

Saving koalas will take more than token gestures but the pathway is clear

Office of Environment and Heritage 'Areas of Regional Koala Significance' and 'koala hubs' overlap strongly with community reserve proposals but have been ignored by the government in the development of its koala strategy and setting of policy

Introduction

Following the release of the NSW government's long-awaited Koala Strategy in May 2018, the National Parks Association of NSW (NPA) lodged a freedom of information (GIPA) application in an effort to obtain:

- a) The selection criteria used to decide on the new koala reserves;
- b) OEH's analysis of public feedback related to the koala strategy and;
- c) Information on work done by OEH to identify Areas of Local and Regional Koala Significance (ALKS and ARKS).

We received no information on a) which leads us to question whether there was a selection methodology or whether the reserves were politically and industrially convenient choices. We received no information on b) which leads us to question whether submissions were ignored. We did receive information on c) which is the subject of this report.

ALKS appear to have become known as 'koala hubs', referred to hereafter as 'hubs'. We have primarily focussed this report on north-east NSW as north-east NSW contains 76% of identified hubs and this is the area in which the community reserve proposals are situated.

Explanations of ARKS and hubs are presented in Appendices 1 and 2 and their creation is discussed at length in the GIPA documents. Hubs and ARKS offer a strong basis upon which to identify priority areas for protection of koala populations; priority areas for restoration to increase connectivity between ARKS and priority areas to target for private land investment.

The information received through GIPA reveals **ten key findings** (many are discussed in greater detail in the report and associated GIPA documents):

1. The Office of Environment and Heritage (OEH) has undertaken much valuable work that can be used as a basis for a reserve network for koalas, but this work has been ignored in the development of the koala strategy and current policy settings around land clearing and logging;
2. Neither ARKS nor hubs overlap strongly with the NSW government's reserve proposals (the new koala reserves contain just 0.2%, or 181 hectares, of koala hubs) and government has ignored the work that OEH experts have undertaken to aid the implementation of the koala strategy;
3. The data strongly support the north coast reserve priorities identified by community groups in NPA's 2014 '[Blueprint for a Comprehensive Reserve System for Koalas on the North Coast of NSW](#)' and NPA's 2018 '[50 Parks](#)' proposals as they overlap closely with ARKS and hubs (Figs. 1-4);
4. The Great Koala National Park proposal is the most important area of public land for koalas in NSW and a conservation priority given the concentration of hubs within its boundaries (56% of hubs in north-east NSW are contained within the proposal) and its coverage of two ARKS (Figs. 1 & 3);

5. Of the 77,517 hectares (ha) of hubs in north-east NSW, only 14% are located in national parks. 20% (15,552ha) are found in state forests and 66% (51,463ha) on private land (Table 1, Appendix 2);
6. Of the 15,522 hectares of hubs in state forests, 12,324ha (79%) are outside of exclusion zones and thus subject to logging;
7. Of the total area of koala hubs in state forests, 5,130 ha (approximately 33%) is within the proposed '[Intensive Harvesting Zone](#)' between Taree and Grafton, which will be subject to clearfell logging. Most of this is contained within the Great Koala National Park;
8. The north coast of NSW is broadly identified as 'resilient' for koalas. Habitat protection in this area is therefore a high priority for koala persistence in the face of climate change (Figs. 9 & 10);
9. Urban development poses a serious threat to the future of koala populations as many hubs – including significant numbers in south-west Sydney / Wollondilly - are located in close proximity to urban areas. State Environment Planning Policy (SEPP) 44 that is supposed to protect koala habitat from urban development has been inconsistently applied and has been under review for almost two years (since December 2016);
10. Given OEH's previous advice to the Minister that under 1% of koala habitat on private land is protected from clearing, coupled with the threat of urban development and private native forestry, the hubs on private land are in serious peril and those on public land of overwhelming importance;

We make **five key recommendations** in light of the data provided to us through GIPA:

1. The importance of the Great Koala National Park means it should be created as a priority step towards genuine koala conservation.
2. The NSW government must place all koala hubs on state forests, along with buffers of a minimum of 1km, under a moratorium from logging until further assessments are undertaken to identify boundaries of koala usage and determine meaningful and climate-resilient koala reserves. Given the identified importance of riparian vegetation in maintaining koala populations during droughts the government must rethink its intention to reduce headwater stream buffers via the [new logging laws](#).
3. For land clearing and private native forestry (PNF) existing data must be applied to identify areas of potential high-quality koala habitat and habitat linkages within ARKS for protection. For PNF, current koala prescriptions, including protection of all primary feed trees over 30cm in diameter, should be applied in all identified koala habitat.
4. Around the key urban areas (i.e. Potsville - Bogangar; Lismore; Brunswick Heads - Byron Bay; Iluka; Coffs Harbour - Repton; Port Macquarie; Nelson Bay - Raymond Terrace; Campbelltown -Wollondilly - Southern Highlands; Bermagui) there is an urgent need to build on existing work and SEPP 44 by getting a panel of independent experts to prepare koala plans that identify: remnant koala habitat for protection; corridors; key road crossings; key urban areas for encouragement of koala friendly measures (e.g. speed limits, koala friendly swimming pools, koala friendly fencing, control of roaming dogs); areas for replanting and funding requirements.
5. Current threats to koala habitat (logging, land clearing, urban development and PNF) are being considered in isolation by the NSW government, which poses huge threats to koala hubs and ARKS. There is an urgent need for the Federal Environment Minister to use powers under the *Environment Protection and Biodiversity Conservation Act* to intervene and consider cumulative impacts on the species before impacts worsen, with a view to concrete measures to protect koala habitat.

Section 1: Overlap between community reserve proposals ARKS and hubs

Figure 1 shows a map of the ARKS provided to NPA in the documentation (document 2 Figure 8). Red circles indicate koala reserves identified in NPA’s Blueprint and the 50 Parks document. All of the community reserve proposals contain at least part of an ARKS and, in some cases (such as the Great Koala National Park and Wang Wauk National Park) correspond very closely with and entirely contain ARKS.

