

EUROBODALLA KOALA RECOVERY STRATEGY
REVISED EDITION
2021



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INTRODUCTION and SUMMARY

This strategy is based on research and consultation undertaken since 2011 and still ongoing.

This revised edition replaces the original strategy published in 2013.

It has been prepared by the Eurobodalla Koala Project, a citizen science movement sponsored by The Coastwatchers Association Inc (the Eurobodalla's not-for-profit environment group) with non-binding incidental support from the Commonwealth Government, Forestry Corporation NSW Southern Region and National Parks and Wildlife Service South Coast Branch.

The strategy is deemed necessary because wild koalas across NSW now face extinction within 30 years and the Eurobodalla offers a temperate climate, documented history of koala presence (albeit mostly on alluvial lowlands in the 19th Century, then very low density since the mid-20th Century), and large-scale forested spaces (albeit mostly remnant on rugged country with low fertility soils) as a possible safety valve. There are also community, cultural, employment, training and business advantages for the Eurobodalla in exploiting its koala story, establishing commercial sanctuaries and encouraging this iconic animal's persistence in the wild.

We believe this is the first relevant publication to emerge after the 2019-2020 fires. The Eurobodalla Koala Project has researched the fires' impact on habitat, demonstrating the necessity for urgent, deliberate protective and rehabilitative action.

Koalas within the boundaries of the Eurobodalla Shire have been at such low density since the mid-20th Century that sightings are now only reported about twice every decade. Prior to that, koalas appear to have been widespread in low density or as dispersing individuals across the Shire, with isolated pockets of higher density resident groups. The main reason for the decline is habitat loss, especially on the lower slopes and more fertile soils. Koalas are an indicative species whose habitat is shared by many important others which are also in decline. They are therefore a productive focus for the concept of rewilding.

Wild koalas in the south east require home ranges of up to 350 hectares for a single "breeding association" (eg a dominant male, a breeding female and a few others) plus viable corridors up to 50 kilometres long, connecting home ranges for dispersing animals to breed. This means the whole forested landscape of the Eurobodalla and beyond needs to form part of a very large habitat mosaic. This has implications for State and Local Government level planning, development approvals, native forest protection and rehabilitation, watercourse management, fire and predator management.

This strategy outlines principles for planning and approval, giving some examples of practical actions.

The chapter on *Tree Species* describes the browse requirements of local koalas and contains a list of eucalypt species that require special protection and can also be used for plantings.

Subsequent chapters address the importance of other habitat factors, the roles of public and private landholders, potential business initiatives and the need for an informed community, and provide a resource pool.

The volunteer Eurobodalla Koala Project works on Yuin country. The authors acknowledge local Elders and Local Aboriginal Lands Councils, not only for their significance as original and continuing custodians but also for their current initiatives such as the development of a cultural burning regime providing youth training and a service to private properties.



Smoking Ceremony at re-opening of Mogo Wildlife Park, February 2020

BACKGROUND RESEARCH

Three local research documents produced in 2013 and 2021 as well as contemporary NSW Government materials and the previous Eurobodalla Koala Recovery Strategy edition, contain the evidence-based context for this revised strategy. The local perspective is strengthened by numerous references on the koala habitat subject from elsewhere in Australia.

“HABITAT ASSESSMENT AND KOALA REVIVAL PROSPECTS IN THE EUROBODALLA, NSW - A PILOT STUDY” January 2013 established a theoretical basis, constructed a predictive habitat model for enquiry and analysis, and drew some conclusions after a year of testing through a literature search, fieldwork sampling and preliminary Geographic Information Systems (GIS) mapping. The pilot study suggested a recovery strategy, having explored local koala history, studied potential local habitat and nominated places where the best habitat appeared present based on the then known mix of browse species. It contains a comprehensive reference list.

<http://www.coastwatchers.org.au/wp-content/uploads/2017/06/Eurobodalla-Koalas-Project-Pilot-Study-Report.pdf>

Testing of multiple additional habitat factors was undertaken during an intensive research expedition to Bendethera, described in “EUROBODALLA KOALAS PROJECT – BENDEThERA MAY 2013 – SURVEYS AND ANALYSIS REPORT”. <http://www.coastwatchers.org.au/wp-content/uploads/2017/06/Bendethera-Report.pdf>

