From:	s. 73(2) - Not rele
To:	Holly Sorohan
Cc:	Luke Lankowski; s. 73(2) - Not relevant/ Out of scop
Subject:	Response for additional information - proposed Southside TLPI
Date:	Friday, 13 December 2019 3:24:44 PM
Attachments:	image001.jpg November - Response to DSDMIP for additional information.pdf
Importance:	High

Good afternoon Holly,

Please find attached Council's response for additional information for the proposed Southside TLPI. This has also been uploaded to DSDMIP's Plan Making Portal this afternoon.

Council understands that the State my need to extend the paused timeframe to allow for the assessment of this additional information.

If you have any questions, please don't hesitate to contact me.

Kind Regards

s. 73(2) - Not relevant/ Out
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PLANNING STRATEGY AND MAJOR PROJECTS

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Significant Risk in Southside Structure Plan Area

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1.0 Significant Risk in the Southside Structure Plan Area Summary

A Temporary Local Planning Instrument for the protection of biodiversity matters in the Southside Structure Plan Area is needed:

- To mitigate the significant risk of serious adverse environmental conditions happening in the Gympie Regional Council area, as a consequence of:
    i. Continued development pressure in this area given this area is identified as a key growth area in the Wide Bay Burnett Regional Plan 2011 and is subject to a Council-endorsed Structure Plan. This includes many landowners, who aren't developers, seeing the benefit in on-selling cleared 'development ready' land.
    ii. The absence of any controls around the clearing of vegetation (outside of a Material Change of Use or Reconfiguring a Lot application) under the current Planning Scheme.
    iii. MLES not being adequately reflected in current mapping, instead relying on a Planning Scheme Overlay Map based on 2005 data.
    iv. Number and complexity of State government exemptions for clearing and from development assessment (as this area is an 'urban' area)
    v. Locally significant koala habitat is not captured by State government mapping (limitations of the current MSES mapping)
    vi. Lack of detailed information on biodiversity values at the time of developing the Structure Plan (which has now been ground-truthed).

- To mitigate the significant risk of serious adverse economic conditions happening in the Gympie Regional Council area, namely:
    i. Significant economic impact resulting from the loss of biodiversity values
    ii. The environment is a key pillar to the region's economy, as discussed in Council's endorsed Tourism Strategy 2019 – 2024
    iii. The Gympie region's environment attracts visitors from within Australia as well as internationally (13,000 visitors from the United Kingdom, 10,000 visitors from Germany and 4,000 visitors from the Scandinavian market)
    iv. Nature-based tourism is a mega trend with great significance in the Gympie region

- As Council has investigated other amendment process options and concluded that the delay involved in using the process in section 18 of the *Planning Act 2016* to amend the local planning scheme would increase the risk to environmental and economic matters.

PRE-RELEASE

1.1 Introduction

The information within this document is provided in response to the Department of State Development, Manufacturing and Planning's (DSDMIP) pause notice issued on 22 November 2019 to facilitate ongoing discussions regarding the proposed Temporary Local Planning Instrument 02/19 Southside Structure Plan Area (TLPI). Specifically, this document demonstrates, as requested by DSDMIP, the TLPI's compliance with the following criteria set out under section 23(1) of the *Planning Act 2016*:

a) that there is significant risk of serious adverse cultural, economic, environmental or social conditions happening in the local government area
b) the delay involved in using the process in section 18 to amend the local planning scheme would increase the risk.

1.2 Background

The Southside Local Development Area is identified in the Wide Bay Burnett Regional Plan 2011 (WBBRP) as a key growth area for residential development over the medium to long term. This area is anticipated to accommodate significant future residential growth in the Gympie region. The WBBRP states (emphasis added):

> *Further development of the area will not occur until comprehensive planning has been completed. This will require consideration of the fragmented nature of the area, **natural features**, potential flooding impacts and topography to provide high levels of accessibility and connectivity.*

As mentioned in previous correspondence, the Southside Structure Plan is now complete and has received endorsement from Council. Throughout the development of the structure plan, significant community consultation was undertaken on the proposed Southside Structure Plan. The community supported an environmental corridor as a key element of the Local Development Area.

This enabled the next level of comprehensive planning, as mentioned in the WBBRP (see quote above), to commence. Given the anticipated development pressure in this area, being a Local Development Area, Council commenced comprehensive planning on matters of biodiversity to ensure biodiversity values are balanced and protected in light of development.

The significant risk to biodiversity in the Southside Area is due to a number of factors (outlined below) including the fact that this area is a designated Local Development Area, acknowledged in the WBBRP as an area where:

> *Urban growth will continue to be accommodated by the expansion of the suburb of Southside.*

Put simply, this means that the Southside Structure Plan area is subject to ongoing development pressure.

1.3 Need for a Temporary Local Planning Instrument (TLPI)

Commonly Council's mitigate impacts on biodiversity by regulating Operational Works for Vegetation Clearing. The Gympie Regional Council Planning Scheme 2013 (the Planning Scheme) **does not regulate** Operational Works for Vegetation Clearing. This means, a person can go and clear their lot in the Southside Local Development Area (as this area has an urban zoning, for urban purposes under legislative exemptions)

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and there is no mechanism in the Planning Scheme to enable Council consider the impacts to biodiversity that may result from clearing. This presents a significant risk to biodiversity matters, particularly in light of the values identified in this area.

Not having a TLPI in place in this area where significant development is not only anticipated but facilitated by the WBBRP and Council jeopardises biodiversity values that were supported by the community and embedded in the Council endorsed Structure Plan for the area. It also diminishes the potential attraction of future development that would otherwise surround an environmental corridor.

In addition to the significant impacts to biodiversity, there is also an economic impact resulting from the loss of biodiversity values in the Gympie region as the environment is a key pillar to the region's economy. The recently Council-endorsed Tourism Strategy 2019-2024 highlights the importance of the natural environment in being a pillar for the region's economy and attracting visitors from not just within Australia, but also internationally. The region's natural environment and nature-based experiences provide a strong attraction for visitors from the United Kingdom (13,000 visitors) and Germany (10,000 visitors). The region is also enjoying modest growth from the emerging Scandinavian market (4,000 visitors) and North America also contributes 11 per cent share of all international visitors to the region.

Nature-based tourism is identified as a 'mega trend' in the Tourism Strategy, having a global impact on business, society, culture and also consumer behaviour. Therefore, not only is there considered to be a significant risk to biodiversity values, but also to the region's economy and tourism industry.

1.4 Consideration of alternatives to TLPI

Other amendment processes/ options have been considered by Council to progress the proposed elements within the TLPI, including the proposed whole-of-region Protection of Biodiversity Values TLPI and a Qualified State Interest Amendment and a Major Amendment, however are not supported due to a number of significant reasons including:

- If the proposed Southside TLPI elements were to be incorporated into the proposed whole-of-region Protection of Biodiversity Values TLPI, prior to lodgment of the Protection of Biodiversity Values TLPI Council would need to draft the elements of the Southside TLPI into the whole-of-region TLPI, undertake scenario testing to ensure no unintended flow on effects will occur, then take the whole-of-region TLPI back to Council for consideration and formal resolution due to the significant changes. The process in which Council follow when taking an item such as a TLPI to Council for formal resolution is to first present the item at a Council Workshop to allow for a robust and transparent discussion with Councilors on the item, prior to presenting the item at a formal Ordinary meeting for resolution. There are no Council Workshops scheduled for the rest of 2019, nor is there a Workshop proposed for January 2020. This means staff would have to wait until the February 2019 Workshop and Ordinary meeting to present the revised whole-of-region TLPI to Council for consideration, with no further meetings until after the caretaker period for Council elections. Furthermore, this would result in a significant gap in time in which the Southside TLPI lapsed on 19 October 2019, to a potential effective date of February 2019 for the whole-of-region Protection of Biodiversity Values TLPI, meaning there would potentially be a four month period in which significant clearing could occur without consideration of significant biodiversity values in this area.

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- Alternatively, if the proposed Southside TLPI elements were to be progressed as a qualified state interest amendment or major amendment to the Planning Scheme, Council would face the same issues outlined above regarding time frames and Council Workshops and Ordinary meetings. The process in which Council follow when taking an item such as a qualified state interested amendment to the Planning Scheme to Council for formal resolution (required under the Minister's Guidelines and Rules) is to first present the item at a Council Workshop to allow for a robust and transparent discussion with Councilors on the item, prior to presenting the item at a formal Ordinary meeting for Council resolution. There are no Council Workshops scheduled for the rest of 2019, nor is there a Workshop proposed for January 2020. This means staff would have to wait until the February 2019 Workshop and Ordinary meeting to present the qualified state interest amendment to Council for consideration, with no further meetings until after the caretaker period for Council elections. This also means that public consultation would occur under a new Council after caretaker period ends and the uncertainty around volume and contexts of submission may jeopardize the effectiveness of protection measures.

As mentioned in previous correspondence, Council is proposing to formally incorporate the Southside TLPI elements into the Planning Scheme as part of a new Amendment Package 3. Council are proposing to present Amendment Package 3 to a Council Workshop and subsequent Ordinary meeting in the new year, prior to the caretaker period.

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2.0 Significant risk to Koalas

In South East Queensland, there is clear evidence of catastrophic declines in koala populations. This indicates a need for urgent policy change if these declines are to be reversed and the long-term persistence of the koala is to be secured.

The Queensland Government established a Queensland Koala Expert Panel in 2016 to review existing measures and make recommendations about the "most appropriate and realistic actions to reverse the decline in koala population densities and ensure the long-term persistence of koala populations in the wild within SEQ". The panel identified that the loss of koala habitat is considered to be the threat having the greatest impact on koalas, and that urban development is considered to be the primary cause of habitat loss (Koala Expert Panel – Interim report Summary). "The lack of protection of koala habitat was one of the most prominent issues raised during the consultation process and almost always this was associated with issues identified in planning framework (Koala Expert Panel, 2017)".

Protecting koala habitat through both existing State and Local planning mechanisms are also clearly failing in the Southside LDA which is placing both koalas and their habitat at extreme risk.

The mapping layers and codes currently in place in State government policy to protect koala habitat are having no real effect, some of which have also been identified by the Koala Expert Panel. The Queensland Koala Expert Panel lists a number of recommendations that have been supported by the Queensland Government of which are also listed in Appendix 2 of the recently released *Draft SEQ Koala Conservation Strategy 2019-2024*. In particular, a number of recommendations relevant to Objective 2 'Koala habitat is protected' is very relevant to the Gympie region and have been described in further detail below.

The **four** mains reasons why current protection measures at both a State and Local level are failing in the Gympie Region include:

1. **Number and complexity of exemptions from development assessment**: Whilst some koala habitat may be mapped regulated vegetation under the *Vegetation Management Act 1999* (VM Act) in the Southside Structure Plan Area, exemptions under the *Planning Act 2016* (the Planning Act) allow for many of these areas to be cleared for an 'urban purpose' as the entirety of the Southside Structure Planned Area is zoned as urban. This significant risk was also highlighted by the Koala Expert Panel Report. Exemptions continue to impose a serious risk of koala habitat loss within urban areas of the Gympie Region (Refer to item 2.1.1) below for more information).

2. **Locally significant koala habitat not captured by Queensland Government Mapping (limitations of current MSES mapping)** Since the Gympie region is located outside the SEQ region, it is not represented by SPP Koala habitat mapping values. Therefore, SPP koala habitat values such as 'Urban' koala habitat values (that are not necessarily vegetation patches but include open space/ scattered trees) are **not** recognised in the Gympie region, including the Southside Structure Plan Area. It also means that SPP koala habitat values are not reflected in MSES Wildlife habitat threatened and special least concern. Instead Gympie relies on MSES 'Regulated Vegetation' and MSES 'Essential Habitat' mapping which is not reflective of true habitat values specific to koalas. Not only does this MSES mapping significantly under-represent true koala habitat (as they only identify 'Endangered' or 'Of Concern' vegetation patches), but of particular concern, is that connectivity and/ or landscape permeability between vegetation patches is not considered, particularly within an urban environment. Refer to item 2.1.2 below for more information

3. **Limitations of Gympie's current Planning Scheme and MLES:** Although the current MLES biodiversity overlay 'Conservation Significant Overlay' is intended to incorporate koala habitat, the mapping is outdated and is of poor resolution. Even if this layer was to reflect true koala habitat values, which it does not, it has no effect as 'Vegetation clearing for operational works' is not regulated within Gympie's current Planning Scheme. Refer to item 2.1.3 below for more information.

4. **Lack of Information at the time of developing the Structure Plan:** The LDA was designated as an Urban Expansion area and a Structure Plan was developed at a time when minimal information about biodiversity values in the region was available. Spatial technologies and advanced survey techniques have allowed Gympie Regional Council to better understand koala habitat values within the region. Gympie Regional Council have invested significant time and effort over the last 5 years to better understand koala habitat values and their threats within the region.
   Council recently engaged Queensland University of Technology (QUT) to undertake detailed field surveys using heat-sensing drones to detect koalas in the Southside Structure Plan Area in June 2019. Koalas were found to be present in all sites that were surveyed in Southside. Koalas in south-east Queensland typically occur at low densities, however the density of koalas found at every site exceeded the estimated average for the region of 0.04 koalas/ha (Rhodes et al. 2015). Now that Council better understands the significant biodiversity values in the region, and the significant risk from development pressures, Council is attempting to balance development with known koala habitat values through a proposed TLPI until amendments can be made to the planning scheme. Refer to item 2.1.4 below for more information.

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The Environment and Conservation Precinct that is not currently protected by MSES Category B (requiring referral to SARA) is displayed in **Figure 1**. The Environment and Conservation Precinct covers approximately 341 hectares, of which 54 hectares is mapped MSES Category B (symbolised pink). If the TLPI was not approved, potentially 287 hectares of high biodiversity values (symbolised green) would be at risk of being cleared (noting that some of this area is already constrained). This figure also highlights properties that have expressed interest to Council in clearing for development.

The Environment and Conservation Precinct that is not currently protected by MSES layers (i.e. Category B, C, and Essential Habitat) is displayed in **Figure 2**. The Environment and Conservation Precinct covers approximately 341 hectares, of which 107 hectares is mapped MSES Category B, C or Essential Habitat (symbolised pink). If the TLPI was not approved, then 234 hectares of high biodiversity values (symbolised green) would be at risk of being cleared (nothing that some of this area is already constrained). This figure also highlights properties that have expressed interest to Council in clearing for development.

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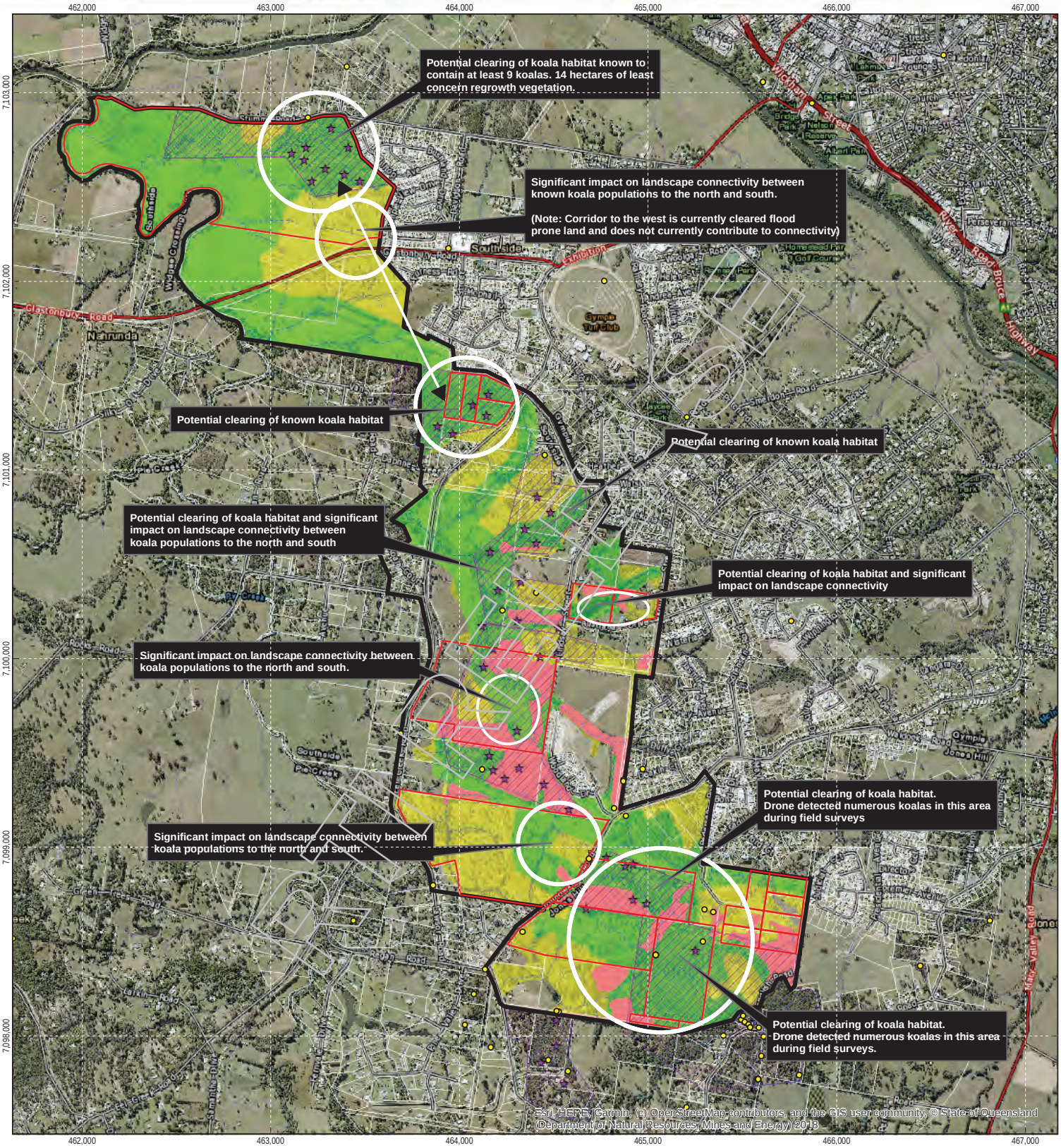
Southside TLPI
Environment and Conservation Precinct

Areas at significant risk (MSES Regulated Vegetation - Category B (remnant)



N W E S

0 100 200 300 400 500

Metres

1:20,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA94 MGA zone 56

Legend

- Koala evidence (sightings/scats)
- Southside Plan Precinct
- Koala detection (Drone Survey, June 2019)
- Drone Survey Area
- Watercourse line

Cadastre

- Properties at significant risk
- Koala Habitat Value (outside ECP)
- Final Environment and Conservation Precinct Boundary
- MSES Regulated Vegetation - Cat B (Referral to SARA)

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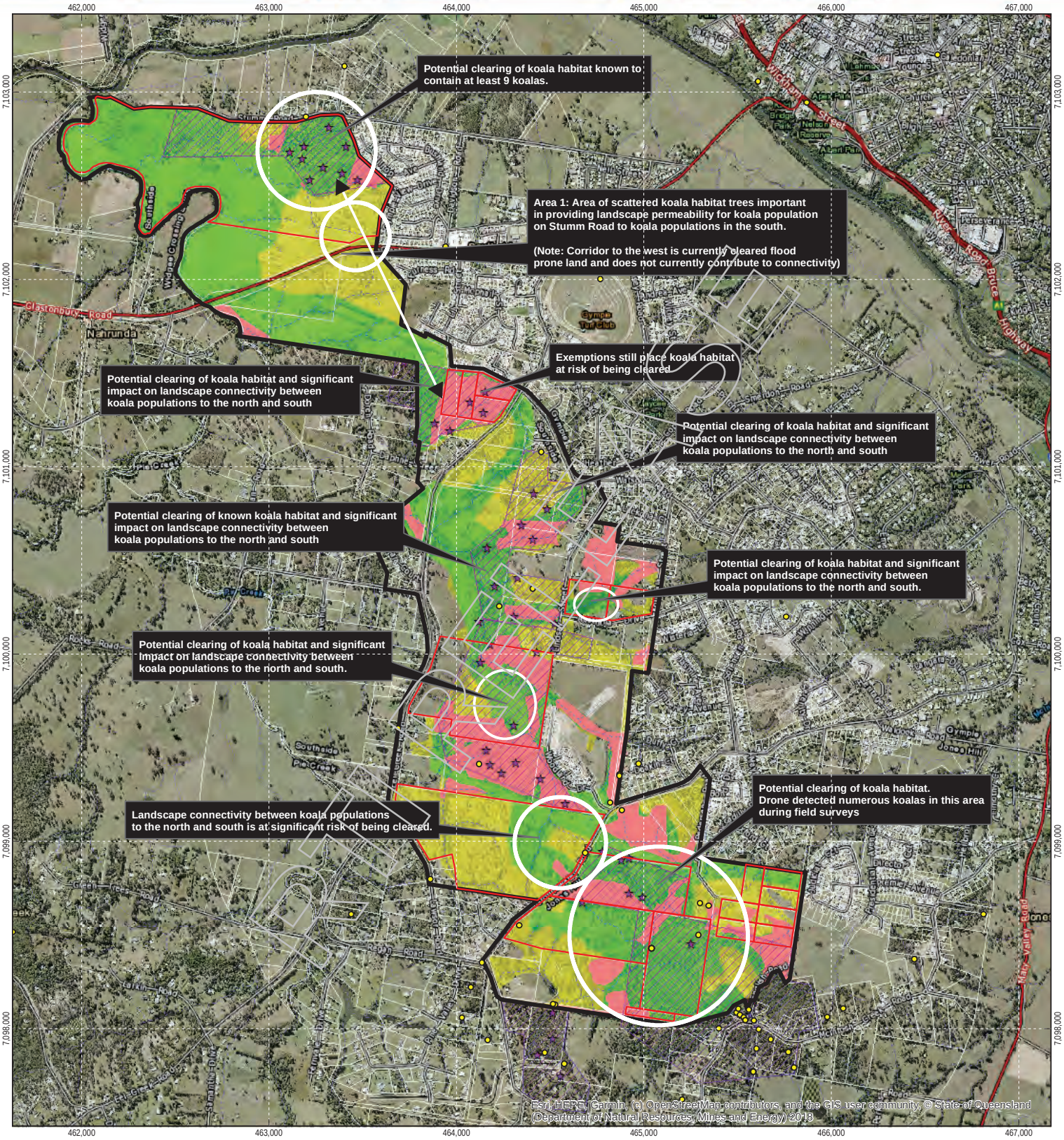
FIGURE 1

27 Nov 2019
P:\Planning & Development\Environment\Sally\projects\sthside\report\response\screening_atrisk\figure1_mses_b.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) © State of Queensland (DNRM)

Southside TLPI
Environment and Conservation Precinct

Areas at significant risk (MSES regulated vegetation - Cat B, C and Essential Habitat)



Legend

- Koala evidence (sightings/scats)
- Southside Plan Precinct
- Koala detection (Drone Survey, June 2019)
- Drone Survey Area
- Watercourse line

Cadastre

- Properties at significant risk
- MSES (Regulated Veg - Cat B or C) & Essential habitat
- Koala Habitat Value (outside ECP)
- Final Environment and Conservation Precinct Boundary

0 100 200 300 400 500
Metres
1:20,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA94 MGA zone 56

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FIGURE 2

27 Nov 2019
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Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) © State of Queensland (DNRM)

Interest in property development and clearing by a number of applicants have been brought to the attention of Council. Refer to **Appendix B** which lists individual properties containing important koala habitat that are at risk of clearing for development. This is a significant volume of habitat in comparison to the two 'at risk' properties identified by the State government at the meeting held between DSDMIP and Council on 15 November 2019.

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2.1 Significant Risks – Koala Expert Findings & how the TLPI addresses these issues

If the TLPI was to expire, and the proposed TLPI not approved by the State, potentially hundreds of hectares of koala habitat could be cleared resulting in even further fragmentation of koala habitat in the Structure Plan Area. This would ultimately result in a severe decline of koala populations and koalas may become functionally extinct within the area.

Gympie Regional Council's current planning framework alongside coarse State MSES mapping offers little protection for koalas and their habitat with regards to clearing in urban areas.

Council's proposed TLPI in fact addresses a number of key issues and recommendations identified by the Koala Expert Panel in 2017 that have had a major impact on significant koala declines in SEQ. Similar declines in Koala populations are also occurring in the Gympie region and hence the need for a proposed TLPI.

The Queensland Government Response to the Queensland Koala Expert Panel's Report highlighted a number of objectives and recommendations which have all been supported by the Queensland Government. The proposed TLPI addresses a number of these recommendations which are discussed below.

2.1.1 Number and Complexity of Exemptions from development assessment

The Queensland Government Response to the Queensland Koala Expert Panel's Report
Objective 2: Koala habitat is protected
Action relates to recommendation 2.2 (b)

The Queensland Koala Expert Panel report identifies that the number and complexity of exemptions from development assessment have had major impacts on koala habitat loss and have recommended:

"Reduce the number and complexity of exemptions from development assessment and put in place a transparent system of conditional approval. Two prominent examples of important exemptions that impact on koala habitat are:

i) Schedule 21 Part 2 item 2 of the Planning Regulation, exempts large amounts of development by providing that clearing of certain vegetation for urban purposes in urban areas is not assessable development under the Planning Act and cannot be made assessable development by a planning scheme

ii) Schedule 21 Part 1 item 1 of the Planning Regulation has the effect of exempting vegetation clearing from assessment for a material change of use or reconfiguring a lot if, among other things, the approval relates to premises of less than 5 ha. Removing these exemptions, or substantially reducing their scope as they apply to koala habitat, is vital for effectively protecting koala habitat"

(Queensland Koala Expert Panel, 2017)

Queensland Government Response: **Support in principal**

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DNRME exemptions continue to impose a serious risk of koala habitat loss within urban areas of the Gympie region of which Southside is included. With such exemptions in place, koala habitat is and still can be cleared within mapped MSES areas that are zoned urban as demonstrated by recent clearing of koala habitat in the Southside Structure Plan Area.

A recent example where significant koala habitat was lost due to current inaccurate MSES mapping is 415 Groundwater Road whereby a large amount of koala habitat was cleared in 2017. A significant amount of least concern remnant as well as MSES regulated vegetation (Of Concern) was cleared through DNRME exemptions (in which DNRME was engaged for specific advice on the matter). This clearing has not only resulted in significant koala habitat loss, but it has also degraded an important linkage between koala populations to the north and south. It is unknown how many koalas were potentially harmed during tree felling as spotter catchers are not required in District B of the Nature Conservation (Koala) Conservation Plan 2017. This property is currently up for sale and has generated interest from several property developers wanting to clear the entire property to create a large residential estate. Without the TLPI the whole corridor could potentially be cleared and koala populations to the north and south of the lot would be isolated from one another resulting in reduced genetic diversity, increased stress and disease and limited refugia from fire, drought, predators and vehicle strikes.

Proposed TLPI Response: The proposed TLPI utilises high resolution koala habitat mapping (which has been undertaken in accordance with Policy 7 of the Nature Conservation (Koala) Conservation Plan 2006 and Management Program 2006-2016 which was prepared in accordance with section 112 of the Nature Conservation Act 1992) to better reflect true koala habitat. It will also introduce vegetation clearing for operational works to enable Council to consider any proposed clearing and significant risk to biodiversity. This will allow Council to balance development with known koala habitat values within an urban area.

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2.1.2 Locally significant koala habitat not captured by the Queensland Government Mapping (limitations of current MSES mapping)

The Queensland Government Response to the Queensland Koala Expert Panel's Report
Objective 2: Koala habitat is protected
Action relates to recommendation 2.2 (g)

"Allow locally significant koala habitat, not captured by the Queensland Government mapping or within identified priority areas for koalas, to be able to be protected through local government planning schemes".

Queensland Government Response: **Supported**

SPP Koala habitat values and MSES Wildlife habitat threatened and special least concern (koala bushland) only encompasses SEQ and excludes the Gympie Council Region. Gympie Council is therefore reliant on MSES 'Regulated Vegetation' and MSES 'Essential habitat' mapping which not only under-represents true koala habitat values in the region but they do not take into account the importance of connectivity and/or landscape permeability. There are a number of lots containing significant koala habitat that are currently not

mapped MSES regulated vegetation, and are potentially at severe risk of being cleared. These areas are known to contain numerous koalas through drone surveys undertaken in June 2019.

Findings from the Queensland Expert Panel Report (2017) regarding connectivity and threats to koalas include;

- *"There is strong evidence that koala populations in SEQ are declining due to multiple threatening processes and that these act cumulatively on koala populations to drive declines, both through impacts on habitat, and direct impacts on koalas (Figure. 1, Dique et al. 2003, McAlpine et al. 2006, Rhodes et al. 2011, Craig et al. 2014, de Oliveira et al. 2014). Further, the expert-elicited evaluation of threat management options that the Panel commissioned also highlighted that addressing individual threats alone is unlikely to recover koala populations across urban, peri-urban and rural landscapes (**Figure 2**). This is also supported by other studies (Rhodes et al. 2011). Therefore, the need for a more holistic **strategy that simultaneously manages multiple threats, including habitat loss, vehicle collisions, dog attacks, and disease, is critical**"*

- *"Existing State initiatives to reduce threats are dominated by mechanisms to limit habitat loss and habitat degradation through the planning framework. However, the Panel's review indicated that far fewer initiatives are focussed on **reducing threats that directly impact on koala populations, such as vehicle collisions and dog attacks. This is despite these being recognised as key factors driving koala declines in SEQ**"*

- *"Both protection of koala habitat and reduction of threats that directly, or indirectly, impact koala populations are crucial for ensuring the long-term persistence of koalas in SEQ."*

- *"There are a range of threats that impact on koala habitat, causing habitat loss and degradation, but also a range of threats that impact on koala populations directly, such as through direct mortality. Hence, threats to habitat and threats impacting koala populations directly are both important, and in many areas of SEQ (particularly urban areas) the long-term persistence of koalas depends on reducing both types of threat".*

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Koala habitat mapping was undertaken by O2 Ecology in 2016 and this mapping has been supported by field surveys utilising both koala scat detection dogs and advanced drone technologies. Councils high resolution koala habitat mapping layer followed SPP Guidelines for mapping koala habitat and further enhanced upon the methodology by stratifying vegetation by both Land cover and Regional Ecosystems refined by aerial photographic interpretation. Mapping ensured that small patches of vegetation and/or roadside vegetation that are vital stepping stones for connectivity between core habitat patches are identified. More information on this methodology and small deviations can be found in **Appendix A.**

Limitations of MSES regulated vegetation and essential habitat for modelling koala habitat values in Southside LDA include:

MSES regulated vegetation includes only 'endangered' and 'of concern' remnant and regrowth vegetation and excludes 'not of concern' vegetation. There are large areas of known koala habitat that is mapped 'Least

concern' vegetation and therefore not mapped MSES regulated vegetation. These koala habitat areas will be at risk of clearing without consideration of the impacts in the absence of a TLPI.

MSES Essential Habitat is vegetation in which a species that is Endangered or Vulnerable under the *Nature Conservation Act (1992)* has been known to occur. Most of Southside LDA is freehold/private property and there has been limited ecological surveys undertaken in the area up until June 2019. Hence, a large area of koala habitat is not mapped Essential habitat even though they are known to contain good populations of koalas. Council recently engaged Queensland University of Technology to undertake a koala detection survey using advanced drone technologies and results identified good populations of koalas in these areas.

Connectivity: MSES mapping layers not only under-represents true koala habitat values in the region, but MSES regulated vegetation and essential habitat does not take into account connectivity between vegetation patches and landscape permeability. Consequently, it does not consider the potential for increased mortalities from vehicle strikes and dog attacks, but fragmentation of habitat can also lead to an increased incidence of disease, reduced genetic diversity and limit refugia from drought, fire and changing climate conditions.

This makes it challenging for Council to achieve listed SPP biodiversity outcomes, in particular;

- Ecological connectivity
- Ecosystem Resilience
- Biodiversity health (i.e. loss of genetic diversity)

The above outcomes are not given regard to in MSES Regulated vegetation and Essential habitat but are however reflected in SPP Koala habitat values mapping for SEQ of which Gympie just falls outside. It is this reason why Gympie Regional Council have developed koala habitat mapping for the region based on SPP guidelines and propose to include this within the TLPI.

SPP Koala habitat values mapping guidelines take into account not only connectivity but also koala habitat within an urban footprint represented by HV urban koala habitat values. HV urban koala habitat values include small patches of vegetation (< 10 hectares) or open space/ scattered trees that are within close proximity to existing core patches of koala habitat. Yet, despite the higher densities of koala's found in the region, SPP koala habitat values that includes these vital elements around connectivity does not extend to the Gympie region.

GRC's proposed koala habitat mapping has followed SPP guidelines for mapping high value urban koala habitat particularly important for landscape permeability in an Urban Footprint area. A review of Council's methodology will demonstrate this.

Poor Resolution: Council is also aware of the limitations and coarseness of MSES mapping and are concerned that this mapping does not represent true koala habitat values.

Council can only rely on State mapping layers to protect koala habitat which is clearly not working for the reasons mentioned above. MSES layers are coarse in resolution and do not have the intended level of detail required at a scale required by local government.

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Proposed TLPI Response: The proposed TLPI is based on high resolution mapping that has followed SPP guidelines. It is supported by provisions which will assist in reducing the significant risk to koala populations in the Southside LDA. The TLPI also proposes to not only balance development with known koala habitat values (that are not covered by MSES due to the reasons mentioned above) but also retains landscape permeability within an urban footprint. This will help to achieve important SPP Biodiversity Outcomes which are particularly relevant to Koalas.

> *"Limitations of MSES mapping is scale dependent and care needs to be exercised in using the mapping at very large scales and it should not be used as a 'point of truth" (Method for mapping the MSES SPP, 2017).*

2.1.3 Limitations of Gympie's current Planning Scheme and MLES

> *The Queensland Government Response to the Queensland Koala Expert Panel's Report Recommendation for the rest of Queensland*
>
> *"The Queensland Koala Expert Panel believes that the models underpinning the recommendations for SEQ should be capable of being extended to other parts of Queensland, as required. For example, communities in the northern part of the SEQ bioregion report significant koala/habitat impacts already taking place and conservation opportunities will be significantly reduced if conservation measures are not initiated in the near future. LGAs in this region are experiencing the same threatening processes found within the SEQ Planning Region and concern is rising within local community groups".*
>
> ***"State-wide approaches to koala conservation will vary between, and within, regions depending on local circumstances."***

Gympie koala populations are experiencing the same threats as SEQ koala populations and it is already recognised that significant koala/habitat impacts are occurring. Without effective State protection, we are reliant on MLES layers and the current Planning Scheme to protect koala habitat. However, both the current environmental provisions and MLES mapping layers are failing to protect important koala habitat. Gympie's MLES layer 'Conservation Significance Overlay' is not only outdated and based on very old Regional Ecosystem mapping, but it is based on a very simple methodology. Even if this layer was to reflect koala habitat values, it has no effect for 'vegetation clearing for operational works' as this is not regulated within Gympie's current Planning Scheme like most other local government planning schemes.

Hence, without high resolution koala habitat value mapping and a supporting biodiversity overlay code, koalas in the Gympie Region are at extreme risk from both direct and in-direct impacts, particularly in Southside as this area is designated for Gympie's future urban growth. Council is very aware of the significant impacts to koalas in the region having invested a considerable amount of time and effort in understanding koala habitat, their distribution and threats within the Region.

PRE-RELEASE

Major initiatives over the last 5 years include;

- 2015 - high resolution koala habitat mapping (in accordance with Policy 7 of the Nature Conservation (Koala) Conservation Plan 2006 and Management Program 2006-2016 which was prepared in accordance with section 112 of the Nature Conservation Act 1992. This mapping is a key component of the State's Mapping for Matters of State Environmental Significance (MSES).
- 2016 - a very comprehensive Koala Conservation Management Plan (including detailed threat mapping and targets for restoration),
- 2016-19 - Large scale mapping of koala health and tracking fine-scale koala movements (USC);
- 2017 – Field verification of unverified vegetation and koala habitat suitability
- 2017 – Koala Conservation Management Plan adopted by Council in 2018
- 2018/19 – Development of a Biodiversity Overlay Code to include koalas
- 2019 - Road Ecology Study to identify priority hotspots and road mitigation measures
- 2019 - Climate Change impacts and Refugia for koalas
- 2019 - Guidelines for Rehabilitation of koala habitat
- 2019 - Koala Retrovirus Eucalypt Testing (USC)
- 2019 - Heat-sensing drone surveys using automated algorithms to detect koalas for both Southside and Widgee
- 2019 - Development of a Wildlife Reporter App (soon to be released) to record not only distribution, but also health and threats to koalas to assist with threat mapping and priority hotspots for road mitigation measures, improving linkages, etc.
- 2019 - Development of interactive dashboards to identify hotspots or trends occurring over time including automated heat maps of vehicle road strike

Refer to **Appendix C** for more information.

RTI RELEASE

***Proposed TLPI Response:** Gympie Regional Council has been very proactive and have spent considerable time and effort into mapping and understanding koala habitat distribution and threats throughout the region. High resolution koala habitat mapping has been undertaken in accordance with SPP guidelines and offers a more accurate representation of koala habitat and movement paths. This mapping has not only been supported by advanced drone surveys but surveys have also detected good koala populations remaining in the Southside Structure Plan Area. The TLPI will reflect high resolution mapping, and provisions that will not only introduce vegetation clearing for operational works, but also maintain connectivity or koala movement paths. This may give Gympie a chance to balance development with known koala populations within the Southside Structure Plan Area of which both State and Local planning mechanisms are currently failing to address.*

2.1.4 Lack of Information at the time of developing the Structure Plan

The Queensland Government Response to the Queensland Koala Expert Panel's Report
Objective 2: Koala habitat is protected
Action relates to recommendation 2.2 (f)

"Any future expansion of the urban footprint should not occur over areas of core koala habitat (remnant and regrowth)"

- *"Any future expansion of the Urban Footprint, undertaken by the State as part of revisions to the SEQRP, should not occur over areas where core koala habitat (remnant and regrowth) has been identified through the EHP mapping, **or where koala populations are known to occur"** (Queensland Koala Expert Panel, 2017, p.3.*

- *Although koalas may be able to withstand some level of low density urban development, Rhodes et al. (2015) suggest that ongoing urban development, and densification, are incompatible with viable koala populations and that current strategies to mitigate these effects have not been successful (Queensland Koala Expert Panel, 2017, p.3)*

Government Response: Supported

The WBBRP applies to the Gympie region and was last updated in 2011. As stated above, any future expansion of the urban footprint should not occur where there are known koala populations. Advanced drone surveys have identified good koala populations in the Structure Plan Area proposed for future development.

Stumm Road which is currently outside of the Wide Bay Burnett urban footprint but within the Structure Plan Area is of particular concern as drone surveys detected 9 koalas in a 13-hectare patch of vegetation. This area is relatively isolated to other koala populations and hence it is even more vital to protect this area while maintaining landscape permeability to other koala populations in the south. Current owners have expressed interest to Council in clearing for development.

RTI RELEASE

***Proposed TLPI Response:** The TLPI proposes to balance development with existing known koala habitat values off Stumm Road and retain landscape permeability to known koala populations in the south. The TLPI also aims to balance development with other known koala habitat within the Structure Plan Area that are currently at risk from clearing and development.*

Summary:

Based on the limited amount of koala habitat that is identified in the State's current MSES mapping in the Southside Structure Plan Area, ongoing development pressure as this area is identified in the WBBRP as an urban growth area for the region, the timeframe associated with pursuing an alternative amendment process, and the risks detailed above, it is considered there is significant risk to biodiversity values that demonstrates the need for the proposed TLPI.

RTI RELEASE

Appendix A: Koala Habitat Mapping Methodology for the Southside Region

RTI RELEASE

Appendix A: Koala Habitat Mapping Methodology for the Southside Region

Koala habitat mapping for Southside Precinct utilised GRC's koala habitat layer (O2 Ecology, 2016) which has been undertaken in accordance with Policy 7 of the Nature Conservation (Koala) Conservation Plan 2006 and Management Program 2006-2016 which was prepared in accordance with section 112 of the Nature Conservation Act 1992. Koala habitat values are a key component of the State's Mapping for Matters of State Environmental Significance (MSES).

Koala habitat value mapping (O2 Ecology, 2016) is displayed in **Figure 3** including HV urban koala habitat values. High or medium value 'bushland', 'remnant' and 'urban' values were extracted to derive a Koala habitat overlay map **Figure 4**.

The Environment and Conservation Precinct has incorporated the koala habitat values specified above and any remaining koala habitat not identified through the Environment and Conservation Precinct was mapped as a proposed layer 'Koala habitat outside the Environment and Conservation Precinct'. This mapping layer does not stop development but rather retains important landscape permeability for koala movement through the area. These areas are predominantly mapped HV Urban Koala habitat and are open space or paddocks containing scattered koala habitat trees that provide high or medium-high connectivity between core habitat areas within the urban footprint. They provide important koala movement paths or landscape permeability between koala populations.

Deviations to Koala Habitat Mapping

The only deviations from the Koala Habitat Mapping undertaken by O2 Ecology (in accordance with Policy 7 of the Nature Conservation (Koala) Conservation Plan 2006 and Management Program 2006-2016) are identified in **Figure 5** which include seven additional areas of koala habitat value (symbolised blue).

These seven areas have been added to the proposed 'koala habitat areas outside the Environment and Conservation Precinct' layer in response to results from a koala detection drone survey which accurately depicts koala numbers in the Southside Structure Plan Area as well as their movement paths.

In June 2019, GRC engaged Queensland University of Technology to conduct a field survey using drone-based thermal imaging surveys of six sites across the Southside Precinct to detect koala presence. The footage from these surveys was analysed using an automated image detection algorithm in order to estimate the number and location of koalas present at each site. A total of 51 koalas were found across all sites surveyed. On the basis of the above survey results, these seven areas have been added into the proposed 'koala habitat areas outside the Environment and Conservation Precinct' as they provide important landscape connectivity between koala populations that currently reside within the LDA or contribute to, a koala movement path from the site to the Southside Environment and Conservation Precinct. They are generally open space or paddocks consisting of scattered koala habitat trees providing safe, practical and unobstructed koala movement opportunities.

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Results from the drone survey concluded that *"Koalas were found to be present in all sites that were surveyed in Southside. Koalas in south-east Queensland typically occur at low densities, however the density of koalas found at every site exceeded the estimated average for the region of 0.04 koalas/ha (Rhodes et al. 2015). This suggests the six sites are currently highly suitable habitat for a low-density koala population (Callaghan et al. 2011; Dargan et al. 2019). Maintenance of stable, low-density koala populations such as those found across the six Gympie sites is critical to preventing further decline of the species in south-east Queensland (Lollback et al. 2018; McAlpine et al. 2015).* ***Ensuring fragmented areas of suitable habitat remain as connected as possible throughout the urban landscape is key to maintaining these populations, as it bolsters genetic diversity and reduces the risk of mortality associated with koalas moving between more isolated areas*** (Beyer et al. 2018; Lollback et al. 2018)."

Area 1: Area contains scattered koala habitat trees important for providing connectivity between koala populations in the north to koala populations in the south.

Nine koalas were identified in the 13-hectare patch of regrowth vegetation on Stumm Road with an estimated koala density of 0.34 koalas/ha. This area is relatively isolated from other core koala habitat in the region hence making it even more important to retain existing landscape permeability within the area. The area to the south of this region is a large open paddock containing scattered koala habitat trees and may provide important landscape permeability to koala populations found in the south. This area was not originally mapped as 'Urban Koala Habitat' as the core habitat on Stumm Road was originally considered too isolated from other core habitat areas within the region and was considered unlikely to hold a koala population. However, we now have a better understanding of the koala populations within the region and the importance of retaining landscape permeability to other koala populations in the south. The Environment and Conservation Precinct corridor to the west of this area is a flood prone area and does not currently provide good landscape permeability for koala movement as it contains very few koala habitat trees and exposes koalas to predator attacks while traversing along the ground.

Areas 2-7: Areas containing koala scattered trees adjacent to or in the vicinity of existing koala habitat. Although they do not necessarily connect core koala habitat areas they may be areas that koalas frequent. The drone did not survey these areas due to cost constraints, however where they did fly, koalas were identified (i.e. Area 2). These areas are considered important for landscape permeability particularly in response to QUT's findings and recommendations which is to ensure fragmented areas of suitable habitat remain as connected as possible throughout the urban landscape.

Also note that some areas previously mapped koala habitat value has been excluded from the environment and conservation precinct layer as vegetation clearing has since occurred (symbolised red) and they no longer provide suitable koala habitat or connectivity value.

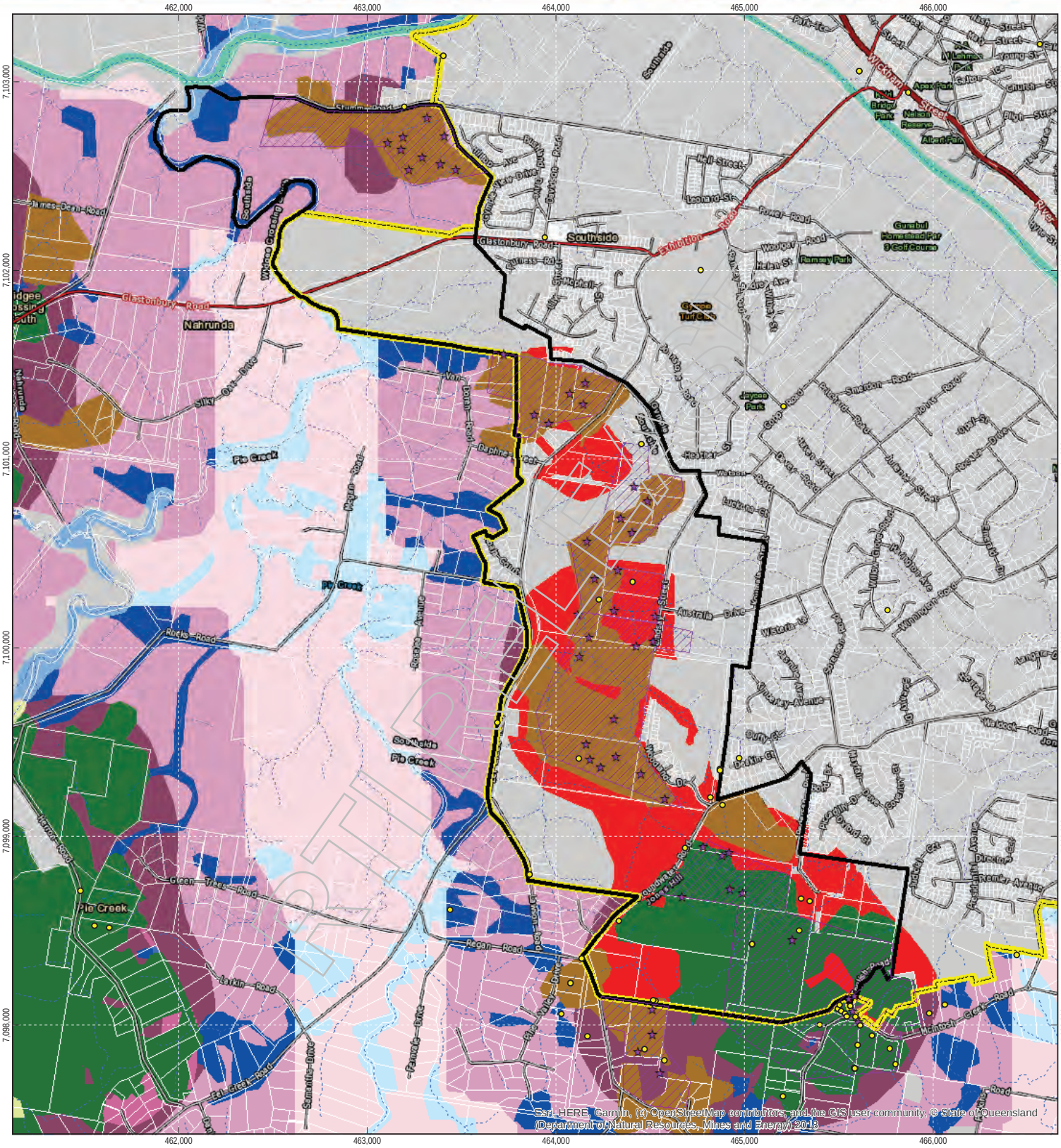
Conclusion

In conclusion, all koala habitat mapping has been in accordance with Policy 7 of the Nature Conservation (Koala) Conservation Plan 2006 and Management Program 2006-2016 which was prepared in accordance with section 112 of the Nature Conservation Act 1992. Deviations to this mapping are only limited and have been represented as proposed 'Koala habitat values outside the Environment and Conservation Precinct'. This layer is not intended to stop development but rather retain landscape permeability and movement paths. They have been based on results of a Koala Drone Survey designed to analyse populations and estimate koala densities.

PRE RELEASE

Southside TLPI
Environment and Conservation Precinct

Koala Habitat Values - Southside Plan Precinct



PRELIMINARY

N
W E
S

0 100 200 300 400 500
Metres

1:20,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA94 MGA zone 56

Legend

- Koala evidence (sightings/scats)
- Koala detection (Drone Survey, June 2019)
- Drone Survey Area
- Southside Plan Precinct
- Urban Footprint Area
- Watercourse line
- Cadastre (September 2019)

Koala Habitat Value Map

- HV bushland
- M-HV bushland
- L-MV bushland
- LV bushland
- HV Remnant bushland
- M-HV Remnant bushland
- L-MV Remnant bushland
- LV Remnant bushland
- HV rural
- M-HV rural
- L-MV rural
- LV rural
- HV urban
- M-HV urban
- HV rehabilitation
- M-HV rehabilitation
- L-MV rehabilitation
- LV rehabilitation
- Non-habitat
- Water

FIGURE 3

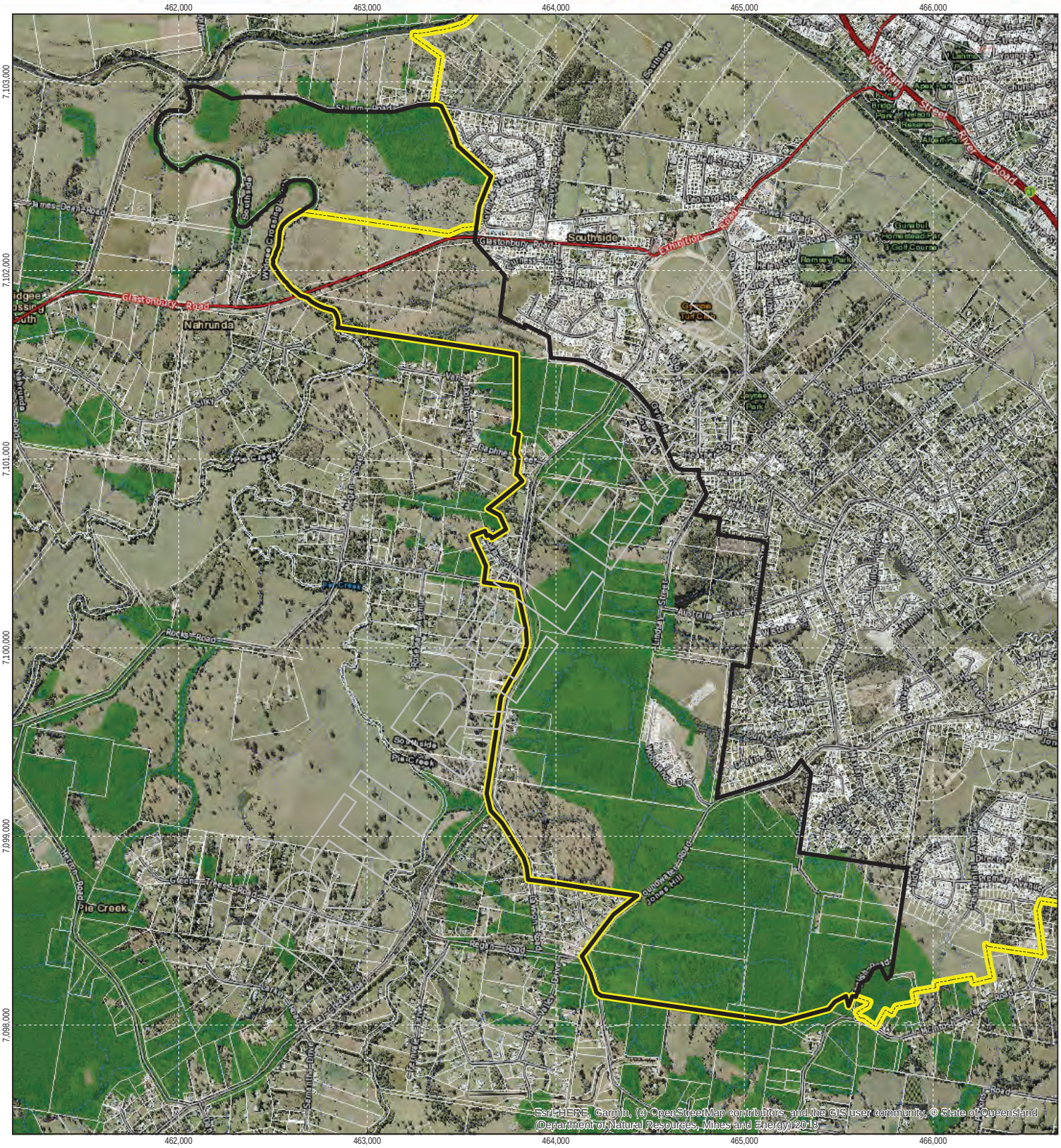
Gympie Regional Council does not warrant the accuracy of information in this publication and any person using or relying upon such information does so on the basis that Gympie Regional Council shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.

28 Nov 2019
P:\Planning & Development\Environment\Sally\projects\sthside\toHolly\response to risk nov 2019\fig3_khv_southside.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) © State of Queensland (DNRM)

Southside TLPI
Environment and Conservation Precinct

Koala Habitat Overlay Map - Southside Plan Precinct



DRAFT

N
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0 100 200 300 400 500
Metres

1:20,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA94 MGA zone 56

Legend

- Southside Plan Precinct
- Urban Footprint Area
- Watercourse line
- Cadastre (September 2019)
- Koala Habitat Value Biodiversity Overlay

FIGURE 4

Gympie Regional Council does not warrant the accuracy of information in this publication and any person using or relying upon such information does so on the basis that Gympie Regional Council shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.

18 Sep 2019
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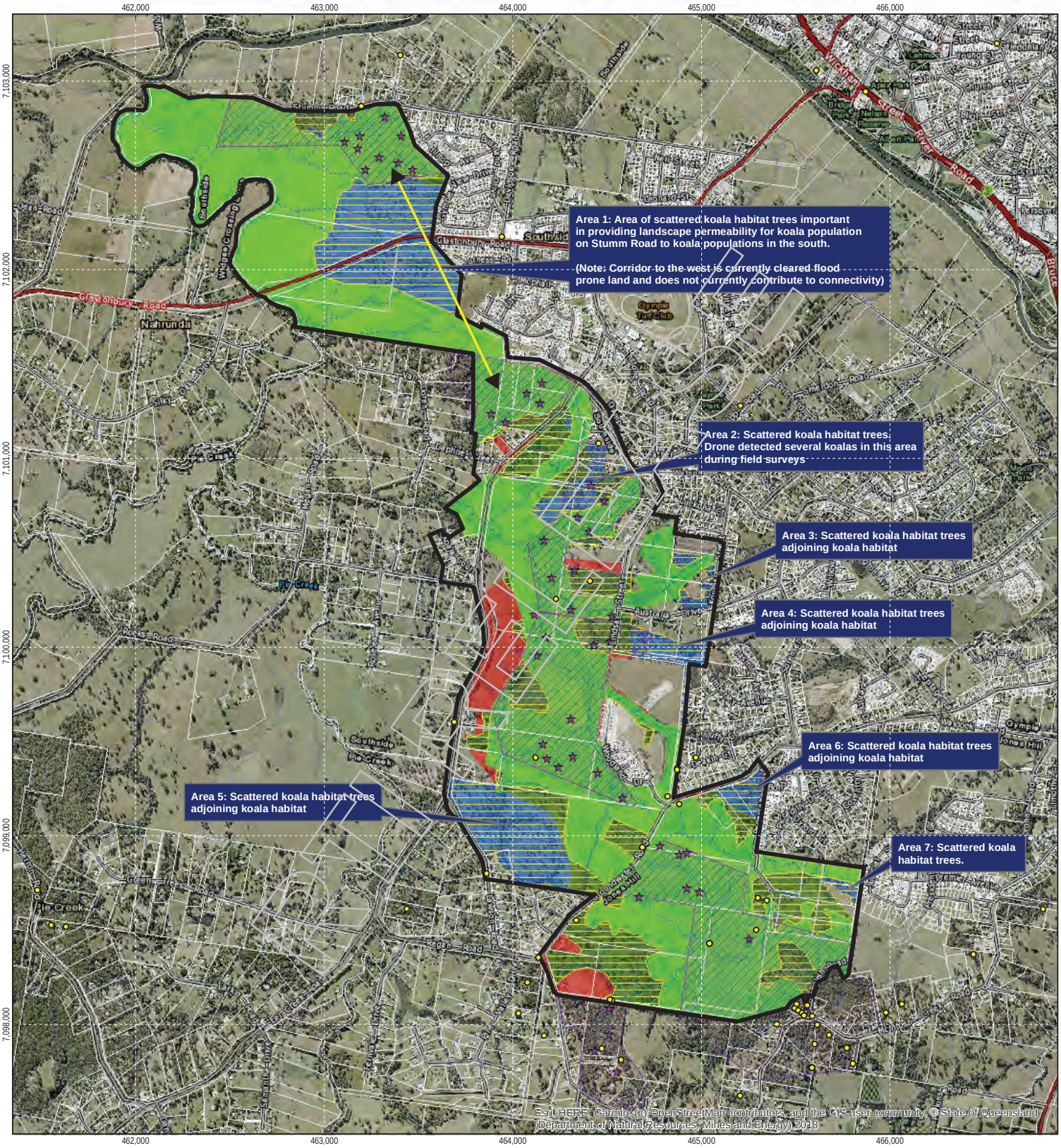
Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) © State of Queensland (DNRM)

Southside TLPI
Environment and Conservation Precinct

Deviations to Koala Habitat Value Mapping



0 100 200 300 400 500
Metres
1:20,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA94 MGA zone 56

Legend

- Koala evidence (sightings/scats)
- Koala detection (Drone Survey, June 2019)
- Drone Survey Area
- Southside Plan Precinct
- Watercourse line
- Cadastre (September 2019)
- Final Environment and Conservation Precinct Boundary
- Koala Habitat Value (outside ECP)
- Previously mapped Koala Habitat (generally HV Urban)

Deviations to Koala Habitat Values Mapping Overlay

- Additional areas (provide landscape permeability)
- Subtracted (cleared since)

Gympie Regional Council does not warrant the accuracy of information in this publication and any person using or relying upon such information does so on the basis that Gympie Regional Council shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.

FIGURE 5

18 Sep 2019
P:\Planning & Development\Environment\Sally\projects\sthside\report\response\fig5_khv_deviations.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) © State of Queensland (DNRM)

Appendix B: Properties at Risk of clearing for development

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Appendix B – Properties at Risk of clearing for development

Property	Images	Adverse impacts to biodiversity
Property one - seven – Alpha Road and Pedersen Road (one property owner). Owned by Noel Andreassen (a developer) – I believe that we looked into this one at the time the TLPI was adopted 2017 (the 2017 imagery was taken prior to the TLPI adoption). No DA applications on any of these lots. Located in the environment and conservation precinct.	2019 imagery 2017 imagery 	Properties are habitat for the following priority local fauna and flora species: • BrushTailed Phascogale • Eastern Yellow Robin • Feathertail Glider • Noisy Pitta • Koala • Sugar Glider • Top Knot Pigeon • Woompoo Fruit Dove • *Eucalyptus tereticornis* • *Melaleuca quinquenervia* Impacts (particularly for the koala) include: • Loss of habitat • Loss of connectivity (decreased genetic diversity, potential for increase in disease) • Loss of feed trees • Loss of shelter trees • Introduced impacts i.e. predation by domestic cats/dogs, introduced weeds, vehicle strikes • Loss of movement to and from the conservation precinct • Mortalities associated with vegetation clearing (i.e. if no pre-clearance surveys and spotter catchers required) • Loss of core habitat for Koalas. There is 0.89 km of watercourse mapped on this property.

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Property	Images	Adverse impacts to biodiversity
Property eight - Silva Road We had several enquiries about this property when it was up for sale, all for residential use. Most were put off by the need to construct an access road. The property is still up for sale; last ownership change was in 2010. No DA applications over lot. Located in the environment and conservation precinct.	2019 imagery 	Properties are habitat for the following priority local fauna and flora species: • BrushTailed Phascogale • Eastern Yellow Robin • Feathertail Glider • Great Barred Frog • Noisy Pitta • Koala • Sugar Glider • Top Knot Pigeon • Woompoo Fruit Dove • *Eucalyptus tereticornis* • *Melaleuca quinquenervia* • *Flindersia australis* Impacts include: • Loss of habitat • Loss of connectivity (decreased genetic diversity, potential for increase in disease) • Loss of feed trees • Loss of shelter trees • Introduced impacts i.e. predation by domestic cats/dogs, introduced weeds, vehicle strikes • Loss of movement to and from the conservation precinct • Mortalities associated with vegetation clearing (i.e. if no pre-clearance surveys and spotter catchers required) • Loss of core habitat for Koalas. There is 0.05 km of watercourse mapped on this property.

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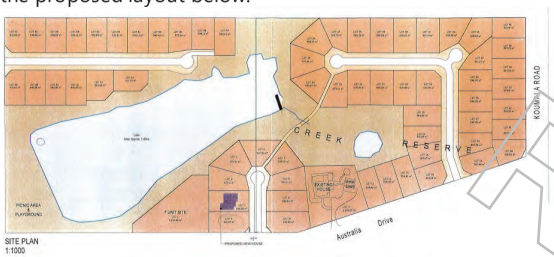
Property	Images	Adverse impacts to biodiversity
Property nine and ten - 34 and 40 Australia Drive, Southside (one property owner) No DA over these. PAM was undertaken on 17 April 2019 with the proposed layout below:  The proposal was unfavourable and, as yet, nothing has been lodged. Located in the environment and conservation precinct.	2019 imagery 	Property is habitat for the following priority local fauna and flora species: • Feathertail Glider • Koala • Sugar Glider • Top Knot Pigeon • Wompoo Fruit Dove • *Melaleuca quinquenervia* Impacts include: • Loss of habitat • Loss of connectivity (decreased genetic diversity, potential for increase in disease) • Loss of feed trees • Loss of shelter trees • Introduced impacts i.e. predation by domestic cats/dogs, introduced weeds, vehicle strikes • Loss of movement to and from the conservation precinct • Mortalities associated with vegetation clearing (i.e. if no pre-clearance surveys and spotter catchers required). There is 0.59 km of watercourse mapped on this property.

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Property	Images	Adverse impacts to biodiversity
Property eleven and twelve - Groundwater Road (one owner) Request from property owner to selective clear for native forestry, (internal) fence lines, around dam, clearing of fruit trees and the clearing of wattle on the property. Both properties entirely covered by the environmental and conservation precinct Seven koalas detected in these properties using the heat sensing drones	2019 imagery 	Properties are habitat for the following priority local fauna and flora species: • BrushTailed Phascogale • Eastern Yellow Robin • Feathertail Glider • Great Barred Frog • Noisy Pitta • Koala • Sugar Glider • Top Knot Pigeon • Woompoo Fruit Dove • *Eucalyptus tereticornis* • *Melaleuca quinquenervia* • *Flindersia australis* Impacts include: • Loss of habitat • Loss of connectivity (decreased genetic diversity, potential for increase in disease) • Loss of feed trees • Loss of shelter trees • Introduced impacts i.e. predation by domestic cats/dogs, introduced weeds, vehicle strikes • Loss of movement to and from the conservation precinct • Mortalities associated with vegetation clearing (i.e. if no pre-clearance surveys and spotter catchers required) • Loss of core habitat for Koalas. Property is a very important linkage to connect habitat. There is 1.78 km of watercourse mapped on this property.

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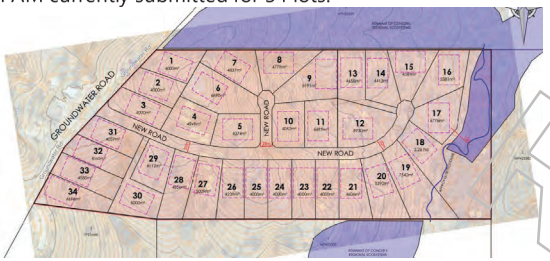
Property	Images	Adverse impacts to biodiversity
Property thirteen – 415 Groundwater Road Cleared in 2017. PAM currently submitted for 34 lots:  Mostly covered by the environment and conservation precinct. Three Koalas seen on-site (including a mother and joey)	2019 imagery 2017 imagery 	Property is habitat for the following priority local fauna and flora species: • BrushTailed Phascogale • Eastern Yellow Robin • Feathertail Glider • Great Barred Frog • Koala • Noisy Pitta • Sugar Glider • Top Knot Pigeon • Wompoo Fruit Dove • *Eucalyptus tereticornis* • *Flindersia australis* • *Melaleuca quinquenervia* Impacts include: • Loss of habitat • Loss of connectivity (decreased genetic diversity, potential for increase in disease) • Loss of feed trees • Loss of shelter trees • Introduced impacts i.e. predation by domestic cats/dogs, introduced weeds, vehicle strikes • Loss of movement to and from the conservation precinct • Mortalities associated with vegetation clearing (i.e. if no pre-clearance surveys and spotter catchers required) • Loss of core habitat for Koalas. There is 0.78 km of watercourse mapped on this property.

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Property	Images	Adverse impacts to biodiversity
Property fourteen – Groundwater Road Approved for development – currently in representation Located in the environment and conservation precinct	2019 imagery 	Properties are habitat for the following priority local fauna and flora species: • BrushTailed Phascogale • Eastern Yellow Robin • Feathertail Glider • Koala • Sugar Glider • *Eucalyptus tereticornis* • *Melaleuca quinquenervia* • *Flindersia australis* Impacts include: • Loss of habitat • Loss of connectivity (decreased genetic diversity, potential for increase in disease) • Loss of feed trees • Loss of shelter trees • Introduced impacts i.e. predation by domestic cats/dogs, introduced weeds, vehicle strikes • Loss of movement to and from the conservation precinct • Mortalities associated with vegetation clearing (i.e. if no pre-clearance surveys and spotter catchers required). Property is a very important linkage to connect habitat. There is 1.99 km of watercourse mapped on this property.

RTI RELEASE

Property	Images	Adverse impacts to biodiversity
Property fifteen – 100 Eel Creek Road Property owner requesting to clear for storage containers and also talking about putting a residence on the property – No current DA's Fully covered by the environment and conservation precinct	2019 imagery 	Property is habitat for the following priority local fauna and flora species: • BrushTailed Phascogale • Feathertail Glider • Koala • Sugar Glider • *Eucalyptus tereticornis* • *Melaleuca quinquenervia* Impacts include: • Loss of habitat • Loss of connectivity (decreased genetic diversity, potential for increase in disease) • Loss of feed trees • Loss of shelter trees • Introduced impacts i.e. predation by domestic cats/dogs, introduced weeds, vehicle strikes • Loss of movement to and from the conservation precinct • Mortalities associated with vegetation clearing (i.e. if no pre-clearance surveys and spotter catchers required). Property is an important linkage to connect habitat. There is 0.11 km of watercourse mapped on this property

RTI RELEASE

Property	Images	Adverse impacts to biodiversity
Property sixteen –eighteen (one owner) Purchased as an investment for development - no current DA's Two koalas detected on the property using the heat sensing drone Fully covered by the environment and conservation precinct	2019 imagery 	Properties are habitat for the following priority local fauna and flora species: • BrushTailed Phascogale • Eastern Yellow Robin • Feathertail Glider • Great Barred Frog • Koala • Sugar Glider • Top Knot Pigeon • Wompoo Fruit Dove • *Eucalyptus tereticornis* • *Melaleuca quinquenervia* Impacts include: • Loss of habitat • Loss of connectivity (decreased genetic diversity, potential for increase in disease) • Loss of feed trees • Loss of shelter trees • Introduced impacts i.e. predation by domestic cats/dogs, introduced weeds, vehicle strikes • Loss of movement to and from the conservation precinct • Mortalities associated with vegetation clearing (i.e. if no pre-clearance surveys and spotter catchers required). Properties are an important linkage to connect habitat. There is 0.11 km of watercourse mapped on this property.

PTI RELEASE

Property	Images	Adverse impacts to biodiversity
Property nineteen – 199 Eel Creek Road Requesting removal of dead trees on the property (ring barked by owner). No current DA's Four koalas detected by heat sensing drone Located in the environment and conservation precinct	2019 Imagery 	Properties are habitat for the following priority local fauna and flora species: • BrushTailed Phascogale • Eastern Yellow Robin • Feathertail Glider • Great Barred Frog • Koala • Sugar Glider • *Eucalyptus tereticornis* • *Melaleuca quinquenervia* • *Flindersia australis* Impacts include: • Loss of habitat • Loss of connectivity (decreased genetic diversity, potential for increase in disease) • Loss of feed trees • Loss of shelter trees • Introduced impacts i.e. predation by domestic cats/dogs, introduced weeds, vehicle strikes • Loss of movement to and from the conservation precinct • Mortalities associated with vegetation clearing (i.e. if no pre-clearance surveys and spotter catchers required). Property is a very important linkage to connect habitat. There is 1.9 km of watercourse mapped on this property.

RELEASE

Property	Images	Adverse impacts to biodiversity
Property twenty – 100 Glastonbury Road Considered next in line for development Nine koalas identified using the heat sensing drone Located in the environment and conservation precinct	2019 imagery 	Properties are habitat for the following priority local fauna and flora species: • BrushTailed Phascogale • Eastern Yellow Robin • Feathertail Glider • Great Barred Frog • Koala • Platypus • Sugar Glider • *Eucalyptus tereticornis* • *Melaleuca quinquenervia* • *Flindersia australis* Impacts include: • Loss of habitat • Loss of connectivity (decreased genetic diversity, potential for increase in disease) • Loss of feed trees • Loss of shelter trees • Introduced impacts i.e. predation by domestic cats/dogs, introduced weeds, vehicle strikes • Loss of movement to and from the conservation precinct • Mortalities associated with vegetation clearing (i.e. if no pre-clearance surveys and spotter catchers required). **<u>Impacts on Koalas and Koala Habitat:</u>** Area contains scattered koala habitat trees important for providing connectivity between koala populations in the north to koala populations in the south. Nine koalas were identified in the 13-hectare patch of regrowth vegetation on Stumm Road with an estimated koala density of 0.34 koalas/ha. This area is relatively isolated from other core koala habitat in the region hence making it even more important to retain existing landscape permeability within the area. The area to the south of this region is a large open paddock containing scattered koala habitat trees and may provide important landscape permeability to koala populations found in the south. This area was not originally mapped as 'Urban Koala Habitat' as the core habitat on Stumm Road was originally considered too isolated from other core habitat areas within the region and was considered unlikely to hold a koala population. However, we now have a better

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		understanding of the koala populations within the region and the importance of retaining landscape permeability to other koala populations in the south. The Environment and Conservation Precinct corridor to the west of this area is a flood prone area and does not currently provide good landscape permeability for koala movement as it contains very few koala habitat trees and exposes koalas to predator attacks while traversing along the ground. There is 4 km of watercourse and 4.95 ha wetlands mapped on this property.

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Appendix C: Gympie Council koala project related initiatives over the last 5 year

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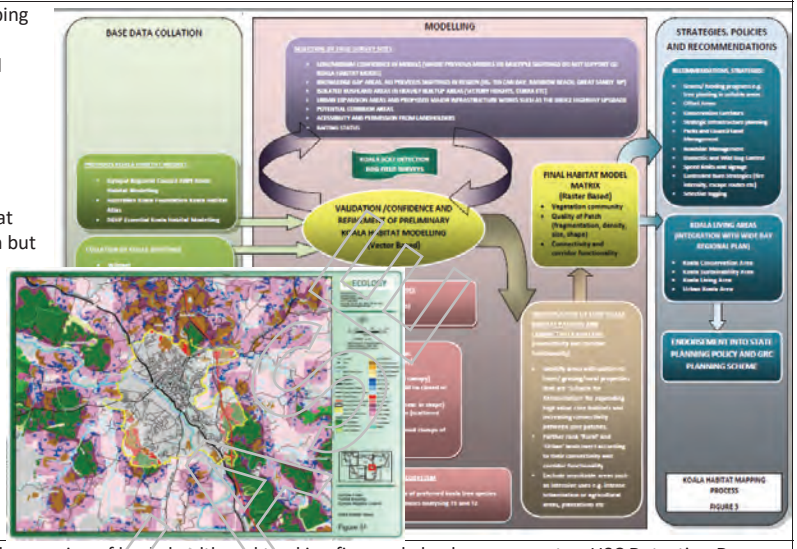
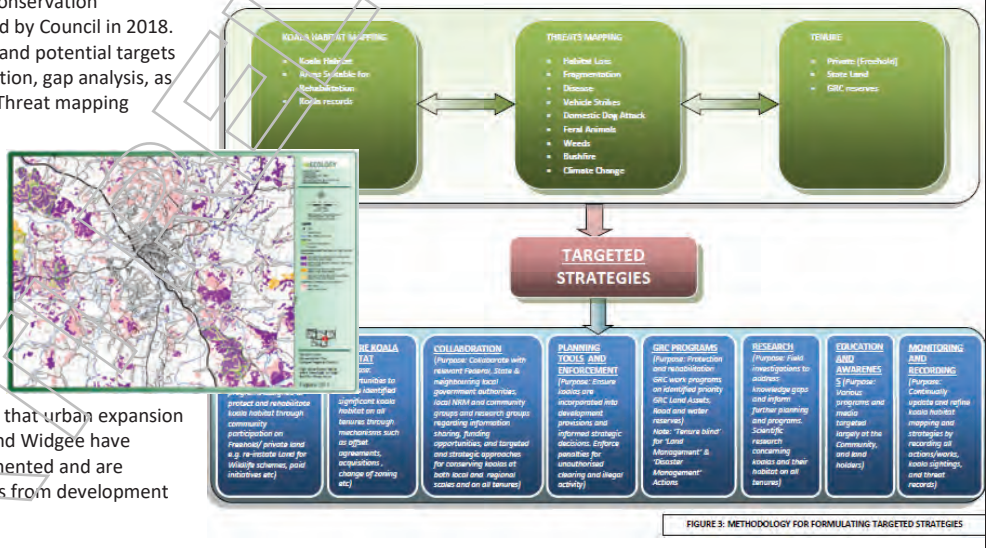
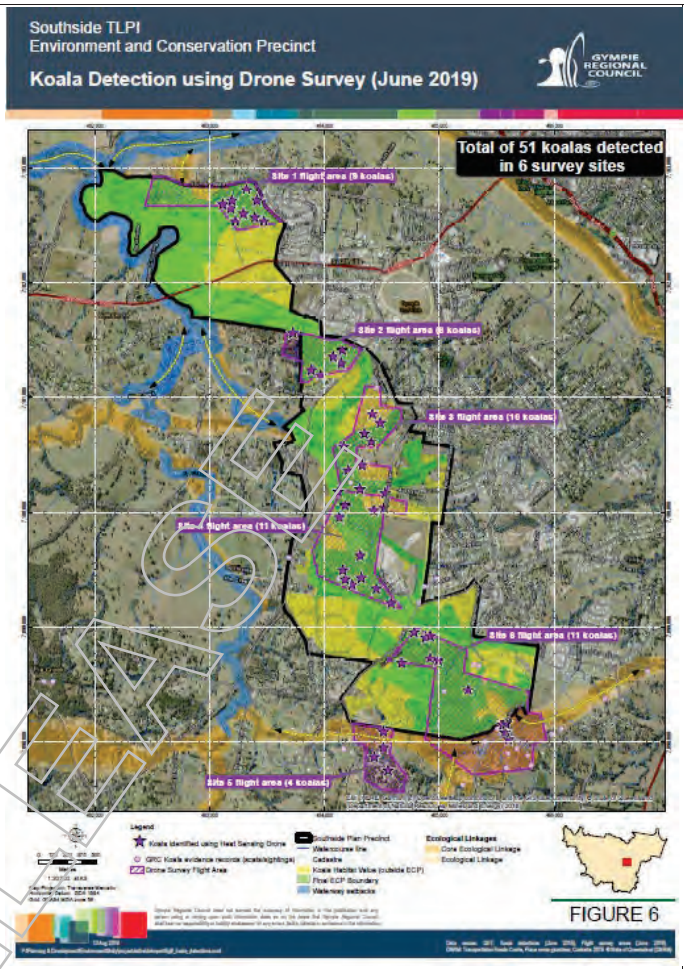
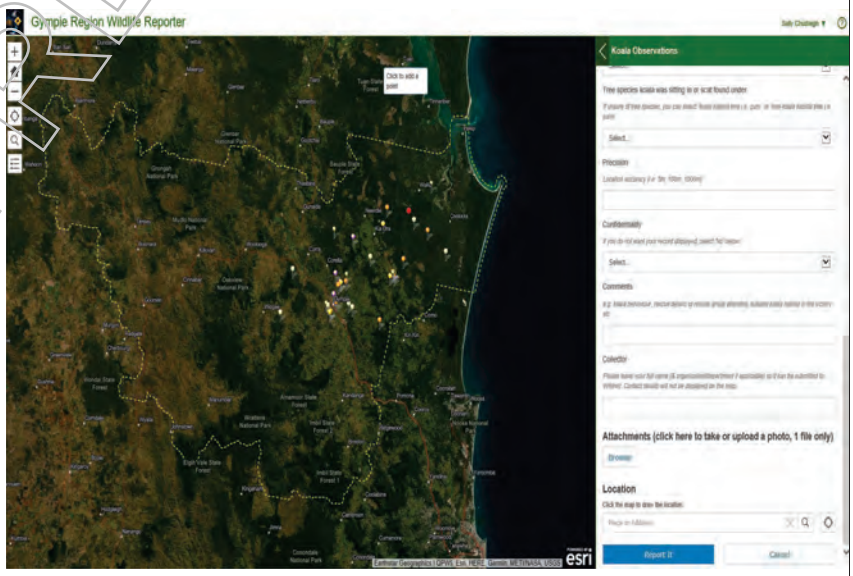
Appendix C: Gympie Council koala project related initiatives over the last 5 years

Year	Project
2015	Generation of high resolution koala habitat mapping in accordance with Policy 7 of the Nature Conservation (Koala) Conservation Plan 2006 and Management Program 2006-2016 which was prepared in accordance with section 112 of the Nature Conservation Act 1992. Important roadside vegetation, small patches of vegetation, and young regrowth (10-15 years) that are not necessarily mapped remnant or regrowth but which are important stepping stones in providing vital connectivity between core habitats, were included in GRC's koala habitat mapping. It is well known that landscape permeability plays a large part in both direct and indirect impacts on koalas is essential for maintaining viable populations, while also allowing for dispersal across modified landscapes to maintain gene flow and refugia from fire, disease, predators and droughts. 
2016-2019	Advancing cost-effective techniques for large scale mapping of koala health and tracking fine-scale koala movements – USC Detection Dogs For Conservation
2017	Field verification of unverified vegetation and koala habitat suitability
2017	Development of a Koala Conservation Management Plan adopted by Council in 2018. This plan mapped threats and potential targets for restoration and protection, gap analysis, as well as threat mitigation. Threat mapping included; • habitat loss, • fragmentation, • disease, • vehicle strikes, • domestic dog attacks, • feral animals, • weeds, • bushfire. It also highlighted the fact that urban expansion areas such as Southside and Widgee have already been largely fragmented and are exposed to significant risks from development pressures.  FIGURE 3: METHODOLOGY FOR FORMULATING TARGETED STRATEGIES
2018-19	Development of a Biodiversity Overlay code to include Koalas
2019 - Draft	Road Ecology Study to identify priority hotspots and road mitigation measures
2019 – in progress	Climate Change impacts and Refugia for koalas
2019 – in progress	Guidelines for Rehabilitation of koala habitat
2019 – In progress	Koala Retrovirus Eucalypt Testing - Research with USC

DRAFT

2019	Heat-sensing drone surveys using automated algorithms to detect koalas for both Southside and Widgee Results from the drone survey concluded that "Koalas were found to be present in all sites that were surveyed in Southside. Koalas in south-east Queensland typically occur at low densities, however the density of koalas found at every site exceeded the estimated average for the region of 0.04 koalas/ha (Rhodes et al. 2015). This suggests the six sites are currently highly suitable habitat for a low-density koala population (Callaghan et al. 2011; Dargan et al. 2019). Maintenance of stable, low-density koala populations such as those found across the six Gympie sites is critical to preventing further decline of the species in south-east Queensland (Lollback et al. 2018; McAlpine et al. 2015). **"Ensuring fragmented areas of suitable habitat remain as connected as possible throughout the urban landscape is key to maintaining these populations, as it bolsters genetic diversity and reduces the risk of mortality associated with koalas moving between more isolated areas (Beyer et al. 2018; Lollback et al. 2018)."** Preliminary Results for Widgee also demonstrate presence of large koala populations. This area is currently zone rural residential. 
2019	Development of an App (soon to be released) to record not only distribution, but also health and threats to koalas to assist with threat mapping and priority hotspots for road mitigation measures, improving linkages, etc. (Note: Records will be shared to wildnet). "The active collection of wildlife sighting data by trained observers is expensive, restricted to small geographical areas and conducted infrequently. Reporting of wildlife sightings by members of the public provides an opportunity to collect wildlife data continuously over wider geographical areas, at lower cost. Citizen science is gaining momentum as a credible data collection technique due to the ubiquity of social media, smart phones and web technology, which provide economical and easily accessible tools for monitoring wildlife presence".  A comprehensive form to assist with strategies and programs identified in our GRC Koala Conservation Management Plan as well as an educational and awareness tool for the community. Data captured includes presence/absence data, wildlife rescues, threats (such as road strikes, disease, dog attacks, fire etc.) and tree preferences. This can help to guide programs and assist research with regards to; • Mitigation measures for disease, road strikes, fire management guidelines, weed and feral animal control; • Education and awareness programs; and • Restoration targets and incentives

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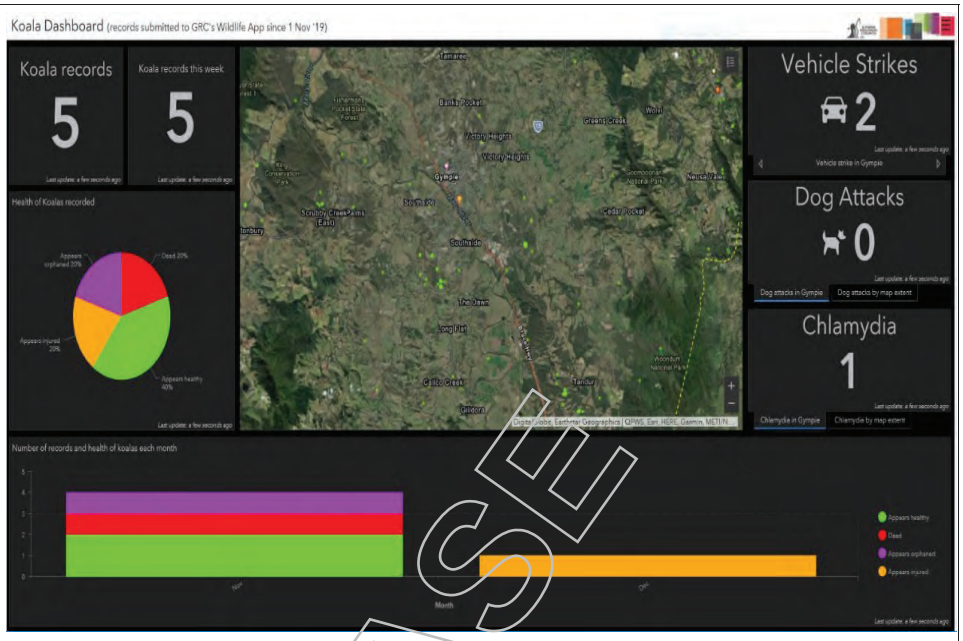
2019	Development of interactive dashboards to identify hotspots or trends occurring over time including automated heat maps of vehicle road strikes It can also be interactive where it changes on the fly according to the map extent you specify. This can assist with letter box drops, treatments for disease and mitigation measures for road strikes, community plantings or rehabilitation efforts in specific locations, etc.	

RTI RELEASE

From: s. 73(2) - Not relevant/ Out of sc
To: Luke Lankowski
Subject: s. 73(2) - Not relev shared "TLPI 2 - Protection of Biodiversity values" with you
Date: Wednesday, 18 December 2019 12:52:14 PM

Hi there,

s. 73(2) - Not relevant/ Out of scope @gympie.qld.gov.au) invited you to edit the folder "**TLPI 2 - Protection of Biodiversity values**" on Dropbox.

s. 73(2) - said:

"Hi Holly, Council has now submitted the proposed Temporary Local Planning Instrument 2 – Protection of biodiversity values through the Plan Making Portal. Please note the raw mapping data file type was not supported by the portal so I am uploading the files via dropbox for you. This data supports the pdf biodiversity mapping submitted via the portal and is for consideration as part of the TLPI assessment process. Kind Regards s. 73(2) - Not relevant/ O...

Go to folder

Enjoy!
The Dropbox team

RTI RELEASE

Report to Dropbox

© 2019 Dropbox

Our Ref: BS:AE0000162 **File No: 216618**

GYMPIE REGIONAL COUNCIL

12 December 2019

The Honourable Cameron Dick
Minister for State Development, Manufacturing, Infrastructure and Planning
PO Box 15009
CITY EAST QLD 4002

Dear Minister

Re: Proposed New Temporary Local Planning Instrument 2 – Protection of Biodiversity Values

I write with regards to a proposed new Temporary Local Planning Instrument for the protection of biodiversity values in the Gympie region, referred to as Temporary Local Planning Instrument 2 – Protection of biodiversity values (TLPI).

At its meeting held on 25 September 2019 Council resolved as follows:

That Council:

1. ***Make a Temporary Local Planning Instrument for the protection of Biodiversity values across the Gympie region;***
2. ***Submit the proposed Temporary Local Planning Instrument 2 – Protection of biodiversity values to the Minister for State Development, Manufacturing, Infrastructure and Planning, seeking approval for the making of the Temporary Local Planning Instrument with a commencement date of 25 September 2019.***

Gympie Regional Council seeks the Minister's approval for the making of the TLPI, attached in **Appendix A**, to alleviate the significant risk of serious environmental impacts occurring in the Gympie region due to the limited scope of the environmental regulation in the Gympie Regional Council Planning Scheme 2013 (the Planning Scheme), the absence of any mechanism to regulate vegetation clearing and outdated biodiversity mapping.

The adoption of the proposed TLPI will ensure immediate protection of the significant environmental values within the Gympie region until the proposed drafted amendments have been appropriately integrated into the Planning Scheme through a major amendment process as part of upcoming Amendment Package 3.

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Background

Council is aware of significant community concern being expressed, in specific instances of large scale clearing in the Gympie region in the absence of any ability for Council to intervene in urban areas in the Gympie region without any consideration by Council (as the Planning Scheme does not regulate Operational Works for vegetation clearing). This clearing (including in Gympie urban area) has resulted in impacts to significant vegetation. These risks triggered a review of the way the Planning Scheme protects significant biodiversity values and balances the relationship between development and environmental protection in the Gympie region.

The review highlighted that there are significant gaps in the Planning Scheme in respect of the protection of significant biodiversity values and as a result, clearing has been and has the potential to continue to occur in areas of environmental significance without any Council assessment or consideration. Following this initial review, a gap analysis was undertaken to determine what is considered 'standard practice' amongst other Local governments in relation to the protection of biodiversity values through the Planning Scheme.

The gap analysis clearly identified that the current Planning Scheme does not meet 'standard practice' approaches. It was determined that contemporary standard practice approaches in relation to environmental protection through the Planning Scheme amongst other Local governments include (but are not limited to):

- The regulation of vegetation clearing in 'mapped' areas i.e. Operational Works for vegetation clearing (the GRC Planning Scheme does not regulate Operational Works for vegetation clearing);
- A suite of Environmental Overlay Mapping that identifies priority values such as corridors, important habitat, waterways and wetlands etc. (the GRC Planning Scheme contains a Conservation Significance Overlay which is outdated and does not identify a number of key environmental elements such as wetlands and waterways);
- A stand-alone Biodiversity Overlay Code (the GRC Planning Scheme does not contain a Biodiversity Overlay Code);
- Planning Scheme Policies providing applicants with additional guidance on how to appropriately address the Biodiversity Overlay Code (the GRC Planning Scheme does not contain Planning Scheme Policies specific to biodiversity matters);
- Biodiversity Offsets as an option to allow flexibility in the development assessment process and a balance between development and the environment (the GRC Planning Scheme does not provide an opportunity for biodiversity offsets).

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A suite of policy documents focussing on the protection of biodiversity values was developed for the purpose of being implemented into the Planning Scheme through a major amendment process under the Minister's Guidelines and Rules. However, due to the time it takes to progress amendments through a Major Amendment process and the significant risk to biodiversity values in the Gympie region, Council resolved that a TLPI is the most appropriate instrument to implement the suite of policy changes to ensure immediate protection.

The proposed TLPI includes:

- Categories of development and assessment;
- Biodiversity Overlay Code;
- Biodiversity Overlay Mapset comprising of 7 subsets;
- Planning Scheme Policy – Ecological Assessment Report;
- Planning Scheme Policy – Offsets;
- New administrative definitions to provide clarity of terms used within the drafting.

The above suite of amendments and new policy documents are proposed to be progressed to the Minister as a major amendment as part of a future Amendment Package 3 to the Planning Scheme.

Studies, reports and methodology that informed the preparation of the proposed TLPI

A number of background studies, reports and ecological value identification techniques were used to inform the preparation of the proposed TLPI and associated mapping, including:

- Gap analysis of the current Planning Scheme against several other Local governments Planning Schemes;
- Threatened species, threatened ecological communities and wildlife corridor mapping for the Gympie region;
- Koala mapping for the Gympie region;
- Priority Species Assessment Gympie Region (undertaken by consultants BAMM)
- *Section 7 Works Cited* within 'Methodology for mapping ecological linkages for the Gympie region' lists additional works and material that was referred to through the process of developing the proposed TLPI and associated mapping.

Two consolidated background reports have been prepared by Council, detailing the methodology for the Biodiversity Overlay Mapping proposed in the TLPI. These reports are attached in **Appendix C and D**. Additionally, both the Ecological Assessment Report and Offsets Planning Scheme Policies provide the necessary background information and context to support their inclusion.

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Biodiversity Overlay Mapsets

As part of the proposed TLPI, Biodiversity Overlay Mapping has been developed comprising the following:

- Priority species habitat;
- Koala habitat;
- Ecological linkages;
- Wetlands and waterways;
- Matters of State Environmental Significance (this has been separated into 3 subsets).

The methodology use to prepare each of these mapsets is detailed in the reports attached in **Appendix C and D**. The priority species list is included in Table 1 below under their common names:

Table 1 GRC Priority Species

Column 1 **Identified priority species (fauna)**	**Column 2** **Identified priority species (flora)**
Brush-tailed Phascogale	Australian Teak
Eastern Yellow Robin	Blue Gum
Feathertail Glider	Blue Quandong
Great Barred Frog	Broad-leafed Paperbark
Koala	Cabbage Tree Palm
Mary River Cod	Gympie Messmate
Noisy Pitta	Gympie Nut
Ornate Rainbowfish	Hoop Pine
Platypus	Kauri
Sugar Glider	Rusty Tulip Oak, Copper Booyong
Topknot Pigeon	Swamp Grasstree
Wompoo Fruit Dove	Wallum Sun Orchid

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Demonstrated need for the proposed TLPI under section 23(1) of the *Planning Act 2016*

Section 23(1) of the *Planning Act 2016* (the Act) states:

(1) A local government may make a TLPI if the local government and Minister decide—

a) there is significant risk of serious adverse cultural, economic, environmental or social conditions happening in the local government area; and

b) the delay involved in using the process in sections 18 to 22 to make or amend another local planning instrument would increase the risk; and

c) the making of the TLPI would not adversely affect State interests.

The proposed TLPI complies with section 23(1) of the Act as the purpose of the TLPI is to alleviate the significant risk of serious adverse environmental impacts in the Gympie region that have occurred due to the lack of environmental regulation in the Planning Scheme. **Appendix B** provides examples of clearing that has occurred across the Gympie region in areas of environmental significance, and details the impacts from the clearing.

Furthermore, the proposed TLPI will also address the delay involved in making a Major Amendment to the Planning Scheme, as the delay will significantly increase the risk of serious adverse environmental impacts occurring in the areas identified in the proposed Biodiversity Overlay Mapping.

Lastly, the proposed TLPI does not adversely affect State interests, advancing the protection of MSES by ensuring the Planning Scheme regulates Operational Work for vegetation clearing in urban areas where clearing is proposed within a mapped biodiversity area (including MSES area).

Proposed Effective Date

Under Section 9(4) of the Act, Council requests an effective date of 25 September 2019 for the proposed new TLPI, coinciding with the date of Council's Ordinary meeting resolution, as previously outlined.

The request for a backdated effective date is due to the proposed TLPI being a publicly available document as of the 25 September 2019 where the TLPI was presented at Council's Ordinary meeting. If a backdated commencement date is not applied, the TLPI would have been available for public viewing without any mechanisms to enforce it and avoid potentially significant pre-emptive clearing.

Should you wish discuss the above matter please contact Council's Coordinator Planning Scheme Program, s. 73(2) - Not relevant/ Out of scope or email s. 73(2) - Not relevant/ Out of scope@gympie.qld.gov.au.

Yours faithfully

Bernard Smith
Chief Executive Office

PART RELEASE

1.0 Short title

This Temporary Local Planning Instrument (TLPI) may be cited as *Temporary Local Planning Instrument 2 – Protection of biodiversity values.*

2.0 Purpose

The purpose of this TLPI is to protect and enhance ecological linkages, priority species habitat, koala habitat, matters of State and local environmental significance and wetlands and waterways.

3.0 Application

This TLPI applies to development within the Biodiversity Overlay mapping, identified by the maps within *Appendix F – Biodiversity Overlay mapping*.

4.0 Effect of this Temporary Local Planning Instrument

Appendix A – Categories of development and assessment – Biodiversity Overlay, prescribes the:

- category of development and assessment for the Biodiversity Overlay
- additional requirements for accepted development; and
- additional assessment benchmarks for assessable development.

Accepted development subject to requirements and assessable development is to be assessed against the requirements and assessment benchmarks contained in *Appendix B – Biodiversity overlay code* as well as any requirements under the Gympie Regional Council Planning Scheme 2013. Where impact assessable under *Appendix A,* development, clearing of vegetation, and operational work (other than for vegetation clearing) will be assessed against the TLPI and the whole of the Gympie Regional Council Planning Scheme 2013. *Appendix D – Ecological Assessment Report* and *Appendix E – Biodiversity offset* provide information that may be required or requested to accompany a development application, and includes guidance on how to satisfy the assessment benchmarks within *Appendix B - Biodiversity overlay code*.

To the extent of any inconsistency between Council's current planning scheme and the TLPI, the TLPI prevails.

However, if development is identified as having a different category of development or category of assessment under a zone in the Gympie Regional Council Planning Scheme 2013 than under

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Appendix A in this TLPI, the highest category of development or category of assessment applies as follows:

(a) accepted development subject to requirements prevails over accepted development not subject to requirements;
(b) assessable development requiring code assessment prevails over accepted development subject to requirements and accepted development not subject to requirements; and
(c) assessable development requiring impact assessment prevails over assessable development requiring code assessment, accepted development subject to requirements and accepted development not subject to requirements.

Note: Where species identified in this Temporary Local Planning Instrument are currently Matters of State Environmental Significance or Matters of National Environmental Significance, they are not Matters of Local Environmental Significance despite their listing within the Temporary Local Planning Instrument as Matters of Local Environmental Significance.

5.0 Interpretation

Terms exclusive to this TLPI have been defined in *Appendix C – Definitions*. All other terms are to have the same meaning as in the *Planning Act 2016* or the Gympie Regional Council Planning Scheme 2013.

Appendix A. – Categories of development and assessment – Biodiversity Overlay

Table 1 – Categories of development and assessment – Biodiversity Overlay

Category of development and assessment	**Additional assessment benchmarks for assessable development and requirements for accepted development**
Accepted development	
Clearing of vegetation, within an area shown on the Biodiversity Overlay Mapping, that is ***accepted vegetation clearing***.	Not applicable
Accepted development subject to requirements	
Material change of use or building work for a Dwelling house	Biodiversity overlay code – Section 1
Code assessment	

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Category of development and assessment	Additional assessment benchmarks for assessable development and requirements for accepted development
Clearing of vegetation within an area shown on the Biodiversity Overlay Mapping, other than clearing of vegetation on land subject to the Biodiversity Overlay Map (ii) Wetlands and Waterways or in a Core ecological linkage, that is not ***accepted vegetation clearing*** in: a) an urban zone; or b) Rural Residential Zone; or c) Sport and Recreation Zone; or d) Open Space Zone; or e) Community Purposes Zone; or f) Limited Development (Constrained Land) Zone; g) Environmental Management and Conservation Zone; or h) Extractive Industry Zone.	Biodiversity overlay code
Clearing of vegetation on land subject to the Biodiversity Overlay Map (ii) Wetlands and Waterways	Biodiversity overlay code
Material change of use or building work for a Dwelling house where: a) not complying with the requirements for Accepted development; and b) not located within the Core ecological linkages.	Biodiversity overlay code
Material change of use, other than for a Dwelling house, if not located within the Core ecological linkages.	Biodiversity overlay code
Reconfiguring a lot, if not located within the Core ecological linkages.	Biodiversity overlay code
Impact assessment	
Clearing of vegetation in the Core ecological linkages that is not *accepted vegetation clearing* in:	The planning scheme

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Category of development and assessment	Additional assessment benchmarks for assessable development and requirements for accepted development
a) an urban zone; or b) Rural Residential Zone; or c) Sport and Recreation Zone; or d) Open Space Zone; or e) Community Purposes Zone; or f) Limited Development (Constrained Land) Zone; or g) Environmental Management and Conservation Zone; or h) Extractive Industry Zone.	
Material change of use or building work for a Dwelling house if located within the Core ecological linkages.	The planning scheme
Material change of use, other than for a Dwelling house if located within the Core ecological linkages.	The planning scheme
Reconfiguring a lot if located within the Core ecological linkages.	The planning scheme

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Table 2 – Categories of development and assessment – Biodiversity Overlay – Operational work other than Operational work for vegetation clearing

Zone	Development	Categories of development and assessment	Additional assessment benchmarks for assessable development and requirements for accepted development
All zones	Any operational work, other than operational work for vegetation clearing, that is on a site located within the Biodiversity Overlay Mapping.	No change to the categories of development and assessment	Biodiversity overlay code

Appendix B. – Biodiversity overlay code

Purpose

The purpose of the biodiversity overlay code is to protect and enhance core ecological linkages, ecological linkages, priority species habitat, koala habitat values, wetlands and waterways, and matters of state environmental significance.

The purpose of the code will be achieved through the following overall outcomes:

(a) development maintains and improves the functionality, connectivity, diversity and viability of core ecological linkages, ecological linkages, matters of state environmental significance and habitat for priority species identified in Table 7.2.1.2.2 Priority species;

(b) development protects koala habitat values and movement corridors, and minimises adverse impacts on koalas;

(c) development protects and enhances the functionality and ecological value of core ecological linkages, and degraded areas are rehabilitated;

(d) development within core ecological linkages is located in areas of lowest ecological value over other areas, and is located and designed to minimise intrusion into identified linkages, providing continuous connected linkages of sufficient dimensions and characteristics that will enable safe and unimpeded movement of fauna through the site;

(e) development does not adversely impact on the physical and hydrological integrity, water quality or ecological functions and values of waterways and wetlands;

(f) management strategies and appropriate clearing practices are implemented to ensure any priority species impacted by development activities are managed and protected during works; and

(g) any significant residual impact caused by development is offset, where appropriate and agreed to by Council.

Editor's Note – In addition to the requirements of this planning scheme, obligations for the protection of matters of environmental significance are established by the Commonwealth and Queensland Government. Additional approvals or referrals may be required.

Editor's Note – An ecological assessment report prepared in accordance with Appendix D is considered an appropriate way to demonstrate compliance with the code.

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7.2.1.2 Biodiversity Overlay Code assessment benchmarks for assessable development and requirements for accepted development

Table 7.2.1.2.1 Biodiversity overlay code

Performance outcome	Acceptable outcomes
Section 1 **For accepted development subject to requirements**	
PO1 Dwelling houses: a) are located in existing cleared areas, or areas of lowest ecological value over other areas; b) are located and designed: i. to minimise intrusion into identified core ecological linkages and ecological linkages, providing continuous connected linkages of sufficient dimensions and characteristics that will enable safe and unimpeded movement of fauna through the site; ii. maintain, and not fragment, the regional connectivity of Core ecological linkages; c) are constructed without having an adverse impact on biodiversity values; d) minimise the total footprint within which all buildings, structures, driveways and other works are contained.	**AO1.1** Dwelling houses are: a) not located within core ecological linkages; and b) constructed without clearing of vegetation.
Section 2 **For all assessable development**	
Priority species habitat, ecological linkage and matters of state environmental significance	
PO2 Development avoids and minimises impacts on the physical integrity, ecological integrity and biodiversity value of matters of state environmental significance.	**AO2.1** No acceptable outcome specified.
PO3 Development does not adversely impact on priority species or their habitat. Priority species are identified in Table 7.2.1.2.2 – Priority species.	**AO3.1** No acceptable outcome specified.
PO4 Development within ecological linkages maintains or reinstates a vegetated setback to core ecological linkages to minimise risk of edge effects and other adverse impacts.	**AO4.1** No acceptable outcome specified.

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Performance outcome	Acceptable outcomes
The reinstatement of a vegetated setback to core ecological linkages is vegetated: (a) with priority species habitat; (b) at a density appropriate to the location; (c) with a mix of trees, shrubs and groundcovers.	
Koala habitat values	
PO5 Koala habitat is protected.	**AO5.1** Development: (a) retains koala feed trees, koala shelter trees and koala habitat trees; and (b) is not located within the tree protection zone of koala feed trees, koala shelter trees and koala habitat trees. **Editor's note:** Building envelopes can be submitted as part of applications demonstrating compliance with this acceptable outcome. Building envelopes may also need to consider bushfire mitigation works which are required by zone and development codes. **Editor's note:** The method for determining the tree protection zone is included within Appendix D. **Editor's note:** Koala feed trees, koala shelter tree's and koala habitat tree's found in the Gympie region and relevant to the outcomes in this code are identified within Appendix D.
PO6 Development: (a) provides for safe, practical, unobstructed koala movement across the site; (b) incorporates measures to mitigate the risk of death or injury to koalas; and (c) incorporates planting that improves food and shelter for koalas. **Editor's note:** Applicants can refer to the *Koala-sensitive Design Guideline, A guide to koala-sensitive design measures for planning and development activities, 2012, DEHP* for further guidance.	**AO6.1** No acceptable outcome specified.
PO7	**AO7.1**

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Performance outcome	Acceptable outcomes
During any clearing and construction phases, measures are incorporated to protect koalas from death or injury.	Threats to koalas during clearing and construction are mitigated by: (a) ensuring no tree in which a koala is present or a tree with a crown overlapping a tree containing a koala is cleared; (b) undertaking clearing of vegetation in stages, and ensuring: i. no more than 1 ha is cleared per day for sites less than 6 ha in size; ii. no more than 2 ha is cleared per day for sites greater than 6 ha in size; iii. that between each stage there is at least 12 hours where no clearing occurs; and iv. koala habitat is always linked to allow koalas to move out of the site; (c) ensuring suitably qualified and experienced koala spotters and catchers are on site when clearing is being undertaken; (d) preventing domestic dogs and security dogs entering the site; and (e) using koala safety fencing. **Editor's note:** Clearing of vegetation is only contemplated where compliance with the other performance outcomes of the code can be achieved. In circumstances where compliance can be achieved, this performance outcome and acceptable outcome applies. **Editor's note:** A description of suitably qualified and experienced spotter catchers is included within Appendix D.
Core ecological linkage	
PO8 Development is located wherever possible outside of core ecological linkages and where proposed within a core ecological linkage: a) is located in existing cleared areas, or areas of lowest ecological value over other areas; b) is located and designed to: i. minimise intrusion into identified core ecological linkages and ecological linkages,	**AO8.1** No acceptable outcome specified.

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Performance outcome	Acceptable outcomes
providing continuous connected linkages of sufficient dimensions and characteristics that will enable safe and unimpeded movement of fauna through the site; ii. maintains, and not fragment, the regional connectivity of core ecological linkages; c) is constructed without having an adverse impact on biodiversity values; d) minimises the total footprint within which all buildings, structures, driveways and other works are contained. **Editor's note**: In this provision 'development' includes clearing of vegetation but does not include planting native vegetation. **Editor's note:** Building envelopes can be submitted as part of applications demonstrating compliance with this acceptable outcome. Building envelopes may also need to consider bushfire mitigation works which are required by zone and development codes.	
PO9 Disturbed, cleared or degraded areas within mapped core ecological linkages are reinstated, enhanced and rehabilitated with vegetation that: a) is consistent with the pre clear regional ecosystem for the site; b) includes a mix of trees, shrubs and groundcovers. **Editor's note:** Enhancement and rehabilitation may include but is not limited to planting of native vegetation or removal of pest species.	**AO9.1** No acceptable outcome specified.
PO10 The operation of the development minimises impacts on the physical integrity, ecological integrity and biodiversity value of core ecological linkages.	**AO10.1** No acceptable outcome specified.
Wetlands and Waterways **Editor's note- some mapped habitat areas are also waterways or wetland areas. In these circumstances, all relevant priority species habitat, koala habitat values, core ecological linkages, ecological linkages and waterways and wetlands acceptable outcomes or performance outcomes apply.**	
PO11 Development maintains waterway and wetland habitat areas and does not create impediments to the connectivity of that habitat.	**AO11.1** No acceptable outcome specified.

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Performance outcome	Acceptable outcomes
PO12 Development provides and maintains a buffer to wetlands and waterways, in order to: (a) protect or enhance ecological processes and values; (b) protect water quality and aquatic conditions; (c) provide unimpeded movement of fauna along waterways or around wetlands; and (d) improve bank stability and prevent soil erosion.	**AO12.1** Development is setback: (a) 50 metres from the outermost part of a wetland; (b) 25 metres from the top of the outer bank of a waterway with a stream order 1 or 2; (c) 50 metres from the top of the outer bank of a waterway with a stream order 3 or 4; and (d) 100 metres from the top of the outer bank of a waterway with a stream order 5 or greater.
PO13 Development does not alter the location, storage or natural functions of surface and ground water of wetlands and waterways.	**AO13.1** No acceptable outcome specified.
Other matters	
PO14 Development is designed and located to maintain and enhance connectivity between areas of priority species habitat, matters of state environmental significance, koala habitat values, core ecological linkages and ecological linkages on and adjacent to the site. **Editor's Note:** Where development is proposed to cross priority species movement paths, fauna friendly movement solutions developed in accordance with the *Queensland Government Fauna Sensitive Road Design Manual Volume 2: Preferred Practices;* and the *QLD Government Koala- Sensitive Design Guidelines* should be incorporated to provide for the safe movement of fauna through the site and to adjoining sites.	**AO14.1** No acceptable outcome specified.
PO15 Where development occurs, it is designed and sited to minimise adverse impacts, and protect the physical and ecological integrity and biodiversity values of matters of local environmental significance by:	**AO15.1** No acceptable outcome specified.

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Performance outcome	Acceptable outcomes
(a) minimising the total footprint within which all activities, buildings, structures, driveways and other works are contained; (b) ensuring development is located in existing cleared areas or areas of lowest ecological value over other areas; (c) incorporating measures to protect and retain ecological values and ecosystem processes.	
PO16 Development does not result in the introduction of pest species (plant or animal), that pose a risk to ecological integrity or disturbance to native flora and fauna.	**AO16.1** No acceptable outcome specified.
PO17 Development minimises potential for disturbance of fauna from the impacts of noise, light, vibration or other sources.	**AO17.1** No acceptable outcome specified.
PO18 Where development involving clearing of vegetation occurs: (a) fauna is safely relocated by suitably qualified and experienced spotter catchers to appropriate, safe alternative locations that contain a similar habitat structure; (b) the sequence of habitat clearing and/or disturbance ensures that fauna is not isolated from adjoining areas of habitat to allow for the safe and practical movement of fauna to areas of habitat not proposed to be cleared (c) impacts from construction and ongoing use on native fauna and flora are minimised; (d) any cleared vegetation is reused, recycled or disposed of safely; (e) measures are implemented to prevent soil degradation, erosion, slippage and sedimentation. **Editor's note:** Clearing of vegetation is only contemplated where compliance with the other outcomes of this code can be achieved. In circumstances where compliance can be achieved, this performance outcome and acceptable outcome applies.	**AO18.1** No acceptable outcome specified.

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Performance outcome	Acceptable outcomes
Editor's note: A description of suitably qualified and experienced spotter catchers is included within Appendix D.	
PO19 Development retains natural landforms, including steep land and gullies.	**AO19.1** No acceptable outcome specified.
Offsets	
PO20 Any significant residual impact on priority species habitat, wetlands or waterways, core ecological linkages, or ecological linkages caused by development is offset in accordance with Appendix E Biodiversity offsets. Editor's note: Offsets will be sought for matters of local environmental significance in accordance with the *Queensland Environmental Offsets Act*. The State government will be responsible for any offsets required for significant residual impacts on matters of state environmental significance including koala habitat. Editor's note: A guideline to assist in determining if an impact is a significant residual impact has been included within Appendix D.	**AO20.1** No acceptable outcome specified.

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Table 7.2.1.2.2 Priority species

Column 1 **Identified priority species (fauna)**	**Column 2** **Identified priority species (flora)**
Brush-tailed Phascogale (Phascogale tapoatafa)	Australian Teak (Flindersia australis)
Eastern Yellow Robin (Eopsaltria australis)	Blue Gum (Eucalyptus tereticornis)
Feathertail Glider (Acrobates pygmaeus)	Blue Quandong (Elaeocarpus grandis)
Great Barred Frog (Mixophyes fasciolatus)	Broad-leafed Paperbark (Melaleca quinquenervia)
Koala (Phascolartcos cinereus)	Cabbage Tree Palm (Livistona australis)
Mary River Cod (Maccullochella mariensis)	Gympie Messmate (Eucalyptus cloeziana)
Noisy Pitta (Pitta versicolor)	Gympie Nut (Macadamia ternifolia and Macadamia integrifolia)
Ornate Rainbowfish (Rhadinocentrus ornatus)	Hoop Pine (Araucaria cunninghamii)
Platypus (Ornithorhynchus anatinius)	Kauri (Agathis robusta)
Sugar Glider (Petaurus breviceps)	Rusty Tulip Oak, Copper Booyong (Argyrodendron sp. Kin Kin)
Topknot Pigeon (Lophoaimus antarcticus)	Swamp Grasstree (Xanthorrhea fulva)
Wompoo fruit dove (Ptilinopus magnificus)	Wallum Sun Orchid (Thelmitra purpurata)

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Appendix C. – Definitions

Table SC1.5 Administrative terms and definitions

Column 1 Term	Column 2 Definition
Accepted vegetation clearing	Clearing of vegetation under the following circumstances – (a) vegetation clearing undertaken by a statutory authority on land other than freehold land; (b) vegetation clearing undertaken by the Council in the exercise of its power under the *Local Government Act 2009*; (c) vegetation clearing undertaken by or on behalf of the Council on Council owned or controlled land; (d) clearing of a plant defined as a prohibited or restrictive biosecurity matter under the *Biosecurity Act 2014*; (e) vegetation clearing that is reasonably necessary for carrying out work that is: - i. authorised or required under legislation; or ii. specified in a notice served by Council or another regulatory authority; (f) vegetation clearing in accordance with a current development permit for: i. material change of use, reconfiguring a lot or other operational work; or ii. building work associated with a dwelling house; (g) vegetation clearing in accordance with a current permit or other approved plan granted under a local law; (h) vegetation clearing where: i. a person is acting to control an immediate threat to life or property; ii. no other lawful action is reasonably available to the person to avoid the immediate threat to life or property; iii. no reasonable opportunity exists for an application to be made to clear the vegetation; and iv. Council is provided details in writing as soon as practicable after the action has been taken; (i) vegetation clearing within 5 metres of a lawful building or structure (excluding fences), unless the vegetation is otherwise required to be retained in accordance with a development approval; and (j) clearing that is for essential management under the Planning Regulation 2017. **Editor's note:** *vegetation clearing* which is defined as *accepted vegetation clearing* for the purposes of the planning scheme may be subject to assessment under State and/or Federal legislation. **Editor's note:** exemptions for clearing for fences under the Planning Regulation 2017 also apply. Please refer to these exemptions in the relevant State legislation.
Clearing, for vegetation	Has the same meaning as the *Vegetation Management Act 1999*
Core ecological linkages	Core ecological linkages are identified on the Biodiversity Overlay – Ecological linkages mapset.

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Column 1 Term	Column 2 Definition
Ecological linkages	Ecological linkages are identified on the Biodiversity Overlay – Ecological linkages mapset.
Koala habitat values	Koala habitat values are identified on the Biodiversity Overlay – Koala habitat values mapset.
Linkages	Linkages refer to 'Core ecological linkages' and 'Ecological linkages'.
Matters of local environmental significance (MLES)	The following are matters of local environmental significance (MLES) for the Gympie region: • Priority species habitat; • Core ecological linkage; • Ecological linkage; • Wetlands and waterways and associated buffers; • Koala habitat values. Gympie Regional Council's MLES are identified in the Biodiversity Overlay Mapset.
Non-juvenile koala habitat tree	Has the same meaning as the *Planning Regulation 2017*.
Priority species habitat	Priority species habitat is identified on the Biodiversity Overlay – Priority species habitat mapset.
Urban zone	For the purpose of this TLPI, an urban zone refers to the following zones: • Residential Living • Residential Choice • Character Residential • Township • Tourist Accommodation • Low Impact Industry • Medium Impact Industry • High Impact Industry • Waterfront and Marine Industry • Industry Investigation • Principal Centre • District Centre • Local Centre • Specialised Centre

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Column 1 Term	Column 2 Definition
Waterway	A waterway is: • identified on the Biodiversity Overlay - Wetlands and Waterways overlay mapset; or • a watercourse as defined under the *Water Act 2000*.
Wetland	Areas of permanent or periodic/intermittent inundation, whether natural or artificial, with water that is static or flowing, fresh, brackish or salt, including areas of marine water, the depth of which at low tide does not exceed six metres.

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Appendix D. Ecological Assessment Report

SC6.2.1.1 Purpose of the policy

(1) The purpose of this policy is to outline the minimum requirements of an ecological assessment report that may be required to support a development application where subject to the Biodiversity overlay code. It's intended that applicants who follow this guideline will provide Council with enough information to:

(a) assess the ecological impacts of proposed development;
(b) assist in demonstrating compliance with the performance outcomes of the Biodiversity overlay code; and
(c) determine if an ecological impact is a significant residual impact.

Applicants are encouraged to discuss with Council about additional information that would assist in the assessment of ecological impacts.

SC6.2.2 What is a significant residual impact?

For the purposes of the Biodiversity overlay code, a significant residual impact (SRI) is an impact on a matter of local environmental significance (MLES) that is likely to:

MLES: Priority Local Species

An action will have a significant residual impact on priority local species habitat if the action is likely to:

- reduce the extent of the occurrence of a priority local species
- reduce the extent of vegetation required for priority local species survival
- lead to a decrease in the size of the local population of a priority local species
- fragment habitat or an existing population for a priority local species
- result in genetically distinct populations forming as a result of habitat isolation
- introduce disease that may cause a priority local species population to decline
- interfere with the recovery of a priority local species
- cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a priority local species.

MLES: Wetlands and waterways, including buffer areas

An action will have a significant residual impact on a wetlands or waterway if it is likely that the action will result in environmental values being affected in any of the following ways:

- areas of the wetland or waterway being degraded or artificially modified;
- a measurable change in water quality of the wetland or waterway; for example, a change in the level of the physical and/or chemical characteristics of the water, including salinity, pollutants, or nutrients in the wetland or waterway, to a level that exceeds the water quality guidelines for the waters;
- any impact resulting in a change to the habitat or lifecycle of native species, including invertebrate fauna and fish species, dependent upon the wetland or waterway;

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- any impact resulting in a change in the volume, timing, duration and frequency of ground and surface water flows in either a wetland or waterway.

MLES: Core ecological linkages and ecological linkages

An action will have a significant residual impact on core ecological linkages and ecological linkages if it is likely that the action will result in environmental values being affected in any of the following ways:

- vegetation clearing results in the physical separation (any clearing that would result in the separation of an otherwise intact area of vegetation) of vegetation within the Core ecological linkages or ecological linkages and on adjoining sites;
- development that is located in an area on the site that creates a physical barrier, causes fragmentation and loss of connectivity;
- permanent modification of vegetation within the corridor boundaries;
- vegetation clearing results in loss of stepping stones or connectivity to habitat nodes;
- vegetation clearing isolates wildlife populations and their habitat resources;
- the installation of physical barriers that prevent wildlife movement and dispersal;
- any impact resulting in edge effects that degrade the values of the corridor;
- any impact resulting in the reduction of the width of the core ecological linkages.

SC6.2.3 Who is qualified to prepare an ecological assessment report?

An ecological assessment report must be prepared by a specialist with a tertiary qualification in environment science, botany, ecology, zoology or other related discipline, and with demonstrated experience in undertaking flora and fauna surveys and environmental assessment.

SC6.2.4 Contents of an ecological assessment reports

The minimum information to be contained within an ecological assessment report is outlined in the sections below.

SC6.2.4.1 Description of methodology

The methodology used to complete the ecological assessment report must be provided, including:

(a) desktop methodology that was used;
(b) field survey techniques and methodology that was used; and
(c) any assumptions that were made.

SC6.2.4.2 Assessment area

The assessment area is to include the maximum area that is likely to be affected by the construction and ongoing operation of the proposed development, including potential offsite impacts.

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SC6.2.4.3 Identification of physical characteristics and ecological features

The physical characteristics of the site and existing local natural values must be described, including:

(a) Regional ecosystems, geology and soils;
(b) hydrology, water quality (surface and groundwater) and stream health indicators;
(c) topography, slope and landform;
(d) waterbodies and wetlands;
(e) connectivity; and
(f) existing buildings and infrastructure.

The ecological features and functions of the site (the assessment area) must be identified and detailed, including:

(a) location, size and extent of ecological features;
(b) presence of flora, fauna, and vegetation communities (remnant, regrowth and any other vegetation on site) including those listed as threatened under Commonwealth legislation or State legislation;
(c) presence of priority flora and fauna species (including suitable habitat) described in section 6.2.5 (these are the same species as those identified in the Biodiversity overlay code);
(d) habitat features and requirements, movement paths/connectivity, breeding and dispersal behaviours;
(e) ecologically significant areas of the site and identify measures required to maintain their viability; and
(f) presence of weed species, including their status under relevant legislation.

Fauna surveys used to inform point (1)(b) above must be fit for purpose depending on species within the target area. Suggested survey techniques are outlined in Table SC6.55 below.

All threatened and priority fauna sightings data is to be submitted to Council as part of the Ecological Assessment Report. Preferable format is a GIS layer or a spreadsheet with eastings and northings.

Table SC6.55 – Fauna survey techniques

Fauna survey techniques	
• Diurnal search	• Pitfall traps
• Opportunistic records	• Spotlighting
• Elliot and wire cage traps	• Bird surveys
• Targeted feed tree search	• Camera traps
• Hair tubes	• Targeted ground search
• Targeted bird surveys	• Harp traps
• Electronic bat detectors	• Arboreal trapping

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Fauna survey techniques
• Nocturnal voice playback and call recording

SC6.2.4.4 Description of proposed works

An overview of the site and proposed works must be provided, including:

(a) the location of existing or approved dwellings, buildings or structures;
(b) all associated on site works including but not limited to earth works and vegetation removal likely to have an environmental impact. A map is to be submitted showing all proposed works including a GIS layer;
(c) methods that will be used by suitably qualified and experienced spotter catchers to relocate fauna, including the likely relocation destinations;
(d) a statement of reasons for the clearing and any relevant factors associated with the purpose of the proposed clearing;
(e) potential impacts to water quality from the proposed works;
(f) identification of potential impacts from noise and light during and post development;
(g) an outline of how the vegetation clearing will affect ecological values and how the assessment benchmarks of the Biodiversity overlay code are met;
(h) methods for avoiding, minimising and mitigating impact to ecological values, including any offsets that may be required;
(i) details of fauna friendly movement solutions which are developed in accordance with the *Queensland Government Fauna Sensitive Road Design Manual Volume 2: Preferred Practices* and the *QLD Government Koala-Sensitive Design Guidelines*;
(j) particulars of how vegetation to be retained will be protected during works in accordance with *Australian Standard AS4970-2009 – Protection of trees on development sites*; and
(k) a staging plan for clearing vegetation, if clearing is proposed.

If works are proposed near vegetation, impacts to vegetation should also prevent intrusions into the tree protection zone. Methods for identifying the tree protection zone are included within section 6.2.6.

A vegetation management plan and wildlife habitat management plan may be required to support the ecological assessment along with any other relevant site surveys and management plans (e.g. traffic), as determined by the values identified in the report.

(a) A Vegetation Management Plan must clearly identify the vegetation to be retained on site and vegetation that is proposed to be cleared and should include:
(i) a tree management plan that demonstrates how retained trees are to be protected during construction (in accordance with Australian Standard 4970-2009 Protection of trees on development sites);
(ii) details of the proposed landscaping and revegetation areas, including proposed species palettes and relevant ecosystem services that landscaping and revegetation is to provide (for example stormwater management or enhancing safe fauna movement); and

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(iii) details of how weeds are to be managed on the site, by identifying any existing weed infestations and proposed actions to prevent weed incursion during construction.

(b) Wildlife Habitat Management Plan

(1) A wildlife habitat management plan must be prepared by an ecologist with suitable experience and should address the survival and ongoing access to habitat during construction and operation of the development. This plan should indicate the broad range of fauna expected on the site, the proposed site preparation and construction methods (e.g. how the vegetation is to be cleared), as well as a summary of future on-site operations and any expected constraints. The plan should:

(i) identify habitat trees, including standing trees with hollows, ground logs and bush rocks, to be retained wherever possible;

(ii) clearly identify vegetation to be removed to ensure minimal disturbance to the existing native vegetation; and

(iii) details on how fauna will be managed during construction (for example, engaging an accredited spotter and ensuring clearing is undertaken sequentially).

SC6.2.4.5 Evaluation of threats and potential impacts and mitigation

All threatening processes and potential impacts must be evaluated, and mitigation measures appropriate to the scale of the impact must be detailed (for example landscape effects, biodiversity loss, edge effects etc.).

SC6.2.4.6 Who is a suitably qualified and experienced spotter catcher?

When causing damage to vegetation, including the removal of vegetation, it is important to ensure fauna will not be adversely impacted on. This is particularly important because the damaged vegetation is likely to be habitat for a variety of fauna species. The roll of a spotter catcher is to identify fauna before, during and after works have been undertaken and to implement suitable mitigation strategies.

For the purpose of satisfying SC6.2.4.4(1)(c) above and performance outcomes and acceptable outcomes of the Biodiversity overlay code, a suitably qualified and experience spotter catcher is a spotter catcher who has been licensed by the Department of Environment and Science.

Spotter catchers are to be on site in the following circumstances:

(a) prior to booking a pre-start meeting to undertake the pre-clearing fauna spotter catcher report;
(b) at the pre-start meeting;
(c) immediately prior to the commencement of works;
(d) for daily pre-clearance inspections;
(e) as stated in any conditions of approval; and
(f) for clearing or disturbance of stockpiled vegetation.

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SC6.2.5 Priority species

SC6.2.5.1 Priority fauna species

Table SC6.56 – Priority fauna species

Brush-tailed Phascogale (Phascogale tapoatafa)	
Description: A small hollow-dwelling marsupial that is little known but extremely striking. Populations are highly sensitive to changes in the environment. Females have home ranges of 20 – 40 hectares, and males 100 hectares. Males live less than one year and die after mating season. Females live for 3 years.	 *Brush-tailed Phascogale – DES (https://apps.des.qld.gov.au/species-search/details)*
Eastern Yellow Robin (Eopsaltria australis)	
Description: Found in a range of habitats from dry woodlands to rainforests, this bird is an excellent indicator of good environmental condition. They have habitat patches of 1 hectare or more and are a species that returns to restored habitat areas once re-established. A favourite of the Gympie's backyards and bush patches.	 *Eastern Yellow Robin – DES (https://apps.des.qld.gov.au/species-search/details)*

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Feathertail Glider (Acrobates pygmaeus)

Description:

A tiny glider weighing 10-15 grams but capable of gliding up to 28 metres. They are named for their unusual tail, which is flat with stiff fringed hair, and used to steer and brake as they glide. These gliders live in large communal groups, in a range of habitats that support hollows and other nesting sites.

Feathertail Glider - DES (https://apps.des.qld.gov.au/species-search/details)

Great Barred Frog (Mixophyes fasciolatus)

Description:

Closely related to the Giant Barred Frog and grows to the same size (11.5cm). It is found in forests and woodlands and usually near permanent running water. They kick the eggs from the stream once fertilised, where they develop in moist leaf litter nearby. Adequate vegetated stream buffers are important for their life cycle.

Great Barred Frog - DES (https://apps.des.qld.gov.au/species-search/details)

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Koala (Phascolarctcos cinereus)

Description:

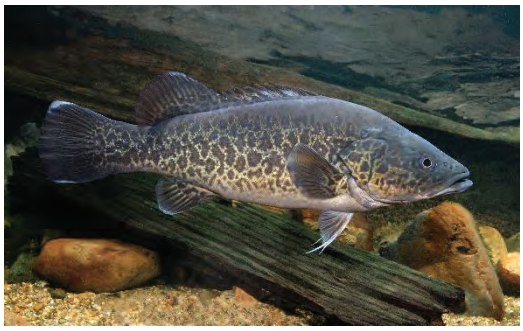
An Australian icon, koalas are found throughout the Gympie Region, in open forest and woodland habitats where a select group of food trees are located. As koala populations in South East Queensland compete for space with a rapidly growing human population, Gympie Region's populations become increasingly important for sustaining genetic diversity and healthy populations.

Koala - Widgee

Mary River Cod (Maccullochella mariensis)

Description:

Once more widespread throughout river systems in South East Queensland, it is now found exclusively in the Mary River catchment. The ideal cod habitat is thought to be deep, shaded, slow flowing pools with plenty of log-piles.



Mary River Cod by Gunther Schmida

Noisy Pitta (Pitta versicolor)

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Description:

A colourful local that is found in Gympie Region's rainforests and also in nearby forests, woodlands and mangroves. It is known to use stones as 'anvils' for cracking open the shells of snails and insects.

Noisy Pitta by Graham Winterflood (CC BY-SA)

Ornate Rainbowfish (Rhadinocentrus ornatus)

Description:

A species sporting striking colours. This fish exhibits a range of colour variations, indicating unique populations occurring in different wallum creeks, streams and perched lakes. Each population contributes to the genetic diversity of the species. The greatest genetic diversity occurs in the Gympie Region.

Ornate Rainbowfish - DES (https://apps.des.qld.gov.au/species-search/details)

Platypus (Ornithorhynchus anatinus)

Description:

Usually shy, they are an iconic Australian species that inhabits the creeks and watercourses of the Mary River catchment. Regarded as one of the Gympie Region's local attractions. In recent times they have suffered population declines from being caught in unattended yabby traps.

Platypus - DES (https://apps.des.qld.gov.au/species-search/details)

Sugar Glider (Petaurus breviceps)

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Description:

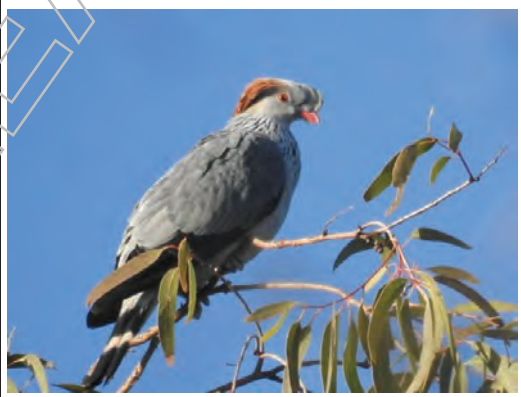
These charismatic animals live in large groups during winter and disband during summer months. They are able to thrive in remnant patches of vegetation, with home ranges of between 0.5 and 7 hectares, eating insects, honeydew, nectar and pollen.

Sugar Glider by DES (https://apps.des.qld.gov.au/species-search/details)

Topknot Pigeon (Lopholaimus antarcticus)

Description:

Also known as the flock pigeon, it is a large, fruit-eating pigeon found in Gympie Region's rainforests, but can be seen wheeling in flocks across open areas to feed in rainforest patches. Once hunted for food, populations have declined across its range, and some of the largest flocks can now be seen in the Gympie Region. It should not to be confused with the ground foraging crested pigeon.



Topknot Pigeon by Gary Brookes (CC BY)

Wompoo fruit dove (Ptilinopus magnificus)

Description:

A spectacular fruit dove displaying bright colouration, but easily overlooked as it forages high in rainforest canopies. It's distinctive 'wompoo' call gives the bird its name.

Wompoo fruit dove by Liz Scott (CC BY)

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SC6.2.5.2 Priority flora species

Table SC6.57 – Priority flora species

Australian Teak (Flindersia australis)	
Description: A forest tree that has showy cream flowers from September to February, decorative seed pods and is sought after as a durable timber.	 *Flindersia australis by Craig Hodges (CC BY)*
Blue Gum (Eucalyptus tereticornis)	
Description: One of the koala's preferred food trees, the blue gum grows in a range of environments across Gympie. Many river frontage environments across its range were cleared for agriculture, mining and plantation forests. The wood is hard and durable, and used for construction in heavy engineering, including railway sleepers.	 *Eucalyptus tereticornis by Megan (1) and John Barkla (2) (CC BY NC/4.0)*

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Blue Quandong (Elaeocarpus grandis)

Description:

Known for its colourful fruit and cabinet timber qualities, the blue quandong is a fast growing rainforest timber that reaches 50 metres in height. The blue colour of the fruit is caused by refracted light, rather than by blue pigment.

Elaeocarpus grandis by Ian McMaster (CC BY)

Broad-leafed Paperbark (Melaleuca quinquenervia)

Description:

A small tree that defines many vegetated wetlands in the Gympie Region and is from western parts to the coast. Much of its habitat was historically been cleared for pine plantations.

Melaleuca quinquenervia by Ian McMaster (CC BY)

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Cabbage Tree Palm (Livistona australis)

Description:

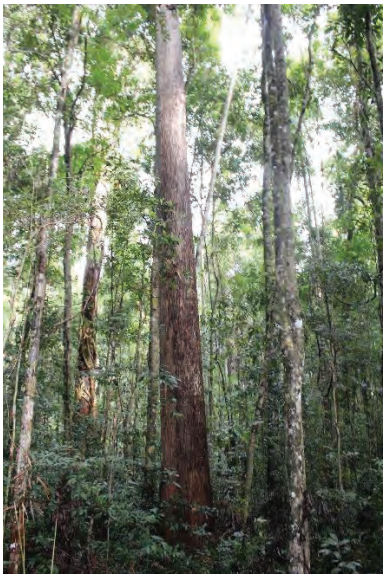
This palm grows at a range of altitudes (0-1000 metres), in moist areas of open forest, swamp forest, along stream banks and in rainforests. It can form large colonies, like that seen in The Palms locality.

Livistona australis by Ian McMaster (CC BY NC/4.0)

Gympie Messmate (Eucalyptus cloeziana)

Description:

This tree grows best within the Gympie Region, where some forest trees attain heights of nearly 60 metres. Elsewhere the trees may reach only 15 metres. One of the major hardwood plantation species in southern Queensland.



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Macadamia (Macadamia spp. ((M.ternifolia and M. integrifolia)

Description:

Macadamia ternifolia

This species of macadamia is confined to the first line of significant hills West of the Pacific Ocean. A small, multi-stemmed tree which grows up to 8 metres tall with distinctive pink flowers. Unlike other macadamias, the Gympie Nut is toxic and inedible.

Macadamia integrifolia

A small to medium sized tree to about 15 metres with a bushy habit. Flowers are white and usually occur in winter and spring. It has proved to be hardy in a range of climates and soils but prefers good drainage and rich soils on South facing slopes. This is the edible variety of the Macadamia Nut and is planted commercially.

Macadamia ternifolia by Macadamia Conservation Trust

Macadamia integrifolia by Ian McMaster (CC BY NC/4.0)

Hoop Pine (Araucaria cunninghamii)

Description:

The Hoop Pine is a striking timber tree that can live up to 450 years and grow to a height of 60 metres. This species has seen extensive historical clearing for logging and agriculture and is now valuable as a revegetation species in landslip prone areas due to its extensive root system. It is often grown commercially in timber plantations.

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Kauri (Agathis robusta)

Description:

An emergent of lowland tropical rainforests. The Queensland Kauri occurs in two separate localities; a southern population is located in the Wide Bay area, and a northern population is located on the Atherton Tableland in North Queensland. This tree was heavily logged in the past, making large specimens rare in the wild.

Agathis robusta by Charmaine Thomas (CC BY)

Rusty Tulip Oak, Copper Booyong (Argyrodendron sp. Kin Kin (W.D Francis AQ 81198)

Description:

This tree has a distinctive deep coppery colour on the underside of leaves. It is found in rainforests on less fertile or drier soils from Caboolture to Gladstone. A rainforest cabinet timber.

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Swamp Grasstree (Xanthorrhoea fulva)	
Description: This grasstree does not develop a trunk and is found in wet sandy soils. Ground Parrots cut thin stems of this grasstree to line their nests at ground level in the Cooloola wallum country.	 *Xanthorrhoea fulva by John Barkla (CC BY NC/4.0)*
Wallum Sun Orchid (Thelymitra purpurata)	
Description: A ground orchid found in the Cooloola area in wallum heath. It is known for its stunning flower colour and is sought after as a collectors' item by plant enthusiasts.	 *Thelymitra purpurata by Gordon Deans (CC BY)*

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SC6.2.6 Tree protection zone

SC6.2.6.1 Description

The tree protection zone (TPZ) is an area around a tree that contains vital root and crown structures necessary for maintaining tree health. Preventing work within the TPZ is one method for minimising damage to trees during development.

SC6.2.6.2 Measuring the TPZ

The TPZ is represented as a radius around the tree and is calculated by measuring the trunk diameter at 1.4m above the ground and multiplying it by 12. This is represented as:

TPZ = DBH x 12

Where:
TPZ = tree protection zone
DBH = diameter at breast height

An example the TPZ based on DBH is included in Table SC6.2.5.2 and an illustration demonstrating how to measure the TPZ is provided in Figure SC6.2.5.2 below.

Table SC6.58 Example of the TPZ

Diameter at breast height (DBH)	Tree protection zone (TPZ)
10cm	1.2m
2cm	2.4m
40cm	4.8m
75cm	9m
100cm	12m

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Figure SC6.59 Example of TPZ calculation

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Table SC6.59 Major koala food, shelter and habitat trees in the Gympie region

Species	Common Name	Usual Habitat
Primary		
Eucalyptus bancroftii	Tumbledown Gum	Sandy soils in coastal areas (dry heath)
Eucalyptus major	Grey Gum	Low ridges
Eucalyptus microcorys	Tallowwood	Fertile, well drained slopes and gullies
Eucalyptus propinqua	Small-fruited Grey Gum	Mid-lower slopes & valleys
Eucalyptus robusta	Swamp Mahogany	Swampy areas on coastal lowlands
Eucalyptus tereticornis	Blue / Forest Red Gum	Alluvial flats - also on some fertile slopes
Secondary		
Corymbia citriodora ssp variegata	Spotted Gum	Ridges
Eucalyptus crebra	Narrow-leaved Ironbark	Hilly terrain at lower altitudes (dry areas)
Eucalyptus grandis	Flooded Gum / Rose Gum	Fertile soils along creeks / gullies & rainforest margins
Eucalyptus longirostrata	Grey Gum	Hilly loam to clay soils
Eucalyptus moluccana	Gum-topped Box	Alluvial soils (not close to waterways)

Species	Common Name	Usual Habitat
Eucalyptus racemosa	Scribbly Gum	Deep sandy soils on coastal lowlands - can occur in hinterland
Eucalyptus resinifera	Red Mahogany / Messmate	Sandy or well drained acidic soils (good soil moisture)
Corymbia intermedia *	Pink Bloodwood	A wide range of soils and conditions
Eucalyptus acmenoides *	Yellow Stringybark	Slopes & ridges with sandy or stony soils
Lophostemon confertus *	Brush Box	Variety of habitats - well drained soils
Supplementary		
Corymbia tessellaris	Moreton Bay Ash	Sandy soil or well drained slopes
Eucalyptus burturbinata	Grey Gum	Fertile soils at higher altitude
Eucalyptus carnea	Broad-leaf White Mahogany	Hills & ridges on shallow soil
Eucalyptus fibrosa	Broad-leaf Ironbark	Sandy or stony soils
Eucalyptus latisinensis	Broad-leaf White Mahogany	Poorly drained sandy or loamy soils
Eucalyptus pilularis	Blackbutt	Sandy, well drained soils in coastal areas
Eucalyptus siderophloia	Grey Ironbark	Stoney slopes & ridges (or alluvial flats)
Lophostemon suaveolens	Swamp Box	Swamps, alluvial flats & poorly drained sites
Melaleuca quinquenervia	Paperbark Tea tree	Swamps in coastal or sub-coastal areas
Other potentially useful species found uncommonly in the region		
Eucalyptus dura	Smooth branched Ironbark	Dry ridges
Eucalyptus eugeniodes	Thin-leaf Stringybark	Mountainous areas with basalt soils
Eucalyptus exserta	Qld Peppermint	Rocky sites with skeletal soils
Eucalyptus melanoleuca	Yarraman Ironbark	
Eucalyptus melanophloia	Silver-leaf Ironbark	Undulating ridges & slopes (drier inland areas)
Eucalyptus melliodora	Yellow Box	High altitude fertile soils (e.g. basalt)
Eucalyptus montivaga	High elevations	
Eucalyptus salignus	Sydney Blue Gum	One site only (Munro logging area)
Eucalyptus sideroxylon	Red Ironbark	Poor shallow soils in western areas
Eucalyptus tindaliae	Qld White Mahogany	Sandy, acidic soils at low altitudes
Eucalyptus populnea **	Poplar Box	
Eucalyptus cloeziana **	Gympie Messmate	

** upgraded from supplementary to secondary post field surveys*

*** included as supplementary post field surveys*

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Appendix E. Biodiversity offset

SC6.4.1 Purpose of the policy

The purpose of *Appendix E* is to assist applicants to adequately address the assessment benchmarks in the Biodiversity Overlay Code relating to offsets for matters of local environmental significance.

SC6.4.2 Application

Appendix E applies to assessable development providing a biodiversity offset for the significant residual impact on matters of local environmental significance. A biodiversity offset applies when the impact is a significant residual impact as defined in SC6.4.3.

SC6.4.3 Significant residual impact

A significant residual impact (SRI) is an impact on a matter of local environmental significance (MLES) that is likely to:

MLES: Priority Local Species

An action will have a significant residual impact on priority local species habitat if the action is likely to:

- reduce the extent of the occurrence of a priority local species
- reduce the extent of vegetation required for priority local species survival
- lead to a decrease in the size of the local population of a priority local species
- fragment habitat or an existing population for a priority local species
- result in genetically distinct populations forming as a result of habitat isolation
- introduce disease that may cause a priority local species population to decline
- interfere with the recovery of a priority local species
- cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a priority local species.

MLES: Wetlands and waterways, including buffer areas

An action will have a significant residual impact on a wetlands or waterway if it is likely that the action will result in environmental values being affected in any of the following ways:

- areas of the wetland or waterway being degraded or artificially modified;
- a measurable change in water quality of the wetland or waterway; for example, a change in the level of the physical and/or chemical characteristics of the water, including salinity, pollutants, or nutrients in the wetland or waterway, to a level that exceeds the water quality guidelines for the waters;
- any impact resulting in a change to the habitat or lifecycle of native species, including invertebrate fauna and fish species, dependent upon the wetland or waterway;
- any impact resulting in a change in the volume, timing, duration and frequency of ground and surface water flows in either a wetland or waterway.

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MLES: Core ecological linkages and ecological linkages

An action will have a significant residual impact on core ecological linkages and ecological linkages if it is likely that the action will result in environmental values being affected in any of the following ways:

- vegetation clearing results in the physical separation (any clearing that would result in the separation of an otherwise intact area of vegetation) of vegetation within the core ecological linkages or ecological linkages and on adjoining sites;
- development that is located in an area on the site that creates a physical barrier, causes fragmentation and loss of connectivity;
- permanent modification of vegetation within the corridor boundaries;
- vegetation clearing results in loss of stepping stones or connectivity to habitat nodes;
- vegetation clearing isolates wildlife populations and their habitat resources;
- the installation of physical barriers that prevent wildlife movement and dispersal;
- any impact resulting in edge effects that degrade the values of the corridor;
- any impact resulting in the reduction of the width of the core ecological linkages.

Editor's note: Council will be utilising the EHP Landscape Fragmentation and Connectivity tool during the assessment of applications.

This reflects the State guidelines used to assess significant residual impacts on matters of state environmental significance (MSES), adapted to apply to MLES.

Offsets are not always suitable and must only be applied where it has been demonstrated that clearing cannot be practicably avoided and any impacts have been minimised. An application must comply with all assessment benchmarks in the Biodiversity Overlay Code in order to comply. There may be instances where an offset is not sufficient to warrant approval.

SC6.4.4 State and Federal government offset policies

Offset policies exist under State and Federal government legislation. *Appendix E* will not apply to those matters of environmental significance which have been conditioned to be offset under a State or Federal government policy (unless otherwise allowed for under the *Environmental Offset Act 2014*). Guidance on satisfying offset requirements for Matters of State Environmental Significance (MSES) can be found on the State government's offsets website.

SC6.4.5 Biodiversity offset principals

The following principles apply to a biodiversity offset:

(a) A biodiversity offset is not to replace or undermine existing environmental principles or regulatory requirements;

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(b) A biodiversity offset is not to be used to facilitate development in areas otherwise identified as being unacceptable through the planning scheme or legislation;
(c) Environmental impact is first to be avoided, then minimised and mitigated before considering the use of offsets for any remaining significant residual impact;
(d) A biodiversity offset is to produce a better environmental outcome and deliver a net ecological gain at maturity;
(e) A biodiversity offset is to be provided in a strategically important location;
(f) The time-lag between the impact and the delivery of the biodiversity offset is to be minimised by commencing the offset prior to the vegetation clearing;
(g) Biodiversity offset sites must be provided with permanent protection as conservation land;
(h) A biodiversity offset is to be the responsibility of the applicant for the development or the vegetation clearing, including the payment of all costs associated with securing and managing a biodiversity offset.

SC6.4.6 Calculating offset requirements

Offset areas and costs are calculated using the State government financial settlement offset calculator. Offsets are to be calculated on the basis of the following:

For impacts on Priority species habitat, Wetlands and waterways (including buffer areas)	State offset calculator ratio 2:1
For impacts on Ecological linkages and Core ecological linkages	State offset calculator ratio 3:1

SC6.4.7 Biodiversity offset delivery options

There are two types of biodiversity offsets that may be provided in accordance with the *Offsets Act*:

(a) Financial settlement (calculator is provided on the State government's offsets website);
(b) Land-based offsets that is proponent driven.

A biodiversity offset can also be delivered as a combination of financial settlement and land-based offset.

SC6.4.7.1 Financial settlement offset

An applicant may choose to pay a financial contribution to Gympie Regional Council to undertake the offset on the applicant's behalf. Funds received by Gympie Regional Council will be accumulated and spent strategically through the purchase and protection of suitable cleared or degraded land for offsets restoration works and ongoing maintenance.

Financial settlement offsets are calculated using the State offset calculator as identified in **SC6.4.6** above.

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SC6.4.7.2 Land-based offset (proponent driven)

A proponent driven offset is delivered entirely by the applicant. This includes sourcing and acquiring of the offset site, implementation of the offset planting and ecological restoration, ongoing maintenance, monitoring, auditing and any required reporting. This land is required to be protected in perpetuity. Offsets may be provided on the same site as the significant residual impact is occurring, or on a suitable strategic offset receiving site.

SC6.4.8 Biodiversity offset areas

Offsets must be located within the Gympie Regional Council boundary and may constitute an entire lot or be a defined area within one or more lots. A biodiversity offset receiving site:

(a) Is to be located on land:
   i) That is suitable for the direct planting of vegetation;
   ii) That has the same or very similar underlying geology, soils, aspect and drainage to re-establish (offset) the vegetation subject to clearing;
   iii) That is strategically important in its location.

(b) Achieves the following standards:
   i) Is designed and delivered to minimise edge effects;
   ii) Is designed and managed to attain and maintain habitat functionality and ecological connectivity, and achieve remnant vegetation status over time;
   iii) Where feasible, be like for like. The site is to be managed in a way which contributes towards a comparable vegetation community in comparable condition to the site where the impact is occurring.
   iv) An offset receiving site capable of being planted with the same regional ecosystem, or of the same broad vegetation type, as the impact site is preferred.
   v) Be able, over time, to achieve equivalent ecological outcomes in relation to vegetation community, habitat, species, ecosystems, landscape, hydrology and physical area;
   vi) The offset enhances and contributes to the Biodiversity Overlay areas, as identified on the **Biodiversity Overlay mapsept**.

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SC6.4.9 Agreed delivery arrangement

The applicant is required to enter into an agreed delivery arrangement with Gympie Regional Council for each biodiversity offset. The State government provides a series of forms that can be used for MLES offsets to assist applicants to work through and enter into an agreed delivery arrangement with Gympie Regional Council.

SC6.4.10 Offset delivery and management plan

Where land-based proponent driven offsets are proposed (either on private land or public land), a biodiversity offset delivery and management plan is to be prepared by a competent person and submitted to Council for approval, which includes details (including costing) specifying:

(a) Land holder details and signature;
(b) The proposed offset area with associated Lot on Plan, GPS reference points, including any areas subject to specific management actions;
(c) The proposed vegetation clearing and environmental values impacted, as determined by an ecological assessment report prepared by a suitably qualified person;
(d) Table of existing flora/fauna on the offset receiving site, as determined by the ecological assessment report prepared by a suitably qualified person;
(e) Details of surrounding land uses;
(f) Restoration and rehabilitation of the land is to be informed by the principles detailed within the SEQ Ecological Restoration Framework Guideline and Manual;
(g) The management objectives and outcomes expressed as measurable and achievable criteria (including key performance indicators) for the biodiversity offset area on which the performance of the floristic and structural re-vegetation components can be assessed annually over at least five-years;
(h) At the end of the 5-year maintenance period, a report is prepared by a suitably qualified person and delivered to Council certifying that the offset planting has achieved a survival rate of a minimum of 90% and not more than 5% weed cover across the site;
(i) The density and diversity of species reflecting the target regional ecosystem and how this is to be achieved by either planting, natural regeneration from seed stock, or reliance upon natural encroachment into the site;
(j) Identification and detailed mitigation strategies for possible risks to the offset site (including, but not limited to; pest threats, domestic animal threats, risks associated with natural hazards);
(k) How weeds and pests will be removed and prevented from re-infestation
(l) Any failed biodiversity offsets are to be rectified or replaced;
(m) Schedule of maintenance activities to be undertaken for a period of five-years following the offset establishment phase;
(n) Details of regular monitoring, auditing and reporting to be undertaken by the proponent;
(o) A template monitoring and evaluation checklist that identifies how the key performance measures are being met (e.g. vegetation coverage, plant survival rates and weed eradication rates), that is to be utilised in all annual monitoring reports;
(p) The estimated management costs associated with achieving the offset management objectives, actions and outcomes;
(q) Details of the proposed protection mechanism to be placed over the offset receiving site.

The proponent for a land-based proponent driven offset is responsible for all:

(a) administrative costs including but not limited to costs associated with reconfiguration, surveying, transfer of ownership to the local government (if transfer of ownership is agreed to by Council) and protection of the offset site;

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(b) rehabilitation costs that include, but are not limited to, revegetation, weed and pest management, monitoring, auditing and reporting for a period of five-years.

Environmental offset receiving sites must become secure land managed for conservation purposes.

SC6.4.11 Securement of biodiversity offsets

Securement of a land-based biodiversity offset is to be achieved through one or more of the following:

(a) Environmental Covenant;
(b) A reserve for environmental purposes under the *Land Act 1994*;
(c) A nature refuge under the *Nature Conservation Act 1992*;
(d) Utilising (by agreement) land held by Gympie Regional Council that is located in a strategically important area.

SC6.4.12 Register of offset sites

Gympie Regional Council will maintain a register of biodiversity offsets to:

(a) Record income from financial contributions and expenses of acquiring and rehabilitating offset land;
(b) Maintain a database of locations of:
    i. Land-based proponent driven offsets;
    ii. Financial settlement offsets.

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Appendix F. Biodiversity Overlay mapping

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Koala Mapping for the Gympie Region

RTI RELEASE

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Gympie Regional Council

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List of Abbreviations

Abbreviation	Definition
ACT	Australian Capital Territory
DEHP	Queensland Department of Environment and Heritage Protection
DERM	Queensland (former) Department of Environment and Resource Management
DSITIA	Queensland department of Science, Information Technology, Innovation and the Arts
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
EPA	Environmental Protection Agency
GPS	Global Positioning System
GRC	Gympie Regional Council
ha	Hectare
m	metre
NC Act	Queensland's *Nature Conservation Act 1992*
NSW	New South Wales
QLD	Queensland
RE	Regional Ecosystem
REDD	Regional Ecosystem Description Database
SEQ	South East Queensland
SEQ Regional Plan	South East Queensland Regional Plan 2005-2026
the Koala Conservation Plan	Nature Conservation (Koala) Conservation Plan 2006
the Koala Management Program	Nature Conservation (Koala) Management Program 2006–2016
the Koala Plan	Queensland Government's Nature Conservation (Koala) Conservation Plan 2006 and Management Program 2006–2016
VM Act	Queensland's *Vegetation Management Act 1999*

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1. Introduction

The iconic koala (*Phascolarctos cinereus*) inhabits a range of *Eucalyptus* dominated communities (Martin & Handasyde 1999) and occurs at its highest population density in Southeast Queensland (SEQ) (Environmental Protection Agency 2006). Often considered as the stronghold for wild populations of koala, Southeast Queensland is also the fastest growing area in the State (Australian Bureau of Statistics 2015). The koala is listed as Vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the Queensland *Nature Conservation Act 1992* (NC Act).

In its efforts to conserve koalas and their habitat within the Gympie region, Gympie Regional Council (GRC) commissioned O2 Ecology to gather current koala sightings and habitat data and provide updated mapping as described in the Nature Conservation (Koala) Conservation Plan 2006 and Management Program 2006-2016 (Environmental Protection Agency 2006) for State Government endorsement and inclusion within GRC's mapping system.

This report presents the methods and rationale used to produce the Koala Habitat Areas and Koala Living Areas mapping for the GRC area (**Figure 1**) as described in the Nature Conservation (Koala) Conservation Plan 2006 and Management Program 2006-2016 (Environmental Protection Agency 2006). The final mapping will inform the implementation of appropriate policies across the GRC area.

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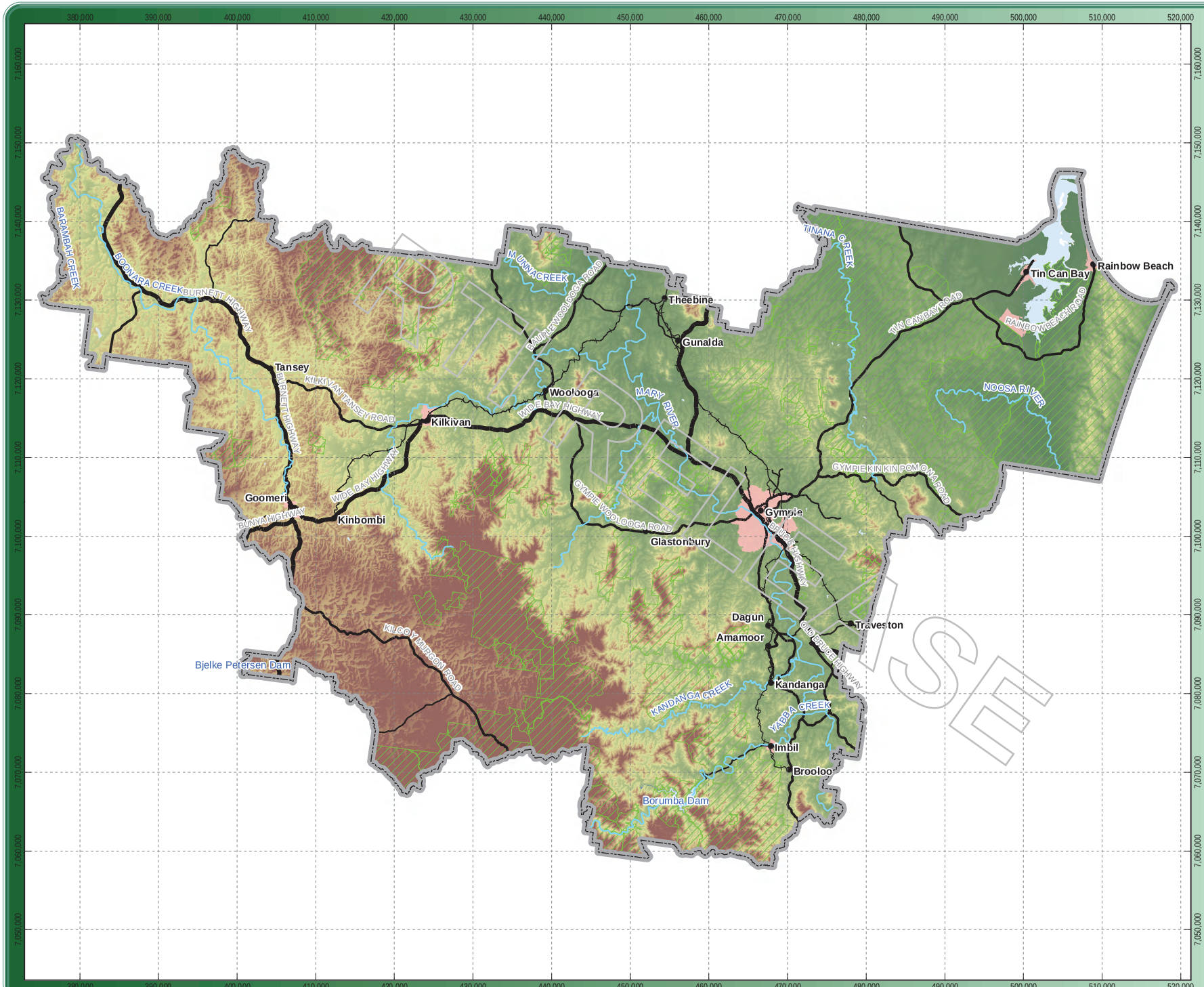

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N
W E
S

0 5 10 15 20
Kilometers

1:460,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Legend

- Populated Centre
- Major Watercourse
- Rail

Road Network

- Highways
- Secondary Roads
- Local Connector Road
- Gympie LGA Boundary
- Urban Footprint
- Protected Area Estates

Elevation (m)

High : 740

Low : 0

Gympie Koala
Habitat Mapping
Gympie Regional Council

Locality

Figure 1

30 Oct 2015 Z:\GIS\ECO15_0024\GIS\Final\maps\v2\ECO15_0024_01_locality.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015), Digital Elevation Model 25m (Mar 2013), DILGP: Widebay Regional Plan (Sep 2011), DNPSR: Protected Areas of Qld (Mar 2015) DSITI: Biodiversity Status of pre-clearing and remnant regional ecosystems
© State of Queensland (Department of DNRM, DEHP, DSITI, DNPSR)

2. Background

2.1. Koala Habitat and Conservation

Koala habitat includes any forest or woodland containing species that are known koala food trees, or shrubland with emergent food trees. The distribution of the koala and its habitat are influenced by altitude (generally limited to <800 m above sea level), temperature, rainfall patterns, soil types and the resultant soil moisture availability and fertility and leaf moisture (Munks et al. 1996; Department of the Environment 2015). According to the Australian Koala Foundation (2015), research shows that socially stable koala populations occur only in the presence of primary (favourite) tree species and the two most important factors for habitat suitability are the presence of:

(1) tree species preferred by koalas (usually eucalypts, but also some non-eucalypts) growing in particular associations on suitable soils with adequate rainfall; and
(2) other koalas.

Crowther and colleagues (2013) suggest that shelter trees play an essential role in thermoregulation and are equally important as food trees and should be weighted as such when assessing habitat suitability.

Within the species' range in Queensland, koalas are found in the following habitats:

- Great Dividing Range and the coastal belt – moist forests and woodlands mostly dominated by *Eucalyptus* species (Department of the Environment 2015);
- coastal lowlands – vegetation communities dominated by *Melaleuca* or *Casuarina* species (Threatened Species Scientific Committee 2012); and
- western slopes, tablelands and plains – sub-humid *Eucalyptus*-dominated forests and woodlands in riparian and non-riparian environments, and some *Acacia*-dominated forests and woodlands in non-riparian environments (Melzer et al. 2000).

Koalas are also known to occur in modified or regenerating native vegetation communities, as well as urban and rural landscapes where food trees or shelter trees may be highly scattered (Department of the Environment 2015).

Population estimates for the South East Queensland bioregion have been focussed particularly on the Koala Coast and Pine Rivers Shire (the latter now part of the Moreton Bay local government area). The Koala Coast population declined approximately 65% from the 1996–1999 population to 2279 koalas in 2008 (Department of Environment and Resource Management 2009). Pine Rivers Shire population declined by about 40% from the 2001 population to less than 2700 koalas in 2008 (Dique et al. 2003). Koala numbers in all South-east Queensland local government areas (Sunshine Coast Regional, Moreton Bay Regional, Brisbane City, Redland City, Logan City, Ipswich City and Gold Coast City Councils) appear to be following a similar downward trend to the Koala Coast and Pine Rivers populations (Phillips et al. 2007). The occurrence of koalas distributed north of the Sunshine Coast in this bioregion is not well known (Department of the Environment 2015).

The main threats to the koala are ongoing habitat loss and habitat fragmentation, vehicle strike, predation by the domestic or feral dogs, fire, drought and disease (Department of the Environment 2015).

The koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) is listed as Vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). In Queensland, the koala (*Phascolarctos cinereus*) is listed as Vulnerable under the *Nature Conservation Act 1992* (NC Act).

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The Queensland Government's *Nature Conservation (Koala) Conservation Plan 2006 and Management Program 2006–2016* (the Koala Plan) addresses the need for an integrated landscape strategy to maintain vital koala habitat and for development to be compatible with the survival of wild koala populations (Environmental Protection Agency 2006). The Koala Plan is made up of two parts:

- the *Nature Conservation (Koala) Conservation Plan 2006* (the Koala Conservation Plan) – subordinate legislation made under the Nature Conservation Act; and
- the *Nature Conservation (Koala) Management Program 2006–2016* (the Koala Management Program) – a policy document providing direction and management approaches to address key threatening processes to koalas in Queensland.

2.2. Koala Habitat Mapping

The Queensland Government has identified known important koala habitat within the SEQ region. The South East Queensland Regional Plan 2005-2026 (SEQ Regional Plan) defines significant areas of koala habitat in Southeast Queensland (Policy 2.2.1). These habitat areas are statutory under the *Integrated Planning Act 1997* and are categorised as Koala Conservation Area, Koala Sustainability Area and Urban Koala Area. Koala Living Area is an additional non-statutory category identified in the Koala Plan.

Local governments, in collaboration with the Environmental Protection Agency (EPA), are encouraged to undertake further mapping to identify koala habitat and provide additional habitat protection (Environmental Protection Agency 2006). The Koala Management Program provides guidance for koala survey methods (Policy 4) and koala habitat assessment and mapping (Policy 7).

Of particular importance are areas of non-remnant vegetation that are readily used by koalas and are not necessarily protected from clearing under Queensland's *Vegetation Management Act 1999* (VM Act) (Environmental Protection Agency 2006).

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3. Method

Koala habitat value mapping across the GRC area was created by customising the method set out in Policy 7 of the Koala Management Program for the GRC area. Koala habitat areas were identified through koala sightings, field surveys and vegetation mapping, separated into different land cover categories and evaluated for quality and function. **Figure 2** illustrates our Koala Habitat assessment method, which follows a repeatable process that can be used for future updates to the mapping.

Koala habitat values across the GRC area were evaluated using:

- Availability of preferred koala feed and shelter trees on particular land zones using Regional Ecosystem mapping and validated by existing sighting data and previous modelling
- Land cover analysis taking into account vegetation patch size, shape, canopy density and level of urbanisation and fragmentation
- Field surveys using a koala scat detection dog
- Connectivity and corridor function

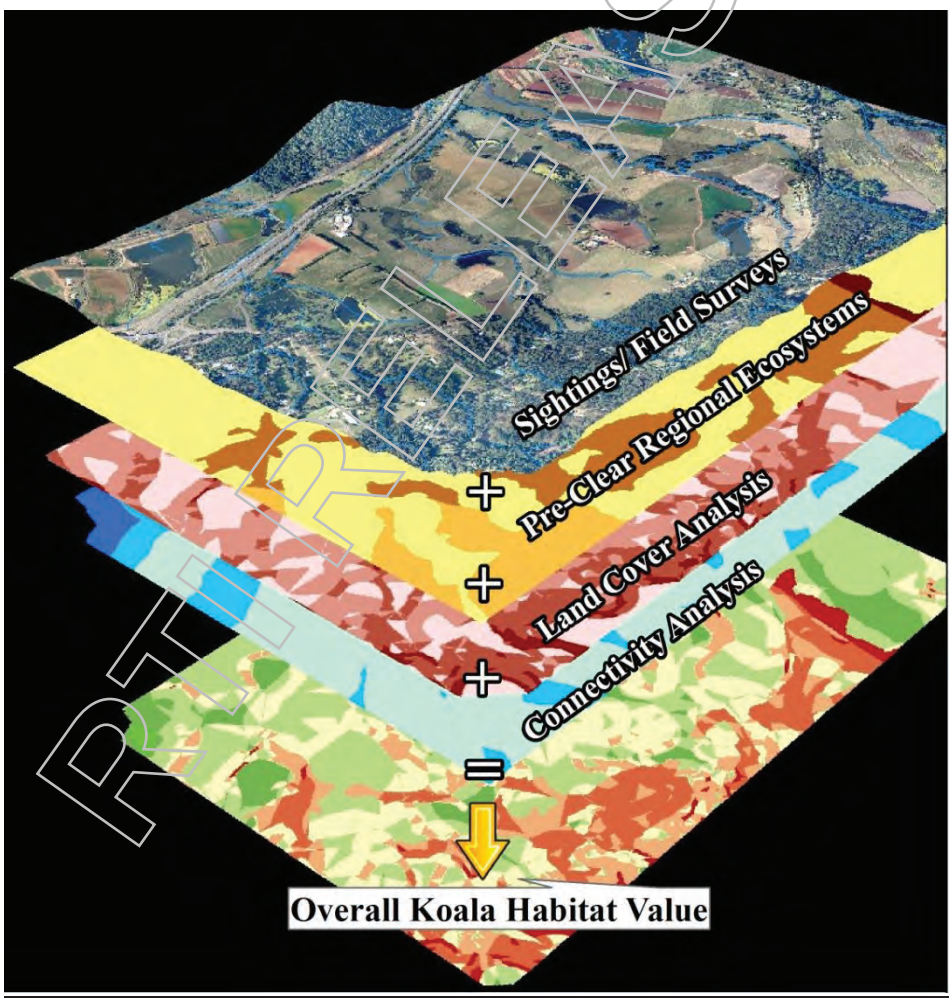

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Figure 2 Pictorial representation of the koala habitat assessment method

The following steps were used to achieve the overall koala habitat value mapping (**Figure 3**) and are presented as separate sections in this report:

- Stratification and ranking of regional ecosystems by the relative abundance and numbers of koala preferred trees species
- Land cover analysis including native vegetation extent, patch size, shape and density of patches to produce land cover categories: bushland, remnant bushland, urban, rural and suitable for rehabilitation
- Development of a preliminary spatial model
- Validation and refinement of the preliminary spatial model using
    - Previous koala sightings, previous modelling and community consultation
    - Targeted field surveys using a koala scat detection dog
    - Identification of core habitat areas and connectivity analysis
- Finalising the matrix to produce Koala Habitat Area mapping
- Incorporating the Wide Bay Regional Plan to produce Koala Living Area mapping

Koala habitat assessment followed Table 13 in Policy 7 with the exception of an additional landscape category called 'Areas Suitable for Rehabilitation'. These areas are rural areas with scattered trees that have the potential to expand existing high value core patches and assist in rehabilitating key corridors and are discussed further in **Section 3.5.2**.

3.1. Data Sources

A variety of data was incorporated into the koala habitat modelling, including previous koala habitat modelling over the region; preferred koala habitat tree species; spatial data from the Queensland Government; koala sighting data from the State government, local government, not for profit organisations and community group databases; aerial photography; and field survey results.

Three previous koala habitat models that include the GRC area were used to assist in verification of our model and identification of areas requiring field surveys. These included:

- Koala habitat modelling for the Cooloola Conservation Strategy 2002, revised in 2005 and 2009;
- Queensland Department of Environment and Heritage Protection (DEHP) essential koala habitat modelling; and
- Australian Koala Foundation (AKF) Koala Habitat Atlas.

Spatial data obtained from the Queensland Government provided the basis of the spatial modelling, including cadastral, land use and planning boundaries; transportation; elevation and waterways; koala hospital data; Regional Ecosystem and mature regrowth; and orthophotos (**Appendix A**). Regional Ecosystems (REs) are vegetation communities that are consistently associated with a particular combination of geology, land form and soil in a bioregion. The Queensland Herbarium has mapped the remnant and pre-clearing extent of REs for much of the State using a combination of satellite imagery, aerial photography interpretation and on-ground studies. Mature regrowth describes areas of non-remnant woody vegetation derived from Department of Natural Resources and Mines (DNRM) remote sensing data.

A list of preferred koala habitat tree species was obtained from Mary River Catchment Coordinating Committee (MRCCC) to inform the stratification and ranking of REs (**Section 3.2.2**).

Koala sighting data was obtained from Queensland Government records; the Australian Koala Foundation (AKF); crowd sourced databases such as the Atlas of Living Australia (ALA) and Koala Tracker; various community groups, wildlife hospitals, wildlife carers, vets; and national park rangers (**Section 3.4.1**).

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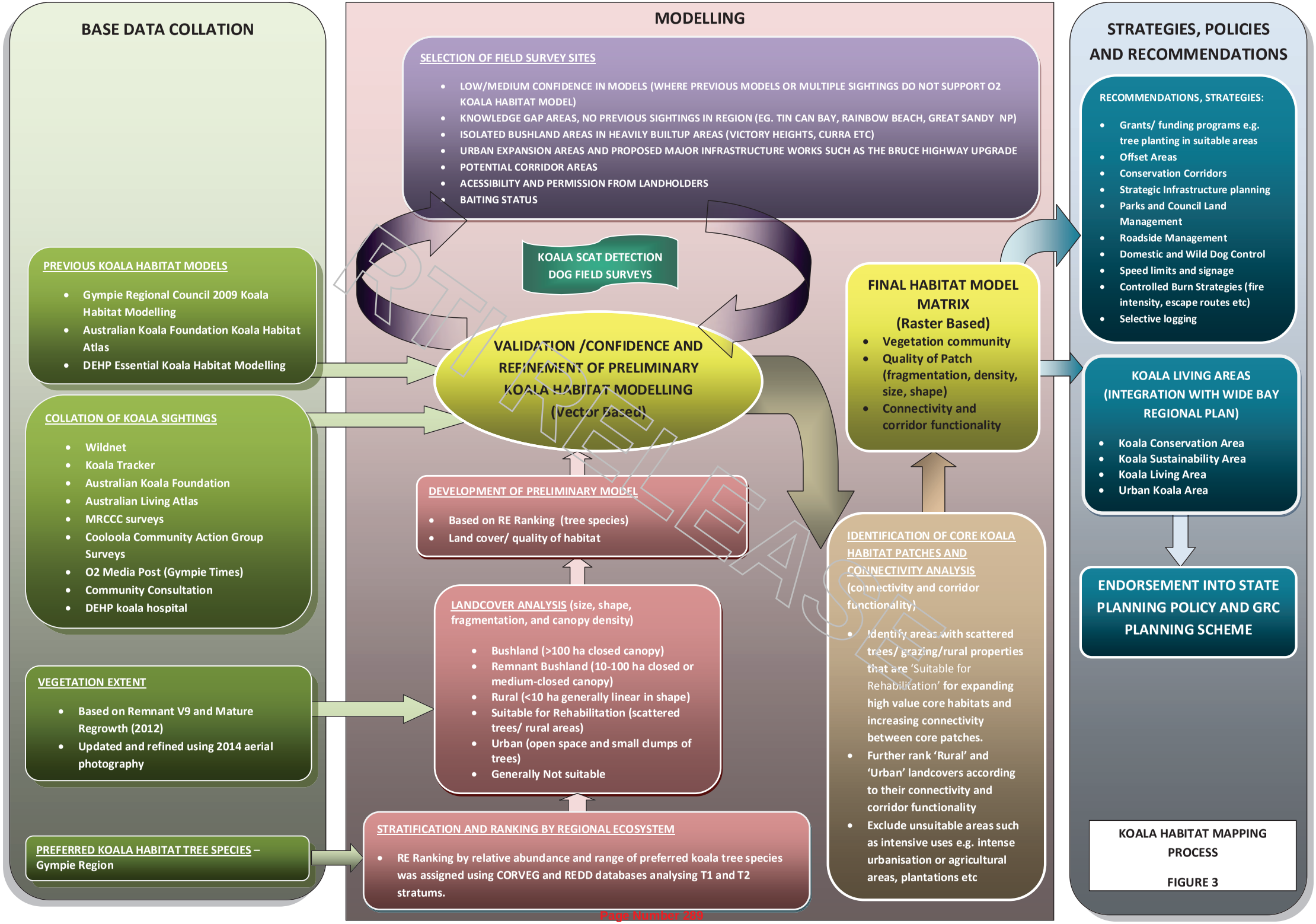

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3.2. Stratification and Ranking of Regional Ecosystems

3.2.1. Stratification by Regional Ecosystem

Policy 7 states that modelling can be by stratified by:

- Landscape parameters/preferences and official Wildnet sightings using census district boundaries to remove bias; or
- Regional Ecosystems

Models were stratified by Regional Ecosystems rather than landscape preferences for a number of reasons:

- There were few official (Wildnet) records, however, the lack of records within the GRC area cannot be used as an indication of the absence of a species. The database relies on people submitting data to the Queensland Government. The GRC area is mostly rural with large areas that are held on private land or not easily reached by road and is therefore unlikely to be the subject of citizen science.
- Social boundaries (e.g. census districts) are not very applicable in the region for removing bias in sightings data. GHD (2009) listed using Census district boundaries as a limitation as it is a social boundary not a biological boundary.
- A preliminary spatial model was developed to check for correlations between non-official sightings and landscape parameters (slope, elevation and land zone) across the GRC area. Sightings were found in a vast array of landscape parameters from low flat areas to high steep areas (although they were generally below 500m elevation) with no strong correlation.
- Preferred koala feed and shelter trees, and hence the vegetation communities (REs) these species occur in, are a dominant factor influencing habitat value.
- Stratifying by RE allows for a more refined, accurate approach that can be applied to smaller regions than South East Queensland (SEQ), such as the local government level.

Vegetation communities were ranked by koala preferred tree species for the GRC area. These rankings were later verified using koala sightings, previous modelling, community consultation and targeted field surveys using a koala scat detection dog (**Section 3.4**).

3.2.2. RE Ranking

Regional ecosystems were ranked by the relative abundance of preferred koala tree species specific to the GRC area as well as the number of preferred koala tree species found in each RE. A preferred tree species list was obtained from the Mary River Catchment Coordinating Committee (MRCCC 1 June 2015).

Table 1 Major koala food trees in the Gympie region

Species	Common Name	Usual Habitat
Primary		
Eucalyptus bancroftii	Tumbledown Gum	Sandy soils in coastal areas (dry heath)
Eucalyptus major	Grey Gum	Low ridges
Eucalyptus microcorys	Tallowwood	Fertile, well drained slopes and gullies
Eucalyptus propinqua	Small-fruited Grey Gum	Mid-lower slopes & valleys
Eucalyptus robusta	Swamp Mahogany	Swampy areas on coastal lowlands
Eucalyptus tereticornis	Blue / Forest Red Gum	Alluvial flats - also on some fertile slopes
Secondary		

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Species	Common Name	Usual Habitat
Corymbia citriodora ssp variegata	Spotted Gum	Ridges
Eucalyptus crebra	Narrow-leaved Ironbark	Hilly terrain at lower altitudes (dry areas)
Eucalyptus grandis	Flooded Gum / Rose Gum	Fertile soils along creeks / gullies & rainforest margins
Eucalyptus longirostrata	Grey Gum	Hilly loam to clay soils
Eucalyptus moluccana	Gum-topped Box	Alluvial soils (not close to waterways)
Eucalyptus racemosa	Scribbly Gum	Deep sandy soils on coastal lowlands - can occur in hinterland
Eucalyptus resinifera	Red Mahogany / Messmate	Sandy or well drained acidic soils (good soil moisture)
Corymbia intermedia *	Pink Bloodwood	A wide range of soils and conditions
Eucalyptus acmenoides *	Yellow Stringybark	Slopes & ridges with sandy or stony soils
Lophostemon confertus *	Brush Box	Variety of habitats - well drained soils
Supplementary		
Corymbia tessellaris	Moreton Bay Ash	Sandy soil or well drained slopes
Eucalyptus burturbinata	Grey Gum	Fertile soils at higher altitude
Eucalyptus carnea	Broad-leaf White Mahogany	Hills & ridges on shallow soil
Eucalyptus fibrosa	Broad-leaf Ironbark	Sandy or stony soils
Eucalyptus latisinensis	Broad-leaf White Mahogany	Poorly drained sandy or loamy soils
Eucalyptus pilularis	Blackbutt	Sandy, well drained soils in coastal areas
Eucalyptus siderophloia	Grey Ironbark	Stoney slopes & ridges (or alluvial flats)
Lophostemon suaveolens	Swamp Box	Swamps, alluvial flats & poorly drained sites
Melaleuca quinquenervia	Paperbark Tea tree	Swamps in coastal or sub-coastal areas
Other potentially useful species found uncommonly in the region		
Eucalyptus dura	Smooth branched Ironbark	Dry ridges
Eucalyptus eugeniodes	Thin-leaf Stringybark	Mountainous areas with basalt soils
Eucalyptus exserta	Qld Peppermint	Rocky sites with skeletal soils
Eucalyptus melanoleuca	Yarraman Ironbark	
Eucalyptus melanophloia	Silver-leaf Ironbark	Undulating ridges & slopes (drier inland areas)
Eucalyptus melliodora	Yellow Box	High altitude fertile soils (e.g. basalt)
Eucalyptus montivaga	High elevations	
Eucalyptus salignus	Sydney Blue Gum	One site only (Munro logging area)
Eucalyptus sideroxylon	Red Ironbark	Poor shallow soils in western areas
Eucalyptus tindaliae	Qld White Mahogany	Sandy, acidic soils at low altitudes
Eucalyptus populnea **	Poplar Box	
Eucalyptus cloeziana **	Gympie Messmate	

** upgraded from supplementary to secondary post field surveys*
*** included as supplementary post field surveys*

Koala food trees are divided into primary, secondary and supplementary tree species. Primary species have a significantly higher usage than secondary species, which in turn have a significantly higher usage than

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supplementary species (Australian Koala Foundation 2015). Soils and geology can play a major role in the nutrition found in the leaves of eucalypt species and in turn the health and density of koalas in the area (Australian Koala Foundation 2015).

REs were ranked using a combination of Corveg data (data collected at sites across Queensland for ground-truthing and validating RE mapping) and descriptions from the Regional Ecosystem Description Database (REDD) version 9.0 (Queensland Herbarium 2015) where Corveg data was not available. The relative abundance of trees that are koala preferred species and number of koala preferred species dominant in the canopy (T1) and subcanopy (T2) for each RE were used in the ranking system to account for dominant tree species in each RE, the presence and combination of primary, secondary and supplementary tree species and the number of dominant feed trees in the RE.

The following ratings were applied to each category of koala food tree:

- Primary = '9'
- Secondary = '3'
- Supplementary = '1'

Corveg information was imported and formatted in excel where it could be analysed and referenced to a lookup table with ratings for each preferred koala tree species. The applied rating (i.e. 9, 3 or 1) for each dominant tree species found within each RE was multiplied by the proportion of sites for that RE where that the tree species was found. This was applied to both T1 and T2.

The values for all primary tree species for each RE were added together and the mean calculated. Hence the maximum value for 'primary' tree species can only be 9 i.e. 100% of sites contain the primary tree species as a dominant canopy species. This process was repeated for both secondary and supplementary tree species. The mean values for all categories were then added together to give an overall rating. The maximum koala habitat value in one stratum of an RE would be 13 (i.e. 9 + 3 + 1).

In addition, the number of dominant preferred koala tree species was incorporated to further rank REs as koalas prefer to select from a range of tree species to fulfil their nutritional requirements. The number of tree species was incorporated for primary and secondary tree species only (not supplementary). For each preferred primary tree species within an RE, a value of '1' was added to its total value, while for each number of secondary tree species, a value of '0.5' was added. This was applied to both T1 and T2.

Validation of RE rankings was analysed as part of a preliminary spatial model using existing koala records, previous koala modelling, community consultation and targeted field surveys (**Section 3.4.2**). The final RE rankings are shown in **Appendix B**.

3.3. Land cover analysis

The next step was to segregate the GRC area into different land covers which are later overlaid with the RE rankings described above to develop a preliminary spatial model **(Section 3.4)** for field investigations.

Vegetation extent and density was used to formulate land cover categories and further separated by GIS analysis of size, shape and fragmentation into six strata (**Figure 4**) similar to Policy 7. One additional land stratum, 'Areas Suitable for Rehabilitation' (**Section 3.5.2**), was defined. A similar stratum was also used by GHD in the South East Queensland Koala Habitat Assessment and Mapping Project Report (2009).

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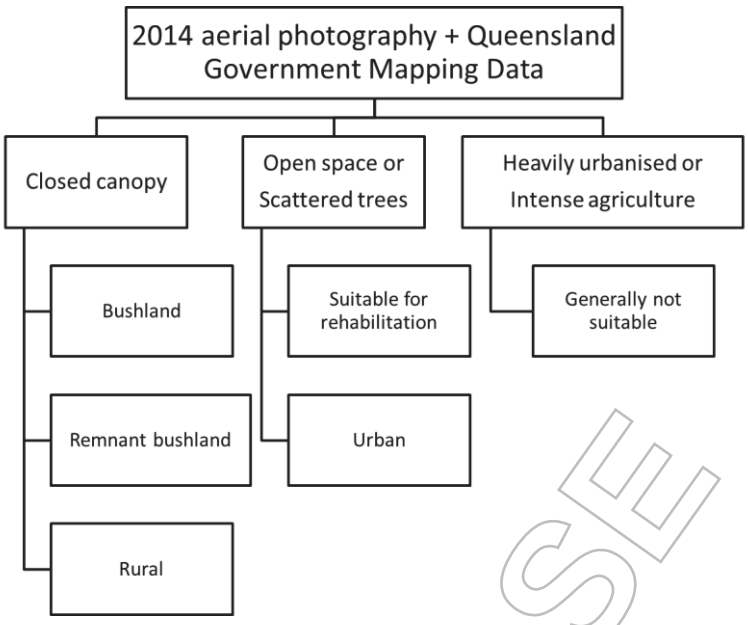

Figure 4 Land cover analysis

3.3.1. Native vegetation extent

A native vegetation extent layer was created by using RE V9 (remnant only) and mature regrowth (2012) as a base, refined using aerial photography interpretation of 2014 ortho-photos. Plantation areas, water and estuaries were removed from the remnant vegetation layer. Aerial photography interpretation identified:

- Areas where mapped vegetation has been cleared between the 2014 ortho-photo and the 2013 RE v9 and 2012 mature regrowth mapping;
- New regrowth areas (not included in the 2012 mature regrowth mapping); and
- Identification of small patches not identified in State vegetation layers that might be important to koala movement such as roadside corridors and riparian vegetation.

Note that while the presence or absence of vegetation has been identified through 2014 aerial photography interpretation, the type of vegetation has not been verified through field surveys.

Refer to **Appendix E – Map 1** for changes to the vegetation extent observed through aerial photography interpretation. Areas were symbolised by three categories:

- Unverified vegetation/Regrowth: vegetation identified from 2014 ortho-photos may include areas of new regrowth and private plantations. Vegetation type (native or introduced) has not been field verified.
- Cleared: area mapped as remnant vegetation or regrowth is not observed in the 2014 ortho-photos. Vegetation clearing after the 2014 ortho-photo capture has not been included.
- Unchanged: vegetation extent on ortho-photo matches remnant or regrowth mapping extents.

3.3.2. Land cover categories

Vegetation extent was differentiated by size, shape, density and fragmentation using the criteria in **Table 2**. The shape of patches is important and vegetation patches were separated where the patch width was below 100 m (DEHP corridor width) to differentiate between Bushland, Remnant Bushland and Rural patches. Land cover categories are represented in **Appendix E – Map 2.**

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Table 2 Land cover criteria

Bushland	>100 hectares closed canopy where width does not drop below 100m
Remnant Bushland	10-100 hectares predominately closed canopy but some new regrowth areas may be included. Width >100m
Rural	<10 hectares closed canopy not in the WBB urban footprint and can be below 100m width
Urban areas	<10 hectares closed bushland patches and open space/ private backyards with some scattered trees in the urban footprint (excluding lots <0.5ha)
Areas suitable for rehabilitation	scattered trees in cleared areas
Areas generally not suitable	Intensively urbanised/built up areas, intense agriculture (such as irrigated cropping), mangroves, highway and railway.
Water	estuaries, large river systems, lakes, dams

3.4. Preliminary Koala Habitat Model

A preliminary spatial model was developed to identify targeted field survey sites. The preliminary spatial model was a vector based model based on land cover (native vegetation extent) described above, ranked by vegetation communities (excluding Areas Suitable for Rehabilitation).

The preliminary spatial model does not take into account connectivity and corridor function, as its purpose is to determine the location of core habitats within the GRC area. Connectivity and other factors were incorporated at a later stage in the final matrix using a raster based overlay analysis. The preliminary spatial model was developed to identify priority areas for field investigations for model validation and refinement.

To create the preliminary spatial model, native vegetation extent was intersected with the pre-clearing layer to separate the vegetation extent into vegetation communities (RE). Homogenous polygons were ranked using the RE ranking value (**Section 3.2.2**). Where the vegetation fell within heterogeneous RE polygons, the ranking value of each represented RE was multiplied by the proportion of the RE in that polygon and a total koala habitat value was calculated. Values were categorised into five classes according to the relative abundance of primary and secondary trees and number of dominant tree species (**Table 3**).

Koalas can survive entirely from the primary species but cannot maintain optimal health eating only secondary species (Australian Koala Foundation 2015). Therefore, where only secondary tree species appeared in the dominant canopy, the 'high' classification was not applied. Other methods to categorise values into classes, such McAlpine *et al*. (2006), were based on canopy cover instead of the relative abundance used by this method. **Table 3** show how limits were established.

The preliminary spatial model was validated by a combination of data sets including:

- Existing koala habitat models;
- Previous sightings;
- Community consultation; and
- Results of the targeted field survey.

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Table 3 Preliminary spatial model classification criteria and examples

Category	Minimum Score	Primary Trees Only	Primary And Secondary Trees	Secondary Trees Only
High	>7	At least 70% relative abundance of primary and at least 1 primary tree species (i.e. 0.7 x 9 + 1 = 7.3) Total = 7.3	At least 20% relative abundance of primary and at least 1 primary tree species in at least T1 or T2 strata (i.e. 0.20 x 9 + 1 = 2.8) AND At least 100% relative abundance of secondary and at least 3 secondary tree species (i.e. 1 x 3 + 3 = 4) Total = 6.8	*Must have primary tree species to qualify as 'high'*
Medium-high	4-7	At least 35% relative abundance of primary and at least 1 primary tree species (i.e. 0.35 x 9 + 1 = 4.1) Total = 4.1	At least 20% relative abundance of primary and at least 1 primary tree species (i.e. 0.2 x 9 + 1 = 2.8) AND At least 20% relative abundance of secondary and at least 2 secondary tree species (i.e. 0.20 x 3 + 1 = 1.6) Total = 4.4	Eg.1 At least 100% relative abundance of secondary and at least 2 secondary tree species (i.e. 1 x 3 + 1 = 4) OR Eg.2 At least 50% relative abundance of secondary with at least 5 secondary dominant tree species (i.e. 1 x 3 + 1 = 4)
Low-Medium	2-4	At least 10% relative abundance of primary and at least 1 primary tree species (i.e. 0.1 x 9 + 1 = 1.9) Total = 1.9		Eg.1 At least 50% relative abundance of secondary and at least 1 secondary tree species (i.e. 0.5 x 3 + 0.5 = 2) OR Eg.2 At least 15% relative abundance of secondary with at least 3 secondary dominant tree species (i.e. 0.15 x 3 + 1.5 = 2)
Low	0-2	Containing supplementary trees only	Containing supplementary trees only	Containing supplementary trees only
None	0	No primary, secondary or supplementary koala tree species		

Notes:
T1 and T2 strata are added together to determine final rating
Patches with sightings are upgraded to the level above

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3.4.1. Validation against previous sightings and modelling

Not all REs could be field surveyed at a great enough sampling intensity to fully validate the model within the given time frame. However, by comparing the preliminary spatial model to existing data such as previous high value koala habitat modelling, previous koala sightings and information gathered from community consultation, knowledge gaps and inconsistencies were identified as priority field survey locations to ensure all high value koala habitat was captured.

Collation of Previous Koala Sightings, Habitat Modelling and Community Consultation

The following koala sighting records were collated from various formats and sources and joined into one dataset:

- Wildnet
- Australian Koala Foundation (AKF)
- Atlas of Living Australia (ALA)
- Koala Tracker
- MRCCC surveys
- Cooloola Community Action Group koala surveys
- Jones Hill Community Koala Survey
- O2 media post
- Community consultation including telephone conversations with
    - Koala Action Group (also attended a Meeting at MRCCC)
    - Rural fire brigade members
    - Wildlife Carers and Koala Hospitals (Sunshine Coast Koala Rescue, Australia Wildlife Hospital, Wildlife Carers, Gympie Vets)
    - Ranger in charge at Rainbow Beach and Gympie
- DEHP koala hospital (road precision only)
- Bruce Highway Stage C Koala Surveys

Records and scats from the targeted field surveys were also included. Information about location (both address and eastings/northings), source, date of sighting, evidence (sighting/rescue/calls/scats), collector, precision and comments/description were all retained (the minimum for entry into Wildnet). Results of the collation are shown in **Appendix E – Map 3** koala sightings and scats by date and **Map 4** koala sightings and scats by source and health. Note that both maps include positive field survey scat results. **Map 4** can be used to locate areas where koalas might be experiencing greater exposure to human influenced threats (e.g. mortalities, accidents and illness potentially due to stress).

Previous high koala habitat REs were extracted from the following koala habitat mapping models:

- Koala habitat modelling for the Cooloola Conservation Strategy 2002, revised in 2005 and 2009;
- Queensland Department of Environment and Heritage Protection (DEHP) essential koala habitat modelling; and
- Australian Koala Foundation (AKF) Koala Habitat Atlas.

Appendix B shows the RE Rankings with the number of recorded sightings and koala habitat value from previous modelling. Existing records and previous modelling generally supported the RE ranking model. Discrepancies were attributed to the scale of mapping layers.

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3.4.2. Validation against Targeted Field Surveys

Field surveys using a koala scat detection dog to confirm the presence or absence of koalas across the GRC area were conducted to validate the koala habitat modelling and mapping. Koala scat detection using Maya, a trained koala scat detection dog, is approximately 150% more accurate and 20 times more efficient than human-only searches (Cristescu et al. 2015). Maya's handler and ecologist in charge of the detection dog survey, Dr Romane Cristescu, has 10 years of experience in conducting koala scat searches. Surveys were conducted for 13 days over two periods, 5-13 and 18-21 September 2015, inclusive.

Field surveys incorporated:

- Site selection;
- Field preparation;
- Survey design; and
- Results of field surveys and incorporation into the RE Ranking table

Stes selection

If previous models or previous multiple sightings supported rankings, then confidence was considered high and the priority for field surveys was lower. If previous models or previous sightings didn't support rankings, the confidence was considered low/medium and these locations were prioritised for field survey.

The representation of an RE in the GRC area was also considered. If the RE occurs in one very small patch on, or close to, the boundary of the GRC area, it was considered of lesser importance given time constraints. It would provide greater value to survey REs with a larger representation in the GRC area than to spend time travelling to one very small patch located in an isolated area.

Other factors were also considered important for site selection and sites were prioritised using the following:

- Low/medium confidence areas where previous high value habitat modelling or previous multiple records did not support the koala habitat model
- Knowledge gap areas where there were no or very few records in the vicinity e.g. Tin Can Bay, Cooloola Cove, Rainbow Beach, Great Sandy National Park
- Presence in isolated remnant bushland areas within heavily built up areas (e.g. Victory Heights, Curra)
- Urban Expansion Areas (under GRC Strategic Planning) and proposed major infrastructure works such as the Bruce Highway Upgrade
- Potential areas that do not contain koala feed tree species but are important movement and water sources

Appendix E – Map 5 displays priority field investigations according to RE validation, Urban Expansion Areas, Proposed Highway Upgrades and knowledge gap areas.

Field survey sites were also distributed over the bushland, remnant bushland, rural and urban land cover categories and spread throughout the entire GRC area.

The availability of field survey sites were limited in some cases due to:

- Accessibility;
- Permission from private landholders; and/or
- Recently baited properties which are unsafe for the scat detection dog.

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Survey and field preparation

Sites for field survey were identified for each property according to RE prioritisation/ validation, presence in an urban area, presence in an urban expansion area or Bruce Highway upgrade areas, presence in a knowledge gap area, and corridor function. Field ecologists knew the specific purpose for the selection of each site.

Permission to survey private property was sought from properties prioritised for field surveys through letters from the GRC. Additional survey sites were visited if land holders volunteered their properties for survey outside of priority locations.

Extensive effort was expended towards collecting and incorporating GRC's feral animal control baiting program information into site selection and survey timing to avoid conducting searches in areas where there was a potential for bait presence and a safety risk to the dog.

A field map series was created and data was uploaded onto a Magellan DGPS with custom menus to capture information specified in Policy 4 and additional information about located scats.

Survey design

A maximum of three sites per priority RE were surveyed. If a koala scat was identified within the first priority RE on a property, another priority RE on that property was surveyed to check for use for shelter or movement. If there were no other REs to be surveyed, the next property would be surveyed.

Each site was searched by Maya until a koala scat was found and confirmed by the handler or when the handler was confident that the search had been thorough. Searches were not constrained by time or distance from the starting location as the aim of the survey was to confirm koala presence or absence from a site.

Information was collected about location, search time, scat characteristics, tree species and mapped Regional Ecosystems for each search. In the few instances where a scat was detected but could not be verified in the field (unusual size, shape or texture), it was sent to an expert scat analyst (Georgeanna Story, Scats About) for identification.

Field survey results and incorporation into modelling

A total of 96 sites were searched by Maya for koala scat. Three additional sites (73, 76 and 85) had not been included in GRC's baiting program data and were not searched due to 1080 baiting signage at the entry to the site.

Most scats were easily confirmed in the field. Ten scat samples were collected and sent for verification. Of these, Scats About confirmed 5 koala, 3 brushtail possum species and 2 inconclusive scats due to samples being too small or old.

The presence of koala scat was confirmed at 48 of the 96 sites, with koalas sighted at two of these sites and three other koalas whilst travelling between sites. No koala scat was recorded at 46 of the 96 sites. Very old scats that are likely to be koala but could not be positively identified were found at two sites. Scat age varied from extremely fresh to very old.

On average, it took 5.4 minutes to confirm the presence of koala scat (ranging from 19 seconds to 36 minutes) and 13 minutes to confirm the absence of koala scat (ranging from 5 to 33 minutes).

Observations of note:

- A number of searches recorded scats under *Corymbia intermedia* and *Lophostemon confertus*. Both of these species were upgraded to secondary species in the model.

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- Areas with predominately Gympie messmate were also surveyed and numerous scats were found under some of the trees, and this species was added as a secondary tree species.
- Koala scats were identified in a Council reserve used for recreational trails in the heart of Gympie surrounded by housing on one side and a railway line bounding the property on the northern side. There had been no recorded sightings of koala sightings in this reserve until the morning of the field surveys.
- Koala scats and a sighting was recorded in a rural living area in Curra where vegetation is highly fragmented and there are many dogs. It was located between Curra and the extractive quarry on the Bruce Highway.
- A koala was sighted at Jones Hill and a number of scats were identified in this area.
- A koala scat was identified in the Great Sandy National Park close to a creek line. There have been very few sightings in this park.
- Koala scats were found in native vegetation corridors in pine plantation areas (Toolara State Forest and Imbil SF1).
- Opportunistic records included where scats were identified in areas between survey sites or koalas were observed. Five koalas were recorded (Goomboorian, Jones Hill, Traveston, Widgee and Wolvi).

The complete field survey report is attached in **Appendix D** while **Appendix E – Map 5** displays the field results and opportunistic records during the field survey.

No high habitat value modelling was downgraded if a scat was not identified on the day. However, if a scat was identified in a low ranking area, then it would be upgraded accordingly.

The RE ranking table was recalculated to include the change in the above tree species weightings. In instances where a koala sighting had been recorded and the patch was rated medium-high, the patch was upgraded to high. Refer to **Appendix E – Map 6** for Pre-clearing RE Ranking based on the availability and range of preferred koala tree species. There were a couple of circumstances, where the RE was rated none but there were scats in these areas. The patch did not consist of koala preferred trees however the areas were being used by koalas, as movement corridors. These were upgraded from none to low-medium and were upgraded again when they were overlaid with the connectivity grid which highlights their connectivity value. The only RE that was upgraded on a whole was 12.3.5 (from low to low-medium). However this was increased when connectivity was incorporated. RE 12.3.5 contains melaleuca but can contain a number of primary feed trees. Melaleuca has been known to form up to 15% in a koala's diet in other regions (Melzer et al. 2014) but in Gympie it may serve as a valuable tree when moving through corridors. RE 12.3.5 was also identified by the AKF as an important RE.

3.5. Identification of High Quality Core Habitats and Connectivity Analysis

Once field surveys were complete and REs validated and refined for koala habitat value, core habitats were identified and the six land strata were assessed for connectivity and corridor function to further evaluate koala habitat value.

It is important to identify high quality core habitats so that connectivity and corridor function can be determined. Maintaining and establishing connectivity is important for direct dispersal between neighbouring pairs of habitat patches and for preserving connectivity between patches (McAlpine et al. 2011). Connectivity was analysed to determine koala habitat values, particularly in urban and smaller rural patches, as well as identifying 'Areas Suitable for Rehabilitation' that will benefit koalas by expanding and connecting core habitat patches. **Appendix E – Map 7** shows core habitat areas and level of connectivity.

A focal sum operation in GIS was used to identify contiguous areas and connectivity of the highest quality core habitats that were within a 1km radius of each 10 metre cell on the study area. Core habitats were rated into 2 classes:

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- High Quality Core Patches (4) - Consists of High Value 'Bushland' or 'Remnant Bushland'
- Medium-High quality Core Patches (2) - Consists of Medium-High Value 'Bushland' or 'Remnant Bushland'

This neighbourhood analysis takes the surrounding sum of cell values (based on koala habitat value) out to a distance of 1km i.e. If a cell is completely surrounded by high quality core patch out to a distance of 1km it will get the total value of 4x10,000 = 40,000 (the maximum value). The grid was then reclassified into 4 categories;

- High Connectivity (value 3000)
    - At least 50% of the cell is surrounded by high quality core habitat, generally fills in gaps of high quality core habitat out to the core boundary and partly beyond (extends to a variable distance depending on patch value and shape).
    - Provides short-term rehabilitation of core habitat areas.
- Medium-High Connectivity (value 2000)
    - Expands core patch out to a variable distance depending on neighbouring cells.
    - Provides short-medium term rehabilitation by expanding core habitat and connecting core patches 500m apart (distance that a koala will traverse in 24 hours (Department of Environment and Heritage Protection 2014)).
- Low-Medium (value 1000)
    - Connects core patches of up to a distance of 1km apart which is particularly relevant for long lineal patches along roadsides and creeks which provide important movement corridors.
    - Provides medium to long term rehabilitation efforts in connecting core patches up to 1km apart.
- Low (value 0)
    - Areas more than 1km from core habitat patches that provide minimal connectivity.

Connectivity is overlaid upon the RE ranking and land cover rasters for the final matrix but predominately impacts ratings for upgrading and downgrading land covers 'Rural', 'Urban' and 'Areas Suitable for Rehabilitation'. This is explained further in **Table 5**.

It must be noted that potential obstructions or barriers such as major roads and highly urbanised areas (resistance rasters) were not included in this analysis as these can be addressed in a conservation management plan where mitigation issues can be identified and safe corridors identified in more detail. This study is focussed on areas where koalas may live or use for movement.

3.5.1. Corridors

Connectivity was used to further rate habitat areas particularly for areas which don't necessarily contain koala preferred tree species, but may act as vital corridor links between core patches such as 12.3.1 along Tinana Creek at Goomboorian. Connectivity has minimal impact on upgrading and degrading existing ratings of 'Bushland' areas which are largely influenced by the preliminary RE ranking model.

For 'rural' and 'urban' areas, patches are rated predominantly by their connectivity value to high quality core patches, although pre-clearing RE ranking still has some influence in determining if the site can be replanted with suitable koala feed trees. They are initially rated by their RE ranking and then they are either upgraded or downgraded by their connectivity value. Connectivity is a vital component in ranking these areas. However rural patches can play a vital role in connecting core habitat patches particularly in largely

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fragmented or urbanised areas. Hence rural patches and urban areas have been rated by their connectivity and role in corridor function. High connectivity in urban patches may highlight the need for programs to protect koalas from threats associated with urban areas.

These have been differentiated from 'Areas suitable for Rehabilitation' as they are actively playing an important role in connecting core patches. These areas can include patches of roadside vegetation, riparian corridors. These areas are already vegetated and should be protected until such time adjacent areas or more formalised and safer corridors can be planted or time for new regrowth to mature.

3.5.2. 'Areas Suitable for Rehabilitation'

'Areas Suitable for Rehabilitation' category consists of rural areas with scattered trees that have the potential to expand existing high value core patches and assist in rehabilitating key corridors. There are a number of benefits of 'Areas Suitable for Rehabilitation'. They can help to conserve areas around and between core patches, guide conservation and replanting programs and identify suitable areas for offsets.

Areas suitable for rehabilitation are rated up by a combination of their connectivity value and Pre-clear RE suitability. Pre-clear suitability value is important in terms of protecting natural regrowth and any existing mature preferred koala trees in the area. It is also important to ensure that planting programs are directed towards suitable areas where preferred koala feed trees can be planted. These areas are either upgraded or downgraded according to their connectivity value.

Climate change has not been incorporated into this study however a conservation management plan will help to identify areas in relation to potential impact of climate change.

Areas categorised as 'generally unsuitable habitat' included plantations, major highways, railways, intensive residential development and intensive agriculture such as large scale cropping. These areas were masked out in the final matrix.

3.6. Final Koala Habitat Value (Matrix)

The final koala habitat value matrix incorporates pre-clearing RE ranking validated by field surveys, land cover and connectivity. Each land cover category is ranked differently according to their function in koala habitat (**Table 4**).

Identifying koala habitat by availability of preferred tree species is particularly helpful for large bushland areas where there are fewer threats. Koala habitat in smaller isolated pockets or alongside creeks and roadsides play a vital role in corridor linkage. Hence these patches of vegetation (rural) were largely rated on their corridor function to link core habitats. Urban areas are also predominantly rated on their connectivity to existing core habitats so that appropriate policies and education can be implemented in these areas. While 'Areas Suitable for Rehabilitation' are vital for short and long-term viability of the koala which will help to establish local and regional corridors, network connectivity and reduce fragmentation and associated threats. These areas were largely identified through their ability to expand and connect existing core patches in suitable areas that can also support koala feed trees. It will allow natural regrowth to re-establish into mature trees as well as protect the remaining scattered koala feed trees on site. They are also areas in which conservation efforts such as replanting programs would be best targeted.

A spatial overlay analysis of all factors in the final matrix influencing koala habitat quality was performed. The following data layers were rated and converted to rasters using a 10x10m cell resolution:

- Pre-clear (ranked by RE) reflecting preferred tree composition
- Koala sightings (upgrade patches not already high) reflecting known koala habitat
- Land cover (size, shape and fragmentation of patch, and canopy density)

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- Connectivity (corridor function)

All layers were added together and reclassified according to the values in **Table 5**. This resulted in an overall habitat value layer which incorporates all of the factors above. The resulting 'koala habitat values' layer is displayed in **Appendix E – Map 8**.

Table 4 Land cover categories

Category	Habitat Value	Criteria	Role
Bushland	The most dominant factor influencing koala habitat value in bushland areas is the availability of preferred koala feed and shelter trees on particular land zones. The land zone is a simplified geology/substrate-landform classification for Queensland. Hence habitat values were stratified and ranked by regional ecosystems and their composition of preferred koala tree species.	>100 hectares (largely unfragmented). Closed Canopy	Core Habitat
Remnant Bushland	The most dominant factor influencing koala habitat value in remnant bushland areas is the availability of preferred koala feed and shelter trees on particular land zones as well as their connectivity in the whole network in terms of stepping stones between major core habitats	10-100 hectares (patches do not fall below 100m in width). Generally closed canopy but can include regrowth.	Core Habitat and Stepping Stone
Rural	The most dominant factor influencing koala habitat value in small rural patches or lineal corridors are connectivity and corridor function to existing core habitats however vegetation community also plays an important role.	<10 hectares (not within the urban footprint). Generally closed canopy and usually lineal in nature. Includes riparian corridors, roadside vegetation etc	Corridor Movement
Urban	The most dominant factor influencing koala habitat value in urban areas is connectivity to existing core patches which in turn can implement policies and educate the community in promoting the co-existence of koalas and human populations.	Open space and <10 hectares patches within the Urban Zone	Co-existence
Areas Suitable for Rehabilitation	The most dominant factor influencing koala habitat value in Areas suitable for Rehabilitation is the ability to expand and connect existing core patches in suitable pre-clearing vegetation communities.	Scattered trees/Rural Areas	Expanding and Connecting Core Habitat Areas
Generally Not Suitable	Intensive Residential and Agricultural Areas such as large scale cropping, Plantations etc		

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Table 5 Koala Habitat Value matrix

PRECLEAR (REGIONAL ECOSYSTEM RANKING FOR KOALA PREFERRED TREE SPECIES)				
HIGH	MED-HIGH	LOW-MED	LOW	NONE
5	4	3	2	1

LAND COVER	GRID VALUE	Conservation Value	PRECLEAR + LANDCOVER VALUE (INC SIGHTINGS)	PRECLEAR + SIGHTINGS + LANDCOVER + CONNECTIVITY												Final Combined Koala Habitat Class(incorporating connectivity		Final Koala Habitat Class
				CONNECTIVITY HIGH (3000)			CONNECTIVITY MED (2000)			CONNECTIVITY LOW-MED (1000)			CONNECTIVITY LOW (0)					
				TOTAL HAB VALUE	new value		TOTAL HAB VALUE	new value		TOTAL HAB VALUE	new value		TOTAL HAB VALUE	new value				
BUSHLAND	500	High	505	3505	same	50000	2505	same	50000	1505	same	50000	505	same	50000	BUSHLAND	High	50000
		Medium-High	504	3504	same	40000	2504	same	40000	1504	same	40000	504	same	40000		Medium-High	40000
		Low-Medium	503	3503	same	30000	2503	same	30000	1503	same	30000	503	same	30000		Low-Medium	30000
		Low	502	3502	upgrade	30000	2502	same	20000	1502	same	20000	502	same	20000		Low	20000
		None	501	3501	upgrade	20000	2501	upgrade	20000	1501	same	10000	501	same	10000		None	10000
REMNANT BUSHLAND	400	High	405	3405	same	5000	2405	same	5000	1405	same	5000	405	same	5000	REMNANT BUSHLAND	High	5000
		Medium-High	404	3404	same	4000	2404	same	4000	1404	same	4000	404	same	4000		Medium-High	4000
		Low-Medium	403	3403	upgrade	4000	2403	same	3000	1403	same	3000	403	same	3000		Low-Medium	3000
		Low	402	3402	upgrade	3000	2402	upgrade	3000	1402	same	2000	402	same	2000		Low	2000
		None	401	3401	upgrade	2000	2401	upgrade	2000	1401	same	1000	401	same	1000		None	1000
RURAL	300	High	305	3305	same	500	2305	same	500	1305	same	500	305	downgrade	*200	RURAL	High	500
		Medium-High	304	3304	upgrade	500	2304	same	400	1304	same	400	304	downgrade	200		Medium-High	400
		Low-Medium	303	3303	upgrade	500	2303	upgrade	400	1303	same	300	303	downgrade	200		Low-Medium	300
		Low	302	3302	upgrade	500	2302	upgrade	400	1302	upgrade	300	302	same	200		Low	200
		None	301	3301	upgrade	500	2301	upgrade	400	1301	upgrade	300	301	same	100		None	100
URBAN	200	High	205	3205	same	50	2205	same	50	1205	downgrade	10	205	downgrade	10	URBAN	High	50
		Medium-High	204	3204	upgrade	50	2204	same	40	1204	downgrade	10	204	downgrade	10		Medium-High	40
		Low-Medium	203	3203	upgrade	50	2203	upgrade	40	1203	downgrade	10	203	downgrade	10		Low-Medium	30
		Low	202	3202	upgrade	50	2202	upgrade	40	1202	downgrade	10	202	downgrade	10		Low	20
		None	201	3201	upgrade	50	2201	upgrade	40	1201	same	10	201	same	10		None	10
WATER	100	Water	101-105	3101-3105	N.A	999	2101-2105	N.A	999	101-105	N.A	999	101-105	N.A	999	WATER	Water	999
OTHER (REHAB)	0	High	5	3005	same	5	2005	same	5	1005	downgrade	3	5	downgrade	2	OTHER (REHAB)	High	5
		Medium-High	4	3004	upgrade	5	2004	same	4	1004	downgrade	3	4	downgrade	2		Medium-High	4
		Low-Medium	3	3003	upgrade	4	2003	upgrade	4	1003	same	3	3	downgrade	2		Low-Medium	3
		Low	2	3002	upgrade	3	2002	upgrade	3	1002	same	2	2	same	2		Low	2
		None	1	3001	upgrade	2	2001	upgrade	2	1001	same	1	1	same	1		None	1
GENERALLY UNSUITABLE		None																

* Vegetation patches that meet criteria but also have multiple recent sightings were given a rating of 400 (Medium-High) instead of 200 (Low).

3.7. Koala Living Areas

Koala Living Areas is the integration of koala habitat values and the Wide Bay Regional Plan (**Table 6**) to help with establishing zones and guidelines for incorporation into a Local Government Planning Scheme. **Appendix E – Map 9** displays the Wide Bay Regional Plan categories.

Koala Living Area categories were established through a spatial overlay analysis using Table 15 of the Koala Conservation Plan 2006-2016.

These categories include;

- Koala Conservation Areas,
- Koala Sustainability Areas and
- Urban Koala Areas.

The Koala Plan recognises Koala Conservation Areas and Koala Sustainability Areas as the most critical to the continued existence of viable koala populations in the wild. **Appendix E – Map 10** displays Koala Living Areas.

3.8. Limitations and Enhancements

This mapping method has incorporated and improved previous modelling methods to provide the best possible outcome for GRC. Improvements include:

- Incorporation of RE mapping over more generalised landscape parameters resulted in a more accurate representation of koala habitat in the region.
- Refinement of vegetation extent through aerial photography interpretation resulted in a more accurate representation of koala habitat in the region.
- Segregation of 'Rural' category into "Rural" and 'Areas Suitable for Rehabilitation' to ensure existing vegetated corridors and small patchs are protected until safer corridors are established.
- Corveg data was incorporated in addition to REDD and the RE rating system accounted for both relative abundance and number of preferred tree species present. This resulted in a more accurate rating system than used in previous models.
- A koala scat detection dog was used during field surveys. This method is more efficient and accurate than traditional human surveys.
- In addition to evaluating areas on their ability to expand core habitat patches, modelling incorporated identifying areas to help re-establish important corridors between core patches

Limitations of this mapping project included:

- Existing Queensland Government mapping and aerial interpretation of new regrowth layers were incorporated but have not been ground-truthed
- The latest available aerial photography was 2014
- Field survey sites were limited in some cases due to:
  - Accessibility;
  - Permission from private landholders;
  - Recently baited properties which are unsafe for the scat detection dog; and
  - Time limitations
- Climate change has not been incorporated into this study however a conservation management plan will help to identify areas in relation to potential impact of climate change.

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Table 6 Koala Living Area Matrix

Koala Habitat Value			Wide Bay Regional Plan								
			Regional landscape/Rural Production (100)			Rural Living (200)			Urban footprint (300)		
	Values	Reclass	Value	Class	new code	Value	Class	new code	Value	Class	new code
High	5,50,500,5000,50000	5	105	KCA	5	205	KSA	4	305	UKA	3
Med-High	4,40,400,4000,40000	4	104	KCA	5	204	KSA	4	304	UKA	3
Low-Med	3,30,300,3000,30000	3	103	KCA	5	203	KLA	2	303	KLA	2
Low	2,20,200,2000,20000	2	102	KLA	2	202	NR	1	302	NR	1
None	1,10,100,1000,10000,999,65000	1	101	NR	1	201	NR	1	301	NR	1

KOALA LIVING AREA VALUES	CODE
Koala Conservation Area	5
Koala Sustainability Area	4
Urban Koala Area	3
Koala Living Area	2
No Requirements	1

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4. Discussion and Conclusion

The Gympie Region supports koala populations throughout the whole shire, from large bushland areas to highly fragmented patches in both rural and urban areas. The koala habitat model shows that koala habitat is diminishing in quantity and quality due to fragmentation of bushland areas and the presence of koalas in isolated remnant patches. Fragmentation is predominantly caused by clearing of land for urbanisation, and agriculture where there is competing demand for fertile soils (on alluvial flats and deep red volcanic soils).

Many koala records are associated with car strikes and domestic dog attacks, human-induced threats to koalas. Loss of habitat and associated fragmentation is associated with increased threats to koalas and diminished health from increased stresses, highlighting the need to protect existing koala habitats, expand core habitats and establish corridors to large bushland areas for both the short and long term survival of the species. These threats include:

- Isolation of core habitats leading to diminished genetics and compounding the risk of disease
- Habitat loss pushing koalas out of primary habitats into secondary habitats
- Increased threat of collision and predation when moving between patches through urbanised areas
- Increasing populations of predators such as wild dogs
- Compromised habitat due invasive plant species
- Bushfire
- Selective logging of preferred koala tree species
- Climate change
- Large scale developments and other incompatible land-uses in high koala habitat areas
- Diseases such as Chlamydia and retrovirus (KoRV)

It is important to identify core koala habitats and movement corridors that exist now so that conservation measures can be established and implemented in the right areas to help re-establish safe corridors and expand existing core habitats which in turn will help to reduce some of the above threats. Identifying koala habitats in different planning zones also assists in generating suitable policies that promote and safe-guard the co-existence of both koalas and people. The mapping produced by this project will assist by informing the implementation of appropriate policies across the GRC area.

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5. Recommendations

Koala habitat mapping can assist local and State governments by information strategic planning decisions. Successful koala conservation will depend upon land management practices and policies that conserve the integrity of large habitat patches, but also protect the small, high-quality habitat patches that can sustain small populations or facilitating dispersal.

By identifying koala habitat, known threats can be overlaid and priority actions planned. These may include:

- Grants/ funding programs e.g. tree planting in suitable areas that will promote connectivity to existing core patches.
- Preserving important vegetation in high koala habitat areas that are within council reserves and roadside corridors.
- Wild dog control in areas of high koala habitat value.
- Domestic dog control in high koala habitat areas.
- Targeted invasive weed control in high koala habitat values.
- Effective management strategies in areas where koala habitat must be intersected by transportation infrastructure
- Retaining and/or enhancing vegetation in road reserves which are known to be movement corridors for koalas.
- Controlled Burn Strategies and Wildfire (fire intensity, escape routes, fire breaks etc) in high koala habitat areas.
- Vaccination programs for chlamydia in areas free of disease and ensuring rehabilitated koalas are released back into a safe location close to its collection point to minimise the spread or introduction of disease to koalas in other areas.
- Selective logging restrictions in high koala habitat areas.
- Expanding and protecting habitat areas with climate change in mind.
- Planning for proposed major infrastructure works with due consideration to threatened species such as the koala. Loss, fragmentation and isolation of quality habitat should be minimised and creation and rehabilitation of suitable habitat should be implemented well in advance of projects where habitat loss cannot be avoided.

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6. Works Cited

Australian Bureau of Statistics, 2015. Queensland State Summary. *3218.0 - Regional Population Growth, Australia, 2013-14*. Available at: http://www.abs.gov.au/ausstats/abs@.nsf/Latestproducts/3218.0Main Features302013-14?opendocument&tabname=Summary&prodno=3218.0&issue=2013-14&num=&view=.

Australian Koala Foundation, 2015. Australian Koala Foundation. Available at: www.savethekoala.com [Accessed April 15, 2015].

Cristescu, R.H. et al., 2015. Accuracy and efficiency of detection dogs: a powerful new tool for koala conservation and management. *Scientific Reports*, 5, p.8349. Available at: http://www.nature.com/doifinder/10.1038/srep08349.

Crowther, M. et al., 2013. Climate-mediated habitat selection in an arboreal folivore. *Ecography*, 36, pp.001–008.

Department of Environment and Heritage Protection, 2014. *Guideline: South East Queensland Koala Conservation State Planning Regulatory Provisions*, Brisbane: State of Queensland (Department of Environment and Heritage Protection). Available at: https://www.ehp.qld.gov.au/wildlife/koalas/legislation/pdf/koala-sprp-guideline.pdf.

Department of Environment and Resource Management, 2009. *Decline of the Koala Coast koala population: population status in 2008*, Brisbane, Queensland: Queensland Department of Environment and Resource Management.

Department of the Environment, 2015. Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) in Species Profile and Threats Database. Available at: http://www.environment.gov.au/sprat [Accessed April 15, 2015].

Dique, D., Preece, H. & Villiers, D. De, 2003. *Koalas in Pine Rivers Shire: distribution, abundance and management*, Brisbane, Queensland: Parks and Wildlife Service.

Environmental Protection Agency, 2006. *Nature Conservation (Koala) Conservation Plan 2006 and Management Program 2006-2016*, Queensland Government.

GHD, 2009. *South East Queensland Koala Habitat Assessment and Mapping Project*, Brisbane.

Martin, R. & Handasyde, K., 1999. *The Koala: Natural history, conservation and management*, Sydney, NSW: UNSW Press.

McAlpine, C. et al., 2011. *Conserving Biodiversity in Brigalow Landscapes*, Brisbane: UQ School of Geography Planning and Environmental Management. Available at: https://www.gpem.uq.edu.au/docs/Brigalow/ConservingBrigalowLandscapesl.pdf.

McAlpine, C.A. et al., 2006. The importance of forest area and configuration relative to local habitat factors for conserving forest mammals: A case study of koalas in Queensland, Australia. *Biological Conservation*, 132(2), pp.153–165. Available at:

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http://linkinghub.elsevier.com/retrieve/pii/S0006320706001455.

Melzer, A. et al., 2000. Overview, critical assessment, and conservation implications of koala distribution and abundance. *Conservation Biology*, 14, pp.619–628.

Melzer, A. et al., 2014. The habitat and diet of koalas (Phascolarctos cinereus) in Queensland. *Australian Mammalogy*. Available at: http://www.publish.csiro.au/?paper=AM13032.

Munks, S.A., Corkrey, R. & Foley, W.J., 1996. Characteristics of arboreal marsupial habitat in the semi-arid woodlands of northern Queensland. *Wildlife Research*, 23, pp.185–195.

Phillips, S., Hopkins, M. & Callaghan, J., 2007. *Koala Habitat and Population Assessment for Gold Coast City*, Uki, NSW: Biolink Pty Ltd.

Queensland Herbarium, 2015. *Regional Ecosystem Description Database (REDD). Version 9.0 (April 2015)*, Brisbane.

Threatened Species Scientific Committee, 2012. *Listing advice for Phascolarctos cinereus (Koala)*, Available at: http://www.environment.gov.au/biodiversity/threatened/species/pubs/197-listing-advice.pdf.

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Appendix A Data sources

Dataset	Version and/or Date	Source	Brief Description
Property Boundaries Queensland	Apr 2015	DNRM	The Digital Cadastre DataBase (DCDB) is the spatial representation of the property boundaries in Queensland and their related property descriptions.
Local government area boundaries - Queensland	Mar 2015	DNRM	The local government area (LGA) boundaries dataset is the spatial representation of local government areas in Queensland.
Rail network - Queensland	Feb 2014	DNRM	This dataset shows the position, name and ownership of Railway centrelines within the State of Queensland.
Baseline roads and tracks Queensland	Mar 2015	DNRM	This dataset represents street centrelines of Queensland developed in compliance with the provisions of the Queensland Spatial Information Infrastructure Strategy (QSIIS) Standard 3.
Place names gazetteer - Queensland	Mar 2015	DNRM	The place names gazetteer dataset is an extract from the place names database (PNDB) and each place name is represented as a point of latitude and longitude.
Major Watercourse lines	Topo 250k v3	Geoscience Australia	1:250k Watercourse lines ranked by hierarchy
Future State Major Road Network	Supplied by GRC May 2015	Supplied by GRC	Proposed Bruce Highway Stage 'C' and 'D' upgrades indicative line
Wide Bay Regional Plan	Sep 2011	DILGP	This dataset represents the Wide Bay Burnett Regional Plan Regional Landuse Categories, composed of three land use categories. The purpose of the WBB Regional Plan is to manage regional growth and change by shaping and supporting the future growth of communities in the region.
DEHP Koala Hospital Data (spreadsheet) 1997-2013	Jul 2013	DEHP	Koala hospital rescue locations. General Road Precision only
Protected areas of Queensland - boundaries	Mar 2015	DNPSR	Protected areas of Queensland represent those areas protected for the conservation of natural and cultural values and those areas managed for production of forest resources, including timber and quarry material.
Digital Elevation Model	Mar 2013	DNRM	Model of elevation values (25m cell resolution)
Land use mapping - Queensland current	May 2015	DSITI	Indicates the current primary use or management objective of the land. The dataset is a product of the Queensland Land Use Mapping Program (QLUMP) and was produced by the Queensland Government.
Biodiversity status of pre-clearing and remnant regional ecosystems	1/05/2015 (version 9.0)	DSITI	Pre-clearing regional ecosystems mapping at a map scale of 1:100,000 and 1:50,000 in part, based on surveys of vegetation communities and related landform, soils and geology and 2013 photography.
Environmental Protection Act 1994 - mature regrowth	Mar 2012	DEHP	This dataset has been derived from the dataset 'Vegetation Management Act High Value Regrowth' (version 2.1) and was created to reflect the conservation status of mature regrowth vegetation as per the Queensland Herbariums biodiversity status.
2014 Orthophotos 25cm	June - Sep 2014	AAM	Digital ortho-rectified aerial photography captured in 2014

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Appendix B RE Rankings

RE	Number of Patches	Total Area (ha)	Proportion of GRC by Area	Source of Ranking	Koala records in homogenous polygons	Koala records in heterogeneous polygons	Previous 'High' Modelling*	RE Ranking	Upgrade
12.2.11	25	768	0.1984	tech				high	
12.3.11	2615	11631	3.0049	tech	70	7	YY	high	
12.3.2	420	1736	0.4485	tech	5			high	
12.3.3	594	2602	0.6723	tech	5		YY	high	
12.3.3d	N/A	N/A	N/A	tech				high	
12.3.4	90	1460	0.3772	tech			YY	high	
12.3.6	36	82	0.0212	tech	3		YY	high	
12.3.7	760	2998	0.7746	tech	5	1	YY	high	
12.5.1b	10	134	0.0347	REDD	3			high	
12.5.2	36	83	0.0215	REDD	1		YYY	high	
12.5.2a	21	235	0.0608	tech			Y	high	
12.5.2b	N/A	N/A	N/A	tech				high	
12.5.6a	1	12	0.0031	REDD			Y	high	
12.5.6c	1	61	0.0157	REDD				high	
12.8.14	10	34	0.0087	tech	1		Y	high	
12.8.16	4	49	0.0127	tech				high	
12.8.17	N/A	N/A	N/A	tech				high	
12.8.8	13	170	0.0439	tech				high	
12.8.9	N/A	N/A	N/A	tech				high	
12.9-10.1	6	41	0.0106	tech			Y	high	
12.9-10.17	20	209	0.0539	tech			YY	high	
12.9-10.17b	494	9829	2.5394	tech	20	4	Y	high	
12.9-10.18	69	500	0.1293	tech				high	
12.9-10.19	14	86	0.0223	tech				high	
12.9-10.1x1	4	20	0.0052	REDD			Y	high	
12.9-10.2	181	2231	0.5763	tech	4			high	
12.9-10.3	229	5788	1.4953	tech	3	1		high	
12.9-10.4	335	10224	2.6414	tech	64	1	Y	high	

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RE	Number of Patches	Total Area (ha)	Proportion of GRC by Area	Source of Ranking	Koala records in homogenous polygons	Koala records in heterogeneous polygons	Previous 'High' Modelling*	RE Ranking	Upgrade
12.9-10.7	120	852	0.2200	tech	1		Y	high	
12.9-10.7a	95	374	0.0965	tech	3			high	
12.9-10.8	N/A	N/A	N/A	tech				high	
12.11.14	2056	18550	4.7925	tech	75	11		high	
12.11.15	283	9744	2.5174	tech	4		Y	high	
12.11.16	1314	7638	1.9733	tech	23			high	
12.11.17	19	85	0.0221	tech		1		high	
12.11.18	377	4907	1.2677	tech	41		Y	high	
12.11.2	33	787	0.2034	tech				high	
12.11.22	110	3001	0.7754	tech	1	3		high	
12.11.3	1770	29768	7.6905	tech	83	24	Y	high	
12.11.3a	86	1015	0.2622	tech	1		Y	high	
12.11.5	13	82	0.0211	REDD			Y	high	
12.11.5e	645	11070	2.8600	tech	8	1	YY	high	
12.11.8	172	4767	1.2316	tech		3		high	
12.11.9	245	2370	0.6122	tech			Y	high	
12.12.12	1044	14036	3.6262	tech	29	7	Y	high	
12.12.14	15	85	0.0219	tech				high	
12.12.15	218	11018	2.8465	tech	19	3		high	
12.12.15a	25	422	0.1090	tech				high	
12.12.15b	19	320	0.0826	tech			Y	high	
12.12.23	58	1018	0.2629	tech		3	Y	high	
12.12.28	40	349	0.0902	tech	4	2		high	
12.12.28x1	N/A	N/A	N/A	REDD				high	
12.12.3	64	591	0.1527	tech			YY	high	
12.2.5	88	2818.401549	0.7281	tech				medium high	
12.2.6	46	5458	1.4100	tech				medium high	upgrade patch to 'high' with sightings
12.2.7	69	1477	0.3817	tech			Y	medium high	
12.3.3a	29	79	0.0204	REDD			Y	medium high	
12.5.1	3	24	0.0062	tech				medium high	

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RE	Number of Patches	Total Area (ha)	Proportion of GRC by Area	Source of Ranking	Koala records in homogenous polygons	Koala records in heterogeneous polygons	Previous 'High' Modelling*	RE Ranking	Upgrade
12.5.12	491	10397	2.6860	tech	18			medium high	upgrade patch to 'high' with sightings
12.5.1e	N/A	N/A	N/A	tech				medium high	
12.5.7	8	37	0.0095	tech				medium high	
12.8.24	18	46	0.0118	REDD				medium high	
12.8.25	N/A	N/A	N/A	tech				medium high	
12.9-10.14	1	35	0.0091	tech				medium high	
12.9-10.17a	6	19	0.0049	REDD			Y	medium high	
12.9-10.21	49	916.005652	0.2367	tech	3	4		medium high	upgrade patch to 'high' with sightings
12.11.16x1	151	1019	0.2634	tech	11			medium high	upgrade patch to 'high' with sightings
12.11.6	325	6337	1.6371	tech	9			medium high	upgrade patch to 'high' with sightings
12.11.7	229	7900	2.0409	tech	6			medium high	upgrade patch to 'high' with sightings
12.12.11	33	576	0.1487	tech				medium high	
12.12.2	11	381	0.0983	tech	1			medium high	upgrade patch to 'high' with sightings
12.12.5	445	19083	4.9302	tech	5	2		medium high	upgrade patch to 'high' with sightings
12.12.7	1609	32793	8.4722	tech	11	1		medium high	upgrade patch to 'high' with sightings
12.12.9	7	426.3132585	0.1101	tech				medium high	
12.2.8	32	5481	1.4161	tech	1			low-medium	upgrade patch to 'medium-high' with sightings
12.3.12	2	302	0.0781	tech				low-medium	
12.3.14a	100	606	0.1565	REDD				low-medium	
12.5.4a	2	1	0.0002	tech				low-medium	
12.9-10.18b	N/A	N/A	N/A	tech				low-medium	
12.11.19	6	297	0.0767	tech				low-medium	
12.12.24	310	5684	1.4684	tech	1	1		low-medium	upgrade patch to 'medium-high' with sightings
12.12.25	12	536	0.1385	tech				low-medium	

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RE	Number of Patches	Total Area (ha)	Proportion of GRC by Area	Source of Ranking	Koala records in homogenous polygons	Koala records in heterogeneous polygons	Previous 'High' Modelling*	RE Ranking	Upgrade
12.12.8	596	24620	6.3606	tech	2	4		low-medium	upgrade patch to 'medium-high' with sightings
12.3.10	19	120	0.0311	tech			Y	low	Only found in heterogenous polygons with 12.12.5. Upgrade patches to medium-low
12.3.5	226	3527	0.9111	tech			Y	low	Upgrade general RE to medium-low as sometimes can contain catterred primary trees. Will be upgraded in connectivity later. Rated high by AKF
12.5.1a	1	39	0.0099	tech				low	
12.7.1	1	9	0.0024	REDD				low	
12.12.13	344	15409	3.9808	tech	4			low	upgrade patch to 'low medium' with sightings
12.12.16	317	7281	1.8810	tech	2	1		low	upgrade patch to 'low medium' with sightings
12.1.1	2	1	0.0002	tech					
12.1.2	32	691	0.1785	tech					
12.1.3	28	617	0.1593	tech					
12.2.1	38	2698	0.6969	REDD - rainforest					
12.2.12	57	4092	1.0572	tech					
12.2.14	17	1116	0.2884	tech					
12.2.15	16	43	0.0110	tech					
12.2.15a	N/A	N/A	N/A	tech					
12.2.15f	1	10	0.0026	lakes					
12.2.16	20	51	0.0131	REDD - sandblow					
12.2.3	16	124	0.0319	REDD - rainforest					
12.2.4	29	514	0.1328	REDD					
12.2.9	188	4728	1.2214	tech					
12.3.1	788	2557	0.6606	tech	12	1			Important RE for corridor function. Upgraded patches

RTI RELEASE

RE	Number of Patches	Total Area (ha)	Proportion of GRC by Area	Source of Ranking	Koala records in homogenous polygons	Koala records in heterogeneous polygons	Previous 'High' Modelling*	RE Ranking	Upgrade
12.3.10a	N/A	N/A	N/A	tech					
12.3.13	376	5585	1.4428	tech					
12.3.14	53	1956.916436	0.5056	tech					
12.3.7a	1	11	0.0028	tech					
12.3.7b	73	421	0.1089	REDD - instream waterholes and lagoons					
12.3.7c	1	2	0.0006	REDD - billabongs and oxbows					
12.3.7d	8	7	0.0019	closed depressions					
12.3.8	46	225	0.0582	tech					
12.5.10	180	836	0.2160	tech					
12.5.13	4	12	0.0031	REDD					
12.5.13a	9	81	0.0209	tech					
12.5.13c	1	5	0.0014	REDD - rainforest					
12.5.4	221	2047	0.5288	REDD					
12.5.9	244	1497	0.3867	REDD - sedgeland					
12.8.13	94	591	0.1528	tech					
12.8.19	N/A	N/A	N/A	tech					
12.8.1a	3	91	0.0235	REDD					
12.8.20	N/A	N/A	N/A	tech					
12.8.21	16	49	0.0126	tech					
12.8.23	N/A	N/A	N/A	tech					
12.9-10.15	N/A	N/A	N/A	REDD - rainforest					
12.9-10.16	99	714	0.1843	tech					
12.9-10.22	24	83	0.0214	REDD					
12.9-10.6	N/A	N/A	N/A	REDD					
12.9-10.9	15	77	0.0198	REDD					
12.11.1	300	2822	0.7290	REDD - rainforest		1			Heterogeneous polygon only, Upgrade patch to low

DRAFT RELEASE

RE	Number of Patches	Total Area (ha)	Proportion of GRC by Area	Source of Ranking	Koala records in homogenous polygons	Koala records in heterogeneous polygons	Previous 'High' Modelling*	RE Ranking	Upgrade
12.11.10	1550	21685	5.6023	tech	8				Upgrade patches with sightings to low-medium. Reason for 2 records is because RE was mapped wrong in Dagun Area. Change of soils and vegetation. Remapped RE
12.11.11	88	884	0.2284	REDD - rainforest		5			All in heterogeneous polygons, upgrade patches
12.11.12	68	792	0.2046	tech					
12.11.13	N/A	N/A	N/A	REDD - rainforest					
12.12.1	25	402	0.1040	tech					
12.12.10	N/A	N/A	N/A	tech					
12.12.17	N/A	N/A	N/A	REDD - rainforest					
12.12.18	35	696	0.1798	tech					
12.12.19	1	17	0.0044	tech					
12.12.26	17	645	0.1666	REDD					
12.12.6	3	31	0.0080			1			Heterogeneous polygon 12.12.12. Upgrade patch to 'low'
estuary	N/A	N/A	N/A						
ocean	N/A	N/A	N/A						

* Y denotesnumber of models

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Appendix C Preliminary spatial model classification

Preliminary Tree Species Only

Total RE Ranking Value - Relative abundance and Range of Dominant Canopy Primary Tree Species Only (weighting = 9)										
No. Of Primary tree species (1 value per primary)	100%	90%	80%	70%	60%	50%	40%	30%	20%	10%
1	10.0	9.1	8.2	7.3	6.4	5.5	4.6	3.7	2.8	1.9
2	11.0	10.1	9.2	8.3	7.4	6.5	5.6	4.7	3.8	2.9
3	12.0	11.1	10.2	9.3	8.4	7.5	6.6	5.7	4.8	3.9
4	13.0	12.1	11.2	10.3	9.4	8.5	7.6	6.7	5.8	4.9
5	14.0	13.1	12.2	11.3	10.4	9.5	8.6	7.7	6.8	5.9

Secondary Tree Species Only

Total RE Ranking Value - Relative abundance and Range of Dominant Canopy Secondary Tree Species Only (weighting = 3)										
No. Of Secondary tree species (0.5 value per secondary)	100%	90%	80%	70%	60%	50%	40%	30%	20%	10%
1	3.5	3.2	2.9	2.6	2.3	2.0	1.7	1.4	1.1	0.8
2	4.0	3.7	3.4	3.1	2.8	2.5	2.2	1.9	1.6	1.3
3	4.5	4.2	3.9	3.6	3.3	3.0	2.7	2.4	2.1	1.8
4	5.0	4.7	4.4	4.1	3.8	3.5	3.2	2.9	2.6	2.3
5	5.5	5.2	4.9	4.6	4.3	4.0	3.7	3.4	3.1	2.8

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Combination of Primary and Secondary Tree Species

	PRIMARY TREE SPECIES													
SECONDARY TREE SPECIES	100% (3 species)	100% (2 species)	100%(1 species)	80% (3 species)	80% (2 species)	80%(1 species)	60% (3 species)	60% (2 species)	60% (1 species)	40% (3 species)	40% (2 species)	40% (1 species)	20% (3 species)	20% (2 species)	20% (1 species)
100% (3 species)	**16.5**	**15.5**	**14.5**	**14.7**	**13.7**	**12.7**	**12.9**	**11.9**	**10.9**	**11.1**	**10.1**	**9.1**	**9.3**	**8.3**	7.3
100% (2 species)	16.0	15.0	14.0	14.2	13.2	12.2	12.4	11.4	10.4	10.6	9.6	8.6	8.8	7.8	6.8
100%(1 species)	15.5	14.5	13.5	13.7	12.7	11.7	11.9	10.9	9.9	10.1	9.1	8.1	8.3	7.3	6.3
80% (3 species)	**15.9**	**14.9**	**13.9**	**14.1**	**13.1**	**12.1**	**12.3**	**11.3**	**10.3**	**10.5**	**9.5**	**8.5**	**8.7**	7.7	6.7
80% (2 species)	15.4	14.4	13.4	13.6	12.6	11.6	11.8	10.8	9.8	10.0	9.0	8.0	8.2	7.2	6.2
80% 1 species)	14.9	13.9	12.9	13.1	12.1	11.1	11.3	10.3	9.3	9.5	8.5	7.5	7.7	6.7	5.7
60% (3 species)	**15.3**	**14.3**	**13.3**	**13.5**	**12.5**	**11.5**	**11.7**	**10.7**	**9.7**	**9.9**	**8.9**	7.9	**8.1**	7.1	**6.1**
60% (2 species)	14.8	13.8	12.8	13.0	12.0	11.0	11.2	10.2	9.2	9.4	8.4	7.4	7.6	6.6	5.6
60% (1 species)	14.3	13.3	12.3	12.5	11.5	10.5	10.7	9.7	8.7	8.9	7.9	6.9	7.1	6.1	5.1
40% (3 species)	**14.7**	**13.7**	**12.7**	**12.9**	**11.9**	**10.9**	**11.1**	**10.1**	**9.1**	**9.3**	**8.3**	7.3	7.5	6.5	**5.5**
40% (2 species)	14.2	13.2	12.2	12.4	11.4	10.4	10.6	9.6	8.6	8.8	7.8	6.8	7.0	6.0	5.0
40% (1 species)	13.7	12.7	11.7	11.9	10.9	9.9	10.1	9.1	8.1	8.3	7.3	6.3	6.5	5.5	4.5
20% (3 species)	**14.1**	**13.1**	**12.1**	**12.3**	**11.3**	**10.3**	**10.5**	**9.5**	**8.5**	**8.7**	7.7	6.7	6.9	**5.9**	**4.9**
20% (2 species)	13.6	12.6	11.6	11.8	10.8	9.8	10.0	9.0	8.0	8.2	7.2	6.2	6.4	5.4	4.4
20% (1 species)	13.1	12.1	11.1	11.3	10.3	9.3	9.5	8.5	7.5	7.7	6.7	5.7	5.9	4.9	3.9

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Appendix D Survey Results

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Koala presence survey - Gympie

Prepared for O2 Ecology

By Dr Romane Cristescu, University of the Sunshine Coast

October 2015

PRE-RELEASE

Attention: Paul Fox

Introduction

O2 Ecology contracted the University of the Sunshine Coast to confirm presence / absence of koalas *Phascolarctos cinereus* across the Gympie shire in order to validate O2 Ecology modelling and mapping of the koala distribution for the Gympie Regional Council.

The best method to confirm koala presence, or detect koala habitat, is the novel method of using a detection dog specifically trained on the odour of koala scats. The detection dog method is approximately 150% more accurate (dogs find scats where humans missed them) and 20 times more efficient (quicker) than human-only searches[1]. Performances of detection dog surveys will vary between dogs and should always be assessed.

Methods

A koala scat detection dog named Maya, a border-collie cross, the first koala scat detection dog to be trained and scientifically tested[1], was hired through the University of the Sunshine Coast.

The handler and ecologist in charge of the detection dog survey was Dr Romane Cristescu.

[1] Romane H. Cristescu, Emily Foley, Anna Markula, Gary Jackson, Darryl Jones, Céline Frère, Accuracy and efficiency of detection dogs: a powerful new tool for koala conservation and management, 2015, *Scientific Reports*

Dr Cristescu has 10 years experience in conducting koala scat searches and published a paper focusing on koala scats[2]. This allows some certainty in scat identification. Typical koala scats have the following characteristics:

- symmetrical and bullet shaped (not jelly bean shaped),
- generally about 1.5cm by 0.5 (adult koala scat size),
- even sized and especially fine particles,
- absence of insect parts (koalas don't eat insects),
- very compact.

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Many variations exist between koala scats and not all scats are typical, in addition old and partial scats are more difficult to identify. Any scat sample where 100% identification certainty was not reached was collected in the field and sent to an expert (Georgeanna Storey, Scat About).

[2] Romane Cristescu, Klaartje Goethals, Frank Carrick, Peter Banks, Céline Frere, Experimental evaluation of koala scat persistence and detectability with implications for pellet-based fauna census, 2012, *International Journal of Zoology*

Surveys happened between the 5th and the 13th, then between the 18th and the 21st of September 2015, for a total of 13 days.

A Job Safety Analysis was completed. Some of the relevant points are that the dog is professionally trained to not be a threat to wildlife, the wellbeing of the dog is ensured by Animal Ethics approvals (DAFF Animal Ethics: CA 2012/05/610 and USC: AN/A/14/91), the dog is regularly treated against ticks and checked, as well as being insured in the event of a snake bite. O2 Ecology and the Gympie Council ensured that no baiting occurred in the areas to be surveyed. The dog is thoroughly brushed before entering the property so that no weed is introduced.

The handler is in view of the dog at all time and control the movements of the dog by voice, which means the risk of the dog escaping and getting lost or injured is remote. Finally, the dog was operating under O2 Ecology scientific permit (Queensland Government: WITK16322415 and WISP10259411).

On arrival on site, general information were recorded including location name and number (from O2 Ecology survey design) and regional ecosystems, pictures were taken of the dog to show the understorey complexity, then the detection dog was given the command to find.

The search was timed. The search ended either when the detection dog found a scat or when the dog handler was confident the search had been thorough. The searches were not constrained by time because the time a dog needs to check a site varies depending on understorey complexity

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and terrain (which can slow down the dog) as well as temperature, wind, humidity and rain. The number of trees searched was not constrained to 30 close-by trees (a wide spread method to search for koalas), because the goal was to reach confidence on whether koalas were present, so we allowed the dog to follow its nose and did not stay in a close proximity to the starting point (in addition, 30 trees was considered too small a search). The method used in this project is an efficient method for presence / absence surveys.

When scats were found, attributes of the scats and trees under which scats were found were recorded on a paper data sheet – this allowed double checking the O2 Ecology GPS records. We recorded:

- The tree species and circumference at breast high ;
- The number of scats, their age classes and their sizes. When only one size (based on scat width) and age class (see classification below) are present, the tree is considered less used than when scats of different age classes (indicative of repetitive visits) and sizes (indicative of different animals) are present. A picture of the scats was also taken.

Scats of different widths

Age class are defined by:

Scat Age Categories	Characteristics
1	Extremely fresh (covered in mucus)
2	Fresh (shiny)
3	Medium fresh (no shine, smells when broken)
4	Old (no shine, no smell)
5	Very old and discoloured

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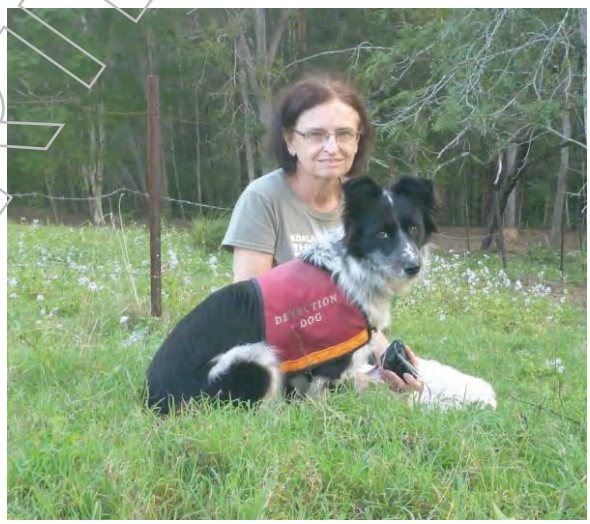
Extremely fresh (category 1, on the right) and fresh scats (category 2, on the left)

Data were entered electronically to complete Sally Chudleigh data sheet, all Sally's data was double checked with our paper records. The Excel data sheet was given to O2 Ecology.

When surveys occurred on private properties and at lunch breaks, we took every opportunity of meeting locals to raise awareness for the work the Gympie Regional Council, in collaboration with O2 Ecology and the Detection Dogs for Conservation at USC, was undertaking and give information on koalas in general. We did demonstrations for the Mayor and Gympie Regional Council staff as well as meeting with the Gympie Times. Detection dogs are great ambassadors for conservation.



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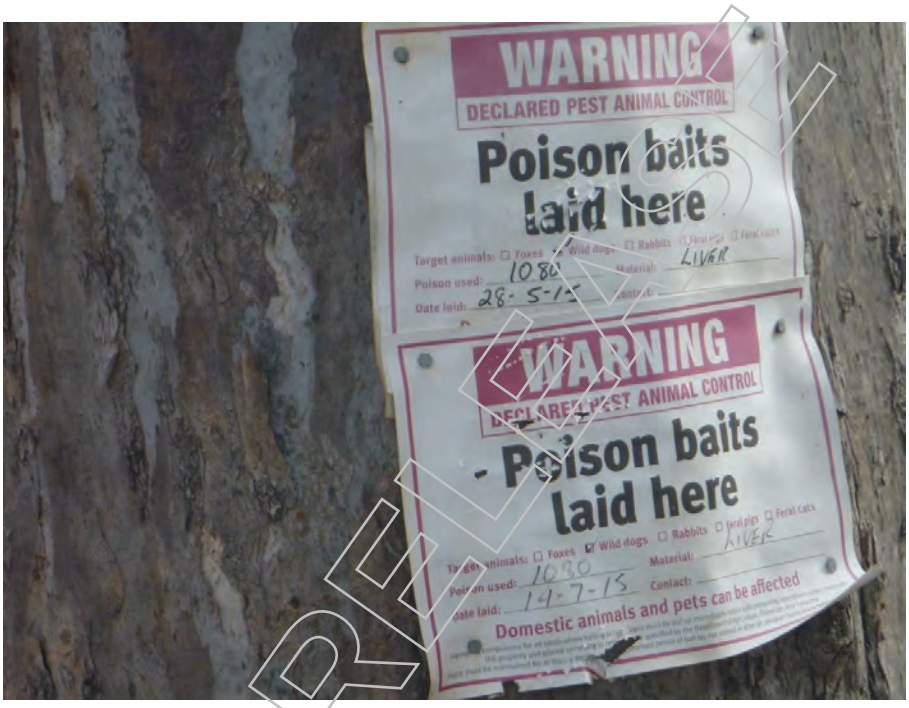
Results

A total of 96 sites were checked.

Three locations were not searched because of the presence of 1080 baiting (locations 73, 76 and 85).



Most scats could easily be confirmed in the field; however 10 scat samples were collected for verification. Scat About examined the samples and confirmed:
- 5 koalas
- 3 brushtail sp
- 2 samples were too small / old to reach a conclusion.

Therefore, 48 locations were found positive for koala presence based on scats (and two also had a koala present) and 46 had no koala sign (two had very old scats that could not be 100% confirmed, but are likely to be koalas). An additional 12 opportunistic koala presence records were made.

Scats found varied from extremely fresh to very old (see Excel spreadsheet).

It took on average 5.4 minutes to confirm the presence of scats (from 19sec to 36 mins) and 13 min to confirm their absence (from 5 to 33 mins).

order_	Date	survey	Day	survey_	SITE_NO	ID	site_desc	Locality	Tenure	SCAT	ScatAbout check	age_scat	age_scat2	Time_	EVIDENCE	TREE_SP	T_diam	T_height	KOALA	COMMENTS	PHOTOS	RE_LABEL	PC_LABEL	cover	easting	northing
0	5/09/2015	SC	1	timed survey	23-1	23	Messmate Park - Survey 1	Goomboorian	Council Park	yes		old	4,5	2 mins	scats and scratches	eucalyptus tereticornis	57cm	10m		young tereticornis amoungst many Gympie messmate trees	2-7	12.5.1	100	remnant	478258	7119854
1	5/09/2015	SC	1	timed survey	23-2	23	Messmate Park - Survey 2	Goomboorian	Council Park	yes		old, many	4,5	3 mins	scats	eucalyptus cloeziana	78cm	15m		lots of scats under gympie messmate, well used tree	8-12	12.5.1	100	remnant	478212	7119889
2	5/09/2015	SC	1	timed survey	23-3	23	Messmate Park - Survey 3	Goomboorian	Council Park	yes		old	5	2 mins	scats	unsure, many close trees				unsure which trees are many close together	13,14	12.3.11	100	remnant	478103	7119910
3	5/09/2015	SC	1	timed survey	21-1	21	Taggan Road - Kevin Jackson - Survey 1 (CK)	Goomboorian	Private	yes		old, few	4	1 min	scats and scratches	eucalyptus tereticornis	207cm	30m		using Tinana Ck as corridor movement	15,16	12.3.1	100	mature regrowth	478133	7114636
4	5/09/2015	SC	1	observation	21-2	21	Taggan Road - Kevin Jackson	Goomboorian	Private	yes		old, few	5	found on track after survey	scats	ficus coronata (travelling past tree)	34cm	15m		Found scat on track as walking through. In gallery rainforest area with some scattered blue gum, ironbark, streblis, brushbox. travelling through or water	17	12.3.1	100	mature regrowth	478111	7114616
5	5/09/2015	SC	1	timed survey	21-3	21	Taggan Road- Kevin Jackson - Survey 2 (CK)	Goomboorian	Private	yes		old	4	30 seconds	scats and scratches	eucalyptus tereticornis	140cm	30m		old scats	18,19	12.3.1	100	mature regrowth	478095	7114615
6	5/09/2015	SC	1	observation	21-4	21	Taggan Road - Kevin Jackson	Goomboorian	Private	yes		v. old,few	5	found on track after survey	scats and scratches	eucalyptus tereticornis	80cm	30m		Found travelling back to car		12.3.1	100	mature regrowth	478158	7114614
7	5/09/2015	SC	1	timed survey	23-4	23	Tinana Road - Boundary of Joe and Council Reserve	Goomboorian	Private	yes		v. old,few	5	5 mins	scats and scratches	eucalyptus racemosa	178cm	20m		few,very old	20	12.5.12	100	remnant	478334	7118995
8	5/09/2015	SC	1	timed survey	23-5	23	Tinana Road - Tooilara Forestry	Goomboorian	Protected Area Estate	yes		few	4	1 min	scats	eucalyptus pilularis	56cm	10m		few Scats,	21	12.5.1	100	remnant	478438	7119176
9	5/09/2015	SC	1	observation	23-6	23	Tinana Road - Tooilara Forestry (neighbouring tree)	Goomboorian	Protected Area Estate	yes		old, many	5	found in neighbouring tree	scats	eucalyptus microcorys	195cm	30m		found in neighbouring tree	22	12.5.1	100	remnant	478443	7119174
10	5/09/2015	SC	1	timed survey	23-7	23	Tinana Road/ TCB Road - Joe (culvert under TCB Rd)	Goomboorian	Private	no				quick search culvert TCB Rd		cleared area				culvert crossing under Tin Can Bay Rd, Tinana. photo	23	not mapped rem or regrowth			478165	7118893
11	5/09/2015	SC	1	timed survey	23-8	23	Tinana Road/ TCB Road - Joe (scattered trees near culvert)	Goomboorian	Private	yes		old, few	5	5 mins	scats	eucalyptus tereticornis	221 cm	??		several old scats, one of few trees in area, owner would like to plant up with eucalypt trees and upgrade a corridor under TCB Road	24	12.3.11	100	mature regrowth	478159	7118842
12	5/09/2015	SC	1	timed survey	14-1	14	Toolara Forest (behind Hoff Road), Riparian Corridor	Wolvi	Protected Area Estate	yes		recent,few	3, 4	2 mins	scats and scratches	eucalyptus racemosa	102cm	20m		large recent koala scats, possibly large male, lots of paperbark and scribbly in area	25,26	12.3.11	100	remnant	487677	7109590
13	5/09/2015	SC	1	timed survey	13-1	13	Round Mountain	Coondoo	Protected Area Estate	no				17 mins						fire in the last year, may not be representative		12.5.12	100	remnant	493213	7107950
14	5/09/2015	SC	1	timed survey	12-1	12	Great Sandy National Park, Cooloola Way Site 1	Coondoo	Protected Area Estate	no				10 mins						paperbark, scribbly, higher elevation		12.9-10.4	100	remnant	495188	7110040
15	5/09/2015	SC	1	timed survey	12-2	12	Great Sandy National Park, Cooloola Way Site 2	Coondoo	Protected Area Estate	no				12 mins						no scratches, mainly scribbly and paperbark trees, still high elevation		12.9-10.4	100	remnant	497134	7111937
16	5/09/2015	SC	1	timed survey	12-3	12	Great Sandy National Park, Cooloola Way Site 3 (near Creek lower down)	Coondoo	Protected Area Estate	yes			5	12 mins	scats and scratches	melaleuca quinquenervia	35cm	8m		lower elevation, closer to main creek, wetter area. lots of paperbarks	romane 437-443	12.9-10.4	100	remnant	499988	7117757
17	6/09/2015	SC	2	timed survey	17-1	17	Taggan Road - Lorna (Survey 1) Below House	Wolvi	Private	yes		old, few	4	15 mins	scats and scratches	eucalyptus racemosa	252cm	25m		old scats	27	12.9-10.4	100	remnant	482230	7111548
18	6/09/2015	SC	2	timed survey	17-2	17	Taggan Road - Lorna (Survey 2) Tree behind house.	Wolvi	Private	yes		few	3, 4	20 seconds	scats	eucalyptus microcorys	100cm	10m		few scats, sighting in past		12.9-10.4	100	mature regrowth	482121	7111504
19	6/09/2015	SC	2	timed survey	17-3	17	Taggan Road - Lorna (Survey 3) Half way up ridge	Wolvi	Private	yes		old	5	1.3 mins	scats	eucalyptus resinifera	119cm	25m			28-31	12.9-10.17	100	remnant	482090	7111444
20	6/09/2015	SC	2	timed survey	17-4	17	Taggan Road - Lorna (Survey 4) On top of ridgeline and over other side of ridge (western facing)	Wolvi	Private	yes		old	5	1.16mins	scats	eucalyptus resinifera	48cm	7m		old scats	32-33	12.11.16	100	remnant	481969	7111430
21	6/09/2015	SC	2	timed survey	10-1	10	Mallet Street - Council Reserve at end of road, Tin Can Bay (rocks placed over causeway), very wet	Tin Can Bay	Council Reserve	no				20 mins						quite wet, paperbark, swamp mahogany, difficult to access whole property as very wet and dense understorey		12.2.7	100	remnant	500724	7132644
22	6/09/2015	SC	2	timed survey	11-1	11	USL - Teewah Point Road	Tin Can Bay	USL	no				15 mins						scribbly, paperbark, recent fire, plenty of goanna and glider scratches		12.5.12	100	remnant	499012	7131353
23	6/09/2015	SC	2	timed survey	7-1	7	Investigator Avenue, Cooloola Cove	Cooloola Cove	Council Reserve	no				12 mins						Council Reserve, private properties back onto reserve, many domestic dogs (fenced)		12.3.4/12.3.14	80/20	remnant	499288	7125893
24	6/09/2015	SC	2	timed survey	6-1	6	End of Queen Elizabeth Drive, Cooloola Cove	Cooloola Cove	Council Reserve	no				12 mins						Searched along creekline, cut due to loose dogs approaching		12.3.4/12.3.14 and 12.5.10/12.5.4	80/20 & 60/40	remnant both	499647	7126343
25	7/09/2015	SC	3	timed survey	59-1	59	Doyle Rd, Dagun, Steve Burgess - Survey 1 (regrowth area)	Dagun	Private	no				11 mins						regrowth, different mapped re. lots of brushbox, conferta, bloodwood, yellowstringy, lots of koala trees, different soil, localised, Steve to mark up map	34-37	12.11.10/12.11.11	55/45	remnant	465113	7088959
26	7/09/2015	SC	3	timed survey	59-2	59	Doyle Rd, Dagun, Steve Burgess - Survey 1 (remnant area)	Dagun	Private	yes		old, few	4	2.13 mins	scats	corymbia intermedia	125cm	25m		large scats, adult, Veg mapped wrong RE. Lots of brushbox, conferta, bloodwood, and yellow stringy	38,39	12.11.3	100	remnant	464599	7088670
27	7/09/2015	SC	3	timed survey	47-1	47	Old Traveston Road, DTMR block, close to Bruce Highway, Stage C (koala fencing all around)	Traveston	DTMR	no				18 mins						lots of tereticornis, good trees, existing cattle tracks, a lot of koala fencing around for new highway and off roads		12.3.11	100	remnant	474085	7087518
28	7/09/2015	SC	3	timed survey	46-1	46	Traveston Rubbish Tip, Traveston Road	Traveston	Council Reserve	no				17 mins						not much smell at tip, covered most bush on property in the north east of the site, looks more like regrowth, good habitat		12.11.3	100	remnant	477445	7086688
29	7/09/2015	SC	3	observation	45-1	45	Burridge Road, Michelle Daley, sighting in tree below house	Traveston	Private	yes				sighting while visiting	scats and sighting	eucalyptus dunnii			Mum and adult baby	planted line of eucalypts dunnii, mum and bub in tree		not mapped rem or regrowth			474173	7092165
30	7/09/2015	SC	3	timed survey	45-2	45	Burridge Road, Michelle Daley, Survey 1 (behind house)	Traveston	Private	yes		v.old	5	2.07 mins	scats	eucalyptus microcorys	253cm	20m		very old	42-43	not mapped rem or regrowth			474075	7092149
31	8/09/2015	SC	4	timed survey	24-1	24	Needle SF1, Red Ridge Road, Survey 1	Needle	Protected Area Estate	unsure												12.5.12	100	remnant	475685	7125399
32	8/09/2015	SC	4	timed survey	24-2	24	Needle SF1, Red Ridge Road, Survey 1 - continued	Needle	Protected Area Estate	no				19 mins						scribblies, fire 12 months ago		12.5.12	100	remnant	475783	7125423
33	8/09/2015	SC	4	timed survey	25-1	25	Antimony Road, Council land, Survey 1- high on ridge	Anderleigh	Council Reserve	no				18 mins						on top of ridge, lots of spotted gums		12.11.5	100	remnant	473009	7123092
34	8/09/2015	SC	4	timed survey	25-2	25	Antimony Road, Council land, Survey 2 - along gully	Anderleigh	Council Reserve	no				13 mins						walked down along gully to check if watercourse made difference, dry gully, back to track		12.11.5	100	remnant	473220	7123249
35	8/09/2015	SC	4	timed survey	27-2	27	Ballein St, Behind Gunalda tip, Survey 1 - continued	Gunalda	Council Reserve	yes	confirmed koala	v.old		36 mins	scats unsure	eucalyptus resinifera				Covered most of reserve		12.9-10.2	100	remnant	456126	7124389
36	8/09/2015	SC	4	timed survey	27-1	27	Ballein St, Behind Gunalda tip, Survey 1 - continued	Gunalda	Council Reserve	no		v.old scats		33 mins	scats unsure	corymbia citriodora ssp variegata				Covered most of reserve, very old, local said they used to be there years ago, haven't seen them in ages though		12.9-10.2	100	remnant	456129	7124406
37	8/09/2015	SC	4	timed survey	30-1	30	Scotchy Pocket Road, Council reserve	Scotchy Pocket	Council Reserve	unsure	too old to confirm	v.old scats		13 mins	scats unsure					possible scat, could be yellow bellied glider or brush possum, well disturbed area, lots of cats claw, some teretecornis along ck line		12.3.11 and 12.9-10.2	100	remnant both	451910	7121434
38	8/09/2015	SC	4	timed survey	31-1	31	Cliff Jones Rd, Council camping reserve (unformed road access) Survey 1	Curra	Council Reserve	yes	confirmed koala	many		8 mins	scats	eucalyptus crebra	180cm	20m		many scats, possum as well. well used trees, lots of gum topped box trees	44-45	12.9-10.2/12.9-10.3	60/40	remnant	457504	7116401
39	8/09/2015	SC	4	timed survey	31-2	31	Cliff Jones Rd, Council camping reserve (unformed road access) Survey2	Curra	Council Reserve	no				5 mins	possible koala hair on barb fence line					lots of gum topped box in area		12.9-10.2/12.9-10.3	60/40	remnant	457622	7116350
40	8/09/2015	SC	4	timed survey	32-1	32	Elsom Court, (accessed through private property next door, koala sighting 5 weeks beforehand)	Curra	Private Property	yes			5	1.3 mins	scats	corymbia citriodora / eucalyptus acmenoides	105cm	15m		start survey, private property (sighting 5 weeks beforehand)	46-48	12.11.6	100	remnant	456978	7113265
41	9/09/2015	SC	5	timed survey	64-1	64	Rocks Road, Glastonbury	Glastonbury	Council Reserve	no				13 mins						unused reserve, good habitat (lots of red stringy and spotted gum)		12.11.5	100	remnant	459598	7100224
42	9/09/2015	SC	5	timed survey	66-1	66	Rocks Road/ Glastonbury Rd, Glastonbury (cow in reserve)	Glastonbury	Council Reserve	no				12.20 mins						dead calf old, cow in area atm, good hab but near main road, searched most of reserve		12.3.11/12.3.7 & 12.9-10.17b	80/20 & 100	mature regrowth both	458255	7101634
43	9/09/2015	SC	5	timed survey	65-1	65	Palm Drive, Ian Schugall Park , Survey 1	Glastonbury	Council Park	no	Trichosurus sp	old	5	9.30 mins	scats	Wattle/ acacia	39cm	5m			51-53	12.3.11/12.3.7	80/20	mature regrowth	459056	7101884
44	9/09/2015	SC	5	timed survey	65-2	65	Palm Drive, Ian Schugall Park , Survey 2	Glastonbury	Council Park	no				5 mins								12.3.11/12.3.7	80/20	mature regrowth	459099	7101819
45	9/09/2015	SC	5	timed survey	67-1	67	King Regional Park, off Bitiere Road, Survey 1	Glastonbury	Protected Area Estate	yes		medium/old	3	1.03 mins	scats	corymbia intermedia	169cm	15m		scats medium old	54-55	12.9-10.17	100	remnant	457559	7104334
46	9/09/2015	SC	5	timed survey	67-2	67	King Regional Park, off Bitiere Road, Survey 2	Glastonbury	Protected Area Estate	yes			4	55 secs	scats	corymbia citriodora ssp variegata	146cm	17m		mum and bub scats	56	12.9-10.21	100	remnant	457734	7104360
47	9/09/2015	SC	5	timed survey	68-1	68	Brooyar SF1, Point Pure Road (alternative to camping ground where catsclaw taken over) - Survey 1	Bells Bridge	Protected Area Estate	yes			5	14 mins	scats	eucalyptus resinifera	171cm	15m			58-60	12.9-10.17/12.9-10.21	60/40	remnant	454809	7107689
48	9/09/2015	SC	5	timed survey	68-2	68	Brooyar SF1, Point Pure Road (alternative to camping ground where catsclaw taken over) - Survey 2	Bells Bridge	Protected Area Estate	no				6 mins								12.9-10.17/12.9-10.21	60/40	remnant	454703	7107689
49	9/09/2015	SC	5	timed survey	69-1	69	Greendale Road, Paula Rowlands (wildlife carer)	Glastonbury	Private	yes		recent	2	20 secs	scats	eucalyptus tereticornis				previous sightings in area		12.11.14	100	remnant	452778	7104117
50	10/09/2015	SC/ML	6	timed survey	15a-1	15	Taggan Road (Dominics Place/ Sallys neighbour)	Wolvi	Private	yes			1,2	40 secs	scats and sighting	eucalyptus tereticornis	141cm	20m	Adult	very fresh scats with mucous, sighting of adult koala in tree, good habitat, a lot of scats recent and old in the area. A lot of brushbox, occasional teretecornis, lots of spotted and pink bloodwood	sallys photos	12.9-10.4	100	remnant	484717	7108657
51	10/09/2015	SC	6	observation	15a-2	15	Taggan Road (Dominics Place/ Sallys neighbour), neighbouring tree	Wolvi	Private	yes		recent		found next to other tree	scats	lophostemon confertus				fresh scats, numerous scats in area, old and new and differing sizes, undisturbed area, few threats, heard bellowing		12.9-10.4	100	remnant	484726	7108640
52	10/09/2015	SC	6	observation	15a-3	15	1057 Taggan Road, Wolvi (Sallys place)	Wolvi	Private	yes		old		found while walking	scats and scratches	eucalyptus tereticornis				sporadic teretecorns trees in paddock down by creek		12.3.11	100	remnant	484511	7108544
53	10/09/2015	ML	6	timed survey	72-1	72	Webb Park, Gympie Wooloogа Rd, Widgee	Widgee	Council Park	yes			4	1.2 mins	scats	eucalyptus tereticornis	66cm	10m		mowed park area near waterway and unmown area	ml iphone 9.38 -56am	12.3.3	100	mature regrowth	444180	7101618
54	10/09/2015	ML	6	timed survey	72-2	72	Kath O'Donnell, Upper Widgee Rd, Widgee	Widgee	Private	yes			2,3,4,5	1.1 mins	scats and heard	eucalyptus molluciana	184cm	35m		baby scat too, anecdotal - growling 4-5 nights ago	ml iphone 10.26 am	not mapped rem or regrowth			442791	7101740
55	10/09/2015	ML	6	timed survey	73-1	73	Fittler, Power Road, Widgee	Widgee	Private	yes			3	40 secs	scats	corymbia citriodora ssp variegata	47cm	15m		3 stems to tree	ml iphone 11.02am	12.3.11	100	mature regrowth	443649	7101709
56	10/09/2015	ML	6	timed survey	75-1	75	Thornside Road, Widgee, Survey 1	Widgee	Council	no				13 mins						long grass, lantana, gliders		12.12.5	100	remnant	437611	7106158
57	10/09/2015	ML	6	timed survey	75-2	75	Thornside Road, Widgee, Survey 2	Widgee	Council	no				16 mins						dry, old scats, ridgeline, hillside		12.12.5/12.11.6	85/15	mature regrowth	437759	7106436
58	10/09/2015	ML	6	timed survey	75-3	75	Thornside Road, Widgee, Survey 3	Widgee	Council	no				5 mins						creekline 50m only		12.12.5/12.11.6	85/15	mature regrowth	437687	7106344
59	10/09/2015	ML	6	timed survey	70-1	70	Hughes, Hawkins Rd, Widgee, Survey 1	Widgee	Private	yes			2,3,4,5	1.2 mins	scats and sighting	eucalyptus molluciana	85cm	25m	adult	different age scats, double trunk	ml phone 3. 53 pm	12.11.14/12.11.22	60/40	remnant	446640	7099205
60	10/09/2015	ML	6	timed survey	70-2	70	Hughes, Hawkins Rd, Widgee, Survey 2	Widgee	Private	yes			3	40 secs	scats	corymbia citriodora ssp variegata	75cm	20m			ml phone 4. 37pm	12.11.10/12.11.11	55/45	remnant	446929	7098840
61	11/09/2015	ML	7	timed survey	48-1	48	Peacons Pocket Rd/ Kenilworth Skyring Ck Rd, Council	Tuchekoi	Council	no				18 mins						very steep and viney		12.11 5 & 12.11.10/12.11.2	100 & 95/5	mature regrowth & rem	474846	7079313
62	11/09/2015	ML	7	timed survey	48-2	48	Rob Fiend, Kenilworth Skyring Ck Rd	Tuchekoi	Private	no				21 mins						recent scat found in car camp, thick weeds, old fences and barbed wire, however koalas have been seen high off on the hill in forest		12.11.5	100	mature regrowth & rem	474887	7079888
63	11/09/2015	ML	7	timed survey	49-1	49	Mary Fereday Park, Poulsen Rd/ Jubilee Rd, Council	Carters Ridge	Council	yes			5	17 mins	scats	eucalyptus tereticornis	138cm	25m		scat under 2 trees near each other, drizzly day	ml phone 11.19am	12.3.11	100	mature regrowth	476649	7074428
64	11/09/2015	ML	7	timed survey	50-1	50	Simpsons, Moy Pocket Road	Brooloo	Private	yes			5	13 mins	scats	eucalyptus microcorys	128cm	20m		known koala area, raining	ml phone 12.45pm	12.1.1.3	100	remnant	472998	7068679
65	11/09/2015	ML	7	timed survey	55-1	55	Imbil SF1 bounding Yabba Creek	Imbil	Protected Area Estate	no				5 mins						raining at time, weeds/grass/pods not representative of RE	ml phone 2. 40pm	12.3.7	100	remnant	465505	7073523
66	11/09/2015	ML	7	timed survey	51-1	51	Imbil SF 1, Derrier Rd, Survey 1	Imbil	Protected Area Estate	yes			4	11 mins	scats and scratches	eucalyptus tereticornis	184cm	25m		dense lantana around base	ml phone 3. 47pm	12.11.14	100	remnant	463130	7068475
67	11/09/2015	ML	7	timed survey	51-2	51	Imbil SF 1, Derrier Rd, Survey 2	Imbil	Protected Area Estate	yes			4	7 mins	scats	eucalyptus tereticornis	137cm	20m		in thick lantana adjacent to vehicle track	ml phone 4. 20pm	12.11.10/12.11.3	85/15	remnant	463190	7068144
68	11/09/2015	ML	7	timed survey	52-1	52	Imbil SF 1, Derrier Rd, Survey 3 (towards Yabba Ck)	Imbil	Protected Area Estate	no				8 mins						dense after heavy showers, hoop pine and lantana		12.3.1	100	remnant	462818	7069813
69	11/09/2015	ML	7	timed survey	54-1	54	Yabba Creek Rd, Council, Imbil	Imbil	Council	yes			4	2 mins	scats	eucalyptus tereticornis	184cm	25m		adjacent powerline easement, tall grass	rom camera 857-59	12.11.14	100	remnant	465936	7073182
70	12/09/2015	ML	8	timed survey	82-1	82	Burnett Hwy/ Ettrickdale Rd, Booubyjan, Council - Survey 1	Booubyjan	Council	yes			3,5	55 secs	scats and scratches	eucalyptus tereticornis	140cm	20m		adjacent water way, plenty of scats and scratches	ml phone 10.12am	12.12.12/12.12.8/12.3.3	40/40/20	mature regrowth	395139	7129857
71	12/09/2015	ML	8	timed survey	82-2	82	Burnett Hwy/ Ettrickdale Rd, Booubyjan, Council - Survey 2	Booubyjan	Council	yes		recent, different sizes	2	2 mins	scats and scratches	eucalyptus tereticornis	150cm	25m		adjacent to waterway steep bank, scratches fresh very baby koala poo	ml phone 10.23am	12.12.12/12.12.8/12.3.3	40/40/20	mature regrowth	395048	7129878
72	12/09/2015	ML	8	timed survey	81-1	81	Burnett Hwy, Booubyjan, Council	Booubyjan	Council	yes	confirmed koala		5	2 mins	scats	eucalyptus crebra	113cm	20m		narrow leaf ironbark	ml phone 11.04am	12.12.8/12.12.7/12.12.12	50/40/10	remnant	399838	7128099
73	12/09/2015	ML	8	timed survey	79-1	79	Mudlo Rd, Girongah NP - Survey 1	Mudlo	Protected Area Estate	yes	confirmed koala		5	20 mins	scats	corymbia citriodora ssp variegata	166cm	25m		possum and glider also present, 1 old partial scat, many other similar shaped	ml phone 2. 05pm	12.12.5/12.12.23/12.3.11	85/10/5	mature regrowth	422603	7125824
74	12/09/2015	ML	8	timed survey	78-1	78	Mudlo Rd, Mudlo NP	Mudlo	Protected Area Estate	no				5 mins						viney, thicket dry rainforest, no eucs	ml phone 2.40pm	12.11.10/12.12.13	50/50	remnant	423066	7122872
75	12/09/2015	ML	8	timed survey	79-2	79	Mudlo Rd, Girongah NP - Survey 2	Mudlo	Protected Area Estate	no	Trichosurus sp		5	6 mins	scats	corymbia citriodora ssp variegata	90cm	22m		decomposition by bugs old. shouldring house next to site, first scat looks like koala, others large fluffy	ml phone 3. 20pm	12.12.5/12.12.23	90/10	remnant	422908	7125813
76	12/09/2015	ML	8	timed survey	77-1	77	Pine St/ Mudlo Rd, Council Survey 1	Kilkivan	Council	yes			3	19 secs	scats	eucalyptus melanophloia	161cm	15m		open mowed parkland	ml phone 4. 06pm	12.11.6/12.12.5	70/30	mature regrowth	423816	7116104
77	12/09/2015	ML	8	timed survey	77-2	77	Ash St, Council Survey 2	Kilkivan	Council	yes		many scats (more than 100)	3,4,5	7 mins	scats	eucalyptus crebra	145cm	15m		lots of scat, extreme cobbles pegs and cacti	ml phone 4. 30pm	12.11.6/12.12.5	50/50	remnant	423500	7115486
78	12/09/2015	ML	8	timed survey	77-3	77	Mckewen Rd, Council Survey 3	Kilkivan	Council	yes			3	25 mins	scats	eucalyptus molluciana	188cm	30m		long grass, edge of patch adjacent barbed fence. large tree	ml phone 5. 44pm	12.11.7/12.11.8/12.11.14	75/20/5	mature regrowth	422990	7116012
79	13/09/2015	ML	9	timed survey	43-1	43	Hill Road, Woondum NP, Mothar Mountain	Mothar Mountain	Protected Area Estate	no				16 mins						rainforest		12.12.16	100	remnant	479719	7095520
80	13/09/2015	ML	9	timed survey	42-1	42	Todd Lindemann, Hartwig Road, Mothar Mountain	Mothar Mountain	Private	no				17 mins						feed trees present		12.12.12	100	remnant	476023	7098590
81	18/09/2015	SC	10	timed survey	35-1	35	Victory Heights, Recreational Trails - Survey 1 (first ck)	Victory Heights	Council/ DNRM	yes		medium age		40 secs	scats	eucalyptus amenoides	100cm	15m		middle oldness scat, previous sighting near area that morning, check red or yellow stringy	61	12.3.11	100	remnant	467901	7106305
82	18/09/2015	SC	10	timed survey	35-2	35	Victory Heights, Recreational Trails - Survey 2 (second ck) Mayor present	Victory Heights	Council/ DNRM	yes		recent	1,2,3,4,5	1.40 mins	scats	eucalyptus amenoides	144cm	20m		very recent, within 24 hrs.	62,63	12.3.11	100	remnant	468238	7105673
83	18/09/2015	SC	10	timed survey	63-1	63	Jones Hill Water Reservoir, Waterworks Road, Survey 1 (beside Mary River)	Jones Hill	Council	no				13 mins						very steep banks beside Mary River, few large teretecorns left, one seen by council staff about 6 years ago.		12.3.11	100	mature regrowth	467782	7099669
84	18/09/2015	SC	10	timed survey	63-2	63	Jones Hill Water Reservoir, Waterworks Road, Survey 2 (up on hill)	Jones Hill	Council	no				14.5 mins						good habitat, surprised not there, although become isolated, and presence of wild dogs		12.12.12	100	mature regrowth	467593	7099445
85	18/09/2015	SC	10	timed survey	62-1	62	Stephen Learoyd Memorial Park, Jones Hill, McIntosh Ck Rd	Jones Hill	Council	no				18.52 mins						searched most of small park, lots of teretecornis, bat houses and possum nests put in trees		12.12.12	100	mature regrowth	466576	7098597
86	18/09/2015	SC	10	observation	60-1	60	English Rd/ McIntosh Ck Road, (opposite Noni), Jones Hill	Jones Hill	Private	yes				walking along road	scats and sighting	eucalyptus amenoides			mum and bub	mum and bub in tree right beside road, cars travelling fast around bend, sighted while walking to survey point	64-67,71	12.12.12	100	mature regrowth	465543	7098045
87	18/09/2015	SC	10	observation	60-2	60	McIntosh Ck Road (Noni), Jones Hill	Jones Hill	Private	yes		old,many		walking along track	scats					older, many along tracks in Noni's		12.12.12	100	mature regrowth	465615	7097996
88	18/09/2015	SC	10	observation	60-3	60	McIntosh Ck Road (Noni), Jones Hill	Jones Hill	Private	yes		recen,many		walking along track	scats	eucalyptus amenoides				mum and bub scats as walking along tracks, 1 week old ones and older ones been around for awhile, stringybarks		12.12.12	100	mature regrowth	465678	7097943
89	18/09/2015	SC	10	observation	60-4	60	McIntosh Ck Road (Noni), Jones Hill	Jones Hill	Private	yes				walking along track	scats	eucalyptus amenoides						12.12.12	100	mature regrowth	465772	7097874

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90	18/09/2015	SC	10	observation	60-5	60	McIntosh Ck Road (Noni), Jones Hill	Jones Hill	Private	yes		recen,many		walking along track	scats	eucalyptus mollucana				fresh few weeks old		12.1.2.12	100	mature regrowth	465803	7097792
91	18/09/2015	SC	10	timed survey	61-1	61	Pieders on Road (Evelyn Hennell), Southside	Southside	Private	yes		old, few	5	3 mins	scats	eucalyptus mollucana	144cm	15m		mown area, recent sighting May 2015 in front of house	72-73	12.1.2.12	100	remnant	465347	7098655
92	19/09/2015	SC	11	timed survey	33-1	33	Tamaree Park, Old Maryborough Rd/ Tamaree Rd, Council	Tamaree	Council	no			2,3,4	11.40 mins						spotted, yellow stringy, searched whole reserve, lots of fur from feral cat?		12.1.1.5	100	remnant	464688	7109126
93	19/09/2015	SC	11	timed survey	29-1	29	Gravel Pit, Bauple Woolooga Rd, Woolooga	Woolooga	Council	no				17.5 mins						good trees, mollucana, spotted, stringys		12.11.18/12.11.17/12.11.6	40/35/25	remnant	441852	7126345
94	19/09/2015	SC	11	timed survey	28-1	28	Miva SF1, Glen Echo Rd, Glen Echo - Survey 1	Glen Echo	Protected Area Estate	no				18 mins						lots of mollucana, good trees		12.9-10.21	100	remnant	442147	7134819
95	19/09/2015	SC	11	timed survey	28-2	28	Glenbar NP, Glen Echo Rd, Glen Echo - Survey 2	Glen Echo	Protected Area Estate	no				12.2 mins						spotted, recent controlled burn		12.9-10.17/12.9-10.19	95/5	remnant	440684	7134934
96	19/09/2015	SC	11	timed survey	34-1	34	USL, Greenmount St, Gympie	Gympie	USL	no				16.2 mins						good hab, 1.00m diameter search on top of hill		12.11.5	100	remnant	466520	7105839
97	19/09/2015	SC	11	timed survey	35-3	35	Victory Heights (northern lot) - Belvedere Rd, