A Blueprint for a Comprehensive Reserve System for Koalas (*Phascolarctos cinereus*) on the North Coast of New South Wales

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protecting nature through community action

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North Coast Environment Council Inc.

Traditional owners

The NPA acknowledges the traditional Aboriginal owners and original custodians of the land mentioned in this proposal. The proposal seeks to protect country in the tribal lands of the Bundjalung, Gumbainggir, Dainggatti, Biripi and Worimi people.

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Executive summary

The koala is an iconic Australian species which has experienced recent large population declines and is now under serious threat in many areas. Habitat loss, fragmentation and degradation are the main threats to the species, but there are other compounding threats including climate change. The largest koala populations are now found east of the Great Dividing Range and, in NSW, approximately 50% of koalas are found in the north-east of the state.

This document proposes 10 new conservation reserves which would protect almost 50% of NSW's koalas, including two nationally important metapopulations. The proposals align with existing conservation advice and management plans for the koala, and their importance is supported by their alignment with the findings of the 2014 Koala Count. The proposed reserves vary in their implementation: several, including the Great Koala National Park, the flagship proposal in the document, involve removing logging from State Forests and adding the forests to the reserve system. Evidence suggests that logging is not compatible with key habitat features for koalas and other species. Other proposals focus on the voluntary conservation of private land and the purchase of small parcels of high value land. All focus on increasing connectivity in the landscape to allow koalas to move in response to threats and food availability.

Because of the focus on connectivity and forest protection, the proposals would also benefit a range of other threatened species and ecological communities and would make a large contribution to the ambitious Great Eastern Ranges Initiative. The Great Koala National Park is situated in an area with the most diverse tall eucalypt forests in the world which, we believe, are better protected in perpetuity than subject to logging. We believe that these forests, and the koala in particular, comprise a huge potential economic and cultural resource for the communities of north-east NSW. The proposals in this document would go a long way towards the effective exploitation of these natural resources. Maximising outcomes, for example through nature-based tourism, from these reservations will require strategic investment in the region, but would help offset any losses accrued through the removal of native forest logging.

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Abbreviations used

Abbreviation	Full text
EEC	Endangered Ecological Community
EPA	Environmental Protection Authority
EPBC Act	Environment Protection and Biodiversity Conservation Act
CAR	Comprehensive, Adequate and Representative
CMA	Catchment Management Authority
CRA	Comprehensive Regional Assessment
FC	Forestry Corporation of NSW
ha	Hectares
HUA	High Use Area
JANIS	Joint Australian and New Zealand Environment and Conservation Council / Ministerial Council of Forestry Fisheries and Aquaculture National Forest Policy Statement Implementation Sub-committee
km	Kilometres
LGA	Local Government Area
LNE	Lower North East
NEFA	North East Forest Alliance
NKCMS	National Koala Conservation and Management Strategy
NPA	National Parks Association
NPW Act	National Parks and Wildlife Act 1974
NPWS	National Parks and Wildlife Service
NSW	New South Wales
RFA	Regional Forest Agreements
Qld	Queensland
UNE	Upper North East
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WWF	World Wildlife Fund

Introduction

The forests of the NSW North Coast contain koala (*Phascolarctos cinereus*) metapopulations of national and international significance, together with extensive areas of current and proposed World Heritage rainforest areas. The area also contains the most diverse tall eucalypt forests in the world and other threatened fauna habitats of national and international significance (Cerese 2012).

The extraordinary biodiversity values and irreplaceable nature of these areas requires a vision to recognise, protect, promote and utilise the vast potential of these forests in an ecologically sustainable way. There is exceptional potential in this approach: recent estimates by the WWF put the annual value of wild nature-based tourism to Australia as between $6 and $23 billion (Taylor et al. 2014). This report focuses on the iconic koala to develop such a vision by proposing a network of protected areas to conserve up to 9,400 koalas—almost 50% of the NSW population (Woinarski et al. 2014).

Koala reserve proposals on the NSW north coast: where are they and why are they required?

An Australian icon in peril

The koala is one of Australia's most loved and iconic native animals. It is an instantly recognisable symbol of Australia as well as being an integral part of Australian cultural heritage. However, the koala is also in trouble. Across NSW, ACT and Queensland, koala populations declined by 30% in the period 1990-2010 (Woinarski et al. 2014). This is just three koala generations.

Habitat loss and fragmentation are the primary causes of koala population declines (Commonwealth of Australia 2009) and are the greatest threats to the koala's long-term population viability due to their poor dispersal ability (Woinarski et al. 2014). Wildfire can inflict high mortality on koala populations (Woinarski et al. 2014), again largely due to poor dispersal ability, and drought can also impact koala populations (Seabrook et al. 2011). Drought is believed to the primary cause of the recent population crash in the Pilliga Forest (Paull 2013). In the north coast area, logging of both State Forests and private land is a serious threat (Pressey et al. 2002, Scotts 2013) and disease, in particular chlamydia and the koala retrovirus, is also having a significant negative impact on wild koala populations by reducing fertility rates (Woinarski et al. 2014). Queensland scientists have recently completed a successful vaccination field trial against chlamydia on wild animals (Small 2014) which will complement the proposed habitat protection by slowing population declines. Where koalas interface with humans (a consequence of habitat fragmentation and coastal development), dog attacks and vehicle strikes are major threats (Lunney et al. 2007, Commonwealth of Australia 2009, Woinarski et al. 2014)

Both social and land-use impediments to recovery of koala populations exist (Ng et al. 2014). This proposal seeks to address some of the land-use impediments. Reducing the primary threats of habitat loss and fragmentation by reserving areas of land is the key focus of this proposal.

It’s time for a dedicated koala reserve

Despite the global status of the koala as the second-most recognised animal in the world to the giant panda, the recent alarming population declines and ongoing threats, no nationally recognised reserve has yet been set aside in Australia to ensure the protection of the koala in the wild. By contrast, in China, reserves covering one million hectares of the panda’s bamboo forest habitat have been established and are World Heritage listed (UNESCO

World Heritage Centre 2014c). Like the panda, koalas have highly specific food requirements (Hindell and Lee 1987, Phillips and Callaghan 2000) and eat exclusively low-nutrient leaves. This is likely a contributing factor to the vulnerability of koalas to human-driven land-use change.

A Federal Government Senate Committee Inquiry in 2011 (Commonwealth of Australia 2011) agreed on the need for early conservation action to save the koala in the wild. Immediate action, rather than allowing the koala to drift ever closer to extinction, would be more cost-effective and have a better chance of conservation success the Committee found. The inquiry also recommended that priority habitat for the species was mapped and that these maps subsequently be used to protect important habitats. The National Koala Conservation and Management Strategy 1998-2014 (Commonwealth of Australia 2009) also recommended this action.

Large areas of the NSW coast currently contain suitable koala habitat. These coastal areas are likely to become more important to the persistence of the species in the face of climate change as inland areas become less suitable habitat and the distribution of food trees shifts (Adams-Hosking et al. 2012, Adams-Hosking et al. 2014).

Native forest exploitation and biodiversity

Comprehensive Regional Assessments (CRA) (Commonwealth of Australia 2014a), informing the Regional Forest Agreements (RFA) (Commonwealth of Australia 2014b) were the process set up to implement Australia's 1991 National Forest Policy (Commonwealth of Australia 1992, 1995). RFAs were intended to deliver certainty to the timber industry, while achieving environmental outcomes by establishing a Comprehensive, Adequate and Representative (CAR) reserve system of Forest Ecosystems, and reduce conflict over native forest logging. RFAs are reviewed every five years but have not been successful in resolving conflict over forestry and biodiversity conservation (Lane 1999). A recent review found that State enforcement of compliance and standards of native forestry was seriously lacking, and that the RFAs were failing to protect threatened species and achieve core goals (Feehely et al. 2013). It is also recognised that reserve outcomes from the Interim Assessment Process (a precursor to the CRAs) were biased towards less productive forests on steeper slopes and that areas most vulnerable to clearing were conferred less protection (Pressey et al. 2002). The koala, a threatened species under the NSW Threatened Species Act, received a target of 60% of remaining habitat to be protected via the JANIS conservation requirements (NSW National Parks and Wildlife Service and Environment Australia 1998).

The majority of remaining prime koala habitat is located in State Forests (Scotts 2013). In recent years, increasing intensity of industrial-scale logging of State Forests is rendering these forests unsuitable as koala habitat for many years and contributing to the declines in local and regional koala populations (Scotts 2013). Research in the Queensland subtropics has shown that even low intensity logging has cumulative negative effects on forest habitat, including the loss of large live trees and low number of tree hollows (Eyre et al. 2010), and Victorian mountain ash (*Eucalyptus regnans*) forests lack hollows due to fire and widespread logging (Lindenmayer et al. 2012). Large old trees are keystone components of forest ecosystems, but are disproportionately vulnerable to loss due to a variety of reasons, including logging and fire (Lindenmayer et al. 2014). The loss of hollow-bearing trees has been identified as a key threatening process in the state of NSW (NSW Scientific Committee 2007). Additionally, logging may increase the vulnerability of moist eucalypt forests to ignition and high severity fire (Lindenmayer et al. 2009) which in turn can result in the loss of large hollow-bearing trees. Available evidence therefore suggests that native forest logging is not compatible with the retention of key habitat features.

Koala population assessments

In 2012, community groups engaged an experienced ecologist to identify and map koala populations on the NSW Upper mid-north coast (between the Richmond and Macleay rivers). The assessment and mapping identified the

region as containing 25 koala subpopulations, loosely linked in seven regional populations and three metapopulations (Scotts 2013). Twenty one of the subpopulations were assessed as declining and four as stable.

The assessment approach is currently being extended north from the Richmond River to the Queensland Border and south from the Macleay to the Hunter River. Results from the extended project are not yet available to inform this report but they, and other, assessments of koala habitat currently underway will be used to refine the reserve proposals if substantial new information is forthcoming.

The 2014 Koala Count (Cleary 2015), a citizen science project run by the NPA, detected 476 koalas sighted by 164 volunteers. The count is a national initiative but, in NSW, detected significant numbers of koalas in many locations relevant to these reserve proposals. These include Lismore (212 koalas); Port Macquarie-Hastings (47 koalas); Port Stephens (60 koalas) and Tweed (26 koalas).

Scotts (2013) provided up to date information and an improved basis for applying priorities and targets for koala conservation on the Upper Mid-north Coast of NSW. Consistent with the stated JANIS target to protect 60% of remaining koala habitat a within a multi-tiered landscape approach it is proposed:

- to reserve State Forests containing two of the three koala metapopulations identified in the Upper Mid-north Coast study area
- to protect four of the seven identified regional populations
- to protect 14 of the 25 identified subpopulations

The 14 targeted subpopulations include:

- the four stable subpopulations of the 25 subpopulations (the remainder are assessed as declining)
- seven of the eight subpopulations assessed as having 25% or more of their individuals within State Forests

The reserve proposals: a brief summary

The proposed Great Koala National Park—the largest and most important of the reserves proposed in this document—will span 315,000 ha of public land in the Coffs Harbour region. It will be established by adding approximately 175,000 ha of State Forest to 140,000 ha of existing reserves in the region. The reserve would protect two nationally important metapopulations of koalas: the Coffs Harbour—Guy Fawkes and the Bellinger—Nambucca—Macleay metapopulations which are estimated to contain up to 4,550 wild koalas or approximately 20% of the NSW population.

Consideration of metapopulations in conservation planning is crucial as immigration from metapopulations is an important determinant of the persistence of local populations (Margules and Pressey 2000, Lunney et al. 2002). Because the koala metapopulations span a large geographical area, it is likely that the koala will function as an 'umbrella species' in that conservation of the two metapopulations will also result in effective conservation of other fauna species (Breckheimer et al. 2014).

Outside the Upper Mid-North Coast nine additional koala reserves are proposed to improve conservation for an estimated 2,700- 4,750 koalas (up to a further 20% of the NSW population). The location of all the new reserve proposals (none of these protected areas currently exist in this form at present) is shown in Figure 1 and they are summarised below:

1. Tweed Coastal Range National Park

This proposal includes approximately 2,550 ha on the Tweed Coast, including existing reserves and committed conservation land, to protect the Tweed coastal koala subpopulations. Estimated at 144 individuals (Phillips et al. 2011), this population is currently being considered for listing as an endangered population.

2. Sandy Creek National Park

The proposal includes 2,100 ha of Royal Camp and Carwong State Forests to protect a recognised regionally significant population recently threatened by illegal logging activities. Royal Camp State Forest supports a dense local koala population and possibly one of the most important on public land in the region. The estimated koala population is 50 -200 individuals.

3. The Great Koala National Park

The most important initiative in this koala reserve proposal would add approximately 175,000 ha of State Forests to 140,000 ha of existing reserves. This would protect two nationally significant koala metapopulations: Coffs Harbour—Guy Fawkes and Bellinger—Nambucca—Macleay. The estimated koala population is up to 4,550 individuals, or 20% of the NSW population. The proposed reserve possesses extensive tracts of globally significant diverse tall eucalypt forests and rainforests.

4. Coffs—Sawtell Coastal Reserve

Proposed to protect an important urban population of koalas, this reserve would include 900 ha of coastal forest and swamp forest over multiple land tenures. Scotts (2013) estimated the local subpopulation at less than 50 individuals and in decline. The proposal is seeking dedication of available Crown land, negotiated participation of other tenures and voluntary acquisition.

5. Port Macquarie to Camden Haven National Park

Totaling approximately 6,900 ha, this proposal includes 3,523 ha of Lake Innes Nature Reserve, 1,424 ha of Queens Lake Nature Reserve and 1,026 ha of Queens Lake State Conservation Area. It also includes approximately 1,850 ha of Cowarra and Queens Lake State Forests east of the Pacific Highway. This proposal would improve protection for a nationally important and historically significant regional population of koalas, currently estimated by approximately 2,000 individuals (Phillips et al. 2013).

6. The Greater Bulga—Comboyne—Taree National Park

The proposal includes existing reserves and 4608 ha of State Forests in the Bulga, Comboyne, Landsdowne escarpment and Yarratt areas through to Brimbrin. The proposal includes environmental protection to the proposed Brimbin township development. The estimated koala population is 500-1,000 individuals.

7. Bowman National Park

This proposal includes 4600 ha of Bowman and Barrington Tops State Forests and part of Barrington State Conservation Area. The Bowman National Park would significantly improve connectivity between existing reserves. The estimated koala population is 50-200 individuals.

8. Wang Wauk National Park

The proposal includes 12,982 ha of Wang Wauk and Buladelah State Forests and would protect a regionally significant population of koalas, estimated at 200-500 individuals.

9. Extensions to Wallingat National Park

Extensions would cover 10,555 ha of Crown land**,** and would include the addition of 3,887 ha of Wallingat and Bachelor State Forests to the existing 6,557 ha Wallingat National Park. It would also securing improved protection for habitat connecting from Wallingat National Park to Booti Booti and Myall Lakes National Parks. The estimated koala population is 200-500 individuals.

10. Hawks Nest extensions to Myall Lakes National Park

The final proposal includes approximately 580 ha of available Crown land, and the improved protection over other key habitat areas on the peninsula between the existing National Park and Yacaaba headland. The koala population is estimated at fewer than 50 individuals.

Figure 1: Indicative map showing indicative locations of all proposed koala reserves on the north-east coast of NSW (red polygons)

Alignment with existing management plans

The National Koala Conservation and Management Strategy 2009-2014 (Commonwealth of Australia 2009) (NKCMS) expired on 31st December 2014. Nonetheless, in the continued absence of a replacement strategy, this proposal contributes to the outcomes of the outdated NKCMS in the following ways:

1. The proposal will have multi-species benefits. It would ensure the conservation of some of the most diverse eucalypt forests in Australia, as well as many threatened species and ecological communities
2. It addresses the major threats to koala populations identified in the NKCMS: habitat loss, fragmentation and degradation. It will achieve this by removing logging from koala habitat, protecting large tracts of land and enhancing connectivity
3. It will likely reduce the impact of disease by ensuring minimal environmental stress for wild koalas
4. It develops options for protecting priority koala habitat on public land identifies options for private land conservation

The proposal also aligns with the approved conservation advice for the species (Minister for Sustainability Environment Water Population and Communities 2012), specifically by investigating formal conservation agreements.

The proposal to extend the Myall Lakes National Park to assist in the conservation of the endangered Hawks Nest population would help to achieve some targets in the recovery plan for the population. Most notably a reduction in habitat loss and fragmentation (NSW National Parks and Wildlife Service 2003).

Multi-species benefits and alignment with the Great Eastern Ranges Initiative

Creating a network of reserves for koalas will have flow-on benefits to other species of flora and fauna, and will protect several ecological communities. This is known as the 'umbrella species concept' (Breckheimer et al. 2014)—a term which describes the protection of multiple species via a focus on a single species (the umbrella). Flora and fauna likely to be protected via reservations created for koalas are shown in Appendix 1.

The Great Eastern Ranges (GER) Initiative is the second-largest landscape corridor project in the world. It aims to link protected areas via revegetation and restoration across the GER from the Grampians in Victoria to far north Queensland—a distance of 3,600km. The proposals in this document are directly relevant to the goals of the GER. The reserve proposals will particularly benefit the Border Ranges Alliance and the Jaliigirr Biodiversity Alliance. One of the proposals, the Sandy Creek National Park, will help achieve the aims of the Border Ranges Rainforest Biodiversity Management Plan (Department of Environment Climate Change and Water NSW 2010) which guides the activities of the Border Ranges Alliance. Crucially, the GER is a community-based initiative and therefore offers excellent opportunities to align benefits to koalas with broader landscape benefits by focusing efforts on private land that will complement the reserves proposed in this document.

Economic costs and benefits of the proposed reserves

The NPA NSW is currently in the process of producing an analysis of the costs and benefits of the proposed Great Koala National Park. Potential benefits of the Great Koala National Park include increased nature-based tourism and ecosystem services such as clean water supply, erosion control, long-term carbon sequestration and a cessation of forestry subsidies. Globally, ecosystems services are worth trillions of dollars annually (de Groot et al. 2012) but this value is declining (Costanza et al. 2014). Approximately 30% of large cities around the world,

including Sydney, Melbourne and Perth, rely on protected forested catchments for their water supply (Dudley and Stolton 2008). An Australian review on ecosystem services and their value to Natural Resource Management (NRM) recommended that maintaining as much biodiversity as possible was a prudent strategy do deal with environmental change and maintain management options (Cork et al. 2007). Ecosystem services provided by protected areas in Australia have conservatively been estimated to be worth a minimum of $38 billion per year (Taylor et al. 2014).