These studies laid the groundwork for the Commonwealth-funded “EUROBODALLA KOALA HABITAT AND OCCUPANCY PROJECT – GILMORE ELECTORATE – COMMUNITIES ENVIRONMENT PROGRAM 2019-2020”. This study concentrated on a potential breeding corridor between Wamban and Nerrigundah. The study included a major section on fire impact because of the legacy of the 2019-2020 summer. Published in 2021 its report drew cautious conclusions with the benefit of new state-wide research, datasets and GIS technology. It also recommended *this recovery strategy be implemented immediately, while a 3-to-10 year monitoring program occurs supported by a community-based survey technique*.

https://eurokoalas.files.wordpress.com/2021/03/report_wamban-nerrigundah-project_gilmore-electorate.docx.pdf

NSW Government resources are continually updated and have contributed to this strategy’s research background. Publicly available datasets and maps on the BioNet repository “SEED” display topography, vegetation patterns, koala habitat ratings, fire history, geology, soil, watercourses, land use and administrative boundaries. <http://www.bionet.nsw.gov.au/>

The NSW Government Review of Koala Tree Use Across NSW was published in 2018, also updating the patterns of browse species use by koalas on the south coast and across all other

regions. <https://www.environment.nsw.gov.au/research-and-publications/publications-search/a-review-of-koala-tree-use-across-new-south-wales>

Also publicly available are Forestry Corporation NSW Forest Type Maps and some history and condition data for logging compartments

<https://www.forestrycorporation.com.au/operations/harvest-plans/south-coast>.

and mapping associated with the formal and informal reserve system on State Forest

<https://data-fcnsw.opendata.arcgis.com/search>

Eurobodalla Koala Project volunteers have intensified private property surveys for their koala habitat features and established a public awareness strategy. They have begun work on a carrying capacity study of the East Lynne precinct and a review of the habitat significance of the Bodalla State Forest precinct, both sites of post-wildfire koala reports between December 2019 and May 2020.

There is substantial interest in the idea of koala reintroduction through translocation amongst the private property owners wanting surveys done, but there is also considerable naivety about the issue's complexities. Combined with a lack of specific knowledge amongst the general community, this indicates the need for enhanced public education as part of this recovery strategy.

Eurobodalla Koala Project researchers in the Wamban Creek area, Deua National Park, 2020



PLANNING AND APPROVALS

(GOVERNMENT AND AUTHORITIES ACTION)

This section provides some strategies for Local Government (as well as State and Federal) and associated agencies and authorities to facilitate the recovery of the koala population in the Eurobodalla

Principles

- Protect and restore koala habitat at both localized and landscape scales.
- Ensure vegetation connectivity and avoid fragmentation.
- Recognize the importance of topography, soils and water as wildlife habitat factors.
- Prioritize koala browse species in tree protection and tree planting.
- Recognize that koalas can live successfully near humans, including in suburbs and towns.
- Be proactive in modern climate change mitigation, fire and dog control strategies.
- Recognize the relationship between koala revival and a good lifestyle and economy – koalas are worth around \$3billion annually to the Australian economy.

Some Practical Actions

- In concert with the NSW Government, Forestry Corporation NSW and National Parks and Wildlife Service, Eurobodalla Shire Council's plan for protecting native wildlife across the whole LGA should include a plan for creating and/or preserving large regional-scale wildlife corridors between substantial areas of koala habitat.
- Ideally, approve only developments that have not cut down any native trees. Developments on old, cleared farmland, and old housing or industrial sites are suitable.
- Approve only developments that have preserved or added to wildlife corridors. Development-scale wildlife corridors should be wider than 100 metres, continuous, preferably beside streams or waterways and not alongside roads. They should be planted at all levels (compatible sedges, grasses, shrubs, understorey and large trees).
- Ideally, 30% of the site should be representative of the natural ecosystem on that site, so if the site was Ironbark forest for example, at least 30% should be that type of forest.
- Include safe highway crossings. Cars, trucks and dogs kill koalas at a higher rate than they can breed. Underpasses are suitable but avoid narrow ones that create a natural funnel for feral predators to exploit, or long ones that koalas will not use. Rope-bridge overpasses with pole access are also suitable but can provide dining tables for owls, so consult experienced Councils and Roads & Maritime Services NSW for advice.

- Consult the Koala Plans of Management used by Councils like Lismore, Byron, Tweed and Ballina for detail on town planning, infrastructure design, specialized installations like street lights etc.
- Community tree planting days are very valuable as a practical contribution to restoring vegetation but also as a public education tactic.



VEGETATION CONNECTIVITY

Simple Google Earth images graphically display the fragmentation caused by historical clearing for farming and urban development without adequate vegetated corridors. On the other hand, they also give indications of where remediation could feasibly occur to enhance connectivity.

