea pandorana*, *Cissus hypoglauca* (T), *Marsdenia rostrata*, *Calamus muelleri* (L1), *Passiflora suberosa**, *Eustrephus latifolius*, *Stephania japonica* var. *discolor*, *Ripogonum album*, *Melodinus australis*, *Passiflora edulis**, *Coelospermum paniculatum*, *Parsonsia straminea*, *Ripogonum elseyanum* (M2), *Rubus moluccanus* var. *trilobus*, *Marsdenia longiloba*, *Palmeria scandens*, *Pothos longipes*, *Austrosteenisia glabristyla*, *Callerya megasperma*, *Carronia multiseptata*, *Cissus antarctica*, *Cissus sterculiifolia*, *Passiflora subpeltata**, *Smilax glyciphylla*, *Caesalpinia scortechinii*, *Callerya australis*, *Diplocyclos palmatus*, *Hibbertia dentata*, *Hippocratea barbata*, *Ipomoea cairica**, *Pandorea jasminoides*, *Celastrus subspicata*, *Derris involuta*, *Elattostachys nervosa*, *Parsonsia velutina*, *Ripogonum discolor*.

Epiphytes: *Asplenium australasicum* f. *australasicum* (L1), *Platyserium bifurcatum*, *Platyserium superbum*.

Grasses: *Ottocloa gracillima* (L1), *Oplismenus undulatifolius* var. *mollis* (L1), *Oplismenus imbecillis* (L1), *Paspalum wettsteinii**, *Entolasia marginata*, *Imperata cylindrica* var. *major*, *Oplismenus aemulus*, *Paspalidium distans**.

Ferns: *Blechnum cartilagineum* (L1), *Calochlaena dubia* (L1), *Cyathea leichhardtiana* (M1), *Asplenium australasicum* f. *australasicum* (L1), *Doodia aspera* (L1), *Christella dentata*, *Doodia caudata*, *Hypolepis muelleri* (L1), *Pteridium esculentum*, *Pyrrosia rupestris*, *Lastreopsis munita* (L1), *Lastreopsis marginans* (L1), *Cyathea australis*, *Psilotum nudum*, *Lastreopsis microsora* subsp. *microsor*, *Pyrrosia confluens* var. *confluens*, *Adiantum silvaticum*, *Legnephora moorei*, *Adiantum diaphanum*, *Arachniodes aristata*, *Arthropteris tenella*, *Blechnum indicum*, *Cupaniopsis parvifolia*, *Davallia solida* var. *pyxidata*, *Dictymia brownii*, *Lindsaea brachypoda*.

Sedges and rushes: *Lomandra longifolia* (L1), *Gahnia aspera* (L1), *Gahnia clarkei*, *Gahnia insignis*, *Gahnia sieberiana*, *Lepidosperma laterale*, *Lomandra spicata*.

Herbs and shrubs: *Cordyline rubra*, *Ageratina riparia** (L1), *Eupomatia laurina* (L1), *Dianella caerulea*, *Zieria smithii* (L1), *Pseuderanthemum variabile* (L1), *Alpinia caerulea*, *Senna pendula* var. *glabrata**, *Breynia oblongifolia*, *Cyperus tetraphyllus*, *Homalanthus populifolius*, *Pratia purpurascens*, *Viola banksii*, *Cleistanthus cunninghamii* (L1), *Alyxia ruscifolia*, *Aneilema acuminatum*, *Capparis arborea*, *Macaranga tanarius*, *Vernonia cinerea*, *Alpinia arundelliana*, *Eupomatia bennettii*, *Gymnostachys anceps*, *Hovea acutifolia*, *Linospadix monostachya*, *Ageratina adenophora**, *Brunoniella spiciflora*, *Cordyline petiolaris*, *Olearia nernstii*, *Oxalis chnoodes*, *Solanum mauritianum**, *Tasmannia insipida*, *Tripladenia cunninghamii*, *Acianthus amplexicaulis*, *Alocasia brisbanensis*, *Centella asiatica*, *Cordyline congesta*, *Cyperus enervis*, *Lepidozamia peroffskyana*, *Ozothamnus diosmifolius*, *Sida rhombifolia**, *Solanum capsicoides**, *Wikstroemia indica*.

Number of native taxa: 256

Number of taxa per site: 34–107 (mean 59 ± 20)

Number of exotic taxa: 20

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Acmena smithii</i>	2	58%	1	13%	positive
<i>Adiantum hispidulum</i>	2	63%	2	7%	positive
<i>Arachniodes aristata</i>	1	5%	0	0%	positive
<i>Archirhodomomyrtus beckleri</i>	4	84%	2	3%	positive
<i>Asplenium australasicum</i> f. <i>australasicum</i>	2	53%	1	13%	positive
<i>Blechnum cartilagineum</i>	3	74%	2	9%	positive
<i>Calochlaena dubia</i>	2	58%	2	7%	positive
<i>Cordyline rubra</i>	2	53%	2	10%	positive
<i>Cryptocarya microneura</i>	2	68%	1	7%	positive
<i>Denhamia celastroides</i>	2	58%	1	6%	positive
<i>Dictymia brownii</i>	1	5%	0	0%	positive
<i>Dioscorea transversa</i>	2	63%	2	14%	positive
<i>Elaeocarpus</i> species. Rocky Creek	4	5%	0	0%	positive
<i>Elaeocarpus williamsianus</i>	3	5%	0	0%	positive
<i>Endiandra globosa</i>	3	63%	3	3%	positive
<i>Eupomatia laurina</i>	2	58%	1	4%	positive
<i>Geitonoplesium cymosum</i>	2	63%	2	40%	positive
<i>Guioa semiglaucula</i>	2	100%	1	25%	positive
<i>Hibbertia scandens</i>	2	53%	1	27%	positive
<i>Lophostemon confertus</i>	5	84%	3	15%	positive
<i>Machura cochinchinensis</i>	2	74%	2	25%	positive
<i>Melicope hayesii</i>	2	5%	0	0%	positive
<i>Morinda jasminoides</i>	2	79%	2	24%	positive
<i>Olearia nernstii</i>	1	5%	0	0%	positive
<i>Ottochloa gracillima</i>	2	58%	2	31%	positive
<i>Pilidistigma glabrum</i>	2	68%	1	11%	positive
<i>Rhodmaniania rubescens</i>	2	58%	1	6%	positive
<i>Smilax australis</i>	2	79%	2	40%	positive
<i>Synoum glandulosum</i>	2	95%	2	10%	positive
<i>Syzygium oleosum</i>	3	58%	2	11%	positive
<i>Tabernaemontana pandacacui</i>	2	53%	1	7%	positive
<i>Toeckia dasyrrhache</i>	2	53%	2	3%	positive
<i>Trochocarpa laurina</i>	2	58%	2	11%	positive
<i>Wilkia huegiana</i>	2	84%	2	12%	positive

Community 44 Tweed–Brunswick Valley Blue Quandong Subtropical Rainforest

Scientific name: Tweed–Brunswick Valley Blue Quandong (*Elaeocarpus obovatus*) Subtropical Rainforest.

Sites: (13) BIL04lsrh, MUR13lsrh, BIL05vbrh, TWE06lsrh, MUR07lsrh, TWE05lsrh, BRU05alterr, MUR17lsrh, MUR18lsrh, POT24alfl, POT25lsrh, POT26lsrh, POT27lsrh, TWE16lsrh.

Equivalent communities

Rainforest-Subtropical Rainforest (Keith 2006); Qld Regional Ecosystem 12.11.1 Brush Box closed forest in gullies (Young and Dillewaard 1999); Subtropical rainforest on metasediments, and Subtropical rainforest on alluvial soils (Landmark Ecological Services 1999); 102 – Sub-tropical/Warm Temperate Rainforest on Bedrock Substrates (Kingston *et al.* 2004); Suballiance 2 – *Toona–Flindersia* (Floyd 1990).

Description

This community is characterised by emergent Blue Quandong (*Elaeocarpus grandis*), Red Ash (*Alphitonia excelsa*), Cudgerie (*Flindersia schottiana*), Strangling Fig (*Ficus watkinsiana*), Brush Box (*Lophostemon confertus*) and Logan Apple (*Acmena hemilampra* subsp. *hemilampra*) and a closed tallest strata with Cudgerie (*Flindersia schottiana*), Bangalow Palm (*Archontophoenix cunninghamiana*), Red Ash, Hoop Pine (*Araucaria cunninghamii*), Red Bean (*Dysoxylum mollissimum* subsp. *molle*) and Sandpaper Fig (*Ficus fraseri*). The middle stratum consists of shrubs and small trees, including Bangalow Palm, Rough-leaved Elm (*Aphananthe philippinensis*), Red-fruited Laurel (*Cryptocarya laevigata*), Hairy-leaved Bolly Gum (*Neolitsea dealbata*) and *Toecharia dasyrrhache*. Ferns (including *Lastreopsis decomposita*, *Lastreopsis marginans*, *Lastreopsis munita*, and *Adiantum hispidulum*), grasses (e.g. *Oplismenus undulatifolius* var. *mollis*) and shrubs (e.g. *Cleistanthus cunninghamii*, *Cryptocarya laevigata*) are the most frequent lower strata groups. A total of 52 climbing and twining plant taxa was recorded in the survey sites, and 31 threatened species were recorded in this community.



Distribution and Habitat

Habitat: Metamorphic sedimentary and basalt soils on lower slopes of rolling hills in the Tweed Valley, the Burringbar Range and near Billinudgel. Also occurs on alluvial terraces and floodplain.

Disturbance: Disturbance includes moderate to severe logging and light to moderate invasion of weeds, and light to moderate clearing at several sites. Moderate fire damage was recorded at site BIL05vbrh (50years previously).

Example locations: Durobby Creek, Terranora Plateau, Terranora Country Club, Chambers Lookout, Terranora, McCauleys Road, SW of Billinudgel, Palmdale Road, Hogans Road, Cudgera Creek Road, Taggets Hill, Sleepy Hollow, and Birds Bay Road.

Conservation

Threats: This is a lower slope community subject to significant threat from clearing, logging, inappropriate fire regimes and invasion by noxious weeds. This rainforest type is a hotspot for populations of rare and threatened plant species.

Conservation status: Sites sampled on lower sedimentary quartz and basalt soils are examples of 'Lowland Rainforest in NSW North Coast and Sydney Basin Bioregion' EEC. Occurrences on the floodplain are examples of 'Lowland Rainforest on Floodplain in the NSW North Coast Bioregion' EEC. Surveyed sites were in reserves at Cudgera Creek NR and Billinudgel NR.

Significant taxa: *Acalypha eremorum* (TSC: Endangered), *Grevillea hilliana* (TSC: Endangered), *Syzygium moorei* (TSC: Vulnerable), *Archidendron muellerianum* (ROTAP: 3RCa), *Macadamia tetraphylla* (TSC: Vulnerable), *Randia moorei* (TSC: Endangered), *Cassia brewsteri* var. *marksiana* (TSC: Endangered), *Cupaniopsis newmanii* (ROTAP: 2RC-), *Davidsonia jerseyana* (TSC: Endangered), *Cryptocarya foetida* (TSC: Vulnerable), *Endiandra floydii* (TSC: Endangered), *Endiandra muelleri* subsp. *bracteata* (TSC: Endangered), *Endiandra hayesii* (TSC: Vulnerable), *Lepiderema pulchella* (TSC: Vulnerable), *Rhodamnia maideniana* (ROTAP: 2RC-), *Bosistoa transversa* (TSC: Vulnerable), *Cordyline congesta* (ROTAP: 2RC-), *Diospyros major* var. *ebenus* (TSC: Endangered), *Ochrosia moorei* (TSC: Endangered), *Peristeranthus hillii* (TSC: Vulnerable), *Syzygium hodgkinsoniae* (TSC: Vulnerable), *Argophyllum nullumense* (ROTAP: 3RCa), *Endiandra globosa* (ROTAP: 2RC-), *Acronychia baeuerlenii* (ROTAP: 3RC-), *Archidendron hendersonii* (TSC: Vulnerable), *Marsdenia hemiptera* (ROTAP: 3RC-).

Structure

Layer	Height (m)	Cover (%)
Emergent	20–45	20–40
Tallest	10–30	60–95
Middle 1	2–20	30–80
Middle 2	1–10	30–60
Lower 1	0–2	30–80

Floristics

Trees: *Archontophoenix cunninghamiana* (T), *Guioa semiglaucula* (T), *Jagera pseudorhus* var. *pseudorhus* forma *pseudorhus* (T), *Dysoxylum mollissimum* subsp. *molle* (T), *Aphananthe philippinensis* (T), *Flindersia schottiana* (T), *Diospyros pentamera* (T), *Cryptocarya obovata*, *Pouteria queenslandica*, *Endiandra pubens* (T), *Heritiera trifoliolata*, *Elaeocarpus grandis* (E), *Ficus fraseri* (T), *Cupaniopsis newmanii*, *Dysoxylum fraserianum* (T), *Syzygium moorei* (T), *Araucaria cunninghamii* (T), *Synoum glandulosum* subsp. *glandulosum*, *Alphitonia excelsa* (E, T), *Cinnamomum camphora**, *Grevillea hilliana* (T), *Toeckia dasyrrhache* (T), *Diploglottis cunninghamii*, *Glochidion sumatranum*, *Acacia bakeri*, *Commersonia bartramia* (T), *Litsea australis* (T), *Pentaceras australe* (T), *Tabernaemontana pandacaqui*, *Beilschmiedia elliptica*, *Cinnamomum virens*, *Cryptocarya microneura* (T), *Ficus watkinsiana* (E), *Castanospermum australe* (T), *Endiandra discolor*, *Pouteria australis*, *Syzygium francisii*, *Acmena hemilampra* subsp. *hemilampra* (E), *Archidendron hendersonii*, *Cryptocarya foetida*, *Endiandra floydii*, *Ficus virens* var. *sublanceolata* (T), *Flindersia bennettiana* (T), *Flindersia schottiana* (E), *Hodgkinsonia ovatiflora*, *Lophostemon confertus* (E, T), *Mallotus discolor* (T), *Baloghia inophylla* (T), *Cassia brewsteri* var. *marksiana*, *Pouteria chartacea*, *Siphonodon australis*, *Sloanea australis*, *Sterculia quadrifida*, *Elaeocarpus obovatus* (T), *Endiandra hayesii*, *Flindersia australis*, *Ficus obliqua* (T), *Gmelina leichhardtii* (T), *Polyosma cunninghamii*, *Pouteria pohlmanniana* var. *pohlmanniana*, *Cupaniopsis anacardioides*, *Doryphora sassafras*, *Dysoxylum rufum*, *Elaeocarpus kirtonii*, *Litsea reticulata*, *Pseudoweinmannia lachnocarpa*, *Schefflera actinophylla**, *Toona ciliata*, *Cinnamomum oliveri*, *Geissois benthamiana*, *Polyscias elegans*, *Quintinia verdonii*, *Stenocarpus sinuatus*, *Syagrus romanoffiana**.

Shrubs and small trees: *Cryptocarya laevigata* (M1), *Archontophoenix cunninghamiana* (M1), *Wilkiea huegeliana* (M1), *Mallotus philippensis* (M1), *Sarcopteryx stipata* (M1), *Arytera distylis* (M1), *Calamus muelleri* (M1), *Neolitsea*

dealbata (M1), *Flagellaria indica* (M1), *Aphananthe philippinensis* (M1), *Cleistanthus cunninghamii* (M1), *Diospyros pentamera*, *Endiandra globosa* (M1), *Machura cochinchinensis*, *Cryptocarya triplinervis* var. *pubens*, *Ficus coronata* (M1), *Hedraianthera porphyropetala* (M2), *Streblus brunonianus* (M2), *Lepiderema pulchella*, *Macadamia tetraphylla* (M1), *Arytera divaricata* (M1), *Endiandra pubens* (M1), *Randia moorei* (M2), *Endiandra muelleri* subsp. *muelleri* (M1), *Medicosma cunninghamii* (M1), *Mischocarpus pyriformis* subsp. *pyriformis* (M1), *Syzygium luehmannii*, *Harpullia hillii*, *Toechima dasyrrhache* (M1), *Sloanea woollsii* (M1), *Canarium australasicum*, *Drypetes deplanchei*, *Meiogyne stenopetala* subsp. *stenopetala*, *Pittosporum multiflorum*, *Wilkiea macrophylla*, *Pilidiostigma glabrum*, *Croton verreauxii*, *Glochidion ferdinandi* (M1), *Gossia acmenoides* (M2), *Helicia glabriflora*, *Pentaceras australe* (M1), *Psychotria loniceroides*, *Archidendron muellerianum* (M1), *Elattostachys nervosa*, *Neolitsea australiensis*, *Acmena smithii*, *Cryptocarya glaucescens*, *Notelaea longifolia*, *Rhodamnia maideniana*, *Acmena ingens* (M1), *Alangium villosum* subsp. *polyosmoides*, *Anthocarapa nitidula*, *Archidendron hendersonii*, *Capparis arborea*, *Coffea arabica**, *Daphnandra tenuipes* (M1), *Cryptocarya foetida*, *Decaspermum humile*, *Euroschinus falcata* var. *falcata*, *Olea paniculata*, *Acronychia pubescens*, *Archirhodomyrtus beckleri*, *Baloghia inophylla*, *Denhamia celastroides*, *Gossia bidwillii*, *Gossia punctata* (M1), *Pittosporum revolutum*, *Syzygium oleosum* (M1), *Symplocos stawellii*, *Alchornea ilicifolia*, *Ailanthus triphysa*, *Archidendron grandiflorum*, *Atractocarpus chartaceus*, *Carissa ovata*, *Citrus australasica*, *Diospyros major* var. *ebenus*, *Elaeodendron australe*, *Harpullia pendula*, *Lantana camara**, *Ligustrum lucidum*, *Mischocarpus anodontus*, *Notelaea johnsonii*, *Wilkiea austroqueenslandica*, *Acronychia wilcoxiana*, *Argophyllum nullumense*, *Bosistoa pentacocca* var. *pentacocca*, *Celtis paniculata*, *Ligustrum sinense**, *Excoecaria dallachyana*, *Hymenosporum flavum*, *Myrsine variabilis*, *Ochrosia moorei*, *Pararchidendron pruinoseum* var. *pruinoseum*, *Psydrax lamprophylla*, *Rhodamnia rubescens*, *Sarcomelicope simplicifolia* subsp. *simplicifolia*, *Trochocarpa laurina*, *Acalypha eremorum*, *Acronychia bauerlenii*, *Akania bidwillii*, *Alectryon subcinereus*, *Atalaya salicifolia*, *Bosistoa transversa*, *Bridelia exaltata*, *Callicarpa pedunculata*, *Claoxylon australe*, *Clerodendrum tomentosum*, *Cupaniopsis parvifolia*, *Harpullia alata*, *Diospyros fasciculosa*, *Elaeocarpus eumundii*, *Myrsine subsessilis*, *Scolopia braunii*, *Symplocos thwaitesii*, *Syzygium hodgkinsoniae*, *Trema tomentosa* var. *viridis*, *Triunia youngiana*.



Climbers: *Trophis scandens*, *Calamus muelleri* (M1), *Flagellaria indica* (M1), *Smilax australis*, *Callerya megasperma* (M1), *Dioscorea transversa*, *Geitonoplesium cymosum*, *Melodinus australis*, *Cissus antarctica* (M1), *Ripogonum album*, *Cissus hypoglaucha*, *Pothos longipes*, *Morinda jasminoides*, *Carronia multiseptata* (L1), *Austrosteenisia blackii* var. *blackii*, *Derris involuta*, *Pararistolochia praevenosa*, *Rauwenhoffia leichhardtii*, *Stephania japonica* var. *discolor*, *Caesalpinia scortechinii* (M1), *Embelia australiana*, *Mucuna gigantea*, *Cayratia clematidea*, *Ripogonum elseyanum*, *Cissus sterculiifolia*, *Echinostephia aculeata*, *Marsdenia rostrata*, *Melodinus acutiflorus*, *Pandorea jasminoides*, *Pandorea pandorana*, *Ripogonum discolor*, *Sarcopetalum harveyanum*, *Tragia novae-hollandiae*, *Anredera cordifolia**, *Asparagus plumosus**, *Celastrus subspicata*, *Eustrephus latifolius*, *Marsdenia hemiptera*, *Passiflora subpeltata*, *Coelospermum paniculatum*, *Hibbertia scandens*, *Hippocratea barbata*, *Parsonsia fulva*, *Parsonsia straminea*, *Passiflora edulis*, *Passiflora suberosa*.

Epiphytes: *Pothos longipes*, *Peristeranthus hillii*, *Asplenium harmanii*, *Asplenium australasicum* f. *australasicum*, *Platyterium superbum*, *Asplenium attenuatum*.

Ferns: *Adiantum hispidulum* (L1), *Lastreopsis decomposita* (L1), *Lastreopsis marginans* (L1), *Arthropteris tenella* (L1), *Blechnum cartilagineum* (L1), *Lastreopsis munita* (L1), *Cyathea leichhardtiana* (L1), *Doodia caudata* (L1), *Doodia aspera* (L1), *Adiantum diaphanum* (L1), *Adiantum hispidulum* (L1), *Christella dentata*, *Arthropteris beckleri*, *Pellaea nana*, *Adiantum silvaticum*, *Asplenium attenuatum*, *Adiantum formosum*, *Asplenium australasicum* f. *australasicum*, *Pteris tremula*.

Grasses: *Oplismenus undulatifolius* var. *mollis* (L1), *Ottobachloa gracillima*, *Oplismenus imbecillis* (L1), *Paspalum wettsteinii**.

Sedges and rushes: *Cyperus tetraphyllus*, *Exocarya sclerioides*, *Gahnia aspera*, *Lomandra longifolia*, *Lomandra spicata*.

Herbs and shrubs: *Cordyline rubra*, *Dioscorea transversa*, *Actephila lindleyi* (L1), *Alpinia caerulea* (L1), *Ageratina riparia**, *Alpinia caerulea* (L1), *Linospadix monostachya* (M2), *Meiogyne stenopetala* subsp. *stenopetala* (L1), *Alyxia ruscifolia*, *Ochna serrulata**, *Breynia oblongifolia*, *Eupomatia bennettii*, *Homalanthus populifolius*, *Eupomatia laurina*, *Ixora beckleri*, *Atractocarpus chartaceus* (L1), *Alocasia brisbanensis* (L1), *Cordyline petiolaris*, *Dianella caerulea*, *Macaranga tanarius*, *Solanum mauritianum**, *Myrsine variabilis* (L1), *Cordyline congesta*, *Brunoniella spiciflora*, *Bryophyllum delagoense**, *Impatiens walleriana*, *Pseuderanthemum variabile*, *Tasmannia insipida*, *Ageratina adenophora**, *Aneilema acuminatum*, *Hibiscus tiliaceus*, *Polia crispata*, *Senna pendula* var. *glabrata**, *Viola hederacea*.

Number of native taxa: 268

Number of taxa per site: 40–101 (mean 66 ± 17)

Number of exotic taxa: 23

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Acmena ingens</i>	3	13%	0	0%	positive
<i>Adiantum formosum</i>	1	7%	0	0%	positive
<i>Adiantum hispidulum</i>	2	87%	2	7%	positive
<i>Adiantum silvaticum</i>	2	13%	0	0%	positive
<i>Alectryon subcinereus</i>	1	7%	0	0%	positive
<i>Aphananthe philippinensis</i>	3	53%	1	6%	positive
<i>Archontophoenix cunninghamiana</i>	2	73%	2	24%	positive
<i>Arthropteris beckleri</i>	1	7%	0	0%	positive
<i>Arytera distylis</i>	2	73%	2	4%	positive
<i>Asplenium harmanii</i>	2	7%	0	0%	positive
<i>Calamus muelleri</i>	2	73%	2	7%	positive
<i>Callicarpa pedunculata</i>	1	7%	0	0%	positive
<i>Cleistanthus cunninghamii</i>	3	60%	2	3%	positive
<i>Cordyline rubra</i>	2	93%	2	9%	positive
<i>Crypocarya obovata</i>	2	67%	1	7%	positive
<i>Cryptocarya laevigata</i>	3	80%	2	2%	positive
<i>Cupaniopsis newmanii</i>	2	60%	2	2%	positive
<i>Dioscorea transversa</i>	2	80%	2	14%	positive
<i>Diospyros pentamera</i>	2	67%	2	4%	positive
<i>Dysoxylum mollissimum</i> subsp. <i>molle</i>	2	67%	2	5%	positive

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Dysoxylum rufum</i>	2	7%	0	0%	positive
<i>Elaeocarpus eumundii</i>	1	7%	0	0%	positive
<i>Elaeocarpus grandis</i>	5	20%	0	0%	positive
<i>Excoecaria dallachyana</i>	2	7%	0	0%	positive
<i>Ficus coronata</i>	2	53%	1	12%	positive
<i>Flagellaria indica</i>	2	73%	2	15%	positive
<i>Fontainea australis</i>	2	7%	0	0%	positive
<i>Gahnia insignis</i>	1	7%	0	0%	positive
<i>Geissois benthamiana</i>	1	7%	0	0%	positive
<i>Gossia punctata</i>	3	13%	0	0%	positive
<i>Guioa semiglauc</i>	2	87%	1	26%	positive
<i>Hedraianthera porphyropetala</i>	2	60%	2	3%	positive
<i>Hicksbeachia pinnatifolia</i>	2	7%	0	0%	positive
<i>Hymenosporum flavum</i>	1	7%	0	0%	positive
<i>Jagera pseudorhus</i> var. <i>pseudorhus</i> forma <i>pseudorhus</i>	2	73%	1	26%	positive
<i>Legnephora moorei</i>	2	7%	0	0%	positive
<i>Lomandra spicata</i>	2	13%	0	0%	positive
<i>Maclura cochinchinensis</i>	2	60%	2	26%	positive
<i>Mallotus philippensis</i>	2	80%	2	13%	positive
<i>Medicosma cunninghamii</i>	2	40%	0	0%	positive
<i>Melodinus acutiflorus</i>	3	7%	0	0%	positive
<i>Melodinus australis</i>	2	53%	2	7%	positive
<i>Mischocarpus anodontus</i>	2	13%	0	0%	positive
<i>Neolitsea dealbata</i>	2	73%	2	5%	positive
<i>Oplismenus undulatifolius</i> var. <i>mollis</i>	2	73%	2	5%	positive
<i>Parsonsia fulva</i>	1	7%	0	0%	positive
<i>Peristeranthus hillii</i>	3	7%	0	0%	positive
<i>Polia crispata</i>	1	7%	0	0%	positive
<i>Ripogonum album</i>	2	53%	2	5%	positive
<i>Sarcopteryx stipitata</i>	2	80%	1	5%	positive
<i>Smilax australis</i>	2	73%	2	41%	positive
<i>Synoum glandulosum</i>	2	53%	2	13%	positive
<i>Triunia youngiana</i>	2	13%	0	0%	positive
<i>Trophis scandens</i>	2	73%	1	14%	positive
<i>Wilkiea huegeliana</i>	2	93%	2	12%	positive

Community 45 Tweed–Brunswick Valleys Bangalow Palm–Lilly Pilly Subtropical Rainforest

Scientific Name: Tweed–Brunswick Bangalow Palm (*Archontophoenix cunninghamiana*) and Lilly Pilly (*Acmena smithii*) Subtropical Rainforest.

Sites (9) WAR11un, BRU17cbbbf, MUR04lsrh, MUR05lsrh, BRU40cbbbf, BRU42vbrlh, BRU43vbrlh, TWE15lsrh, TWE17albk.

Equivalent communities

Rainforest-Subtropical Rainforest (Keith 2006); Qld Regional Ecosystem 12.11.1 Brush Box Closed Forest in gullies (Young and Dillewaard 1999); 102 – Sub-tropical/Warm Temperate Rainforest on Bedrock Substrates (Kingston *et al.* 2004); Subtropical rainforest on metasediments, and Subtropical rainforest on basalt soils (Landmark Ecological Services 1999); Suballiance 6 – *Archontophoenix–Livistona* (Floyd 1990).

Description

A subtropical rainforest community with emergent Flooded Gum (*Eucalyptus grandis*) and Hoop Pine (*Araucaria cunninghamii*). The tallest layer contains Bangalow Palm (*Archontophoenix cunninghamiana*), Hoop Pine, Strangling Fig (*Ficus watkinsiana*), Cheese Tree (*Glochidion ferdinandi*), Umbrella Cheese Tree (*Glochidion sumatranum*) and a mix of rainforest trees, including Lilly Pilly (*Acmena smithii*), Brown Kurrajong (*Commersonia bartramia*), Pepperberry (*Cryptocarya obovata*), Three-veined Laurel (*Cryptocarya triplinervis*), Myrtle Ebony (*Diospyros pentamera*), Rose Walnut (*Endiandra discolor*), Black Walnut (*Endiandra globosa*), Bennett's Ash (*Flindersia bennettiana*), Red Kamala (*Mallotus philippensis*) and Giant Water Gum (*Syzygium francisii*). There are occasional canopy occurrences of *Eucalyptus* species such as Flooded Gum (*E. grandis*) and Red Gum (*E. tereticornis*). A mid-stratum of small trees and shrubs includes Bangalow Palm, Twin-leaved Googera (*Arytera distylis*), *Cleistanthus cunninghamii*, Sandpaper Fig (*Ficus coronata*) and Burny Vine (*Trophis scandens*). Southern Lawyer Vine (*Calamus muelleri*), Whip Vine (*Flagellaria indica*) and Burny Bean (*Mucuna gigantea*) are common vine species in the mid-stratum. Lower strata consist of the grass *Oplismenus undulatifolius* var. *mollis*, Cunjevoi (*Alocasia brisbanensis*), palm lilies (*Cordyline petiolaris*, *Cordyline rubra*) and Rasp Fern (*Doodia aspera*). This community contains populations of many rare and threatened plant taxa (22), and climbers and twiners are also well represented (40 taxa).



Distribution and Habitat

Habitat: Occurs on gently undulating coastal barrier sandplains near Tyagarah, lower slopes on metamorphic rocks in the Tweed Valley, and on mid-slopes near Urliup.

Disturbance: There is evidence of light to moderate logging, light infestations of weeds, and light to moderate

levels of grazing. There is also evidence of fire at sites MUR04lsrh and BRU40cbbbf (40–60 years prior).

Example locations: Tuckean Broadwater, Urliup Road, Tandys Lane, Charles Bay. A significant remnant is located north of the Tuckean Broadwater.

Conservation

Threats: This is a lower slope community subject to significant threat from clearing, logging, inappropriate fire regimes and invasion by noxious weeds.

Conservation status: The community described here is an example of 'Lowland Rainforest in NSW North Coast and Sydney Basin Bioregion' EEC. Occurrences on the floodplain are examples of 'Lowland Rainforest on Floodplain in the NSW North Coast Bioregion' EEC. One survey site was in Tyagarah NR.

Significant taxa: *Endiandra floydii* (TSC: Vulnerable), *Xylosma terrae-reginae* (TSC: Vulnerable), *Acacia bakeri* (TSC: Endangered), *Acronychia baeuerlenii* (ROTAP: 2RC-), *Archidendron hendersonii* (TSC: Vulnerable), *Endiandra hayesii* (TSC: Vulnerable), *Endiandra muelleri* subsp. *bracteata* (TSC: Endangered), *Lepiderema pulchella* (TSC: Vulnerable), *Cupaniopsis newmanii* (ROTAP: 2RC-), *Cassia brewsteri* var. *marksiana* (TSC: Endangered), *Archidendron muellerianum* (ROTAP: 3RCa), *Dendrocnide moroides* (TSC: Endangered), *Diospyros major* var. *ebenus* (TSC: Endangered), *Endiandra floydii* (TSC: Endangered), *Endiandra globosa* (ROTAP: 2RC-), *Ochrosia moorei* (TSC: Endangered), *Rhodamnia maideniana* (ROTAP: 2RC-), *Syzygium moorei* (TSC: Vulnerable), *Tinospora tinosporoides* (TSC: Vulnerable).

Structure

Layer	Height (m)	Cover (%)
Emergent	25–35	30
Tallest	13–40	30–100
Middle 1	1–25	10–90
Middle 2	1–10	60–70
Lower 1	0–2	20–60

Floristics

Trees: *Archontophoenix cunninghamiana* (T), *Glochidion ferdinandi* (T), *Mallotus philippensis* (T), *Glochidion sumatranum* (T), *Guioa semiglaucula* (T), *Cryptocarya triplinervis*, *Eucalyptus grandis* (E), *Ficus watkinsiana* (T), *Araucaria cunninghamii* (E, T), *Capparis arborea* (T), *Diospyros pentamera* (T), *Endiandra globosa*, *Commersonia bartramia* (T), *Flindersia bennettiana* (T), *Melaleuca quinquenervia* (T), *Syzygium francisi* (T), *Endiandra discolor* (T), *Pseudoweinmannia lachnocarpa* (T), *Stenocarpus sinuatus* (T), *Cryptocarya obovata* (T), *Diploglottis cunninghamii*, *Livistona australis*, *Polyscias elegans*, *Pouteria australis*, *Gossia bidwillii*, *Lophostemon confertus* (T), *Macaranga tanarius* (T), *Cinnamomum camphora**, *Beilschmiedia elliptica*, *Beilschmiedia obtusifolia*, *Ficus obliqua*, *Ficus virens* var. *sublanceolata*, *Pentaceras australe*, *Toeckia dasyrrhache*, *Acacia bakeri*, *Alphitonia excelsa*, *Castanospermum australe*, *Endiandra muelleri* subsp. *bracteata*, *Eucalyptus tereticornis* (T), *Heritiera trifoliolata*, *Arytera divaricata*, *Cryptocarya glaucescens*, *Endiandra muelleri* subsp. *muelleri*, *Podocarpus elatus*, *Siphonodon australis*, *Sloanea australis*, *Syzygium corynanthum*, *Syzygium moorei*, *Emmenosperma alphitonioides*, *Ficus fraseri*, *Flindersia australis*, *Schefflera actinophylla**, *Synoum glandulosum* subsp. *glandulosum*.

Sub-canopy trees: *Archontophoenix cunninghamiana* (M1), *Calamus muelleri* (M1), *Glochidion ferdinandi* (M1), *Arytera distylis* (M1), *Acmena smithii* (M1), *Glochidion sumatranum* (M1), *Cordyline petiolaris* (M1), *Endiandra globosa* (M1), *Syzygium francisi* (M1), *Endiandra floydii* (M1), *Dysoxylum mollissimum* subsp. *molle* (M1), *Alyxia ruscifolia* (M1), *Elaeocarpus obovatus* (M1), *Mischocarpus pyramidalis* subsp. *pyramidalis* (M1), *Dysoxylum fraserianum*.

Shrubs and small trees: *Archontophoenix cunninghamiana* (M2), *Wilkiea huegeliana* (M2), *Lantana camara** (M2), *Ficus coronata*, *Trophis scandens* (M2), *Cleistanthus cunninghamii* (M2), *Diospyros australis*, *Diospyros*

pentamera, *Jagera pseudorhus* var. *pseudorhus* forma *pseudorhus*, *Pittosporum multiflorum*, *Neolitsea dealbata*, *Machura cochinchinensis*, *Pouteria chartacea*, *Aphananthe philippinensis* (M2), *Drypetes deplanchei* (M2), *Elattostachys nervosa*, *Endiandra floydii* (M2), *Melodinus australis*, *Alchornea ilicifolia*, *Archidendron hendersonii* (M2), *Notelaea longifolia*, *Pouteria australis* (M2), *Toeckia dasyrrhache*, *Bridelia exaltata*, *Claoxylon australe*, *Croton verreauxii*, *Cupaniopsis newmanii*, *Elaeocarpus obovatus*, *Rhodamnia rubescens*, *Mischocarpus pyriformis* subsp. *pyriformis*, *Tabernaemontana pandacaqui*, *Cryptocarya laevigata*, *Cupaniopsis parvifolia*, *Endiandra hayesii*, *Harpullia hillii*, *Pilidiostigma glabrum*, *Pittosporum revolutum*, *Psychotria loniceroides*, *Elaeodendron australe* (M2), *Ixora beckleri* (M2), *Sarcopteryx stipata*, *Streblus brunonianus*, *Trochocarpa laurina*, *Xylosma terrae-reginae*, *Acronychia pubescens*, *Acronychia wilcoxiana*, *Archidendron muellerianum*, *Atractocarpus benthamianus*, *Celtis paniculata*, *Clerodendrum tomentosum*, *Cryptocarya microneura*, *Daphnandra tenuipes*, *Denhamia celastroides* (M2), *Hedraianthera porphyropetala*, *Lepiderema pulchella*, *Pouteria myrsinifolia*, *Rhodamnia maideniana*, *Rhodomyrtus psidioides*, *Symplocos thwaitesii*, *Wilkiea austroqueenslandica*, *Acronychia baeuerlenii*, *Akania bidwillii*, *Archidendron grandiflorum*, *Citrus australasica*, *Polyosma cunninghamii*, *Dendrocnide moroides*, *Diospyros major* var. *ebenus*, *Endiandra sieberi*, *Endiandra virens*, *Excoecaria agallocha*, *Ligustrum sinense**, *Ligustrum lucidum**, *Mallotus discolor*, *Maytenus disperma*, *Mischocarpus australis*, *Ochrosia moorei*, *Psychotria simmondsiana*, *Syzygium australe*.

Climbers: *Calamus muelleri* (M2), *Flagellaria indica* (M2), *Cissus antarctica*, *Derris involuta*, *Smilax australis*, *Geitonoplesium cymosum*, *Mucuna gigantea*, *Capparis arborea*, *Dioscorea transversa*, *Pothos longipes*, *Ripogonum elseyanum*, *Morinda jasminoides*, *Ripogonum album*, *Celastrus subspicata*, *Cissus hypoglauca* (M2), *Ipomoea cairica**, *Pandorea jasminoides* (L1), *Stephania japonica*, *Tinospora tinosporoides*, *Austrosteenisia blackii* var. *blackii*, *Diospyros fasciculosa*, *Hippocratea barbata*, *Pararistolochia praevenosa*, *Parsonsia straminea*, *Caesalpinia subtropica*, *Coelospermum paniculatum*, *Embelia australiana*, *Histiopteris incisa*, *Hoya australis* subsp. *australis*, *Marsdenia hemiptera*, *Passiflora edulis**, *Echinostephia aculeata*, *Callerya australis*, *Marsdenia rostrata*, *Tetrastigma nitens*.

Epiphytes: *Asplenium australasicum* f. *australasicum*, *Platynerium superbum*, *Dendrobium bowmanii*, *Plectorrhiza tridentata*.

Grasses: *Oplismenus undulatifolius* var. *mollis* (L1), *Panicum lachnophyllum*, *Oplismenus imbecillis*, *Paspalum wettsteinii**, *Oplismenus aemulus*.

Ferns: *Blechnum cartilagineum*, *Doodia aspera* (L1), *Arthropteris tenella*, *Calochlaena dubia*, *Christella dentata*, *Doodia caudata*, *Hypolepis muelleri*, *Lastreopsis decomposita*, *Lastreopsis marginans*, *Lastreopsis microsora* subsp. *microsora*, *Lastreopsis munita*, *Microsorium scandens*, *Pellaea nana*.

Sedges and rushes: *Lomandra longifolia* (L1), *Gahnia clarkei* (L1), *Gahnia aspera* (L1), *Cyperus tetraphyllus*.

Herbs and shrubs: *Cordyline rubra*, *Cleistanthus cunninghamii* (L1), *Alpinia caerulea* (L1), *Alocasia brisbanensis*, *Pseuderanthemum variabile*, *Cordyline petiolaris* (L1), *Linospadix monostachya*, *Alyxia ruscifolia*, *Lepidozamia peroffskyana*, *Macaranga tanarius*, *Carissa ovata*, *Ageratina riparia**, *Atractocarpus chartaceus*, *Breynia oblongifolia*, *Gymnostachys anceps*, *Meiogyne stenopetala* subsp. *stenopetala* (L1), *Myrsine variabilis*, *Tripladenia cunninghamii*, *Viola banksii*, *Alpinia arundelliana*, *Cheirostylis notialis*, *Crinum pedunculatum*, *Eupomatia bennettii*, *Homalanthus populifolius*, *Jasminum didymum*, *Myrsine subsessilis*, *Ochna serrulata*.

Number of native taxa: 210

Number of taxa per site: 27-85 (mean 58 ± 21)

Number of exotic taxa: 9

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Archontophoenix cunninghamiana</i>	3	89%	2	24%	positive
<i>Calamus muelleri</i>	3	89%	2	8%	positive
<i>Acmena smithii</i>	2	78%	1	14%	positive
<i>Cordyline rubra</i>	2	78%	2	11%	positive
<i>Flagellaria indica</i>	2	78%	2	16%	positive
<i>Mallotus philippensis</i>	2	78%	2	15%	positive
<i>Wilkiea huegeliana</i>	2	78%	2	14%	positive
<i>Arytera distylis</i>	3	67%	2	5%	positive
<i>Asplenium australasicum</i> f. <i>australasicum</i>	2	67%	1	13%	positive
<i>Cordyline petiolaris</i>	2	67%	2	4%	positive
<i>Derris involuta</i>	2	67%	2	5%	positive
<i>Dioscorea transversa</i>	2	67%	2	16%	positive
<i>Geitonoplesium cymosum</i>	2	67%	2	49%	positive
<i>Oplismenus undulatifolius</i> var. <i>mollis</i>	4	67%	2	6%	positive
<i>Smilax australis</i>	2	67%	2	42%	positive
<i>Alpinia caerulea</i>	2	56%	1	10%	positive
<i>Cissus antarctica</i>	3	56%	2	9%	positive
<i>Cryptocarya triplinervis</i>	2	56%	2	5%	positive
<i>Cupaniopsis anacardioides</i>	2	56%	1	34%	positive
<i>Ficus coronata</i>	2	56%	1	13%	positive
<i>Glochdion ferdinandi</i>	4	56%	1	24%	positive
<i>Maclura cochinchinensis</i>	2	56%	2	27%	positive
<i>Pittosporum multiflorum</i>	2	56%	2	5%	positive
<i>Trophis scandens</i>	3	56%	1	15%	positive
<i>Panicum lachnophyllum</i>	3	22%	0	0%	positive
<i>Tinospora tinosporoides</i>	2	22%	0	0%	positive
<i>Dendrobium bowmanii</i>	1	11%	0	0%	positive
<i>Dendrocnide moroides</i>	1	11%	0	0%	positive
<i>Emmenosperma alphitonioides</i>	1	11%	0	0%	positive
<i>Maytenus disperma</i>	1	11%	0	0%	positive
<i>Microsora scandens</i>	2	11%	0	0%	positive
<i>Psychotria simmondsiana</i>	1	11%	0	0%	positive
<i>Syzygium corynanthum</i>	2	11%	0	0%	positive
<i>Xylosma terrae-reginae</i>	3	11%	0	0%	positive

Community 46 Stinging Tree–White Fig–Brush Bloodwood Subtropical Rainforest

Scientific Name: Stinging Tree (*Dendrocnide excelsa*), White Fig (*Ficus virens* var. *sublanceolata*) and Brush Bloodwood (*Baloghia inophylla*) Subtropical Rainforest.