There are also a suite of non-use benefits that accrue from protected areas. Non-use refer to benefits that people may gain from a protected area without ever directly using or visiting it. An example of these benefits is the pleasure derived from reading books or looking at pictures of natural areas, or the value that is gained from knowing that natural areas are protected for the next generation, or spiritual connections to protected areas. Cultural and spiritual benefits are difficult to quantify, but are extremely important to well-being, particularly of Aboriginal people (Higgins-Zogib 2008).

Tourism

Nature-based tourism is already a hugely valuable industry Australia and is growing (Taylor et al. 2014). The NPA believes that protecting koalas, particularly via the creation of the Great Koala National Park, will provide opportunities to exploit that growth. In 2006-7 the World Heritage Gondwana Rainforests in north east (NE) NSW drew $327m of visitor expenditure, of which $145m was value-added, and accounted for over 1600 jobs (Driml). Furthermore, a summary of several economic studies has shown protected areas in NE NSW to have added $124m to the local region, and to have supported almost 2000 jobs (Driml).

Forestry

Potential costs may include a decrease in timber harvests and, potentially, loss of some employment involved in the timber industry. At a very rough estimate (derived simply by calculating the proportion of State Forest that would be taken out of harvest and subtracting this proportion from current timber harvests) 50,000m^3 of timber per year would be withdrawn from annual allocations from now until 2023 to facilitate the establishment of the koala reserves. Compensation in the order of $8m is proposed for the timber industry to offset this loss. This figure is again very rough and is based on the recent 50,000m^3 timber buy-back from Boral from north coast forests (Hodgkinson 2014).

The exploitation of native forests for commercial uses is fundamentally flawed. This is due to the inherent tension that exists between commercial objectives and the requirement to adhere to environmental standards which conflict with the commercial objectives (Feehely et al. 2013). As an example, any time spent conducting flora and fauna surveys and implementing mitigation measures adds costs and makes it more difficult to compete with the plantation industry which can produce timber at a lower cost. Any cost-cutting measures applied in native forests will inevitably result in compromises in environmental standards (Ajani 2003).

The majority of the 175,000 ha of State Forest proposed for inclusion into the Great Koala National Park is regrowth forest with older forests on steeper, less accessible, slopes. The high rainfall and relatively fertile soils of the area should ensure that the forests sequester large quantities of carbon into the future. A reasonable return from this carbon could pay for the establishment and ongoing maintenance of the Great Koala National Park and additional reserves, including proposed visitor facilities. The NPA believes however that methods for accounting for carbon sequestration and ecosystem services are still to be thoroughly developed, and that more direct benefits like nature-based tourism will be more tangible to local communities.

Private land

Private land conservation priorities were also identified via the Regional Forest Agreements (RFAs) using several criteria:

- Identification by expert panels convened during the UNE and LNE Comprehensive Regional Assessments (CRAs) as forest ecosystems of concern on private land
- Ecological communities with a 100% target set and not met that have extant occurrences on private land
- Ecological communities with a 60% target set and not met that are ranked highly vulnerable or are more than 50% cleared and have more than 50% of their occurrence on private land
- Ecological communities with a 15% target set and not met that are ranked highly vulnerable or are more than 50% cleared and have more than 50% of their occurrence on private land

The relevant ecological communities on private land are identified in each reserve proposal throughout this document. All of these priorities for protection are only proposed via voluntary conservation mechanisms. This proposal supports the protections of important koala habitat on private land on a voluntary basis—particularly private land adjacent to the proposed reserves on public land. This will be key to ensure the persistence of the species across the landscape by providing connectivity between reserved populations and will help to buffer the proposed protected areas.

Voluntary private land conservation covenants, such as those offered by the Nature Conservation Trust, should be promoted, support for local koala habitat protection programs on private property should be expanded and voluntary buyback offered for critical habitat links. New applications for funding projects could be made through the federal governments National Landcare Program.

Consultation

Initial consultation has commenced with local and regional Aboriginal communities on the Great Koala National Park proposal. These communities will be fully consulted in all further planning and should be involved in the establishment and management of all koala reserves. The NPA is committed to ensuring that all community members have input and a voice in all proposals.

Additional requirements for effective koala conservation

Increased assistance will need to be provided to community volunteers providing welfare for sick and injured koalas, including support to act as vaccination centers, if the chlamydia vaccination is successful and implemented widely. Support should be provided for a koala hospital, interpretation and education centre focused on supporting koalas in the Coffs Harbour—Guy Fawkes and Bellenger—Nambucca—Macleay metapopulations. A suitable site for such a facility lies adjacent to the Pacific Highway on Pine Creek Forest Way. This site, adjacent to Mailman's Track, was formerly identified as a site for a highway rest stop but development did not proceed. The site and proposed facility should be incorporated into the nearby Bongil Bongil National Park.

Beyond reservation

The North Coast contains areas of current World Heritage listed rainforest (UNESCO World Heritage Centre 2014a). They intergrade with the most diverse tall eucalypt forests in the world (Cerese 2012) which provide habitat for koala metapopulations of national significance. Once the koala metapopulation reserve has been established the

preparation of a nomination for World Heritage listing should be considered as part of a broader campaign for further international recognition and protection. World Heritage areas have been shown to attract significant tourism revenue (Driml) and therefore this nomination should underpin the development of an expanded nature-based tourism industry to sustainably exploit our magnificent and unique North Coast forests.

The reserves in detail

1. Tweed Coastal Range National Park

The proposed Tweed Coastal Range National Park incorporates habitat of four of the five identified koala subpopulations remaining on the Tweed Coast and provides for landscape connectivity between these subpopulations. Due to the variety of land-uses and tenures this proposal would not form a continuous block of native vegetation, as typically associated with a national park, but would be patchy with vegetated links where possible. Therefore no map is provided as the precise locations of reserved areas would need to be determined by land availability.

The Tweed Coast Koala Population was recently proposed as an Endangered Population by the NSW Scientific Committee (NSW Scientific Committee 2014). The remnant population of an estimated 144 individuals occupies the coastal lowlands of the Tweed Local Government Area (LGA) east of the Pacific Highway. An estimated 4,368 ha of fragmented but otherwise suitable koala habitat remains in this area including 2,982 ha of primary or secondary koala habitat. The major threat to the species is habitat loss and fragmentation.

The proposed Tweed Coastal Range National Park covers approximately 2550 ha and extends for 20km along the coast and coastal range from Cudgen Nature Reserve in the north to Wooyung Nature Reserve in the south. As well as comprising approximately 1330 ha of existing reserves it comprises approximately 200 ha of Crown land, 575 ha of Council owned lands and 670 ha of privately owned land largely zoned for conservation. All areas included in the proposal are koala habitat or strategic regeneration areas for linkage of koala habitat as recommendation by the Tweed Koala Habitat Study (Phillips et al. 2011).

The Tweed Coast, part of the remnant Tweed volcanic caldera, is an area of high biodiversity. The proposed Tweed Coastal Range National Park additions includes 24 forest ecosystems (Table 1). Because of the relatively small size of the proposal the contribution of forest ecosystems in the proposal to unmet Upper North East (UNE) regional conservation targets is relatively small, being less than 5% for any ecosystem. The primary and secondary koala habitat present includes a range of preferred koala food trees including swamp mahogany (*Eucalyptus robusta),* forest red gum (*E*. *tereticornis),* tallowwood (*E. microcorys*) and grey gum (*E. propinqua*). 1,177 ha or 89% of the proposal is comprised of below target forest ecological communities.

Table 1: Forest Ecosystems occurring in the proposed Tweed Coast Ranges National Park; the area (ha) of the ecosystem present; the percentage of the Upper North East (UNE) national reserve target this meets and the area required to fully meet the target; the vulnerability of the Forest Ecosystem (1 = high or most vulnerable, 5 = low or least vulnerable); the threatened status as defined under JANIS (R = Rare, V = Vulnerable and E = Endangered); the depleted status (S = Severely Depleted or >55% cleared); reservation status (HIR = Highly Inadequately Reserved); Private land priority (P = Priority)

Forest Ecosystem	Area (ha)	%UNE RFA target met	Area (ha) required to meet RFA target	Vulnerability	Threatened status	Depleted status	Reservation status	Private land priority
Baileys Stringybark	18	100	0	4	-			
Banksia	38	25	1,532	2	R	S	HIR	P
Casuarina Woodland	8	13	37	2	R		HIR	P
Coast Cypress Pine	3	79	17	5	R			P
Coast Range Bloodwood-Mahogany	7	90	271	3	-	S		
Dry Heathy Blackbutt-Bloodwood	14	100	0	3	-			
Wet Bangalow-Brushbox	25	52	2,876	1	V			P
Heath	22	100	0	2	V			
Herbfield and Fjaeldmark	3	79	14	2	R			P
Lowland Red Gum	191	40	12,573	2	-	S		P
Lowlands Scribbly Gum	8	89	239	4	V			P
Coastal Mallee	2	100	0	5	V			
Mangrove	5	52	354	2	R			P
Northern Moist Blackbutt	11	100	0	1	-			
Paperbark	493	52	8,220	2	V			P
Swamp	53	48	12,604	2	E			P
Swamp Mahogany	59	46	314	4	R			P
Swamp Oak	150	30	2,012	2	R	S	HIR	P
Turpentine	27	100	0	1	-	S		
Wattle	15	0	198	0	-		HIR	
Wet Bloodwood-Tallowwood	20	67	2,637	2	-			
Wet Flooded Gum-Tallowwood	27	19	2,930	1	-	S	HIR	P
Rainforest	38	68	50,099	1	E			P
Scrub	29	91	289	5	V			P
Total	**1,329**							

In 2002 / 2003 'in principle' agreement was negotiated between the National Parks and Wildlife Service (NPWS) and Tweed Shire Council executive for the transfer of high conservation value Council owned land and Crown lands to NPWS estate. Included in those negotiations were freehold lands proposed for dedication to Council for habitat protection as part of major urban development proposals and lands previously identified by NPWS for addition to NPWS estate.

2. Sandy Creek National Park

This reserve was proposed to Minister Rob Stokes by the North East Forest Alliance (NEFA) in November 2014 (North East Forest Alliance 2014). It is proposed to create the 2,100 ha Sandy Creek National Park in the headwaters of the Richmond River south-west of Casino (Figure 2). The proposal is comprised of two sections: part of Royal Camp State Forest (compartments 13-16, 1,500ha) and the whole of Carwong State Forest (600ha). These forests are primarily proposed for protection for their exceptional importance for koala conservation in an area where populations are in decline and in danger of extinction (Scotts 2013). The estimated koala population is 50-200 individuals.

Royal Camp and Carwong State Forests have clusters of koala records and have been the subject of recent surveys confirming the presence of a regionally significant population (Scotts 2013). The area appears to be an important koala subpopulation and the focus for koala conservation in the Northern Clarence–Southern Richmond regional populations. Within the proposal area koalas have been found to prefer grey gum (*Eucalyptus propinqua*), grey box (*E. moluccana*) and various species of red gums for feeding, favouring trees over 30cm diameter at breast height.

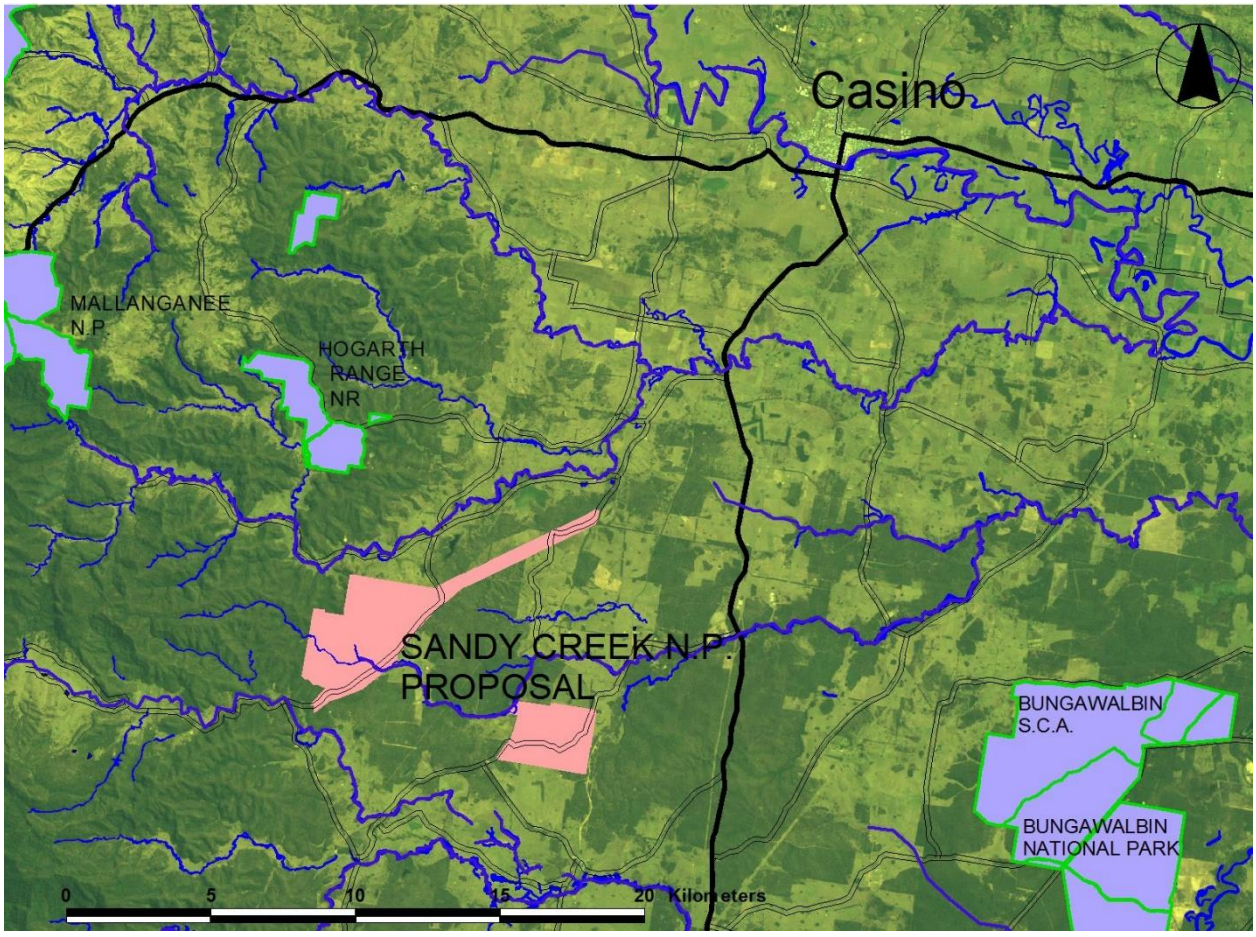

Figure 2: Draft map of the proposed Sandy Creek National Park (pink polygons)

The proposal is comprised of inadequately reserved Forest Ecosystems, including two Endangered Ecological Communities (EECs). There is the potential to improve its long term integrity by voluntarily acquiring intervening freehold land which has also been assessed as being of high value for koalas. The forests are dominated by spotted gum (*Corymbia maculata*), grey gum (*E. propinqua*), grey box (*E. moluccana*), grey ironbark (*E. paniculata*), and various red gums. Narrow-leaved white mahogany (*E. tenuipes*), red mahogany (*E. resinifera*), flooded gum (*E. grandis*) and brush box (*Lophostemon confertus*) occur along drainage lines (particularly Sandy Creek) which also include the EECs of Swamp Sclerophyll Forest and Subtropical Coastal Floodplain Forest.

There are a variety of other eucalypts mixed in with the aforementioned species, including hundreds of the nationally vulnerable slaty red gum *(E. glaucina)* which occurs at densities of 5-10 stems per hectare. The NSW endangered sedge water nutgrass *(Cyperus aquatilis)* and the endangered herbs native milkwort *(Polygala linariifolia)* and *Oldenlandia galioides* occur in the proposed reserve and are all threatened by grazing and logging activities.

Ten Forest Ecosystems have been mapped within the proposal area and are identified in Table 2 below. Eight of these are classed as inadequately reserved in that they have not achieved the national forest reserve targets (NSW National Parks and Wildlife Service and Environment Australia 1998), with 96% of the extent of forest communities within the proposal required to satisfy national reserve targets. The proposal makes a particularly significant contribution towards unmet targets for Richmond Range Spotted Gum-Box (17%) and Lowlands Spotted Gum-Box (46%).

Table 2: List of ecological communities found in the proposed Sandy Creek National Park, their area (ha), the percentage of the Upper North East (UNE) national reserve target met by the current reserved area and the area (ha) required to meet the national reserve target. Their threat status (as defined by the Regional Forest Agreement) is shown and whether the ecological community is a priority on private land.

Ecological communities	Area (ha)	% UNE national reserve target met	Area required to meet UNE target	Threatened status	Priority private property ecosystem?
Northern Wet Brushbox	4	100	0		
Open Coastal Brushbox	11	88	168		
Wet Flooded Gum-Tallowwood	31	36	2,342		
Gorge Ironbark-Grey Gum	80	100	0		
Richmond Range Spotted Gum-Box	690	34	4,157		
Lowlands Spotted Gum-Box	1151	55	2,484		
Lowland Redgum	37	36	13,647		
Escarpment Redgum	42	62	3,216		
Lowlands Grey Box	7	2	14,110		
Stringybark-Apple	7	52	4,151		
TOTAL	**2,060**				

Poor forestry practices threaten koala populations

In 2012 the North East Forest Alliance (NEFA) stopped the Forestry Corporation of NSW (FC) illegally logging a koala High Use Area (HUA) in Royal Camp SF. Four other koala HUAs were also about to be logged. The Environment Protection Authority (EPA) found that the FC had not adequately looked for koala scats and had logged 61 trees and constructed 405m of snig tracks within a koala HUA.

When the FC resumed logging nearby a few days later NEFA again found evidence of koalas. The EPA confirmed that the FC had not adequately looked for koala scats, had logged seven trees and constructed 230m of snig tracks within another koala HUA. The FC continued logging and were found by NEFA to have logged another koala HUA.

When the FC proposed to begin logging in compartment 13 in 2013, claiming no koalas were present, NEFA found extensive koala HUAs within the proposed logging area. Based on his inspections of Royal Camp State Forest, wildlife expert David Milledge concluded: *"The level of koala activity revealed by these searches is amongst the highest I have recorded in my experience of over 20 years conducting koala scat surveys in coastal and escarpment forests in north-eastern NSW. This highlights the significance of Royal Camp State Forest in supporting a dense local koala population and possibly one of the most important on public land in the region".* A thorough audit of the Royal Camp State Forest was conducted by NEFA in August 2012 (Pugh 2012).

The EPA again confirmed NEFA's findings, informing the FC that they found "*areas that indicate koala high use that is ongoing and contemporary",* noting "*Based upon these findings and recent findings made from investigations undertaken in compartments 14, 15 and 16 of Royal Camp State Forest, the EPA considers these areas contain koala habitat and play an important role to koala populations in the region".*

The then Minister for the Environment requested the EPA to determine the regional significance of the koala population, with the subsequent June 2014 report by Dr. Steve Phillips for the EPA finding a resident koala population within Royal Camp that *"should be considered important at all levels of assessment"* due to the koala populations of the encompassing Richmond Valley LGA being found to be *"endangered on the basis of international, national and state-based conservation criteria".*

The publication in February 2015 of the NSW Legislative Inquiry into the performance of the EPA (New South Wales Parliament 2015) publically revealed the numerous breaches by Forestry Corporation of their Threatened Species license in Royal Camp SF. This confirms the position taken by environmental lawyers that the RFAs lead to poor biodiversity outcomes (Feehely et al. 2013).

There are numerous koala records in Carwong SF. Pre-logging fauna surveys in 1998 found koala scats throughout the forest, with numerous high use trees, including many with both small and large scats indicating the presence of females with young.

In summary, the proposed Sandy Creek National Park is of immense importance to the regional persistence of koalas and provides significant habitat for a variety of other threatened species. Due to breaches outlined above, it is obvious that the habitat value of the forest for koalas (and likely other species) has been significantly diminished by past logging and grazing, and that exclusion of these activities is crucial to allow the opportunity for habitat values to recover.

3. The Great Koala National Park

The proposed Great Koala National Park (GKNP) is centered on two koala metapopulations on the Mid North Coast of New South Wales, the Coffs Harbour—Guy Fawkes metapopulation and the Bellinger—Nambucca—Macleay metapopulation (Figure 3). The metapopulations were identified by Scotts (2013) based on a qualitative representation of likely habitat for koalas in the region. The proposed GKNP covers approximately 315,000 ha of public land and includes the all existing conservation reserves and native forests within State Forests within the defined metapopulation areas (Figure 4). Approximately 175,000 ha of State Forest would be added to the conservation estate (140,000 ha) to comprise the GKNP. The estimated koala population is up to 4,550 individuals making this by some distance the most important reserve proposal.

The GKNP also includes outstanding examples of other conservation features including extensive rainforests, World Heritage listed forests (the Gondwana Rainforests of Australia) (UNESCO World Heritage Centre 2014b) and other forests assessed for World Heritage listing (Cerese 2012). The proposal includes extensive areas of eucalypt forests from a region recognized as having the most diverse tall eucalypt forests in the world. The eucalypt forests were accepted by the Federal and New South Wales Governments in the North East NSW Regional Forest Agreement 1999 (Commonwealth of Australia 2014b), for assessment for potential World Heritage Listing.

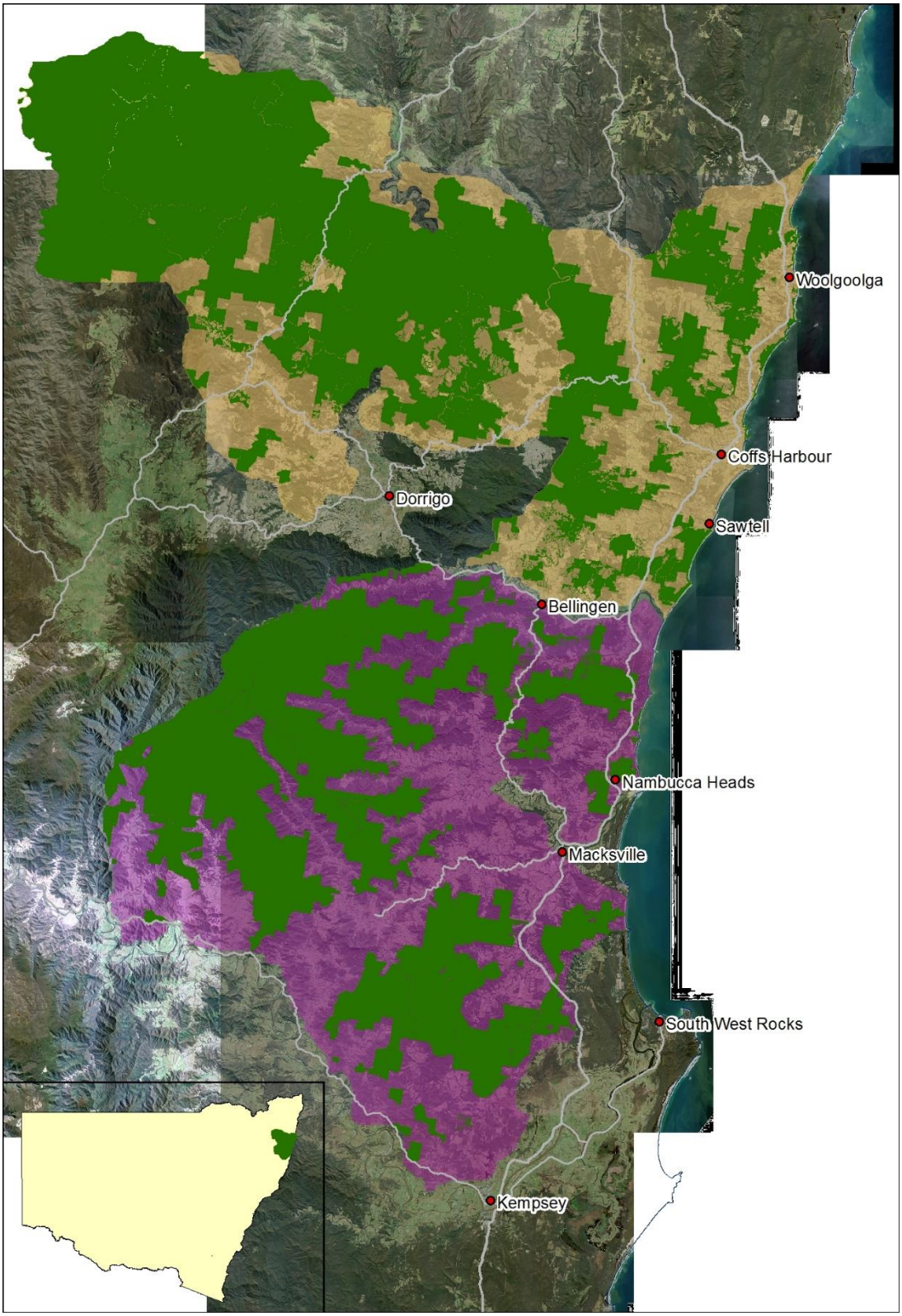

Figure 3: Geographical distribution of the Coffs Harbour—Guy Fawkes (yellow polygon) and the Bellenger—Nambucca—Macleay (purple polygon) koala metapopulations. The proposed Great Koala National Park is shown in green. Note: the tenures of forest included in the proposal are shown in Figure 5.

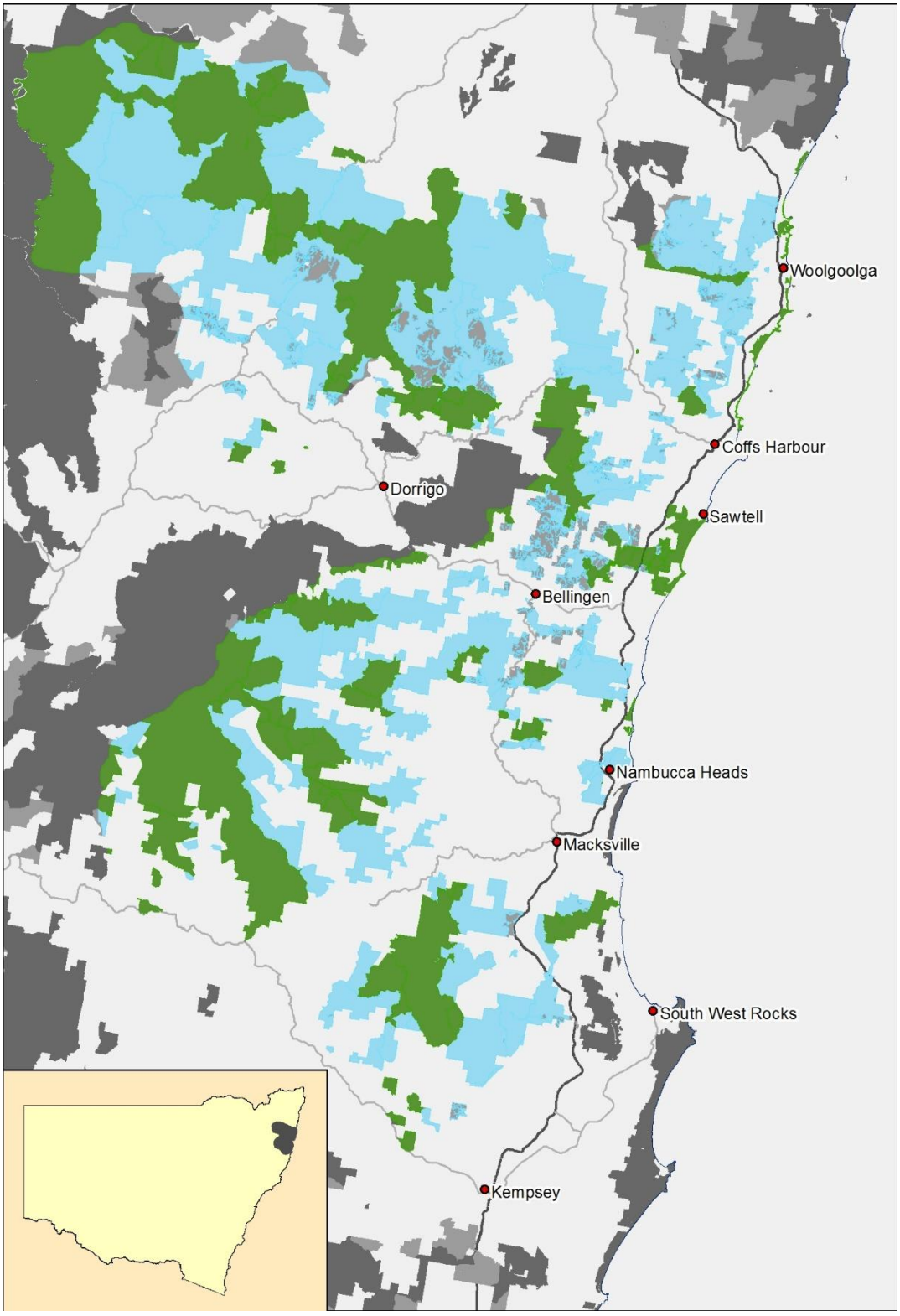

Figure 4: Map of the proposed Great Koala National Park (GKNP) boundaries (green and blue polygons). Green polygons are existing conservation reserves and blue polygons State Forests. Outside the proposed park dark grey polygons are conservation reserves, light grey State Forests and white private land. The total area of the proposed GKNP is 315,000 ha, of which approximately 175,000 ha is currently State Forest and 140,000 ha is conservation estate.

The koala metapopulations within the GKNP proposal, and the regional koala populations identified within them are described below. This information is summarised from Scotts (2013).

1. The Coffs Harbour—Guy Fawkes metapopulation

The Coffs Harbour—Guy Fawkes metapopulation includes the coastal plains and foothill forests of the Coffs Harbour and Bellingen LGAs extending inland to include the hinterland forests bounded to the north by the non-preferred sandstone- based forests and woodlands and to the south by the clearing associated with the Dorrigo plateau and unsuitable rainforest habitats .To the west it is bounded by the by rugged and lower fertility forests and woodlands of the Guy Fawkes valley. This metapopulation is comprised of three regional koala populations. Two of these three regional populations are comprised of two or more subpopulations. This is described below in the text and summarised in Table 3. These populations may further extend into the Guy Fawkes Wilderness Area.

The regional populations comprising the Coffs Harbour—Guy Fawkes metapopulation are:

a. The Coffs Harbour—North Bellinger regional population

Includes the coastal plains and foothills forests of the Coffs Harbour and north-east Bellingen areas. Regional population boundaries are formed by sandstone-based habitats in the north, rainforest habitats to the southwest and cleared river valleys to the west and south that act as likely barriers to koala movement.

This regional population supports the greatest koala numbers (>1000 individuals) and highest population densities in the region. However significant threats exist that are associated with the close proximity of human centres and infrastructure. This is the most important koala regional population on the Mid-North Coast and perhaps one of the most important in the nation.

b. The Coffs Harbour Hinterland regional population

This regional population is bounded to the north by non-preferred sandstone-based forests and woodlands, to the south by clearing associated with the eastern Dorrigo Plateau and non-preferred rainforest habitats, to the west by the rugged, steep gorges associated with the Nymboida River and to the east by clearing associated with the Orara Valley.

This appears to be a critical koala regional population supporting in the order of 500 – 1000 individuals centered upon hinterland public forests, particularly State Forests, but also including important private forests on the eastern Dorrigo Plateau. Some protected koala habitat is found on NPWS reserves.

c. The Chaelundi—Clouds Creek—West Dorrigo regional population

This regional population is bounded to south by clearing associated with the eastern Dorrigo Plateau and also non-preferred rainforest habitats, to the east by the rugged, steep gorges associated with the Nymboida River and to the west by rugged and lower fertility forests and woodlands of the Guy Fawkes River valley. To the north of the mapped regional population koala records become scarce (e.g. Marara, Dalmorton State Forests) and habitats may be less suitable. The Boyd River may also present a barrier or, at a minimum, a filter to koala movement.

This appears to be a critical koala regional population supporting in the order of 500 – 1000 individuals. The mapped area includes hinterland, escarpment and gorge public forests and some tracts of private

forest west of Dorrigo. Some reasonably extensive potential koala habitats occur on NPWS reserves. Past surveys for koalas in this area have been largely restricted to State Forests and koala records are widespread on that tenure. Two subpopulations (Table 3) have been identified with the Chaelundi—Clouds Creek sub- population which are considered critically important in the context of long term koala conservation.

Table 3: Regional populations and sub populations that comprise the Coffs Harbour—Guy Fawkes metapopulation. The estimated population size of each subpopulation is included, along with status (stable, S, or declining, D) density (high, H, moderate, M, or low, L) and threat status (high, H, moderate, M, or low, L), an estimate of confidence in the assessment is included as is further information on the nature of the threats.

Regional population	Subpopulation	Subpop size	Status	Density	Threat	Confidence	Threat information and other comments
Coffs-Harbour—North Bellinger	Bongil Bongil—Pine Creek	500-1000	S	H	L-M	Well known	Includes Bongil Bongil—Pine Creek core; logging, fire, vehicle strike
Coffs-Harbour—North Bellinger	North Bellingen—Gleniffer	50-500	D	M	M	Largely unknown	State Forest logging
Coffs-Harbour—North Bellinger	Bonville	50-500	D	M	H	Well known	Targeted and increasing urban and rural residential development
Coffs-Harbour—North Bellinger	Coffs Harbour—Toormina—Korora	<50	D	M	H	Well known	Habitat fragmentation, dogs, vehicle strike
Coffs-Harbour—North Bellinger	Orara West—Boambee	50-500	D	M	M	Well known	State Forest logging, fire
Coffs-Harbour—North Bellinger	Coffs northern beaches	<50	D	L	H	Well known	Highway upgrade, urban and rural residential development, dogs
Coffs-Harbour—North Bellinger	Lower Bucca—Orara East	<50	D	L	H	Well known	State Forest logging, fire
Coffs-Harbour—North Bellinger	Red Rock—Wedding Bells—Conglomerate	<50	D	L	M	Unknown	State Forest logging, fire
Coffs Harbour Hinterland	Coffs Harbour Hinterland	500-1000	S	M	M	Largely unknown	Predominantly State Forest. Can't distinguish subpopulations
Chaelundi—Clouds creek—West Dorrigo	Chaelundi—Clouds Creek	50-500	S	M	M	Largely unknown	Predominantly State Forest & National Park
Chaelundi—Clouds creek—West Dorrigo	West Dorrigo	<50	D	L	M	Largely unknown	Fragmented and sparse population

2. The Bellinger—Nambucca—Macleay metapopulation

The Bellinger—Nambucca—Macleay metapopulation extends from the southern Bellingen LGA through the Nambucca LGA to the north of the Kempsey LGA and is comprised of a single regional koala population:

a. The South Bellinger—Nambucca—North Macleay regional population

Northern and southern boundaries of the regional population are formed by geographic barriers associated with the lower reaches of the Bellinger River (north) and Macleay River (south) including extensive clearing and urban and agricultural development. The north-western boundary is mapped but remains ill-defined with little knowledge relating to koala occurrence.

Overall the South Bellinger—Nambucca—North Macleay regional koala population remains poorly understood. It may be comprised of an extensive, but likely sparse, population with a rough estimate between 130 – 1,550 individuals. The metapopulation is considered nationally important but a targeted program of koala habitat mapping and population characterization is needed to further inform its relative conservation status. The three koala subpopulations identified within this regional population are shown in Table 4.

Table 4: Sub populations that comprise the South Bellinger—Nambucca—North Macleay regional population, itself part of the Bellinger—Nambucca—Macleay metapopulation. The estimated population size of each subpopulation is included, along with status (stable, S, or declining, D) density (high, H, moderate, M, or low, L) and threat status (high, H, moderate, M, or low, L). An estimate of confidence in the assessment is included as is further information on the nature of the threats.