This first example shows Meringo to the east where suitable koala habitat trees are still present on acreages with sympathetic owners, the Princes Highway at the centre, and Moruya State Forest which offers koala habitat to the west. Clearly the historical fragmentation is capable of remediation. The interrupted corridor across the highway south of Bergalia needs to be refreshed and widened. Collaboration between Council, private landholders and Roads & Maritime Services NSW would achieve this with relative ease.



This second example displays a much more complex mosaic, with lost opportunities along the coastal urban strip and the obvious disruption caused by the cleared infrastructure line, but there are also avenues for positive action.

Sympathetic householders at Lilli Pilli (a property with Blackbutt and Spotted Gum) and Tall Gums Way (Spotted Gum and Coast Grey Box) are interested in their connectivity to Mogo State Forest via the wooded Council lands around Deep Creek Dam. They look upon it as a legacy to work on for future generations. Cooperating neighbours, large and small, will be essential.

Protected animal crossings at strategic points on the infrastructure line should be well designed and monitored. Retrofitting the Princes Highway with animal underpasses or overpasses might be difficult but should be considered.

Widespread thinning on ridges and multiple cleared patches in this image demonstrate the task ahead for Forestry Corporation NSW and Eurobodalla Shire Council in repairing the broad scale health of their tenures in this area. The danger of further clearing and fragmentation in the future is apparent.

A visionary urban reforestation program in the heavily developed component might be contemplated.



TREE SPECIES

This table compares tree species commonly found in the Eurobodalla with documented evidence of their rates of use by koalas on the south coast and in other regions (*KMA = Koala Management Area*). Simply by selecting the “high” and “significant” use species for the south coast and elsewhere, an idea can be obtained of which ones require special preservation or are wisest to plant.

Species	High use KMA	Significant use KMA	Irregular use KMA	Low use KMA
E saligna (Sydney Blue Gum)		North Coast	Central Coast	
E scias (Red Mahogany)		Central Coast		
E botryoides (Bangalay)		Central Coast		
E longifolia (Woollybutt)	Central Coast; South Coast			
E cypellocarpa (Monkey Gum)	Central Coast; South Coast		Southern Tablelands	
E bosistoana (Coast Grey Box)	Central Coast; South Coast			
E paniculata (Grey Ironbark)	Central Coast			
E tricarpa (Red Ironbark)	South Coast			
E muelleriana (Yellow Stringybark)	South Coast			Central Coast
E globoidea (White Stringybark)	Central Coast; South Coast	North Coast		Central & Southern Tablelands
E agglomerata (Blue-leaved Stringybark)	Central Coast		South Coast; Central & Southern Tablelands	
E fastigata (Brown Barrel)				South Coast

E sieberi (Silvertop Ash)	Central Coast	South Coast	Central & Southern Tablelands	
E consideniana (Yertchuk)		South Coast		Central Coast
E piperita (Sydney Peppermint)		Central Coast; Central & Southern Tablelands	North Coast	
E smithii (Gully Gum)				Central Coast
E angophoroides (Apple-topped Box)	<i>No data as yet</i>	<i>No data as yet</i>	<i>No data as yet</i>	<i>No data as yet</i>
E baueriana (Blue Box)			Central Coast; South Coast	
E maidenii (Maiden's Gum)	South Coast			
E elata (River Peppermint)		Central Coast		South Coast
E pilularis (Blackbutt)	Central Coast	North Coast		
E radiata (Narrow-leaved Peppermint)	Northern Tablelands	Central Coast	Central & Southern Tablelands	
C maculata (Spotted Gum)			North Coast; Central Coast; South Coast	
A floribunda (Rough-barked Apple)		South Coast; Northern Tablelands	North Coast; Central Coast	North West Slopes
A costata (Smooth-barked Apple)		North Coast		Central Coast
C gummifera (Red Bloodwood)			Central Coast	North Coast; South Coast
E obliqua (Messmate)		South Coast	Northern Tablelands; Central & Southern Tablelands	

Allocasuarina littoralis (Black She-Oak)			North Coast	Central Coast; South Coast; Northern Tablelands; Central & Southern Tablelands
Acmena smithii (Lilli Pilli)				South Coast

This list is a work in progress. In places like the Eurobodalla where koala numbers are very low, statistically significant faecal pellet counts have not been undertaken. There are also climatic and soil conditions that affect the nutritional components of browse variably in the same species across different regions. The list is a good guide for now, but those using it for conservation or planting purposes should stay up to date with emerging NSW Government data. Positions best suited to each species can be checked in popular references or by consulting arborists or nurseries.