Sites: (1) BIL06vbrh.

Equivalent communities

Rainforest-Subtropical Rainforest (Keith 2006); Qld Regional Ecosystem 12.8.4 Complex notophyll rainforest on basalt and laterised basalt (Young and Dillewaard 1999); 102 – Sub-tropical/Warm Temperate Rainforest on Bedrock Substrates (Kingston *et al.* 2004); Subtropical Rainforest on basalt soils (Landmark Ecological Services 1999); Suballiance 3 – *Cryptocarya obovata*–*Dendrocnide excelsa*–*Ficus* spp.–*Araucaria* (Floyd 1990).

Description

A closed forest community in which Brush Bloodwood (*Baloghia inophylla*) and White Fig (*Ficus virens* var. *sublanceolata*) and Stinging Tree (*Dendrocnide excelsa*) are the most abundant canopy species. A dense mid-layer of sub-canopy trees is also present and includes Ferny-leaf Bosistoa (*Bosistoa pentacocca* var. *pentacocca*), Brown Bolly Gum (*Litsea australis*) and Green Bolly Gum (*Neolitsea australiensis*). A second middle layer of shrubs also occurs, with Veiny Wilkiea (*Wilkiea macrophylla*) and Lantana (*Lantana camara*). The lower layer consists of *Arthropteris tenella*, Lantana, White Supplejack (*Ripogonum album*) and Native Mulberry (*Pipturus argenteus*). The climbing plants *Callerya megasperma* and *Calamus muelleri* are common.

Distribution and Habitat

Habitat: A lower slope basalt site on rolling hills.

Disturbance: Evidence of moderate levels of logging, and light infestation of weeds.

Location: Durobby Creek.

Conservation

Threats: Clearing, logging and weeds.

Conservation status: Not known. Floyd (1990) records Rainforest Suballiance 3 from basalt-enriched alluvial lowland floodplains north from the Manning River. There is very little of this community remaining on the FNC, and it is only known to be reserved in Stotts Island NR.

Significant taxa: None recorded.

Structure

Layer	Height (m)	Cover (%)
Tallest	18–25	70
Middle 1	5–18	60
Middle 2	1–5	65
Lower 1	0–1	40

Floristics

Trees: *Ficus virens* var. *sublanceolata* (T), *Baloghia inophylla* (T), *Dendrocnide excelsa*, *Dysoxylum mollissimum* subsp. *molle*, *Endiandra pubens*, *Cinnamomum virens*, *Cryptocarya obovata*, *Castanospermum australe*.

Shrubs and small trees: *Litsea australis* (M1), *Neolitsea australiensis* (M1), *Wilkia macrophylla* (M2), *Bosistoa pentacocca* var. *pentacocca* (M1), *Harpullia pendula*, *Lantana camara** (M1), *Cryptocarya triplinervis* var. *pubens*, *Hedraianthera porphyropetala*, *Neolitsea dealbata*, *Pipturus argenteus*, *Atractocarpus benthamianus*, *Cryptocarya laevigata*, *Lepiderema pulchella*, *Macaranga tanarius*, *Psychotria loniceroides*, *Sarcopteryx stipata*.

Climbers: *Calamus muelleri* (M1), *Callerya megasperma*, *Carronia multiseptata*, *Geitonoplesium cymosum*, *Sarcopetalum harveyanum*, *Tetrastigma nitens*, *Trophis scandens*, *Dioscorea transversa*, *Passiflora subpeltata**.

Epiphytes: *Asplenium australasicum* f. *australasicum*, *Pothos longipes*.

Ferns: *Arthropteris tenella*, *Asplenium australasicum* f. *australasicum*, *Adiantum hispidulum*.

Grasses: *Oplismenus imbecillis*.

Herbs and shrubs: *Ripogonum album*, *Acalypha capillipes*, *Ageratina riparia**, *Alpinia caerulea*, *Commelina cyanea*, *Cordyline petiolaris*, *Homalanthus populifolius*, *Peperomia blanda* var. *floribunda*.

Number of native species: 45

Number of native taxa per site: 45

Number of exotic taxa: 2

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Atalaya multiflora</i>	3	33%	0	0	positive
<i>Bosistoa selwynii</i>	3	17%	0	0	positive
<i>Bouchardatia neurococca</i>	3	17%	0	0	positive
<i>Citronella moorei</i>	4	17%	0	0	positive
<i>Dendrocnide photinophylla</i>	3	33%	0	0	positive
<i>Diospyros mabacea</i>	3	17%	0	0	positive
<i>Guilfoylia monostylis</i>	1	17%	0	0	positive
<i>Monococcus echinophorus</i>	5	17%	0	0	positive
<i>Notothixos cornifolius</i>	2	17%	0	0	positive
<i>Parsonsia longifolia</i>	3	17%	0	0	positive
<i>Piper novae-hollandiae</i>	1	17%	0	0	positive
<i>Pisonia aculeata</i>	1	17%	0	0	positive
<i>Planchonella myrsinoides</i>	4	17%	0	0	positive

Community 47 Tweed Valley Meta-sediment and Basalt Low-Elevation Subtropical Rainforest

Scientific name: Tweed Valley Moreton Bay Fig (*Ficus macrophylla*), Rough-leaved Elm (*Aphananthe phillipensis*), Myrtle Ebony (*Diospyros pentamera*), Red Kamala (*Mallotus philippinensis*), Brush Bloodwood (*Baloghia inophylla*) and White Booyong (*Heritiera trifoliata*) Subtropical Rainforest on Basalt/Sediments on Rolling Hills.

Sites: (6) MUR01vbrh, TWE21vbrh, TWE24vbrh, MUR08lsrh, MUR09lsrh, MUR10lsrh.

Equivalent communities

Rainforest-Subtropical Rainforest (Keith 2006); Qld Regional Ecosystems 12.8.3 Complex notophyll rainforest on Cainozoic igneous rocks (Young and Dillewaard 1999); Subtropical rainforest on metasediments, and Subtropical rainforest on basalt soils (Landmark Ecological Services 1999); 102 – Sub-tropical/Warm Temperate Rainforest on Bedrock Substrates (Kingston *et al.* 2004); Suballiance 1 – *Argyrodendron trifoliatum* (Floyd 1990).

Description

This community is a closed forest characterised by emergent Moreton Bay Fig (*Ficus macrophylla*) and a tallest strata with White Booyong (*Heritiera trifoliolata*), White Bean (*Ailanthus triphysa*), Rough-leaved Elm (*Aphananthe philippinensis*), Twin-leaved Coogera (*Arytera divaricata*), Myrtle Ebony (*Diospyros pentamera*), Small-leaved Tamarind (*Diploglottis campbellii*), Moreton Bay Fig, Strangling Fig (*Ficus watkinsiana*), Red Kamala (*Mallotus philippensis*), Yellow Carabeen (*Sloanea australis*) and Giant Water Gum (*Syzygium francisii*). A dense sub-canopy of trees includes *Actephila lindleyi*, Bangalow Palm (*Archontophoenix cunninghamiana*), Brush Bloodwood (*Baloghia inophylla*), Shiny-leaved Stinging Tree (*Dendrocnide photinophylla*), Grey Ebony (*Diospyros fasciculosa*), Red Bean (*Dysoxylum mollissimum* subsp. *molle*), Beetroot Tree (*Elatostachys nervosa*), *Hedraianthera porphyropetala* and Cockspur Thorn (*Maclura cochinchinensis*). A mid-layer of small trees and shrubs is often present, with Large-leaved Wilkiea (*Wilkiea macrophylla*), *Capparis arborea*, *Alyxia ruscifolia*, Muskwood (*Alangium villosum* subsp. *polyosmoides*), *Monococcus echinophorus*, and Steelwood (*Sarcopteryx stipata*) being frequent species. The lower stratum is a mix of *Cleistanthus cunninghamii*, *Oplismenus undulatifolius* var. *mollis*, Pastel Flower (*Pseuderanthemum variable*), Palm Lily (*Cordyline petiolaris*) and *Meiogyne stenopetala* subsp. *stenopetala*. Vines are common in all strata, in particular *Calamus muelleri*, *Cissus antarctica*, *Hippocratea barbata* and *Trophis scandens*.



Distribution and Habitat

Habitat: Sheltered lower slopes with metamorphic sedimentary rocks and basalt at Terranorra, Duroby Creek Razorback and the Condong Range.

Disturbance: Infestation by weeds varies from light to moderate, and there is no evidence of fire. Light clearing is evident at sites TWE21vbrh and MUR10lsrh, and light logging at site MUR01vbrh.

Example locations: Farrants Hill, Tom Beatson Outlook, and McCauleys Road.

Conservation

Threats: A lower slope community subject to significant threats from clearing, logging, inappropriate fire regimes and invasion by noxious weeds.

Conservation status: The community described here is an example of 'Lowland Rainforest in NSW North Coast and Sydney Basin Bioregion' EEC.

Significant taxa: *Cryptocarya foetida* (TSC: Vulnerable), *Diploglottis campbellii* (TSC: Endangered), *Grevillea hillianiana*, *Lepiderema pulchella* (TSC: Vulnerable), *Macadamia tetraphylla* (TSC: Vulnerable), *Niemeyera antiloga*, *Randia moorei* (TSC: Endangered), *Syzygium moorei* (TSC: Vulnerable), *Cordyline congesta* (ROTAP: 3RC-), *Endiandra hayesii* (TSC: Vulnerable), *Diospyros major* var. *ebenus*, (TSC: Endangered) *Diospyros mabacea* (TSC: Endangered), *Cupaniopsis newmanii* (ROTAP: 2RC-), *Bosistoa selwynii* (TSC: Vulnerable), *Archidendron hendersonii* (TSC: Vulnerable), *Syzygium hodgkinsoniae* (TSC: Vulnerable), *Acalypha eremorum* (TSC: Endangered), *Rhodamnia maideniana* (ROTAP: 2RC-).

Structure

Layer	Height (m)	Cover (%)
Emergent	20–35	30
Tallest	10–40	80–90
Middle 1	2–30	50–90
Middle 2	1–15	60–70
Lower 1	0–3	10–70

Floristics

Trees: *Heritiera trifoliolata* (T), *Heritiera actinophylla* (M1), *Aphananthe philippinensis* (T), *Diospyros pentamera* (T), *Mallotus philippensis*, *Baloghia inophylla* (M1), *Elattostachys nervosa* (M1), *Ficus watkinsiana* (T), *Syzygium francisii* (M1), *Diploglottis campbellii* (M1), *Ficus macrophylla* (E, T), *Arytera divaricata* (T), *Machura cochinchinensis* (T), *Pouteria queenslandica*, *Syzygium moorei* (T), *Ailanthus triphylla*, *Archontophoenix cunninghamiana* (M1), *Celtis paniculata* (M1), *Dysoxylum mollissimum* subsp. *molle* (M1), *Castanospermum australe* (T), *Cryptocarya foetida* (M1), *Mallotus discolor* (M1), *Grevillea hillianiana*, *Siphonodon australis*, *Atalaya multiflora*, *Ficus virens* var. *sublanceolata* (T), *Pentaceras australe*, *Sloanea woollsi* (T), *Dysoxylum fraserianum* (T), *Planchonella myrsinoides* (M1), *Sloanea australis* (M1), *Bosistoa pentacocca* var. *pentacocca*, *Citronella moorei*, *Cryptocarya obovata*, *Beilschmiedia elliptica*, *Litsea reticulata*, *Mischocarpus pyriformis* subsp. *pyriformis*, *Neolitsea dealbata*, *Toechima dasyrrhache*, *Elaeodendron australe* (M1), *Flindersia schottiana*, *Schefflera actinophylla**, *Syzygium luehmannii*, *Syzygium moorei*, *Endiandra muelleri* subsp. *muelleri*, *Ficus fraseri*, *Guioa semiglaucula*, *Niemeyera antiloga*, *Stenocarpus sinuatus*, *Sterculia quadrifida*, *Toona ciliata*.

Shrubs and small trees: *Actephila lindleyi* (M2), *Diospyros pentamera*, *Machura cochinchinensis* (L1), *Actephila lindleyi*, *Syzygium francisii* (L1), *Arytera divaricata* (L1), *Diploglottis campbellii* (L1), *Hedraianthera porphyropetala*, *Alangium villosum* subsp. *polyosmoides* (M2), *Streblus brunonianus*, *Olea paniculata*, *Celtis paniculata*, *Wilkiea macrophylla*, *Anthocarpa nitidula*, *Arytera distylis*, *Cryptocarya foetida*, *Cryptocarya triplinervis*, *Dendrocnide photinophylla*, *Diospyros fasciculosa*, *Hodgkinsonia ovatiflora*, *Mallotus discolor*, *Akania bidwillii*, *Gossia acmenoides*, *Monococcus echinophorus* (M2), *Randia moorei*, *Drypetes deplanchei*, *Dysoxylum fraserianum*, *Ixora beckleri*, *Pouteria myrsinifolia*, *Alchornea ilicifolia*, *Alectryon tomentosus*, *Bosistoa selwynii* (M2), *Bosistoa transversa* (M2), *Bouchardatia neurococca* (L1), *Croton verreauxii*, *Cupaniopsis newmanii*, *Diospyros mabacea* (M2), *Endiandra hayesii*, *Harpullia alata*, *Mischocarpus australis*, *Pittosporum multiflorum*, *Polyalthia nitidissima*, *Syzygium hodgkinsoniae*, *Alyxia ruscifolia* (M2), *Aurantiarpa rhombifolia*, *Cryptocarya laevigata*, *Elaeodendron australe*, *Endiandra pubens*, *Harpullia hillii*, *Lepiderema pulchella*, *Murraya*

*paniculata**, *Notelaea johnsonii*, *Sarcomelicope simplicifolia* subsp. *simplicifolia*, *Sarcopteryx stipata*, *Atalaya salicifolia*, *Clerodendrum tomentosum*, *Guilfoylia monostylis*, *Jagera pseudorhus* var. *pseudorhus* forma *pseudorhus*, *Pararchidendron pruinosum* var. *pruinoseum**, *Pittosporum revolutum*, *Pouteria chartacea*, *Psychotria loniceroides*, *Psydrax lamprophylla*, *Rhodamnia maideniana*, *Tabernaemontana pandacacui*, *Wilkiea austroqueenslandica*, *Diospyros major* var. *ebenus*.

Climbers: *Cissus antarctica*, *Calamus muelleri* (L1), *Callerya megasperma*, *Hippocratea barbata*, *Pothos longipes*, *Caesalpinia subtropica*, *Derris involuta*, *Rauwenhoffia leichhardtii*, *Ripogonum album*, *Trophis scandens*, *Pandorea jasminoides*, *Carronia multiseptata*, *Flagellaria indica*, *Parsonsia longipetiolata*, *Mucuna gigantea*, *Cayratia acris*, *Dioscorea transversa*, *Ipomoea cairica**, *Marsdenia hemiptera*, *Anredera cordifolia**, *Parsonsia velutina*, *Smilax australis*, *Tetrastigma nitens*, *Cissus sterculiifolia*, *Morinda jasminoides*, *Pararistolochia praevenosa*, *Passiflora suberosa**, *Piper novae-hollandiae*, *Pisonia aculeata*.

Epiphytes: *Platyserium bifurcatum*, *Pyrrosia confluens* var. *confluens*, *Asplenium australasicum* f. *australasicum*.

Misteltoes: *Notothixos cornifolius*.

Ferns: *Arthropteris tenella*, *Lastreopsis microsora* subsp. *microsora*, *Asplenium attenuatum*, *Doodia aspera*, *Pellaea nana*, *Pyrrosia confluens* var. *confluens*, *Adiantum diaphanum*, *Asplenium australasicum* f. *australasicum*, *Lastreopsis decomposita*, *Lastreopsis marginans*.

Grasses: *Oplismenus undulatifolius* var. *mollis*.

Herbs and shrubs: *Cleistanthus cunninghamii* (L1), *Meiogyne stenopetala* subsp. *stenopetala* (L1), *Coffea arabica** (L1), *Hedraianthera porphyropetala* (L1), *Capparis arborea*, *Cordyline petiolaris* (L1), *Castanospermum australe* (L1), *Pseuderanthemum variabile*, *Cordyline rubra*, *Ochna serrulata** (L1), *Linospadix monostachya*, *Monococcus echinophorus*, *Cordyline congesta*, *Rivina humilis**, *Asparagus plumosus**, *Polyalthia nitidissima* (L1), *Carissa ovata*, *Alyxia ruscifolia*, *Asparagus aethiopicus**, *Breynia oblongifolia*, *Protasparagus africanus**.

Number of native species: 155

Number of native taxa per site: 45–68 (mean 57 ± 8)

Number of exotic taxa: 12

Number of indicator taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	class
<i>Actephila lindleyi</i>	3	67%	2	2%	positive
<i>Aphananthe philippinensis</i>	3	100%	2	7%	positive
<i>Baloghia inophylla</i>	3	83%	3	1%	positive
<i>Caesalpinia subtropica</i>	2	67%	2	1%	positive
<i>Calamus muelleri</i>	2	83%	2	9%	positive
<i>Capparis arborea</i>	2	67%	2	4%	positive
<i>Cissus antartica</i>	2	83%	2	9%	positive
<i>Cleistanthus cunninghamii</i>	2	100%	3	4%	positive
<i>Cryptocarya triplinervis</i>	2	67%	2	5%	positive
<i>Diospyros fasciculosa</i>	2	67%	2	2%	positive
<i>Diospyros pentamera</i>	2	100%	2	5%	positive
<i>Elattostachys nervosa</i>	2	83%	1	3%	positive
<i>Hedraianthera porphyropetala</i>	2	67%	2	4%	positive
<i>Heritiera trifoliolata</i>	4	83%	3	2%	positive
<i>Hippocratea barbata</i>	3	67%	2	2%	positive
<i>Maclura cochinchinensis</i>	3	67%	2	27%	positive
<i>Mallotus philippensis</i>	2	100%	2	15%	positive

Species	Group score	Group frequency	Non-group score	Non-group frequency	class
<i>Meiogyne stenopetala</i> subsp. <i>stenopetala</i>	2	83%	3	1%	positive
<i>Pouteria queenslandica</i>	2	83%	3	2%	positive
<i>Streblus brunonianus</i>	2	83%	2	6%	positive
<i>Wilkiea macrophylla</i>	2	100%	2	1%	positive
<i>Neolitsea dealbata</i>	2	67%	2	7%	positive
<i>Pothos longipes</i>	2	67%	2	4%	positive
<i>Pseuderanthemum variabile</i>	2	67%	2	13%	positive
<i>Randia moorei</i>	2	67%	2	3%	positive
<i>Rauwenhoffia leichhardtii</i>	2	67%	1	2%	positive
<i>Trophis scandens</i>	2	67%	2	16%	positive
<i>Alangium villosum</i> subsp. <i>polyosmoides</i>	2	50%	2	1%	positive
<i>Archontophoenix cunninghamiana</i>	3	50%	2	25%	positive
<i>Arytera distylis</i>	2	50%	2	6%	positive
<i>Beilschmiedia elliptica</i>	2	50%	1	3%	positive
<i>Celtis paniculata</i>	2	50%	2	2%	positive
<i>Cordyline rubra</i>	2	50%	2	12%	positive
<i>Derris involuta</i>	2	50%	2	6%	positive
<i>Diploglottis campbellii</i>	3	50%	0	0%	positive
<i>Ficus watkinsiana</i>	3	50%	1	6%	positive
<i>Flagellaria indica</i>	2	50%	2	17%	positive
<i>Hodgkinsonia ovatiflora</i>	2	50%	2	1%	positive
<i>Ixora beckleri</i>	2	50%	2	1%	positive
<i>Linospadix monostachya</i>	2	50%	2	3%	positive
<i>Olea paniculata</i>	3	50%	2	2%	positive
<i>Oplismenus undulatifolius</i> var. <i>mollis</i>	2	50%	2	7%	positive
<i>Pandorea jasminoides</i>	2	50%	2	1%	positive
<i>Ripogonum album</i>	2	50%	2	6%	positive
<i>Syzygium francisii</i>	4	50%	4	1%	positive
<i>Syzygium moorei</i>	2	50%	3	2%	positive
<i>Atalaya multiflora</i>	3	33%	0	0%	positive
<i>Dendrocnide photinophylla</i>	3	33%	0	0%	positive
<i>Bosistoa selwynii</i>	3	17%	0	0%	positive
<i>Bouchardatia neurococca</i>	3	17%	0	0%	positive
<i>Citronella moorei</i>	4	17%	0	0%	positive
<i>Diospyros mabacea</i>	3	17%	0	0%	positive
<i>Guilfoylia monostylis</i>	1	17%	0	0%	positive
<i>Monococcus echinophorus</i>	5	17%	0	0%	positive
<i>Notothixos cornifolius</i>	2	17%	0	0%	positive
<i>Parsonsia longifolia</i>	3	17%	0	0%	positive
<i>Piper novae-hollandiae</i>	1	17%	0	0%	positive
<i>Pisonia aculeata</i>	1	17%	0	0%	positive
<i>Planchonella myrsinoides</i>	4	17%	0	0%	positive

Community 48 Flooded Gum–Pink-flowered Doughwood–Hard Quandong Alluvial Plain Wet Sclerophyll Forest

Scientific name: Flooded Gum (*Eucalyptus grandis*), Pink-flowered Doughwood (*Melicope elleryana*), Hard Quandong (*Elaeocarpus obovatus*) and Harsh Ground Fern (*Hypolepis muelleri*) Alluvial Plain Wet Sclerophyll Forest.

Sites: (4) BRU02alchfl, POT15unfswp, POT10alfan, POT13alfan.

Equivalent communities

Wet Sclerophyll Forests-North Coast Wet Sclerophyll Forests (Keith 2006); Qld Regional Ecosystem 12.3.2 *Eucalyptus grandis* ± *Eucalyptus microcorys* tall open forest with rainforest understorey (Young and Dillewaard 1999); 206 – Flooded Gum Open Forest (Kingston *et al.* 2004); Mixed regrowth (mr)/Wattle (w), and Flooded Gum (fG) (Landmark Ecological Surveys 1999); North-east NSW Forest Ecosystem 26 Coastal Flooded Gum (NPWS 1999).

Description

A wet sclerophyll forest in which Blackwood (*Acacia melanoxylon*), Flooded Gum (*Eucalyptus grandis*), Hard Quandong (*Elaeocarpus obovatus*) and Pink-flowered Doughwood (*Melicope elleryana*) are common in the tallest stratum. Pink-flowered Doughwood, Lantana (*Lantana camara*), Camphor Laurel (*Cinnamomum camphora*) and *Senna pendula* var. *glabrata* dominate the mid-stratum of shrubs and small trees. The ground layer consists of *Ageratum houstonianum*, Harsh Ground Fern (*Hypolepis muelleri*), Blady Grass (*Imperata cylindrica* var. *major*), *Paspalum wettsteinii* and *Setaria sphacelata*. The sites are heavily disturbed by clearing and weeds are abundant in the ground layer.



Distribution and Habitat

Habitat: Low-lying moist sites located on the alluvial plain in riparian zones and creek channels. The community also occurs in freshwater swamps on undifferentiated sediments.

Disturbance: These are heavily disturbed sites with a history of severe logging, clearing and infestation by weeds.

Example locations: Jones Road, Vallances Road, and Billinudgel NR.

Conservation

Threats: Occurrences of Flooded Gum on the alluvial plain are probably poorly reserved. This community qualifies as a northern mesic variation of the River Flat Forest of coastal floodplains EEC.

Conservation status: Under considerable threat from clearing and disturbance from weeds. Sites POT10alfan and POT13alfan are within Billinudgel NR.

Significant taxa: None recorded.

Structure

Layer	Height (m)	Cover (%)
Tallest	3–28	30–40
Middle 1	1–12	20–50
Middle 2	1–2.2	30
Lower 1	0–2	15–95

Floristics

Trees: *Melicope elleryana* (T), *Acacia melanoxylon* (T), *Eucalyptus grandis* (T), *Callistemon salignus* (T), *Cinnamomum camphora** (T), *Cupaniopsis anacardioides*, *Corymbia intermedia* (T), *Ficus obliqua* (T), *Melaleuca quinquenervia* (T), *Synoum glandulosum* subsp. *glandulosum*, *Ficus fraseri*, *Livistona australis*, *Syagrus romanzoffiana**.

Shrubs and small trees: *Melicope elleryana* (M1), *Lantana camara** (L1, M2), *Acacia melanoxylon* (M1), *Elaeocarpus obovatus* (M1), *Senna pendula* var. *glabrata** (M1), *Pittosporum undulatum* (M1), *Glochidion sumatranum* (M1), *Maclura cochinchinensis*, *Callistemon salignus* (M1), *Cinnamomum camphora** (M1), *Elaeocarpus reticulatus*, *Syzygium oleosum* (M1), *Rhynchospora corymbosa* (M2), *Tabernaemontana pandacahui*, *Acmena smithii*, *Archirhodomyrtus beckleri*, *Commersonia bartramia*, *Ficus coronata*, *Pilidiostigma glabrum*, *Jagera pseudorhus* var. *pseudorhus* forma *pseudorhus*, *Rhodomyrtus psidioides*.

Climbers: *Morinda jasminoides*, *Marsdenia rostrata*, *Parsonsia straminea*, *Hibbertia scandens*, *Stephania japonica* var. *discolor*, *Hibbertia scandens*, *Geitonoplesium cymosum*, *Ipomoea cairica**, *Rubus moluccanus* var. *trilobus*.

Ferns: *Hypolepis muelleri* (L1), *Pteridium esculentum* (L1), *Cyathea cooperi*, *Calochlaena dubia*.

Grasses: *Paspalum wettsteinii** (L1), *Setaria sphacelata**, *Imperata cylindrica* var. *major* (L1), *Baccharis halimifolia**, *Paspalum conjugatum**, *Axonopus fissifolius**, *Oplismenus aemulus*, *Paspalum dilatatum**.

Sedges and rushes: *Gahnia clarkei* (L1), *Rhynchospora corymbosa*, *Eleocharis sphacelata*, *Lomandra longifolia*.

Herbs and shrubs: *Ageratum houstonianum**, *Ageratina adenophora**, *Solanum mauritianum**, *Drymaria cordata* subsp. *cordata*, *Gomphocarpus fruticosus**, *Macaranga tanarius*, *Commelina cyanea* (L1), *Ageratina riparia**, *Oxalis purpurea**, *Persicaria dichotoma*, *Gomphocarpus physocarpus**, *Oxalis chnoodes*, *Persicaria strigosa*, *Phytolacca octandra**, *Pratia purpurascens*, *Senna septemtrionalis**, *Solanum capsicoides**, *Verbena incompta**.

Number of native taxa: 51

Number of native taxa per site: 24–36 (mean 32 ± 3)

Number of exotic taxa: 23

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Acacia melanoxylon</i>	3	75%	1	8%	positive
<i>Alphitonia excelsa</i>	3	50%	2	26%	positive
<i>Cupaniopsis anacardioides</i>	3	50%	1	34%	positive
<i>Drymaria cordata</i>	2	50%	3	0%	positive
<i>Elaeocarpus obovatus</i>	2	100%	1	16%	positive
<i>Elaeocarpus reticulatus</i>	2	50%	2	18%	positive
<i>Eleocharis sphacelata</i>	2	25%	0	0%	positive
<i>Eucalyptus grandis</i>	5	50%	3	4%	positive
<i>Gahnia clarkei</i>	3	50%	3	17%	positive
<i>Glochidion sumatranum</i>	3	50%	1	21%	positive
<i>Hypolepis muelleri</i>	4	100%	2	15%	positive
<i>Marsdenia rostrata</i>	2	50%	1	23%	positive
<i>Melicope elleryana</i>	4	100%	2	19%	positive
<i>Morinda jasminoides</i>	2	75%	2	26%	positive
<i>Pittosporum undulatum</i>	2	75%	2	10%	positive
<i>Pteridium esculentum</i>	3	50%	2	20%	positive
<i>Tabernaemontana pandacacui</i>	2	50%	1	9%	positive

Community 49 Camphor Laurel–Forest Red Gum Open to Closed Forest

Scientific Name: Camphor Laurel (*Cinnamomum camphora*) and Forest Red Gum (*Eucalyptus tereticornis*) Open to Closed Forest.

Sites: (4) LIS01vbrh, LIS02vbrh, LIS03vbrh, LIS04lsrh.

Equivalent communities

Wet Sclerophyll Forests-North Coast Wet Sclerophyll Forests (Keith 2006); 1004 – Camphor Laurel Dominant Closed to Open Forests (Kingston *et al.* 2004); Camphor Laurel (cL1, cL2) (Landmark Ecological Surveys 1999).

Description

An open forest in which the exotic Camphor Laurel (*Cinnamomum camphora*) dominates and is occasionally associated with Forest Red Gum (*Eucalyptus tereticornis*), Brush Box (*Lophostemon confertus*) and Pink Bloodwood (*Corymbia intermedia*). Camphor Laurel also co-occurs with other rainforest species, such as Guioa (*Guioa semiglauc*) and Foambark Tree (*Jagera pseudorhus* var. *pseudorhus* forma *pseudorhus*). The middle stratum is also dominated by weeds, including Large-leaved Privet (*Ligustrum lucidum*) and Small-leaved Privet (*Ligustrum sinense*). Some natives are also present, including Red Kamala (*Mallotus philippensis*), *Pittosporum undulatum* and Scrub Turpentine (*Rhodamnia rubescens*). The lower stratum comprises privet seedlings, Blue Couch (*Cynodon dactylon*), *Ottocloa gracillima*, *Paspalum wettsteinii*, *Ochna serrulata*, Fishbone Fern (*Nephrolepis cordifolia*) and *Ardisia crenata*.



Distribution and Habitat

Habitat: Basalt and low sedimentary quartz geology on rolling hills.

Disturbance: This community consists of heavily disturbed sites with infestations of weed species.

Example locations: Near Lismore Golf Course, Saltwater Creek at Mullumbimby, and Mullumbimby cemetery.

Conservation

Threats: This is a lower slope community subject to significant threats from clearing, logging, inappropriate fire regimes and invasion by noxious weeds.

Conservation status: Camphor Laurel forests do contain varying proportions of rainforest species and structure, including threatened plant species. *Davidsonia jerseyana*, an endangered rainforest tree, was recorded at one site (LIS04lsrh).

Significant taxa: *Davidsonia jerseyana* (TSC: Endangered).

Structure

Layer	Height (m)	Cover (%)
Tallest	10–26	40–65
Middle 1	1–10	5–80
Middle 2	1–3	25
Lower 1	0–1	40–95
Lower 2	0–1	85%

Floristics

Trees: *Cinnamomum camphora** (T), *Guioa semiglauc*a, *Ligustrum sinense** (M1), *Jagera pseudorhus* var. *pseudorhus* forma *pseudorhus*, *Eucalyptus tereticornis* (T), *Elaeocarpus obovatus*, *Lophostemon confertus* (T), *Corymbia intermedia* (T), *Cupaniopsis anacardioides*, *Pentaceras australe*, *Alphitonia excelsa*, *Archontophoenix cunninghamiana*, *Eriobotrya japonica**, *Ficus fraseri*, *Flindersia schottiana*, *Jacaranda mimosifolia**, *Pinus elliotii**, *Schinus terebinthifolius**, *Syagrus romanoffiana**.

Shrubs and small trees: *Ligustrum lucidum** (M1), *Guioa semiglauc*a (M1), *Lantana camara** (L1), *Mallotus philippensis* (M1), *Pittosporum undulatum* (M1), *Schefflera actinophylla** (M1), *Maclura cochinchinensis*, *Cestrum nocturnum**, *Euroschinus falcata* var. *falcata*, *Glochidion ferdinandi*, *Rhodamnia rubescens* (M1), *Acacia maidenii*, *Murraya paniculata**, *Pilidistigma glabrum*, *Rhodomyrtus psidioides*, *Trema tomentosa* var. *viridis*, *Banksia integrifolia* subsp. *monticola*, *Celtis sinensis*, *Citrus x taitensis**, *Mischocarpus pyriformis* subsp. *pyriformis*, *Psidium guajava*, *Streblus brunonianus*, *Wilkiea huegeliana*.

Climbers: *Elaeocarpus obovatus*, *Passiflora suberosa**, *Passiflora edulis**, *Passiflora subpeltata**, *Passiflora subpeltata**, *Eustrephus latifolius*, *Asparagus plumosus**, *Derris involuta*, *Dioscorea transversa*, *Geitonoplesium cymosum*, *Hibbertia scandens*, *Araujia sericifera**, *Cissus sterculiifolia*, *Marsdenia rostrata*, *Pandorea pandorana*, *Smilax australis*.

Ferns: *Nephrolepis cordifolia** (L2), *Doodia aspera*, *Adiantum aethiopicum*, *Hypolepis muelleri*, *Pteris tremula*, *Asplenium australasicum* f. *australasicum*.

Grasses: *Oplismenus aemulus*, *Ottocloa gracillima* (L1), *Paspalum wettsteinii** (L1), *Paspalum scrobiculatum**, *Cynodon dactylon* (L1), *Oplismenus imbecillis*, *Paspalidium distans*, *Axonopus compressus**, *Bothriochloa macra*, *Chloris gayana**, *Microlaena stipoides* var. *stipoides*, *Paspalum dilatatum**, *Sporobolus indicus**.

Sedges and rushes: *Cyperus gracilis*, *Lomandra longifolia*, *Scleria mackaviensis*.

Herbs and shrubs: *Ochna serrulata**, *Senna pendula* var. *glabrata** (M1), *Ageratina adenophora**, *Centella asiatica*, *Ambrosia artemisiifolia**, *Cirsium vulgare**, *Rhaphiolepis indica**, *Bidens pilosa**, *Crassocephalum crepidioides**, *Cestrum nocturnum** (M1), *Ageratina riparia**, *Asparagus aethiopicus**, *Caesalpinia decapetala**, *Centipeda minima*, *Commelina cyanea*, *Geranium homeanum*, *Geranium solanderi*, *Hydrocotyle acutiloba*, *Macaranga tanarius*, *Ozothamnus diosmifolius*, *Physalis peruviana**, *Salvia coccinea**, *Solanum capsicoides**, *Solanum mauritianum**, *Solanum nigrum**, *Verbena incompta**, *Desmodium rhytidophyllum*, *Phytolacca octandra**, *Potentilla indica**, *Pratia purpurascens*, *Pterostylis nutans*, *Senecio madagascariensis**, *Sida rhombifolia**, *Solanum pseudocapsicum**.

Number of native species: 62 **Number of taxa per site:** 24–36 (mean 30 ± 5)

Number of exotic taxa: 39

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Banksia integrifolia</i>	1	25%	0	0%	positive
<i>Bothriochloa macra</i>	1	25%	0	0%	positive
<i>Centella asiatica</i>	3	50%	2	12%	positive
<i>Cupaniopsis anacardioides</i>	2	50%	1	34%	positive
<i>Cyperus gracilis</i>	2	50%	2	0%	positive
<i>Elaeocarpus obovatus</i>	2	75%	1	16%	positive
<i>Eucalyptus tereticornis</i>	4	50%	1	10%	positive
<i>Eustrephus latifolius</i>	2	50%	1	10%	positive
<i>Glochidion ferdinandi</i>	2	50%	1	25%	positive
<i>Guioa semiglauc</i>	3	100%	1	28%	positive
<i>Jagera pseudorhus</i> var. <i>pseudorhus</i> forma <i>pseudorhus</i>	2	100%	1	27%	positive
<i>Machura cochinchinensis</i>	2	50%	2	27%	positive
<i>Mallotus philippensis</i>	2	75%	2	16%	positive
<i>Oplismenus aemulus</i>	3	75%	2	14%	positive
<i>Pandorea pandorana</i>	2	75%	1	11%	positive
<i>Pittosporum undulatum</i>	2	100%	2	9%	positive
<i>Pratia purpurescens</i>	2	50%	2	15%	positive
<i>Scleria mackaviensis</i>	2	25%	0	0%	positive

Community 50 Swamp Oak–Forest Red Gum–Broad-leaved Paperbark–Swamp Box Swamp Sclerophyll Woodland to Open Forest

Scientific name: Swamp Oak (*Casuarina glauca*), Forest Red Gum (*Eucalyptus tereticornis*), Broad-leaved Paperbark (*Melaleuca quinquenervia*) and Swamp Box (*Lophostemon suaveolens*) Swamp Sclerophyll Woodland to Open Forest.

Sites (16) BRU07esticd, POT21alfl, POT22alfl, BRU08un, BRU14cbbbf, BRU24cbdne, TWE22allv, TWE23albk, ELL12albk, WOO21unund, WOO26unund, WOO27allv, TAB04alvf, WOO08albk, WOO24unund, WOO05alvf.

Equivalent communities

Forested Wetlands-Coastal Swamp Forests, and Coastal Floodplain Wetlands (Keith 2006); Qld Regional Ecosystem 12.3.5 *Melaleuca quinquenervia* tall open forest on alluvium (Young and Dillewaard 1999); Group 1 Swamp Sclerophyll Forest on Coastal Floodplains, and Group 10 Swamp Sclerophyll Forest on Coastal Sandplains (Keith and Scott 2005); 309 – Coastal Swamp Box Open Forest to Woodland (Kingston *et al.* 2004); F5 – *Eucalyptus tereticornis*–*Eucalyptus intermedia*–*Lophostemon suaveolens* tall to very tall open forest (Pressey and Griffith 1992); Mixed eucalypt spp. (me2) (Landmark Ecological Services 1999); 4013 – *Melaleuca quinquenervia*–*Lophostemon suaveolens*/*Eucalyptus tereticornis* mid-high to very tall, open woodland to closed forest, 3003 – *Lophostemon suaveolens* tall to very tall, open to closed forest, and 3010 – *Lophostemon suaveolens*–*Eucalyptus intermedia*–*E. tereticornis* tall to very tall, open to closed forest (Griffith & Wilson 2007).

Description

An open swamp sclerophyll forest community in which Forest Red Gum (*Eucalyptus tereticornis*) and Swamp Oak (*Casuarina glauca*) are clearly dominant and associated with Swamp Box (*Lophostemon suaveolens*), Pink Bloodwood (*Corymbia intermedia*), Broad-leaved Paperbark (*Melaleuca quinquenervia*), Swamp Mahogany (*Eucalyptus robusta*), Willow Bottlebrush (*Callistemon salignus*) and, rarely, Flooded Gum (*Eucalyptus grandis*). An open to closed mid-stratum of shrubs and small trees is present, including Salwood (*Acacia disparrima* subsp. *disparrima*), which is abundant, with Swamp Box, Foambark Tree (*Jagera pseudorhus* var. *pseudorhus* forma *pseudorhus*), Tuckerroo (*Cupaniopsis anacardioides*), Swamp Oak, Red Ash (*Alphitonia excelsa*), Cockspur Thorn (*Maclura cochinchinensis*), Guioa (*Guioa semiglauca*) and Willow Bottlebrush (*Callistemon salignus*). A second middle stratum of shrubs is also present, in which the weeds Lantana (*Lantana camara*) and *Senna pendula* var. *glabrata* are abundant and occasionally occur with Salwood (*Acacia disparrima* subsp. *disparrima*), Brush Muttonwood (*Myrsine howittiana*) and Large Mock Olive (*Notelaea longifolia*). The grassy ground cover consists of two layers; the dominants are *Ottocloa gracillima*, *Oplismenus aemulus*, Blady Grass (*Imperata cylindrica* var. *major*) and Warrel Grass (*Paspalum wettsteinii*), and which often occur with other herbs, grasses, shrubs and lilies, including *Centella asiatica*, Blue Flax Lily (*Dianella caerulea*), *Entolasia marginata*, *Enydra fluctuans* and Native Violet (*Viola banksii*). The climbing plant Hairy Silkpod (*Parsonsia straminea*) is common.



Distribution and Habitat

Habitat: Alluvial floodplain, backswamp, levees, valley flat, coastal barrier sands on back barrier flat and dunes.

Disturbance: There is evidence of light to moderate impacts of fire (5–30 years previously), light to moderate levels of grazing, light to severe infestation by weeds and, at some sites, light to moderate logging.

Example locations: Brunswick River, Pottsville Environment Park, Old New Brighton Road, New Brighton, Charles Bay, Yarrungully NR, Brandy Arm Creek, between Brandy Arm and Sawpit Creek on the Evans River, and Tuckombil TSR.

Conservation

Threats: This is a lower slope community subject to significant threats from clearing, logging, inappropriate fire regimes and invasion by noxious weeds.

Conservation status: This community is an example of the 'Sub-tropical Coastal Floodplain Forest of the NSW North Coast bioregion' EEC. Site ELL12albk was within Yarrungully NR. This community is probably poorly reserved on the FNC.

Significant taxa: *Polygala linariifolia* TSC-E; *Dendrobium melaleucaphilum* TSC-E

Structure

Layer	Height (m)	Cover (%)
Tallest	8–35	20–60
Middle 1	1–8	10–70
Middle 2	0–2	5–95
Lower 1	0–2	5–95
Lower 2	0–0.3	10–60

Floristics

Trees: *Casuarina glauca* (T), *Acacia disparrima* subsp. *disparrima* (T), *Eucalyptus tereticornis* (T), *Lophostemon suaveolens* (T), *Melaleuca quinquenervia* (T), *Callistemon salignus* (T), *Glochidion ferdinandi*, *Corymbia intermedia* (T), *Guioa semiglauc*, *Elaeocarpus obovatus*, *Eucalyptus grandis* (T), *Excoecaria agallocha* (T), *Glochidion sumatranum*, *Archontophoenix cunninghamiana*, *Bridelia exaltata*, *Commersonia bartramia* (T), *Eucalyptus robusta*, *Ficus obliqua*, *Flindersia schottiana*, *Syagrus romanzoffiana**, *Flindersia bennettiana*, *Synoum glandulosum* subsp. *glandulosum*, *Schefflera actinophylla**, *Streblus brunonianus*, *Callitris columellaris*, *Erythrina vespertilio*, *Eucalyptus microcorys*, *Mallotus philippensis*, *Rivina humilis**, *Toeckia tenax*, *Araucaria cunninghamii*, *Clerodendrum floribundum*, *Erythrina crista-galli**, *Eucalyptus resinifera* subsp. *hemilampra*, *Ficus watkinsiana*, *Livistona australis*.

Shrubs/Small Trees: *Casuarina glauca* (M1), *Acacia disparrima* subsp. *disparrima* (M1), *Lophostemon suaveolens* (M1), *Lantana camara** (M2), *Senna pendula* var. *glabrata** (M2), *Melaleuca quinquenervia* (M1), *Cinnamomum camphora** (M2), *Maclura cochinchinensis* (M1), M2, *Glochidion ferdinandi* (M1), *Cupaniopsis anacardioides* (M1), *Jagera pseudorhus* var. *pseudorhus* forma *pseudorhus* (M1), *Alphitonia excelsa* (M1), *Guioa semiglauc* (M1), *Notelaea longifolia* (M2), *Glochidion sumatranum* (M1), *Melaleuca styphelioides* (M1), *Excoecaria agallocha* (M1), *Acacia melanoxylon*, *Flindersia bennettiana* (M2), *Croton verreauxii* (M2), *Ligustrum sinense**, *Myrsine variabilis*, *Acmena smithii*, *Commersonia bartramia* (M1), *Flindersia schottiana* (M1), *Hibiscus tiliaceus* (M1), *Myoporum acuminatum*, *Myrsine howittiana* (M2), *Psychotria loniceroides*, *Acacia leiocalyx* subsp. *leiocalyx*, *Acronychia oblongifolia* (M2), *Cyclophyllum longipetalum*, *Macaranga tanarius*, *Melaleuca alternifolia*, *Melicope elleryana*, *Pittosporum revolutum*, *Synoum glandulosum* subsp. *glandulosum* (M2), *Acacia maidenii*, *Baccharis halimifolia**, *Cryptocarya triplinervis* var. *triplinervis*, *Exocarpos latifolius*, *Ficus coronata*, *Litsea australis*, *Pittosporum undulatum*, *Ardisia crenata**, *Celtis paniculata*, *Elaeodendron australe*, *Endiandra discolor*, *Endiandra sieberi*, *Euroschinus falcata* var. *falcata*, *Ficus rubiginosa*, *Ficus virens* var. *sublanceolata*, *Jasminum volubile*, *Leptospermum brachyandrum*, *Ligustrum lucidum**, *Melaleuca sieberi*

(M1), *Scolopia braunii*, *Syzygium luehmannii*, *Trema tomentosa* var. *viridis*.

Climbers: *Parsonsia straminea*, *Geitonoplesium cymosum*, *Ipomoea cairica**, *Smilax australis*, *Stephania japonica* var. *discolor*, *Morinda jasminoides* (L1), *Hibbertia scandens*, *Anredera cordifolia**, *Calystegia marginata*, *Cayratia clematidea*, *Coelospermum paniculatum*, *Marsdenia rostrata*, *Eustrephus latifolius*, *Melodinus australis*, *Embelia australiana*, *Glycine clandestina*, *Trophis scandens*.

Epiphytes: *Platycerium superbum*, *Pyrrosia rupestris*, *Platycerium bifurcatum*, *Pyrrosia confluens* var. *confluens*, *Ripogonum album*, *Plectorrhiza tridentata*.

Ferns: *Asplenium australasicum* f. *australasicum*, *Pteridium esculentum* (L1), *Acrostichum speciosum*, *Blechnum indicum*, *Pyrrosia confluens* var. *confluens*, *Pyrrosia rupestris*, *Hypolepis muelleri*, *Nephrolepis cordifolia**.

Grasses: *Ottocloa gracillima* (L1), *Oplismenus aemulus* (L1), *Imperata cylindrica* var. *major* (L1), **Paspalum wettsteinii* (L1), *Entolasia marginata* (L1), *Axonopus compressus** (L1), *Ischaemum australe* (L1), *Papalidium distans* (L1), *Setaria sphacelata**, *Capillipedium spicigerum*, *Hemarthria uncinata*, *Lachnagrostis billardieri* subsp. *billardieri*, *Lomandra filiformis*, *Sacciolepis indica*.

Sedges and rushes: *Lomandra longifolia* (L1), *Gahnia aspera* (L1), *Baumea juncea* (L1), *Carex appressa*, *Cyperus stradbrokeensis*, *Juncus usitatus*, *Cyperus lucidus*, *Cyperus trinervis*.

Herbs and shrubs: *Viola banksii* (L2), *Dianella caerulea* (L1), *Commelina cyanea*, *Pratia purpurascens*, *Enydra fluctuans* (L1), *Dichondra repens*, *Solanum capsicoides**, *Ageratum houstonianum**, *Hibiscus tiliaceus*, *Hydrocotyle acutiloba*, *Ochna serrulata**, *Oxalis radicata*, *Sida rhombifolia**, *Alternanthera denticulata*, *Apium prostratum*, *Dianella longifolia* var. *longifolia*, *Oxalis chnoodes*, *Plectranthus parviflorus*, *Pseuderanthemum variabile*, *Ageratina adenophora**, *Ageratina riparia**, *Asparagus aethiopicus**, *Bidens pilosa**, *Conyza bonariensis**, *Crassocephalum crepidioides**, *Cuphea carthagenensis**, *Polygala japonica*, *Rubus moluccanus* var. *trilobus*, *Rubus parvifolius*, *Senna septemtrionalis**, *Solanum mauritianum**, *Alocasia brisbanensis*, *Alternanthera nana*, *Ambrosia artemisiifolia**, *Artanema fimbriatum*, *Aster subulatus**, *Celtis paniculata*, *Dendrobium melaleucaphilum*, *Gonocarpus chinensis* subsp. *verrucosus*, *Gonocarpus tetragynus*, *Goodenia paniculata*, *Homalanthus populifolius*, *Hybanthus stellarioides*, *Hydrocotyle peduncularis*, *Oxalis exilis*, *Ranunculus inundatus*, *Solanum nigrum**, *Solanum prinophyllum*, *Tradescantia fluminensis**, *Vernonia cinerea* var. *cinerea*, *Viola betonicifolia*, *Wikstroemia indica*.

Number of native taxa: 195

Number of taxa per site 30–59 (mean 39 ± 9)

Number of exotic taxa: 37

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Acacia disparrima</i>	3	69%	2	11%	positive
<i>Acacia leiocalyx</i> subsp. <i>leiocalyx</i>	3	6%	0	0%	positive
<i>Alphitonia excelsa</i>	2	50%	2	25%	positive
<i>Alternanthera denticulata</i>	1	6%	0	0%	positive
<i>Artanema fimbriatum</i>	1	6%	0	0%	positive
<i>Callistemon salignus</i>	3	50%	1	15%	positive
<i>Capillipedium spicigerum</i>	1	6%	0	0%	positive
<i>Casuarina glauca</i>	3	88%	3	19%	positive
<i>Commelina cyanea</i>	2	50%	1	15%	positive
<i>Cupaniopsis anacardioides</i>	2	56%	1	33%	positive
<i>Dendrobium melaleucaphilum</i>	1	6%	0	0%	positive
<i>Dianella caerulea</i>	2	50%	1	28%	positive
<i>Erythrina vespertilio</i>	2	6%	0	0%	positive
<i>Eucalyptus tereticornis</i>	3	56%	1	8%	positive
<i>Geitonoplesium cymosum</i>	2	81%	2	39%	positive
<i>Imperata cylindrica</i>	2	50%	2	20%	positive
<i>Lomandra longifolia</i>	2	56%	2	28%	positive
<i>Lophostemon suaveolens</i>	3	56%	2	21%	positive
<i>Machura cochinchinensis</i>	2	63%	2	26%	positive
<i>Oplismenus aemulus</i>	2	63%	2	13%	positive
<i>Ottobachloa gracillima</i>	4	100%	2	29%	positive
<i>Parsonsia straminea</i>	2	100%	1	42%	positive
<i>Smilax australis</i>	2	63%	2	41%	positive
<i>Stephania japonica</i>	2	50%	1	18%	positive
<i>Viola banksii</i>	2	69%	2	17%	positive

Community 51 Forest Red Gum–Willow Bottlebrush–Camphor Laurel Dry Open Forest

Scientific name: Forest Red Gum (*Eucalyptus tereticornis*), Willow Bottlebrush (*Callistemon salignus*), Camphor Laurel (*Cinnamomum camphora*) and *Ottochloa gracillima* Dry Open Forest.

Sites: (3) BRU29alfl, BRU30estsswp, BRU31estsswp.

Equivalent communities

Forested Wetlands-Coastal Swamp Forests, and Coastal Floodplain Wetlands (Keith 2006); Qld Regional Ecosystem 12.3.3 *Eucalyptus tereticornis* open forest to woodland on alluvial plains (Young and Dillewaard 1999); Group 8 – Subtropical Coastal Floodplain Forest (Keith and Scott 2005); F5 – *Eucalyptus tereticornis*–*Eucalyptus intermedia*–*Lophostemon suaveolens* tall to very tall open forest (Pressey and Griffith 1992); 304 – Coastal Forest Red Gum Open Forest to Woodland (Kingston *et al.* 2004); Mixed eucalypt spp. (mE2) (Landmark Ecological Services 1999).

Description

An open forest community of Forest Red Gum (*Eucalyptus tereticornis*), Broad-leaved Paperbark (*Melaleuca quinquenervia*) and Willow Bottlebrush (*Callistemon salignus*) and a middle stratum of Cockspur Thorn (*Maclura cochinchinensis*), Camphor Laurel (*Cinnamomum camphora*), Small-leaved Privet (*Ligustrum sinense*) and Lantana (*Lantana camara*). The lower layer comprises Blue Couch (*Cynodon dactylon*), Warrel Grass (*Paspalum wettsteinii*), Harsh Ground Fern (*Hypolepis muelleri*), Native Violet (*Viola banksii*) and *Carex maculata*.



Distribution and Habitat

Habitat: Riparian areas on alluvial floodplain and estuarine saline swamps.

Disturbance: There is severe weed infestation at sites, and moderately intense fires (30–40 years perviously). There has been severe clearing and grazing at site BRU29alfl.

Example locations: Grays Lane, Tyagarah Road.

Conservation

Threats: Floodplain occurrences of this community are threatened by clearing, grazing and weed infestation.

Conservation status: Floodplain occurrences of this community are an example of 'Subtropical Coastal Floodplain Forest of the NSW North Coast bioregion' EEC. The community is probably poorly reserved on the FNC.

Significant taxa: None recorded.

Structure

Layer	Height (m)	Cover (%)
Tallest	10–25	20–35
Middle 1	0–2	10–60
Middle 2	0.5–2	10
Lower 1	0–2	5–95

Floristics

Trees: *Eucalyptus tereticornis* (T), *Callistemon salignus* (T), *Melaleuca quinquenervia* (T), *Ficus obliqua*, *Eucalyptus robusta*.

Shrubs and small trees: *Callistemon salignus* (M1), *Ligustrum sinense** (M1), *Cinnamomum camphora** (M1), *Cupaniopsis anacardioides*, *Lantana camara** (M1), *Commersonia bartramia*, *Maclura cochinchinensis* (M1), *Cryptocarya triplinervis* var. *pubens*, *Cyclophyllum longipetalum*, *Ficus coronata*, *Glochidion sumatranum*, *Acacia melanoxylon*, *Acmena smithii*, *Acronychia oblongifolia*, *Bridelia exaltata*, *Croton verreauxii*, *Endiandra discolor*, *Guioa semiglaucula*, *Jagera pseudorhus* var. *pseudorhus* forma *pseudorhus*, *Myrsine howittiana*, *Pittosporum revolutum*, *Rhodomyrtus psidioides*, *Symplocos thwaitesii*, *Wilkiea huegeliana*.

Climbers: *Morinda jasminoides*, *Hibbertia scandens*, *Ipomoea cairica**, *Parsonsia straminea*, *Geitonoplesium cymosum*, *Melodinus australis*, *Smilax australis*, *Embelia australiana*, *Stephania japonica* var. *discolor*.

Epiphytes: *Asplenium australasicum* f. *australasicum*.

Ferns: *Hypolepis muelleri* (L1), *Blechnum indicum*, *Lygodium microphyllum*.

Grasses: *Axonopus fissifolius** (L1), *Paspalum wettsteinii** (L1), *Cynodon dactylon* (L1), *Hemarthria uncinata* (L1), *Paspalum dilatatum** (L1), *Setaria sphacelata**, *Cuphea carthagenensis**, *Bothriochloa decipiens*, *Carex appressa*, *Imperata cylindrica* var. *major*, *Leersia hexandra*, *Ottolochloa gracillima*, *Paspalidium distans*.

Sedges and rushes: *Cyperus brevifolius*, *Fimbristylis dichotoma*, *Cyperus maculata* (L1), *Cyperus sphaeroides*, *Juncus usitatus*, *Lomandra longifolia*.

Herbs and shrubs: *Viola banksii*, *Commelina cyanea*, *Centella asiatica*, *Dichondra repens*, *Ambrosia artemisiifolia**, *Lespedeza juncea* subsp. *sericea*, *Pterostylis baptistii*, *Rubus moluccanus* var. *trilobus*, *Sida rhombifolia**, *Aster subulatus**, *Breynia oblongifolia*, *Cardamine paucijuga*, *Crassocephalum crepidioides**, *Dianella caerulea*, *Enydra fluctuans*, *Goodenia paniculata*, *Hypochaeris microcephala* var. *albiflora**, *Hypochaeris radicata**, *Ochna serrulata**, *Persicaria strigosa*, *Pratia purpurascens*, *Senecio madagascariensis**, *Solanum pseudocapsicum**, *Wikstroemia indica*.

Number of native taxa: 66

Number of taxa per site 32–49 (mean 40 ± 9)

Number of exotic taxa: 19

Indicator native taxa

Species	Group score	Group frequency	Non-group score)	Non-group frequency	Fidelity class
<i>Callistemon salignus</i>	3	100%	2	16%	positive
<i>Centella asiatica</i>	2	100%	2	12%	positive
<i>Commelina cyanea</i>	2	100%	1	16%	positive
<i>Cyperus brevifolius</i>	3	100%	0	0%	positive
<i>Eucalyptus tereticornis</i>	3	100%	1	10%	positive
<i>Viola banksii</i>	3	100%	2	19%	positive
<i>Bothriochloa decipiens</i>	1	50%	0	0%	positive
<i>Cardamine paucijuga</i>	1	50%	0	0%	positive
<i>Carex maculata</i>	3	50%	2	4%	positive
<i>Cyclophyllum longipetalum</i>	2	50%	1	6%	positive
<i>Cynodon dactylon</i>	3	50%	3	5%	positive
<i>Dichroandra repens</i>	2	50%	2	6%	positive
<i>Hemarthria uncinata</i>	3	50%	2	4%	positive
<i>Hibbertia scandens</i>	3	50%	1	28%	positive
<i>Hypolepis muelleri</i>	3	50%	2	16%	positive
<i>Lespedeza juncea</i> subsp. <i>sericea</i>	2	50%	0	0%	positive
<i>Maclura cochinchinensis</i>	3	50%	2	27%	positive
<i>Melaleuca quinquenervia</i>	4	50%	3	39%	positive
<i>Parsonsia straminea</i>	3	50%	1	44%	positive
<i>Pterostylis baptistii</i>	2	50%	0	0%	positive

Community 52 Small-leaved Fig–Hard Quandong–Bangalow Palm Subtropical/Littoral Rainforest on Pleistocene Dunes

Scientific name: Small-leaved Fig (*Ficus obliqua*), Hard Quandong (*Elaeocarpus obovatus*) and Bangalow Palm (*Archontophoenix cunninghamiana*) Subtropical/Littoral Rainforest on Pleistocene Dunes.

Sites: (2) TWE02cbdne, TWE03cbdne.

Equivalent communities

Rainforest-Subtropical Rainforest (Keith 2006); Qld Regional Ecosystem 12.2.2 Mixed microphyll notophyll rainforest on coastal dunes and beaches (Young and Dillewaard 1999); 101 – Littoral Rainforest (Kingston *et al.* 2004); Subtropical rainforest near the coast – littoral rainforest (Landmark Ecological Services 1999).

Description

A rainforest community with Small-leaved Fig (*Ficus obliqua*), White Fig (*Ficus virens* var. *sublanceolata*), Hard Quandong (*Elaeocarpus obovatus*) and Pepperberry (*Cryptocarya obovata*) being the most abundant (cover) species of the tallest stratum. A dense sub-canopy of shrubs and small trees is present, including Bangalow Palm (*Archontophoenix cunninghamiana*), Brown Kurrajong (*Commersonia bartramia*), Pink-flowered Doughwood (*Melicope elleryana*), Sandpaper Fig (*Ficus coronata*) and Small-leaved Privet (*Ligustrum sinense*). A shrub layer with Sandpaper Fig, White Supplejack (*Ripogonum album*) and Small-leaved Privet is also present. The lower stratum includes Palm Lily (*Cordyline congesta*), River Lily (*Crinum pedunculatum*), Small-leaved Privet, Prickly Supplejack (*Ripogonum discolor*) and Native Violet (*Viola banksii*).



Distribution and Habitat

Habitat: Old Pleistocene dunes.

Disturbance: Sites show evidence of light fire disturbance (40–50 years prior), moderate to severe clearing, light to moderate logging, and moderate to severe weed infestation.

Example locations: North of Chinderah Bypass.

Conservation

Threats: This community is threatened by clearing and weed infestation.

Conservation status: Subtropical rainforest on dunes are part of the 'Littoral Rainforest in the NSW North Coast, Sydney Basin and South East Corner Bioregions' EEC. Littoral Rainforest is reserved in Ukerebagh NR, Cudgen NR, Wooyung NR and Billinudgel NR in the study area.

Significant taxa: *Cordyline congesta* (ROTAP: 2RC-), *Cryptocarya foetida* (TSC: Vulnerable).

Structure

Layer	Height (m)	Cover (%)
Tallest	20–35	80
Middle 1	10–18	60–70
Middle 2	1–8	50–60
Lower 1	0–1	30–40

Floristics

Trees: *Ficus obliqua* (T), *Melaleuca quinquenervia*, *Elaeocarpus obovatus* (T), *Melicope elleryana*, *Ficus virens* var. *sublanceolata* (T), *Casuarina glauca* (T), *Cupaniopsis anacardioides*, *Schefflera actinophylla**, *Cryptocarya obovata* (T), *Cinnamomum camphora**, *Cryptocarya foetida*, *Lophostemon suaveolens*, *Dysoxylum mollissimum* subsp. *molle*.

Shrubs and small trees: *Ligustrum sinense** (M1), *Archontophoenix cunninghamiana* (M1), *Ficus coronata* (M2), *Commersonia bartramia* (M1), *Pouteria chartacea* (M1), *Maclura cochinchinensis*, *Glochidion sumatranum* (M1), *Acacia melanoxylon* (M1), *Diospyros pentamera*, *Lantana camara**, *Litsea australis*, *Murraya paniculata**, *Syzygium australe*, *Syzygium luehmannii*, *Cryptocarya triplinervis*, *Diospyros fasciculosa*, *Endiandra discolor*, *Mallotus discolor*, *Morus nigra**, *Psidium cattleianum* var. *cattleianum**, *Myrsine howittiana*, *Psydrax lamprophylla*, *Acmena smithii*, *Alphitonia excelsa*, *Coffea arabica**, *Notelaea longifolia*, *Syagrus romanzoffiana**.

Climbers: *Ripogonum album* (M2), *Smilax australis*, *Flagellaria indica* (M2), *Mucuna gigantea*, *Ripogonum discolor* (L1), *Geitonoplesium cymosum*, *Melodinus australis*, *Trophis scandens*, *Ipomoea cairica**, *Parsonsia straminea*, *Hibbertia scandens*, *Passiflora suberosa**, *Stephania japonica* var. *discolor*.

Epiphytes: *Asplenium australasicum* f. *australasicum*.

Mistletoes: *Amylotheca dictyophleba*.

Ferns: *Asplenium australasicum* f. *australasicum*, *Christella dentata*.

Grasses: *Oplismenus aemulus*.

Sedges and rushes: *Carex breviculmis*.

Herbs and shrubs: *Senna pendula* var. *glabrata** (L1), *Cordyline congesta* (L1), *Ochna serrulata**, *Homalanthus populifolius*, *Macaranga tanarius*, *Crinum pedunculatum* (L1), *Alocasia brisbanensis*, *Solanum seafortianum**.

Number of native taxa: 55

Number of taxa per site 40–54 (mean 47 ± 10)

Number of exotic taxa: 12

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Archontophoenix cunninghamiana</i>	4	67%	2	25%	positive
<i>Carex breviculmis</i>	2	67%	3	1%	positive
<i>Commersonia bartramia</i>	3	100%	2	9%	positive
<i>Cordyline congesta</i>	3	67%	1	13%	positive
<i>Cupaniopsis anacardioides</i>	2	100%	1	34%	positive
<i>Elaeocarpus obovatus</i>	4	67%	1	16%	positive
<i>Endiandra discolor</i>	2	67%	1	8%	positive
<i>Ficus coronata</i>	3	100%	2	13%	positive
<i>Ficus obliqua</i>	6	100%	1	5%	positive
<i>Flagellaria indica</i>	3	67%	2	17%	positive
<i>Geitonoplesium cymosum</i>	2	100%	2	41%	positive
<i>Homalanthus populifolius</i>	2	67%	1	7%	positive
<i>Machura cochinchinensis</i>	2	67%	2	27%	positive
<i>Melaleuca quinquenervia</i>	3	100%	3	39%	positive
<i>Melicope elleryana</i>	3	67%	2	19%	positive
<i>Melodinus australis</i>	2	100%	2	8%	positive
<i>Mucuna gigantea</i>	2	67%	2	3%	positive
<i>Pouteria chartacea</i>	3	67%	2	5%	positive
<i>Ripogonum album</i>	4	67%	2	7%	positive
<i>Smilax australis</i>	3	100%	2	42%	positive
<i>Syzygium australe</i>	2	67%	1	2%	positive
<i>Trophis scandens</i>	2	67%	2	16%	positive
<i>Viola banksii</i>	2	100%	2	19%	positive

Community 53 Patches Beach Broad-leaved Paperbark–Swamp Oak–Cabbage Tree Palm Swamp Sclerophyll Forest on the Alluvial Plain

Scientific name: Patches Beach Broad-leaved Paperbark (*Melaleuca quinquenervia*), Swamp Oak (*Casuarina glauca*) and Cabbage Tree Palm (*Livistona australis*) Swamp Sclerophyll Forest on the Alluvial Plain.

Sites: (4) EMP01alsw, EMP02albk, EMP05albk, EMP04albk.

Equivalent communities

Forested Wetlands-Coastal Swamp Forests, and Coastal Floodplain Wetlands (Keith 2006); Qld Regional Ecosystem 12.3.5 *Melaleuca quinquenervia* on alluvium (Young and Dillewaard 1999); F8 – *Melaleuca quinquenervia* tall to very tall open to closed forest, and F10 – *Casuarina glauca* tall to very tall open to closed forest (Pressey and Griffith 1992); 4099 – *Melaleuca quinquenervia*–*Casuarina glauca* NPWS NSW Coastal Vegetation (Griffith & Wilson 2007); 401 – Broad-leaved Paperbark Closed Forest to Woodland, and 402 – Broad-leaved Paperbark/Swamp Sheoak Closed Forest to Woodland (Kingston *et al.* 2004); Paperbark (PB), Swamp Oak ± Paperbark (sOP) (Landmark Ecological Services 1999); North-east NSW Forest Ecosystems 112 and 143 (NPWS 1999).

Description

An open forest community with emergent Swamp Oak (*Casuarina glauca*) in one site (EMP02albk).

The tallest stratum is a open swamp sclerophyll forest with a mix of Bangalow Palm (*Archontophoenix cunninghamiana*), Broad-leaved Paperbark (*Melaleuca quinquenervia*) and Swamp Oak. A mid-storey of shrubs and small trees is evident, with Blue Lilly Pilly (*Syzygium oleosum*), Sandpaper Fig (*Ficus coronata*), Brush Muttonwood (*Myrsine howittiana*) and Tuckeroo (*Cupaniopsis anacardioides*). Two lower layers are found, consisting of a sparse to dense cover of Cunjevoi (*Alocasia brisbanensis*), *Ottocloa gracillima*, Blady Grass (*Imperata cylindrica* var. *major*), *Carex appressa*, *Cyperus trinervis* and *Enydra fluctuans*.



Distribution and Habitat

Habitat: All sites are located on the alluvial plain, in backswamps and swales.

Disturbance: Sites show evidence of light to moderate disturbance by weeds.

Example locations: All sites are on the alluvial plain adjacent to Holocene dunes at Patches and Beswicks Beaches, south of Ballina.

Conservation

Threats: This community is threatened by clearing, altered drainage patterns and weed infestation.

Conservation status: Locally the floodplain forests of Patches Beach have been extensively cleared and what little remains has had its drainage altered by farming of sugar cane. Occurrences of this community on the alluvial plain are examples of the 'Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney

Basin and South East Corner bioregions' EEC. The surveyed sites for Community 53 were not reserved. Griffith (2005) states that floodplain occurrences of both Broad-leaved Paperbark and Swamp Oak forest communities are poorly reserved. Floodplain occurrences of Broad-leaved Paperbark are reserved at Stotts Island NR, Tuckean NR, Bungawalbyn NR, Yarrungully SCA and Broadwater NP.

Significant taxa: *Cordyline congesta* (ROTAP: 2RC-).

Structure

Layer	Height (m)	Cover (%)
Emergent	20–25	10
Tallest	15–25	20–60
Middle 1	3–15	5–40
Lower 1	0.5–1.5	10–15
Lower 2	0–2	5–80

Floristics

Trees: *Casuarina glauca* (T), *Cupaniopsis anacardioides* (T), *Melaleuca quinquenervia* (T), *Archontophoenix cunninghamiana* (T), *Cinnamomum camphora**, *Livistona australis*, *Cinnamomum virens*, *Clerodendrum tomentosum*, *Corymbia intermedia*, *Elaeocarpus obovatus*, *Eucalyptus tereticornis*, *Ficus macrophylla*, *Ficus watkinsiana*, *Jagera pseudorhus* var. *pseudorhus* forma *pseudorhus*, *Lophostemon suaveolens*.

Shrubs and small trees: *Syzygium oleosum* (M1), *Symplocos thwaitesii*, *Myrsine howittiana* (M1), *Livistona australis* (M1), *Maclura cochinchinensis*, *Ficus coronata* (M1), *Acacia melanoxylon*, *Acrornychia imperforata*, *Alphitonia excelsa*, *Chrysanthemoides monilifera* subsp. *rotundata**, *Cryptocarya triplinervis* var. *triplinervis*, *Diospyros australis*, *Glochidion ferdinandi*, *Guioa semiglaucula*, *Lantana camara**, *Mallotus discolor*, *Melicope elleryana*, *Notelaea longifolia*, *Pittosporum revolutum*, *Rhodomyrtus psidioides*, *Schefflera actinophylla**.

Climbers and twiners: *Ipomoea cairica**, *Marsdenia rostrata*, *Cassytha glabella*, *Cayratia clematidea*, *Cissus hypoglauca*, *Convolvulus erubescens*, *Echinostephia aculeata*, *Flagellaria indica*, *Geitonoplesium cymosum*, *Hibbertia scandens*, *Parsonsia straminea*, *Passiflora subpeltata**, *Smilax australis*, *Solanum seaforthianum**, *Stephania japonica* var. *discolor*, *Trophis scandens*.

Epiphytes: *Platycerium superbus*, *Platycerium bifurcatum*.

Mistletoes: *Amyema cambagei*.

Ferns: *Hypolepis muelleri*, *Platycerium superbum*, *Blechnum indicum*, *Platycerium bifurcatum*, *Pteridium esculentum*, *Pyrrosia confluens* var. *confluens*.

Grasses: *Imperata cylindrica* var. *major* (L1), *Ottocloa gracillima* (L1), *Panicum pygmaeum*, *Oplismenus aemulus* (L1), *Entolasia marginata*, *Paspalum wettsteinii**, *Phragmites australis*.

Sedges and rushes: *Carex appressa* (L1), *Cyperus trinervis* (L1), *Gahnia aspera*, *Lomandra longifolia*, *Baumea juncea*.

Herbs and shrubs: *Alocasia brisbanensis* (M2), *Cheirostylis notialis*, *Dianella caerulea*, *Rivina humilis** (M2), *Viola banksii* (L1), *Enydra fluctuans* (L1), *Ageratum houstonianum**, *Alternanthera denticulata*, *Aster subulatus**, *Baccharis halimifolia**, *Breynia oblongifolia*, *Centella asiatica*, *Commelina cyanea*, *Cryptostylis subulata*, *Cuphea carthagenensis**, *Dichondra repens*, *Eclipta prostrata*, *Homalanthus populifolius*, *Ochna serrulata**, *Opuntia stricta**, *Persicaria hydropiper*, *Senna pendula* var. *glabrata**, *Solanum nigrum**, *Wikstroemia indica*, *Xanthium italicum**.

Number of native taxa: 80

Number of taxa per site: 30–37 (mean 34 ± 3)

Number of exotic taxa: 19

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Casuarina glauca</i>	3	100%	3	21%	positive
<i>Cupaniopsis anacardioides</i>	3	100%	1	34%	positive
<i>Livistona australis</i>	3	100%	1	15%	positive
<i>Alocasia brisbanensis</i>	3	75%	1	6%	positive
<i>Archontophoenix cunninghamiana</i>	4	50%	2	25%	positive
<i>Ficus coronata</i>	3	50%	2	13%	positive
<i>Oplismenus aemulus</i>	2	50%	2	15%	positive
<i>Platycerium superbum</i>	2	50%	1	8%	positive
<i>Convolvulus erubescens</i>	1	25%	0	0%	positive
<i>Panicum pygmaeum</i>	3	25%	0	0%	positive

Community 54 Whalebone Tree–Thorny Pea–Sweet Myrtle Dry Rainforest

Scientific name: Whalebone Tree (*Streblus brunonianus*), Croton *verreauxii*, Thorny Pea (*Desmodium acanthocladum*) and Sweet Myrtle (*Gossia fragrantissima*) Dry Rainforest.

Sites: (2) WAR39allv, WAR40afl.

Equivalent communities

Rainforests-Dry Rainforests (Keith 2006); 103 – Dry Rainforest (Kingston *et al.* 2004); Suballiance 25 – *Streblus*–*Austromyrtus* (Floyd 1990).

Description

This community is riparian dry rainforest with emergent Forest Red Gum (*Eucalyptus tereticornis*) and Swamp Oak (*Casuarina glauca*). The tallest stratum is dominated by Whalebone Tree (*Streblus brunonianus*), Rough-leaved Elm (*Aphananthe philippinensis*) and Small-leaved Tuckeroo (*Cupaniopsis parvifolia*). There is a middle stratum of Whalebone Tree, Green Native Cascarilla (*Croton verreauxii*), Thorny Pea (*Desmodium acanthocladum*), Sweet Myrtle (*Gossia fragrantissima*), Cockspur Thorn (*Maclura cochinchinensis*) and Orange Thorn (*Pittosporum multiflorum*). The lower layer is comprised of *Oplismenus imbecillis*, Kidney Weed (*Dichondra repens*) and Pastel Flower (*Pseuderanthemum variabile*).



Distribution and Habitat

Habitat: A riparian rainforest found along stream banks subjected to flooding, on fertile basaltic alluvial soils (Floyd 1990). The presence of Swamp Oak (*Casuarina glauca*) may indicate a subsaline ground-water influence at the site.

Disturbance: Sites have been subject to moderate grazing, and light to moderate infestations of weeds.

Example locations: Ruthven Recreation Reserve.

Conservation

Threats: Clearing and grazing.

Conservation status: This community is 'Lowland Rainforest on Floodplain in NSW North Coast and Sydney Basin Bioregion' EEC. Occurrences of rainforest on the floodplain are poorly reserved and under considerable threat. Suballiance 25 – *Streblus*–*Austromyrtus* is restricted in occurrence and it is not known to be reserved.

Significant taxa: *Gossia fragrantissima* (TSC: Endangered), *Desmodium acanthocladum*, (TSC: Vulnerable), *Syzygium hodgkinsonia*, (TSC: Vulnerable).

Structure

Layer	Height (m)	Cover (%)
Emergent	20–30	5
Tallest	10–25	15–60
Middle 1	1–12	10–50
Lower 1	1–2	30
Lower 2	0–0.3	5–40

Floristics

Trees: *Streblus brunonianus* (T), *Casuarina glauca* (E), *Aphananthe philippinensis* (T), *Cupaniopsis parvifolia* (T), *Eucalyptus tereticornis* (E).

Shrubs and small trees: *Desmodium acanthocladum* (M1), *Croton verreauxii* (M1), *Gossia fragrantissima*, *Pittosporum multiflorum* (M1), *Alchornea ilicifolia*, *Atractocarpus chartaceus*, *Callistemon salignus*, *Cryptocarya triplinervis* var. *triplinervis*, *Cyclophyllum longipetalum*, *Diospyros australis*, *Elaeodendron australe*, *Syzygium hodgkinsoniae*.

Climbers and twiners: *Ipomoea cairica**, *Maclura cochinchinensis*, *Geitonoplesium cymosum*, *Austrosteenisia glabristyla*, *Macfadyena unguis-cati**, *Parsonsia straminea*.

Grasses: *Oplismenus imbecillis* (L1), *Oplismenus aemulus* (L1), *Microlaena stipoides* var. *stipoides*.

Sedges and rushes: *Isolepis cernua*.

Herbs and shrubs: *Pseuderanthemum variabile*, *Jasminum volubile*, *Capparis arborea*, *Commelina cyanea*, *Dichondra repens*, *Eryngium expansum*, *Asparagus plumosus**, *Ochna serrulata**, *Plectranthus parviflorus*, *Rostellularia obtusa*, *Solanum americanum**.

Number of native taxa: 32

Number of taxa per site 25–27 (mean 25.5 ± 2)

Number of exotic taxa: 6

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Aphananthe philippinensis</i>	3	100%	2	8%	positive
<i>Casuarina glauca</i>	3	100%	3	22%	positive
<i>Croton verreauxii</i>	2	100%	2	8%	positive
<i>Desmodium acanthocladum</i>	4	100%	0	0%	positive
<i>Geitonoplesium cymosum</i>	2	100%	2	41%	positive
<i>Gossia fragrantissima</i>	3	100%	0	0%	positive
<i>Jasminum volubile</i>	2	100%	2	2%	positive
<i>Machura cochinchinensis</i>	3	100%	2	27%	positive
<i>Oplismenus imbecillis</i>	4	100%	2	10%	positive
<i>Pseuderanthemum variabile</i>	2	100%	2	13%	positive
<i>Streblus brunonianus</i>	4	100%	2	7%	positive
<i>Alchornea ilicifolia</i>	2	50%	2	3%	positive
<i>Atractocarpus chartaceus</i>	2	50%	1	1%	positive
<i>Austrosteenisia glabristyla</i>	3	50%	1	1%	positive
<i>Capparis arborea</i>	2	50%	2	5%	positive
<i>Commelina cyanea</i>	2	50%	1	16%	positive
<i>Cupaniopsis parvifolia</i>	3	50%	1	5%	positive
<i>Dichondra repens</i>	2	50%	2	6%	positive
<i>Eryngium expansum</i>	1	50%	0	0%	positive
<i>Pittosporum multiflorum</i>	2	50%	2	6%	positive

Community 55 Grey Ironbark–Pink Bloodwood–White Mahogany Dry Grassy Open Forest

Scientific Name: Grey Ironbark (*Eucalyptus siderophloia*), Pink Bloodwood (*Corymbia intermedia*) and White Mahogany (*Eucalyptus carnea*) Dry Grassy Open Forest.

Sites: (9) BYR24cbdne, WAR28cbrdg, CUD04lsrh, CUD17lsrh, POT28 lsrh, CUD10lsrh, WAR16hsrlh, POT32lsrh, WAR53vbrlh.

Equivalent communities

Wet Sclerophyll Forest-Northern Hinterland Wet Sclerophyll Forest (Keith 2006); Qld Regional Ecosystem 12.11.5 Mixed tall open forest on metasediments (Young and Dillewaard 1999); 3015 – *Eucalyptus intermedia*–*E. siderophloia*–*E. tereticornis* tall to very tall, open to closed forest, and 3509 – *Eucalyptus siderophloia*–*E. propinqua*–*E. acmenoides*/*E. carnea* tall to very tall, open to closed forest NPWS NSW Coastal Vegetation (Griffith & Wilson 2007); 202 – Grey Ironbark/White Mahogany/Grey Gum Open Forest Complex (Kingston *et al.* 2004); Grey Ironbark–Pink Bloodwood (gIB) (Landmark Ecological Services 1999); CASov22.1 *Eucalyptus carnea* *Corymbia intermedia* (Binns 1995b).

Description

This community is a lower slope dry open forest. Grey Ironbark (*Eucalyptus siderophloia*) is the most abundant canopy species, and is associated with White Mahogany (*Eucalyptus carnea*), Pink Bloodwood (*Corymbia intermedia*), Blackbutt (*Eucalyptus pilularis*) and, occasionally, Brush Box (*Lophostemon confertus*), Swamp Box (*Lophostemon suaveolens*) and, rarely, Small-fruited Grey Gum (*Eucalyptus propinqua*). An understorey of small trees and shrubs includes Forest Oak (*Allocasuarina torulosa*), Brush Box and Red Ash (*Alphitonia excelsa*). The lower stratum includes grasses such as *Ottocloa gracillima*, Blady Grass (*Imperata cylindrica* var. *major*), *Entolasia stricta*, Kangaroo Grass (*Themeda australis*) and *Oplismenus aemulus*, shrubs (e.g. *Desmodium rhytidophyllum*), lilies (e.g. *Dianella caerulea*), mat-rushes (e.g. *Lepidosperma laterale*, Spiny-headed Mat-rush [*Lomandra longifolia*], *Lomandra multiflora* subsp. *multiflora*), herbs (e.g. Pastel Flower [*Pseuderanthemum variabile*]) and ferns (e.g. Bracken Fern [*Pteridium esculentum*]).

Distribution and Habitat

Habitat: Upper to mid-slopes on low-elevation, rolling coastal hills on shallow soils or exposed aspects on sedimentary low rolling hills and basalt hills in the Blackwall and Burringbar Ranges.

Disturbance: Sites show the effects of light to moderate fires (5–30 years previously), light to moderate logging and grazing, and light to moderate infestations by weeds.

Example locations: Broken Head Road, Jali Lands at Wardell, Koala Beach, Clothiers Creek Road, Sleepy Hollow, Gahan Road at Wardell, and Wardell Trig.



Conservation

Threats: Clearing and grazing.

Conservation status: Probably well reserved, except for lower slope occurrences outside of public land. Survey sites were reserved in Cudgen NR and Cudgera Creek NR.

Significant taxa: *Scleria rugosa* (Rare).

Structure

Layer	Height (m)	Cover (%)
Tallest	10–40	20–70
Middle 1	1–15	5–70
Middle 2	1–3	5
Lower 1	0–1	5–80
Lower 2	0–0.4	30

Floristics

Trees: *Corymbia intermedia* (T), *Eucalyptus siderophloia* (T), *Eucalyptus carnea* (T), *Lophostemon confertus* (T), *Eucalyptus pilularis* (T), *Allocasuarina torulosa* (M1), *Lophostemon suaveolens* (M1), *Corymbia gummifera* (T), *Cinnamomum camphora**, *Allocasuarina littoralis* (T), *Flindersia schottiana*, *Mallotus philippensis*, *Eucalyptus microcorys* (M1), *Eucalyptus signata* (T), *Jagera pseudorhus* var. *pseudorhus* forma *pseudorhus*, *Archontophoenix cunninghamiana*, *Clerodendrum tomentosum*, *Elaeocarpus obovatus*, *Ficus macrophylla*, *Syncarpia glomulifera*.

Shrubs and small trees: *Lantana camara** (M1), *Xanthorrhoea macronema* (M1), *Alphitonia excelsa*, *Elaeocarpus reticulatus* (M1), *Acacia melanoxydon*, *Trochocarpa laurina* (M2), *Notelaea longifolia*, *Bursaria spinosa* (M1), *Cupaniopsis anacardioides*, *Synoum glandulosum* subsp. *glandulosum* (M1), *Acacia disparrima* subsp. *disparrima*, *Chrysanthemoides monilifera* subsp. *rotundata**, *Guioa semiglaucula*, *Leptospermum polygalifolium* subsp. *cismontanum*, *Melicope elleryana*, *Acacia longissima*, *Archirhodomyrtus beckleri*, *Cyclophyllum longipetalum*, *Denhamia celastroides*, *Endiandra sieberi*, *Ficus coronata*, *Glochidion ferdinandi*, *Jacksonia scoparia*, *Leucopogon juniperinus*, *Maclura cochinchinensis*, *Myrsine variabilis*, *Pittosporum undulatum*, *Psychotria loniceroides*, *Pultenaea villosa*, *Tabernaemontana pandacacui*, *Trema tomentosa* var. *viridis*.

Climbers and twiners: *Smilax australis*, *Hibbertia scandens*, *Hardenbergia violacea*, *Geitonoplesium cymosum*, *Passiflora subpeltata**, *Eustrephus latifolius*, *Stephania japonica* var. *discolor*, *Passiflora suberosa**, *Morinda jasminoides*, *Parsonia straminea*, *Cynanchum carnosum*, *Glycine clandestina*, *Glycine microphylla*, *Hibbertia dentata*, *Marsdenia rostrata*, *Pandorea pandorana*, *Smilax glycyphylla*, *Cissus hypoglaucula*, *Echinostephia aculeata*, *Glycine tabacina*, **Ipomoea cairica*, *Passiflora foetida* var. *hispida**.

Epiphytes: *Psilotum nudum*.

Ferns: *Pteridium esculentum* (L1), *Acrostichum speciosum* (M1), *Cheilanthes sieberi*, *Calochlaena dubia*, *Adiantum hispidulum*, *Blechnum cartilagineum*, *Psilotum nudum*, *Schizaea dichotoma*.

Grasses: *Themeda australis* (L1), *Imperata cylindrica* var. *major* (L1), *Ottocloa gracillima* (L1), *Entolasia stricta* (L1), *Cymbopogon refractus* (L2), *Oplismenus aemulus*, *Oplismenus imbecillis*, *Paspalum wettsteinii**, *Panicum simile*, *Capillipedium parviflorum* (L1), *Aristida vagans*, *Digitaria parviflora*, *Ischaemum australe*, *Melinis minutiflora**, *Paspalidium distans**, *Paspalidium gracile*, *Echinopogon ovatus*, *Entolasia marginata*, *Eragrostis benthamii*, *Phragmites australis*.

Sedges and rushes: *Lomandra longifolia* (L1), *Lomandra multiflora* subsp. *multiflora*, *Lepidosperma laterale* (L1), *Lomandra filiformis* (L2), *Gahnia aspera*, *Lomandra confertifolia* subsp. *pallida*, *Lomandra glauca*.