Regional population	Subpopulation	Subpop size	Status	Density	Threat	Confidence	Threat information and other comments
South Bellinger—Nambucca—North Macleay	Southern Coastal	<50	D	L	H	Largely unknown	Urban and rural-residential development, dogs, road strike
South Bellinger—Nambucca—North Macleay	Southern Hinterland	50-500	S	L	M	Unknown	Stable but sparse; logging & fire
South Bellinger—Nambucca—North Macleay	Scotts Head – Ngambaa - Willawarrin	50-500	D	L	M	Largely unknown	Overall declined particularly on private lands; State Forests are potential strongholds but also declined; fire, logging

The regional environment and its global conservation significance

The Coffs Harbour—Guy Fawkes and the Bellingen—Nambucca—Macleay koala metapopulations are either in or adjacent to the Dorrigo and New England National Parks and a number of nature reserves listed as part of the Gondwana Rainforests of Australia World Heritage Area (UNESCO World Heritage Centre 2014b). Additional national parks and nature reserves, covering approximately 100,000 ha, were nominated in 2010 as potential additions to the World Heritage listing. The properties were described in the listing nominations as also including extensive areas of eucalypt forests.

The relationship between rainforests and eucalypt forests are uniquely Australian. Three broad groupings of rainforest-eucalypt transition forests, each with distinct tall eucalypt species, have been distinguished Australia-wide. North east NSW is the only region that supports all these types of tall forest. Tall eucalypt forests associated with all three rainforest classes (subtropical, warm temperate and cool temperate) occur within the two koala metapopulation areas spanning the full altitudinal range from coastal ranges and foothills to the escarpment and tablelands. The suite of tall eucalypt species that are either wet sclerophyll specialists or are strongly associated with these forests are Dunns white gum (*Eucalyptus dunni),* brown barrel *(E. fastigata),* flooded gum (*E. grandis),* Sydney blue gum *(E. saligna),* tallowwood (*E. microcorys),* white mahogany *(E. acmenoides),* Maidens blue gum *(E.*

deani), Craven grey box *(E. largeana),* forest ribbon gum *(E. nobilis ,)* messmate *(E. obliqua),* grey ironbark *(E. placita)*, brown box (*E. rummeri)* and dark grey ironbark *(E. ancophila).*

Some of the suite of wet sclerophyll specialists and associated eucalypts are potential koala habitat including primary koala food trees such tallowwood (*E*. *microcorys)* and secondary koala food trees such as flooded gum (*E. grandis)* and Sydney blue gum (*E. saligna)*. The proposed GKNP covers a significant part of the area of NE NSW- SE Qld that contains the most diverse eucalypt forests in the world and significant occurrences of tall eucalypt forests.

The forested gradient extending from Guy Fawkes River National Park to the Pacific Ocean near Coffs Harbour, collectively referred to as the Guy Fawkes to Solitaries link, and the forests of the Bellingen Valley and New England escarpment have recently been highlighted for their likely World Heritage values under the theme of eucalypt diversity (Cerese 2012). This area includes the Moonee—Bindary link, identified in 1997 by the World Heritage National Expert Panel (Australian Government 2015) for the altitudinal gradient and the catena of eucalypt communities and species it presents as best capturing the diversity of eucalypts in the northeast NSW region. The panel was set up to advise the Commonwealth and state governments on the implementation of World Heritage considerations in the National Forest Policy (Commonwealth of Australia 1992, 1995).

The compilation and reporting of Forest Ecosystems and other conservation features during the Regional Forest Assessments divided the area containing the proposed GKNP into two regions: Upper North East (UNE) and Lower North East (LNE). State forests in the UNE section of the proposed GKNP are comprised of 81 Forest Ecosystems. The State Forests in UNE region include eight of sufficient area to meet the remaining national reserve targets, and 40,923 ha or 39% of the proposed additions are comprised of below target Forest Ecosystems (Table 5).

Table 5: Forest Ecosystems occurring in the Upper North East (UNE) section of the proposed Great Koala National Park; the area (ha) of the ecosystem present; the percentage of the UNE national reserve target this meets and the area required to fully meet the target; the vulnerability of the Forest Ecosystem (1 = high or most vulnerable, 5 = low or least vulnerable); the threatened status as defined under JANIS (R = Rare, V = Vulnerable and E = Endangered); the depleted status (S = Severely Depleted or >55% cleared); reservation status (HIR = Highly Inadequately Reserved); Private land priority (P = Priority)

Forest Ecosystem	Area (ha)	% UNE RFA target met	Area (ha) required to meet RFA target	Vulnerability	Threatened status	Depleted status	Reservation status	Private land priority
Alpine Gum	47	39	489	2	V	S	HIR	
Central Mid Elevation Sydney Blue Gum	1,777	52	908	2				P
Clarence Lowland Needlebark Stringybark	282	100	0	4				
Coast Range Bloodwood-Mahogany	5	90	271	3		S		
Clarence Lowlands Spotted Gum	21	27	37,498	1			HIR	P
Coast Range Spotted Gum-Blackbutt	90	13	646	2	R		HIR	P
Coastal Flooded Gum	85	100	0	1				
Corkwood-Crab apple and Mixed Stringybarks	249	100	0	2				
Diehard Stringybark-New England Blackbutt	3	11	943	2	R	S	HIR	P
Dorrigo White Gum	16	11	3,023	2	R		HIR	P
Dry Foothills Blackbutt-Turpentine	4,345	66	478	1				
Dry Foothills Spotted Gum	11,837	100	0	2				
Dry Grassy Blackbutt-Tallowwood	2,099	68	474	2				
Dry Grassy Stringybark	1,307	100	0	5				
Dry Grassy Tallowwood-Grey Gum	506	29	1,041	2			HIR	P
Dry Heathy Blackbutt-Bloodwood	160	100	0	3				
Dry Heathy Sandstone Blackbutt	21	100	0	3				
Dry Open New England Blackbutt	1,693	100	0	2				
Dry Red gum-Bloodwood-Apple	1	90	24	4	R			
Dry Silvertop Stringybark-Apple	2	100	0	5				
Dry open Red gum-Broad Leaved Apple	2	100	0	5				
Dunns White Gum	23	54	449	2	R			P
Eastern Red Gums	207	95	92	4	V			
Escarpment Red Gum	488	59	3,412	2				P
Escarpment Scribbly Gum-Apple	2,513	100	0	4				
Wet Bangalow-Brushbox	146	53	2,876	1	V			P
Foothill Grey Gum-Ironbark-Spotted Gum	148	100	0	3				
Gorge Grey Box	1	100	0	4				
Grey Box-Red Gum-Grey Ironbark	1	37	3,612	4				
Foothills Grey Gum-Spotted Gum	3,448	64	575	2				
Highland Granite Stringybarks	10	100	0	5				
Gorge Grey Gum	1	100	0	4				
Gorge Ironbark-Grey Gum	498	100	0	3				
Grassy New England Blackbutt-Tallowwood-Blue Gum	8,727	100	0	1				
Grey Gum-Stringybark	1,263	100	0	4				
Heathy Scribbly Gum	6	100	0	4				
High Elevation Ferny Blackbutt	6,206	100	0	1				
High Elevation Moist Open Tallowwood-Blue Gum	1,151	100	0	2				
High Elevation Open Spotted Gum	5,782	73	2,525	2				
Low Relief Coastal Blackbutt	337	18	707	1	R		HIR	P
Lowland Red Gum	157	41	12,573	2		S		P
Manna Gum	8	14	1,101	2	R	S	HIR	P
Mid Elevation Wet Blackbutt	490	100	0	1				
Mid North Coast Wet Brushbox-Tallowwood-Blue Gum	4,786	100	0	1				

Forest Ecosystem	Area (ha)	%UNE RFA target met	Area (ha) required to meet RFA target	Vulnerability	Threatened status	Depleted status	Reservation status	Private land priority
Mixed Moist Hardwood	7	37	217	3	R	S		P
Mixed Tableland Stringybark-Gum Open Forest	47	25	1,523	2		S	HIR	P
Moist Escarpment New England Blackbutt	30	100	0	2				
Moist Foothills Spotted Gum	7,438	100	0	1				
Moist Messmate-Gum	157	100	0	1				
Moist Open Escarpment White Mahogany	537	100	0	2				
Moist Shrubby Stringybark-Gum	958	100	0	2				
Needlebark Stringybark-Large Fruited Blackbutt	336	100	0	4				
New England Peppermint	1,513	100	0	3				
Northern Grassy Sydney Blue Gum	365	67	1,823	1	V			P
Northern Wet Brushbox	125	100	0	1				
Nymboida Tallowwood-Turpentine	866	100	0	2				
Open Coastal Brushbox	2,895	88	163	1				
Open Shrubby Brushbox-Tallowwood	34	100	0	2				
Open Silvertop Stringybark-Blue Gum	5	100	0	2				
Open Silvertop Stringybark-Tallowwood	1,910	100	0	2				
Paperbark	134	52	8,220	2	V			P
Richmond Range Spotted Gum-Box	1	38	3,849	1				P
River Oak	3	11	1,728	2	V		HIR	P
Roundleaved Gum	4	81	1,181	2		S		P
Roundleaved Gum-Turpentine	28	0	30	2	R			
Sandstone Spotted Gum-Blackbutt	39	57	568	2				P
South Coast Tallowwood-Blue Gum	2,312	100	0	1				
Stringybark-Apple	73	44	4,829	4				
Swamp Mahogany	9	46	314	4	R			P
Sydney Peppermint-Stringybark	3	10.	229	2	R		HIR	P
Tallowwood	51	100	0	3	-			
Turpentine	4	100	0	1				
Very Wet New England Blackbutt-Tallowwood	18	100	0	2				
Wattle	8	0	198	0			HIR	
Wet Coastal Tallowwood-Brushbox	4,189	9	1,703	1			HIR	
Wet Flooded Gum-Tallowwood	1,206	19	2,930	1		S	HIR	P
Wet Foothills Blackbutt-Turpentine	4,296	100	0	1				
Wet Shrubby Brushbox-Tallowwood	2,001	100	0	1				
Rainforest	10,218	69	50,099	1	E			P
Total	**104,942**							

The State Forests in LNE part of the proposed GKNP comprise 42 Forest Ecosystems. The State Forests in the LNE Region include three of sufficient area to meet the remaining national conservation targets and 36,117ha (55%) of Forest Ecosystems are below target (Table 6).

Table 6: Forest Ecosystems occurring in the proposed Lower North East (LNE) component of the Great Koala National Park; the area (ha) of the ecosystem present; the percentage of the LNE national reserve target this meets and the area required to fully meet the target; the vulnerability of the Forest Ecosystem (1 = high or most vulnerable, 5 = low or least vulnerable); the threatened status as defined under JANIS (R = Rare, V = Vulnerable and E = Endangered); the depleted status (S = Severely Depleted or >55% cleared); reservation status (HIR = Highly Inadequately Reserved); Private land priority (P = Priority)

Forest Ecosystem	Area (ha)	%LNE RFA target met	Area (ha) required to meet RFA target	Vulnerability	Threatened status	Depleted status	Reservation status	Private land priority
Central Mid Elevation Sydney Blue Gum	767	41	8,116	2		S		P
Coastal Flooded Gum	19	65	789	1				P
Dorrigo White Gum	63	10	610	2	V	S	HIR	P
Dry Foothills Blackbutt-Turpentine	3,590	65	2,567	1				P
Dry Foothills Spotted Gum	22	60	1,972	2				P
Dry Grassy Blackbutt-Tallowwood	6,204	37	12,677	2		S	HIR	P
Dry Grassy Stringybark	32	100	0	5				
Dry Grassy Tallowwood-Grey Gum	11,369	93	2,643	3				
Dry Heathy Blackbutt-Bloodwood	113	100	0	3				
Dry Red Gum-Bloodwood-Apple	917	100	0	4				
Escarpment Red Gum	8	16	10,275	2	V	S	HIR	P
Escarpment Tallowwood-Bloodwood	366	100	0	2				
Wet Bangalow-Brushbox	31	100	0	1				
Foothills Grey Gum-Spotted Gum	7	100	0	2				
Highland Granite Stringybarks	1	23	711	5	R	S	HIR	P
Grassy New England Blackbutt-Tallowwood-Blue Gum	198	100	0	1				
Heathy Scribbly Gum	33	100	0	4				
High Elevation Ferny Blackbutt	1,764	100	0	1				
High Elevation Moist Open Tallowwood-Blue Gum	43	100	0	2				
Low Relief Coastal Blackbutt	80	35	2,267	1			HIR	P
Lowland Red Gum	9	38	226	2	R			P
Lowlands Scribbly Gum	7	100	0	4				
Coastal Mallee	1	91	73	5	R			
Mid Elevation Wet Blackbutt	2,342	100	0	1				
Mid North Coast Wet Brushbox-Tallowwood-Blue Gum	710	100	0	1				
Mixed Moist Hardwood	128	9	212	3	R		HIR	
Mixed Tableland Stringybark-Gum Open Forest	19	57	1,298	2		S		P
Moist Escarpment New England Blackbutt	26	100	0	2				
Moist Foothills Spotted Gum	8	86	262	2				P
Moist Messmate-Gum	1	4	75	1	R		HIR	P
Moist Open Escarpment White Mahogany	82	100	0	2				
Needlebark Stringybark-Large Fruited Blackbutt	2	52	239	4	R			P
Nymboida Tallowwood-Turpentine	63	21	196	2	R			P
Open Coastal Brushbox	10,110	100	0	1				
Paperbark	108	97	234	2	V			
River Oak	2	45	504	2	R			P

Forest Ecosystem	Area (ha)	%LNE RFA target met	Area (ha) required to meet RFA target	Vulnerability	Threatened status	Depleted status	Reservation status	Private land priority
South Coast Tallowwood-Blue Gum	965	77	3,715	1				P
Stringybark-Apple	4	64	11,281	2		S		P
Swamp	70	82	1,620	2	R			
Swamp Mahogany	77	66	237	4				P
Swamp Oak	67	46	1,589	2	V	S		P
Sydney Peppermint-Stringybark	1	100	0	2				
Turpentine	18	16	198	2	R		HIR	
Very Wet New England Blackbutt-Tallowwood	245	100	0	2				
Wet Coastal Tallowwood-Brushbox	2,335	29	1,686	1			HIR	P
Wet Flooded Gum-Tallowwood	1,336	55	639	1				P
Wet Foothills Blackbutt-Turpentine	13,091	100	0	1				
Wet Shrubby Brushbox-Tallowwood	2,396	100	0	1				
Rainforest	8,781	73	70,032	1	R			P
Total	**71,630**							

4. Coffs Harbour Koala Conservation Area

The proposed Coffs Harbour Koala Conservation Area covers approximately 900 ha of diverse natural vegetation types on low lying coastal land between Coffs Harbour in the north and Sawtell in the south. The proposal includes a range of land tenures including Crown land, the Coffs Harbour airport, Council owned land, land owned by the Coffs Education campus, the Coffs Harbour hospital and small areas of privately owned land. Due to the degree of development and the variety of land-uses and tenures this proposal would not form a continuous block of native vegetation, but would be patchy with vegetated links where possible. Therefore no map is provided as the precise locations of reserved areas would need to be determined by land availability.

The proposed Coffs Harbour Koala Conservation Area lies within the area of the Coffs Harbour—Toormina Korora koala subpopulation(Scotts 2013), which is an area of predominantly remnant habitat patches on coastal plains and foothills. The Coffs Harbour—Toormina Korora koala subpopulation is part of the Coffs Harbour—North Bellingen regional population and the Coffs Harbour—Guy Fawkes koala metapopulation (Table 3).

The Coffs Harbour—Toormina Korora subpopulation extends from the northern side of Sawtell to Sapphire beach and includes the Coffs Harbour metropolitan area. Residents report a scattered population of koalas throughout Coffs Harbour. For example, the Coffs Creek reserve east of the highway is estimated to contain a semi-permanent population of seven animals. Koalas are regularly seen in Coffs Harbour city centre and the Botanic Gardens and are a unique feature of the city. The proposed Coffs Harbour Koala Conservation Area is considered to be the main source population for koalas in the city centre. However, due to the population status (declining) and an estimated subpopulation size of fewer than 50 individuals the functional viability of this population is questionable in the face of ongoing threats (Scotts 2013). It would be a significant loss for the community of Coffs Harbour if this population was allowed to become extinct.

The Coffs northern beaches koala subpopulation inhabits 6,707 ha with only 21 ha of vegetation included in State Forest and 108 ha in a regional park. The rest is private land. Scotts (2013) recommended retention and enhancement of habitat and corridor links wherever possible.

The proposed Coffs Harbour Koala Conservation Area contains approximately 370 ha of recognised koala habitat (Lunney et al. 1999), 320 ha of endangered ecological communities (mainly coastal swamp forest), 145 ha of coastal wetland (SEPP14) and almost 10 ha of high value arboreal habitat (Fisher et al. 2014). The proposal comprises 23 Forest Ecosystems. Because of the relatively small size of the proposal area the contribution to unmet UNE regional conservation targets is relatively small, and is less than 5% for any ecological community (Table 7). 683 ha (81 %) of the proposal is comprised of below target forest ecological communities.

Table 7: Forest Ecosystems occurring in the proposed Coffs Harbour Koala Conservation Area; the area (ha) of the ecosystem present; the percentage of the Upper North East national reserve target this meets and the area required to fully meet the target; the vulnerability of the Forest Ecosystem (1 = high or most vulnerable, 5 = low or least vulnerable); the threatened status as defined under JANIS (R = Rare, V = Vulnerable and E = Endangered); the depleted status (S = Severely Depleted or >55% cleared); reservation status (HIR = Highly Inadequately Reserved); Private land priority (P = Priority)

Forest Ecosystem	Area (ha)	%UNE RFA target met	Area (ha) required to meet RFA target	Vulnerability	Threatened status	Depleted status	Reservation status	Private land priority
Banksia	118	25	1,532	2	R	S	HIR	P
Casuarina Woodland	9	14	37	2	R		HIR	P
Central Mid Elevation Sydney Blue Gum	1	52	908	2				P
Coastal Sands Blackbutt	14	100	0	3				
Dry Foothills Blackbutt-Turpentine	10	66	478	1				
Dry Grassy Blackbutt-Tallowwood	3	68	474	2				
Dry Grassy Tallowwood-Grey Gum	14	29	1,041	2			HIR	P
Dry Heathy Blackbutt-Bloodwood	23	100	0	3				
Foothills Grey Gum-Spotted Gum	1	64	575	2				
Heathy Scribbly Gum	2	100	0	4				
Low Relief Coastal Blackbutt	21	18	707	1	R		HIR	P
Mangrove	15	52	354	2	R			P
Open Coastal Brushbox	8	89	163	1				
Paperbark	272	52	8,220	2	V			P
Swamp	73	48	12,604	2	E			P
Swamp Mahogany	25	46	314	4	R			P
Swamp Oak	8	30	2,012	2	R	S	HIR	P
Tallowwood	61	100	0	3				
Wet Coastal Tallowwood-Brushbox	15	9	1,703	1			HIR	
Wet Flooded Gum-Tallowwood	18	19	2,930	1		S	HIR	P
Wet Foothills Blackbutt-Turpentine	75	100	0	1				
Rainforest	2	69	50,099	1	E			P
Scrub	70	91	289	5	V			P
Total	**1,134**							

The Coffs Harbour City Council Landscape Corridor document (Scotts and Cotsell 2014) identifies a number of wildlife corridors situated in the proposed Coffs Harbour Koala Conservation Area. These include two north-south regional corridors and one east-west regional corridor, as well as numerous local and urban link corridors.

The area was first proposed as a nature reserve by the Ulitaria Society some fifteen years ago. The potential to establish the area entirely as a nature reserve is unrealistic due to the mix of land tenures and ownership. There are three parcels of private lands within the proposed Coffs Harbour Koala Conservation Area currently for sale, comprising over 100 ha of high conservation value land including recognised koala habitat and endangered ecological communities.

Private lands within the conservation proposal should be purchased by voluntary acquisition and incorporated with the bulk of the Crown lands in a formal conservation reserve – perhaps as an extension of the Coffs Harbour Coastal Regional Park. Negotiations should be conducted with other landholders and managers to establish voluntary conservation agreements.

Consideration will also be given to nominating the Coffs Harbour-Toormina Korora and Coffs northern beaches koala subpopulations as endangered populations under the NSW Threatened Species Act to ensure a higher priority for a range of conservation actions.

5. Port Macquarie to Camden Haven National Park

The proposed Port Macquarie to Camden Haven National Park is located between Port Macquarie and Camden Haven east of the Pacific Highway. It includes the existing Lake Innes Nature Reserve, Queens Lake Nature Reserve and State Conservation Area. It also includes 1,855 ha of Queens Lake and part of Cowarra State Forests and available vacant Crown land (Figure 5). This is a nationally important and historically significant regional population of koalas, currently estimated at approximately 2,000 individuals (Phillips et al. 2013).

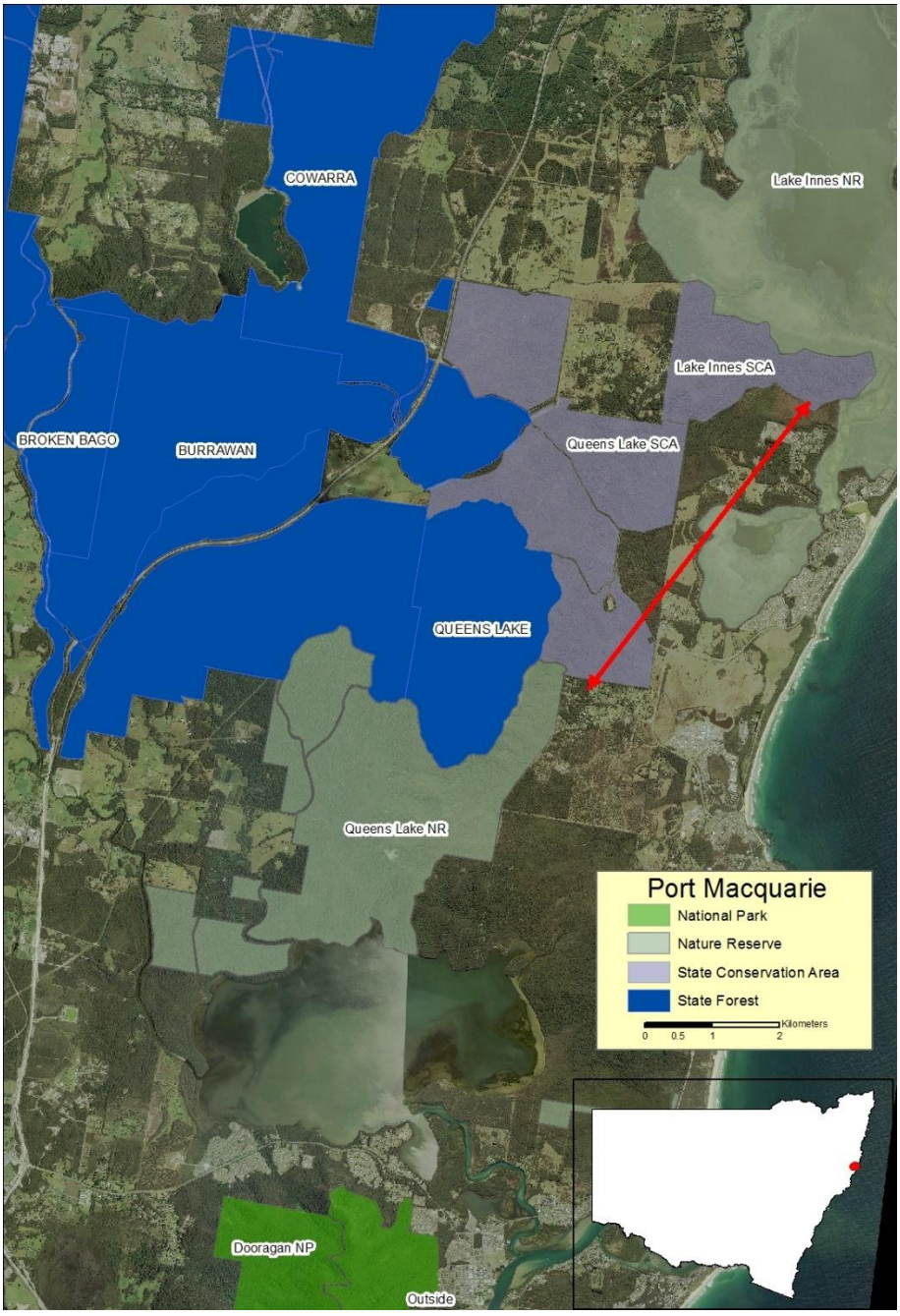

Figure 5: Draft indicative map of the proposed Port Maquarie (north) to Camden Haven (south) National Park (red arrow)

The town of Port Macquarie is arguably the home of koala conservation in NSW, and the base for what is now known as the Koala Preservation Society of NSW Inc. Hence the species has a high profile in the area. Koala records from 1949 to the present indicate a major area of koala persistence located around the northern fringes of Lake Innes, Kooloonbung Creek and the Christmas Bell Plains. A second major area is associated with the coastal villages of Lake Cathie and Bonny Hills to the south, but this population has declined over the last 20 years to a small and quite localised population. Smaller, localised populations occur in the coastal villages of Laurieton and Dunbogan (Phillips et al. 2013). This important regional populations is also a potential source population. However significant barriers exist to the north (the Hastings River), to the west (the Pacific Highway) and to the south (the Camden Haven River).

The Port Macquarie to Camden Haven National Park proposal also includes a diverse range of erosional and depositional landforms and associated biological features which demonstrate the evolution of the coastline between the Manning and Macleay Rivers.

The vegetation is dominated by three Forest Ecosystems: Dry Grassy Tallowood - Grey Gum; Wet Foothills Blackbutt - Turpentine and Low Relief Coastal Blackbutt with occasional occurrences of Blackbutt/Tallowwood and Flooded Gum/Brushbox and pockets of rainforest (Table 8). Four tree species: forest red gum (*Eucalyptus tereticornis*), swamp mahogany (*E. robusta),* tallowwood (*E. microcorys*) and grey gum (*E. propinqua*), were identified as the tree species most preferred by koalas within the proposed park.

The area also comprises coastal plains and wetlands on which the vegetation consists of wet and dry heathland, saltmarsh, open forest of Melaleuca/Casuarina, and open water totaling 3,200 ha. Innes Swamp is fresh water and supports wetlands including sedges, rushes and reeds. Queens Lake, Lake Innes, Lake Cathie and Cathie Creek are estuarine systems which possess salt marshes. Fresh water wetlands within NSW have been depleted to a greater extent than estuarine communities and are therefore conservation significant. The Christmas Bell Plains contain a mosaic of coastal heath, and heath/swamp associations. The dry/wet heath complex includes displays of Christmas Bells (*Blandfordia grandiflora*) which was a primary reason for its addition to Lake Innes Nature Reserve.

The State Forest additions to the Port Macquarie to Camden Haven National Park proposal include 17 Forest Ecosystems. Due of the relatively small size of the proposed additions the contribution of ecosystems in the proposal to unmet Lower North East (LNE) regional conservation targets is modest, being less than 5% for any ecosystem (Table 8). 1,365ha (73%) of the proposal is comprised of below target Forest Ecosystems. Several NSW EECs also occur within the proposed park including Freshwater Wetlands on Coastal Floodplains; Swamp Oak Floodplain Forest; Swamp Sclerophyll Forest on Coastal Floodplains and Lowland Rainforest.

Table 8: Forest Ecosystems occurring in the proposed Port Macquarie to Camden Haven National Park; the area (ha) of the ecosystem present; the percentage of the Lower North East (LNE) national reserve target this meets and the area required to fully meet the target; the vulnerability of the Forest Ecosystem (1 = high or most vulnerable, 5 = low or least vulnerable); the threatened status as defined under JANIS (R = Rare, V = Vulnerable and E = Endangered); the depleted status (S = Severely Depleted or >55% cleared); reservation status (HIR = Highly Inadequately Reserved); Private land priority (P = Priority)

Forest Ecosystem	Area (ha)	%LNE RFA target met	Area (ha) required to meet RFA target	Vulnerability	Threatened status	Depleted status	Reservation status	Private land priority
Central Mid Elevation Sydney Blue Gum	38	41	8,116	2		S		P
Coastal Flooded Gum	42	65	789	1				P
Dry Foothills Blackbutt-Turpentine	67	65	2,567	1				P
Dry Grassy Tallowwood-Grey Gum	480	93	2,643	3				
Dry Heathy Blackbutt-Bloodwood	2	100	0	3				
Dry Red Gum-Bloodwood-Apple	5	100	0	4				
Escarpment Red Gum	1	16	10,275	2		S	HIR	P
Escarpment Tallowwood-Bloodwood	14	100	0	2	V			
Low Relief Coastal Blackbutt	420	35	2,267	1			HIR	P
Open Coastal Brushbox	110	100	0	1				
Paperbark	10	97	234	2				
South Coast Tallowwood-Blue Gum	131	77	3,715	1	V			
Swamp Oak	2	46	1,589	2		S		P
Wet Flooded Gum-Tallowwood	25	55	639	1	V			P
Wet Foothills Blackbutt-Turpentine	280	100	0	1				
Wet Shrubby Brushbox-Tallowwood	7	100	0	1				
Rainforest	10	73	70,032	1	E			P
Total	**1,855**							

There is also a need to focus conservation and management effort around the Lake Innes—Queens Lake and Lake Cathie catchments, where the overall objective should be to ensure the long-term survival and sustainable management of what appears to be a koala population of national significance. The Lake Innes population is also of considerable research importance in terms of assisting in understanding changes that occur at the individual animal and intra-population levels as koalas move along what is a short but steep disturbance gradient: from relatively intact forest wherein disease rates are low and individual longevity and reproductive outputs are high compared with to the urban environment where the opposite trends apply (Phillips et al. 2013).

The Koala Preservation Society of NSW has an international reputation and is at the forefront of koala care and welfare issues in Australia (Phillips et al. 2013). Consultation should occur with the Society to identify issues that could be addressed to improve care for koalas in the region. The need for ongoing recruitment of active careers, sourcing of financial and in-kind assistance for ongoing equipment and training, along with the establishment of food tree plantations have been identified as priorities for local koala care.

6. Greater Bulga—Comboyne—Landsdowne—Taree National Park

The proposed Greater Bulga—Comboyne—Landsdowne—Taree National Park is located on the Mid North Coast of New South Wales north west of Taree. The proposed National Park encompasses what appear to be parts of three koala subpopulations: one located in the Yarratt State Forest—Taree—Wingham area, another in the Bulga—Tapin Tops area and a third based in the Lorne—Kendall—Wauchope area. There is evidence of migration between the three subpopulations through the network of nature reserves and retained vegetation on private lands. It is evident that the three koala subpopulations form part of an important regional koala population of high conservation significance and potential long them viability (Scotts 2013). Much of the area has been recently identified as high quality habitat in a survey by the Australian Koala Foundation. The estimated koala population is 500-1000 individuals.

The proposal extends east from the Bulga plateau then forks to the south to Mount Goonook and to Brimbin near Taree. The eastern fork skirts the Landsdowne escarpment almost to Coopernook. The proposed Greater Bulga—Comboyne—Landsdowne—Taree National Park includes Bulga, Comboyne, Yarrat and part of Landsdowne and Coopernook state forests. It is proposed to add these areas to existing reserves including Brimbin (50 ha), Boorganna (400 ha), Coxcomb (73 ha), Goonook (1074 ha), and Killabakh (2,644 ha) Nature Reserves and Coorabakh (1830 ha) National Park. The park proposal also joins at the western end to Biriwal Bulga and Tapin Tops National Parks (Figure 6).

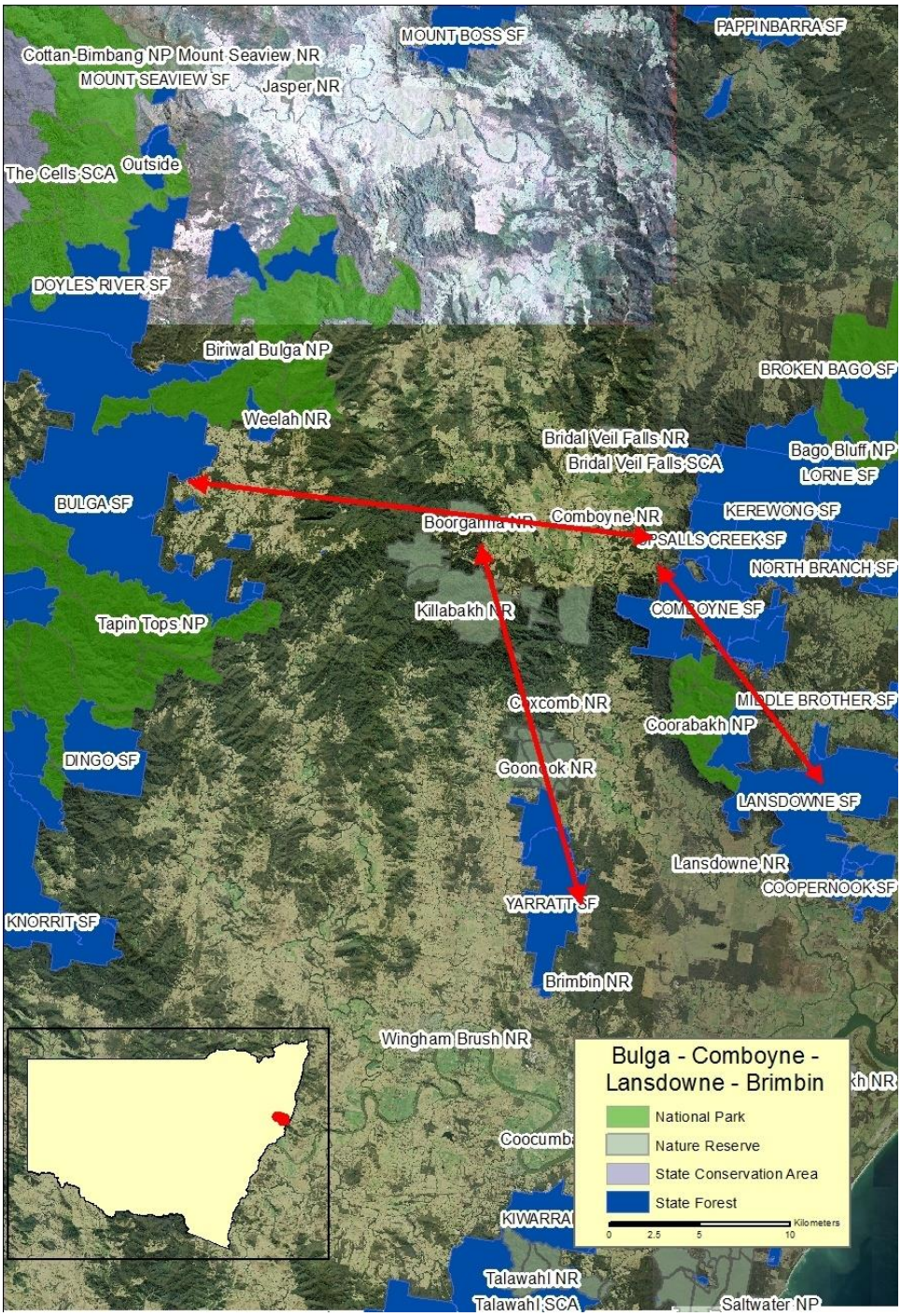

Figure 6: Draft indicative map of the proposed Greater Bulga—Comboyne—Landsdowne—Taree National Park showing the western (Mt Goonook) and eastern (Landsdowne escarpment) forks (red arrows)

The Yarratt State Forest—Brimbin—Taree—Wingham subpopulation is separated by the Manning River from what appears to be two subpopulations in the Kiwarrak area. One is situated east of the Pacific Highway extending to the coast at Red Head and Blackhead and the other to the west to the Krambak and Burrell creek area. The Bulga—Tapin Tops subpopulation may have some connectivity to what appears to be a Doyles Creek subpopulation to the north. The Lorne—Kendall—Wauchope subpopulation is separated by the Pacific Highway from the well-documented population of the coastal area from Port Macquarie to North Haven.

The proposed Greater Bulga—Comboyne—Landsdowne—Taree National Park is part of the traditional country of the Biripi Aboriginal people. A NPA NSW initiated project aimed at increasing knowledge of local koala populations will refine the current understanding of local and regional koala populations presented here.

The Greater Bulga—Comboyne—Landsdowne—Taree National Park proposal includes important geological features including the elevated Comboyne plateau; the steep to undulating and dissected southern escarpment and associated ridge systems of the Comboyne Plateau; the Lansdowne escarpment; and the alluvial floodplain of the Manning Valley. The landscape includes the important features of Killabakh Mountain, Mount Coxcomb, Mount Goonook and the rock escarpments in the upper Lansdowne valley.

The proposal includes a high diversity of Forest Ecosystems, fragile mountain and escarpment vegetation, and a number of threatened fauna species. It also has also has an important role as part of a wildlife corridor extending from the Manning valley to the Great Dividing Range and forms much of the forested skyline viewed from many parts of the valley. As a result of the variety of soils and landform within the Greater Bulga—Comboyne—Landsdowne—Taree National Park proposal area, a highly diverse range of forest ecological communities, including large stands of old-growth forest, are found.

The proposed National Park would protect water catchments in the upper reaches of the Ellenburough River (a tributary of the Hastings River) as well as the upper Lansdowne River, Dingo Creek, Yellow Rocks Creek and headwaters of the Dawson River which contribute to water quality in the Manning River catchment.
The proposed additions also contain 2649 ha of rainforest. Sub-tropical rainforest is found along Dingo, Yellow Rocks and Mooral Creeks and in the upper Lansdowne and upper Dawson River catchments—particularly in those areas with southerly aspects and on talus slopes where fire has been excluded. These rainforests are dominated by figs (*Ficus spp*.), giant stingers (*Dendrocnide excelsa*), coachwoods (*Ceratopetalum apetulum*), black booyong (*Argyrodendron actinophyllum*), whitebeech (*Gmelinaleich hardtii*) and bangalow palms (*Archontophoenix cunninghamiana).* Other moist forest types are well represented including communities of tallowwood (*Eucalyptus microcorys)*, a primary koala food tree, Sydney blue gum (*E. saligna*) and stands of flooded gum (*E. grandis)*.
Drier forest associations are restricted to exposed ridges and escarpments and are generally at lower elevations within the planning area. Dry grassy tallowwood/small-fruited grey gum (*E. propinqua*); small-fruited grey gum/white mahogany (*E. acmenoides*)/red bloodwood (*Corymbia gummifera*) and small-fruited grey gum/grey ironbark (*E. placita*)/white mahogany are extensive.

The Forest Ecosystems Escarpment Tallowwood-Bloodwood (1,732 ha) High Elevation Moist Open Tallowwood-Blue Gum (1116ha), Mid North Coast Wet Brushbox-Tallowwood-Blue Gum (1,408ha) and Wet Foothills Blackbutt-Turpentine (1,492) all have occurrences of over 1000ha in the proposed additions and all contain prime koala food trees. The proposed Greater Bulga—Comboyne—Landsdowne—Taree National Park includes a total of 40 Forest Ecosystems. The contribution of the proposal to unmet LNE regional targets is substantial, with eight Forest Ecosystems meeting more than 10% of remaining targets. (Table 9). 5,953 ha (43%) of the proposal is comprised of below target Forest Ecosystems.

Table 9: Forest Ecosystems occurring in the proposed Greater Bulga—Comboyne—Landsdowne—Taree National Park; the area (ha) of the ecosystem present; the percentage of the Lower North East (LNE) national reserve target this meets and the area required to fully meet the target; the vulnerability of the Forest Ecosystem (1 = high or most vulnerable, 5 = low or least vulnerable); the threatened status as defined under JANIS (R = Rare, V = Vulnerable and E = Endangered); the depleted status (S = Severely Depleted or >55% cleared); reservation status (HIR = Highly Inadequately Reserved); Private land priority (P = Priority)

Forest Ecosystem	Area (ha)	%LNE RFA target met	Area (ha) required to meet RFA target	Vulnerability	Threatened status	Depleted status	Reservation status	Private land priority
Barrington Wet New England Blackbutt-Blue Gum	158	83	1,781	2				P
Central Mid Elevation Sydney Blue Gum	610	41	8,116	2		S		P
Coastal Flooded Gum	142	65	789	1				P
Diehard Stringybark-New England Blackbutt	168	100	0	2				
Dry Foothills Blackbutt-Turpentine	48	65	2,567	1				P
Dry Foothills Spotted Gum	258	60	1,972	2				P
Dry Grassy Blackbutt-Tallowwood	139	37	12,677	2		S	HIR	P
Dry Grassy Stringybark	6	100	0	5				
Dry Grassy Tallowwood-Grey Gum	319	93	2,643	3				
Dry Red Gum-Bloodwood-Apple	46	100	0	4				
Escarpment Red Gum	21	16	10,275	2	V	S	HIR	P
Escarpment Scribbly Gum-Apple	20	42	2,621	2	V	S		P
Escarpment Tallowwood-Bloodwood	1,732	100	0	2				
Wet Bangalow-Brushbox	69	100	0	1				
Grassy New England Blackbutt-Tallowwood-Blue Gum	23	100	0	1				
High Elevation Ferny Blackbutt	590	100	0	1				
High Elevation Moist Open Tallowwood-Blue Gum	1,116	100	0	2				
Low Relief Coastal Blackbutt	47	35	2,267	1			HIR	P
Mid Elevation Wet Blackbutt	235	100	0	1				
Mid North Coast Wet Brushbox-Tallowwood-Blue Gum	1,408	100	0	1				
Moist Escarpment New England Blackbutt	273	100	0	2				
Moist Foothills Spotted Gum	200	86	262	2				P
Moist Open Escarpment White Mahogany	188	100	0	2				
Needlebark Stringybark-Large Fruited Blackbutt	2	52	239	4	R			P
Open Coastal Brushbox	102	100	0	1				
Open Shrubby Brushbox-Tallowwood	1	100	0	2				
Open Silvertop Stringybark-Blue Gum	32	100	0	2				
Paperbark	41	97	234	2	V			
South Coast Shrubby Grey Gum	2	100	0	2		S	HIR	P
South Coast Tallowwood-Blue Gum	358	35	34,719	1				P
Sydney Peppermint-Stringybark	9	77	3,715	2				
Turpentine	20	100	0	2	R		HIR	
Wet Flooded Gum-Tallowwood	160	16	198	1				P
Wet Foothills Blackbutt-Turpentine	1,492	55	639	1				

Wet New England Blackbutt-Silvertop Stringybark	12	100	0	2		
Wet Shrubby Brushbox-Tallowwood	505	100	0	1		
Rainforest	2,649	73	70,032	1	R	P
Total	**13,568**					

Negotiations are well advanced between state agencies, Taree City Council and local landholders to focus planned urban development in the Brimbin area on already cleared lands and protect local bushland. This bushland is an important component of the habitat for the Yarratt State Forest—Brimbin—Taree—Wingham koala subpopulation and should be afforded permanent protection.

7. Bowman National Park

The proposed Bowman National Park is located north east of Barrington Tops on the fall into the Barrington and Manning Rivers and includes 4,608 ha of the Bowman State Forest and an eastern section of Barrington State Forest. The estimated koala population is 50-200 individuals (Figure 7).

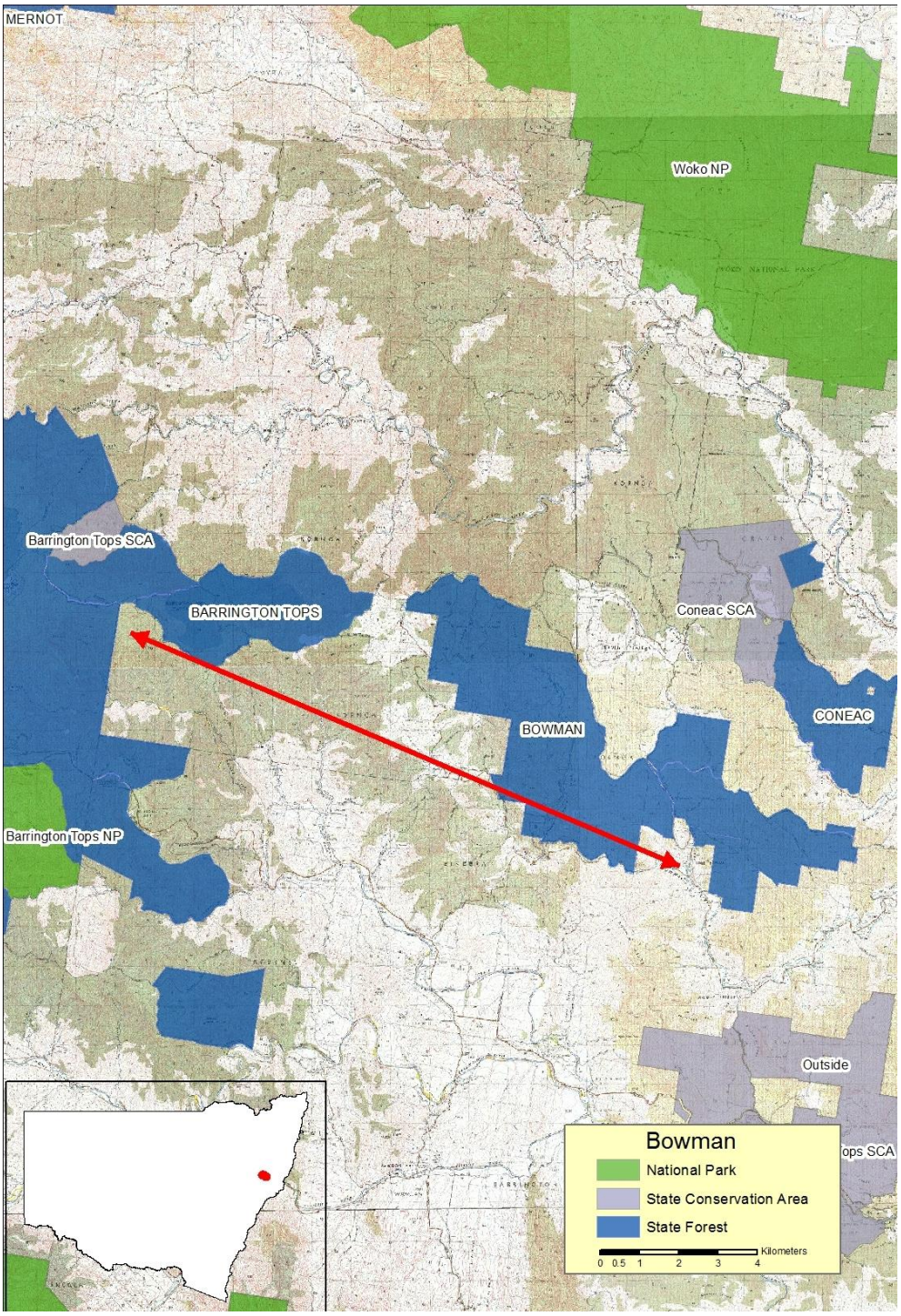

Figure 7: Draft indicative map of the proposed Bowman National Park.

The proposed Bowman National park is a key component of what appears to be a dispersed koala subpopulation extending from the northern fall of the Barrington Tops to the Copeland State Conservation area and further east. There is potential for dispersal of koalas to nearby subpopulations on the eastern and western side of the Barrington Tops. Connections to koala subpopulations to the north and the east appear more problematic.

The open forest on the ridge tops in the proposed national park contains areas of tall open eucalypt forest containing the endangered Craven grey box (*Eucalyptus largeana*) which is restricted to the local area. Sydney blue gum (*E. saligna*), a secondary food tree for koalas, can be found in the moist forest areas.

The State Forest inclusions to the proposed Bowman National Park include 709 ha of Barrington Wet New England Blackbutt-Blue Gum and 704 ha of Central Mid Elevation Sydney Blue Gum, both Forest Ecosystems containing preferred koala feed trees. The proposed State Forest additions contain 27 Forest Ecosystems (Table 10). 3517 ha or 76% of the proposal is comprised of below target Forest Ecosystems.

Because of the relatively small size of the proposal the contribution of Forest Ecosystems in the proposal to unmet LNE regional targets is modest (< 10% for any ecosystem), except for Barrington Wet New England Blackbutt-Blue Gum which would achieve almost 50% of its remaining required reserve area as a result of the proposal (Table 10). The proposal would also add 1888 ha of rainforest to the reserve system and, in more fertile and protected areas, are stands of the Lowland Rainforest EEC, typically containing Moreton Bay figs (*Ficus macrophylla*), giant stinging trees (*Dendrocnide excelsa*), red carabeens (*Geissois benthamiana*), white cedar (*Melia azedarach*) and red cedar (*Toonah ciliata*). In the understory there are numerous ferns and orchids.

Table 10: Forest Ecosystems occurring in the proposed Bowman National Park; the area (ha) of the ecosystem present; the percentage of the Lower North East (LNE) national reserve target this meets and the area required to fully meet the target; the vulnerability of the Forest Ecosystem (1 = high or most vulnerable, 5 = low or least vulnerable); the threatened status as defined under JANIS (R = Rare, V = Vulnerable and E = Endangered); the depleted status (S = Severely Depleted or >55% cleared); reservation status (HIR = Highly Inadequately Reserved); Private land priority (P = Priority)

Forest Ecosystem	Area (ha)	%LNE RFA target met	Area (ha) required to meet RFA target	Vulnerability	Threatened status	Depleted status	Reservation status	Private land priority
Barrington Dry Shrubby New England Blackbutt-Blue Gum	6	100	0	2				
Barrington Moist Blue Gum-White Mahogany	88	61	2,704	2				P
Barrington Wet New England Blackbutt-Blue Gum	709	82	1,781	2				P
Central Mid Elevation Sydney Blue Gum	704	41	8,116	2		S		P
Dry Foothills Spotted Gum	9	60	1,972	2				P
Dry Grassy Blackbutt-Tallowwood	6	37	12,677	2		S	HIR	P
Dry Grassy Stringybark	88	100	0	5				
Dry Open New England Blackbutt	7	25	14,666	2	V	S	HIR	P
Dry Redgum-Bloodwood-Apple	3	100	0	4				
Escarpment Redgum	7	16	10,275	2	V	S	HIR	P
Escarpment Tallowwood-Bloodwood	6	100	0	2				
Grassy New England Blackbutt-Tallowwood-Blue Gum	1	100	0	1				
Grey Gum-Stringybark	4	100	0	4				
High Elevation Ferny Blackbutt	4	100	0	1				
High Elevation Messmate-Brown Barrell	49	100	0	2				
High Elevation Moist Open Tallowwood-Blue Gum	3	100	0	2				
Mid North Coast Wet Brushbox-Tallowwood-Blue Gum	1	100	0	1				
Moist Escarpment New England Blackbutt	1	100	0	2				
Moist Open Escarpment White Mahogany	337	100	0	2				
Open Messmate-New England Blackbutt	39	100	0	2				
Open Ribbon Gum	64	100	0	2				
Open Silvertop Stringybark-Blue Gum	437	100	0	2				
South Coast Shrubby Grey Gum	25	35	34,719	2		S	HIR	P
South Coast Tallowwood-Blue Gum	1	77	3,715	1				P
Stringybark-Apple	73	64	11,281	2		S		P
Wet New England Blackbutt-Silvertop Stringybark	4	100	0	2				
Rainforest	1,888	73	70,032	1	R			P
Total	**4,608**							

There are important leasehold and freehold lands included in the subpopulation area which should be encouraged to maintain management sympathetic to koala conservation. Voluntary acquisition should remain an option to secure habitat protection in perpetuity.

8. Wang Wauk National Park

The proposed Wang Wauk National Park covers 12,982 ha of land in the current Wang Wauk and Buladelah State Forests, located immediately to the north of Buladelah and west of Coolongolook (Figure 8). The proposed national park is in an area of recognised koala habitat (Scotts 2013) with numerous koala records and recognised high use areas extending over both the state forests and adjoining private lands between the Myall and Coolonglook rivers. The proposed National Park appears to be the focal area of an important koala subpopulation. It is separated from The Wallingat koala subpopulatioion to the east and by the Pacific Highway from what is likely to be a separate koala subpopulation to the west centred on Ghin Dooee National Park, Myall River State Forest and part of the Myall Nakes National Park. The number of koalas in the Wang Wauk subpopulation is estimated to be 200-500 individuals in what appears a regionally significant population. The proposed Wang Wauk National Park lies within the sensitive catchments of the Wombah Broadwater, the Myall and Wallis Lakes, all lying within the Great Lakes LGA.