Below is a selection of Eurobodalla species where position, drainage, soil type, rainfall etc have been specified by the Australian Koala Foundation.

- *E. agglomerata* Blue-leaved Stringybark: shale-derived soils, gentle to moderate slopes, good levels of subsoil moisture
- *E. amplifolia* ssp. *amplifolia* Cabbage gum: by streams or in lower moister sites, in deeper loamy soils
- *E. baueriana* Blue box, Round-leaved box: low rolling hills on well-drained granitic soils, elevations below 500m, 700–1100 mm rainfall
- *E. bosistoana* Coast grey box, Gippsland grey box, Bosisto's Box: lowland areas on better quality soils, particularly over limestone, 700 to 1200 mm
- *E. botryoides* Bangalay, Southern mahogany: sandstone or shale-based soils generally close to the coast
- *E. consideriana* Yertchuk, Prickly Stringybark: shale or sandstone-derived soils
- *E. cypellocarpa* Mountain grey gum, Mountain gum, Monkey gum, Spotted mountain grey gum, Pyrenees Gum: wet forest on deep fertile soils in sheltered valleys
- *E. globoidea* White Stringybark: moist well drained soils in foothills
- *E. globulus* ssp. *maidenii* Maiden's gum: heavy clay loam or sand, wet forest on fertile soils in valleys in subcoastal ranges
- *E. longifolia* Woollybutt: near coastal, soils of medium fertility, often on alluvial flats
- *E. mannifera* ssp. *mannifera* Brittle gum, Red spotted gum: always on dryish, often stony sites, skeletal soils of plateaus and hill slopes, cold, frost-prone sites

- *E. melliodora* Yellow box, Honey box, Yellow ironbox: gentle slopes, foothills or on flats near watercourses. Soils include alluvials, loams and clays, frost and drought tolerant, 500-1400 mm
- *E. muelleriana* Yellow Stringybark: coastal plains and foothills often on nutritionally poor soils but grows well on well-drained deep clay loams
- *E. obliqua* Messmate Stringybark: fertile acidic well-drained loams, > 600 mm rainfall, drought tolerant
- *E. ovata* var. *ovata* Swamp Gum: poor drainage or swamps
- *E. piperita* ssp. *urceolaris* Sydney Peppermint: sandstone-derived soils on plateaus, slopes and gullies, drought tolerant
- *E. robusta* Swamp Mahogany: swampy, seasonally waterlogged soils, very moist fertile soils, heavy clay, sandy clay, alluvial sand soils
- *E. tereticornis* ssp. *tereticornis* Forest red gum, Blue gum, Red iron gum: alluvial soils, 600-2500 mm, tolerates salt-laden coastal winds, tolerates saline soils, medium-heavy clays, does not tolerate waterlogged soils
- *E. tricarpa* Red ironbark: 550-1000 mm, tolerates slight frosts, drought tolerant, well-drained, wide variety of soils
- *E. viminalis* ssp. *viminalis* Manna gum: lower slopes adjacent to major streamlines, well-drained alluvial or sandy loam soils with clay subsoils, tolerates frosts

The numbers are: m = elevation (height above sea level); mm = annual rainfall in millimetres.



A stand of *Eucalyptus cypellocarpa* (Monkey Gum/Mountain Grey Gum) – Getty Images

TOPOGRAPHY, GEOLOGY, SOIL, SHADE AND WATER

Other key habitat factors to be taken into account in planning, approvals, revegetation or planting are topography, geology, soil, shade and access to reliable water.

Although evidence shows they are not hard and fast conditions, the best features of koala habitat (at least for higher density home ranges) include:

- Slopes of 20 degrees or less
- North or West facing aspects
- Underlying basalt or alluvium geology
- High nutrient soils
- Good canopy cover for shade in hot weather
- Reliable, clean fresh water within about a kilometre

These happen to be conditions favoured by humans for farming, housing and industry, so much of the best habitat in the Eurobodalla is already lost to koalas. The reason why modern sightings of Eurobodalla koalas are so rare is that the large spaces of remnant forest now tend to occur only on more rugged country with lower fertility soils.

The implication for land management agencies and private landholders is therefore that any remnant optimal sites must be preserved and linked up, and opportunities to resume and repair optimal sites should be grasped.