Herbs and shrubs: *Dianella caerulea*, *Desmodium rhytidophyllum* (L2), *Pseuderanthemum variabile* (L1), *Goodenia*

rotundifolia, *Hibbertia aspera* (L1), *Austromyrtus dulcis*, *Pratia purpurascens*, *Vernonia cinerea*, *Desmodium gunnii*, *Brenya oblongifolia*, *Brunoniella australis*, *Dodonaea triquetra* (M1), *Senna pendula* var. *glabrata**, *Ageratina adenophora**, *Alyxia ruscifolia*, *Leucopogon lanceolatus* var. *gracilis* (M1), *Lilaeopsis polyantha* (L1), *Bacopa monnieri* (L1), *Banksia oblongifolia*, *Brunoniella pumilio*, *Chorizema parviflorum*, *Cryptostylis erecta*, *Dampiera stricta*, *Desmodium brachypodium*, *Dipodium variegatum*, *Gomphocarpus fruticosus**, *Hybanthus stellarioides*, *Hydrocotyle acutiloba*, *Homalanthus populifolius*, *Lobelia gibbosa*, *Logania pusilla*, *Monotoca scoparia*, *Wikstroemia indica*, *Ageratum houstonianum**, *Alternanthera denticulata*, *Apium prostratum*, *Arthrochilus prolixus*, *Bidens pilosa**, *Chamaecrista nomame* var. *nomame*, *Cordyline stricta*, *Crinum pedunculatum*, *Cryptostylis subulata*, *Daviesia ulicifolia* subsp. *ulicifolia*, *Dendrobium linguiforme*, *Desmodium varians*, *Dichondra repens*, *Geranium solanderi*, *Gymnostachys anceps*, *Hibbertia linearis*, *Hovea acutifolia*, *Hydrocotyle peduncularis*, *Lomatia silaifolia*, *Macaranga tanarius*, *Oxalis chnoodes*, *Oxalis exilis*, *Patersonia glabrata*, *Patersonia sericea*, *Persoonia stradbrokeensis*, *Plectranthus parviflorus*, *Polyscias sambucifolia*, *Solanum mauritianum**, *Solanum nigrum**, *Verbena hispida**, *Veronica calycina*, *Veronica plebeia*, *Xanthosia pilosa*.

Number of native taxa: 176

Number of taxa per site: 29–67 (mean 41 ± 11)

Number of exotic taxa: 17

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Austromyrtus dulcis</i>	3	100%	2	15%	positive
<i>Dianella caerulea</i>	2	100%	1	29%	positive
<i>Elaeocarpus reticulatus</i>	4	100%	2	18%	positive
<i>Entolasia stricta</i>	4	100%	2	13%	positive
<i>Goodenia rotundifolia</i>	2	100%	2	1%	positive
<i>Lepidosperma laterale</i>	3	100%	2	2%	positive
<i>Lomandra longifolia</i>	3	100%	2	29%	positive
<i>Lomandra multiflora</i> subsp. <i>multiflora</i>	3	100%	1	7%	positive
<i>Pteridium esculentum</i>	3	100%	2	20%	positive
<i>Smilax australis</i>	2	100%	2	42%	positive
<i>Allocasuarina littoralis</i>	5	50%	1	3%	positive
<i>Aristida vagana</i>	2	50%	2	1%	positive
<i>Banksia oblongifolia</i>	2	50%	2	3%	positive
<i>Brunoniella pumilio</i>	2	50%	2	0%	positive
<i>Corymbia gummifera</i>	3	50%	1	0%	positive
<i>Corymbia intermedia</i>	3	50%	3	16%	positive
<i>Dampiera stricta</i>	2	50%	2	1%	positive
<i>Dodonaea triquetra</i>	2	50%	2	2%	positive
<i>Eucalyptus carnea</i>	3	50%	3	2%	positive
<i>Eucalyptus siderophloia</i>	3	50%	3	9%	positive
<i>Hibbertia aspera</i>	3	50%	1	1%	positive
<i>Leptospermum polygalifolium</i> subsp. <i>cismontanum</i>	2	50%	1	1%	positive
<i>Leucopogon lanceolatus</i> var. <i>gracilis</i>	2	50%	1	7%	positive
<i>Monotoca scoparia</i>	2	50%	1	1%	positive
<i>Smilax glyciphylla</i>	2	50%	1	8%	positive
<i>Synoum glandulosum</i>	3	50%	2	14%	positive
<i>Veronica calycina</i>	1	50%	0	0%	positive

Community 56 Broad-leaved Paperbark–Swamp Box–Tuckeroo Swamp Sclerophyll Open Forest

Scientific name: Broad-leaved Paperbark (*Melaleuca quinquenervia*), Swamp Box (*Lophostemon suaveolens*) and Tuckeroo (*Cupaniopsis anacardioides*) Swamp Sclerophyll Open Forest.

Sites: (4) ELL01albk, ELL02alvf, ELL03lsrlh, WAR15lsrh.

Equivalent communities

Forested Wetlands-Coastal Swamp Forests, and Coastal Floodplain Wetlands (Keith 2006); Qld Regional Ecosystem 12.3.5 *Melaleuca quinquenervia* on alluvium (Young and Dillewaard 1999); 401 – Broad-leaved Paperbark Closed Forest to Woodland (Kingston *et al.* 2004); F8 – *Melaleuca quinquenervia* tall to very tall open to closed forest (Pressey and Griffith 1992); 40031/2 *Melaleuca quinquenervia* forest and woodland (Griffith & Wilson 2007); CASf24, *Lophostemon suaveolens* *Melaleuca quinquenervia*, and CASf25 *Eucalyptus tereticornis* *Lophostemon suaveolens* (Binns 1995b); North-east NSW Forest Ecosystem 112 Paperbark (NPWS 1999).

Description

This is a swamp sclerophyll forest community with emergent Swamp Oak (*Casuarina glauca*). The tallest stratum comprises Broad-leaved Paperbark (*Melaleuca quinquenervia*), Tuckeroo (*Cupaniopsis anacardioides*), Swamp Oak and Swamp Box (*Lophostemon suaveolens*). There are two middle strata: one is a layer of small trees, the other a layer of shrubs. The dominant species in the mid-strata include Blue Lilly Pilly (*Syzygium oleosum*), Cabbage Tree Palm (*Livistona australis*), Sandpaper Fig (*Ficus coronata*), Buff Hazelwood (*Symplocos thwaitesii*) and Camphor Laurel (*Cinnamomum camphora*). The lower layer of shrubs includes Cunjevoi (*Alocasia brisbanensis*), Coral Berry (*Rivina humilis*), Lantana (*Lantana camara*) and Brush Muttonwood (*Myrsine howittiana*). Grasses (e.g. *Oplismenus aemulus*, *Ottochloa gracillima*), herbs (e.g. *Viola hederacea*) and ferns (e.g. *Hypolepis muelleri*) are dominant in the ground layer.



Distribution and Habitat

Habitat: This community was found at the upper limit of the alluvial backplain of Bora Creek, and also at a site on low sedimentary quartz soils on rolling low hills.

Disturbance: The sites have been subject to moderate fire damage (fire 10–30 years previously). light infestations of weeds, and light grazing. There is evidence of light clearing at site WAR15lsrh.

Example locations: West of Bora Ridge, and Tuckean Broadwater.

Conservation

Threats: Threatened by clearing.

Conservation status: Occurrences of this community on the alluvial plain are examples of 'Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions' EEC. Floodplain occurrences of Broad-leaved Paperbark are poorly reserved (Griffith 2005), but areas are reserved at Stotts Island NR, Tuckean NR, Bungawalbyn NR, Yarrungully SCA, and Broadwater NP.

Significant taxa: None recorded.

Structure

Layer	Height (m)	Cover (%)
Emergent	20–25	10
Tallest	15–25	25–60
Middle 1	3–15	5–40
Middle 2	0.5–3	10–20
Lower 1	0–2	5–60

Floristics

Trees: *Melaleuca quinquenervia* (T), *Lophostemon suaveolens* (T), *Eucalyptus tereticornis*, *Eucalyptus pilularis*, *Cupaniopsis anacardioides* (T), *Casuarina glauca* (T), *Archontophoenix cunninghamiana* (T), *Livistona australis* (M1), *Cinnamomum camphora** (M1), *Corymbia intermedia*, *Elaeocarpus obovatus*, *Melicope elleryana*.

Shrubs and small trees: *Glochidion ferdinandi*, *Acacia disparrima* subsp. *disparrima*, *Alphitonia excelsa*, *Elaeocarpus reticulatus*, *Trochocarpa laurina*, *Leptospermum polygalifolium* subsp. *polygalifolium*, *Callistemon salignus*, *Nematolepis squamea* subsp. *squamea*, *Lantana camara** (M2), *Syzygium australe*, *Endiandra sieberi*, *Glochidion sumatranum*, *Acacia melanoxylon*, *Acmena smithii*, *Allocasuarina torulosa*, *Duboisia myoporoides*, *Maclura cochinchinensis*, *Notelaea longifolia*, *Pittosporum undulatum*, *Symplocos stawellii*.

Climbers: *Hibbertia scandens*, *Parsonsia straminea*, *Smilax glyciphylla*, *Geitonoplesium cymosum*, *Marsdenia rostrata*, *Smilax australis*.

Ferns: *Pteridium esculentum*, *Calochlaena dubia*, *Hypolepis muelleri*, *Blechnum indicum*.

Grasses: *Ottocloa gracillima* (L1), *Entolasia stricta*, *Imperata cylindrica* var. *major*, *Axonopus compressus**, *Oplismenus aemulus* (L1), *Microlaena stipoides* var. *stipoides*, *Themeda australis*, *Andropogon virginicus**, *Cymbopogon refractus*, *Entolasia marginata*, *Eragrostis benthamii*, *Eragrostis leptostachya*, *Paspalidium gracile*, *Paspalum orbiculare*, *Sacciolepis indica*, *Sporobolus sessilis*.

Sedges and rushes: *Gahnia clarkei*, *Lomandra longifolia*, *Baloskion tetrachyllum*, *Carex maculata*, *Lomandra multiflora* subsp. *multiflora*.

Herbs and shrubs: *Dichondra repens*, *Leucopogon lanceolatus* var. *gracilis*, *Pomax umbellata*, *Stylidium debile* var. *debile*, *Melastoma affine*, *Pratia purpurascens*, *Viola hederacea* (L1), *Viola banksii*, *Austromyrtus dulcis*, *Centella asiatica*, *Alocasia brisbanensis* (M2), *Rivina humilis** (M2), *Ageratina adenophora**, *Polygala paniculata**, *Ageratina riparia**, *Babingtonia densifolia*, *Brachyscome microcarpa*, *Breynia oblongifolia*, *Brunoniella australis*, *Caladenia catenata*, *Commelina cyanea*, *Desmodium gunnii*, *Dianella caerulea*, *Gonocarpus chinensis* subsp. *verrucosus*, *Gonocarpus micranthus*, *Hibbertia aspera*, *Hydrocotyle peduncularis*, *Hydrocotyle tripartita*, *Hypochaeris radicata**, *Hypoxis hygrometrica* var. *villosisepala*, *Lagenophora gracilis*, *Leucopogon juniperinus*, *Leucopogon margarodes*, *Oxalis exilis*, *Vernonia cinerea* var. *cinerea*.

Number of native taxa: 87

Number of taxa per site 28–65 (mean 41 ± 16)

Number of exotic taxa: 8

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Entolasia stricta</i>	2	100%	2	11%	positive
<i>Glochidion ferdinandi</i>	2	100%	1	24%	positive
<i>Melaleuca quinquenervia</i>	3	100%	3	38%	positive
<i>Alphitonia excelsa</i>	2	86%	2	25%	positive
<i>Hibbertia scandens</i>	2	86%	1	27%	positive
<i>Imperata cylindrica</i>	2	86%	2	20%	positive
<i>Ottochloa gracillima</i>	2	86%	2	31%	positive
<i>Gahnia clarkei</i>	3	71%	3	16%	positive
<i>Lophostemon suaveolens</i>	3	71%	2	22%	positive
<i>Pteridium esculentum</i>	2	71%	2	20%	positive
<i>Acacia disparrima</i>	3	57%	3	13%	positive
<i>Geitonoplesium cymosum</i>	2	57%	2	41%	positive
<i>Marsdenia rostrata</i>	2	57%	1	22%	positive
<i>Oplismenus aemulus</i>	2	57%	2	14%	positive
<i>Pomax umbellata</i>	2	57%	2	8%	positive
<i>Hypoxis hygrometrica</i> var. <i>villosisepala</i>	1	29%	0	0%	positive
<i>Babingtonia densifolia</i>	1	14%	0	0%	positive
<i>Caladenia catenata</i>	1	14%	0	0%	positive
<i>Goodenia heterophylla</i>	1	14%	0	0%	positive
<i>Lagenophora gracilis</i>	1	14%	0	0%	positive
<i>Leucopogon lanceolatus</i>	1	14%	0	0%	positive
<i>Pimelea ligustrina</i>	1	14%	0	0%	positive
<i>Sporobolus sessilis</i>	1	14%	0	0%	positive

Community 57 Red Mahogany–Pink Bloodwood–Swamp Mahogany–Swamp Box Dry Open Forest

Scientific name: Red Mahogany (*Eucalyptus resinifera*), Pink Bloodwood (*Corymbia intermedia*), Swamp Mahogany (*Eucalyptus robusta*) and Swamp Box (*Lophostemon suaveolens*) Dry Open Forest.

Sites: (3) WOO04alvf, WAR29hsrlh, WAR35cbr.

Equivalent communities

Swamp sclerophyll forest mixed eucalypt spp. (mE2) (Landmark Ecological Services 1999); 3014 – *Eucalyptus resinifera* subsp. *hemilampra* tall to very tall, open to closed forest, and 3519 – *Eucalyptus resinifera* ssp. *hemilampra* tall to very tall, open to closed forest NPWS NSW Coastal Vegetation (Griffith & Wilson 2007); CASf18 *Eucalyptus robusta* *Eucalyptus resinifera* *Lophostemon suaveolens* (Binns 1995b).

Description

A dry open forest community in which Red Mahogany (*Eucalyptus resinifera* subsp. *hemilampra*) is abundant and associated with Pink Bloodwood (*Corymbia intermedia*), Swamp Mahogany (*Eucalyptus robusta*), Swamp Box (*Lophostemon suaveolens*) and Willow Bottlebrush (*Callistemon salignus*). There is an open middle layer of shrubs with a variable species composition that includes Salwood (*Acacia disparrima* subsp. *disparrima*), Satinwood (*Nematolepis squamea* subsp. *squamea*), Lantana (*Lantana camara*), Blueberry Ash (*Elaeocarpus reticulatus*) and *Pultenaea villosa*. The lower story comprises Saw Sedge (*Gahnia clarkei*), Weeping Meadow Grass (*Microlaena stipoides* var. *stipoides*), *Ottlochloa gracillima*, Bracken Fern (*Pteridium esculentum*) and *Pomax umbellata*.



Distribution and Habitat

Habitat: Moist, lower slope, high sedimentary soils and an alluvial valley flat.

Disturbance: Sites show evidence of a recent, moderate fire (3 years previously) and light to moderate infestations of weeds; there has been light grazing and clearing at site WAR35cbr.

Example locations: Tuckombil TSR, Jali Lands, and Thurgates Lane.

Conservation

Threats: Clearing.

Conservation status: Poorly reserved on the FNC.

Significant taxa: *Arthrochilus prolixus* (ROTAP: 3K), *Cordyline congesta* (ROTAP: 2RC-).

Structure

Layer	Height (m)	Cover (%)
Tallest	10–30	25–35
Middle 1	1–5	10–40
Middle 2	1–3	15
Lower 1	0–1	10–25

Floristics

Trees: *Eucalyptus resinifera* subsp. *hemilampra* (T), *Acacia disparrima* subsp. *disparrima*, *Corymbia intermedia* (T), *Lophostemon suaveolens* (T), *Melaleuca quinquenervia* (M1), *Acacia longissima*, *Alphitonia excelsa*, *Callistemon salignus* (T), *Eucalyptus robusta* (T), *Livistona australis*, *Eucalyptus tereticornis* (T), *Angophora paludosa*, *Cinnamomum camphora**, *Elaeocarpus obovatus*, *Eucalyptus siderophloia*, *Lophostemon confertus*, *Trochocarpa laurina*.

Shrubs and small trees: *Lantana camara** (M2), *Acacia disparrima* subsp. *disparrima* (M1), *Glochidion ferdinandi*, *Acacia longissima* (M1), *Callistemon salignus*, *Elaeocarpus reticulatus*, *Nematolepis squamea* subsp. *squamea* (M1), *Melaleuca sieberi*, *Endiandra sieberi*, *Viola banksii*, *Oxylobium arborescens* (M1), *Pittosporum revolutum*, *Allocasuarina torulosa*, *Banksia integrifolia* subsp. *integrifolia*, *Duboisia myoporoides*, *Glochidion sumatranum*, *Psychotria loniceroides*.

Climbers: *Geitonoplesium cymosum*, *Smilax australis*, *Hibbertia scandens*, *Marsdenia rostrata*, *Parsonsia straminea*, *Kennedia rubicunda* (M1), *Eustrephus latifolius*, *Morinda jasminoides*, *Ripogonum album*, *Stephania japonica* var. *discolor*.

Ferns: *Pteridium esculentum* (L1), *Blechnum indicum*, *Hypolepis muelleri*.

Grasses: *Microlaena stipoides* var. *stipoides* (M2), *Entolasia stricta* (L1), *Ottlochloa gracillima*, *Entolasia marginata* (L1), *Imperata cylindrica* var. *major* (L1), *Oplismenus aemulus*, *Oplismenus imbecillis*, *Paspalidium gracile*, *Paspalum wettsteinii**.

Sedges and rushes: *Gahnia clarkei* (L1), *Lomandra longifolia*, *Baloskion tetraphyllum*.

Herbs and shrubs: *Pultenaea villosa* (M1), *Dianella caerulea*, *Dodonaea triquetra* (M1), *Pomax umbellata* (L1), *Austromyrtus dulcis*, *Brunoniella pumilio*, *Cordyline congesta*, *Persoonia stradbrokeensis*, *Arthrochilus prolixus*, *Bidens pilosa**, *Breynia oblongifolia*, *Erechtites valerianifolia**, *Gonocarpus teucrioides*, *Goodenia heterophylla* subsp. *eglandulosa*, *Hibbertia aspera*, *Hypoxis hygrometrica* var. *villosisepala*, *Leptospermum whitei*, *Leucopogon parviflorus*, *Oxylobium arborescens*, *Pimelea ligustrina*, *Pratia purpurascens*, *Pseuderanthemum variabile*, *Senecio madagascariensis**, *Senna pendula* var. *glabrata**, *Sida rhombifolia**.

Number of native taxa: 74

Number of taxa per site: 32–54 (mean 41 ± 12)

Number of exotic taxa: 7

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Acacia disparrima</i> subsp. <i>disparrima</i>	3	57%	3	13%	positive
<i>Alphitonia excelsa</i>	2	86%	2	25%	positive
<i>Babingtonia densifolia</i>	1	14%	0	0%	positive
<i>Caladenia catenata</i>	1	14%	0	0%	positive
<i>Entolasia stricta</i>	2	100%	2	11%	positive
<i>Gahnia clarkei</i>	3	71%	3	16%	positive
<i>Geitonoplesium cymosum</i>	2	57%	2	41%	positive
<i>Glochidion ferdinandi</i>	2	100%	1	24%	positive
<i>Goodenia heterophylla</i>	1	14%	0	0%	positive
<i>Hibbertia scandens</i>	2	86%	1	27%	positive
<i>Hypoxis hygrometrica</i> var. <i>villosisepala</i>	1	29%	0	0%	positive
<i>Imperata cylindrica</i>	2	86%	2	20%	positive
<i>Lagenophora gracilis</i>	1	14%	0	0%	positive
<i>Leucopogon parviflorus</i>	1	14%	0	0%	positive
<i>Lophostemon suaveolens</i>	3	71%	2	22%	positive
<i>Marsdenia rostrata</i>	2	57%	1	22%	positive
<i>Melaleuca quinquenervia</i>	3	100%	3	38%	positive
<i>Oplismenus aemulus</i>	2	57%	2	14%	positive
<i>Ottobachloa gracillima</i>	2	86%	2	31%	positive
<i>Pimelea ligustrina</i>	1	14%	0	0%	positive
<i>Polygala paniculata</i>	1	14%	0	0%	positive
<i>Pomax umbellata</i>	2	57%	2	8%	positive
<i>Pteridium esculentum</i>	2	71%	2	20%	positive
<i>Sporobolus sessilis</i>	1	14%	0	0%	positive

Community 58 Pink Bloodwood–Grey Ironbark–Swamp Box–Forest Red Gum–Blackbutt Tall Dry Open Forest

Scientific name: Pink Bloodwood (*Corymbia intermedia*), Grey Ironbark (*Eucalyptus siderophloia*), Swamp Box (*Lophostemon suaveolens*), Forest Red Gum (*Eucalyptus tereticornis*) and Blackbutt (*Eucalyptus pilularis*) Tall Dry Open Forest.

Sites: (13) GIB02alrf, GIB03alfl, GIB05alfl, GIB07alfl, WAR52vbrlh, WAR54vbrlh, TAB01sulh, TAB02alrf, TAB03alvf, WAR48hsrlh, WOO22estsswmp, WOO19sulh, WOO03alvf.

Equivalent communities

Wet Sclerophyll Forest-Northern Hinterland Wet Sclerophyll Forest (Keith 2006); 202 – Grey Ironbark/White Mahogany/Grey Gum Open Forest Complex (Kingston *et al.* 2004); Grey Ironbark–Pink Bloodwood (gIB), and Blackbutt (BB) (Landmark Ecological Services 1999); 3015 – *Corymbia intermedia*–*Eucalyptus siderophloia*–*Eucalyptus tereticornis* wet sclerophyll forest NPWS NSW Coastal Vegetation (Griffith & Wilson 2007); CASf10 – *Eucalyptus moluccana* *Eucalyptus siderophloia* *Corymbia intermedia* *Lophostemon suaveolens*, and CASf25 *Eucalyptus tereticornis* –, *Lophostemon suaveolens* (Binns 1995b).

Description

A tall, coastal, subtropical, dry open to wet open forest complex occurring on alluvium, basalt and sediments. Sites on alluvium were dominated by Forest Red Gum (*Eucalyptus tereticornis*), Narrow-leaved Red Gum *Eucalyptus seeana*, Grey Ironbark (*Eucalyptus siderophloia*) and Swamp Box (*Lophostemon suaveolens*). Sites on basalt hillslopes were wet sclerophyll forests of Blackbutt (*Eucalyptus pilularis*), Grey Ironbark, Brush Box (*Lophostemon confertus*) and Tallowwood (*Eucalyptus micocrorys*). Drier sites on sediments were dominated by Pink Bloodwood (*Corymbia intermedia*) and *Eucalyptus carnea*. Salwood (*Acacia disparrima* subsp. *disparrima*), Red Ash (*Alphitonia excelsa*) and Willow Bottlebrush (*Callistemon salignus*) form a middle layer of small trees. A second mid-stratum of Lantana (*Lantana camara*), Lilly Pilly (*Acmena smithii*) and Tree Heath (*Trochocarpa laurina*) is present. The lower stratum consists of *Entolasia stricta*, Saw Sedge (*Gahnia aspera*), Blady Grass (*Imperata cylindrica* var. *major*) and Native Violet (*Viola banksii*).

Distribution and Habitat

Habitat: This community occurs in a range of habitats, from the stagnant alluvial plain in the Bungwalbin Catchment, to levees and floodplains on Sandy Creek, to undulating low hills and gently undulating rises on low sedimentary quartz geology in the Tabbimoble Lowlands, as well as on basalt soils on the Blackwall Range.

Disturbance: There was no disturbance recorded at sites GIB05alfl and WOO22estsswmp. Elsewhere, infestations of weeds was light to moderate and there had been light to moderate levels of grazing at a few sites. Severe logging was recorded at site TAB01sulh, and moderate levels of clearing recorded at sites TAB03alvf and WOO03alvf.

Example locations: Tuckombil TSR, Boggy Creek Road, Brandy Arm Creek, Bagotville Wardell Road, New Italy



Swan Bay Road, Wardell Trig, Bungawalbyn SCA, and Sandy Crossing TSR.

Conservation

Threats: Clearing and logging.

Conservation status: This community is probably adequately reserved. One survey site was in Bundjalung SCA. An equivalent community is recorded in Bundjalung NP (Griffith and Wilson 2007).

Significant taxa: *Cordyline congesta* (ROTAP: 2RC-), *Oberonia complanata* (TSC: Endangered), *Oberonia titania* (TSC: Vulnerable).

Structure

Layer	Height (m)	Cover (%)
Tallest	20–40	10–40
Middle 1	5–20	20–40
Middle 2	1–5	10–40
Lower 1	0–2	10–80
Lower 2	0–0.2	20

Floristics

Trees: *Alphitonia excelsa* (T), *Eucalyptus siderophloia* (T), *Corymbia intermedia* (T), *Lophostemon suaveolens* (T), *Eucalyptus tereticornis* (T), *Eucalyptus pilularis* (T), *Livistona australis* (M1), *Glochidion ferdinandi*, *Archontophoenix cunninghamiana* (M1), *Lophostemon confertus* (T), *Angophora subvelutina* (T), *Eucalyptus seeana* (T), *Eucalyptus microcorys* (T), *Eucalyptus carnea* (T), *Eucalyptus acmenoides* (T), *Waterhousea floribunda* (M1), *Casuarina glauca* (M1), *Elaeocarpus obovatus*, *Melaleuca styphelioides*, *Eucalyptus signata* (T), *Corymbia henryi*, *Cupaniopsis anacardioides*, *Eucalyptus propinqua*, *Eucalyptus resinifera* subsp. *hemilampra*, *Polyscias elegans*.

Shrubs and small trees: *Acacia disparrima* subsp. *disparrima* (T), *Lantana camara** (M2), *Trochocarpa laurina* (M1), *Notelaea longifolia* (M2), *Endiandra sieberi* (M2), *Callistemon salignus* (M1), *Acmena smithii* (M1), *Claoxylon australe* (M2), *Croton verreauxii* (M2), *Jagera pseudorhus* var. *pseudorhus* forma *pseudorhus*, *Pittosporum revolutum*, *Psychotria loniceroides*, *Cryptocarya microneura* (M1), *Cupaniopsis parvifolia*, *Maclura cochinchinensis*, *Myrsine howittiana*, *Babingtonia similis* (M2), *Cinnamomum camphora**, *Commersonia bartramia*, *Glochidion sumatranum*, *Leptospermum petersonii* (M1), *Rhodomyrtus psidioides* (M1), *Melaleuca styphelioides* (M1), *Myrsine variabilis*, *Synoum glandulosum* subsp. *glandulosum* (M2), *Tabernaemontana pandacaqui*, *Acacia irrorata* subsp. *irrorata* (M2), *Cyclophyllum longipetalum*, *Denhamia celastroides*, *Endiandra pubens*, *Endiandra discolor*, *Melaleuca linariifolia*, *Pittosporum multiflorum*, *Pittosporum undulatum*, *Psydrax odorata*, *Wilkiea huegeliana*, *Acronychia oblongifolia*, *Duboisia myoporoides*, *Elaeocarpus reticulatus*, *Geijera salicifolia*, *Guioa semiglaucula*, *Hakea florulenta*, *Leptospermum polygalifolium*, *Maytenus silvestris*, *Olea paniculata*, *Polyscias sambucifolia*, *Rhodamnia rubescens*.

Climbers and twiners: *Geitonoplesium cymosum*, *Morinda jasminoides* (L1), *Smilax australis*, *Parsonsia straminea*, *Hibbertia scandens*, *Cissus hypoglaucula*, *Eustrephus latifolius*, *Echinostephia aculeata*, *Calystegia marginata*, *Dioscorea transversa*, *Flagellaria indica*, *Pandorea pandorana*, *Plectorrhiza tridentata*, *Embelia australiana*, *Marsdenia rostrata*, *Passiflora suberosa**, *Cayratia clematidea*, *Cissus antarctica*, *Glycine clandestina*, *Glycine microphylla*, *Passiflora edulis**, *Passiflora herbertiana*, *Ripogonum elseyanum*, *Smilax glycyphylla*, *Stephania japonica* var. *discolor*.

Epiphytes: *Platynerium bifurcatum*, *Asplenium australasicum* f. *australasicum*, *Cymbidium suave*, *Dendrobium aemulum*, *Oberonia complanata*.

Mistletoes: *Notothixos incanus*.

Ferns: *Adiantum aethiopicum* (L1), *Doodia aspera* (L1), *Blechnum cartilagineum* (L1), *Platynerium bifurcatum*, *Pteridium esculentum*, *Adiantum hispidulum*, *Asplenium australasicum* f. *australasicum*, *Cheilanthes sieberi* subsp. *sieberi*, *Pyrrosia confluens* var. *confluens*, *Davallia solida* var. *pyxidata*, *Pellaea paradoxa*, *Pyrrosia rupestris*.

Grasses: *Ottobachloa gracillima* (L1), *Imperata cylindrica* var. *major*, *Entolasia stricta* (L1), *Oplismenus imbecillis*, *Microlaena stipoides* var. *stipoides* (L1), *Entolasia marginata*, *Axonopus compressus**, *Cymbopogon refractus*, *Oplismenus aemulus*, *Paspalum wettsteinii**, *Themeda australis*.

Sedges and rushes: *Gahnia aspera* (L1), *Lomandra longifolia* (L1), *Lomandra multiflora* subsp. *multiflora*, *Lomandra filiformis* subsp. *filiformis*, *Cyperus enervis*, *Lomandra hystrix*, *Gahnia clarkei* (L1), *Carex appressa*, *Lepidosperma laterale*.

Herbs and shrubs: *Acacia concurrens* (M1), *Dianella caerulea* (L1), *Breynia oblongifolia*, *Viola banksii* (L1), *Pratia purpurascens*, *Vernonia cinerea*, *Dichondra repens*, *Aneilema acuminatum*, *Desmodium gunnii*, *Pseuderanthemum variabile*, *Oxalis exilis*, *Commelina cyanea*, *Pomax umbellata*, *Gymnostachys anceps*, *Hybanthus stellarioides*, *Jasminum volubile*, *Leucopogon juniperinus*, *Pterostylis pedunculata*, *Ageratina riparia**, *Alyxia ruscifolia*, *Bursaria spinosa*, *Cordyline congesta*, *Cordyline petiolaris*, *Desmodium rhytidophyllum*, *Hydrocotyle peduncularis*, *Persoonia stradbrokeensis*, *Veronica plebeia*, *Alpinia arundelliana*, *Ambrosia artemisiifolia**, *Austromyrtus dulcis*, *Bidens pilosa**, *Brunoniella australis*, *Cordyline stricta*, *Dianella revoluta* var. *revoluta*, *Eupomatia laurina*, *Homalanthus populifolius*, *Hydrocotyle acutiloba*, *Leucopogon lanceolatus* var. *gracilis*, *Lomatia silaifolia*, *Melaleuca nodosa*, *Melaleuca sieberi*, *Plectranthus parviflorus*, *Poranthera microphylla*, *Rubus moluccanus* var. *trilobus*, *Senna septemtrionalis**, *Solanum densevestitum*.

Number of native taxa: 167

Number of taxa per site: 24–52 (mean 39 ± 9)

Number of exotic taxa: 11

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Acacia disparrima</i> subsp. <i>disparrima</i>	3	88%	2	10%	positive
<i>Alphitonia excelsa</i>	2	94%	1	23%	positive
<i>Arthropodium minus</i>	1	13%	0	0%	positive
<i>Asperula gemella</i>	1	6%	0	0%	positive
<i>Babingtonia similis</i>	3	6%	0	0%	positive
<i>Carex inversa</i>	1	6%	0	0%	positive
<i>Corymbia henryi</i>	3	19%	0	0%	positive
<i>Dendrobium aemulum</i>	1	6%	0	0%	positive
<i>Dianella caerulea</i>	2	50%	1	28%	positive
<i>Dianella revoluta</i>	1	19%	0	0%	positive
<i>Entolasia stricta</i>	2	63%	2	11%	positive
<i>Gahnia aspera</i>	2	56%	2	9%	positive
<i>Geijera salicifolia</i>	1	6%	0	0%	positive
<i>Geitonoplesium cymosum</i>	2	100%	2	38%	positive
<i>Hakea florulenta</i>	1	6%	0	0%	positive
<i>Imperata cylindrica</i>	2	63%	2	19%	positive
<i>Leptospermum petersonii</i>	3	6%	0	0%	positive
<i>Lophostemon suaveolens</i>	2	75%	3	20%	positive
<i>Maytenus silvestrus</i>	1	6%	0	0%	positive
<i>Melaleuca linariifolia</i>	2	6%	0	0%	positive
<i>Morinda jasminoides</i>	2	69%	2	25%	positive
<i>Oberonia complanata</i>	1	6%	0	0%	positive
<i>Oberonia titania</i>	1	6%	0	0%	positive
<i>Ottobachloa gracillima</i>	3	94%	2	29%	positive
<i>Pellaea paradoxa</i>	1	6%	0	0%	positive
<i>Psydrax odorata</i>	1	13%	0	0%	positive
<i>Pteridium pedunculatum</i>	1	19%	0	0%	positive
<i>Smilax australis</i>	2	56%	2	42%	positive
<i>Solanum densevestitum</i>	1	19%	0	0%	positive

Community 59 Large-fruited Spotted Gum–Grey Ironbark–Small-fruited Grey Gum Dry Grassy Open Forest

Scientific name: Large-fruited Spotted Gum (*Corymbia henryi*), Grey Ironbark (*Eucalyptus siderophloia*) and Small-fruited Grey Gum (*Eucalyptus propinqua*) Dry Grassy Open Forest.

Sites: (3) WOO07hsur, WOO01alvf, WOO18lsulh.

Equivalent communities

Grassy Woodlands-Coastal Valley Grassy Woodlands (Keith 2006); Qld Regional Ecosystem 12.11.5 Mixed Tall Open Forest on metasediments (Young and Dillewaard 1999); CASf8 *Corymbia intermedia* *Corymbia henryi* (Binns 1995b); North-east NSW Forest Ecosystem 24 – Clarence Lowlands Spotted Gum (NPWS 1999).

Description

A dry grassy open forest with Large-fruited Spotted Gum (*Corymbia henryi*) and Grey Gum (*Eucalyptus propinqua*) as the dominant tallest strata species. Occasional canopy species include Grey Ironbark (*Eucalyptus siderophloia*), Forest Red Gum (*Eucalyptus tereticornis*), *Eucalyptus tindaliae* and Broad-leaved Paperbark (*Melaleuca quinquenervia*). There is a middle stratum of shrubs and small trees including Salwood (*Acacia disparrima* subsp. *disparrima*), Red Ash (*Alphitonia excelsa*) and a second mid-stratum of shrubs such as Lantana (*Lantana camara*) and *Pultenaea spinosa*. The grassy lower stratum contains *Ottobachloa gracillima*, Barbwire Grass (*Cymbopogon refractus*), Blady Grass (*Imperata cylindrica* var. *major*) and *Lomandra multiflora* subsp. *multiflora*.

Distribution and Habitat

Habitat: This community is found on high sedimentary quartz, low hills and undulating rises on the Tabbimoble Plains.

Disturbance: Sites have light to severe infestations of weeds, and light to moderate levels of grazing. There is evidence of clearing at site WOO07hsur.

Example Locations: Tuckombil TSR, New Italy Swan Bay Road, and Boggy Creek Road.

Conservation

Threats: Clearing, logging and weed infestation.

Conservation status: This community is related to North-east NSW Forest Ecosystem 24 – Clarence Lowlands Spotted Gum, which was considered highly inadequately reserved and is a private land priority (NPWS 1999).

Significant taxa: *Asperula gemella*.



Structure

Layer	Height (m)	Cover (%)
Tallest	20–35	20–25
Middle 1	4–15	10–20
Middle 2	0.5–3	10–40
Lower 1	0–1	10–60

Floristics

Trees: *Corymbia henryi* (T), *Eucalyptus propinqua* (T), *Lophostemon suaveolens*, *Eucalyptus siderophloia* (T), *Melaleuca quinquenervia* (M1), *Melaleuca styphelioides* (M1), *Jagera pseudorhus* var. *pseudorhus* forma *pseudorhus*, *Eucalyptus tereticornis* (T), *Corymbia intermedia*, *Cupaniopsis anacardioides*, *Eucalyptus tindaliae*, *Glochidion ferdinandi*.

Shrubs and small trees: *Acacia disparrima* subsp. *disparrima* (M1), *Lantana camara** (M2), *Alphitonia excelsa* (M1), *Notelaea longifolia*, *Pultenaea spinosa* (M2), *Acacia maidenii*, *Cyclophyllum longipetalum*, *Maclura cochinchinensis*, *Myrsine variabilis*, *Pittosporum revolutum*.

Climbers and twiners: *Geitonoplesium cymosum*, *Eustrephus latifolius*, *Glycine clandestina*, *Glycine microphylla*, *Hardenbergia violacea*, *Hibbertia scandens*, *Morinda jasminoides*, *Pandorea pandorana*, *Parsonsia straminea*.

Epiphytes: *Dendrobium linguiforme*.

Grasses: *Ottocloa gracillima* (L1), *Cymbopogon refractus* (L1), *Imperata cylindrica* var. *major* (L1), *Entolasia stricta* (L1), *Microlaena stipoides* var. *stipoides*, *Aristida vagans*, *Digitaria parviflora*, *Axonopus compressus**, *Oplismenus aemulus*.

Sedges and rushes: *Lomandra multiflora* subsp. *multiflora*, *Lomandra filiformis* subsp. *filiformis* (L1), *Lomandra confertifolia* subsp. *pallida*, *Carex inversa*, *Juncus usitatus*.

Herbs and shrubs: *Pratia purpurascens*, *Oxalis exilis*, *Vernonia cinerea*, *Viola banksii*, *Arthropodium minus*, *Dichondra repens*, *Rostellularia adscendens* subsp. *adscendens*, *Solanum densevestitum*, *Arthropodium milleflorum*, *Asparagus aethiopicus**, *Asperula gemella*, *Brachyscome microcarpa*, *Commelina cyanea*, *Daviesia ulicifolia* subsp. *ulicifolia*, *Desmodium gunnii*, *Desmodium rhytidophyllum*, *Dianella revoluta* var. *revoluta*, *Goodenia hederacea* subsp. *hederacea*, *Hybanthus stellarioides*, *Lagenophora stipitata*, *Laxmannia gracilis*, *Pseuderanthemum variabile*, *Senna pendula* var. *glabrata**.

Number of native taxa: 65

Number of taxa per site: 29–34 (mean 26 ± 18)

Number of exotic taxa: 4

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Acacia disparrima</i> subsp. <i>disparrima</i>	3	88%	2	10%	positive
<i>Alphitonia excelsa</i>	2	94%	1	23%	positive
<i>Arthropodium minus</i>	1	13%	0	0%	positive
<i>Asperula gemella</i>	1	6%	0	0%	positive
<i>Carex inversa</i>	1	6%	0	0%	positive
<i>Corymbia henryi</i>	3	19%	0	0%	positive
<i>Dianella caerulea</i>	2	50%	1	28%	positive
<i>Dianella revoluta</i>	1	19%	0	0%	positive
<i>Entolasia stricta</i>	2	63%	2	11%	positive
<i>Eucalyptus tindaliae</i>	1	6%	0	0%	positive
<i>Gahnia aspera</i>	2	56%	2	9%	positive
<i>Geitonoplesium cymosum</i>	2	100%	2	38%	positive
<i>Hakea florulenta</i>	1	6%	0	0%	positive
<i>Imperata cylindrica</i>	2	63%	2	19%	positive
<i>Leptospermum petersonii</i>	3	6%	0	0%	positive
<i>Lophostemon suaveolens</i>	2	75%	3	20%	positive
<i>Maytenus silvestrus</i>	1	6%	0	0%	positive
<i>Melaleuca linarifolia</i>	2	6%	0	0%	positive
<i>Morinda jasmonoides</i>	2	69%	2	25%	positive
<i>Ottobachloa gracillima</i>	3	94%	2	29%	positive
<i>Pultenea spinosa</i>	3	6%	0	0%	positive
<i>Rostellularia adscendens</i> subsp. <i>adscendens</i>	1	19%	0	0%	positive
<i>Smilax australis</i>	2	56%	2	42%	positive
<i>Solanum densevestitum</i>	1	19%	0	0%	positive

Community 60 Grey Ironbark–Thin-leaved Stringybark–Pink Bloodwood–Swamp Box Dry Open Grassy Forest

Scientific name: Grey Ironbark (*Eucalyptus siderophloia*), Thin-leaved Stringybark (*Eucalyptus eugenioides*), Pink Bloodwood (*Corymbia intermedia*) and Swamp Box (*Lophostemon suaveolens*) Dry Open Grassy Forest.

Sites: (2) ELL07hsur, GIB10laf1.

Equivalent communities

Wet Sclerophyll Forest-Northern Hinterland Wet Sclerophyll Forest (Keith 2006); Qld Regional Ecosystem 12.9/10.7 Tall Open Forests on sediments (Young and Dillewaard 1999); 202 – Grey Ironbark/White Mahogany/Grey Gum Open Forest Complex (Kingston *et al.* 2004); Gey Ironbark–Pink Bloodwood (gIB) (Landmark Ecological Services 1999); 3538 – *Eucalyptus eugenioides*–*E. siderophloia*–*E. intermedia* tall to very tall, open forest NPWS NSW Coastal Vegetation (Griffith & Wilson 2007); North-east NSW Forest Ecosystem 73 – Lowland Red Gum (NPWS 1999).

Description

A dry grassy open forest in which Grey Ironbark (*Eucalyptus siderophloia*) occurs with or without Thin-leaved Stringybark (*Eucalyptus eugenioides*). The middle stratum of small trees includes Pink Bloodwood (*Corymbia intermedia*), Forest Oak (*Allocasuarina torulosa*), Rough-barked Apple (*Angophora subvelutina*) and Swamp Box (*Lophostemon suaveolens*). Lower strata consist of a sparse lower layer of shrubs (including *Acacia concurrens*, *Alphitonia excelsa*) and a ground cover of *Entolasia stricta*, *Gahnia aspera*, Blady Grass (*Imperata cylindrica* var. *major*), Spiny-headed Mat-rush (*Lomandra longifolia*), *Ottochloa gracillima* and Kangaroo Grass (*Themeda australis*).



Distribution and Habitat

Habitat: This community is located on a stagnant alluvial plain and on gently undulating rises on high sedimentary quartz parent material in the Tabbimoble Lowlands.

Disturbance: Sites have been affected by light to moderate fires (5–10 years prior), light logging and light disturbance by weeds.

Example locations: Mothersoles Road and Bungawalbyn Creek SCA.

Conservation

Threats: Lower slope occurrences of this community are threatened by logging and clearing.

Conservation status: Site GIB10laf1 was within Bungawalbyn Creek SCA. Lower slope occurrences on private land are probably a priority for reservation.

Significant taxa: None recorded.

Structure

Layer	Height (m)	Cover (%)
Tallest	20–35	20–25
Middle 1	10–15	10–20
Middle 2	1–5	10
Lower 1	0–1	15–20

Floristics

Trees: *Eucalyptus siderophloia* (T), *Eucalyptus eugenoides* (T), *Eucalyptus tereticornis* (T).

Shrubs and small trees: *Alphitonia excelsa* (M2), *Acacia concurrens* (M2), *Lophostemon suaveolens* (M1), *Angophora subvelutina* (M1), *Allocasuarina torulosa* (M1), *Corymbia intermedia* (M1), *Callistemon salignus*, *Lantana camara**, *Melaleuca alternifolia*, *Melaleuca quinquenervia*.

Climbers and twiners: *Eustrephus latifolius*, *Calystegia marginata*, *Geitonoplesium cymosum*, *Glycine clandestina*, *Glycine microphylla*, *Hibbertia scandens*, *Parsonsia straminea*.

Ferns: *Pteridium esculentum*, *Cheilanthes sieberi* subsp. *sieberi*.

Grasses: *Entolasia stricta* (L1), *Imperata cylindrica* var. *major*, *Themeda australis* (L1), *Eragrostis leptostachya*, *Ottocloa gracillima* (L1), *Lomandra longifolia*, *Lomandra multiflora* subsp. *multiflora*, *Aristida vagans*, *Oplismenus aemulus*, *Panicum effusum*.

Sedges and rushes: *Lomandra longifolia* (L1), *Gahnia aspera* (L1), *Lomandra filiformis* subsp. *filiformis*, *Cyperus trinervis*.

Herbs and shrubs: *Desmodium varians*, *Hibbertia diffusa*, *Dianella longifolia*, *Hypericum gramineum*, *Phyllanthus virgatus*, *Poranthera microphylla*, *Pratia purpurascens*, *Vernonia cinerea* var. *cinerea*, *Brunoniella australis*, *Daviesia ulicifolia* subsp. *stenophylla*, *Desmodium rhytidophyllum*, *Dianella caerulea*, *Goodenia paniculata*, *Hydrocotyle tripartita*, *Indigofera australis*, *Lagenophora stipitata*, *Laxmannia gracilis*, *Leucopogon lanceolatus* var. *gracilis*, *Persoonia stradbokensis*, *Pultenaea myrtilloides*.

Number of native taxa: 56

Number of taxa per site: 34–42 (mean 38 ± 6)

Number of exotic taxa: 4

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Imperata cylindrica</i>	3	100%	2	19%	positive
<i>Lophostemon suaveolens</i>	3	100%	2	21%	positive
<i>Themeda australis</i>	3	100%	2	6%	positive
<i>Alphitonia excelsa</i>	2	88%	1	25%	positive
<i>Melaleuca quinquenervia</i>	3	88%	3	38%	positive
<i>Pratia purpurascens</i>	2	88%	2	14%	positive
<i>Entolasia stricta</i>	2	75%	2	12%	positive
<i>Goodenia paniculata</i>	2	75%	2	3%	positive
<i>Phyllanthus virgatus</i>	1	75%	0	0%	positive
<i>Brunoniella australis</i>	2	63%	1	1%	positive
<i>Oplismenus aemulus</i>	2	50%	2	14%	positive
<i>Panicum effusum</i>	2	50%	0	0%	positive
<i>Pultenaea myrtoidea</i>	1	25%	0	0%	positive
<i>Daviesia ulicifolia</i> subsp. <i>stenophylla</i>	1	13%	0	0%	positive
<i>Eucalyptus eugenioides</i>	3	13%	0	0%	positive
<i>Hibbertia diffusa</i>	2	13%	0	0%	positive
<i>Indigofera australis</i>	1	13%	0	0%	positive

Community 61 Broad-leaved Paperbark–Narrow-leaved Rough-barked Apple–Swamp Box–Pink Bloodwood Dry Grassy Alluvial Open Forest

Scientific name: Broad-leaved Paperbark (*Melaleuca quinquenervia*), Narrow-leaved Rough-barked Apple (*Angophora paludosa*), Swamp Box (*Lophostemon suaveolens*) and Pink Bloodwood (*Corymbia intermedia*) Dry Grassy Alluvial Open Forest.

Sites: (6) ELL08alfl, TAT02alfl, TAT03alfl, TAT01alfl, ELL10alfl, ELL09alvf.

Equivalent communities

Forested Wetlands-Coastal Floodplain Wetlands (Keith 2006); Qld Regional Ecosystem 12.3.5 *Melaleuca quinquenervia* on alluvium (Young and Dillewaard 1999); F5 – *Eucalyptus tereticornis*–*C. intermedia*–*Lophostemon suaveolens* (Pressey and Griffith 1992); 3569 – *Angophora paludosa* Dry Sclerophyll Forest and Woodland (Griffith & Wilson 2007); 301 – Coastal Pink Bloodwood Open Forest to Woodland, 309 – Coastal Swamp Box Open Forest to Woodland, and 401 – Broad-leaved Paperbark Closed Forest to Woodland (Kingston *et al.* 2004); Mixed Eucalypt spp. (mE2) Swamp Sclerophyll Forest (Landmark Ecological Services 1999); North-east NSW Forest Ecosystems 46 – Eastern Red Gums, and 73 – Lowland Red Gum (NPWS 1999).

The occurrence of Narrow-leaved Rough-barked Apple (*Angophora paludosa*) as a dominant canopy is not commonly recorded in the literature.

Description

A grassy, dry, open alluvial forest in which Broad-Leaved Paperbark (*Melaleuca quinquenervia*), Narrow-leaved Rough-barked Apple (*Angophora paludosa*), Swamp Box (*Lophostemon suaveolens*), Pink Bloodwood (*Corymbia intermedia*) and Forest Red Gum (*Eucalyptus tereticornis*) dominate.

Small trees and shrubs form an open middle stratum. Common species in the mid-storey include Salwood (*Acacia disparrima* subsp. *disparrima*), Red Ash (*Alphitonia excelsa*) and Cheese Tree (*Glochidion ferdinandi*). A second middle stratum of Salwood, Swamp Box, Lantana (*Lantana camara*) and Cheese Tree is sometimes evident. The grassy lower stratum comprises Kangaroo Grass (*Themeda australis*), Australian Vetiver (*Chrysopogon filipes*), Blady Grass (*Imperata cylindrica* var. *major*), *Axonopus compressus*, *Brunoniella australis*, *Centella asiatica*, *Entolasia stricta* and White Root (*Pratia purpurascens*).



Distribution and Habitat

Habitat: Located on a wide alluvial drainage plain on gently undulating rises on Sandy Creek in the Bungawalbin Catchment.

Disturbance: Sites showed evidence of light to moderate fires (5–10 years previously) and light to moderate grazing. There had also been light logging at site TAT03alfl.

Example locations: Mothersoles Road and Tatham Myrtle Creek Road.

Conservation

Threats: Clearing and logging.

Conservation status: Community 62 is an example of 'Sub-tropical Coastal Floodplain Forest of the NSW North Coast bioregion' EEC. This community was located in the Tatham area and is possibly poorly reserved. None of the survey sites was in reserves. Griffith and Wilson (2007) record an association of Narrow-leaved Rough-barked Apple (*Angophora paludosa*) with Pink Bloodwood (*Corymbia intermedia*) as a minor associate in Yuraygir NP.

Structure

Layer	Height (m)	Cover (%)
Tallest	15–35	15–35
Middle 1	2–15	10–40
Middle 2	1–5	5–25
Lower 1	0–1	15–80

Floristics

Trees: *Melaleuca quinquenervia* (T), *Lophostemon suaveolens* (T), *Corymbia intermedia* (T), *Angophora paludosa* (T), *Eucalyptus tereticornis* (T), *Callistemon salignus* (T), *Eucalyptus siderophloia* (T), *Eucalyptus seeana* (T).

Shrubs and small trees: *Glochidion ferdinandi* (M2), *Alphitonia excelsa*, *Acacia disparrima* subsp. *disparrima* (M1), *Callistemon salignus* (M1), *Lantana camara**, *Acacia concurrens*, *Acacia irrorata* subsp. *irrorata*, *Allocasuarina littoralis*, *Melaleuca alternifolia*, *Trochocarpa laurina*.

Climbers and twiners: *Paspalidium gausum*, *Parsonsia straminea*, *Glycine microphylla*, *Calystegia marginata*.

Ferns: *Botrychium australe*.

Grasses: *Imperata cylindrica* var. *major* (L1), *Themeda australis* (L1), *Axonopus compressus** (L1), *Chrysopogon filipes* (L1), *Entolasia stricta* (L1), *Oplismenus aemulus*, *Panicum effusum*, *Cymbopogon refractus*, *Digitaria parviflora*, *Ottolochloa gracillima* (L1), *Eragrostis leptostachya*, *Aristida vagans*, *Cynodon dactylon*, *Dichelachne micrantha*, *Eragrostis leptostachya*, *Paspalidium distans**, *Paspalidium gausum* (L1), *Microlaena stipoides* var. *stipoides*.

Sedges and rushes: *Lomandra longifolia*, *Lomandra multiflora* subsp. *multiflora*, *Cyperus sphaeroideus*, *Cyperus trinervis*, *Juncus usitatus*, *Lomandra filiformis* subsp. *filiformis*, *Schoenus apogon*.

Herbs and shrubs: *Pratia purpurascens*, *Brunoniella australis*, *Goodenia paniculata*, *Pimelea linifolia* subsp. *collina*, *Centella asiatica*, *Hydrocotyle tripartita*, *Viola betonicifolia*, *Dichondra repens*, *Hypoxis hygrometrica*, *Polygala japonica*, *Lagenophora stipitata*, *Vernonia cinerea* var. *cinerea*, *Hypericum japonicum*, *Mitrasacme paludosa*, *Phyllanthus virgatus*, *Breynia oblongifolia*, *Desmodium gunnii*, *Murdannia graminea*, *Persoonia stradbokensis*, *Poranthera microphylla*, *Tricoryne elatior*, *Dianella brevipedunculata*, *Dianella caerulea*, *Dianella longifolia*, *Caesia parviflora* var. *parviflora*, *Cirsium vulgare**, *Hydrocotyle peduncularis*, *Hypochaeris radicata**, *Senecio madagascariensis**, *Ambrosia artemisiifolia**, *Arthropodium milleflorum*, *Desmodium rhytidophyllum*, *Desmodium varians*, *Gamochaeta spicata*, *Gonocarpus tetragynus*, *Goodenia hederacea* subsp. *hederacea*, *Haloragis heterophylla*, *Hibbertia empetrifolia* subsp. *empetrifolia*, *Laxmannia gracilis*, *Pseuderanthemum variabile*, *Pultenaea myrtoidea*, *Stylidium debile* var. *debile*, *Viola banksii*.

Number of native taxa: 56

Number of taxa per site: 34–42 (mean 38 ± 6)

Number of exotic taxa: 4

Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Alphitonia excelsa</i>	2	88%	1	25%	positive
<i>Angophora paludosa</i>	3	50%	2	1%	positive
<i>Botrychium australe</i>	1	13%	0	0%	positive
<i>Brunoniella australis</i>	2	63%	1	1%	positive
<i>Caesia parviflora</i> var. <i>parviflora</i>	1	25%	0	0%	positive
<i>Centella asiatica</i>	2	50%	2	12%	positive
<i>Chrysopogon filipes</i>	2	63%	0	0%	positive
<i>Dianella brevipedunculata</i>	2	13%	0	0%	positive
<i>Dichelachne micrantha</i>	1	25%	0	0%	positive
<i>Entolasia stricta</i>	2	75%	2	12%	positive
<i>Gamochaeta spicata</i>	1	13%	0	0%	positive
<i>Glochidion ferdinandi</i>	2	63%	1	24%	positive
<i>Goodenia paniculata</i>	2	75%	2	3%	positive
<i>Hibbertia empetrifolia</i> subsp. <i>empetrifolia</i>	1	13%	0	0%	positive
<i>Hypoxis hygrometrica</i>	1	38%	0	0%	positive
<i>Imperata cylindrica</i>	3	100%	2	19%	positive
<i>Lophostmeon suaveolens</i>	3	100%	2	21%	positive
<i>Melaleuca quinquenervia</i>	3	88%	3	38%	positive
<i>Mitrasacme paludosa</i>	2	25%	0	0%	positive
<i>Oplismenus aemulus</i>	2	50%	2	14%	positive
<i>Panicum effusum</i>	2	50%	0	0%	positive
<i>Phyllanthus virgatus</i>	1	75%	0	0%	positive
<i>Pimelea linifolia</i> subsp. <i>collina</i>	1	63%	0	0%	positive
<i>Pratia purpurascens</i>	2	88%	2	14%	positive
<i>Schoenus apogon</i>	1	13%	0	0%	positive
<i>Themeda australis</i>	3	100%	2	6%	positive
<i>Viola betonicifolia</i>	2	50%	2	1%	positive

Community 62 River Mangrove–Grey Mangrove–Black Mangrove–Milky Mangrove–Spider Mangrove Forest to Shrubland

Scientific name: Grey Mangrove (*Avicennia marina*), Black Mangrove (*Bruguiera gymnorhiza*), Milky Mangrove (*Excoecaria agallocha*), River Mangrove (*Aegiceras corniculata*) and Spider Mangrove (*Rhizophora stylosa*) Forest to Shrubland.

Sites: (13) BALL12estsswp, BRU13estsw, TWE07estcl, BALL13estsswp, BALL15estsswp, BIL10albk, BIL08albk, TWE08estcl, TWE13estsswp, TWE10esttdf, TWE18estcbb, TWE29cslg, BRU20estsswp.

Equivalent communities

Saline Wetlands-Mangroves (Keith 2006); Qld Regional Ecosystem 12.1.3 Mangrove Shrubland to low closed forest on Quaternary estuarine deposits (Young and Dillewaard 1999); 602 – Mangrove Low Closed Forest to Woodland (Kingston *et al.* 2004); Grey Mangrove/River Mangrove (M) (Landmark Ecological Services 1999); 5302 – *Avicennia marina* var. *australasica* mangrove shrubland, and 2502 – *Avicennia marina* var. *australasica* mangrove forest and woodland NPWS NSW Coastal Vegetation (Griffith & Wilson 2007); *Excoecaria agallocha* forest and woodlands, *Rhizophora stylosa* forest and woodland, and *Bruguiera gymnorhiza* forest and woodland (Robinson and Benson 1990); North-east NSW Forest Ecosystem 77 – Mangrove (NPWS 1999).

Description

Predominantly a mangrove-dominated open to closed shrubland to a low open forest of Grey Mangrove (*Avicennia marina* subsp. *australasica*), Black Mangrove (*Bruguiera gymnorhiza*), Milky Mangrove (*Excoecaria agallocha*) and Cottonwood Hibiscus (*Hibiscus tilaceus*), and associated with Spider Mangrove (*Rhizophora stylosa*) and River Mangrove (*Aegiceras corniculatum*).

Site BALL12estsswp has an open forest structure. Four sub-groups are defined, based on presence of understorey vegetation and mangrove species present: (1) Sites with an understorey of saw sedges, rushes and mangrove fern at the upper tidal limit. The remaining three groups are more frequently inundated sites without an understorey,

with groups based on the combination of mangrove species present: (2) Sites dominated by Grey Mangrove in which River Mangrove also occurs. (3) Sites with abundant River Mangrove co dominant with Black Mangrove and Grey Mangrove and with Milky Mangrove and Spider Mangrove occasionally present. (4) Sites with Black Mangrove, River Mangrove, Grey Mangrove and Milky Mangrove co dominant with a dense layer of Mangrove Fern (*Acrostichum speciosum*) and Saltwater Couch (*Sporobolus virginicus*).



Distribution and Habitat

Habitat: Sites subject to regular tidal influence fringing coastal lagoons, estuarine to alluvial tidal deltas and low-level tidal flats on Quaternary marine and fluvial sediments. Associated with the Burns Point and Ukerebagh soil landscapes.

Disturbance: No disturbance was recorded.

Example Locations: Brunswick Heads, Fingal north of Ballina Racecourse, Chickiba Creek at Ballina, Cobaki Broadwater, Fingal Head, Ukererabagh NR, Tweed Heads Golf Club and Tweed River.

Conservation

Threats: Filling, draining and rises in sea level.

Conservation status: Mangrove Forests are reserved in the Tweed Estuary NR, Ukerebagh NR, Cudgen NR, Wooyung NR, Billinudgel NR, Brunswick Heads NR, Bundjalung NP, Marshalls Creek NR, Tyagarah NR, Ballina NR and Richmond River NR.

Significant taxa: *Amyema mackayense* subsp. *mackayense*.

Structure

Layer	Height (m)	Cover (%)
Emergent	4–7	10
Tallest	1–25	15–90
Middle 1	0–10	10–70
Lower 1	0.2–2	10–50

Floristics

Trees: *Aegiceras corniculatum* (M1), *Avicennia marina* subsp. *australasica* (T), *Bruguiera gymnorhiza* (T), *Excoecaria agallocha* (T), *Hibiscus tiliaceus* (T), *Rhizophora stylosa* (M1).

Shrubs and small trees: *Clerodendrum inerme* (M1).

Climbers and twiners: *Cynanchum carnosum* (L1), *Ipomoea cairica**.

Mistletoes: *Amyema cambagei*, *Amyema mackayense* subsp. *mackayense*.

Ferns: *Acrostichum speciosum* (M2), *Lygodium microphyllum*.

Grasses: *Hemarthria uncinata*, *Sporobolus virginicus* (L1).

Sedges and rushes: *Juncus usitatus* (M2), *Carex maculata*, *Cyperus brevifolius*, *Cyperus sphaeroideus*, *Fimbristylis dichotoma*.

Herbs and shrubs: *Gahnia clarkei* (L1), *Suaeda australis* (L1), *Cyperus lucidus* (L1).

Number of native taxa: 26

Number of taxa per site: 2–10 (mean 9 ± 13)

Number of exotic taxa: 1



Indicator native taxa

Species	Group score	Group frequency	Non-group score	Non-group frequency	Fidelity class
<i>Aegiceras corniculatum</i>	4	100%	1	3%	positive
<i>Avicennia marina</i> subsp. <i>australasica</i>	4	100%	2	2%	positive
<i>Bruguiera gymnorhiza</i>	3	62%	1	1%	positive
<i>Clerodendrum inerme</i>	3	8%	0	0%	positive
<i>Rhizophora stylosa</i>	2	23%	0	0%	positive

Appendix 2 - Vascular plant species recorded from survey sites in the Far North Coast

The common names are from PlantNet (<http://plantnet.rbgsyd.nsw.gov.au/>), though a few commonly used alternative names have been added as needed. In the following list, all significant taxa are indicated (§), as are exotic species (*). For significant taxa, the following abbreviations are used to indicate status: TSC-V and TSC-E = Vulnerable or Endangered under the NSW Threatened Species Conservation Act 1995 Rare = rare species in NSW (Sheringham & Westaway 1995, and P. Sheringham pers. comm); and standard codes are given for ROTAP species (Briggs & Leigh, 1995).

§-significant taxa *- Exotic taxa

Species and Taxonomic Authority	Status	Common Name
Fern Allies		
Psilotaceae		
<i>Psilotum nudum</i> (L.) P.Beauv.		Skeleton Fork-fern
Selaginellaceae		
<i>Selaginella uliginosa</i> (Labill.) Spring		Swamp Selaginella
Ferns		
Adiantaceae		
<i>Adiantum aethiopicum</i> L.		Common Maidenhair
<i>Adiantum diaphanum</i> Blume		Filmy Maidenhair
<i>Adiantum formosum</i> R.Br.		Black Stem, Black Stem Maidenhair, Giant Maidenhair
<i>Adiantum hispidulum</i> Sw.		Rough Maidenhair Fern
<i>Adiantum silvaticum</i> Tindale		
<i>Cheilanthes sieberi</i> subsp. <i>sieberi</i> Kunze		
<i>Pellaea nana</i> (Hook.) Bostock		Dwarf Sickle Fern
<i>Pellaea paradoxa</i> (R.Br.) Hook.		
<i>Pellaea viridis</i> var. <i>viridis</i> (Forssk.) Prantl		Green Cliff Brake
Aspleniaceae		
<i>Asplenium attenuatum</i> R.Br.		Simple Spleenwort
<i>Asplenium australasicum</i> forma <i>australasicum</i> (J.Sm.) Hook.		Bird's Nest Fern
<i>Asplenium harmanii</i> . D.L.Jones		
Azollaceae		
<i>Azolla filiculoides</i> Lam.		
<i>Azolla pinnata</i> R.Br.		
Blechnaceae		
<i>Blechnum camfieldii</i> Tindale		
<i>Blechnum cartilagineum</i> Sw.		Gristle Fern, Soft Water Fern
<i>Blechnum indicum</i> Burm.f.		Swamp Water Fern
<i>Doodia aspera</i> R.Br.		Prickly Rasp Fern
<i>Doodia caudata</i> (Cav.) R.Br.		Small Rasp Fern
Cyatheaceae		
<i>Cyathea australis</i> (R.Br.) Domin		Black Tree-fern, Rough Tree-fern
<i>Cyathea cooperi</i> (F.Muell.) Domin		Straw Tree-fern

Species and Taxonomic Authority	Status	Common Name
<i>Cyathea leichhardtiana</i> (F.Muell.) Copel.		Prickly Tree-fern, Prickly Tree Fern
Davalliaceae		
<i>Arthropteris beckeri</i> . (Hook.) Mett.		
<i>Arthropteris tenella</i> (G.Forst.) J.Sm. ex Hook.f.		
<i>Davallia solida</i> var. <i>pyxidata</i> (Cav.) Noot.		Hare's Foot Fern
<i>Nephrolepis cordifolia</i> (L.) Presl??		Fishbone Fern, Herringbone Fern, Sword Fern
Dennstaedtiaceae		
<i>Histiopteris incisa</i> (Thunb.) J.Sm.		Bat's Wing Fern, Oak Fern
<i>Hypolepis muelleri</i> N.A.Wakef.		Harsh Ground Fern
<i>Pteridium esculentum</i> (G.Forst.) Cockayne		Common Bracken, Gurgi (Cadigal), Austral Bracken, Bracken
Dicksoniaceae		
<i>Calochlaena dubia</i> (R.Br.) M.D.Turner & R.A.White		Rainbow Fern
Dryopteridaceae		
<i>Arachniodes aristata</i> (G.Forst.) Tindale		
<i>Lastreopsis decomposita</i> (R.Br.) Tindale		Trim Shield-fern, Trim Shield Fern
<i>Lastreopsis marginans</i> (F.Muell.) D.A.Sm. & Tindale		Bordered Shield Fern, Glossy Shield Fern
<i>Lastreopsis microsora</i> subsp. <i>microsora</i> (Endl.) Tindale		Creeping Shield Fern
<i>Lastreopsis munita</i> (Mett.) Tindale		Naked Shield Fern
Gleicheniaceae		
<i>Gleichenia dicarpa</i> R.Br.		Pouched Coral Fern, Tangle Fern
Lindsaeaceae		
‡ <i>Lindsaea brachypoda</i> (Baker) Salomon	TSC-V	
<i>Lindsaea linearis</i> Sw.		Screw Fern
Marsileaceae		
<i>Marsilea mutica</i> Mett.		Nardoo
Ophioglossaceae		
<i>Botrychium australe</i> R.Br.		Austral Moonwort, Parsley Fern, Austral Moorward
Osmundaceae		
<i>Todea barbara</i> (L.) T.Moore		King Fern
Polypodiaceae		
<i>Dictymia brownii</i> (Wikstr.) Copel.		Strap Fern
<i>Microsorium pustulatum</i> (G.Forst.) Copel.		Kangaroo Fern
<i>Platyserium bifurcatum</i> (Cav.) C.Chr.		Elkhorn
<i>Platyserium superbum</i> de Jonch. & Hennisman		Staghorn
<i>Pyrrosia confluens</i> var. <i>confluens</i> (R.Br.) Ching		Robber Fern, Horseshoe Felt Fern
<i>Pyrrosia rupestris</i> (R.Br.) Ching		Rock Felt Fern
Pteridaceae		
<i>Acrostichum speciosum</i> Willd.		Mangrove Fern, Leather Fern
<i>Pteris tremula</i> R.Br.		Tender Brake, Tender Brakefern
Schizaeaceae		
<i>Lygodium microphyllum</i> (Cav.) R.Br.		Climbing Snake Fern
<i>Schizaea bifida</i> Willd.		Forked Comb Fern
<i>Schizaea dichotoma</i> (L.) Sm.		Branched Comb Fern
Thelypteridaceae		
<i>Christella dentata</i> (Forssk.) Brownsey & Jermy		Binung, Binung

Species and Taxonomic Authority	Status	Common Name
<i>Cyclosorus interruptus</i> (Willd.) H.It		
Cycads		
Zamiaceae		
<i>Lepidozamia peroffskyana</i> Regel		Burrawang
Conifers		
Araucariaceae		
<i>Araucaria cunninghami</i> Aiton ex A.Cunn.		Hoop Pine
Cupressaceae		
<i>Callitris columellaris</i> F.Muell.		Coast Cypress Pine, Coastal Cypress Pine
Pinaceae		
* <i>Pinus elliotii</i> Engelm.		Slash Pine
Podocarpaceae		
<i>Podocarpus elatus</i> R.Br. ex Endl.		Plum Pine, Brown Pine
Dicots		
Acanthaceae		
<i>Brunoniella australis</i> (Cav.) Bremek.		Blue Trumpet
<i>Brunoniella pumilio</i> (R.Br.) Bremek.		Dwarf Brunoniella, Dwarf Blue Trumpet
<i>Brunoniella spiciflora</i> (F.Muell. ex Benth.) Bremek.		
<i>Hygrophila angustifolia</i> R.Br.		
<i>Pseuderanthemum variabile</i> (R.Br.) Radlk.		Pastel Flower
<i>Rostellularia adscendens</i> subsp. <i>adscendens</i> (R.Br.) R.M.Barker		
<i>Rostellularia obtusa</i> Nees		
* <i>Thunbergia alata</i> Bojer ex Sims		Black-eyed Susan
Aizoaceae		
<i>Sesuvium portulacastrum</i> L.		Sesuvium
<i>Tetragonia tetragonioides</i> (Pall.) Kuntze		New Zealand Spinach, Native Spinach
Akaniaceae		
<i>Akania bidwillii</i> (Hogg) Mabb.		Turnipwood
Alangiaceae		
<i>Alangium villosum</i> subsp. <i>polyosmoides</i> (F.Muell.) Bloemb.		Black Muskheart, Brown Muskheart, Canary Muskheart Muskwood
Amaranthaceae		
<i>Alternanthera denticulata</i> R.Br.		Lesser Joyweed
Anacardiaceae		
<i>Euroschinus falcata</i> var. <i>falcata</i> Hook.f.		Ribbonwood, Blush Cudgerie
* <i>Schinus terebinthifolius</i> Raddi		Brazilian Pepper Tree, Christmas Berry Tree
Apiaceae		
<i>Apium prostratum</i> Labill. ex Vent.		Sea Celery
<i>Centella asiatica</i> (L.) Urb.		
<i>Eryngium expansum</i> F.Muell.		
<i>Hydrocotyle acutiloba</i> (F.Muell.) Wakef.		
* <i>Hydrocotyle bonariensis</i> Lam.		Kurnell Curse
<i>Hydrocotyle peduncularis</i> R.Br. ex A.Rich.		
<i>Hydrocotyle tripartita</i> R.Br. ex A.Rich.		Pennywort
<i>Hydrocotyle verticillat</i> Thunb.		Shield Pennywort
<i>Lilaeopsis polyantha</i> (Gand.) H.Eichler		
<i>Platysace ericoides</i> (Sieber ex Spreng.) Norman		

Species and Taxonomic Authority	Status	Common Name
<i>Platysace lanceolata</i> (Labill.) Druce		Shrubby Platysace
<i>Trachymene incisa</i> Rudge		
<i>Xanthosia pilosa</i> Rudge		Woolly Xanthosia
Apocynaceae		
<i>Alyxia ruscifolia</i> R.Br.		Prickly Alyxia, Chain Fruit
<i>Carissa ovata</i> R.Br.		Kunberberry, Currant Bush
<i>Melodinus acutiflorus</i> F.Muell.		
<i>Melodinus australis</i> (F.Muell.) Pierre		Southern Melodinus
<i>Ochrosia moorei</i> (F.Muell.) F.Muell. ex Benth.	TSC-E	Southern Ochrosia
<i>Parsonsia fulva</i> S.T.Blake		Furry Silkpod
<i>Parsonsia longipetiolata</i> J.B.Williams		Green-leaved Silkpod
<i>Parsonsia straminea</i> (R.Br.) F.Muell.		Common Silkpod, Monkey Rope
<i>Parsonsia velutina</i> R.Br.		
<i>Tabernaemontana pandacacui</i> Lam.		Banana Bush
Araliaceae		
<i>Polyscias elegans</i> (C.Moore & F.Muell.) Harms		Celery Wood, Silver Basswood, Black Pencil Ceda
<i>Polyscias sambucifolia</i> (DC. ex Sieber) Harms		Elderberry Panax, Ornamental Ash, Elderberry Ash
* <i>Schefflera actinophylla</i> (Endl.) Harms		Umbrella Tree
Argophyllaceae		
‡ <i>Argophyllum nullumense</i> R.T.Baker	3RCa	Silver Leaf
Aristolochiaceae		
<i>Pararistolochia praevenosa</i> (F.Muell.) M.J.Parsons		
Asclepiadaceae		
* <i>Araujia sericifera</i> E.Fourn.		Moth Vine, Mothplant
* <i>Asclepias curassavica</i> L.		Redhead Cottonbush, Blood Flower
<i>Cynanchum carnosum</i> (R.Br.) Merr. & Rolfe		
* <i>Gomphocarpus fruticosus</i> (L.) W.T.Aiton		Narrow-leaved Cotton Bush
* <i>Gomphocarpus physocarpus</i> E.Mey.		Balloon Cotton Bush
<i>Hoya australis</i> subsp. <i>australis</i> R. Br. Ex Traill		Native Hoya
<i>Marsdenia fraseri</i> Benth.		Narrow-leaved Milk Vine
<i>Marsdenia hemiptera</i> Rchb.		
<i>Marsdenia longiloba</i> Benth.	TSC-E	
<i>Marsdenia rostrata</i> R.Br.		Milk Vine
<i>Tylophora benthamii</i> S.T. Blake		Coast Tylophora
<i>Tylophora paniculata</i> R.Br.		Thin-leaved Tylophora
Asteraceae		
* <i>Ageratina adenophora</i> (Spreng.) R.M.King & H.Rob.		Crofton Weed
* <i>Ageratina riparia</i> (Regel) R.M.King & H.Rob.		Mistflower, Creeping Crofton Weed
* <i>Ageratum houstonianum</i> Mill.		
* <i>Ambrosia artemisiifolia</i> L.		Annual Ragweed
* <i>Aster subulatus</i> Michx.		Wild Aster, Bushy Starwort
* <i>Baccharis halimifolia</i> L.		Groundsel Bush
* <i>Bidens pilosa</i> L.		Cobblers Pegs, Pitch-forks, Teasers
* <i>Bidens tripartita</i> L.		Burr Marigold
<i>Brachyscome microcarpa</i> F.Muell.		
<i>Centipeda minima</i> (L.) A.Braun & Asch.		Spreading Sneezeweed

Species and Taxonomic Authority	Status	Common Name
* <i>Chrysanthemoides monilifera</i> subsp. <i>rotundata</i> (DC.) Norl. (L.) Norl.		Bitiou Bush
* <i>Cirsium vulgare</i> (Savi) Ten.		Spear Thistle
* <i>Conyza bonariensis</i> (L.) Cronquist		Flaxleaf Fleabane
* <i>Cotula coronopifolia</i> L.		Water Buttons
* <i>Crassocephalum crepidioides</i> (Benth.) S.Moore		Thickhead
<i>Eclipta platyglossa</i> F.Muell.		
<i>Eclipta prostrata</i> (L.) L.		
* <i>Emilia sonchifolia</i> (L.) DC.		
<i>Enydra fluctuans</i> DC.		
<i>Epaltes australis</i> Less.		Spreading Nut-heads
* <i>Erechtites valerianifolia</i> (Wolf) DC.		Brazilian Fireweed
* <i>Gamochaeta spicata</i> (Lam.) Cabrera		
* <i>Hypochaeris microcephala</i> var. <i>albiflora</i> (Sch.Bip.) Cabrera		White Flatweed
* <i>Hypochaeris radicata</i> L.		Catsear, Flatweed
<i>Lagenophora gracilis</i> Steetz		
<i>Lagenophora stipitata</i> (Labill.) Druce		Blue Bottle-daisy, Common Lagenophora
<i>Leptinella longipes</i> Hook.f.	Uncommon	
<i>Melanthera biflora</i> (L.) Wild		
<i>Olearia nernstii</i> (F.Muell.) F.Muell. ex Benth.		
<i>Ozothamnus diosmifolius</i> (Vent.) DC.		Rice Flower, White Dogwood, Pill Flower, Sago Bush
* <i>Senecio madagascariensis</i> Poir.		Fireweed
* <i>Soliva anthemifolia</i> (Juss.) R.Br. ex Less.		Dwarf Jo-jo, Button Burweed
* <i>Sonchus oleraceus</i> L.		Common Sowthistle
<i>Vernonia cinerea</i> (L.) Less.		
<i>Vernonia cinerea</i> var. <i>cinerea</i> (L.) Less.		
* <i>Xanthium italicum</i> Moretti		Hunter Burr
<i>Xerochrysum bracteatum</i> (Vent.) Tzvelev		Golden Everlasting
Avicenniaceae		
<i>Avicennia marina</i> subsp. <i>australasica</i> (Walp.) Moldenke		Mangrove, Grey Mangrove
Basellaceae		
* <i>Anredera cordifolia</i> (Ten.) Steenis		Madeira Vine, Lamb's Tail, Jalap, Potato Vine
* <i>Jacaranda mimosifolia</i> D.Don		Jacaranda
Bignoniaceae		
* <i>Macfadyena unguis-cati</i> (L.) A.H.Gentry		Cat's Claw Creeper
<i>Pandorea jasminoides</i> (Lindl.) Schum.		Bower Vine
<i>Pandorea pandorana</i> (Andrews) Steenis		Wonga Wonga Vine
Brassicaceae		
* <i>Cardamine paucijuga</i> Turcz.		
Burseraceae		
<i>Canarium australasicum</i> (F.M.Bailey) Leenh.		Mango Bark, Carrot Wood, Brown Cudgerie, Parsnip Wood
Cactaceae		
* <i>Opuntia stricta</i> (Haw.) Haw.		Common Prickly Pear, Smooth Pest Pear
Casuarinaceae		
<i>Casuarina glauca</i>		Swamp Oak

Species and Taxonomic Authority	Status	Common Name
<i>Casuarina equisetifolia</i> subsp. <i>incana</i> (Benth.) L.A.S.Johnson		Horsetail She-oak, Horsetail Sheoak
<i>Allocasuarina littoralis</i> (Salisb.) L.A.S.Johnson		Black She-oak
<i>Allocasuarina torulosa</i> (Aiton) L.A.S.Johnson		Forest Oak
Celastraceae		
<i>Celastrus subspicata</i> Hook.		Large-leaved Staff Vine
<i>Denhamia celastroides</i> (F.Muell.) Jessup		Denhamia, Orange Boxwood
<i>Elaeodendron australe</i> Vent.		
<i>Hedraianthera porphyropetala</i> F.Muell.		Hedraianthera
<i>Hippocratea barbata</i> F.Muell.		Knot Vine
Chenopodiaceae		
<i>Atriplex semibaccata</i> R.Br.		Creeping Saltbush, Berry Saltbush
<i>Einadia hastata</i> (R.Br.) A.J.Scott		Berry Saltbush
<i>Rhagodia candolleana</i> subsp. <i>candolleana</i> Moq.		
<i>Sarcocornia quinqueflora</i> subsp. <i>quinqueflora</i> (Bunge ex Ung.-Sternb.) A.J.Scott		
<i>Suaeda australis</i> (R.Br.) Moq.		
Clusiaceae		
<i>Hypericum gramineum</i> G.Forst.		Small St. John's Wort
<i>Hypericum japonicum</i> Thunb.		
Convolvulaceae		
<i>Calystegia marginata</i> R.Br.		
<i>Convolvulus erubescens</i> Sims		Blushing Bindweed
<i>Dichondra repens</i> J.R.Forst. & G.Forst.		Kidney Weed
* <i>Ipomoea cairica</i> (L.) Sweet		
<i>Ipomoea pes-caprae</i> subsp. <i>brasiliensis</i> (L.) R.Br.		
Corokiaceae		
‡ <i>Corokia whiteana</i> L.S.Sm.	TSC-V	
Crassulaceae		
* <i>Bryophyllum delagoense</i> (Eckl. & Zeyh.) Schinz		Mother-of-millions
Cucurbitaceae		
<i>Diplocyclos palmatus</i> (L.) Jeffrey		
‡ <i>Trichosanthes subvelutina</i> F.Muell. ex Cogn.	3RC-	
<i>Zehneria cunninghamii</i> (F.Muell.) Benth.		Slender Cucumber
Cunoniaceae		
<i>Aphanopetalum resinosum</i> Endl.		Gum Vine
<i>Callicoma serratifolia</i> Andrews		Black Wattle, Callicoma, Silver-leaf Butterwood
<i>Geissois benthamiana</i> F.Muell.		Red Carabeen, Red Bean, Leather Jacket, Brush Mahogany
<i>Pseudoweinmannia lachnocarpa</i> (F.Muell.) Engl.		Rose Marara
Davidsoniaceae		
‡ <i>Davidsonia jerseyana</i> (F.Muell. ex F.M.Bailey) G.J.Harden & J.B.Williams	TSC-E	Davidson's Plum
Dilleniaceae		
<i>Adrastaea salicifolia</i> (DC.) F.Muell.		
<i>Hibbertia acicularis</i> (Labill.) F.Muell.		
<i>Hibbertia aspera</i> DC.		Rough Guinea Flower
<i>Hibbertia dentata</i> R.Br. ex DC.		Trailing Guinea Flower

Species and Taxonomic Authority	Status	Common Name
<i>Hibbertia diffusa</i> DC.		Wedge Guinea Flower
<i>Hibbertia empetrifolia</i> subsp. <i>empetrifolia</i> (DC.) Hoogland		
<i>Hibbertia fasciculata</i> DC.		
<i>Hibbertia linearis</i> DC.		
<i>Hibbertia riparia</i> (R.Br. ex DC.) Hoogland		Erect Guinea-flower
<i>Hibbertia scandens</i> (Willd.) Gilg		Climbing Guinea Flower
Droseraceae		
<i>Drosera auriculata</i> Backh. ex Planch.		Sundew
<i>Drosera spatulata</i> Labill.		Sundew
Ebenaceae		
<i>Diospyros australis</i> (R.Br.) Hiern		Black Plum, Yellow Persimmon, Grey Plum
<i>Diospyros fasciculosa</i> (F.Muell.) F.Muell.		Grey Ebony, Clustered Persimmon, Long Tom
‡ <i>Diospyros mabacea</i> (F.Muell.) F.Muell.	TSC-E	
‡ <i>Diospyros major</i> var. <i>ebenus</i> (G.Forst.) Bakh.	TSC-E	Ebony
<i>Diospyros pentamera</i> (Woolfs & F.Muell.) F.Muell.		Myrtle Ebony, Grey Persimmon, Black Myrtle, Grey Plum
Elaeocarpaceae		
<i>Elaeocarpus eumundii</i> F.M.Bailey		Eumundi Quandong, Smooth-leaved Quandong
<i>Elaeocarpus grandis</i> F.Muell.		Blue Quandong, Blue Fig, Silver Quandong
<i>Elaeocarpus kirtonii</i> F.Muell. ex F.M.Bailey		Silver Quandong, White Quandong, Brown-hearted Quandong, Brownheart, Mountain Beech, Pigeonberry Ash, White Beech, Whitewood
<i>Elaeocarpus obovatus</i> G.Don		Hard Quandong, Blueberry Ash, Whitewood, Grey Carabeen, Freckled Oliveberry, Grey Carrobeen
<i>Elaeocarpus reticulatus</i> Sm.		Blueberry Ash, Ash Quandong, Blue Olive Berry, Fairy Petticoats, Fringe Tree, Koda, Lily of the valley Tree, Scrub Ash
‡ <i>Elaeocarpus williamsianus</i> Guymmer	TSC-E	Hairy Quandong
‡ <i>Elaeocarpus</i> sp. Rocky Creek (G.Read AQ 562114)	TSC-E	Minyon Quandong
<i>Sloanea australis</i> (Benth.) F.Muell.		Maiden's Blush, Blush Alder, Blush Carrabeen, Blush
<i>Sloanea woollsii</i> F.Muell.		Yellow Carabeen, Carribin, Grey Carrobean, Carabeen
Epacridaceae		
<i>Acrotriche aggregata</i> R.Br.		Red Cluster Heath, Tall Acrotriche, Tall Groundberry
<i>Agiortia pedicellata</i> (C.T.White) Quinn in Quinn et al		
<i>Astroloma pinifolium</i> (R.Br.) Benth.		Pine Heath
<i>Brachyloma daphnoides</i> (Sm.) Benth.		Daphne Heath
<i>Brachyloma scortechinii</i> F.Muell.		
<i>Epacris microphylla</i> R.Br.		
<i>Epacris obtusifolia</i> Sm.		Blunt-leaf Heath
<i>Epacris pulchella</i> Cav.		Wallum Heath
<i>Leucopogon deformis</i> R.Br.		
<i>Leucopogon ericoides</i> (Sm.) R.Br.		Pink Beard-heath
<i>Leucopogon juniperinus</i> R.Br.		Prickly Beard-heath
<i>Leucopogon lanceolatus</i> var. <i>gracilis</i> Benth.		

Species and Taxonomic Authority	Status	Common Name
<i>Leucopogon leptospermoides</i> R.Br.		
<i>Leucopogon margarodes</i> R.Br.		
<i>Leucopogon parviflorus</i> (Andrews) Lindl.		Coastal Beard-heath, Native Currant
<i>Leucopogon virgatus</i> (Labill.) R.Br.		
<i>Monotoca elliptica</i> (Sm.) R.Br.		Tree Broom-heath
<i>Monotoca scoparia</i> (Sm.) R.Br.		
<i>Sprengelia sprengelioides</i> (R.Br.) Druce		
<i>Styphelia viridis</i> subsp. <i>breviflora</i> (Benth.) J.M.Powell		Green Five Corners
<i>Trochocarpa laurina</i> R.Br.		Tree Heath, Axebreaker, Sandberry, Wheel-fruit
Euphorbiaceae		
<i>Acalypha capillipes</i> Muell.Arg.		
‡ <i>Acalypha eremorum</i> Muell.Arg.	TSC-E	
<i>Actephila lindleyi</i> (Steud.) Airy Shaw		Actephila
<i>Alchornea ilicifolia</i> (J.Sm.) Muell.Arg.		Dovewood, Native Holly
<i>Baloghia inophylla</i> (G.Forst.) P.S.Green		Brush Bloodwood, Ivory Birch, Scrub Bloodwood
<i>Breynia oblongifolia</i> Muell.Arg.		Coffee Bush
<i>Bridelia exaltata</i> F.Muell.		Brush Ironbark, Scrub Ironbark, Grey Birch, Brown Birch
<i>Claoxylon australe</i> Baill.		Brittlewood
<i>Cleistanthus cunninghamii</i> Muell.Arg.		Cleistanthus, Omega
<i>Croton verreauxii</i> Baill.		Green Native Cascarilla
<i>Drypetes deplanchei</i> (Brongn. & Gris) Merr.		Yellow Tulipwood, Greybark, Yellow Tulip, Grey Boxwood, White Myrtle, Grey Bark
<i>Excoecaria agallocha</i> L.		Milky Mangrove
<i>Excoecaria dallachyana</i> L.		Milky Mangrove, River Poison Tree, Blind-your-eye
‡ <i>Fontainea australis</i> Jessup & Guymmer	TSC-V	Southern Fontainea
<i>Glochidion ferdinandi</i> (Muell.Arg.) F.M.Bailey		Cheese Tree
<i>Glochidion sumatranum</i> Miq.		Umbrella Cheese Tree
<i>Homalanthus populifolius</i> Graham		
<i>Macaranga tanarius</i> (L.) Muell.Arg.		Nasturtium Tree, Blush Macaranga, David's Heart, Heart Leaf
<i>Mallotus discolor</i> F.Muell. ex Benth.		White Kamala, Yellow Kamala
<i>Mallotus philippensis</i> (Lam.) Muell.Arg.		Red Kamala, Orange Kamala
<i>Phyllanthus virgatus</i> G.Forst.		
<i>Poranthera microphylla</i> Brongn.		
<i>Pseudanthus orientalis</i> (Baill.) F.Muell.		
<i>Ricinocarpos pinifolius</i> Desf.		Wedding Bush
<i>Tragia novae-hollandiae</i> Muell.Arg.		Stinging Vine
* <i>Triadica sebifera</i> (L.) Small		Chinese Tallowood
Eupomatiaceae		
<i>Eupomatia bennettii</i> F.Muell.		Small Bolwarra
<i>Eupomatia laurina</i> R.Br.		Bolwarra, Copper Laurel
Fabaceae (Caesalpinioideae)		
* <i>Caesalpinia decapetala</i> (Roth) Alston		Thorny Poinciana, Wait-a-while
* <i>Caesalpinia scortechinii</i> (F.Muell.) Hattink		Large Prickle-vine, Wait-a-while
* <i>Caesalpinia subtropica</i> Pedley		Corky Prickle-vine

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<i>Cassia brewsteri</i> var. <i>marksiana</i> (F.Muell.) Benth.		Native Laburnum
<i>Chamaecrista nomame</i> var. <i>nomame</i> (Siebold) H.Ohashi		
<i>Chorizema parviflorum</i> Benth.		Eastern Flame Pea
* <i>Senna pendula</i> var. <i>glabrata</i> (Vogel) H.S.Irwin & Barneby		
* <i>Senna septemtrionalis</i> (Viv.) H.S.Irwin & Barneby		Arsenic Bush
Fabaceae (Faboideae)		
<i>Aotus ericoides</i> (Vent.) Don		
<i>Aotus lanigera</i> A.Cunn. ex Benth.		
<i>Austrosteenisia blackii</i> var. <i>blackii</i> (F.Muell.) R.Geesink		Blood Vine
<i>Austrosteenisia glabristyla</i> Jessup		Giant Blood Vine
<i>Bossiaea ensata</i> Sieber ex DC.		Sword Bossiaea
<i>Bossiaea heterophylla</i> Vent.		Variable Bossiaea
‡ <i>Callerya australis</i> (Endl.) Schot	3RC	Native Wisteria
<i>Callerya megasperma</i> (F.Muell.) Schot		Native Wisteria
<i>Canavalia rosea</i> (Sw.) DC.		Coastal Jack Bean
<i>Castanospermum australe</i> A.Cunn. ex Mudie		Black Bean, Moreton Bay Chestnut
<i>Daviesia arborea</i> W.Hill		
<i>Daviesia ulicifolia</i> subsp. <i>stenophylla</i> G.Chandler & Crisp		Gorse Bitter Pea
<i>Daviesia ulicifolia</i> subsp. <i>ulicifolia</i> Andrews		Gorse Bitter Pea
<i>Derris involuta</i> (Sprague) Sprague		
‡ <i>Desmodium acanthocladum</i> F.Muell.	TSC-V	Thorny Pea
<i>Desmodium brachypodum</i> A.Gray		Large Tick-trefoil, Large Tick-trefoil
<i>Desmodium gunnii</i> Benth. ex Hook.f.		Slender tick trefoil
<i>Desmodium nemorosum</i> Benth.		
<i>Desmodium rhytidophyllum</i> Benth.		
<i>Desmodium varians</i> (Labill.) G.Don		Slender Tick-trefoil
<i>Dillwynia floribunda</i> Sm.		
<i>Dillwynia retorta</i> (J.C.Wendl.) Druce		
<i>Erythrina crista-galli</i> L.		Cockspur Coral Tree
<i>Erythrina vespertilio</i> Benth.		Bat-Wing Coral Tree, Bat's Wing Coral Tree
<i>Galactia tenuiflora</i> var. <i>villosa</i> (Wight & Arn.) Benth		
<i>Glycine clandestina</i> J.C.Wendl.		
<i>Glycine microphylla</i> (Benth.) Tindale		Small-leaf glycine
<i>Glycine tabacina</i> (Labill.) Benth.		
<i>Gompholobium virgatum</i> Sieber ex DC.		Leafy Wedge Pea
<i>Hardenbergia violacea</i> (Schneev.) Stearn		Purple Coral Pea, False Sarsparilla, Waraburra
<i>Hovea acutifolia</i> A.Cunn. ex G.Don		
<i>Indigofera australis</i> Willd.		Australian Indigo
<i>Jacksonia scoparia</i> R.Br.		Winged Broom-pea, Dogwood
<i>Kennedia rubicunda</i> Vent.		Dusky Coral Pea
* <i>Lablab purpureus</i> (L.) Sweet		Indian Bean
<i>Lespedeza juncea</i> subsp. <i>sericea</i> (Thunb.) Steenis		
<i>Zornia muriculata</i> D.C. subsp. <i>angustata</i>		
<i>Mucuna gigantea</i> (Willd.) DC.		Burny Bean
<i>Oxylobium arborescens</i> R.Br.		Tall Shaggy Pea
<i>Oxylobium robustum</i> Joy Thomps.		Tree Shaggy Pea
<i>Phyllota phyllicoides</i> Benth.		Heath Phyllota
<i>Pultenaea myrtoidea</i> A.Cunn. ex Benth.		

Species and Taxonomic Authority	Status	Common Name
<i>Pultenaea retusa</i> Sm.		
<i>Pultenaea spinosa</i> (DC.) H.B.Will.		
<i>Pultenaea villosa</i> Willd.		
<i>Viminaria juncea</i> (Schrad.) Hoffmanns.		Golden spray, Native Broom
Fabaceae (Mimosoideae)		
<i>Acacia aulacocarpa</i> A.Cunn. ex Benth.		Salwood, Golden-flowered Salwood, Lancewood
‡ <i>Acacia bakeri</i> Maiden	TSC-V	Baker's Wattle, Marblewood, Scrub Wattle, White Marblewood
<i>Acacia concurrens</i> Pedley		Curraabah
<i>Acacia disparrima</i> subsp. <i>disparrima</i> M.McDonald & Maslin		Salwood, Southern Salwood, Brush Ironbark Wattle, Hickory
<i>Acacia elongata</i> Sieber ex DC.		Swamp Wattle
<i>Acacia irrorata</i> subsp. <i>irrorata</i> Sieber ex Spreng.		Green Wattle, Blueskin
<i>Acacia leiocalyx</i> subsp. <i>leiocalyx</i> (Domin) Pedley		Curraabah
<i>Acacia longifolia</i> subsp. <i>sophorae</i> (Labill.) Court		Coast Wattle, Wadanguli (Cadigal)
<i>Acacia longissima</i> H.L.Wendl.		Long-leaf Wattle
<i>Acacia maidenii</i> F.Muell.		Maiden's Wattle
<i>Acacia melanoxylon</i> R.Br.		Blackwood
* <i>Acacia saligna</i> (Labill.) H.L.Wendl.		Golden Wreath Wattle, Orange Wattle,
<i>Acacia suaveolens</i> (Sm.) Willd.		Sweet Wattle
<i>Acacia ulicifolia</i> (Salisb.) Court		Prickly Moses
<i>Acacia viscidula</i> Benth.		Sticky Wattle
<i>Archidendron grandiflorum</i> (Sol. ex Benth.) I.C.Nielsenv		Pink Lace Flower, Laceflower Tree, Tassel Tree, Fairy Paint Brushes
‡ <i>Archidendron hendersonii</i> (F.Muell.) I.C.Nielsen	TSC-V	White Lace Flower, Tulip Siris
‡ <i>Archidendron muellerianum</i> (Maiden & R.T.Baker) I.C.Nielsen		Veiny Lace Flower, Small-flower Laceflower
<i>Pararchidendron pruinosum</i> var. <i>pruinosum</i> (Benth.) I.C.Nielsen		Snow Wood
Flacourtiaceae		
<i>Scolopia braunii</i> (Klotzsch) Sleumer		Flintwood, Mountain Cherry, Brown Birch, Scolopia
‡ <i>Xylosma terrae-reginae</i> C.T.White & Sleumer	TSC-E	Xylosma
Goodeniaceae		
<i>Dampiera stricta</i> (Sm.) R.Br.		
<i>Goodenia hederacea</i> subsp. <i>hederacea</i> Sm.		Forest Goodenia, Ivy Goodenia
<i>Goodenia heterophylla</i> subsp. <i>eglandulosa</i> Carolin		
<i>Goodenia paniculata</i> Sm.		Branched Goodenia
<i>Goodenia rotundifolia</i> R.Br.		
<i>Scaevola calendulacea</i> (Andrews) Druce		
Haloragaceae		
<i>Gonocarpus chinensis</i> subsp. <i>verrucosus</i> (Maiden & Betche) Orchard		
<i>Gonocarpus humilis</i> Orchard		
<i>Gonocarpus micranthus</i> Thunb.		
<i>Gonocarpus tetragynus</i> Labill.		
<i>Gonocarpus teucroides</i> DC.		Raspwort
<i>Haloragis heterophylla</i> Brongn.		Rough Raspwort

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* <i>Myriophyllum aquaticum</i> (Vell.) Verdc.		Parrots Feather, Brazilian Water-milfoil
 Icacinaceae		
<i>Citronella moorei</i> (Benth.) R.A.Howard		Churnwood
 Lamiaceae		
<i>Lycopus australis</i> R.Br.		Native gipsywort, Australian Gipsywort
<i>Plectranthus parviflorus</i> Willd.		
<i>Prostanthera nivea</i> A. Cunn ex. Benth.		Snowy Mint Bush
* <i>Salvia coccinea</i> Juss. ex Murray		
 Lauraceae		
<i>Beilschmiedia elliptica</i> C.T.White & W.D.Francis		Grey Walnut
<i>Beilschmiedia obtusifolia</i> (F.Muell. ex Meisn.) F.Muell.		Blush Walnut
<i>Cassytha filiformis</i> L.		
<i>Cassytha glabella</i> R.Br.		
<i>Cassytha pubescens</i> R.Br.		
* <i>Cinnamomum camphora</i> (L.) T.Nees & C.H.Eberm.		Camphor Laurel
<i>Cinnamomum oliveri</i> F.M.Bailey		Oliver's Sassafras
<i>Cinnamomum virens</i> R.T.Baker		Red-barked Sassafras
‡ <i>Cryptocarya foetida</i> R.T.Baker	TSC-V	Stinking Cryptocarya
<i>Cryptocarya glaucescens</i> R.Br.		Jackwood
<i>Cryptocarya laevigata</i> Blume		Red-fruited Laurel, Glossy Laurel
<i>Cryptocarya microneura</i> Meisn.		Murrogon
<i>Cryptocarya obovata</i> R.Br.		Pepperberry
<i>Cryptocarya rigida</i> Meisn.		Forest Maple
<i>Cryptocarya triplinervis</i> R.Br.		Three-veined Cryptocarya, Three-veined Laurel
<i>Cryptocarya triplinervis</i> var. <i>pubens</i> R.Br.		Three-veined Cryptocarya
<i>Endiandra discolor</i> Benth.		Rose Walnut, Domatia Tree
‡ <i>Endiandra floydii</i> B.Hyland	TSC-V	
‡ <i>Endiandra globosa</i> Maiden & Betche	2RC-	Black Walnut
‡ <i>Endiandra hayesii</i> Kosterm.	TSC-V	Rusty Rose Walnut
‡ <i>Endiandra muelleri</i> subsp. <i>bracteata</i> Meisn.	TSC-E	Green-leaved Rose Walnut
<i>Endiandra muelleri</i> subsp. <i>muelleri</i> Meisn.		Green-leaved Rose Walnut
<i>Endiandra pubens</i> Meisn.		Hairy Walnut
<i>Endiandra sieberi</i> Nees		Hard Corkwood
<i>Endiandra virens</i> F.Muell.		White Apple
<i>Litsea australis</i> B.Hyland		Brown Bolly Gum
<i>Litsea reticulata</i> (Meisn.) F.Muell		Bolly Gum
<i>Neolitsea australiensis</i> Kosterm.		Green Bolly Gum
<i>Neolitsea dealbata</i> (R.Br.) Merr.		Hairy-leaved Bolly Gum
 Lentibulariaceae		
<i>Utricularia gibba</i> L.		Floating Bladderwort
 Lobeliaceae		
<i>Lobelia anceps</i> L.f.		
<i>Lobelia gibbosa</i> Labill.		Tall Lobelia
<i>Lobelia trigonocaulis</i> F.Muell.		Forest Lobelia
<i>Pratia purpurascens</i> (R.Br.) E.Wimm.		Whiteroot
 Loganiaceae		
<i>Logania pusilla</i> R.Br.		
<i>Mitrasacme alsinoides</i> R.Br.		

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<i>Mitrasacme paludosa</i> R.Br.		
<i>Mitrasacme polymorpha</i> R.Br.		
Loranthaceae		
<i>Amyema cabbagei</i> (Blakely) Danser		
<i>Amyema congener</i> subsp. <i>congener</i> (Sieber ex Schult. & Schult.f.) Tiegh.		
<i>Amyema mackayense</i> Barlow subsp. <i>mackayense</i>		Mangrove Mistletoe
<i>Amylothea dictyophleba</i> (F.Muell.) Tiegh.		
<i>Benthamina alyxifolia</i> (F.Muell. ex Benth.) Tiegh.		Shiny-leaved Mistletoe
<i>Dendrophthoe vitellina</i> (F.Muell.) Tiegh.		
<i>Muellerina celastroides</i> (Sieber ex Schult. & Schult.f.) Tiegh.		
Lythraceae		
* <i>Cuphea carthagenensis</i> (Jacq.) J.F.Macbr		
Malaceae		
* <i>Eriobotrya japonica</i> (Thunb.) Lindl.		Loquat
* <i>Rhaphiolepis indica</i> (L.) Lindl. ex Ker Gawl.		Indian Hawthorn
Malvaceae		
<i>Hibiscus diversifolius</i> Jacq.		Swamp Hibiscus
<i>Hibiscus heterophyllus</i> subsp. <i>heterophyllus</i> Vent.		Native Rosella, Toilet Paper Bush
<i>Hibiscus tiliaceus</i> L.		Cottonwood Hibiscus
* <i>Sida rhombifolia</i> L.		Paddy's Lucerne
‡ <i>Sida cordifolia</i> L.	Rare	
* <i>Urena lobata</i> L.		Congo Jute
Melastomataceae		
<i>Melastoma affine</i> D.Don		Blue Tongue, Native Lasiandra
Meliaceae		
<i>Anthocarapa nitidula</i> (Benth.) T.D.Penn. ex Mabb.		Incense Cedar
<i>Dysoxylum fraserianum</i> (Juss.) Benth.		Rosewood, Rose Mahogany
<i>Dysoxylum mollissimum</i> subsp. <i>molle</i> (Miq.) Mabb.		
<i>Dysoxylum rufum</i> (A. Rich.) Benth		Hairy Rosewood
<i>Synoum glandulosum</i> subsp. <i>glandulosum</i> (Sm.) Juss.		Scentless Rosewood
<i>Toona ciliata</i> M.Roem.		Red Cedar
Menispermaceae		
<i>Carronia multiseptata</i> F.Muell.		
<i>Legnephora moorei</i> (F.Muell.) Miers		Round-leaf Vine
<i>Sarcopetalum harveyanum</i> F.Muell.		Pearl Vine
<i>Stephania aculeata</i> F.M.Bailey		Prickly Snake Vine
<i>Stephania japonica</i> var. <i>discolor</i> (Thunb.) Miers		Snake Vine
‡ <i>Tinospora tinosporoides</i> (F.Muell.) Forman	TSC-V	Arrow-head Vine
Menyanthaceae		
<i>Nymphoides indica</i> (L.) Kuntze		Water Snowflake
<i>Villarsia exaltata</i> (Sol. ex Sims) G.Don		Yellow Marsh Flower
Monimiaceae		
<i>Daphnandra tenuipes</i> J.R.Perkins		Red-flowered Socketwood
<i>Doryphora sassafras</i> Endl.		Sassafras
<i>Palmeria scandens</i> F.Muell.		Anchor Vine, Pomegranate Vine
<i>Wilkiea austroqueenslandica</i> Domin		Smooth Wilkiea

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<i>Wilkiea huegeliana</i> (Tul.) A.DC.		Veiny Wilkiea
<i>Wilkiea macrophylla</i> (R.Cunn.) A.DC.		Large-leaved Wilkiea
Moraceae		
<i>Ficus coronata</i> Spin		Sandpaper Fig, Creek Sandpaper Fig
<i>Ficus fraseri</i> Miq.		Sandpaper Fig
<i>Ficus macrophylla</i> Desf. ex Pers.		Moreton Bay Fig
<i>Ficus obliqua</i> G.Forst.		Small-leaved Fig
<i>Ficus rubiginosa</i> Desf. ex Vent.		Port Jackson Fig, Rusty Fig
<i>Ficus superba</i> var. <i>superba</i> Miq.		
<i>Ficus virens</i> var. <i>sublanceolata</i> Aiton		White Fig
<i>Ficus watkinsiana</i> F.M.Bailey		Strangling Fig
<i>Maclura cochinchinensis</i> (Lour.) Corner		Cockspur Thorn
* <i>Morus nigra</i> Britton, N.L. & Brown A.		Black Mulberry
<i>Streblus brunonianus</i> (Endl.) F.Muell.		Whalebone Tree
<i>Trophis scandens</i> (Lour.) Hook. & Arn.		Burny Vine
Myoporaceae		
<i>Myoporum acuminatum</i> R.Br.		
<i>Myoporum boninense</i> subsp. <i>australe</i> Koidz.Chinnock		
Myrsinaceae		
<i>Aegiceras corniculatum</i> (L.) Blanco		River Mangrove
* <i>Ardisia crenata</i> Sims		Coralberry
<i>Embelia australiana</i> (F.Muell.) F.M.Bailey		Embelia
<i>Myrsine howittiana</i> (F.Muell. ex Mez) Jackes		Brush Muttonwood
<i>Myrsine subsessilis</i> F.Muell.		Red Muttonwood
<i>Myrsine variabilis</i> R.Br.		Muttonwood
Myrtaceae		
<i>Acmena hemilampra</i> subsp. <i>hemilampra</i> (F.Muell. ex F.M.Bailey) Merr. & L.M.Perry		Broad-leaved Lilly Pilly, Blush Satinash
<i>Acmena ingens</i> (F.Muell. ex C.Moore) Guymer & B.Hyland		Red Apple
<i>Acmena smithii</i> (Poir.) Merr. & L.M.Perry		Lilly Pilly, Midjuburi (Cadigal)
<i>Angophora paludosa</i> (G.J.Leach) K.R.Thiele & Ladiges		Narrow-leaved Rough-barked Apple
<i>Angophora subvelutina</i> F.Muell.		Broad-leaved Apple
<i>Archirhodomyrtus beckeri</i> (F.Muell.) A.J.Scott		Rose Myrtle
<i>Austromyrtus dulcis</i> (C.T.White) L.S.Sm.		Midgen Berry
<i>Babingtonia densifolia</i> (Sm.) F.Muell.		
<i>Babingtonia similis</i> A.R.Bean		
<i>Backhousia myrtifolia</i> Hook. & Harv.		Grey Myrtle, Ironwood
<i>Baeckea frutescens</i> F. Muell.		
<i>Callistemon pachyphyllus</i> Cheel		Wallum Bottlebrush
<i>Callistemon salignus</i> (Sm.) Sweet		Willow Bottlebrush
<i>Corymbia gummifera</i> (Gaertn.) K.D.Hill & L.A.S.Johnson		Red Bloodwood
<i>Corymbia henryi</i> (S.T.Blake) K.D.Hill & L.A.S.Johnson		Large-leaved Spotted Gum
<i>Corymbia intermedia</i> (R.T.Baker) K.D.Hill & L.A.S.Johnson		Pink Bloodwood
<i>Decaspermum humile</i> (G.Don) A.J.Scott		Silky Myrtle
<i>Eucalyptus acmenoides</i> Schauer		White Mahogany
<i>Eucalyptus carnea</i> R.T.Baker		Thick-leaved Mahogany

Species and Taxonomic Authority	Status	Common Name
<i>Eucalyptus eugenioides</i> Sieber ex Spreng.		Thin-leaved Stringybark
<i>Eucalyptus grandis</i> W.Hill ex Maiden		Flooded Gum, Rose Gum
<i>Eucalyptus microcorys</i> F.Muell.		Tallowwood
<i>Eucalyptus pilularis</i> Sm.		Blackbutt
<i>Eucalyptus propinqua</i> H.Deane & Maiden		Small-fruited Grey Gum, Grey Gum
<i>Eucalyptus resinifera</i> subsp. <i>hemilampra</i> (F.Muell.) L.A.S.Johnson & K.D.Hill		Red Mahogany
<i>Eucalyptus robusta</i> Sm.		Swamp Mahogany
<i>Eucalyptus seeana</i> Maiden		Narrow-leaved Red Gum
<i>Eucalyptus siderophloia</i> Benth.		Grey Ironbark
<i>Eucalyptus signata</i> Sm.		Scribbly Gum
<i>Eucalyptus tereticornis</i> Sm.		Forest Red Gum
<i>Eucalyptus tindaliae</i> Blakely		Stringybark
<i>Gossia acmenoides</i> (F.Muell.) N.Snow & Guymer		Scrub Ironwood
<i>Gossia bidwillii</i> (Benth.) N.Snow & Guymer		Python Tree
‡ <i>Gossia fragrantissima</i> (F.Muell. ex Benth.) N.Snow & Guymer	TSC-E	Sweet Myrtle
<i>Gossia hillii</i> (Benth.) N.Snow & Guymer		Scaly Myrtle
<i>Gossia punctata</i> N.Snow & Guymer		
<i>Homoranthus virgatus</i> A.Cunn. ex Schauer		
<i>Leptospermum brachyandrum</i> (F.Muell.) Druce		
<i>Leptospermum juniperinum</i> Sm.		Prickly Tea-tree
<i>Leptospermum laevigatum</i> (Gaertn.) F.Muell.		Coast Teatree
<i>Leptospermum liversidgei</i> R.T.Baker & H.G.Sm.		
<i>Leptospermum microcarpum</i> Cheel		
<i>Leptospermum petersonii</i> F.M.Bailey		Lemon-scented Teatree
<i>Leptospermum polygalifolium</i> Salisb.		Tantoon
<i>Leptospermum polygalifolium</i> subsp. <i>cismontanum</i> Joy Thomps.		Tantoon
<i>Leptospermum polygalifolium</i> subsp. <i>polygalifolium</i> Salisb.		Tantoon
<i>Leptospermum semibaccatum</i> Cheel		
<i>Leptospermum speciosum</i> Schauer		
<i>Leptospermum trinervium</i> (Sm.) Joy Thomps.		Slender Tea-tree
<i>Leptospermum whitei</i> Cheel		
<i>Lophostemon confertus</i> (R.Br.) Peter G.Wilson & J.T.Waterh.		Brush Box
<i>Lophostemon suaveolens</i> (Sol. ex Gaertn.) Peter G.Wilson & J.T.Waterh.		Swamp Mahogany, Swamp Turpentine
<i>Melaleuca alternifolia</i> (Maiden & Betche) Cheel		
<i>Melaleuca linarifolia</i> Sm.		Flax-leaved Paperbark, Budjur (Gadigal)
<i>Melaleuca nodosa</i> (Sol. ex Gaertn.) Sm.		
<i>Melaleuca quinquenervia</i> (Cav.) S.T.Blake		Broad-leaved Paperbark
<i>Melaleuca sieberi</i> Schauer		
<i>Melaleuca squamea</i> Labill.		Swamp Honey-myrtle
<i>Melaleuca styphelioides</i> Sm.		Prickly-leaved Tea Tree
<i>Ochrosperma citriodorum</i> Penfold & J. L. Willis		
<i>Ochrosperma lineare</i> (C.T.White) Trudgen		Straggly Baeckea
<i>Ptilodictya glabrum</i> Burret		Plum Myrtle

Species and Taxonomic Authority	Status	Common Name
* <i>Psidium cattleianum</i> var. <i>cattleianum</i> Sabine		Porpay, Red or Strawberry Guava, Cherry Guava
* <i>Psidium guajava</i> L.		Common Guava, Yellow Guava
‡ <i>Rhodamnia maideniana</i> C.T.White	2RC-	Smooth Scrub Turpentine
<i>Rhodamnia rubescens</i> (Benth.) Miq.		Scrub Turpentine
<i>Rhodomyrtus psidioides</i> (G.Don) Benth.		Native Guava
<i>Syncarpia glomulifera</i> (Sm.) Nied.		Turpentine
<i>Syzygium australe</i> (J.C.Wendl. ex Link) B.Hyland		Brush Cherry
<i>Syzygium corynanthum</i> (F.Muell.) L.A.S.Johnson		Sour Cherry
<i>Syzygium francisii</i> (F.M.Bailey) L.A.S.Johnson		Giant Water Gum
‡ <i>Syzygium hodgkinsoniae</i> (F.Muell.) L.A.S.Johnson	TSC-V	Smooth-barked Rose Apple
<i>Syzygium luehmannii</i> (F.Muell.) L.A.S.Johnson		Small-leaved Lilly Pilly
‡ <i>Syzygium moorei</i> (F.Muell.) L.A.S.Johnson	TSC-V	Coolamon, Durobby
<i>Syzygium oleosum</i> (F.Muell.) B.Hyland		Blue Lilly Pilly
<i>Tristanopsis laurina</i> (Sm.) Peter G.Wilson & J.T.Waterh.		Water Gum, Kanooka, Kanuka
<i>Waterhousea floribunda</i> (F.Muell.) B.Hyland		Weeping Lilly Pilly, Weeping Myrtle
Nyctaginaceae		
<i>Pisonia aculeata</i> L.		Thorny Pisonia
Ochnaceae		
* <i>Ochna serrulata</i> (Hochst.) Walp.		Mickey Mouse Plant
Oleaceae		
<i>Jasminum didymum</i> G.Forst.		Jasmine
<i>Jasminum volubile</i> Jacq.		Stiff Jasmine
* <i>Ligustrum lucidum</i> Aiton		Large Leaved Privet
* <i>Ligustrum sinense</i> Lour.		Small Leaved Privet
<i>Notelaea johnsonii</i> P.S.Green		Veinless Mock-olive
<i>Notelaea longifolia</i> Vent.		Large Mock-olive, Large-leaved Olive
<i>Notelaea venosa</i> F.Muell.		Veined Mock-olive, Smooth Mock-olive, Large-leaved Mock-olive
<i>Olea paniculata</i> L.		Native Olive, Maulwood
Onagraceae		
‡ <i>Ludwigia octovalvis</i> (Jacq.) Raven	Uncommon	Willow Primrose
<i>Ludwigia peploides</i> subsp. <i>montevidensis</i> (Kunth) Raven		Water Primrose
Oxalidaceae		
<i>Oxalis chnoodes</i> Lourteig		
* <i>Oxalis corniculata</i> L.		
<i>Oxalis exilis</i> A.Cunn.		
* <i>Oxalis purpurea</i> Jacq.		
<i>Oxalis radicata</i> A.Rich.		
Passifloraceae		
* <i>Passiflora edulis</i> Sims		Common Passionfruit
* <i>Passiflora foetida</i> var. <i>hispida</i> L.		Stinking Passionflower
<i>Passiflora herbertiana</i> Ker Gawl.		Native Passionfruit
* <i>Passiflora suberosa</i> L.		Cork Passionflower, Small Passionfruit
* <i>Passiflora suberosa</i> L.		
* <i>Passiflora subpeltata</i> Ortega		White Passionflower
Peperomiaceae		
<i>Peperomia blanda</i> var. <i>floribunda</i> (Miq.) H.Huber		
Phytolaccaceae		
<i>Monococcus echinophorus</i> F.Muell.		

Species and Taxonomic Authority	Status	Common Name
* <i>Phytolacca octandra</i> L.		Inkweed
* <i>Rivina humilis</i> L.		Coral Berry
Piperaceae		
<i>Piper novae-hollandiae</i> Miq.		Giant Pepper Vine
Pittosporaceae		
<i>Auranticarpa rhombifolia</i> (A.Cunn. ex Hook.) L.W.Cayzer et al.		Holley-leaved Pittosporum, White Hollywood
<i>Bursaria spinosa</i> Cav.		Blackthorn, Boxthorn, Sweet Bursaria
<i>Hymenosporum flavum</i> (Hook.) F.Muell.		Native Frangipani
<i>Pittosporum multiflorum</i> (A.Cunn. ex Loudon) L.W.Cayzer et al.		Orange Thorn
<i>Pittosporum revolutum</i> Dryand. ex W.T.Aiton		Wild Yellow Jasmine, Rough-fruit Pittosporum
<i>Pittosporum undulatum</i> Vent.		Native Daphne, Sweet Pittosporum
Plantaginaceae		
<i>Veronica calycina</i> R.Br.		Hairy Speedwell
<i>Veronica plebeia</i> R.Br.		Trailing Speedwell, Creeping Speedwell
Polygalaceae		
‡ <i>Polygala japonica</i> Houtt.	TSC-E	
* <i>Polygala paniculata</i> L.		
Polygonaceae		
<i>Persicaria decipiens</i> (R.Br.) K.L.Wilson		Slender knotweed, Slender Knotweed
<i>Persicaria dichotoma</i> (Blume) Masam.		
‡ <i>Persicaria elatior</i> R. Br.	TSC-V	
<i>Persicaria hydropiper</i> (L.) Spach		
<i>Persicaria orientalis</i> (L.) Spach		Princes Feathers
<i>Persicaria strigosa</i> (R.Br.) H.Gross		
<i>Rumex brownii</i> Campd.		Swamp Dock
* <i>Rumex obtusifolius</i> subsp. <i>obtusifolius</i> L.		Broadleaf Dock
Polyosmaceae		
<i>Polyosma cunninghamii</i> Benn.		Featherwood
Proteaceae		
<i>Banksia aemula</i> R.Br.		Wallum Banksia
<i>Banksia ericifolia</i> subsp. <i>macrantha</i> (A.S.George)		Heath-leaved Banksia
<i>Banksia integrifolia</i> subsp. <i>integrifolia</i> L.f.		Coast Banksia
<i>Banksia integrifolia</i> subsp. <i>monticola</i> K.R.Thiele		
<i>Banksia oblongifolia</i> Cav.		Fern-leaved Banksia
<i>Banksia robur</i> Cav.		Swamp Banksia
<i>Banksia serrata</i> L.f.		Old-man Banksia, Wiriagan (Cadigal)
<i>Conospermum taxifolium</i> C.F.Gaertn.		Variable Smoke-bush, Yew-leaf Smoke Bush, Paint Brush
‡ <i>Grevillea hilliana</i> F.Muell.	TSC-E	White Yiel Yiel, White Silky Oak
<i>Grevillea robusta</i> A.Cunn. ex R.Br.		Silky Oak
<i>Hakea florulenta</i> Meisn.		
<i>Helicia ferruginea</i> F.Muell.		Rusty Helicia, Rusty Oak, Hairy Honeysuckle
<i>Helicia glabriflora</i> F.Muell.		Smooth or Pale Helicia, Pale Oak, Leather Oak, Brown Oak
<i>Lomatia silaifolia</i> (Sm.) R.Br.		Crinkle Bush, Fern-leaved Lomatia, Parsley Bush

Species and Taxonomic Authority	Status	Common Name
‡ <i>Macadamia tetraphylla</i> L.A.S.Johnson	TSC-V	
<i>Persoonia cornifolia</i> A.Cunn. ex R.Br.		
<i>Persoonia linearis</i> Andrews		Narrow-leaved Geebung
<i>Persoonia media</i> R.Br.		
<i>Persoonia stradbokensis</i> Domin		
<i>Persoonia tenuifolia</i> R.Br.		Fine-leaf Geebung
<i>Persoonia virgata</i> R.Br.		
<i>Petrophile canescens</i> A.Cunn. ex R.Br.		Conesticks
<i>Stenocarpus sinuatus</i> R.Br.		Scrub Beefwood
<i>Strangea linearis</i> Meisn.		
<i>Triunia youngiana</i> (C.Moore & F.Muell.) L.A.S.Johnson & B.G.Briggs		Spice Bush, Native Honeysuckle, Red Nut
Quintiniaceae		
<i>Quintinia verdonii</i> F.Muell.		Grey Possumwood, Smooth Possumwood
Ranunculaceae		
<i>Clematis glycinoides</i> Benth.		Headache Vine
<i>Clematis glycinoides</i> var. <i>submutica</i> Benth.		Headache Vine
<i>Ranunculus inundatus</i> R.Br. ex DC.		River Buttercup
* <i>Ranunculus repens</i> L.		Creeping Buttercup
* <i>Ranunculus sceleratus</i> L.		Celery Buttercup
Rhamnaceae		
<i>Alphitonia excelsa</i> (Fenzl) Benth.		Red Ash
<i>Emmenosperma alphitonioides</i> F.Muell.		Yellow Ash Bonewood Yellow Almond Grey Ash, Yellow Rosewood Pink Ooline
<i>Pomaderris argyrophylla</i> subsp. <i>argyrophylla</i> N. A. Wakef		
<i>Pomaderris discolor</i> (Vent.) Poir.		
Rhizophoraceae		
<i>Bruguiera gymnorhiza</i> (L.) Lam.		Black Mangrove
<i>Rhizophora stylosa</i> Griff.		Spider Mangrove, Red Mangrove, Stilt-rooted Mangrove
Ripogonaceae		
<i>Ripogonum album</i> R.Br.		White Supplejack
<i>Ripogonum brevifolium</i> Conran & Clifford		Small-leaved Supplejack
<i>Ripogonum discolor</i> F.Muell.		Prickly Supplejack
<i>Ripogonum elseyanum</i> F.Muell.		Hairy Supplejack
<i>Ripogonum fawcettianum</i> F.Muell. ex Benth.		Small Supplejack
Rosaceae		
* <i>Potentilla indica</i> (Jacks.) Th.Wolf		Indian Strawberry
<i>Rubus moluccanus</i> var. <i>trilobus</i> A.R.Bean		Molucca Bramble
<i>Rubus parvifolius</i> L.		Native Raspberry
<i>Rubus rosifolius</i> Sm.		Rose-leaf Bramble, Native Raspberry
Roussaceae		
<i>Abrophyllum ornans</i> (F.Muell.) Hook.f. ex Benth.		Native Hydrangea
Rubiaceae		
<i>Asperula gemella</i> Airy Shaw & Turrill		Twin-leaved Bedstraw
<i>Atractocarpus benthamianus</i> (F.Muell.) Puttock		Native Gardenia
<i>Atractocarpus chartaceus</i> (F.Muell.) Puttock		Thin-leaved Gardenia Narrow-leaved Gardenia
<i>Coelospermum paniculatum</i> F.Muell.		

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* <i>Coffea arabica</i> L.		Coffee
<i>Cyclophyllum longipetalum</i> S.T.Reynolds & R.J.F.Hend.		Coast Canthium
<i>Hodgkinsonia ovatiflora</i> F.Muell.		
<i>Ixora beckleri</i> Benth.		Native Ixora
<i>Morinda canthoides</i> (F.Muell.) Halford & R.J.F.Hend.		Veiny Morinda
<i>Morinda jasminoides</i> A.Cunn.		Sweet Morinda
<i>Pomax umbellata</i> (Gaertn.) Sol. ex A.Rich.		Billy Buttons
<i>Psychotria loniceroides</i> Sieber ex DC.		Hairy Psychotria
<i>Psychotria simmondsiana</i> F.M.		Small Psychotria
<i>Psydrax lamprophyllum</i> (F.Muell.) Bridson		Large-leaved Canthium
<i>Psydrax odorata</i> (G.Forst.) A.C.Sm. & S.P.Darwin		Shiny-leaved Canthium, Iamboto
‡ <i>Randia moorei</i> F.Muell. ex Benth.	TSC-E	Spiny Gardenia
* <i>Richardia brasiliensis</i> Gomes		White Eye, Mexican Clover
Rutaceae		
‡ <i>Acronychia baeuerlenii</i> T.G.Hartley	3RC-	Byron Bay Acronychia
<i>Acronychia imperforata</i> F.Muell.		Logan Apple
‡ <i>Acronychia littoralis</i> T.G.Hartley & J.B.Williams	TSC-E	Scented Acronychia
<i>Acronychia oblongifolia</i> (A.Cunn. ex Hook.) Endl. ex Heynh.		White Aspen, Yellow Wood
<i>Acronychia pubescens</i> (F.M.Bailey) C.T.White		Hairy Acronychia
<i>Acronychia wilcoxiana</i> (F.Muell.) T.G.Hartley		Silver Aspen
<i>Boronia falcifolia</i> A. Cunn. Ex Lindl.		
<i>Boronia rosmarinifolia</i> A.Cunn. ex Endl.		
<i>Bosistoa pentacocca</i> var. <i>pentacocca</i> (F.Muell.) Baill.		Ferny-leaf Bosistoa
‡ <i>Bosistoa transversa</i> J.F.Bailey & C.T.White	TSC-V	Three-leaved Bosistoa
<i>Bouchardatia neurococca</i> (F.Muell.) Baill.		Union Nut
* <i>Citrus australasica</i> F.Muell.		Finger Lime
* <i>Citrus taitensis</i> Risso		Rough Lemon, Rangpur Lime, Wild Lemon, Bush Lemon
<i>Flindersia australis</i> R.Br.		Crows Ash, Australian Teak
<i>Flindersia bennettiana</i> F.Muell. ex Benth.		Bennett's Ash
<i>Flindersia schottiana</i> F.Muell.		Cudgerie, Bumpy Ash, Southern Silver Ash
<i>Geijera salicifolia</i> Schott		Green Satinheart
<i>Halfordia kendack</i> F.Muell.		Saffron Heart
<i>Medicosma cunninghamii</i> (Hook.) Hook.f.		Pinkheart, Bonewood
<i>Melicope elleryana</i> (F.Muell.) T.G.Hartley		Pink-flowered Doughwood
<i>Melicope hayesii</i> T.G.Hartley		Small-leaved Doughwood
* <i>Murraya paniculata</i> (L.) Jack		
<i>Nematolepis squamea</i> subsp. <i>squamea</i> (Labill.) Paul G.Wilson		Satinwood
<i>Pentaceras australe</i> (F.Muell.) Hook.f. ex Benth.		Bastard Crow's Ash, Black Teak, Penta Ash
<i>Sarcomelicope simplicifolia</i> subsp. <i>simplicifolia</i> (Endl.) T.G.Hartley		Big Yellow Wood, Yellow Wood
<i>Zieria laevigata</i> Bonpl.		Smooth Zieria, Smooth-leaved Zieria, Twiggy Midge Bush
<i>Zieria laxiflora</i> (Benth.) Domin		Wallum Zieria
<i>Zieria smithii</i> Jacks.		Sandfly Zieria, Smithian Zieria, Dr Smith's Zieria

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Santalaceae		
<i>Exocarpos cupressiformis</i> Labill.		Cherry Ballart, Native Cherry
<i>Exocarpos latifolius</i> R.Br.		Broad-leaved Native Cherry
<i>Leptomeria acida</i> R.Br.		Native Currant, Sour Currant Bush
<i>Leptomeria drupacea</i> (Labill.) Druce		
Sapindaceae		
<i>Alectryon coriaceus</i> (Benth.) Radlk.		Beach Alectryon, Beach Birds Eye
<i>Alectryon subcinereus</i> (A.Gray) Radlk.		Native Quince, Wild Quince, Bird's Eye
<i>Alectryon tomentosus</i> (F.Muell.) Radlk.		Hairy Bird's Eye, Bed-jacket
<i>Arytera distylis</i> (F.Muell. ex Benth.) Radlk.		Twin-leaved Coogera
<i>Arytera divaricata</i> F.Muell.		Coogera, Rose Tamarind
<i>Atalaya multiflora</i> Benth.		Broad-leaved Whitewood
<i>Atalaya salicifolia</i> (A.DC.) Blume		Brush Whitewood
<i>Cardiospermum grandiflorum</i> Sweet		Balloon Vine
<i>Cupaniopsis anacardioides</i> (A.Rich.) Radlk.		Tuckeroo
‡ <i>Cupaniopsis newmanii</i> S.T.Reynolds	2RC-	Long-leaved Tuckeroo
<i>Cupaniopsis parvifolia</i> (F.M.Bailey) L.A.S.Johnson		Small-leaved Tuckeroo
‡ <i>Diploglottis campbellii</i> Cheel	TSC-E	Small-leaved Tamarind
<i>Diploglottis cunninghamia</i> (Hook.) Hook.f. ex		Native Tamarind
<i>Dodonaea triquetra</i> J.C.Wendl.		Hop Bush
<i>Elatostachys nervosa</i> (F.Muell.) Radlk.		Beetroot Tree
<i>Guioa semiglauc</i> (F.Muell.) Radlk.		Guioa
<i>Harpullia alata</i> F.Muell.		Wing-leaved Tulip
<i>Harpullia hillii</i> F.Muell.		Blunt-leaved Tulip
<i>Harpullia pendula</i> Planch. ex F.Muell.		Tulipwood
<i>Jagera pseudorhus</i> var. <i>pseudorhus</i> forma <i>pseudorhus</i> (A.Rich.) Radlk.		Foam Bark Tree, Foambark Tree
‡ <i>Lepiderema pulchella</i> Radlk.	TSC-V	Fine-leaved Tuckeroo
<i>Mischocarpus anodontus</i> (F.Muell.) Radlk.		Fine-leaved Brush Apple, Pear-fruited Tamarind
<i>Mischocarpus australis</i> S.T.Reynolds		Shiny Brush Apple, Red Pear Fruit
<i>Mischocarpus pyriformis</i> subsp. <i>pyriformis</i> (F.Muell.) Radlk.		Pear-fruited Tamarind
<i>Sarcopteryx stipata</i> (F.Muell.) Radlk.		Steelwood, Corduroy
<i>Toechima dasyrrhache</i> Radlk.		Blunt-leaved Steelwood
<i>Toechima tenax</i> (A.Cunn. ex Benth.) Radlk		
Sapotaceae		
<i>Pouteria australis</i> (R.Br.) Baehni		Black Apple
<i>Pouteria chartacea</i> (F.Muell. ex Benth.) Baehni		Thin-leaved Plum, Thin-leaved Coondoo
<i>Pouteria myrsinifolia</i> (F.Muell.) Jessup		Blunt-leaved Coondoo, Yellow Plumwood
<i>Pouteria pohlmiana</i> var. <i>pohlmiana</i> (F.Muell.) Baehni.		Yellow Boxwood
<i>Niemeyera antiloga</i> (F.Muell.) T.D.Penn.		Brown Pearwood
<i>Pouteria queenslandica</i> (P.Royen) Jessup		Blush Coondoo
Scrophulariaceae		
‡ <i>Artanema fimbriatum</i> D.Don	Uncommon	
<i>Bacopa monnieri</i> (L.) Pennell		Bacopa, Brahmi
Simaroubaceae		
<i>Ailanthus triphylla</i> (Dennst.) Alston		White Bean, White Siris
Solanaceae		
* <i>Cestrum nocturnum</i> L.		Lady-of-the-Night

Species and Taxonomic Authority	Status	Common Name
<i>Duboisia myoporoides</i> R.Br.		Corkwood, Eye-opening Tree, Poisonous Corkwood
Poison Corkwood, Yellow Basswood		
* <i>Physalis peruviana</i> L.		Cape Gooseberry
<i>Solanum americanum</i> Mill.		Glossy Nightshade
* <i>Solanum capsicoides</i> All.		Devil's Apple
<i>Solanum densevestitum</i> F.Muell. ex Benth.		
* <i>Solanum mauritianum</i> Scop.		Wild Tobacco Bush
* <i>Solanum nigrum</i> L.		Black-berry Nightshade
<i>Solanum prinophyllum</i> Dunal		Forest Nightshade
* <i>Solanum pseudocapsicum</i> L.		Madeira Winter or Jerusalem Cherry
* <i>Solanum seaforthianum</i> Andrews		Climbing Nightshade
Stackhousiaceae		
<i>Stackhousia nuda</i> Lindl.		
Sterculiaceae		
<i>Brachychiton acerifolius</i>		Flame Tree
<i>Commersonia bartramia</i> (L.) Merr.		Brown Kurrajong
<i>Heritiera trifoliolata</i> (F.Muell.) Kosterm.		White Booyong, Crowsfoot Elm
<i>Sterculia quadrifida</i> R.Br.		Red-fruited Kurrajong, Peanut Tree
Stylidiaceae		
<i>Stylidium debile</i> var. <i>debile</i> F.Muell.		Frail Triggerplant
<i>Stylidium laricifolium</i> Rich		Giant Trigger Plant
Surianaceae		
<i>Gulfoylia monostylis</i> (Benth.) F.Muell.		
Symplocaceae		
<i>Symplocos stawellii</i> F.Muell.		White Hazelwood
<i>Symplocos thwaitesii</i> F.Muell.		Buff Hazelwood, Buff Hazelwood
Theophrastaceae		
<i>Samolus repens</i> (J.R.Forst. & G.Forst.) Pers.		Creeping Brookweed
Thymelaeaceae		
<i>Pimelea ligustrina</i> Labill.		
<i>Pimelea linifolia</i> Sm.		Slender Rice Flower
<i>Pimelea linifolia</i> subsp. <i>collina</i> (R.Br.) Threlfall		Slender Rice Flower
<i>Wikstroemia indica</i> (L.) C.A.Mey.		
Tiliaceae		
<i>Triumfetta rhomboidea</i> Jacq.		
Tremandraceae		
<i>Tetradlea thymifolia</i> Sm.		Thyme Pink-bells, Black-eyed Susan
Ulmaceae		
<i>Aphananthe philippinensis</i> Planch.		Rough-leaved Elm, Native Elm
<i>Celtis paniculata</i> (Endl.) Planch.		Native Celtis
* <i>Celtis sinensis</i> Pers.		Japanese Hackberry
<i>Trema tomentosa</i> var. <i>viridis</i> (Roxb.) H.Hara		Native Peach, Poison Peach
Urticaceae		
<i>Dendrocnide excelsa</i> (Wedd.) Chew		Giant Stinging Tree
‡ <i>Dendrocnide moroides</i> (Wedd.) Chew,	TSC-E	Gympie Stinger
<i>Dendrocnide photinophylla</i> (Kunth) Chew		Shiny-leaved Stinging Tree

Species and Taxonomic Authority	Status	Common Name
<i>Pipturus argenteus</i> (G.Forst.) Wedd.		Native Mulberry, La Masigogo, Kwelakwela, Tare, Koro
Uvulariaceae		
<i>Tripladenia cunninghamii</i> D.Don		
Verbenaceae		
<i>Callicarpa pedunculata</i> R.Br.		Callicarpa
* <i>Duranta erecta</i> L.		Sky Flower
* <i>Verbena hispida</i> Ruiz & Pav.		
<i>Verbena incompta</i> P.W.Michael		Purpletop
<i>Gmelina leichhardtii</i> (F.Muell.) Benth.		White Beech
<i>Clerodendrum floribundum</i> R.Br.		Smooth Clerodendrum
<i>Clerodendrum inerme</i> (L.) Gaertn.		Scrambling Clerodendrum
<i>Clerodendrum tomentosum</i> R.Br.		Hairy Clerodendrum, Downy Chance Tree
<i>Lantana camara</i> L.		Lantana
Violaceae		
<i>Viola hederacea</i> Labill.		Ivy-leaved Violet
<i>Hybanthus stellarioides</i> (Domin) P.I.Forst.		
<i>Viola betonicifolia</i> Sm.		Native Violet
<i>Viola banksii</i> K.R.Thiele & Prober		
Viscaceae		
<i>Notothixos cornifolius</i> Oliv.		Kurrajong Mistletoe
<i>Notothixos incanus</i> (Hook.) Oliv.		
<i>Notothixos subaureus</i> Oliv.		Golden Mistletoe
Vitaceae		
<i>Cayratia acris</i> (F.Muell.) Domin		
<i>Cayratia clematidea</i> (F.Muell.) Domin		Native Grape
<i>Cissus antarctica</i> Vent.		
<i>Cissus hypoglauca</i> A.Gray		
<i>Cissus sterculiifolia</i> (F.Muell. ex Benth.) Planch.		Yaroong
<i>Tetrastigma nitens</i> (F.Muell.) Planch.		
Winteraceae		
<i>Tasmania insipida</i> R.Br. ex DC.		Brush Pepperbush
Monocots		
Amaryllidaceae		
<i>Crinum pedunculatum</i> R.Br.		Swamp Lily, River Lily
Anthericaceae		
<i>Arthropodium milleflorum</i> (DC.) J.F.Macbr.		Pale Vanilla-lily
<i>Arthropodium minus</i> R.Br.		
<i>Caesia parviflora</i> var. <i>parviflora</i> R.Br.		Pale Grass-lily
<i>Laxmannia compacta</i> Conran & P.I.Forst.		
<i>Laxmannia gracilis</i> R.Br.		Slender Wire Lily
<i>Tricoryne elatior</i> R.Br.		Yellow rush lily, Yellow Autumn-lily
Araceae		
<i>Alocasia brisbanensis</i> (F.M.Bailey) Domin		Cunjevoi, Spoon Lily
<i>Gymnostachys anceps</i> R.Br.		Settlers's Twine, Boorgay
* <i>Monstera deliciosa</i> Liebm.		Fruit Salad Plant
<i>Pothos longipes</i> Schott		Pothos

Species and Taxonomic Authority	Status	Common Name
Areaceae		
* <i>Archontophoenix alexandrae</i> (H.Wendl.) H.Wendl. & Drude		Alexandra Palm, King Alexander Palm
<i>Archontophoenix cunninghamiana</i> (H.Wendl.) H.Wendl. & Drude		Bangalow Palm, Piccabeen
<i>Calamus muelleri</i> H.Wendl. & Drude		Southern Lawyer Cane, Wait-a-while
<i>Linospadix monostachya</i> (C.Mart.) H.Wendl.		Walking Stick Palm
<i>Livistona australis</i> (R.Br.) Mart.		Cabbage Fan-palm, Cabbage-tree Palm, Cabbage Tree Palm, Daranggara
* <i>Syagrus romanzoffiana</i>		Queen Palm
Asparagaceae		
* <i>Asparagus aethiopicus</i> (L.) Oberm.		
* <i>Asparagus africanus</i> (Lam.) Oberm.		
* <i>Asparagus plumosus</i> (Baker) Oberm.		Climbing Asparagus Fern
Asteliaceae		
‡ <i>Cordyline congesta</i> (Sweet) Steud.	2RC-	
<i>Cordyline petiolaris</i> (Domin) Pedley		Broad-leaved Palm Lily
<i>Cordyline rubra</i> Otto & A.Dietr.		Palm-lily
<i>Cordyline stricta</i> (Sims) Endl.		Narrow-leaved Palm Lily
Balsaminaceae		
* <i>Impatiens walleriana</i> Hook.f.		
Colchicaceae		
<i>Burchardia umbellata</i> R.Br.		Milkmaids
* <i>Gloriosa superba</i> L.		Glory Lily, Climbing Lily
Commelinaceae		
<i>Aneilema acuminatum</i> R.Br.		
* <i>Commelina benghalensis</i> L.		
<i>Commelina cyanea</i> R.Br.		Native Wandering Jew
<i>Murdannia graminea</i> (R.Br.) G.A.Br ckn.		
<i>Polia crispata</i> (R.Br.) Benth.		Polia
* <i>Tradescantia fluminensis</i> Vell.		Wandering Jew
Cyperaceae		
<i>Abildgaardia ovata</i> (Burm.f.) Kral		
<i>Baumea articulata</i> (R.Br.) S.T.Blake		Jointed Twig-rush
<i>Baumea juncea</i> R.Br.		Twig Rush
<i>Baumea muelleri</i> (C.B.Clarke) S.T.Blake		
<i>Baumea rubiginosa</i> (Spreng.) Boeck.		
<i>Baumea teretifolia</i> R.Br.		
<i>Bolboschoenus caldwellii</i> (V.J.Cook) Sojak		
<i>Bolboschoenus fluviatilis</i> (Torr.) Sojak		Marsh Club-rush
<i>Carex appressa</i> R.Br.		Tall Sedge
<i>Carex breviculmis</i> R.Br.		
<i>Carex gaudichaudiana</i> Kunth		
<i>Carex inversa</i> Boott		
<i>Carex maculata</i> Boott		
<i>Caustis recurvata</i> Spreng.		
<i>Chorizandra cymbaria</i> R.Br.		
<i>Cladium procerum</i> S.T.Blake		

Species and Taxonomic Authority	Status	Common Name
* <i>Cyperus brevifolius</i> (Rottb.) Hassk.		
<i>Cyperus eglobosus</i> K.L.Wilson		
<i>Cyperus enervis</i> R.Br.		
<i>Cyperus exaltatus</i> Retz.		
<i>Cyperus gracilis</i> R.Br.		Slender Flat-sedge
<i>Cyperus gunnii</i> subsp. <i>gunnii</i> Hook.f.		
<i>Cyperus haspan</i> subsp. <i>juncoides</i> (Lam.) Kuek.		
<i>Cyperus lucidus</i> R.Br.		Leafy Flat Sedge
<i>Cyperus pilosus</i> Vahl		
<i>Cyperus polystachyos</i> (Rottb.) P.Beauv.		
<i>Cyperus sphaeroideus</i> L.A.S.Johnson & O.D.Evans		
<i>Cyperus stradbrokeensis</i> Domin		
<i>Cyperus tetraphyllus</i> R.Br.		
<i>Cyperus trinervis</i> R.Br.		
<i>Eleocharis acuta</i> R.Br.		
<i>Eleocharis dietrichiana</i> Boeck.		
<i>Eleocharis equisetina</i> C.Presl		
* <i>Eleocharis minuta</i> Boeck.		
<i>Eleocharis sphacelata</i> R.Br.		
‡ <i>Eleocharis tetraquetra</i> Nees		
<i>Exocarya scleroides</i> (F.Muell.) Benth.		
<i>Isolepis nodosa</i> (Rottb.) Goetgh. et al.		Knobby Club Rush
<i>Fimbristylis dichotoma</i> (L.) Vahl		Common Fringe-sedge
<i>Fimbristylis ferruginea</i> (L.) Vahl		
<i>Fimbristylis tristachya</i> R.Br.		
<i>Gahnia aspera</i> (R.Br.) Spreng.		Rough Saw-sedge
<i>Gahnia clarkei</i> Benl		Tall Saw-sedge
<i>Gahnia insignis</i> S.T.Blake		
<i>Gahnia sieberiana</i> Kunth		Red-fruit Saw-sedge
<i>Isolepis cernua</i> (Vahl) Roem. & Schult.		Nodding Club-rush
<i>Isolepis inundata</i> (R.Br.) Poir.		
<i>Lepidosperma laterale</i> R.Br.		
<i>Lepironia articulata</i> (Retz.) Domin		
<i>Ptilothrix deusta</i> (R.Br.) K.L.Wilson		
<i>Rhynchospora corymbosa</i> (L.) Britton		
<i>Rhynchospora rubra</i> (Lour.) Makino		
<i>Schoenoplectus mucronatus</i> (L.) Palla ex A.Kern.		
<i>Schoenoplectus subulatus</i> (Vahl) Lye		
<i>Schoenus apogon</i> Roem. & Schult.		Common Bog-rush, Fluke Bog-rush
<i>Schoenus brevifolius</i> R.Br.		Black Bog-rush
<i>Schoenus ericetorum</i> R.Br.		
<i>Schoenus nitens</i> (R.Br.) Roem. & Schult		
‡ <i>Scleria levis</i> Retz.	Rare	
<i>Scleria mackaviensis</i> Boeck.		
‡ <i>Scleria rugosa</i> R.Br.	Rare	
Dioscoreaceae		
<i>Dioscorea transversa</i> R.Br.		Native Yam

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Flagellariaceae		
<i>Flagellaria indica</i> L.		Whip Vine, Bush Cane, Supplejack
Hydrocharitaceae		
<i>Ottelia ovalifolia</i> subsp. <i>ovalifolia</i> (R.Br.) Rich.		Swamp Lily
Hypoxidaceae		
<i>Hypoxis hygrometrica</i> Labill.		Golden Weather Grass
<i>Hypoxis hygrometrica</i> var. <i>villosisepala</i> R.J.F.Hend.		Golden Weather Grass
Iridaceae		
<i>Patersonia fragilis</i> (Labill.) Asch. & Graebn.		Swamp Iris
<i>Patersonia glabrata</i> R.Br.		Leafy Purple-flag, Bugulbi
<i>Patersonia sericea</i> R.Br.		Silky Purple-Flag
<i>Sisyrinchium</i> species A		Scourweed
Juncaceae		
* <i>Juncus cognatus</i> Kunth		
<i>Juncus kraussii</i> subsp. <i>australiensis</i> Hochst.		Sea Rush
<i>Juncus mollis</i> L.A.S.Johnson		
<i>Juncus prismatocarpus</i> R.Br.		
<i>Juncus subsecundus</i> N.A.Wakef.		
<i>Juncus usitatus</i> L.A.S.Johnson		
Juncaginaceae		
<i>Triglochin multifructum</i> Aston		
<i>Triglochin procerum</i> R.Br.		Water Ribbons
<i>Triglochin striatum</i> Ruiz & Pav.		Streaked Arrowgrass
Lomandraceae		
<i>Lomandra confertifolia</i> subsp. <i>pallida</i> (F.M.Bailey) Fahn		Mat-rush
<i>Lomandra elongata</i> (Benth.) Ewart		
<i>Lomandra filiformis</i> (Thunb.) Britten		Wattle Mat-rush
<i>Lomandra filiformis</i> subsp. <i>filiformis</i> (Thunb.) Britten		Wattle Mat-rush
<i>Lomandra glauca</i> (R.Br.) Ewart		Pale Mat-rush
<i>Lomandra hystrix</i> (R.Br.) L.R.Fraser & Vickery		
<i>Lomandra laxa</i> (R.Br.) A.T.Lee		
<i>Lomandra longifolia</i> Labill.		Spiny-headed Mat-rush, Honey Reed
<i>Lomandra multiflora</i> subsp. <i>multiflora</i> (R.Br.) Britten		Many-flowered Mat-rush
<i>Lomandra spicata</i> A.T.Lee		
Luzuriagaceae		
<i>Eustrephus latifolius</i> R.Br. ex Ker Gawl.		Wombat Berry
<i>Geitonoplesium cymosum</i> (R.Br.) A.Cunn. ex Hook.		Scrambling Lily
Nymphaeaceae		
* <i>Nymphaea caerulea</i> subsp. <i>zanzibarensis</i> (Casp.) S.W.L.Jacobs		Cape Waterlily
Orchidaceae		
‡ <i>Acianthus amplexicaulis</i> (F.M. Bailey) Rolfe	2RC-	
<i>Acianthus pusillus</i> D.L.Jones		Gnat Orchid
‡ <i>Arthrochilus prolixus</i> D.L.Jones	2K	
<i>Caladenia carnea</i> R.Br.		Pink Fairy, Pink Fingers
<i>Caladenia catenata</i> (Sm.) Druce		White Caladenia, White Fingers
<i>Caleana major</i> R.Br.		Large Duck Orchid
<i>Cheirostylis notialis</i> D.L.Jones		

Species and Taxonomic Authority	Status	Common Name
<i>Chiloglottis diphylla</i> R.Br.		
<i>Corybas aconitiflorus</i> Salisb.		Spurred Helmet Orchid
<i>Cryptostylis erecta</i> F.Muell. ex Benth.		Bonnet Orchid, Tartan Tongue Orchid
<i>Cryptostylis subulata</i> (Labill.) Rchb.f.		Large Tongue Orchid
<i>Cymbidium madidum</i> Lindl.		
<i>Cymbidium suave</i> R.Br.		Snake Orchid
<i>Dendrobium aemulum</i> R.Br.		Ironbark Orchid, White Feather Orchid
<i>Dendrobium bowmanii</i> Benth.		
<i>Dendrobium kingianum</i> Bidwill ex Lindl.		Pink Rock Orchid
<i>Dendrobium linguiforme</i> (Sw.) Brieger		Tongue Orchid
‡ <i>Dendrobium melaleucaphilum</i> M.A.Clem. & D.L.Jones	TSC-E	Spider Orchid
<i>Dendrobium monophyllum</i> F.Muell.		Lily-of-the-valley Orchid
<i>Dipodium punctatum</i> (Sm.) R.Br.		
<i>Dipodium variegatum</i> M.A.Clem. & D.L.Jones		
‡ <i>Geodorum densiflorum</i> (Lam.) Schltr	TSC-E	Shepherds Crook Orchid
‡ <i>Oberonia complanata</i> (A.Cunn.) M.A.Clem. & D.L.Jones	TSC-E	
‡ <i>Oberonia titania</i> Lindl.		
‡ <i>Peristeranthus hillii</i> (F.Muell.) T.E.Hunt	TSC-V	
<i>Plectorrhiza tridentata</i> (Lindl.) Dockrill		Tangle Orchid
<i>Pterostylis baptistii</i> Fitzg.		King Greenhood, King Greenhood
<i>Pterostylis nutans</i> R.Br.		Nodding Greenhood
<i>Pterostylis pedunculata</i> R.Br.		Maroonhood
<i>Thelymitra purpurata</i> Rupp		Wallum Sun Orchid
Pandanaceae		
<i>Pandanus tectorius</i> var. <i>australianus</i> Parkinson ex Du Roi		Screw Pine
Philydraceae		
<i>Philydrum lanuginosum</i> (Banks & Sol.) Gaertn.		Woolly Waterlily, Frogmouth
Phormiaceae		
‡ <i>Dianella brevipedunculata</i> R.J.F.Hend.	Rare	
<i>Dianella caerulea</i> Sims		Blue Flax-lily
<i>Dianella congesta</i> R.Br.		
<i>Dianella crinoides</i> R.J.F.Hend.		
<i>Dianella longifolia</i> R.Br.		Blueberry Lily, Blue Flax-lily
<i>Dianella longifolia</i> var. <i>longifolia</i> R.Br.		Blueberry Lily, Blue Flax-lily
<i>Dianella revoluta</i> var. <i>revoluta</i> R.Br.		
Poaceae		
* <i>Andropogon virginicus</i> L.		Whisky Grass, Broomsedge
<i>Aristida vagans</i> Cav.		Threeawn Speargrass
* <i>Axonopus compressus</i> (Sw.) P.Beauv.		Broad-leafed Carpet Grass
* <i>Axonopus fissifolius</i> (Raddi) Kuhl.		Narrow-leafed Carpet Grass
<i>Bothriochloa decipiens</i> (Hack.) C.E.Hubb.		Red Grass, Redleg Grass, Pitted Bluegrass
<i>Bothriochloa macra</i> (Steud.) S.T.Blake		Red Grass, Red-leg Grass
<i>Capillipedium parviflorum</i> (R.Br.) Stapf		Scented-top Grass
<i>Capillipedium spicigerum</i> S.T.Blake		Scented-top Grass
<i>Cenchrus caliculatus</i> Cav.		Hillside Burrgrass
* <i>Chloris gayana</i> Kunth		Rhodes Grass
<i>Chrysopogon filipes</i> (Benth.) Reeder		Australian Vetiver

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<i>Cymbopogon refractus</i> (R.Br.) A.Camus		Barbed Wire Grass
<i>Cynodon dactylon</i> (L.) Pers.		Couch, Bermudagrass
<i>Dichelachne micrantha</i> (Cav.) Domin		Shorthair Plumegrass
<i>Digitaria parviflora</i> (R.Br.) Hughes		Small-flowered Finger Grass
<i>Digitaria ramularis</i> (Trin.) Henrard		
<i>Diplachne fusca</i> (L.) P.Beauv.		Brown Beetle Grass
<i>Echinopogon ovatus</i> G.Forst.) P.Beauv.		Forest Hedgehog Grass
<i>Echinochloa crusgalli</i> (L.) P.Beauv.		Barnyard Grass
<i>Entolasia marginata</i> R. Br.		Bordered Panic
<i>Entolasia stricta</i> (R.Br.) Hughes		Wiry Panic
<i>Eragrostis benthamii</i> Mattei		
<i>Eragrostis brownii</i> (Kunth) Nees		Brown's Lovegrass
* <i>Eragrostis curvula</i> (Schrad.) Nees		African Lovegrass
<i>Eragrostis interrupta</i> (R.Br.) P.Beauv		
<i>Eragrostis leptostachya</i> Steud.		Paddock Lovegrass
<i>Eragrostis pubescens</i> (R.Br.) Steud.		
* <i>Eragrostis tenuifolia</i> (Rich.) Hochst. ex Steud.		Elastic Grass
<i>Eriochloa procera</i> (Retz.) C.E.Hubb.		Spring Grass
<i>Hemarthria uncinata</i> R.Br.		Matgrass
<i>Imperata cylindrica</i> var. <i>major</i> P.Beauv.		Blady Grass
<i>Isachne globosa</i> (Thunb.) Kuntze		Swamp Millet
<i>Ischaemum australe</i> R.Br.		Swamp Millet
<i>Ischaemum triticeum</i> R.Br.		
<i>Lachnagrostis billardierei</i> (Br.) Trin.		
<i>Lachnagrostis filiformis</i> (G.Forst.) Trin.		
<i>Leersia hexandra</i> Sw.		Swamp Ricegrass
* <i>Melinis minutiflora</i> P.Beauv.		Molasses Grass
* <i>Melinis repens</i> (Willd.) Zizka		Red Natal Grass
<i>Microlaena stipoides</i> var. <i>stipoides</i> (Labill.) R.Br.		Weeping Grass
<i>Oplismenus aemulus</i> (R.Br.) Roem. & Schult.		
<i>Oplismenus imbecillis</i> (R.Br.) Roem. & Schult.		
<i>Oplismenus undulatifolius</i> var. <i>mollis</i> (Ard.) P.Beauv.		
<i>Ottlochloa gracillima</i> C.E.Hubb.		
* <i>Panicum bisulcatum</i> Thunb.		Black-seeded Panic
<i>Panicum effusum</i> R.Br.		Hairy Panic
<i>Panicum lachnophyllum</i> Benth.		
* <i>Panicum maximum</i> Jacq.		Guinea Grass
<i>Panicum pygmaeum</i> R.Br.		Pygmy Panic, Dwarf Panic
<i>Panicum simile</i> Domin		Two-colour Panic, Two-colour Panic
<i>Paspalidium distans</i> (Trin.) Hughes		
<i>Paspalidium gausum</i> S.T.Blake		
<i>Paspalidium gracile</i> (R.Br.) Hughes		Slender Panic
* <i>Paspalum conjugatum</i> P.J.Bergius		Sour Grass, Yellow Grass, Hilo Grass, Johnston River Grass
* <i>Paspalum dilatatum</i> Poir.		Paspalum
<i>Paspalum distichum</i> L.		Water Couch
<i>Paspalum orbiculare</i> G.Forst.		Ditch Millet
* <i>Paspalum scrobiculatum</i> L.		Scrobic

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* <i>Paspalum urvillei</i> Steud.		Vasey Grass
<i>Paspalum vaginatum</i> L.		Saltwater Couch
* <i>Paspalum wettsteinii</i> Hack.		
* <i>Phalaris minor</i> Retz.		Lesser Canary Grass
<i>Phragmites australis</i> (Cav.) Trin. ex Steud.		Common Reed
<i>Pseudoraphis paradoxa</i> (R.Br.) Pilg.		Slender Mud-grass, Slender Mudgrass
<i>Pseudoraphis spinescens</i> (R.Br.) Vickery		Mud Grass
* <i>Setaria gracilis</i> Kunth		Slender Pigeon Grass
* <i>Setaria sphacelata</i> (Schumach.) Stapf & C.E.Hubb.		South African Pigeon Grass, Setaria
* <i>Sporobolus indicus</i> (L.) R.Br.		Parramatta Grass
<i>Sacciolepis indica</i> (L.) Chase		Indian Cupscale Grass
<i>Sporobolus sessilis</i> B.K.Simon		
<i>Sporobolus virginicus</i> var. <i>minor</i> F.M.Bailey		Marine Couch, Saltwater Couch
<i>Themeda australis</i> (R.Br.) Stapf		Kangaroo Grass
<i>Zoysia macrantha</i> Desv.		Prickly Couch
Restionaceae		
<i>Baloskion pallens</i> (R.Br.) L.A.S.Johnson & B.G.Briggs		
<i>Baloskion tenuiculme</i> (S.T.Blake) L.A.S.Johnson & B.G.Briggs		
<i>Baloskion tetraphyllum</i> (Labill.) L.A.S.Johnson & B.G.Briggs		
<i>Coleocarya gracilis</i> S.T.Blake		
<i>Empodisma minus</i> (Hook.f.) L.A.S.Johnson & D.F.Cutler		
<i>Eurychorda complanata</i> (R.Br.) B.G.Briggs & L.A.S.Johnson		
<i>Hypolaena fastigiata</i> R.Br.		
<i>Leptocarpus tenax</i> (Labill.) R.Br.		
<i>Sporadanthus interruptus</i> (F.Muell.) L.A.S.Johnson & B.G.Briggs		
Smilacaceae		
<i>Smilax australis</i> R.Br.		Lawyer Vine, Wait-a-while, Barbwire Vine
<i>Smilax glycyphylla</i> Sm.		Sweet Sarsaparilla
Sparganiaceae		
<i>Sparganium subglobosum</i> Morong		Floating Burr-reed
Typhaceae		
<i>Typha domingensis</i> Pers.		Narrow-leaved Cumbungi
<i>Typha benthamii</i> C. Presl.		Broadleaf Cumbungi
Xanthorrhoeaceae		
<i>Xanthorrhoea australis</i> R.Br.		Grass Tree
<i>Xanthorrhoea fulva</i> (A.T.Lee) D.J.Bedford		
<i>Xanthorrhoea johnsoni</i> A.T.Lee		
<i>Xanthorrhoea macronema</i> F.Muell. ex Benth		
Xyridaceae		
<i>Xyris complanata</i> R.Br.		
<i>Xyris gracilis</i> R.Br.		
Zingiberaceae		
<i>Alpinia arundelliana</i> (F.M.Bailey) K.Schum.		Native Ginger
<i>Alpinia caerulea</i> (R.Br.) Benth.		Native Ginger
<i>Hedychium gardnerianum</i> ex Ker Gawl.		Ginger Lily

Appendix 3 - Full Dendrogram

(UPGMA, Bray_Curtis association measure, Beta = -(0.1). Vegetation group 1_ Saline influence; Vegetation Group 2- Group 2 Freshwater, seasonally/ permanently inundated soils; Group 3 Coastal barrier sand and headland; Group 4 Forests on alluvium or fine-textured soils of coastal floodplains and foothills

Assemblage		0.0556	0.4465	0.8374	1.2282	1.6191	2.0100
Community							
Assemblage 1(b) Saltmarsh/ saline grasslands	BALL01ESEX						
	BRU011ach						
	POT07est1cd						
	POT08est1cd						
	BALL06ESTBA						
Community 2 Blue Couch–Prickly Couch grasslands of the estuarine plains	W0013estss						
	GIB01a11v						
	W0010a11bk						
	W0011a11bk						
	W0012a11bk						
Assemblage 1(c) Swamp Oak forests, sedgeland and rushlands	W0016a1vf						
	BALL16estcbb						
	W0015a11v						
	BRU26ESTICD						
	BYR30estsswp						
Community 4 Swamp Oak–Broad- leaved Paperbark estuarine and alluvial plain swamp sclerophyll forest	WAR14a11bk						
	WAR30CBRDG						
	WAR49a11bk						
	WAR50a11un						
	W0023estsswp						

Assemblage		0.0556	0.4465	0.8374	1.2282	1.6191	2.0100
Community							
Assemblage 1(d) Sedgeland/ Rushland	Community 5 Milky Mangrove– Swamp Oak–Grey Mangrove king- tide forest						
	BIL03LSRH						
	TWE14estsswp						
	TWE26a1bk						
	MUR02a11v						
	WAR16estch						
	MUR03a1bk						
	Community 6 Swamp Oak–Hoop Pine–Tuckeroo swamp sclerophyll/ dry 'gallery' floodplain rainforest						
	BIL09a1bk						
	BALL14estcbb						
Assemblage 2(a) Broad- leaved Paperbark swamp forests varying from a sedge to fern understory	Community 7 Prickly Couch–Sea Rush– <i>Schoenoplectus subulatus</i> saltmarsh						
	W0002estss						
	W0025estch						
	W0014estss						
	Community 8 Swamp Oak king-tide swamp sclerophyll forest						
	BYR03cbrdg						
	BYR39cbdne						
	BYR26estsswp						
	BYR27estsswp						
	BYR28estsswp						
Assemblage 2(a) Broad- leaved Paperbark swamp forests varying from a sedge to fern understory	Community 9 Sea Rush–Matgrass saltmarsh						
	TWE09estsswp						
	TWE20esttdf						
	TWE25esttdf						
	BALL03ESSW						
	Community 10 Broad-leaved Paperbark–Swamp Oak–fern/sedge swamp sclerophyll forest						
	BALL05ESTB						
	BALL04ESTSS						
	W0006a1bk						

Assemblage		0.0556	0.4465	0.8374	1.2282	1.6191	2.0100
Community							
Community 11 Broad-leaved Paperbark–Pink-flowered Doughwood swamp sclerophyll open forest	BRU33cbbbf						
	BRU34cbbbf						
	POT12a1fan						
	CUD15esttdf						
	WAR01ALFL						
	WAR04a1sw						
	BALL07DBRDG						
	BALL08estsswp						
	BRU12cbdne						
	BYR23cbdne						
Community 12 Broad-leaved Paperbark–Swamp Oak ferny swamp sclerophyll forest	BYR04estc1						
	BYR141srh						
	BYR221srh						
	BYR21a1fan						
	BYR25estsswp						
	TWE31esttdf						
	BYR10estc1						
	WAR19a1bk						
	WAR45a1bk						
	WAR25a1bk						
Community 13 Alluvial plain Broad-leaved Paperbark–Swamp Mahogany–Bangalow Palm–Saw Sedge–Swamp Water Fern swamp sclerophyll forest	WAR44a1bk						
	WAR31cbrdg						
	BRU18cbbbf						
	WAR47a1fan						
	WAR07a11sw						
Community 14 Swamp Mahogany– Broad-leaved Paperbark–Bangalow Palm–sedge/fern swamp sclerophyll forest	WAR08cbr						
	WAR17a1fan						
	WAR32a1bk						
	BRU25estchf						

Assemblage		0.0556	0.4465	0.8374	1.2282	1.6191	2.0100
Community							
Assemblage 2(b) Floodplain palm forest	BRU45cbrdg						
	BYR05cbw						
	BYR19a1fan						
	BYR16hsrh						
	WAR23a1fan						
Assemblage 2(b) Floodplain palm forest	BYR09cbbbf						
	WAR33a1ch						
	WAR26a1bk						
	WAR27a1fan						
	WAR43a1fan						
Assemblage 2(c) Wet Heath	BAL09CBRDG						
	BRU38unfswp						
	BRU39unfswp						
	BYR37unfswp						
	W0009unfswp						
Assemblage 2(d) Coral Fern fernland	WAR36cbrdg						
	WAR37cbrdg						
	WAR38cbrdg						
	BYR08cbw						
	36estcd						
Assemblage 2(e) Paperbark dunal scrubland	BYR01cbrdg						
	BYR15cbbbf						
	BYR38cbdne						
	BYR32estsswp						
	BYR33estcd						
Assemblage 2(e) Paperbark dunal scrubland	POT23cbdne						
	POT02cbrdg						

Assemblage		0.0556	0.4465	0.8374	1.2282	1.6191	2.0100
Community							
Assemblage 3(b) Vegetation of Holocene sands	Community 34 Coast Banksia frontal dune open forest on Holocene dunes	BRU03cbdne					
		BRU27cbdne					
		BRU28cbdne					
		BYR12cbdne					
		BYR11cbdne					
		TWE19cbdne					
	Community 35 Brush Box lowland rainforest	POT09a1fan					
		TWE19cbdne					
		TWE12esttdf					
		TWE27vbt					
		TWE28cbdne					
		TWE32vbrh					
		BRU04cbdne					
	Community 36 Coast Wattle–Coast Tea-tree–Coast Banksia shrubland on Holocene dunes and ridges	BRU22cbdne					
		BRU21cbdne					
		TWE04ASSW					
		CUD09cbdne					
		POT03cbrdg					
Assemblage 3(c) Headland grassland	Community 37 Kangaroo Grass headland grassland	CUD181srh					
	Community 38 Scribbly Gum–Old Man Banksia–Slender Tea-tree heathy low open sclerophyll forest/shrubland	BYR06cbbsw					
		BYR07estc1					
Assemblage 3(c) Headland grassland	Community 39 Wallum Banksia dry heath	BYR17cbdne					
		BYR34estcd					
		BYR35cbdne					
		CUD01cbdne					
		CUD06cbdne					

Assemblage		0.0556	0.4465	0.8374	1.2282	1.6191	2.0100
Community							
Assemblage 4(a) Tweed Brunswick Brush Box wet sclerophyll forest	Community 40 Lower Richmond mesic successional wet/swamp sclerophyll forest/rainforest						
	BALLO2VBR LH						
	WAR12cbrdg						
	WAR17hsr1h						
	BALL11esttdf						
	EMP03a1bk						
	WAR02cbbbf						
	WAR34cbsw						
	WAR03cbr						
	WAR41vbgur						
	WAR42hsr1h						
	WAR18hsr1h						
	WAR52hsr1h						
	WAR20hsr1h						
	WAR22hsr1h						
Assemblage 4(b) Richmond Valley Brush Box wet sclerophyll forest	Community 41 Lower Richmond Brush Box—Pink Bloodwood—Grey Ironbark mesic tall open forest						
	WAR21a1bk						
	WAR241srh						
	BTL021srh						
	WAR51hsr1h						
	BYR13hsrh						
	BYR181srh						
	BYR20a1fan						
	TWE301srh						
	BTL071srh						
	BTL11a1bk						
	BRU09un						
	BRU10un						
	BRU11a1lv						
	TWE01cbdne						
	POT19estcd						
	POT20estcd						
Assemblage 4(b) Richmond Valley Brush Box wet sclerophyll forest	Community 42 Tweed—Brunswick Valleys Brush Box—Blackbutt—Pink Bloodwood—Tallowood foothill wet sclerophyll forest						
	WAR51hsr1h						
	BYR13hsrh						
	BYR181srh						
	BYR20a1fan						
	TWE301srh						
	BTL071srh						
	BTL11a1bk						
	BRU09un						
	BRU10un						
	BRU11a1lv						
	TWE01cbdne						
	POT19estcd						
	POT20estcd						

Assemblage		0.0556	0.4465	0.8374	1.2282	1.6191	2.0100
Community							
	CUD021srh						
	CUD081srh						
	CUD111srh						
	POT291srh						
	MUR151srh						
Community 43 Brunswick-Tweed Brush Box gully rainforest on meta- sediments	BIL1141srh						
	BUR011srh						
	CUD121srh						
	MUR141srh						
	POT331srh						
	MUR161srh						
	BRU061srh						
	MUR061srh						
	POT16a1vf						
	MUR111srh						
	MUR121srh						
	CUD031srh						
	POT301srh						
	MUR021srh						
	POT11a1fan						
	BUR03LSFL						
	POT141srh						
	POT171srh						
	POT181srh						
Assemblage 4(c)							
Subtropical rainforest	Community 44 Tweed-Brunswick						
Brush Box littoral rainforest	Valley Blue Quandong subtropical rainforest						
	BIL041srh						
	MUR131srh						
	BIL05vbrh						
	TWE061srh						
	MUR071srh						

Assemblage	Community	0.0556	0.4465	0.8374	1.2282	1.6191	2.0100
TWE051srh		_____	_____ _	_____	_____	_____	_____
BRU05a1terr		_____	_____	_____	_____	_____	_____
UR041srh		_____	_____	_____	_____	_____	_____
Twe161srh		_____	_____ _	_____	_____	_____	_____
MUR171srh		_____	_____	_____	_____	_____	_____
MUR181srh		_____	_____	_____	_____	_____	_____
POT24a1fl		_____	_____ _	_____ _	_____	_____	_____
POT251srh		_____	_____	_____	_____	_____	_____
POT261srh		_____	_____	_____	_____	_____	_____
POT271srh		_____	_____	_____	_____	_____	_____
BRU17cbbbf		_____	_____	_____	_____	_____	_____
WAR11un		_____	_____	_____	_____	_____	_____
MUR041srh		_____	_____	_____	_____	_____	_____
MUR051srh		_____	_____	_____	_____	_____	_____
BRU40cbrdg		_____	_____	_____	_____	_____	_____
BRU42vbr1h		_____	_____	_____	_____	_____	_____
BRU43VBR LH		_____	_____ _	_____	_____	_____	_____
TWE151srh		_____	_____	_____	_____	_____	_____
TWE17a1bk		_____	_____	_____	_____	_____	_____
Community 45 Tweed–Brunswick Valley Bangalow Palm–Lilly Pilly subtropical rainforest							
Community 46 Stinging Tree–White Fig–Brush Bloodwood subtropical rainforest							
BTLO6VBRH		_____	_____	_____	_____	_____	_____
MUR01vbrh		_____	_____	_____	_____	_____	_____
Community 47 Tweed Valley meta- sediment and basalt low-elevation subtropical rainforest							
TWE21vbrh		_____	_____	_____	_____	_____	_____
TWE24vbrh		_____	_____	_____	_____	_____	_____
MUR081srh		_____	_____	_____	_____	_____	_____
MUR091srh		_____	_____	_____	_____	_____	_____
MUR101srh		_____	_____	_____	_____	_____	_____

Assemblage		0.0556	0.4465	0.8374	1.2282	1.6191	2.0100
Community							
Assemblage 4(d) Forest Red Gum swamp sclerophyll/dry open forests	Community 48 Flooded Gum–Pink-flowered Doughwood–Hard Quandong alluvial plain wet sclerophyll forest						
	BRU02a1chfl						
	POT15unfswp						
	POT10a1fan						
	POT13a1fan						
	LIS01VBrh						
	LIS02vbrh						
	LIS03vbrh						
	LIS041srh						
	BRU07est1cd						
Community 50 Swamp Oak–Forest Red Gum–Broad-leaved Paperbark–Swamp Box swamp sclerophyll woodland to open forest	POT21a1fl						
	POT22a1fl						
	BRU08un						
	BRU14cbbbf						
	BRU24cbdne						
	TWE22a1lv						
	TWE23a1bk						
	ELL12a1bk						
	W0021unund						
	W0026unund						
Community 51 Forest Red Gum–Willow Bottlebrush–Camphor Laurel dry open forest	W00027a1lv						
	TAB04a1vf						
	W0008a1bk						
	W0024unund						
	W0005a1vf						
	BRU29a1fl						
	BRU30estsswp						

Assemblage		0.0556	0.4465	0.8374	1.2282	1.6191	2.0100
Community							
Community 58 Pink Bloodwood–Grey Ironbark–Swamp Box–Forest Red Gum–Blackbutt tall dry open forest	GIB02a1rf						
	GIB03a1fl						
	GIB05a1fl						
	GIB07a1fl						
	WAR48hsr1h						
	W0022estsswp						
	WAR52vbr1h						
	WAR54vbr1h						
	TAB011su1h						
	TAB021su1h						
Community 59 Large-fruited Spotted Gum–Grey Ironbark–Small-fruited Grey Gum dry grassy open forest	TAB03a1vf						
	W00191su1h						
	W0003a1vf						
	W0007hsur						
	W0001a1vf						
	W00181su1h						
	ELL07hsur						
	GIB10a1fl						
	ELL08a1fl						
	TAT02a1fl						
Community 60 Grey Ironbark–Thin-leaved Stringybark–Pink Bloodwood–Swamp Box dry open grassy forest	TAT03a1fl						
	TAT01a1fl						
	ELL10a1fl						
	ELL09a1vf						
Community 61 Broad-leaved Paperbark–Narrow-leaved Rough-barked Apple–Swamp Box–Pink Bloodwood dry grassy alluvial open forest							

Assemblage		0.0556	0.4465	0.8374	1.2282	1.6191	2.0100
Community							
Assemblage 1(a) Mangroves	Community 62 River Mangrove– Grey Mangrove–Black Mangrove– Milky Mangrove–Spider Mangrove forest to shrubland						
	BALL12estsswp						
	BRU13estsw						
	TWE07estc1						
	BALL13estsswp						
	BALL15estsswp						
	BIL10a1bk						
	BIL08a1bk						
	TWE08estc1						
	TWE13estsswp						
	TWE10esttdf						
	TWE18estcbb						
	TWE29cs1g						
	BRU20estsswp						
		0.0556	0.4465	0.8374	1.2282	1.6191	2.0100

Appendix 4 - Species frequency by community

A two-way table of the frequency of occurrence of each taxa recorded in the 62 communities. The number of sites within the community is also recorded. N = the number of records of the taxa in the 346 full floristic sites. Species identified with an asterisk (*) are exotic species.