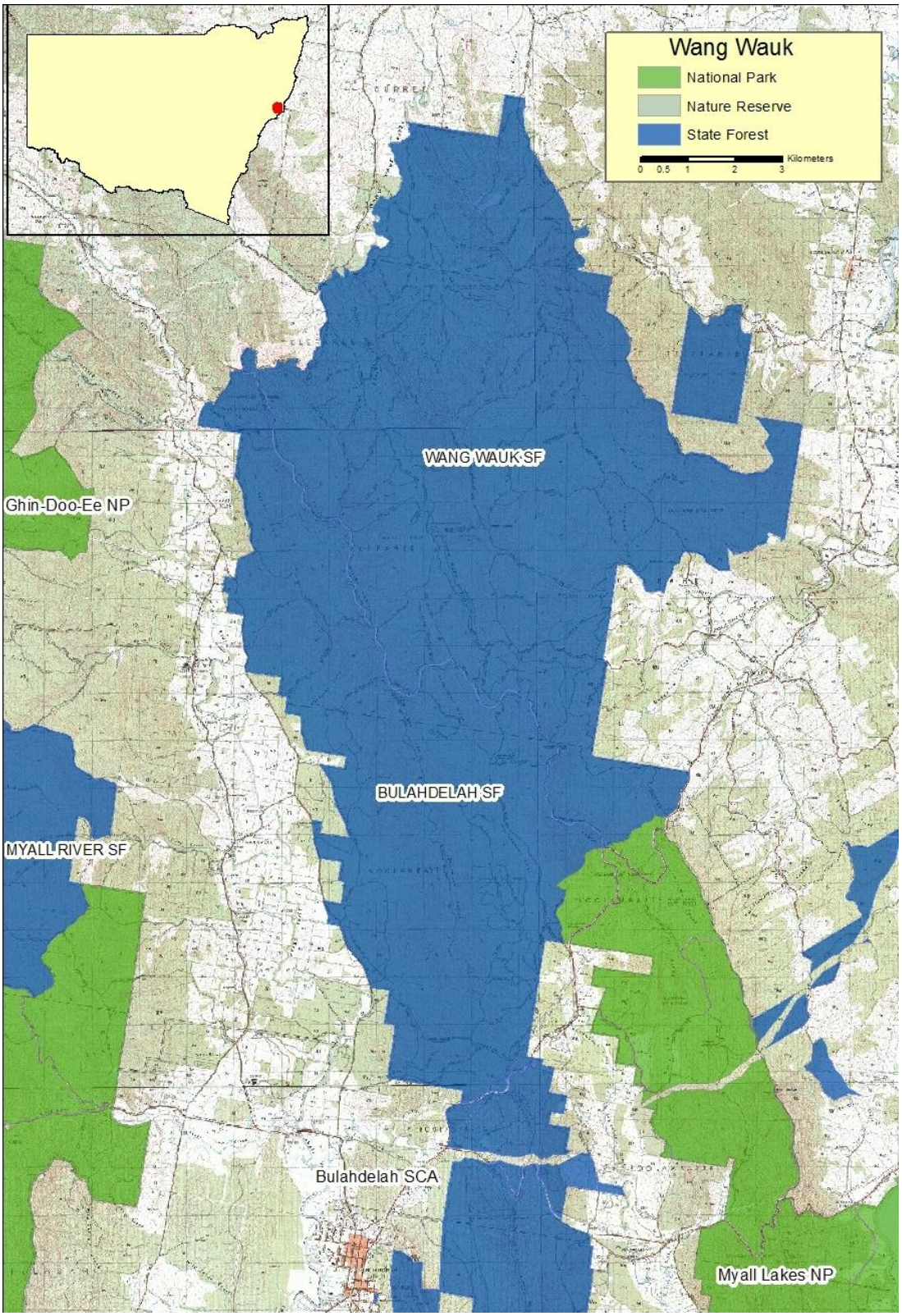

Figure 8: Draft map of proposed Wang Wauk National Park (central blue polygon)

The proposal contains extensive areas of primary and secondary koala food tree species in the following Forest Ecosystems: South Coast Tallowwood-Blue Gum (3,682 ha); Coastal Flooded Gum (849ha); South Coast Shrubby Grey Gum (5,915ha) and Wet Flooded Gum-Tallowwood (367ha) These Forest Ecosystems cover 83% of the proposed national park.

As well as contributing important koala habitat the proposed additions to the reserve system include 16 Forest Ecosystems. The proposed park would see two additional LNE national reserve targets met and a contribution of over 50 % of the target shortfall for another (Wet Flooded Gum-Tallowwood). 11,075 ha or 84% of the proposal is comprised of below target forest ecological communities (Table 11).

Table 11: Forest Ecosystems occurring in the proposed Wang Wauk National Park; the area (ha) of the ecosystem present; the percentage of the Lower North East (LNE) national reserve target this meets and the area required to fully meet the target; the vulnerability of the Forest Ecosystem (1 = high or most vulnerable, 5 = low or least vulnerable); the threatened status as defined under JANIS (R = Rare, V = Vulnerable and E = Endangered); the depleted status (S = Severely Depleted or >55% cleared); reservation status (HIR = Highly Inadequately Reserved); Private land priority (P = Priority)

Forest Ecosystem	Area (ha)	%LNE RFA target met	Area (ha) required to meet RFA target	Vulnerability	Threatened status	Depleted status	Reservation status	Private land priority
Coastal Flooded Gum	849	65	789	1				P
Dry Foothills Spotted Gum	7	60	1,972	2				P
Dry Grassy Blackbutt-Tallowwood	13	37	12,677	2		S	HIR	P
Escarpment Red Gum	1	16	10,275	2	V	S	HIR	P
Wet Bangalow-Brushbox	5	100	0	1				
Grey Box-Red Gum-Grey Ironbark	3	65	4,112	2	V	S		P
Moist Foothills Spotted Gum	5	86	262	2				P
Open Coastal Brushbox	249	100	0	1				
Open Shrubby Brushbox-Tallowwood	201	100	0	2				
Smoothbarked Apple	148	83	636	2				
South Coast Shrubby Grey Gum	5,915	35	34,719	2		S	HIR	P
South Coast Tallowwood-Blue Gum	3,682	77	3,715	1				P
Southern Wet Sydney Blue Gum	10	100	0	1				
Wet Flooded Gum-Tallowwood	367	55	639	1				P
Wet Foothills Blackbutt-Turpentine	3	100	0	1				
Rainforest	1,524	73	70,032	1	R			P
Total	**13,252**							

The Great Lakes Council, supported by the Federal and NSW Goverments and the Hunter Local Land Services, have undertaken an intensive program of catchment management works, primarily on private land, in the catchments of Wombah Broadwater and the Myall and Wallis Lakes. The program has included purchase of strategic wetlands and associated habitats, stormwater management, fencing riparian zones and modifying grazing practices. Removing industrial scale native forest logging from the catchment of the lakes is possibly the most significant remaining iniatitive available to improve and maintain water quality in the LGA.

9. Extensions to Wallingat National Park

The proposed extension of Wallingat National Park covers 10,555 ha, including the addition of 3887 ha of Wallingat and Bachelor state forests to the existing 6,557 Wallingat National Park. It also includes seeking improved protection for environmentally significant habitat connecting Wallingat National Park to Booti Booti and Myall Lakes National Parks. The proposed extension to Wallingat National Park is in an area of recognised koala habitat with numerous koala records, extending over both the existing Wallingat National Park, The Bachelor and Wang Wauk State Forests and adjoining private lands, particularly to the east towards Elizabeth Beach Sandbar and Bungwahl (Figure 9). The proposed National Park appears to a focal area of an important koala subpopulation. It is separated from the Wang Wauk koala subpopulation to the west by the Pacific Highway. The estimated koala population is 200-500 individuals in a regionally significant population.

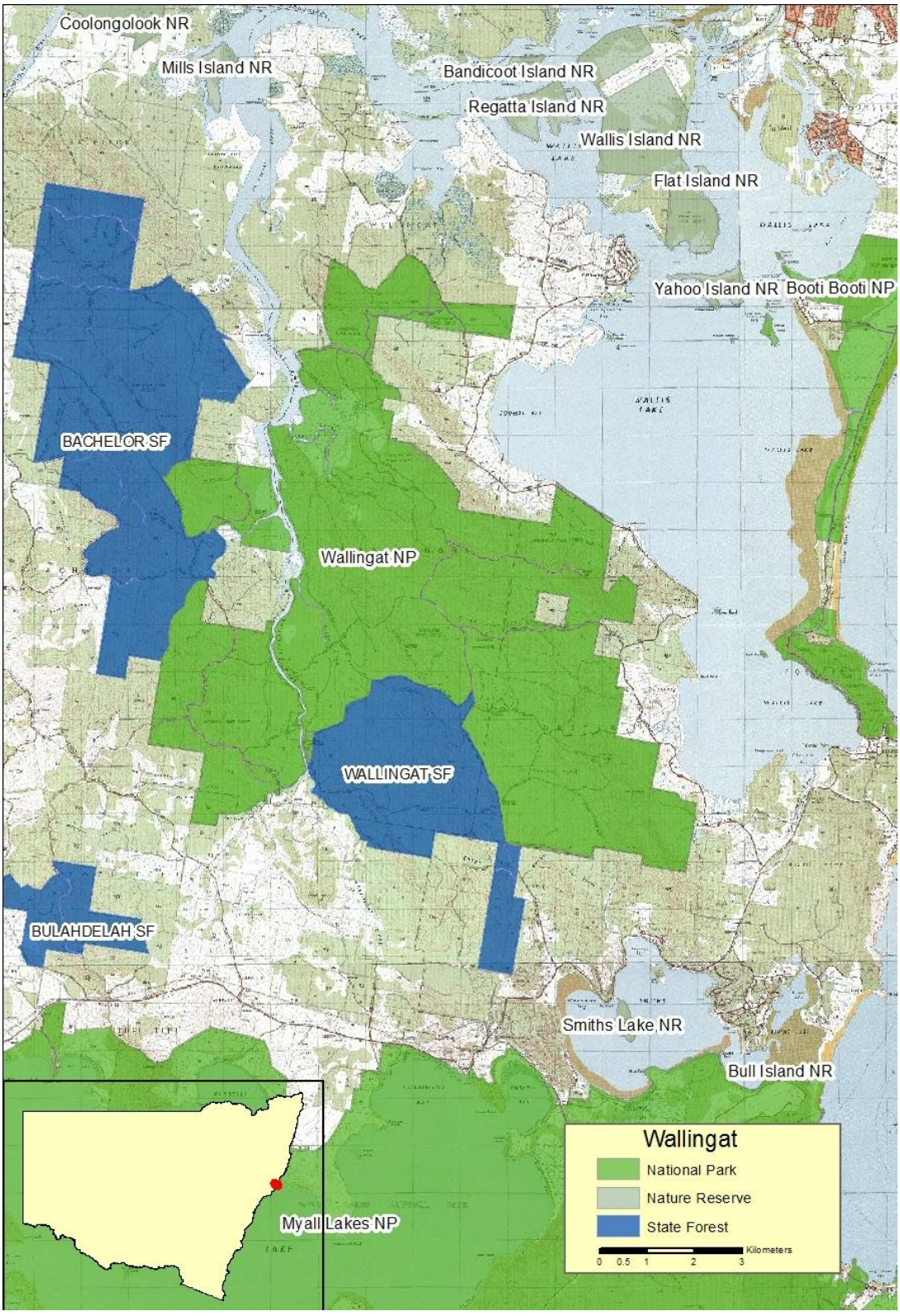

Figure 9: Map illustrating the Bachelor and Wallingat State Forests (blue polygons) which would be added to the Wallingat National Park (central green polygon).

The proposed additions include 468 ha of Coastal Flooded Gum that covers 69% of the remaining reservation target for that Forest Ecosystem in the LNE Region. The proposed additions also include 1,801 ha of Coast Shrubby Grey Gum and 1,264 ha of Southern Wet Sydney Blue Gum. Tallowwood (*Eucalyptus microcorys*), a primary koala food tree species, is included within a number of Forest Ecosystem in the proposed extension to Wallingat National Park. The proposed extension contains extensive areas of the secondary food tree species Sydney blue gum (*E. saligna*), flooded gum (*E. grandis*), red mahogany (*E. resinifera*) and grey gum (*E. propinqua*). The proposed State Forest extensions to Wallingat National Park include 15 ecological communities (Table 12). 2,852 ha or 66% of the proposal is comprised of below target Forest Ecosystems. Limited areas of three EECs, Subtropical Coastal Floodplain Forest , Swamp Sclerophyll Forest on Coastal Floodplain and Lowland Rainforest occur throughout the proposed extensions.

Table 12: Forest Ecosystems occurring in the proposed Wallingat National Park; the area (ha) of the ecosystem present; the percentage of the Lower North East (LNE) national reserve target this meets and the area required to fully meet the target; the vulnerability of the Forest Ecosystem (1 = high or most vulnerable, 5 = low or least vulnerable); the threatened status as defined under JANIS (R = Rare, V = Vulnerable and E = Endangered); the depleted status (S = Severely Depleted or >55% cleared); reservation status (HIR = Highly Inadequately Reserved); Private land priority (P = Priority)

Forest Ecosystem	Area (ha)	%LNE RFA target met	Area (ha) required to meet RFA target	Vulnerability	Threatened status	Depleted status	Reservation status	Private land priority
Coastal Flooded Gum	468	65	789	1				P
Dry Foothills Spotted Gum	5	60	1,972	2				P
Dry Grassy Blackbutt-Tallowwood	162	37	12,677	2		S	HIR	P
Dry Heathy Blackbutt-Bloodwood	1	100	0	3				
Moist Foothills Spotted Gum	1	86	262	2				P
Open Shrubby Brushbox-Tallowwood	15	100	0	2				
Rough-barked Apple	1	59	645	2	V	S		P
Smooth-barked Apple	48	83	636	2				
South Coast Shrubby Grey Gum	1,801	35	34,719	2		S	HIR	P
South Coast Tallowwood-Blue Gum	11	77	3,715	1				P
Southern Wet Sydney Blue Gum	1,264	100	0	1				
Wet Coastal Tallowwood-Brushbox	22	29	1,686	1			HIR	P
Wet Foothills Blackbutt-Turpentine	18	100	0	1				
Rainforest	70	73	70,032	1	R			P
Total	**3,895**							

In recent years Great Lakes Council has undertaken environmental studies and planning for the area between Elizabeth Beach and Bungwahl. The Council has identified substantial areas of high environmental value, including areas of koala habitat and applied environmental protection measures. These areas also provide connectivity with Myall Lakes National Park to the south and Booti Booti National Park to the north. Negotiations should take place with council and private landholders to ensure that these areas are managed to protect the sub-regional koala population and corridors linking the three national parks

The Great Lakes Council, supported by the Federal and State goverments and the Hunter Local Land Services, has undertaken an intensive program of catchment management works in the Wallis Lake catchment over the last ten years. The catchment improvement works,undertaken primarily on private lands, include stormwater management, fencing riparian zones, modified grazing practices and wetland acquisition and repair. Removing industrial scale logging from a substantial area of the catchment of Wallis Lake is perhaps the most significant remaining iniatitive available to improve and maintain water quality.

10. Hawks Nest Extensions to Myall Lakes National Park

The proposed Hawks Nest extensions to Myall Lakes National Park covers approximately 580 ha along the Hawks Nest coastline. The Hawks Nest and Tea Gardens koala population, listed as an Endangered Population under the TSC Act in 1999 (NSW National Parks and Wildlife Service 2003), extends in the south-east to the Yacaaba Headland and in the south-west to the peninsula west of Winda Woppa. The population is limited in the west and north-west to the outskirts of the built-up area of Tea Gardens, including the Shearwater Estate, where it is bounded by Toonang Drive. The population is limited in the north to an east-west line 3km north of the northern boundary of the Hawks Nest golf course, although occasional sightings have been made outside these boundaries. The population is bounded in the south and east by the ocean. The estimated koala population is <50 individuals.

Due to the presence of developed areas and a diversity of tenures, no map of the proposed national park extension is provided. It is likely that the extension would take the form of some blocks of intact native vegetation being protected and linked via revegetation programs to restore connectivity to Myall Lakes National Park.

Koalas in this population are found in a range of eucalypt forest and woodland communities, including coastal forests, rainforest, riparian areas, swamp sclerophyll forests, heathland and shrubland. Swamp mahogany (*Eucalyptus robusta*) and tallowwood (*E. microcorys*) are of primary importance to this koala population. Other local native tree species used by koalas include broad-leaved paperbark (*Melaleuca quinquenervia*), blackbutt (*E. pilularis*), red bloodwood (*Corymbia gummifera*), flooded gum (*E. grandis*) and smooth-barked apple (*Angophera costata*).

The Myall River represents a major barrier between koalas on the eastern Hawks Nest side of the river and the western Tea Gardens side of the river, although occasional movements between these two; including swimming the Myall River at Pipers Creek and crossing the Singing Bridge, has been known to occur. This indicates that some movement of koalas between Hawks Nest and Tea Gardens is possible. Some limited movement may also occur between the Hawks Nest and Tea Gardens koala population and other nearby populations. Myall Lakes National Park to the north of Hawks Nest and the Fame Cove area to the west of Tea Gardens are potential sources of koalas, although the level of interaction is unknown.

There is evidence that koala populations in the lower Hunter, including the Hawks Nest and Tea Gardens Population, are declining due to pressures of clearing of habitat, habitat fragmentation, sand mining, urban development, road kills, dog attacks and disease (NSW National Parks and Wildlife Service 2003). Land clearing in the Hawks Nest and Tea Gardens area has led to the fragmentation of much of the remaining koala habitat. Fragmentation results in koalas spending an increased amount of time travelling over open ground, leaving them more susceptible to dog attack.

It is proposed to add available koala habitat on Crown Land at Hawks Nest and Tea Gardens to Myall Lakes National Park. Negotiations between council, state government, private landholders and a developer were taking place to acquire high quality koala habitat west of Mungo Brush Road in exchange for development on less important habitat east of the road. This acquired habitat was to be transferred to state government to extend Myal Lake National Park, but stalled at the onset of the global financial crisis. This initiative should be revisitedto secure this habitat and provide enhanced connectivity for the koala population.

The proposed additions to Myall Lakes National Park includes nine Forest Ecosystems. Only paperbark and swamp mahogany communities acquire >10% of the unmet reservation targets in the LNE region as a result of this proposal (Table 13). 576 ha (97%) of the proposal is comprised of below target forest ecological communities.

Table 13: Forest Ecosystems occurring in the proposed additions to Myall Lakes National Park; the area (ha) of the ecosystem present; the percentage of the Lower North East (LNE) national reserve target this meets and the area required to fully meet the target; the vulnerability of the Forest Ecosystem (1 = high or most vulnerable, 5 = low or least vulnerable); the threatened status as defined under JANIS (R = Rare, V = Vulnerable and E = Endangered); the depleted status (S = Severely Depleted or >55% cleared); reservation status (HIR = Highly Inadequately Reserved); Private land priority (P = Priority)

Forest Ecosystem	Area (ha)	%LNE RFA target met	Area (ha) required to meet RFA target	Vulnerability	Threatened status	Depleted status	Reservation status	Private land priority
Dry Grassy Blackbutt-Tallowwood	232	37	12,677	2		S	HIR	P
Heath	177	80	2,890	2	R			P
Ironbark	1	100	0	2		S		
Mangrove	5	61	391	2	R			P
Paperbark	63	97	234	2	V			
Smooth-barked Apple	11	83	636	2				
Swamp	50	82	1,620	2	R			
Swamp Mahogany	34	66	237	4				P
Rainforest	4	72	70,032	1	R			P
Total	**594**							

A Recovery Plan for the Hawks Nest and Tea Gardens Endangered koala Population was adopted in 2003 (NSW National Parks and Wildlife Service 2003). The plan considers the conservation requirements of the population and identifies the actions to be taken to ensure the long-term viability of the population. This proposal will help address threats outlined in the recovery plan (e.g. habitat loss and fragmentation). The local community is active in koala conservation should be provided with additional support.

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Appendix 1: List of flora and fauna species present in the Coffs Coast and Escarpment, Chaelundi and Dalmorton sub-regions of the former Northern Rivers Catchment Management Authority (CMA), their conservation status according to the NSW National Parks and Wildlife Act and the Commonwealth Environment Protection and Biodiversity Conservation (EPBC) Act. Source: NSW Office of Environment and Heritage

Common name	Scientific name	NSW status	Commonwealth (EPBC) status	CMA sub-region
Bertya	*Bertya sp. (Clouds Creek, M. Fatemi 4)*	Endangered		Chaelundi
Callistemon pungens	*Callistemon pungens*		Vulnerable	Coffs
Harnieria hygrophiloides	*Harnieria hygrophiloides*	Endangered		Dalmorton
Kardomia prominens	*Kardomia prominens*	Endangered		Chaelundi
Kennedia retrorsa	*Kennedia retrorsa*	Vulnerable	Vulnerable	Coffs
Tephrosia filipes	*Tephrosia filipes*	Vulnerable		Dalmorton
Acalypha	*Acalypha eremorum*	Endangered		Dalmorton
Arrow-head Vine	*Tinospora tinosporoides*	Vulnerable		Coffs
Austral Toadflax	*Thesium australe*	Vulnerable	Vulnerable	Chaelundi
Australasian Bittern	*Botaurus poiciloptilus*	Endangered	Endangered	Coffs
Australian Fritillary	*Argyreus hyperbius*	Endangered		Coffs
Australian Painted Snipe	*Rostratula australis*	Endangered	Endangered	Coffs
Barking Owl	*Ninox connivens*	Vulnerable		Chaelundi
Barred Cuckoo-shrike	*Coracina lineata*	Vulnerable		Chaelundi
Beadle's Grevillea	*Grevillea beadleana*	Endangered	Endangered	Chaelundi
Beccari's Freetail-bat	*Mormopterus beccarii*	Vulnerable		Chaelundi
Big Nellie Hakea	*Hakea archaeoides*	Vulnerable	Vulnerable	Coffs
Black Bittern	*Ixobrychus flavicollis*	Vulnerable		Coffs
Black Grass-dart Butterfly	*Ocybadistes knightorum*	Endangered		Coffs
Black-breasted Button-quail	*Turnix melanogaster*	Critically Endangered	Vulnerable	Chaelundi
Black-chinned Honeyeater (eastern subspecies)	*Melithreptus gularis gularis*	Vulnerable		Chaelundi
Black-necked Stork	*Ephippiorhynchus asiaticus*	Endangered		Chaelundi
Black-striped Wallaby	*Macropus dorsalis*	Endangered		Chaelundi
Black-winged Petrel	*Pterodroma nigripennis*	Vulnerable		Coffs
Bluegrass	*Dichanthium setosum*	Vulnerable	Vulnerable	Dalmorton
Booroolong Frog	*Litoria booroolongensis*	Endangered	Endangered	Chaelundi
Brolga	*Grus rubicunda*	Vulnerable		Coffs
Brown Butterfly Orchid	*Sarcochilus dilatatus*	Endangered		Dalmorton
Brown Fairy-chain Orchid	*Peristeranthus hillii*	Vulnerable		Coffs
Brown Treecreeper (eastern subspecies)	*Climacteris picumnus victoriae*	Vulnerable		Chaelundi
Brush Sauropus	*Phyllanthus microcladus*	Endangered		Dalmorton
Brush-tailed Phascogale	*Phascogale tapoatafa*	Vulnerable		Chaelundi
Brush-tailed Rock-wallaby	*Petrogale penicillata*	Endangered	Vulnerable	Chaelundi
Bush Stone-curlew	*Burhinus grallarius*	Endangered		Coffs
Byron Bay Diuris	*Diuris sp. aff. chrysantha*	Endangered		Coffs
Coast Headland Pea	*Pultenaea maritima*	Vulnerable		Coffs

Common name	Scientific name	NSW status	Commonwealth (EPBC) status	CMA sub-region
Coastal Petaltail	*Petalura litorea*	Endangered		Coffs
Collared Kingfisher	*Todiramphus chloris*	Vulnerable		Coffs
Comb-crested Jacana	*Irediparra gallinacea*	Vulnerable		Coffs
Common Blossom-bat	*Syconycteris australis*	Vulnerable		Coffs
Common Planigale	*Planigale maculata*	Vulnerable		Chaelundi
Coolabah Bertya	*Bertya opponens*	Vulnerable	Vulnerable	Dalmorton
Cotton Pygmy-Goose	*Nettapus coromandelianus*	Endangered		Dalmorton
Coxen's Fig-Parrot	*Cyclopsitta diopthalma coxeni*	Critically Endangered	Endangered	Coffs
Creek Triplarina	*Triplarina imbricata*	Endangered	Endangered	Chaelundi
Cryptic Forest Twiner	*Tylophora woollsii*	Endangered	Endangered	Chaelundi
Crystal Creek Walnut	*Endiandra floydii*	Endangered	Endangered	Coffs
Diamond Firetail	*Stagonopleura guttata*	Vulnerable		Chaelundi
Dorrigo Daisy Bush	*Olearia flocktoniae*	Endangered	Endangered	Chaelundi
Durobby	*Syzygium moorei*	Vulnerable	Vulnerable	Dalmorton
Dwarf Heath Casuarina	*Allocasuarina defungens*	Endangered	Endangered	Coffs
Eastern Bentwing-bat	*Miniopterus schreibersii oceanensis*	Vulnerable		Chaelundi
Eastern Cave Bat	*Vespadelus troughtoni*	Vulnerable		Chaelundi
Eastern Chestnut Mouse	*Pseudomys gracilicaudatus*	Vulnerable		Coffs
Eastern False Pipistrelle	*Falsistrellus tasmaniensis*	Vulnerable		Chaelundi
Eastern Freetail-bat	*Mormopterus norfolkensis*	Vulnerable		Chaelundi
Eastern Grass Owl	*Tyto longimembris*	Vulnerable		Coffs
Eastern Long-eared Bat	*Nyctophilus bifax*	Vulnerable		Chaelundi
Eastern Osprey	*Pandion cristatus*	Vulnerable		Dalmorton
Eastern Pygmy-possum	*Cercartetus nanus*	Vulnerable		Chaelundi
Eastern Quoll	*Dasyurus viverrinus*	Endangered		Dalmorton
Flame Robin	*Petroica phoenicea*	Vulnerable		Chaelundi
Floyd's Grass	*Alexfloydia repens*	Endangered		Coffs
Fragrant Pepperbush	*Tasmannia glaucifolia*	Vulnerable	Vulnerable	Chaelundi
Freckled Duck	*Stictonetta naevosa*	Vulnerable		Dalmorton
Gang-gang Cockatoo	*Callocephalon fimbriatum*	Vulnerable		Coffs
Giant Barred Frog	*Mixophyes iteratus*	Endangered	Endangered	Chaelundi
Gibraltar Grevillea	*Grevillea rhizomatosa*	Vulnerable	Vulnerable	Dalmorton
Glandular Frog	*Litoria subglandulosa*	Vulnerable		Chaelundi
Glenugie Karaka	*Corynocarpus rupestris subsp. rupestris*	Vulnerable	Vulnerable	Coffs
Glossy Black-Cockatoo	*Calyptorhynchus lathami*	Vulnerable		Chaelundi
Golden-tipped Bat	*Kerivoula papuensis*	Vulnerable		Chaelundi
Gould's Petrel	*Pterodroma leucoptera leucoptera*	Vulnerable	Endangered	Coffs
Greater Broad-nosed Bat	*Scoteanax rueppellii*	Vulnerable		Chaelundi
Green and Golden Bell Frog	*Litoria aurea*	Endangered	Vulnerable	Coffs

Common name	Scientific name	NSW status	Commonwealth (EPBC) status	CMA sub-region
Green Waxberry	*Gaultheria viridicarpa subsp. viridicarpa*	Vulnerable	Vulnerable	Coffs
Green-leaved Rose Walnut	*Endiandra muelleri subsp. bracteata*	Endangered		Dalmorton
Green-thighed Frog	*Litoria brevipalmata*	Vulnerable		Chaelundi
Grey-crowned Babbler (eastern subspecies)	*Pomatostomus temporalis temporalis*	Vulnerable		Chaelundi
Grey-headed Flying-fox	*Pteropus poliocephalus*	Vulnerable		Chaelundi
Grove's Paperbark	*Melaleuca groveana*	Vulnerable		Chaelundi
Gympie Stinger	*Dendrocnide moroides*	Endangered		Dalmorton
Hairy Jointgrass	*Arthraxon hispidus*	Vulnerable	Vulnerable	Chaelundi
Hartman's Sarcochilus	*Sarcochilus hartmannii*	Vulnerable	Vulnerable	Chaelundi
Hastings River Mouse	*Pseudomys oralis*	Endangered	Endangered	Chaelundi
Headland Zieria	*Zieria prostrata*	Endangered	Endangered	Coffs
Hoary Wattled Bat	*Chalinolobus nigrogriseus*	Vulnerable		Chaelundi
Hooded Robin (south-eastern form)	*Melanodryas cucullata cucullata*	Vulnerable		Chaelundi
Johnson's Cycad	*Macrozamia johnsonii*	Endangered		Chaelundi
Koala	*Phascolarctos cinereus*	Vulnerable	Vulnerable	Chaelundi
Lady Tankerville's Swamp Orchid	*Phaius tancarvilleae*	Endangered	Endangered	Coffs
Large-eared Pied Bat	*Chalinolobus dwyeri*	Vulnerable	Vulnerable	Chaelundi
Little Bentwing-bat	*Miniopterus australis*	Vulnerable		Chaelundi
Little Eagle	*Hieraaetus morphnoides*	Vulnerable		Chaelundi
Little Lorikeet	*Glossopsitta pusilla*	Vulnerable		Chaelundi
Long-nosed Potoroo	*Potorous tridactylus*	Vulnerable	Vulnerable	Chaelundi
Macadamia Nut	*Macadamia integrifolia*		Vulnerable	Coffs
Magpie Goose	*Anseranas semipalmata*	Vulnerable		Dalmorton
Masked Owl	*Tyto novaehollandiae*	Vulnerable		Chaelundi
Milky Silkpod	*Parsonsia dorrigoensis*	Vulnerable	Endangered	Chaelundi
Moonee Quassia	*Quassia sp. Mooney Creek*	Endangered	Endangered	Coffs
Mountain Angelica	*Gingidia montana*	Endangered	Endangered	Chaelundi
Narrow-leaf Finger Fern	*Grammitis stenophylla*	Endangered		Coffs
Narrow-leaved Black Peppermint	*Eucalyptus nicholii*	Vulnerable	Vulnerable	Chaelundi
Native Milkwort	*Polygala linariifolia*	Endangered		Coffs
New Holland Mouse	*Pseudomys novaehollandiae*		Vulnerable	Chaelundi
Newry Golden Wattle	*Acacia chrysotricha*	Endangered		Coffs
Nightcap Oak	*Eidothea hardeniana*	Endangered	Critically Endangered	Coffs
Nightcap Plectranthus	*Plectranthus nitidus*	Endangered	Endangered	Chaelundi
Olive Whistler	*Pachycephala olivacea*	Vulnerable		Chaelundi
Orara Boronia	*Boronia umbellata*	Vulnerable	Vulnerable	Chaelundi
Painted Honeyeater	*Grantiella picta*	Vulnerable		Coffs

Common name	Scientific name	NSW status	Commonwealth (EPBC) status	CMA sub-region
Pale-headed Snake	*Hoplocephalus bitorquatus*	Vulnerable		Chaelundi
Pale-vented Bush-hen	*Amaurornis moluccana*	Vulnerable		Coffs
Parma Wallaby	*Macropus parma*	Vulnerable		Chaelundi
Peach Myrtle	*Uromyrtus australis*	Endangered	Endangered	Coffs
Peppered Tree Frog	*Litoria piperata*	Critically Endangered	Vulnerable	Dalmorton
Pouched Frog	*Assa darlingtoni*	Vulnerable		Chaelundi
Powerful Owl	*Ninox strenua*	Vulnerable		Chaelundi
Providence Petrel	*Pterodroma solandri*	Vulnerable		Coffs
Pygmy Cypress Pine	*Callitris oblonga*	Vulnerable	Vulnerable	Coffs
Rainforest Cassia	*Senna acclinis*	Endangered		Chaelundi
Ravine Orchid	*Sarcochilus fitzgeraldii*	Vulnerable	Vulnerable	Chaelundi
Red Boppel Nut	*Hicksbeachia pinnatifolia*	Vulnerable	Vulnerable	Coffs
Red Goshawk	*Erythrotriorchis radiatus*	Critically Endangered	Vulnerable	Chaelundi
Red-backed Button-quail	*Turnix maculosus*	Vulnerable		Dalmorton
Red-crowned Toadlet	*Pseudophryne australis*	Vulnerable		Coffs
Red-flowered King of the Fairies	*Oberonia titania*	Vulnerable		Chaelundi
Red-fruited Ebony	*Diospyros mabacea*	Endangered	Endangered	Coffs
Red-legged Pademelon	*Thylogale stigmatica*	Vulnerable		Chaelundi
Red-tailed Tropicbird	*Phaethon rubricauda*	Vulnerable		Chaelundi
Regent Honeyeater	*Anthochaera phrygia*	Critically Endangered	Endangered	Chaelundi
Rose-crowned Fruit-Dove	*Ptilinopus regina*	Vulnerable		Chaelundi
Rough Doubletail	*Diuris praecox*	Vulnerable	Vulnerable	Coffs
Rough-shelled Bush Nut	*Macadamia tetraphylla*	Vulnerable	Vulnerable	Coffs
Rufous Bettong	*Aepyprymnus rufescens*	Vulnerable		Chaelundi
Rufous Scrub-bird	*Atrichornis rufescens*	Vulnerable		Chaelundi
Rupp's Wattle	*Acacia ruppii*	Endangered	Endangered	Dalmorton
Rusty Plum, Plum Boxwood	*Niemeyera whitei*	Vulnerable		Chaelundi
Rusty Rose Walnut	*Endiandra hayesii*	Vulnerable	Vulnerable	Coffs
Sandstone Rough-barked Apple	*Angophora robur*	Vulnerable	Vulnerable	Coffs
Scant Pomaderris	*Pomaderris queenslandica*	Endangered		Chaelundi
Scarlet Robin	*Petroica boodang*	Vulnerable		Chaelundi
Scented Acronychia	*Acronychia littoralis*	Endangered	Endangered	Coffs
Silver Sword Lily	*Neoastelia spectabilis*	Vulnerable	Vulnerable	Coffs
Silverbush	*Sophora tomentosa*	Endangered		Coffs
Slaty Red Gum	*Eucalyptus glaucina*	Vulnerable	Vulnerable	Dalmorton
Slender Marsdenia	*Marsdenia longiloba*	Endangered	Vulnerable	Chaelundi
Slender Screw Fern	*Lindsaea incisa*	Endangered		Coffs
Small-leaved Tamarind	*Diploglottis campbellii*	Endangered	Endangered	Coffs
Soft Grevillea	*Grevillea mollis*	Endangered	Endangered	Dalmorton
Sooty Owl	*Tyto tenebricosa*	Vulnerable		Chaelundi
Southern Myotis	*Myotis macropus*	Vulnerable		Chaelundi

Common name	Scientific name	NSW status	Commonwealth (EPBC) status	CMA sub-region
Southern Pink Underwing Moth	*Phyllodes imperialis southern subspecies*	Endangered	Endangered	Coffs
Southern Swamp Orchid	*Phaius australis*	Endangered	Endangered	Coffs
Speckled Warbler	*Chthonicola sagittata*	Vulnerable		Chaelundi
Sphagnum Frog	*Philoria sphagnicolus*	Vulnerable		Chaelundi
Spider orchid	*Dendrobium melaleucaphilum*	Endangered		Coffs
Spotted Harrier	*Circus assimilis*	Vulnerable		Chaelundi
Spotted-tailed Quoll	*Dasyurus maculatus*	Vulnerable	Endangered	Chaelundi
Square-stemmed Spike-rush	*Eleocharis tetraquetra*	Endangered		Coffs
Square-tailed Kite	*Lophoictinia isura*	Vulnerable		Chaelundi
Squirrel Glider	*Petaurus norfolcensis*	Vulnerable		Chaelundi
Stephens' Banded Snake	*Hoplocephalus stephensii*	Vulnerable		Chaelundi
Stinky Lily	*Typhonium sp. aff. brownii*	Endangered		Chaelundi
Stuttering Frog	*Mixophyes balbus*	Endangered	Vulnerable	Chaelundi
Superb Fruit-Dove	*Ptilinopus superbus*	Vulnerable		Coffs
Swift Parrot	*Lathamus discolor*	Endangered	Endangered	Coffs
Tall Knotweed	*Persicaria elatior*	Vulnerable	Vulnerable	Coffs
Tall Velvet Sea-berry	*Haloragis exalata subsp. velutina*	Vulnerable	Vulnerable	Coffs
Tenterfield Eyebright	*Euphrasia orthocheila subsp. peraspera*	Endangered		Chaelundi
Tinospora Vine	*Tinospora smilacina*	Endangered		Coffs
Trailing Woodruff	*Asperula asthenes*	Vulnerable	Vulnerable	Coffs
Turquoise Parrot	*Neophema pulchella*	Vulnerable		Coffs
Varied Sittella	*Daphoenositta chrysoptera*	Vulnerable		Chaelundi
Veined Doubletail	*Diuris venosa*	Vulnerable	Vulnerable	Coffs
Wallum Froglet	*Crinia tinnula*	Vulnerable		Coffs
Weeping Paperbark	*Melaleuca irbyana*	Endangered		Dalmorton
White Lace Flower	*Archidendron hendersonii*	Vulnerable		Chaelundi
White Tern	*Gygis alba*	Vulnerable		Chaelundi
White-crowned Snake	*Cacophis harriettae*	Vulnerable		Chaelundi
White-eared Monarch	*Carterornis leucotis*	Vulnerable		Chaelundi
White-flowered Wax Plant	*Cynanchum elegans*	Endangered	Endangered	Coffs
Wompoo Fruit-Dove	*Ptilinopus magnificus*	Vulnerable		Chaelundi
Woodland Babingtonia	*Kardomia silvestris*	Endangered		Chaelundi
Yellow-bellied Glider	*Petaurus australis*	Vulnerable		Chaelundi
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*	Vulnerable		Chaelundi
Yellow-flowered King of the Fairies	*Oberonia complanata*	Endangered		Coffs