Climate Change

Another implication is that agencies, landholders and the wider community must play their part in alleviating the worst impacts of climate change, because research is already showing koala numbers are affected by increasing average temperatures and changes to nutrients in browse species because of factors like CO₂ in the atmosphere.

Fire

Increasingly frequent intense wildfire will diminish the density of eucalypt species across the landscape, let alone killing the animals directly. Patterns observed in the Gilmore Electorate study suggest Wamban koala numbers dropped dramatically after the 1952 and 1968 fires, so the 2020 fire could be the death knell if any remained after the last-known evidence of 2013. (*The Gilmore Electorate case study contrasts with NSW Department of Primary Industries research in North-East NSW suggesting the fires did not impact on koala numbers, however 70% of habitat remained unburnt there, whereas only 10% of forest remains unburnt in the South-East.*) Each intense wildfire appears capable of reducing eucalypt density by up to 15% in the short term, with at least a couple of decades required for regrowth to reach adequate size.



Accordingly, a deliberate and nuanced approach to fire management is required, using still-evolving contemporary research. Current initiatives of the NSW Rural Fire Service include updating risk management plans and the range of treatments.

Householders should take advice from experienced RFS personnel about how far to clear from their buildings while still preserving trees nearby for their protective cooling effect. The *Bushfire Program* and *Hotspots Program* within the NSW Nature Conservation Council's *Healthy Ecosystems Program* include workshops and neighbourhood collaborations to prepare fire management plans in rural and urban fringe settings. Smaller private landholders interested in

the protection afforded by Indigenous cultural burning should engage with Batemans Bay Local Aboriginal Lands Council.

The same principle of balance between clearing and preserving trees for fire safety should apply to landscape-scale managers Eurobodalla Shire Council, Forestry Corporation NSW and National Parks and Wildlife Service, and for private native forestry managers. There is a careful balance to be struck between clearing fire breaks, broad-scale hazard reduction and preserving/planting trees to prevent an increasingly hotter, drier landscape which exacerbates the cycle of unmanageable firestorms. New hazard reduction techniques are required.



Multiple contemporary resources and emerging research are available at the website of the multi-university *Bushfire Recovery Project* (see [Resources](#) – [Useful Websites](#), below).

PUBLIC AND PRIVATE LAND-USE ENTITIES

(LOCAL ACTION)

This section provides a list of suggestions for action that could be taken now (and in the longer term) by agencies, groups or individuals wanting to be part of a Eurobodalla Koala Recovery Strategy.

“Public land-use entities” we define as those with formal or traditional responsibility for managing lands on behalf of the whole community. In this category we include:

- Aboriginal Elders and their organisations
- Local Aboriginal Lands Councils
- Eurobodalla Shire Council
- Forestry Corporation NSW Southern Region
- National Parks and Wildlife Service South Coast Branch

“Private land-use entities” we define as those usually considered to be managing lands on behalf of themselves or with a special focus, however they also have a responsibility to the whole community. In this category we include:

- Farmers
- Property owners or managers with private native forests
- Urban, peri-urban, hobby farm and bush-block dwellers
- Businesses
- Not-for-profit community groups

Actions public land-use entities might choose to consider:

Adapt and adopt a guide to best planning practice for koala conservation and recovery (eg Ballarat Koala Plan of Management). These guides address how much habitat is enough; patch size; patch shape; habitat integrity; connectivity corridors; threat management; rezoning; and, development applications. The Ballarat example includes an intensive community education campaign about the preparation of land management plans by property owners, and dog, traffic and fire management strategies.

Provide support for a representative of the volunteer Eurobodalla Koala Project to manage the Eurobodalla Koala Recovery Strategy, such as office space, equipment, communications and a nominated staff liaison person.

Establish a Eurobodalla Shire Council Vegetation Protection Overlay with a koala habitat orientation, with controls applying to land that falls within the overlay.

Issue public guidelines for planting trees with a koala habitat orientation.

Modify conditions for future Development Applications to include: retention of preferred koala food trees; lot sizes; prohibitions on the keeping of domestic dogs; traffic speeds and buffer zones; fencing and underpasses; direction of street lighting; and, options for seeking developer contributions for compensatory habitat protection.

The LGA is already fragmented and future koala management will benefit from development of an informed network of linkages and corridors, none of which necessarily need to compromise existing land uses. Include examination of relative sizes and locations of land that is predominantly vegetated by trees compared with that which is not.

During initial consultation on this strategy, volunteers had suggested the location of Forestry Corporation NSW compartments and coups, the intensity of the contemporary logging regime and the adequacy of protected zones within compartments (ie their breadth and connectivity with others) might warrant review.

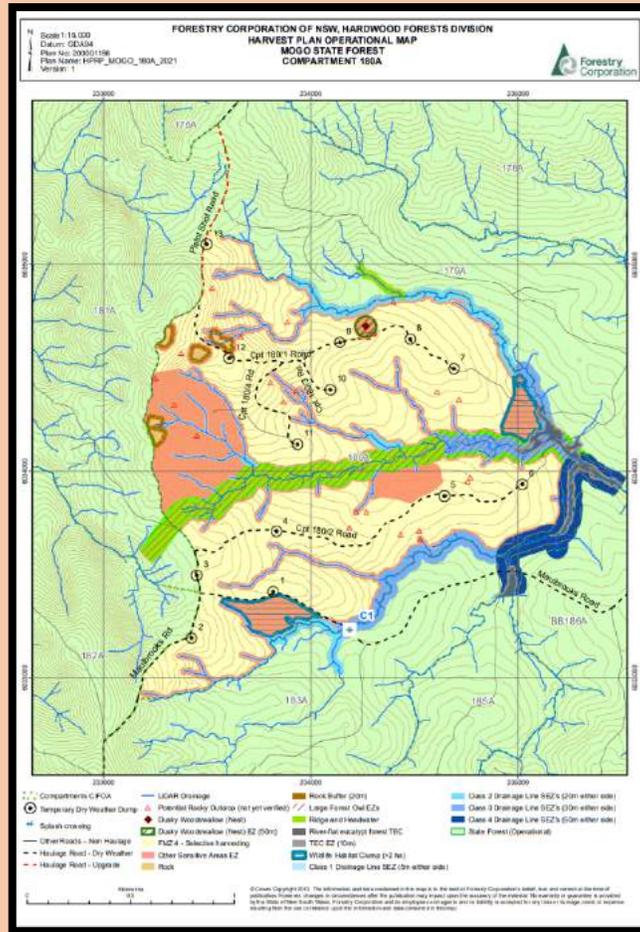
FCNSW Southern Region provided excellent feedback, noting that timber harvesting on State Forest is regulated by the Coastal Integrated Forestry Operations Approval. Integral to this is ensuring forestry operations maintain threatened species populations, including Koala. There is a current formal and informal reserve system on State Forest, which is incorporated in Harvest Plans mapping. The system is described by the FCNSW Forest Management Zones, including comprehensive GIS mapping.

Compliance obligations at operational level appear devolved to Regions via the Harvest Plans. It is the detail of Harvest Plans, especially their maps and lists of species to be harvested, that illustrates the comparative locations, sizes and the various exclusion zones within Compartments. The Operational Plans for Compartments are very detailed, including maps which make it possible to trace and query the width of exclusion zones and connectivity features from one Compartment to another. They also permit close-scale and broad-scale analysis of tree species, slope, disturbance, harvest and silviculture history, koala presence etc.

Action at State or Regional Forest Agreements levels would be required if policy and regulatory aspects need reform. The NSW Forestry Industry Roadmap is a relevant starting point at https://www.dpi.nsw.gov.au/data/assets/pdf_file/0005/711851/nsw-forestry-industry-roadmap.pdf. Under *Regulatory Modernisation*, the roadmap includes the commitment: “The

NSW Government will implement a modern regulatory framework for the NSW forestry industry that ensures the industry is ecologically sustainable.”

Time and resources permitting, Eurobodalla Koala Project volunteers might review the formal and informal reserve system for its adequacy from the koala habitat standpoint, as a 2022 research priority.



Should Eurobodalla Shire Council wish to take a proactive leadership role, the following is a simplified summary of short-term priorities Council might consider:

1. In concert with Forestry Corporation and NPWS, nominate potential tenure-wide low density koala home range areas and connectivity corridors, urban, peri-urban, semi-rural and rural, for both rehabilitation and protection purposes.
2. Implement planning policy to ensure development is compatible with the rehabilitation and preservation of these zones.
3. With help from other agencies, support a Council staff or resourced external advisory position responsible for coordinating the Koala Recovery Strategy and advising stakeholders on implementation detail.
4. Lead or sponsor a community education initiative.

Here is a guide for public land-use entities to transition from short term to long term actions if recovery seems to be succeeding after the suggested 3-to-10 year monitoring program.

It is an example of how a Koala Plan of Management might be implemented if a Eurobodalla population persists or is revived through reintroduction.

- *Evaluate and rank koala habitat throughout the Eurobodalla LGA;*
- *Identify priority conservation areas and strategies to protect significant koala habitat and populations;*
- *Identify threats that impact on koalas and koala habitat;*
- *Provide for the long-term survival of koala populations by devising conservation strategies to effectively address each of the threats impacting on koalas and koala habitat;*
- *Provide for the restoration of degraded koala habitat areas;*
- *Ensure that adequate detail is provided with Development Applications in order to assess, minimize and ameliorate likely impacts on koala habitat;*
- *Provide guidelines and development standards to protect koalas and koala habitat;*
- *Provide for effective public awareness and education programs concerning koala conservation issues;*
- *Encourage appropriate eco-tourism programs;*
- *Provide a formal approach for the assessment, retrieval, rehabilitation and release of sick, injured, orphaned or distressed koalas;*
- *Identify potential funding sources for implementation of the Koala Plan of Management;*
- *Facilitate targeted koala conservation and management-oriented research projects within the Eurobodalla LGA.*

Performance Indicators for such a Plan of Management might be:

- *Loss of koala habitat within areas identified as Koala Habitat, Habitat Buffers and Habitat Linking Areas is:*
 - i) minimised and restricted to that permissible in accordance with the performance criteria for development applications; and*
 - ii) reduced in each successive year over an initial five-year period.*
- *Annual koala population assessments undertaken at designated monitoring sites indicate that the majority of the surveyed koala populations, including urban populations, are stable or increasing (determined on the basis of activity levels, evidence of successful breeding, signs of disease, mortality and survivorship, and population estimates) within 5 years from the adoption of the Plan of Management.*
- *Annual statistics indicate a decrease in koala mortality due to collisions with motor vehicles, in conjunction with stable or increasing koala population estimates in the vicinity of identified black spot areas.*
- *Annual statistics indicate a decrease in koala mortality due to dog attacks, in conjunction with stable or increasing koala population estimates in the vicinity of identified high risk dog-attack areas.*
- *A minimum of 20 hectares of koala habitat per year is replanted (and successfully maintained in subsequent years) throughout the LGA in areas identified as a high priority for restoration.*

Road treatments and management strategies would be required, as follows:

overall design considerations;
fauna exclusion or guide fencing;
underpasses;
overpasses;
signage and 'cats eye' reflectors;
lighting;
verge treatment;
median strip treatment;
other reflectors;
road speed limits;
traffic calming;
cuttings and walled areas;
road works;
public awareness and community participation; and,
monitoring.

Miscellaneous

Develop long-term monitoring programs to enable the tracking of the success or otherwise of working provisions that may be promulgated for any planning area; data on population size and the extent and distribution of currently occupied areas will be fundamental to future planning and monitoring of any persisting or reintroduced population.

Establish a Minimum Viable Population (MVP) of koalas within the Local Government Area long term, accompanied by nomination of large and virtually unroaded habitat patches within a relatively short period of time (10 – 15 years). Such an initiative might benefit from staged actions, encompassing: securing identified habitat areas; translocating koalas; developing restoration management plans; undertaking habitat restoration works; transferring certain development rights; reviewing the efficacy of koala management guidelines; holding discussions with landholders.

Actions private land-use entities might choose to consider:

Private forest owner/managers might wish to prioritize:

1. Maintaining a viable mix of koala browse species on forested private land.
2. Maintaining trees of sufficient size (the larger the better; minimum DBH 150mm).
3. Maintaining habitat connectivity between forested private land and adjacent forested areas.
4. Rehabilitating degraded areas.

Farmers might wish to prioritize:

1. Selecting koala feed trees for wind-break and other farming purposes.
2. Rehabilitating degraded river flat and low hill country by planting koala feed species.
3. Maintaining native species connectivity across the farm, and between the farm and neighbouring areas.
4. Minimizing obstacles to safe koala ground movement.
5. Keeping fresh water sources (eg creeks and springs) clean and viable.
6. Minimizing disturbance (eg control dogs and avoid unnecessary clearing or burning).
7. Minimizing the use of toxic substances.

Urban and peri-urban dwellers might wish to prioritize:

1. Becoming familiar with the basic behaviours and habitat needs of low-density koala populations (eg residency in and across urban, peri-urban, semi-rural, rural and wilderness conditions; size of home ranges; makeup of breeding associations; breeding ages and movement; eucalypt browse species; the need for safe ground-level passage from one feed tree to the next; dog danger; traffic strike danger; fire danger).
2. Preserving and where possible planting browse species.
3. Controlling dogs.
4. Collaborating with neighbours and local government to enhance the mosaic of interconnected habitat.

Aboriginal Elders Groups and Local Aboriginal Lands Councils might wish to prioritize:

1. Participating in the public education program to ensure an Indigenous perspective.
2. Forming alliances with private property owners wanting to establish sanctuaries, for youth training, employment and cultural promotion purposes.
3. Adding koala habitat surveys as an activity for clients in Aboriginal guided tours.

Three aspects we feel deserve special efforts of their own are dog control, business initiatives and public awareness.

Dog Control

Wild dogs, inadequately controlled working dogs or roaming domestic dogs are a particularly destructive predator for koalas. In the short term, this Eurobodalla Koala Recovery Strategy envisages a revived low-density koala population in already forested areas. Leaving aside further intense wildfire within a couple of decades, dogs in this context would threaten localized extinction for any tenuously small koala group that might be present currently or might re-establish. The implications for State Forests, National Parks and all private dog owners are obvious. The longer-term vision of koala rewilding in urban and urban fringe spaces, would of course have strong implications for dog control.

Business Initiatives

The spectacular bush hinterland of the Eurobodalla is an under-marketed and under-utilized resource for eco-tourism and other types of entrepreneurship. Even in circumstances where clients will never see a koala, the mystique of a rare, iconic animal struggling to survive the forces of modernity in remote, remnant bushland offers the opportunity for creative business models, product design and innovative advertising. The approach has been used successfully in and around Gunnedah consistent with that setting. Businesses of all types and sizes might wish to consider developing this “mystique” theme as a suitable one for the Eurobodalla. Chambers of Commerce might wish to consider it.

Private sanctuaries as partnerships with other businesses or venture capital (they are expensive to establish and run) offer an opportunity to develop the koala theme using captive animals for display, education, research, insurance population breeding, breeding for export, youth training, Aboriginal cultural events and all kinds of leveraging amongst transport, accommodation, food and beverage, and government support services.

Mutually beneficial entrepreneurial partnerships between private businesses, Forestry Corporation NSW Southern Region and National Parks and Wildlife Service South Coast Branch could also be considered.

Public Awareness

Activity by the volunteer Eurobodalla Koala Project over the past decade has found keen interest in the koala subject and good will amongst all community sectors, including good local knowledge and clear memories amongst long-term residents. On the other hand, the community's undoubted thoughtfulness is accompanied by lack of detailed knowledge of the fundamentals of koala habitat, breeding patterns and population dynamics. For the Eurobodalla Koala Recovery Strategy to work, lifting this level of community knowledge is vital. The volunteer group will continue its public awareness effort, but collaborative involvement from larger, better resourced and official entities would make a difference.



RESOURCES

Useful Websites

Australian Koala Foundation

<https://www.savethekoala.com/our-work/conservation-and-research>

Koala Clancy Foundation

<https://www.koalacancyfoundation.org.au/learn-about-koalas/koala-research/>

Friends of the Koala

<https://www.friendsofthekoala.org/learn/education-and-research/>

NSW Rural Fire Service

<https://www.rfs.nsw.gov.au/resources>

Nature Conservation Council Bushfire and Hotspot Programs

<https://www.nature.org.au/healthy-ecosystems/>

Bushfire Recovery Project

www.bushfirefacts.org

Sustainable Farms

<https://www.sustainablefarms.org.au/research>

NSW Department of Planning, Industry and Environment

<https://www.environment.nsw.gov.au>

On this site, for a concise background on koala matters we recommend the *Review of Koala Tree Use Across New South Wales*, pp vii-viii and pp 1-5

<https://www.environment.nsw.gov.au/research-and-publications/publications-search/a-review-of-koala-tree-use-across-new-south-wales>

Forestry Corporation NSW

<https://www.forestrycorporation.com.au/>

Institute of Foresters Australia

<https://www.forestry.org.au/>

Legislation and Environment Protection Authority

<https://www.epa.nsw.gov.au/licensing-and-regulation/legislation-and-compliance>

Koala Plans of Management

Koala Plans of Management in other Local Government Areas that are most relevant to the Eurobodalla context are:

- Lismore
- Port Stephens
- Cobbadah/Manilla/Tamworth
- Ballarat

These were summarized along with others in the *Eurobodalla Koala Recovery Strategy First Edition* (published 2013) at

<http://www.coastwatchers.org.au/wp-content/uploads/2017/06/Final-Eurobodalla-Koala-Recovery-Strategy.pdf>