Taxa	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	N
Number of sites	5	2	5	9	6	1	5	4	3	4	5	11	5	12	5	2	5	2	2	1	5	1	1	2	3	9	6	3	6	6	1	2	5	10	6	19	20	13	9	1	6	4	4	16	3	2	4	2	9	4	3	13	3	2	6	13	346						
Acanthaceae																																																															
<i>Brunoniella australis</i>	1																																																														
<i>Brunoniella paniculata</i>																																																															
<i>Brunoniella spiciflora</i>	1 1																																																														
<i>Hygrophila angustifolia</i>	2																																																														
<i>Pseuderanthemum variabile</i>	1																																																														
<i>Rostellularia adscendens</i> subsp. <i>adscendens</i>	2 5 8 8 1 3 4 2																																																														
<i>Rostellularia obtusa</i>																																																															
<i>Thunbergia alata</i> *	1																																																														
Adiantaceae																																																															
<i>Adiantum aethiopicum</i>	1																																																														
<i>Adiantum diaphanum</i>	1 3 1																																																														
<i>Adiantum formosum</i>	1																																																														
<i>Adiantum hispidulum</i>	4 1 1 13 12 1																																																														
<i>Adiantum silvaticum</i>	1 1																																																														
<i>Cheilanthes sieberi</i> subsp. <i>sieberi</i>	1																																																														
<i>Pellaea nana</i>	1 2 1 2																																																														
<i>Pellaea paradoxa</i>																																																															
<i>Pellaea viridilis</i> var. <i>viridis</i>	1																																																														
Alzooaceae																																																															
<i>Sesuvium portulacastrum</i>	1																																																														
<i>Tetragonia tetragonoides</i>	1																																																														
Akaniaceae																																																															
<i>Akania bicknellii</i>	1 1 4																																																														
Alangiaceae																																																															
<i>Alangium villosum</i> subsp. <i>polysomoides</i>	3 3																																																														
Amaranthaceae																																																															
<i>Alternanthera denticulata</i>	1 3 4 2 3 1																																																														
<i>Alternanthera nana</i>	1																																																														
Amaryllidaceae																																																															
<i>Crinum pedunculatum</i>	2 1 1 1 1																																																														
Anacardiaceae																																																															
<i>Euroschinus falcata</i> var. <i>falcata</i>	1 1 4 3 1 1																																																														
<i>Schinus terebinthifolius</i> *	1																																																														
Annonaceae																																																															
<i>Mezogyne stenopetala</i> subsp. <i>stenopetala</i>	1 3 1 5																																																														

[illegible]

[illegible]

284 - Appendix 4

288 - Appendix 4

[illegible]

Taxa	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	N																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
Number of sites	5	2	5	9	6	1	5	4	3	4	5	11	5	12	5	2	5	2	7	5	5	2	2	2	1	5	1	1	2	3	9	6	3	6	6	1	2	5	10	6	19	20	13	9	1	6	4	4	16	3	2	4	2	9	4	3	13	3	2	6	13	346																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
Meliaceae																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
<i>Anthocarpus nitidula</i>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						

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298 - Appendix 4

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Appendix 5 - Equivalent ecological communities

A table showing the possible relationships of the 62 communities delineated in the present survey with a range of statewide (Keith, 2006; Floyd, 1990, Young and Dillewaard, 1999), regional (NPWS, 1999), Local Government Area (Byron LGA Landmark Ecological Services, 1999, Tweed LGA, Kingston *et al.* 2004) and study area focused (NPWS estate and public land; Griffith & Wilson, 2007, State Forest Management Area; Binns, 1995).

Community	Keith (2006)	Old Regional Ecosystems (Young and Dillewaard 1999)	Keith and Scott (2006)	Floyd Rainforest Suballiance (Floyd 1990)	North-east NSW Forest Ecosystems (NPWS 1999)	Tweed LGA (Kingston <i>et al.</i> 2004)	Byron LGA (Landmark Ecological Services 1999)	NSW coast vegetation mapping (Griffith and Wilson 2007)	Wallis Lake Wetland Vegetation (Griffith 2007)	Tweed Lowlands (Pressey and Griffith 1992)	Casino State Forest Management Area (Binns 1995b)
1 Saltmarsh	Saline Wetlands-Saltmarshes	12.1.2 Saltpan vegetation	Group 28 Saltmarsh		125-Saltmarsh	603-Saltmarsh Communities		6102-Chenopod Shrubland-Tussock Grassland		S1-Sporobolus virginicus, Sarcocornia quinqueflora	
2 Blue Couch-Prickly Couch grasslands of the estuarine plain	Saline Wetlands-Saltmarshes	12.1.2 Saltpan vegetation	Group 2 Swamp Oak Floodplain Forest		125-Saltmarsh	902-Native Grasslands		90300-Headland Complex			
3 Broad-leaved Paperbark-Swamp Oak swamp sclerophyll alluvial plain open forest	Forested Wetlands-Coastal Floodplain Wetlands, Coastal Swamp Forests	12.3.5 Melaleuca quinquenervia on alluvium	Group 1 Swamp Sclerophyll Forest on coastal floodplains		112-Paperbark; 143-Swamp Oak	402-Broad-leaved Paperbark/Swamp She-Oak Closed Forest to Woodland	Swamp Oak +/- Paperbark (sOP)	40031/2-Melaleuca quinquenervia swamp sclerophyll forest and woodland; 40051/2-Casuarina glauca forest and woodland; 40991/2-Mixed stands of Melaleuca quinquenervia - Casuarina glauca		F8-Melaleuca quinquenervia tall to very tall open to closed forest; F10-Casuarina glauca tall to very tall open to closed forest	
4 Swamp Oak-Broad-leaved Paperbark estuarine and alluvial plain swamp sclerophyll forest	Forested Wetlands-Coastal Floodplain Wetlands, Coastal Swamp Forests	12.1.1 Casuarina glauca +/- Melaleuca quinquenervia open forest	Group 2 Swamp Oak Floodplain Forest		112-Paperbark; 143-Swamp Oak	402-Broad-leaved Paperbark/Swamp She-Oak Closed Forest to Woodland	Swamp Oak +/- Paperbark (sOP)	40031/2-Melaleuca quinquenervia swamp sclerophyll forest and woodland; 40051/2-Casuarina glauca forest and woodland; 40991/2-Mixed stands of Melaleuca quinquenervia - Casuarina glauca		F8-Melaleuca quinquenervia tall to very tall open to closed forest; F10-Casuarina glauca tall to very tall open to closed forest	
5 Milky Mangrove-Swamp Oak-Grey Mangrove king-tide forest	Saline Wetlands-Mangrove	12.1.3 Mangrove Shrubland to low closed forest	Group 2 Swamp Oak Floodplain Forest; Group 27 Mangroves		77-Mangrove	602-Mangrove Low Closed Forest to Woodland	Grey Mangrove-River Mangrove-Swamp Oak (MSO)	40151-Casuarina glauca - Avicennia marina subsp. australasica			

Community	Keth (2006)	Qld Regional Ecosystems (Young and Dilleward 1999)	Keith and Scott (2006)	Floyd Rainforest Suballiance (Floyd 1990)	North-east NSW Forest Ecosystems (NPWS 1999)	Twed LGA (Kingston <i>et al.</i> 2004)	Byron LGA (Landmark Ecological Services 1999)	NSW coast vegetation mapping (Griffith and Wilson 2007)	Wallis Lake Wetland Vegetation (Griffith 2007)	Twed Lowlands (Pressey and Griffith 1992)	Casino State Forest Management Area (Binns 1995b)
6 Swamp Oak-Hoop Pine-Tucker swamp sclerophyll/dry 'gallery' floodplain rainforest	Forested Wetlands-Coastal Floodplain Wetlands, Rainforest-Dry 'Gallery' Rainforest		Group 3 Lowland Rainforest on floodplain	Suballiance 3-Cryptocarya obovata-Dendrocnide excelsa-Ficus spp. Araucaria; Suballiance 17-Cupaniopsis amarcordioides		601-Swamp She-oak Closed Forest to Woodland					
7 Prickly Couch-Sea Rush-Schoenoplectus subulatus saltmarsh	Saline Wetlands-Saltmarshes	12.1.2 Saltpan vegetation	Group 2 Saltmarsh		125-Saltmarsh	603-Saltmarsh Communities		6102-Chenopod Shrubland-Tussock Grassland		S2-Juncus kraussii tall to very tall closed Rushland	
8 Swamp Oak king-tide swamp sclerophyll forest	Forested Wetlands-Coastal Swamp Forests, Saline Wetlands-Mangroves	12.1.1 Casuarina glauca +/- Melaleuca quinquenervia open forest	Group 2 Saltmarsh, Group 27 Mangrove		143-Swamp Oak	601-Swamp She-oak Closed Forest to Woodland	Grey Mangrove-River Mangrove-Swamp Oak (MSO)				
9 Sea Rush-Matgrass saltmarsh	Saline Wetlands-Saltmarshes	12.1.2 Saltpan Vegetation	Group 28 Saltmarsh		125-Saltmarsh	603-Saltmarsh Communities			Sedgeland (S) Schoenoplectus subulatus	S2-Juncus kraussii tall to very tall closed Rushland	
62 River Mangrove-Grey Mangrove-Black Mangrove-Milky Mangrove-Spider Mangrove forest to shrubland	Saline Wetlands-Saltmarshes	12.1.3 Mangrove Shrubland to low closed forest on Quaternary estuarine deposits	Group 27 Mangroves		77-Mangrove	602-Mangrove Low Closed Forest	Grey Mangrove/River Mangrove (M)	5302-Avicennia marina var. australasica mangrove shrubland; 2502-Avicennia marina var. australasica mangrove forest and woodland	Mangrove Forest and Woodland (MF/W)		
10 Broad-leaved Paperbark-Swamp Oak-fern/sedge swamp sclerophyll forest	Forested Wetlands-Coastal Swamp Forests, Coastal Floodplain Wetlands	12.1.1 Casuarina glauca +/- Melaleuca quinquenervia open forest	Group 1 Swamp Sclerophyll Forest on coastal floodplains		112-Paperbark; 143-Swamp Oak	402-Broad-leaved Paperbark/Swamp She-Oak Closed Forest to Woodland	Swamp Oak +/- Paperbark (sOP)	40031/2-Melaleuca quinquenervia swamp sclerophyll forest and woodland; 40051/2-Casuarina glauca forest and woodland; 40991/2-Mixed stands of Melaleuca quinquenervia - Casuarina glauca	Swamp Sclerophyll Forest and Woodland (SSF/W)	F8-Melaleuca quinquenervia tall to very tall open to closed forest; F10-Casuarina glauca tall to very tall open to closed forest	
11 Broad-leaved Paperbark-Pink-flowered Doughwood swamp sclerophyll open forest	Forested Wetlands-Coastal Swamp Forests, Coastal Floodplain Wetlands	12.2.7 Melaleuca quinquenervia open forest to woodland on Quaternary Sands; 12.3.5 Melaleuca quinquenervia on alluvium	Group 1 Swamp Sclerophyll Forest on coastal floodplains		112-Paperbark	401-Broad-leaved Paperbark Closed Forest to Woodland	Paperbark (PB)	40031/2-Melaleuca quinquenervia forest and woodland	Swamp Sclerophyll Forest and Woodland (SSF/W)	F8-Melaleuca quinquenervia tall to very tall open to closed forest	

Community	Kath (2006)	Qld Regional Ecosystems (Young and Dilleward 1999)	Keith and Scott (2006)	Floyd Rainforest Suballiance (Floyd 1990)	North-east NSW Forest Ecosystems (NPWS 1999)	Twed LGA (Kingston <i>et al.</i> 2004)	Byron LGA (Landmark Ecological Services 1999)	NSW coast vegetation mapping (Griffith and Wilson 2007)	Wallis Lake Wetland Vegetation (Griffith 2007)	Twed Lowlands (Pressey and Griffith 1992)	Cashio State Forest Management Area (Birns 1995b)
12 Broad-leaved Paperbark–Swamp Oak ferny swamp sclerophyll forest	Forested Wetlands-Coastal Swamps Coastal Forests, Coastal Floodplain Wetlands	12.3.5 <i>Melaleuca quinquenervia</i> open forest on alluvium; 12.2.7 <i>Melaleuca quinquenervia</i> open forest to woodland on Quaternary Sands	Group 1 Swamp Sclerophyll Forest on coastal floodplains		112–Paperbark; 143–Swamp Oak	401–Broad-leaved Paperbark Closed Forest to Woodland; 402–Broad-leaved Paperbark/Swamp She-Oak Closed Forest to Woodland	Swamp Oak +/- Paperbark (sOP)	40031/2– <i>Melaleuca quinquenervia</i> forest and woodland; 40051/2– <i>Casuarina glauca</i> forest and woodland; 40991/2–Mixed stands of <i>Melaleuca quinquenervia</i> - <i>Casuarina glauca</i>	Swamp Sclerophyll Forest and Woodland (SSF/W)	F8– <i>Melaleuca quinquenervia</i> tall to very tall open to closed forest; F10– <i>Casuarina glauca</i> tall to very tall open to closed forest	
13 Alluvial plain Broad-leaved Paperbark–Swamp Mahogany–Bangalow Palm–Saw Sedge–Swamp Water Fern swamp sclerophyll forest	Forested Wetlands-Coastal Floodplain Wetlands	12.3.5 <i>Melaleuca quinquenervia</i> open forest on alluvium; 12.2.7 <i>Melaleuca quinquenervia</i> open forest to woodland on Quaternary Sands	Group 1 Swamp Sclerophyll Forest on coastal floodplains		112–Paperbark	401–Broad-leaved Paperbark Closed Forest to Woodland	Swamp Oak +/- Paperbark (sOP)	40031/2– <i>Melaleuca quinquenervia</i> forest and woodland; 40981/2–Mixed stand of <i>Eucalyptus robusta</i> - <i>Melaleuca quinquenervia</i> ; 64051– <i>Lepironia articulata</i> Sedgeland; 64131– <i>Eleocharis equisetina</i> sedgeland	Swamp Sclerophyll Forest and Woodland (SSF/W)	F8– <i>Melaleuca quinquenervia</i> tall to very tall open to closed forest	
14 Swamp Mahogany–Broad-leaved Mahogany–Bangalow Palm–sedge/fern swamp sclerophyll forest	Forested Wetlands-Coastal Swamps Coastal Forests, Coastal Floodplain Wetlands	12.3.5 <i>Melaleuca quinquenervia</i> on alluvium	Group 1 Swamp Sclerophyll Forest on coastal floodplains		112–Paperbark; 142–Swamp Mahogany	305–Coastal Swamp Mahogany Open Forest to Woodland	Swamp Mahogany/Swamp Box (SMB)	40021/2– <i>Eucalyptus robusta</i> forest and woodland; 40981/2–Mixed stand of <i>Eucalyptus robusta</i> - <i>Melaleuca quinquenervia</i> ,	Swamp Sclerophyll Forest and Woodland (SSF/W)	F7– <i>Eucalyptus robusta</i> mid high to very tall open forest	
15 Bangalow Palm–Swamp Box–Cabbage Tree Palm–Weeping Myrtle Open to Closed forest.	Forested Wetlands-Coastal Floodplain Wetlands		Group 3 Lowland Rainforest on floodplain	Suballiance 6–Archontophoenix-Livistonia	168–Rainforest	401–Broad-leaved Paperbark Closed Forest to Woodland		Possibly 40141– <i>Melaleuca quinquenervia</i> - <i>Livistonia australis</i>		F9– <i>Archontophoenix cunninghamiana</i> - <i>Melaleuca quinquenervia</i> very tall feather palm swamp forest	
16 Tea-tree (<i>Leptospermum</i> spp.)– <i>Sporodanthus</i> interruptus wet heath	Freshwater Wetlands-Coastal Heath Swamps	12.2.12 Closed or wet heath on Quaternary sands	Group 38 Wet Heath North Coast		64–Heath; 141–Swamp	502–Wet heathland/Shrubland	Teatree (TT)	55111– <i>Leptospermum whitei</i> - <i>L. polygalifolium</i> Swamp Sclerophyll Shrubland; 60021– <i>Banksia oblongifolia</i> - <i>Leptospermum liversidgei</i> - <i>Lepyrobia interrupta</i> - <i>Sprengelia sprengeloides</i> - <i>Xanthorrhoea fulva</i>	Wet Heathland (WH)	H2– <i>Banksia oblongifolia</i> - <i>Leptospermum liversidgei</i> - <i>Lepyrobia interrupta</i> - <i>Sprengelia sprengeloides</i> - <i>Xanthorrhoea fulva</i>	
17 <i>Leptospermum liversidgei</i> –Wallum Bottlebrush–Grass Tree–Heath-leaved <i>Banksia wallum</i> wet heath complex	Freshwater Wetlands-Coastal Heath Swamps	12.2.12 Closed or wet heath on Quaternary sands	Group 38 Wet Heath North Coast		64–Heath; 141–Swamp	502–Wet Heathland/Shrubland	Teatree (TT)	5503– <i>Banksia ericifolia</i> subsp. <i>macrantha</i> +/- <i>Leptospermum whitei</i> , <i>Leptospermum polygalifolium</i> subsp. <i>cismontanum</i> ; 5506– <i>Melaleuca quinquenervia</i> Swamp sclerophyll shrubland	Wet Heathland (WH)		
18 Coral Fern Fernland	Freshwater Wetlands-Coastal Heath Swamps	12.2.12 Closed or wet heath on Quaternary sands			141–Swamp	702–Fernland/Floodplain	Sedgeland-Fernland/Grassland (SFG)	6418– <i>Gahnia sieberiana</i> - <i>Gleichenia dicarpa</i>			

Community	Kath (2006)	Qld Regional Ecosystems (Young and Dilleward 1999)	Keith and Scott (2006)	Floyd Rainforest Suballiance (Floyd 1990)	North-east NSW Forest Ecosystems (NPWS 1999)	Tweed LGA (Kingston <i>et al.</i> 2004)	Byron LGA (Landmark Ecological Services 1999)	NSW coast vegetation mapping (Griffith and Wilson 2007)	Wallis Lake Wetland Vegetation (Griffith 2007)	Tweed Lowlands (Pressey and Griffith 1992)	Casino State Forest Management Area (Binns 1995b)
19 Broad-leaved Paperbark-Coast Banksia-Red Ash dunal scrubland		12.2.14 Strand and foredune complex				310-Banksia Dry Sclerophyll Forest to Shrubland	Coast Banksia (CB1)	3523-Banksia integrifolia subsp. <i>integrifolia</i> , Dry sclerophyll forest & woodland			
20 Swamp Box-Broad-leaved Paperbark-rush/fern Swamp Sclerophyll Forest	Forested Wetlands-Coastal Swamp Forests	12.2.7 <i>Melaleuca quinquenervia</i> open forest to woodland on Quaternary sands; 12.1.1 <i>Casuarina glauca</i> +/- <i>Melaleuca quinquenervia</i>	Group 1 Swamp Sclerophyll Forest on coastal floodplains			309-Coastal Swamp Box Open Forest to Woodland	Swamp Mahogany/Swamp Box (SMB)	4013-Melaleuca quinquenervia - <i>Lophostemon suaveolens</i> / <i>Eucalyptus tereticornis</i> mid-high to very tall, open woodland to closed forest	Swamp Sclerophyll Forest and Woodland (SSF/W)		
21 Broad-leaved Paperbark-Swamp Oak-rush saline swamp sclerophyll open forest	Forested Wetlands-Coastal Swamp Forests	12.2.7 <i>Melaleuca quinquenervia</i> open forest to woodland on Quaternary sands; 12.1.1 <i>Casuarina glauca</i> +/- <i>Melaleuca quinquenervia</i>	Group 1 Swamp Sclerophyll Forest on coastal floodplains; Group 2 Swamp Oak Floodplain Forest	112-Paperbark; 143-Swamp Oak	402-Broad-leaved Paperbark/Swamp She-Oak Closed Forest to Woodland	Swamp Oak +/- Paperbark (sOP)	40031/2-Melaleuca quinquenervia forest and woodland; 40051/2-Casuarina glauca forest and woodland; 40991/2-Mixed stands of <i>Melaleuca quinquenervia</i> - <i>Casuarina glauca</i>	F8-Melaleuca quinquenervia tall to very tall open to closed forest; F10-Casuarina glauca tall to very tall open to closed forest			
22 Common Reed-Black Bog-rush reedland/rushland	Freshwater Wetlands-Coastal Freshwater Lagoons	12.2.15 Coastal sedgeland wetland on Quaternary sands		141-Swamp	703-Wetlands			65031-Phragmites australis	Rushland (R)		
23 Swamp Box-Broad-leaved Paperbark-Swamp Mahogany swamp sclerophyll forest	Forested Wetlands-Coastal Swamp Forests, Coastal Floodplain Wetlands	12.3.5 <i>Melaleuca quinquenervia</i> open forest on alluvium	Group 1 Swamp Sclerophyll Forest on coastal floodplains	112-Paperbark; 142-Swamp Mahogany	309-Coastal Swamp Box Open Forest to Woodland						
24 Swamp Ricegrass-Smartweed-Juncus ustatus swampy meadow	Freshwater Wetlands-Coastal Freshwater Lagoons	12.2.15 Coastal Sedgeland Wetland	Group 32 Freshwater-lagoon on sand	141-Swamp	703-Wetlands			64051-Lepironia articulata sedgeland, Persicaria strigosa forbland;			
25 Swamp Ricegrass-Bolboschoenus caldwellii-Schoenoplectus validus-Cyperus exaltatus freshwater wetland	Freshwater Wetlands-Coastal Freshwater Lagoons	12.2.15 Coastal Sedgeland Wetland									
26 Hinterland Narrow-leaved Paperbark-tea-tree backswamp shrublands-sedgeland	Freshwater Wetlands-Coastal Freshwater Lagoons, Forested Wetlands-Coastal Floodplain Wetlands	12.2.15 Coastal Sedgeland	Group 1 Swamp Sclerophyll Forest on coastal floodplains	112-Paperbark				In part 64051-Lepironia articulata sedgeland			

Community	Kath (2006)	Qld Regional Ecosystems (Young and Dilleward 1999)	Keith and Scott (2006)	Floyd Rainforest Suballiance (Floyd 1990)	North-east NSW Forest Ecosystems (NPWS 1999)	Tweed LGA (Kingston <i>et al.</i> 2004)	Byron LGA (Landmark Ecological Services 1999)	NSW coast vegetation mapping (Griffith and Wilson 2007)	Wallis Lake Wetland Vegetation (Griffith 2007)	Tweed Lowlands (Pressey and Griffith 1992)	Casino State Forest Management Area (Binns 1995b)
27 Weeping Myrtle–Water Gum floodplain riparian forest	Rainforest–Dry ‘Gallery’ Rainforests	12.3.1 Rainforest on alluvium	Group 3 Lowland Rainforest on floodplain								
28 Narrow-leaved Paperbark–Wallum Bottlebrush swamp sclerophyll shrubland	Forested Wetlands–Coastal Swamp Forests	12.3.5 <i>Melaleuca quinquenervia</i> on alluvium	Group 1 Swamp Sclerophyll Forest on coastal floodplains		112–Paperbark			Possibly related to 4009– <i>Melaleuca sieberi</i> Swamp sclerophyll forest & woodland; 5508– <i>Melaleuca sieberi</i> tall sparse to closed shrubland			
29 Swamp Box–Narrow-leaved Paperbark–Broad-leaved Paperbark alluvial swamp sclerophyll forest	Forested Wetlands–Coastal Floodplain Wetlands	12.3.5 <i>Melaleuca quinquenervia</i> on alluvium	Group 1 Swamp Sclerophyll Forest on coastal floodplains		112–Paperbark	309–Coastal Swamp Box Open Forest to Woodland		4013– <i>Melaleuca quinquenervia</i> - <i>Lophostemon suaveolens</i> / <i>Eucalyptus tereticornis</i> mid-high to very tall, open woodland to closed forest			
30 Middle Richmond freshwater wetlands	Freshwater Wetlands–Coastal Freshwater Lagoons	12.3.8. Freshwater Swamps	Group 32 Freshwater-lagoon on sand		141–Swamp						
31 Scribbly Gum–Red Mahogany–Brush Box dry sclerophyll open to closed forest on coastal barrier sands	Dry Sclerophyll Forests–Coastal Dune Dry Sclerophyll Forests				74–Lowlands Scribbly Gum	306–Coastal Scribbly Gum Open Forest to woodland		3516– <i>Eucalyptus signata</i> tall to very tall, open woodland			
32 Blackbutt–Turpentine Open Forest complex	Dry Sclerophyll Forests–Coastal Dune Dry Sclerophyll Forests	12.2.8 <i>Eucalyptus ptilaris</i> , <i>E. microcoris</i> , <i>E. resinifera</i> & <i>Syncarpia hillii</i> Tall Open Forest			32–Dry Foothills Blackbutt Turpentine	206–Flooded Gum Open Forest; 211–Turpentine +/- Pink Bloodwood Open Forest; 307–Coastal Blackbutt Open Forest to woodland; 303–Coastal Brush Box Open Forest to Woodland; 305–Coastal Swamp Mahogany Open Forest to Woodland	Flooded Gum (fG); Blackbutt (BB) Moist to dry sclerophyll Forest; Swamp Mahogany/Swamp Box (SMB)				
33 Coast Cypress Pine on dunes and ridges	Dry Sclerophyll Forests–Coastal Dune Dry Sclerophyll Forests	12.2.11 Woodlands of coastal dunes and beaches			22–Coastal Cypress Pine	313–Cypress Pine Open Forest to Woodland	Cypress Pine (CP)	3502–Dry sclerophyll forest & woodland NPWS			
34 Coast Banksia frontal dune open forest on Holocene dunes	Dry Sclerophyll Forests–Coastal Dune Dry Sclerophyll Forests	12.2.5 Forests of coastal dunes and beaches	Group 14 Fore dune Scrub		5–Banksia	310–Banksia Dry Sclerophyll Open Forest and Shrubland	Coast Banksia (CB1)	3523– <i>Banksia integrifolia</i> subsp. <i>integrifolia</i>			

Community	Kath (2006)	Qld Regional Ecosystems (Young and Dillewaard 1999)	Keith and Scott (2006)	Floyd Rainforest Suballiance (Floyd 1990)	North-east NSW Forest Ecosystems (NPWS 1999)	Tweed LGA (Kingston <i>et al.</i> 2004)	Byron LGA (Landmark Ecological Services 1999)	NSW coast vegetation mapping (Griffith and Wilson 2007)	Wallis Lake Wetland Vegetation (Griffith 2007)	Tweed Lowlands (Pressey and Griffith 1992)	Casino State Forest Management Area (Binns 1995b)
35 Brush Box lowland rainforest	Rainforest-Subtropical Rainforest		Group 4 Littoral Rainforest	Suballiance 18- <i>Lophostemon confertus</i>	50-Wet Bangalow Brushbox	303-Coastal Brush Box Open Forest to Woodland	Brush Box (Bh)	3002- <i>Lophostemon confertus</i> mid-high to very tall, open to closed forest		F2- <i>Lophostemon confertus</i> tall to very tall closed forest	
36 Coast Wattle-Coast Tea-tree-Coast Banksia shrubland on Holocene dunes and ridges		12.2.14 Strand and foredune complex	Group 25 Beach Grassy Heath			1008-Post mining regeneration; 801-Foredune Complex	Horsetail She-oak-Coast Banksia-Bitou Bush (OeB)	5411-* <i>Chrysanthemoides monilifera</i> subsp. <i>rotundata</i> - <i>Acacia sophorae</i> mid-high to tall closed shrubland			
37 Kangaroo Grass headland grassland	Heathlands-Coastal Headland Heaths							6302-Thenedra australis Sod Grassland			
38 Scribbly Gum-Old Man Banksia-Slender Tea-tree healthy low open sclerophyll forest/shrubland	Dry Sclerophyll Forests-Coastal Dune Dry Sclerophyll Forest	12.2.6 Open forest on dunes			65-Healthy Scribbly Gum						
39 Wallum Banksia dry heath	Heathlands-Wallum Sand Heaths	12.2.9 Banksia aemula low shrubby woodland on coastal dunes and heathes				501-Dry heathland/shrubland	Wallum Banksia (BK); Dwarf Banksia/Coast Banksia (BK)	5802-Dry heathland			
40 Lower Richmond mesic successional wet/swamp sclerophyll forest/rainforest	Wet Sclerophyll Forest-North Coast Wet Sclerophyll Forest					206-Flooded Gum Open Forest; 211-Turpentine +/- Pink Bloodwood Open Forest; 307-Coastal Blackbutt Open Forest to woodland; 303-Coastal Brush Box Open Forest to Woodland; 305-Coastal Swamp Mahogany Open Forest to Woodland; 309-Coastal Swamp Box Open Forest to Woodland	Flooded Gum (fG); Blackbutt (BB); Swamp Mahogany/Swamp Box (SMB)	4013-Melaleuca quinquenervia- <i>Lophostemon suaveolens</i> / <i>Eucalyptus tereticornis</i> mid-high to very tall, open woodland to closed forest			CAS17 <i>Eucalyptus resinifera</i> <i>Eucalyptus pilularis</i> <i>Lophostemon suaveolens</i> <i>Syncarpia glomulifera</i> <i>Corymbia intermedia</i> .
41 Lower Richmond Brush Box-Pink Bloodwood-Grey Ironbark mesic tall open forest	Wet Sclerophyll Forest-North Coast Wet Sclerophyll Forest	12.1.3 Tall open forest on sediments					Brush Box (Bh)	3002- <i>Lophostemon confertus</i> mid-high to very tall, open to closed forest			CAS136 <i>Lophostemon confertus</i> <i>Syncarpia glomulifera</i> <i>Corymbia intermedia</i>

Community	Kath (2006)	Qld Regional Ecosystems (Young and Dilleward 1999)	Keith and Scott (2006)	Floyd Rainforest Suballiance (Floyd 1990)	North-east NSW Forest Ecosystems (NPWS 1999)	Tweed LGA (Kingston <i>et al.</i> 2004)	Byron LGA (Landmark Ecological Services 1999)	NSW coast vegetation mapping (Griffith and Wilson 2007)	Wallis Lake Wetland Vegetation (Griffith 2007)	Tweed Lowlands (Pressey and Griffith 1992)	Casino State Forest Management Area (Birns 1995b)
42. Tweed–Brunswick Valleys Brush Box–Blackbutt–Pink Bloodwood–Tallowood foothill wet sclerophyll forest	Wet Sclerophyll Forests–North Coast Wet Sclerophyll Forest	12.11.3 Tall open forest on sediments				201–Blackbutt Open Forest Complex; 202–Grey Ironbark– White Mahogany/Grey Gum Open Forest complex; 207–Brush Box Open Forest	Blackbutt (BB); Grey Ironbark– Pink Bloodwood (gLB)			F3– <i>Eucalyptus pilularis</i> very tall open forest; F2– <i>Lophostemon confertus</i> tall to very tall closed forest	
43. Brunswick–Tweed Brush Box gully rainforest on meta- sediments	Rainforest– Subtropical Rainforest	12.11.1 Brush Box closed forest in gullies.				207–Brush Box Open Forest	Brush Box (Bb)			F2– <i>Lophostemon confertus</i> tall to very tall closed forest	
44. Tweed–Brunswick Valley Blue Quandong subtropical rainforest	Rainforest– Subtropical Rainforest	12.11.1 Brush Box closed Forest in gullies		Suballiance 2– <i>Irona-Flindersia</i>		102–Subtropical/ warm temperate Rainforest	Subtropical rainforest on metasediments; Subtropical rainforest on alluvial soils				
45. Tweed–Brunswick Valley Bangalow Palm– Lilly Pilly subtropical rainforest	Rainforest– Subtropical Rainforest	12.11.1 Brush Box closed Forest in gullies		Suballiance 6– <i>Archontophoenix- Livistona</i>		102–Subtropical/ warm temperate Rainforest	Subtropical rainforest on metasediments; Subtropical rainforest on basalt soils				
46. Stinging Tree–White Fig–Brush Bloodwood subtropical rainforest	Rainforest– Subtropical Rainforest	12.8.4 Complex notophyll rainforest on basalt and laterised basalt		Suballiance 3– <i>Cryptocarya obovata- Dendrocinide excelsa- Ficus spp.- Araucaria</i>		102–Subtropical/ warm temperate Rainforest	Subtropical rainforest on basalt soils				
47. Tweed Valley meta- sediment and basalt low-elevation subtropical rainforest	Rainforest– Subtropical Rainforest	12.8.3 Complex notophyll rainforest on canozoic igneous rocks		Suballiance 1– <i>Azyrodendron trifoliatum</i>		102–Subtropical/ warm temperate Rainforest	Subtropical rainforest on metasediments; Subtropical rainforest on basalt soils			102–Subtropical/ warm temperate Rainforest	
48. Flooded Gum–Pink- flowered Doughwood– Hard Quandong alluvial plain wet sclerophyll forest	Wet Sclerophyll Forests–North Coast Wet Sclerophyll Forests	12.3.2 Eucalyptus grandis +/- Eucalyptus microcarps tall open forest with rainforest understorey			26–Coastal Flooded Gum	206–Flooded Gum Open Forest	Wattle (W); Mixed regrowth forest and shrubland (mr); Flooded Gum (fG)				
49. Camphor Laurel– Forest Red Gum open to closed forest	Wet Sclerophyll Forests–North Coast Wet Sclerophyll Forests					1004–Camphor Laurel Dominant Closed to Open Forests	Camphor Laurel (cL1, cL2)				

Community	Keith (2006)	Qld Regional Ecosystems (Young and Dillewaard 1999)	Keith and Scott (2006)	Floyd Rainforest Suballiance (Floyd 1990)	North-east NSW Forest Ecosystems (NPWS 1999)	Twiced LGA (Kingston <i>et al.</i> 2004)	Byron LGA (Landmark Ecological Services 1999)	NSW coast vegetation mapping (Griffith and Wilson 2007)	Wallis Lake Wetland Vegetation (Griffith 2007)	Twiced Lowlands (Pressey and Griffith 1992)	Casino State Forest Management Area (Binns 1995b)
50 Swamp Oak–Forest Red Gum–Broad-leaved Paperbark–Swamp Box swamp sclerophyll woodland to open forest	Forested Wetlands–Coastal Swamp Forests, Coastal Floodplain Wetlands	12.3.5 <i>Melaleuca quinquenervia</i> open forest on alluvium	Group 1 Swamp Sclerophyll Forest on Coastal Floodplains; Group 10 Swamp Sclerophyll Forest on Coastal Sandplains			309–Coastal Swamp Box Open Forest to Woodland	Mixed Eucalypt spp. (mc2) Swamp Sclerophyll Forest	4013– <i>Melaleuca quinquenervia</i> - <i>Lophostemon suaveolens</i> / <i>Eucalyptus tereticornis</i> mid-high to very tall, open woodland to closed forest; 3003– <i>Lophostemon suaveolens</i> tall to very tall, open to closed forest; 3010– <i>Lophostemon suaveolens</i> - <i>Eucalyptus intermedia</i> - <i>E. tereticornis</i> tall to very tall, open to closed forest.		F5– <i>Eucalyptus tereticornis</i> - <i>Eucalyptus intermedia</i> - <i>Lophostemon suaveolens</i> tall to very tall open forest	Casino State Forest Management Area (Binns 1995b)
51 Forest Red Gum–Willow Bottlebrush–Camphor Laurel dry open forest	Forested Wetlands–Coastal Swamp Forests, Coastal Floodplain Wetlands	12.3.3 <i>Eucalyptus tereticornis</i> open forest to woodland on alluvial plains	Group 8 Subtropical Coastal Floodplain Forest								
52 Small-leaved Fig–Hard Quandong–Bangalow Palm subtropical/littoral rainforest on Pleistocene dunes	Rainforest–Subtropical Rainforest	12.2.2 Mixed microphyll notophyll rainforest on coastal dunes and beaches				101–Littoral rainforest	Subtropical rainforest near the coast				
53 Patches Beach Broad-leaved Paperbark–Swamp Oak–Cabbage-tree Palm swamp sclerophyll forest on the alluvial plain.	Forested Wetlands–Coastal Swamp Forests, Coastal Floodplain Wetlands	12.3.5 <i>Melaleuca quinquenervia</i> on alluvium	Group 1 Swamp Sclerophyll Forest on Coastal Floodplains		112–Paperbark; 143–Swamp Oak	401–Broad-leaved Paperbark Closed Forest to Woodland; 402–Broad-leaved Paperbark/Swamp She-oak Closed Forest to Woodland	Paperbark (PB); Swamp Oak +/- Paperbark (sOP)	4099– <i>Melaleuca quinquenervia</i> - <i>Casuarina glauca</i>		F8– <i>Melaleuca quinquenervia</i> tall to very tall open to closed forest; F10– <i>Casuarina glauca</i> tall to very tall open to closed forest	
54 Whalebone Tree–Thorny Pea–Sweet Myrtle dry rainforest	Rainforests–Dry Rainforests			Suballiance 25– <i>Streblus</i> - <i>Austromyrtus</i>		103–Dry Rainforest					
55 Grey Ironbark–Pink Bloodwood–White Mahogany dry grassy open forest	Wet Sclerophyll Forest–Northern Hinterland Wet Sclerophyll Forest	12.11.5 Spotted Gum Ironbark mixed Tall Open forest on metasediments				202–Grey Ironbark/White Mahogany/Grey Gum Open Forest Complex	Grey Ironbark–Pink Bloodwood (gIB)	3015– <i>Eucalyptus intermedia</i> - <i>E. siderophloia</i> - <i>E. tereticornis</i> tall to very tall, open to closed forest; 3509– <i>Eucalyptus siderophloia</i> - <i>E. prostrata</i> - <i>E. acmenoides</i> / <i>E. carnea</i> tall to very tall, open to closed forest			CASov22.1 <i>Eucalyptus carnea</i> <i>Corymbia intermedia</i>
56 Broad-leaved Paperbark–Swamp Box–Tuckeroo swamp sclerophyll open forest	Forested Wetlands–Coastal Swamp Forests, Coastal Floodplain Wetlands	12.3.5 <i>Melaleuca quinquenervia</i> on alluvium	Group 1 Swamp Sclerophyll Forest on Coastal Floodplains		112–Paperbark	401–Broad-leaved Paperbark Closed Forest to Woodland		40031/2– <i>Melaleuca quinquenervia</i> forest and woodland		F8– <i>Melaleuca quinquenervia</i> tall to very tall open to closed forest	CASf25 <i>Eucalyptus tereticornis</i> <i>Lophostemon suaveolens</i>

Community	Kath (2006)	Qld Regional Ecosystems (Young and Dilleward 1999)	Keith and Scott (2006)	Floyd Rainforest Suballiance (Floyd 1990)	North-east NSW Forest Ecosystems (NPWS 1999)	Tweed LGA (Kingston <i>et al.</i> 2004)	Byron LGA (Landmark Ecological Services 1999)	NSW coast vegetation mapping (Griffith and Wilson 2007)	Wallis Lake Wetland Vegetation (Griffith 2007)	Tweed Lowlands (Pressey and Griffith 1992)	Casino State Forest Management Area (Binns 1995b)
57 Red Mahogany-Pink Bloodwood-Swamp Mahogany-Swamp Box dry open forest							Swamp sclerophyll forest mixed eucalypt spp. (mE2)	3014-Eucalyptus resinifera subsp. hemidampra tall to very tall, open to closed forest; 3519-Eucalyptus resinifera ssp. hemidampra tall to very tall, open to closed forest			CAS18 Eucalyptus robusta Eucalyptus resinifera Lophostemon suaveolens
58 Pink Bloodwood-Grey Ironbark-Swamp Box-Forest Red Gum-Blackbutt tall dry open forest	Wet Sclerophyll Forest-Northern Hinterland Wet Sclerophyll Forest					202-Grey Ironbark/White Mahogany/Grey Gum Open Forest Complex	Grey Ironbark-Pink Bloodwood (glB); Blackbutt (BB)	3015-Corymbia intermedia-Eucalyptus siderophloia - Eucalyptus tereticornis Wet sclerophyll forest			CAS10 Eucalyptus moluccana Eucalyptus siderophloia Corymbia intermedia Lophostemon suaveolens, CAS125 Eucalyptus tereticornis Lophostemon suaveolens
59 Large-fruited Spotted Gum-Grey Ironbark-Small-fruited Grey Gum dry grassy open forest	Grassy Woodlands-Coastal Valley Grassy Woodlands	12.11.5 Spotted Gum Ironbark mixed Tall Open forest on metasediments			24-Clarence Lowlands Spotted Gum						CAS18 Corymbia intermedia Corymbia henryi
60 Grey Ironbark-Thin-leaved Stringbark-Pink Bloodwood-Swamp Box dry open grassy forest	Wet Sclerophyll Forest-Northern Hinterland Wet Sclerophyll Forest	12.9/10.7 Tall Open Forests on sediments				202-Grey Ironbark/White Mahogany/Grey Gum Open Forest Complex	Gey Ironbark-Pink Bloodwood (glB)	3538-Eucalyptus eugenioides - E. siderophloia - E. intermedia tall to very tall, open forest			
61 Broad-leaved Paperbark-Narrow-leaved Rough-barked Apple-Swamp Box-Pink Bloodwood dry grassy alluvial open forest	Forested Wetlands-Coastal Floodplain Wetlands	12.3.5 Melaleuca quinquenervia on alluvium			46-Forest Red Gum; 73-Lowland Red Gum; 112-Paperbark					F5-Eucalyptus tereticornis-C. intermedia-Lophostemon suaveolens	
62 River Mangrove-Grey Mangrove-Black Mangrove-Milky Mangrove and Spider Mangrove Forest to Woodland	Saline Wetlands-Mangroves	12.1.3 Mangrove Shrubland			77-Mangrove	602-Mangrove Low Closed Forest to Woodland	Grey Mangrove/River Mangrove (M)	5302-Avicennia marina var. australasica mangrove shrubland; 2502-Avicennia marina var. australasica mangrove forest and woodland			

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