Figure 8 Areas of Regional Koala Significance in NSW

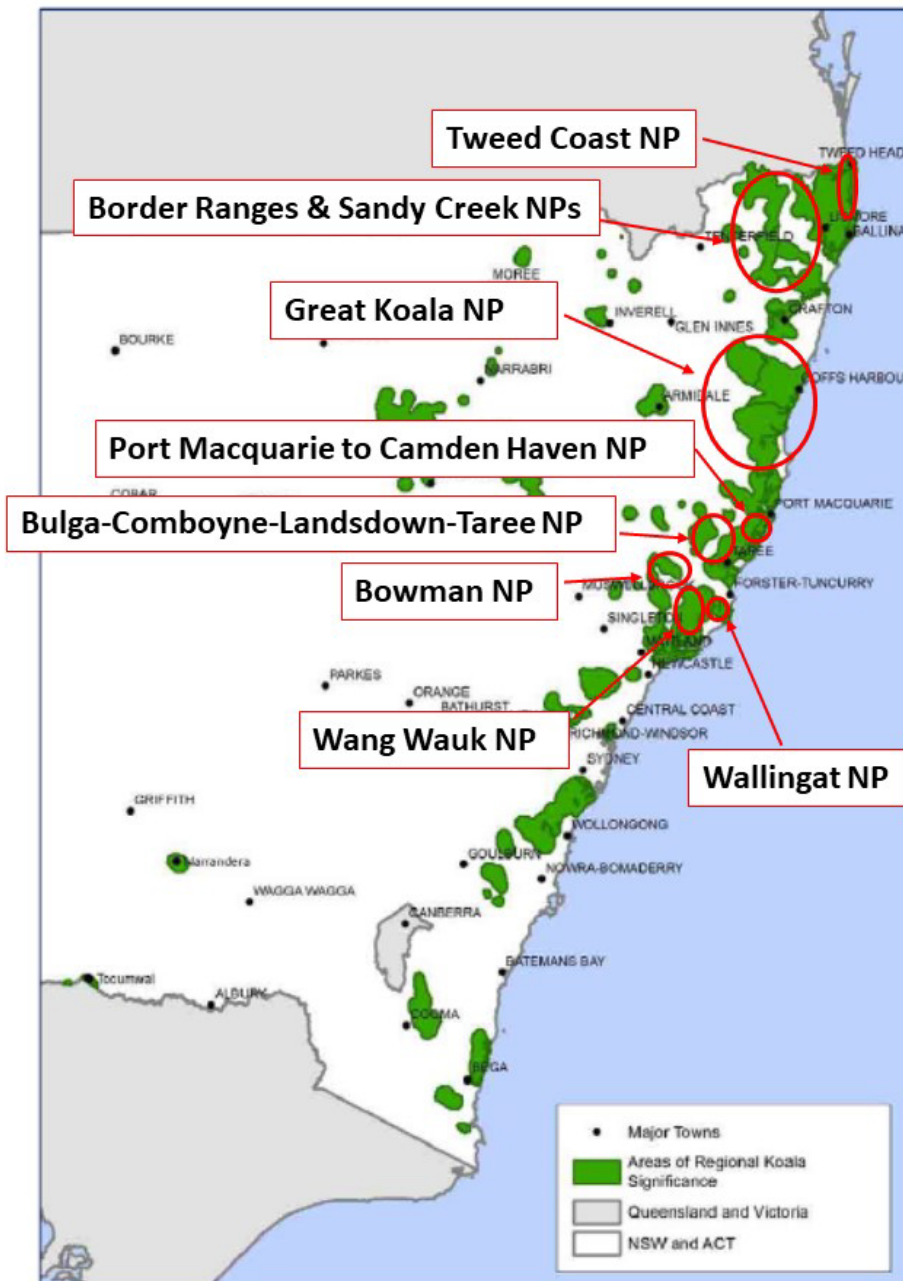


Figure 1: Map of ARKS in NSW (green polygons) provided to NPA under GIPA (Document 2, Figure 8), with indicative locations of community reserve proposals shown in red circles (greater detail is provided in NPA’s Blueprint).

Figures 2- 4 show the koala hubs (areas of local significance) and their overlap with the community reserve proposals:

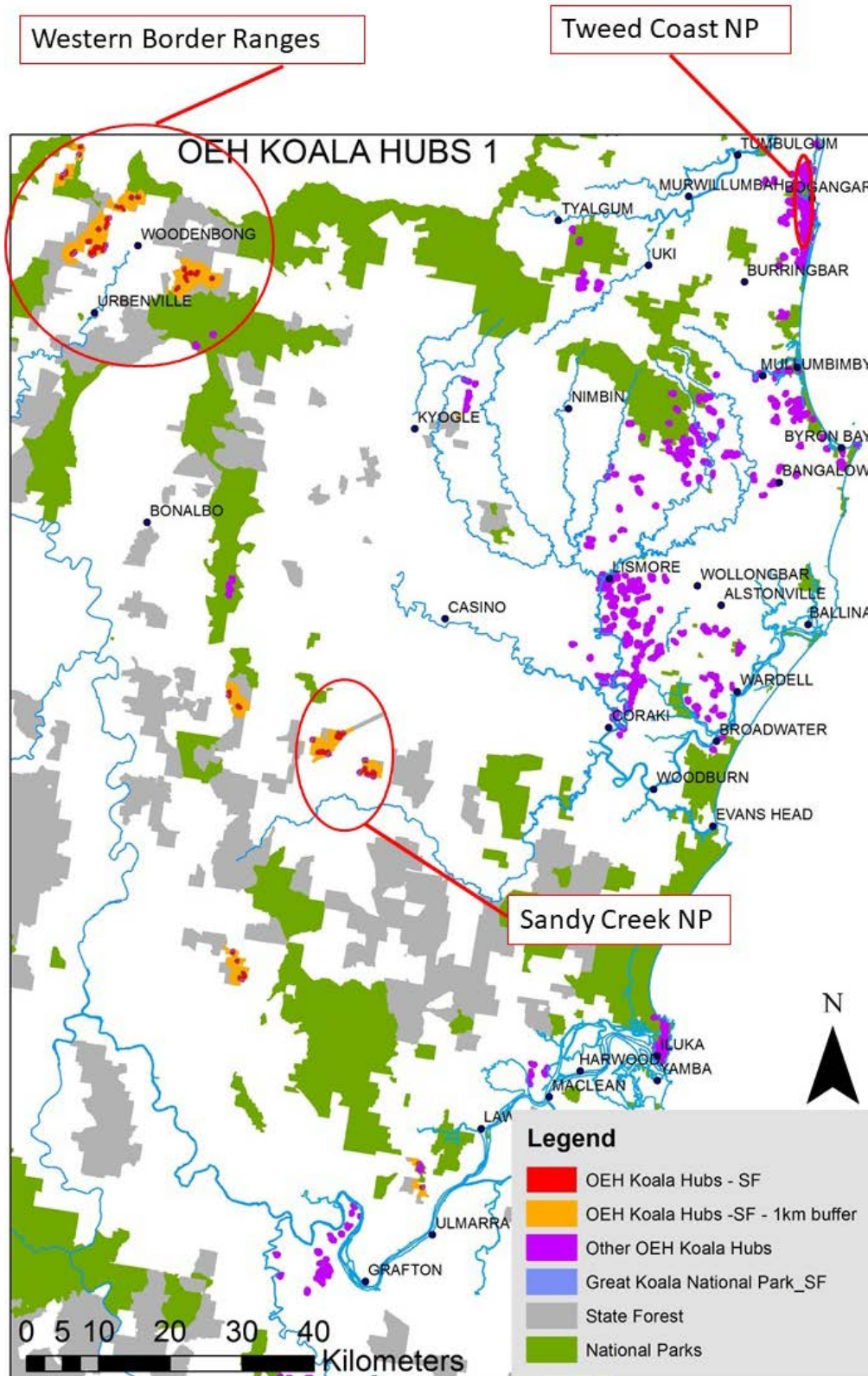


Figure 2: Koala hubs in state forest (red polygons) and on other tenure (purple polygons) from Grafton to the Queensland border. Koala hubs in state forests have had a 1km buffer applied (orange polygons). Red circles indicate the approximate boundaries of community national park proposals or, in the case of the Border Ranges, proposals to work with Aboriginal people to restore control of lands to Aboriginal communities and work towards rehabilitation of forest degraded by bell-miner associated dieback. Many hubs in this area are in close proximity to urban areas and therefore at risk. Map prepared by the North East Forest Alliance using data provided to NPA via GIPA.

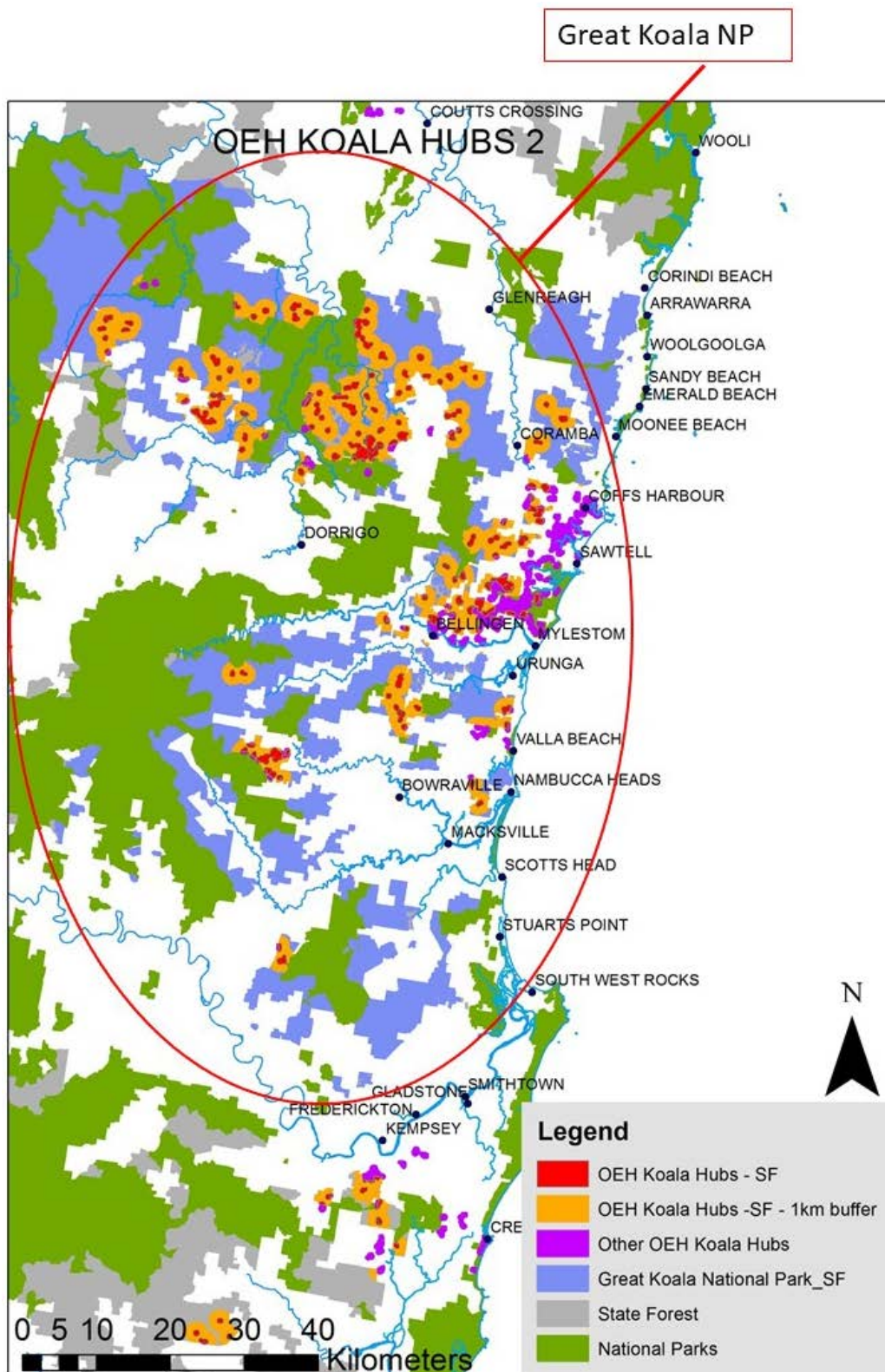


Figure 3: Koala hubs between Crescent Head and Woolgoolga in state forests (red polygons) and on other tenure (purple polygons). 1km buffers are shown as orange polygons. The state forest component of the Great Koala National Park is shown as a blue polygon, with the red circle indicative of the Great Koala National Park area. This map shows the importance of the GKNP proposal for the protection of koala hubs in this area, with 56% of hubs in north-east NSW contained within the proposal. Many hubs that are threatened by urban development on the Coffs Coast. Map prepared by the North East Forest Alliance using data provided to NPA via GIPA.

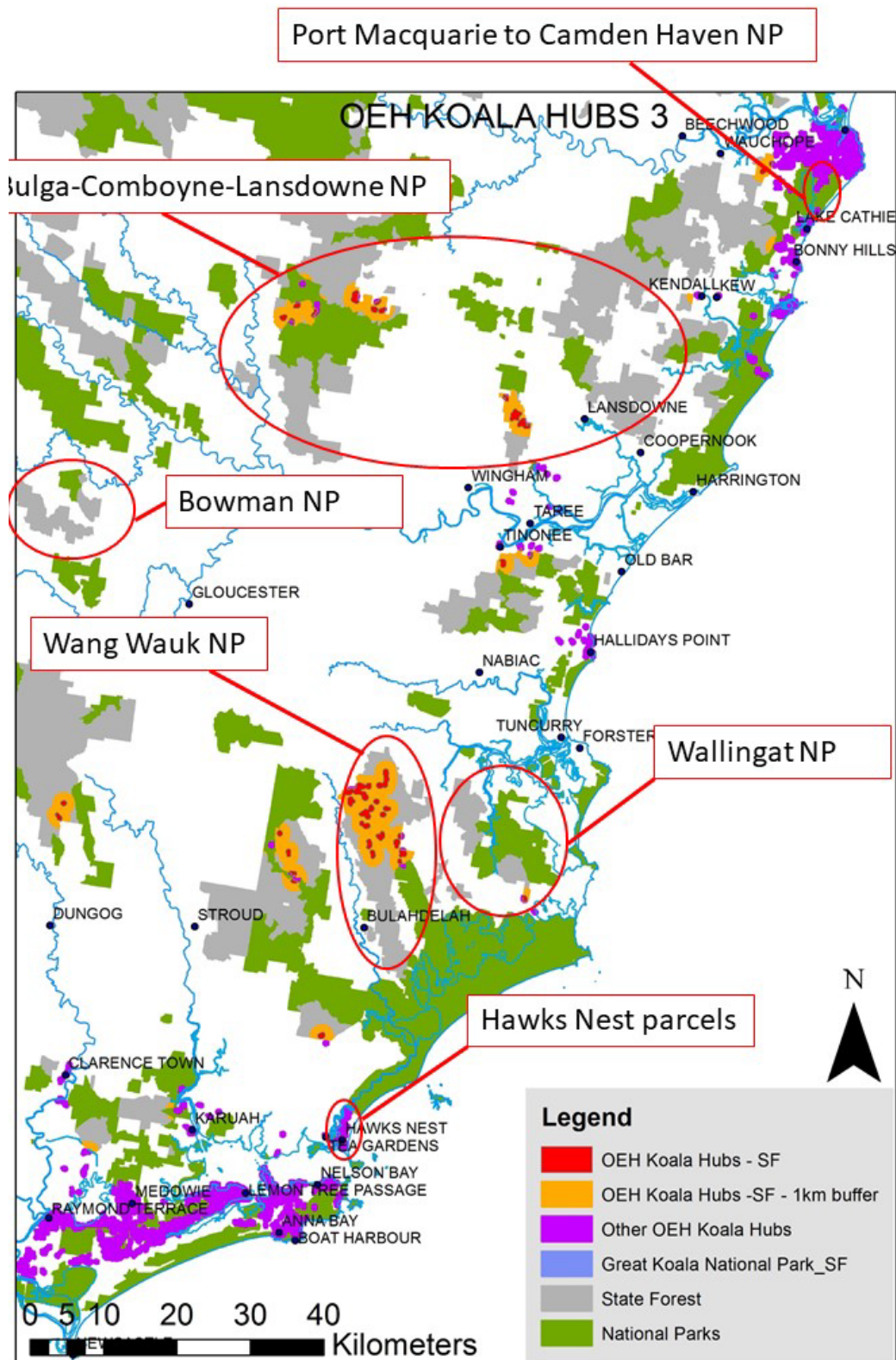


Figure 4: Koala hubs between Port Stephens and Port Macquarie. Hubs on state forest are shown as red polygons with a 1km buffer shown as orange polygons. Indicative boundaries of community reserve proposals are shown as red circles. Only the Bowman National Park proposal contains no koala hubs, with a particular concentration of hubs found in the Wang Wauk National Park proposal and Bulga-Comboyne-Lansdowne proposal. The vulnerability of hubs to urban development is clearly indicated by the concentration of hubs in close proximity to Port Stephens and Port Macquarie. Map prepared by the North East Forest Alliance using data provided to NPA via GIPA.

Section 2: Lack of overlap between hubs and ARKS and the government's koala reserves

At the time of release of the government's koala strategy in May 2018, the North East Forest Alliance released a report highlighting how few koala records were contained in the reserves, and how the reserves were mostly already protected in informal reserves (report available). The data provided to NPA confirm that the government's reserves overlap only minimally with OEH's identified koala hubs and ARKS, therefore appear to largely ignore the work done by OEH and as a consequence will make a minimal contribution to the protection of koalas. In fact, the government's koala reserves contain just 181 hectares of hubs, or 0.2% of the total area of hubs. Figures 5-8 demonstrate the lack of overlap.

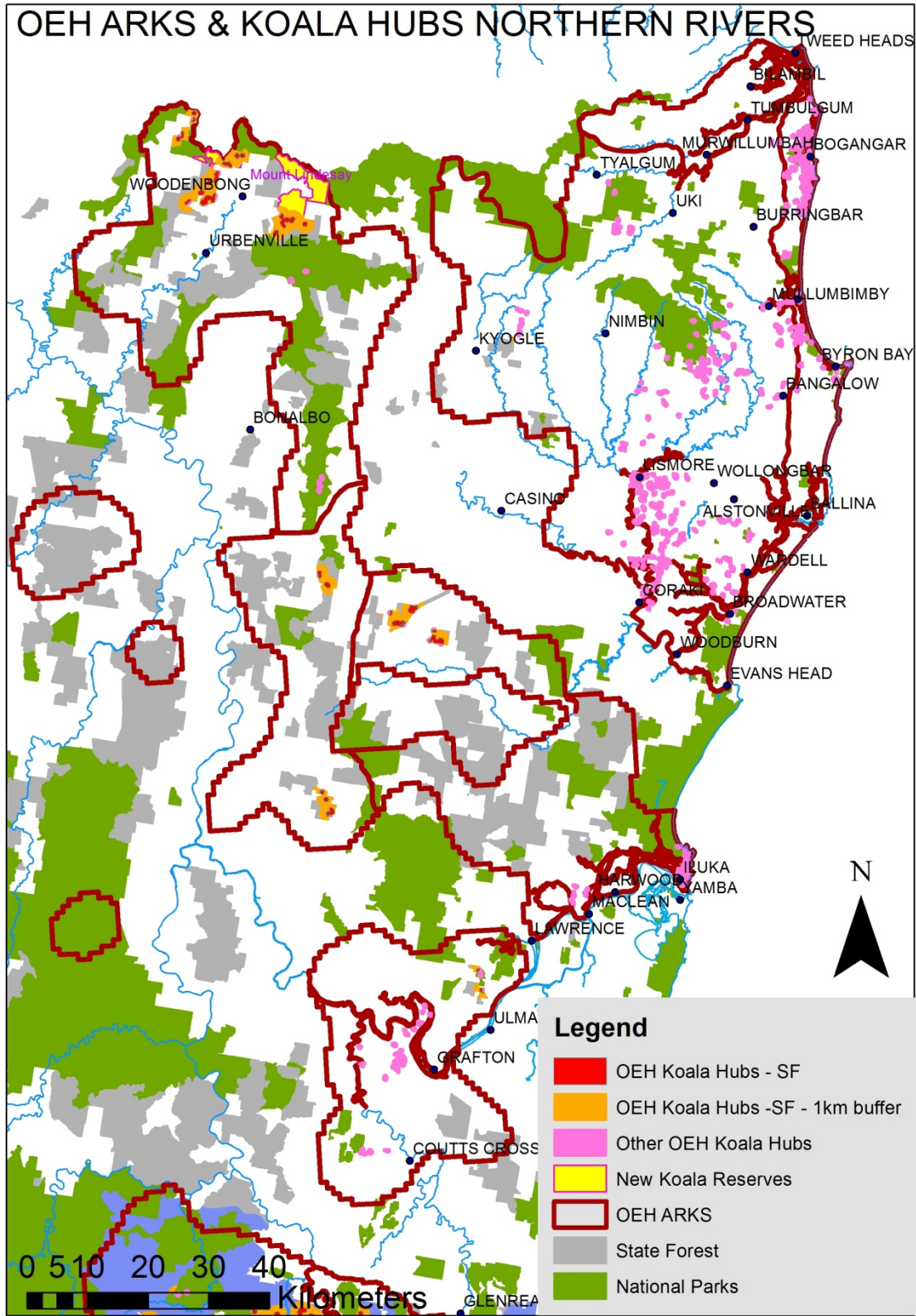


Figure 5: Location of ARKS (brown irregular circles) and hubs on state forests (red polygons) with a 1km buffer (orange polygons) and hubs on other tenure (pink polygons) between Grafton and the Queensland border. The Mount Lindsey koala reserve (yellow polygon in the north-west of the map) is contained within an ARKS and comprises 90 hectares of koala hub (though excludes extensive adjoining hubs), though there are major concerns about forest health in Mount Lindsey as a consequence of bell-miner associated dieback. Map prepared by the North East Forest Alliance using data provided to NPA via GIPA.

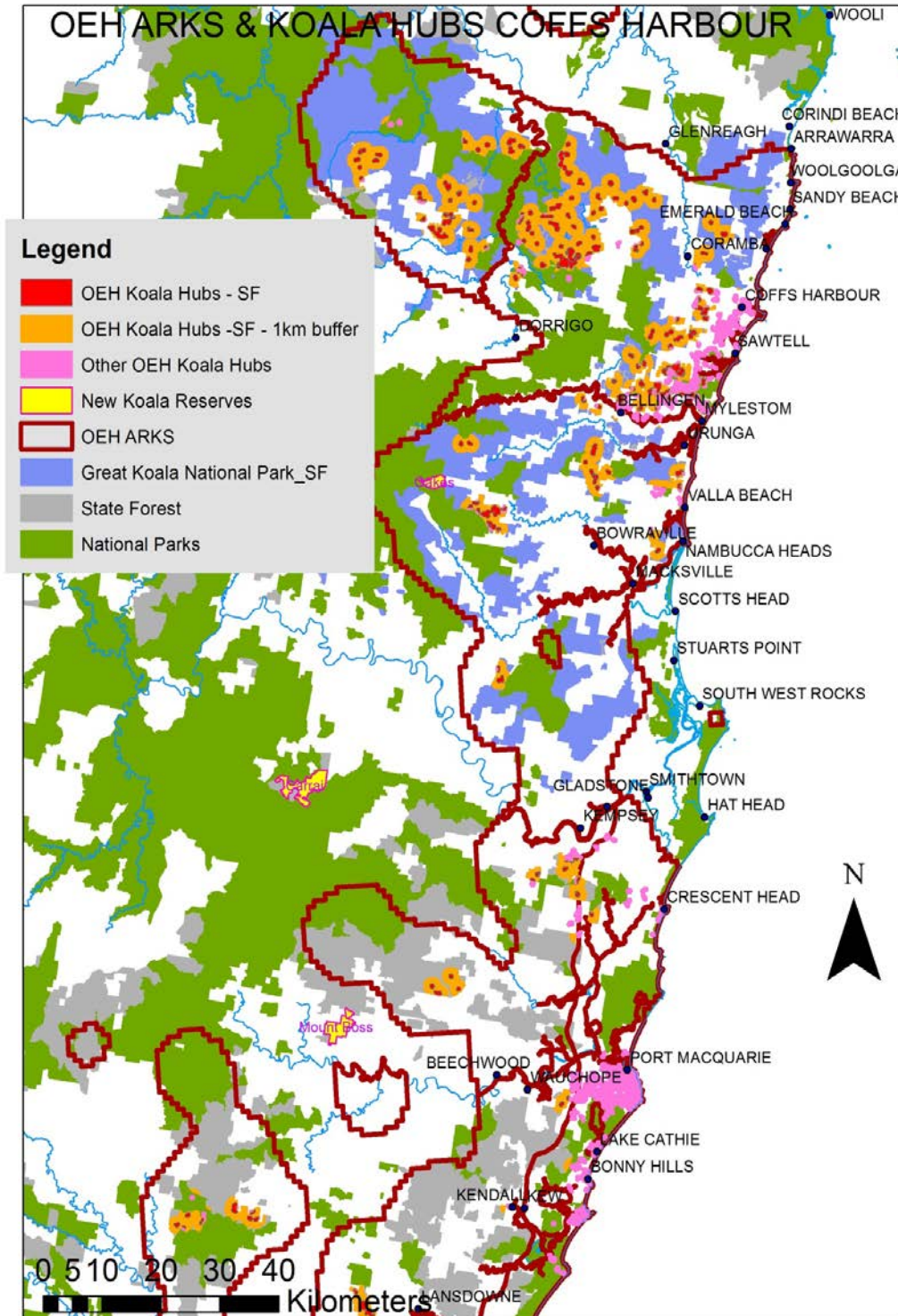


Figure 6: Location of ARKS (brown irregular circles) and hubs on state forests (red polygons) with a 1km buffer (orange polygons) and hubs on other tenure (pink polygons) between Kendall and Woolgoolga. The Oaks koala reserve (yellow polygon due west of Valla Beach) is contained within an ARKS but contains no koala hubs. Carrai (yellow polygon due west of Hat Head) and Mount Boss (due West of Port Macquarie) are not within ARKS and contain no hubs. Map prepared by the North East Forest Alliance using data provided to NPA via GIPA.

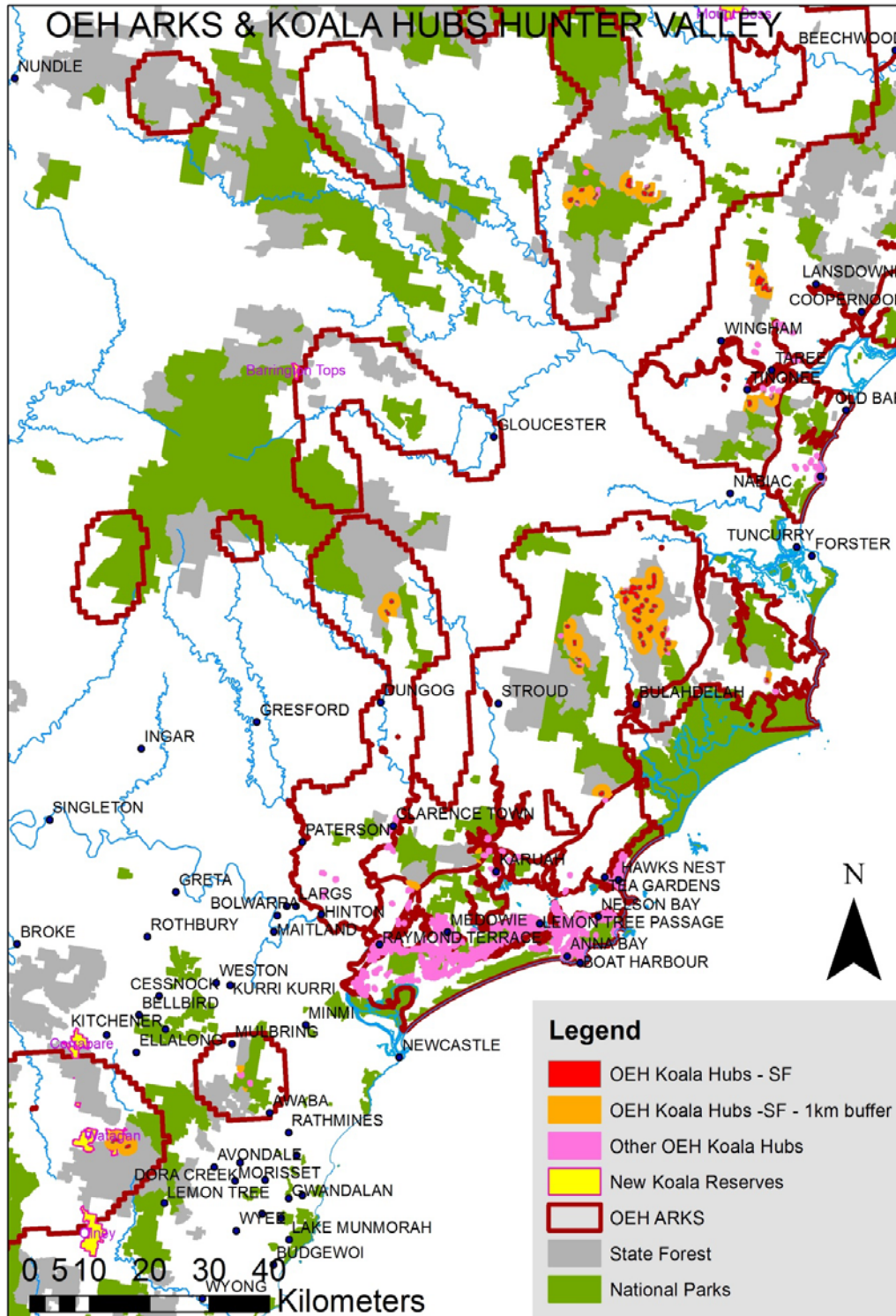


Figure 7: Location of ARKS (brown irregular circles) and hubs on state forests (red polygons) with a 1km buffer (orange polygons) and hubs on other tenure (pink polygons) between Wyong and Forster. Barrington Tops koala reserve (yellow polygon north west of Gloucester) and Corrabare koala reserve (yellow polygon due west of Newcastle) are outside ARKS and contain no hubs; Olney koala reserve (yellow polygon due west of Lake Munmorah) is mostly outside ARKS and contains no hubs while Watagan koala reserve (yellow polygon between Olney and Corrabare) is within an ARKS and contains 36ha of hubs. Map prepared by the North East Forest Alliance using data provided to NPA via GIPA.

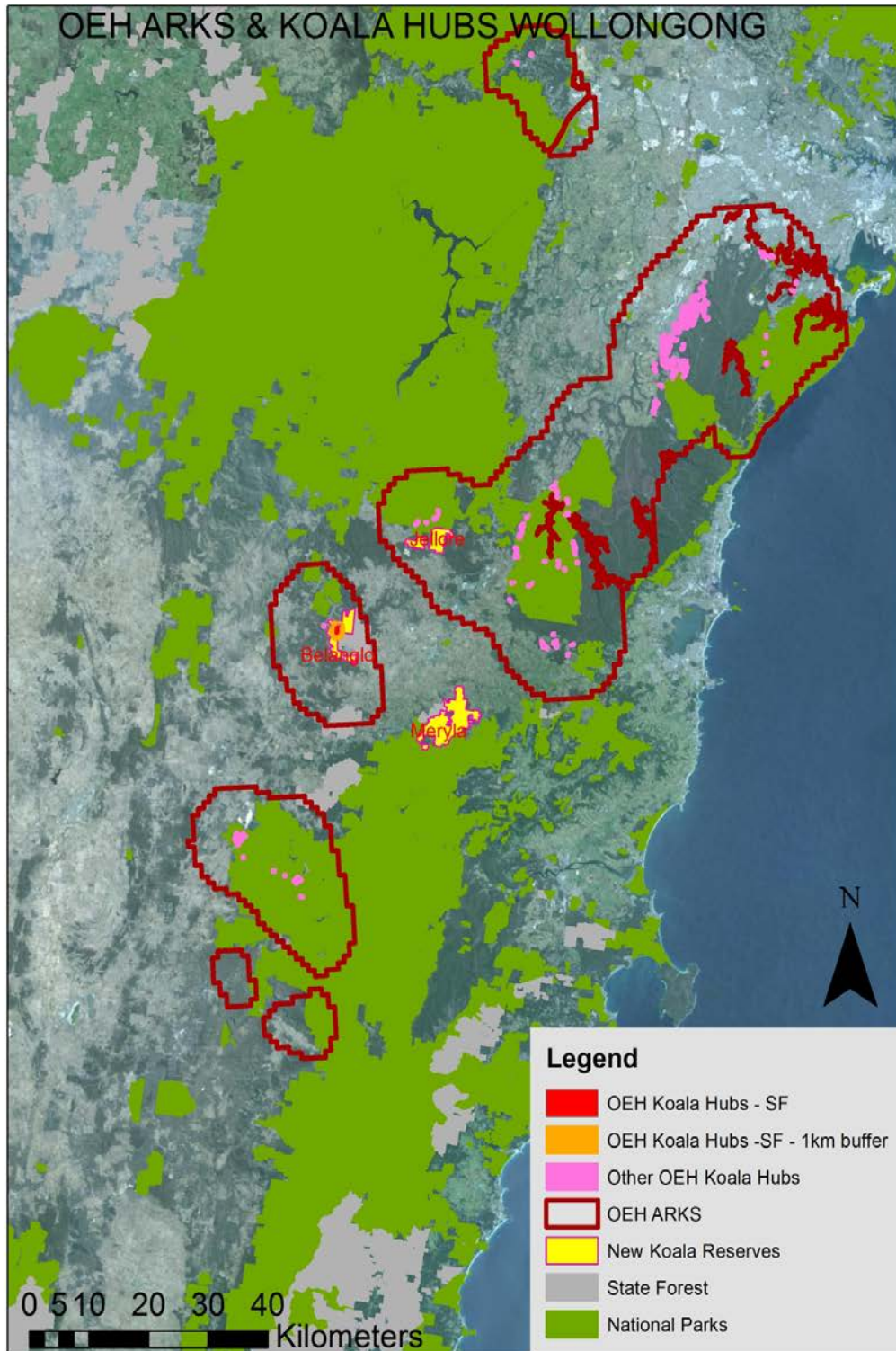


Figure 8: Location of ARKS (brown irregular circles) and hubs on state forests (red polygons) with a 1km buffer (orange polygons) and hubs on other tenure (pink polygons) between Sydney and the NSW Southern Highlands. Detailed topographic maps were not available here and so a satellite image was used. Meryla koala reserve is not within an ARKS and contains no hubs. Jellero koala reserve is within an ARKS but contains no hubs, while Belanglo is within an ARKS and contains 55ha of hubs. The high concentration of hubs in south-west Sydney/Wollondilly reflect the importance of this area for the protection of koalas, which is the subject of ongoing community campaigns to protect the Appin area from urban development. Map prepared by the North East Forest Alliance using data provided to NPA via GIPA.

Section 3: Resilience of ARKS and impacts of climate change on habitat suitability

OEH's ARKS include not only data on koala records and probability of occurrence, but include a measure of resilience that provides information on how future change will impact upon them (see Appendix 1 for further explanation). Figures 9 and 10 display the resilience of ARKS.

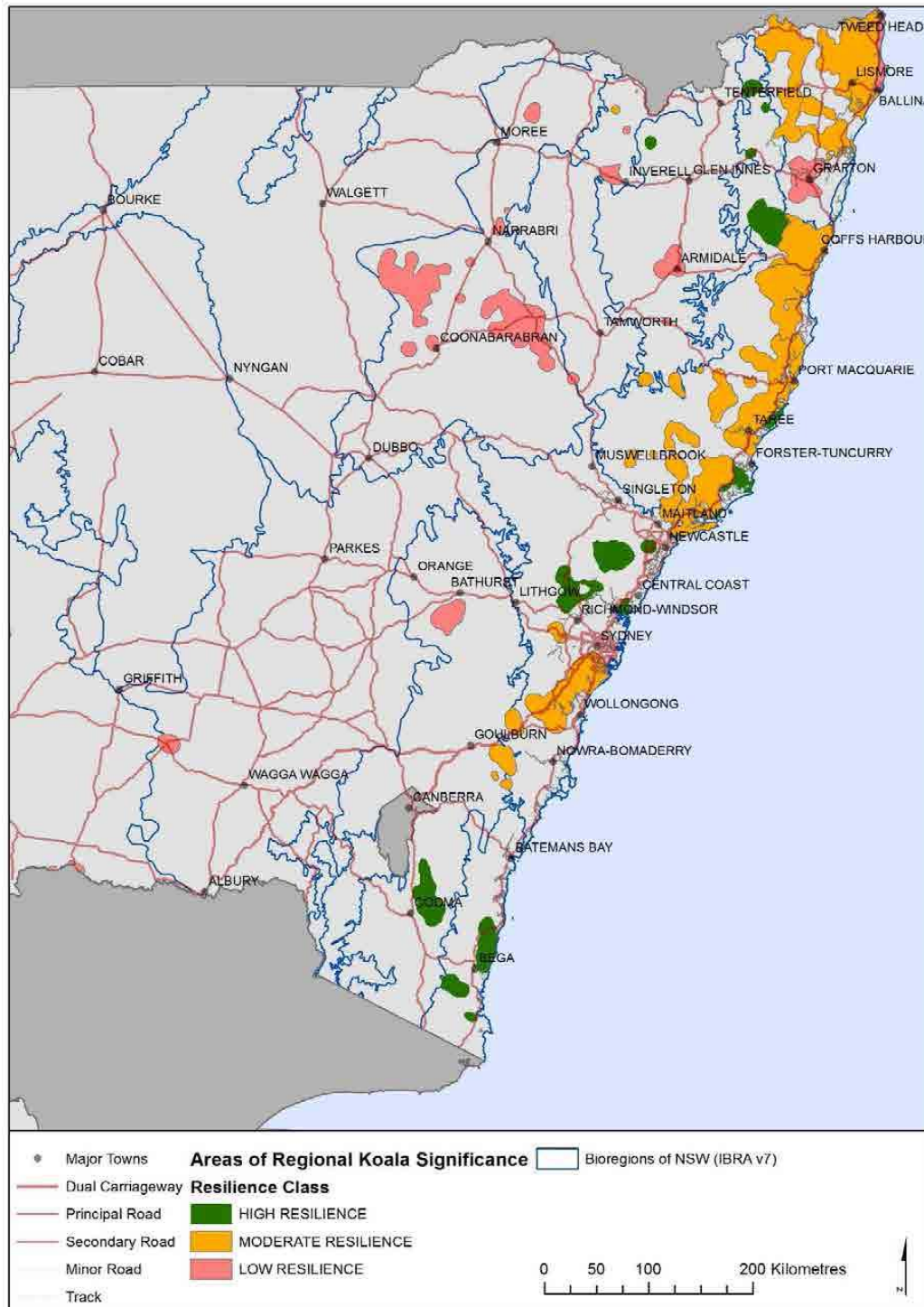


Figure 9: Resilience of koala ARKS in NSW (Figure 11, GIPA document 2). Resilience is determined by the amount of estimated functional habitat (see Appendix 1 for more detail). The low resilience in the west of the state is primarily due to the increasing instances of droughts and heatwaves due to climate change.

Figure 25 Likelihood of reduction in suitability of habitat from climate change – Eastern NSW

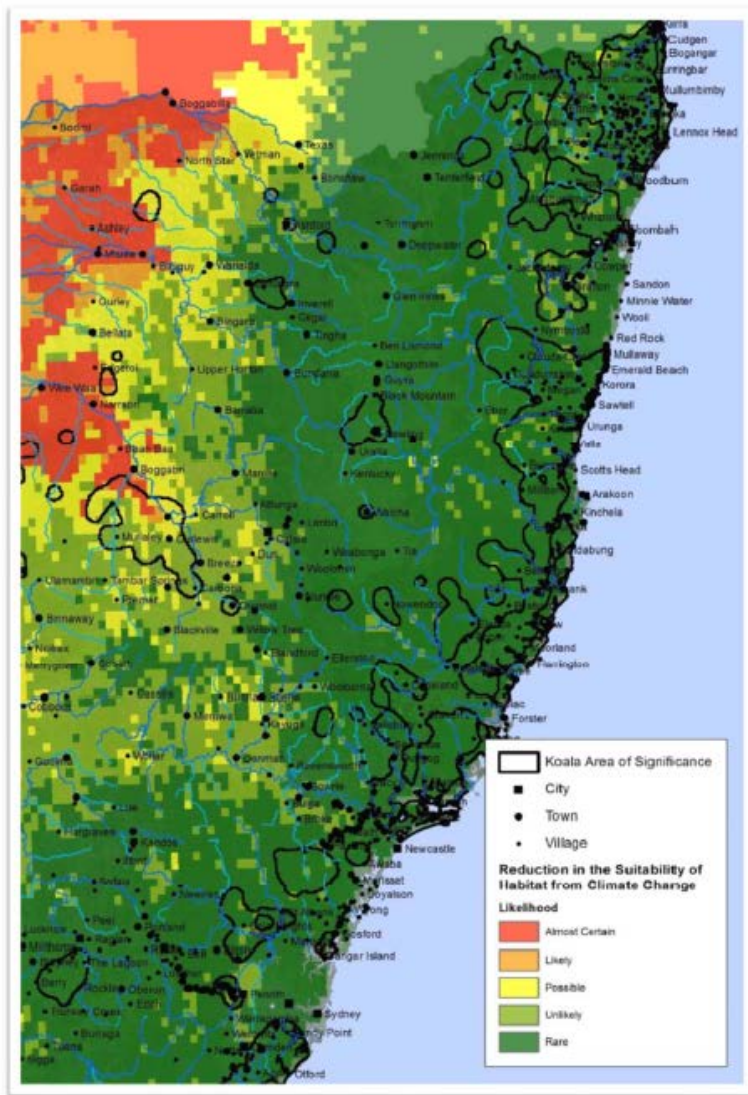


Figure 10: The likelihood of reduction in koala habitat suitability as a result of climate change in eastern NSW (see GIPA document 2 pg. 91 for further explanation). This map illustrates that coastal areas of NSW will function as important refuges for koalas as climate change progresses. This makes protecting habitat in coastal areas critically important if koalas are to persist in the face of climate change and ensuring vegetated links between western areas and the coast to enable koala populations to move in response to warming, drought and weather extremes.

Appendix 1: ARKS

The Office of Environment and Heritage has developed a Framework for the Spatial Prioritisation of Koala Conservation Actions in NSW (Rennison and Fisher 2018 – GIPA document 2). The process has involved the identification of Areas of Regional Koala Significance (ARKS) across NSW. Within each ARKS habitat quality and threats have been broadly mapped to identify priority areas and key threatening processes.

The Framework for the Spatial Prioritisation of Koala Conservation Actions in NSW (Rennison and Fisher 2018) gives the first requirement as "*Identify areas known to be occupied by significant koala populations in NSW*". For this they first identified Areas of Regional Koala Significance (ARKS) across NSW. ARKS are defined as regional scale areas of currently known, moderate to high density of koala occupancy. Spatial ARKS boundaries are based on kernel density analysis of recent koala records (1990-2016). ARKS are regarded as Regional Koala Populations. A total of 48 ARKS were identified, covering 4,195,549 hectares, giving around 5% of NSW mapped as being of significance for koalas.

For each ARKS key indicators were identified, including resilience classes, security classes, functional habitat classes, and threat risk classes.

Functional habitat is defined within the framework as being land which is expected to be able to support koala populations into the future, given current assumptions of threatening processes. The sensitivity to loss within each ARKS was estimated by assessing the availability of functional habitat to support a minimum population of 50 breeding females. The reservation level was based on the number of Koala records within protected lands. A resilience class was allocated using a simple classification of the amount of functional habitat estimated:

High resilience population - 70% or higher functional habitat

Moderate Resilience population - 30% – 70% (Moderate – High) functional habitat

Low resilience population - Less than 30% (Moderate – High) functional habitat

Of the 48 areas of regional koala significance recognised by the study across NSW, 13 have been ranked as high resilience, 22 as moderate resilience and 13 as low resilience.

Resilience of Areas of Regional Koala Significance for NSW. This shows the identified resilience of the identified ARKS (Fig 11 from Rennison and Fisher 2018, Figure 9 above).

To identify preferred Koala Habitat OEH utilised: Forest Maturity, Landscape Integrity (clearing, patch size), Habitat Suitability (presence of feed trees), Riparian Refugia (access to permanent water), and Koala Occupancy (Likelihood of Occurrence derived from Koala records).

Forest Maturity is considered a key factor in identifying Koala habitat on the basis that:

The structure of the forest canopy has been demonstrated to be linked to preference by koalas, with usage by koalas most common in trees of mature and senescent growth stages (over 30cm).

Forests with dominant mature and senescent growth stage and lower associated disturbance evidence are therefore presumed to have higher value for habitat. The NSW Koala Recovery Plan (DECC 2008) comments that many studies point to a preference for koalas utilising larger diameter trees.

Drought, heatwaves and Climate Change are recognised as significant threat to Koalas. Riparian refugia are considered a key factor in identifying Koala habitat, with "*access to permanent water in times of drought and heat stress considered important landscape features for koala populations during these high stress events*". Rennison and Fisher (2018) identify:

Where droughts are severe there is well documented evidence of the devastating effects on koala populations with Gordon et al. (1990) reporting a 63% reduction in the population numbers during a drought in southern Queensland in the early 1980s. In this case the only animals that survived the severe conditions were those in habitat close to permanent water holes. The defoliation of drought stressed trees resulted in the malnutrition and dehydration of koalas away from the better-quality habitat. In years to follow with good seasons the population did recover and recolonise the area.

This reinforces the importance of riparian vegetation as drought refugia for a plethora of threatened species and the folly of reducing riparian buffers on headwater streams down from a mere 10m to 5m. Riparian areas are of immense importance for the survival of many species as climate change gathers momentum.

These habitat attributes were used to undertake Values Integrity Mapping "*as a representation of the overall value of land for koalas, independent of any threatening processes*".

The Bioregional Assessment of Koala Populations in NSW (Rennison 2017 – GIPA document 1) cites the 2012 review as identifying that the north coast Koala population as 8,367 Koalas, with around a 50% decline. A separate records-based analysis also identified an "*overall decline*".

Threats are identified as:

- *Habitat loss, fragmentation and degradation (clearing of native vegetation, timber harvesting, mining exploration, land use)*
- *Urbanisation*
- *Collisions with Motor Vehicles*
- *Predation by wild or domestic dogs*
- *Wildfire and Intense prescribed burns*
- *Drought, Heatwave*
- *Disease*
- *Reduction in suitability of habitat from the effects of Climate Change*

For the north coast the primary threats identified are habitat loss, urbanisation, vehicle collisions and dogs.

Appendix 2: Hubs

The Office of Environment and Heritage (undated) have analysed Koala records "to delineate highly significant local scale areas of koala occupancy currently known for protection", noting:

These areas are not designed to be an exhaustive account of all koala presence across NSW, but rather define areas of currently known significant koala occupancy that indicate clusters of resident populations known as Koala Hubs.

A total of 567 Hubs were identified. Altogether, 101,768 hectares, or around 0.13% of NSW is mapped as Koala Hubs.

Table 1: Proportion and area of Koala Hubs on different tenures in NSW, north-east NSW, the Great Koala National Park and in the NSW government's koala reserves. This table indicates four key things: i) that hubs are found primarily on private land and in state forest; ii) that north-east NSW contains three quarters of hubs in NSW; iii) that the Great Koala National Park is of paramount importance due to the concentration of hubs within its boundaries and iv) that the government's koala reserves contain a small fraction of NSW's koala hubs. (Note there are some small differences to OEH figures due to GIS reporting).

	Mapped Koala Hubs NSW		Mapped Koala Hubs NE NSW		Great Koala NP		NSW Koala Reserves	
	(ha)	% hubs	(ha)	% NSW	(ha)	% NSW	(ha)	% NSW
National Park	15,904	16	10,532	66	2,521	16		
State Forest	19,755	19	15,522	79	8,697	44	181	0.9
Private	66,162	65	51,463	78	0			
TOTAL	101,821		77,517	76	11,218	11	181	0.2

Of the OEH mapped Koala Hubs in NSW, 35,656 ha (35%) occur on public lands. Some 19,755 ha (55%) of these are on State Forests. It is likely that greater survey effort in hinterland areas will significantly increase the number of koala hubs identified and better delineate their extent.

With some 77,517ha, most (76%) of OEH's Koala Hubs occur in north east NSW. These are primarily concentrated around the coastal areas of the Tweed coast, Iluka, Coffs Harbour, Port Macquarie and Port Stephens, as well as around Lismore - which in part reflects the hubs' bias towards areas with both high koala populations and large numbers of observers.

We know that koalas are in real trouble in most of these coastal areas and there is little meaningful protection for them from clearing and logging on private land or from urban development. This makes the koala hubs remaining on public lands of outstanding importance for the survival of this iconic species.

A precautionary approach requires that all OEH mapped koala hubs, along with one kilometre buffers, be immediately placed under logging moratoria until surveys can better delineate the extent of core koala habitat around these nodes for protection. With the buffers included these areas represent some 10% of state forests, so it is an achievable interim measure.

Only three of the Government's recently announced 12 koala reserves in north-east NSW encompass a total of 181 ha (0.9%) of the koala hubs in state forests, which confirms other evidence that most of the reserves do not encompass important, if any, koala habitat.

Conversely the proposed Great Koala National Park encompasses 8,697ha (44%) of the OEH koala hubs in state forests in NSW, confirming existing evidence that it is the most important area of public

land for koalas in NSW. There can be no doubt that its protection is warranted and that it will make a significant contribution towards koala conservation.

The koala hubs also highlight other areas of state forests known to be important for the future of koalas in NSW, such as Royal Camp and Carwong State Forests near Casino (incorporated in the proposed Sandy Creek National Park), Wang Wauk state forest near Bulahdelah, and state forests around Woodenbong. These forests are in need of rehabilitation, not more degradation.

A moratorium on the koala hubs identified by OEH for a protection will buy koalas some respite until a comprehensive scientifically-based and resilient koala reserve system can be established.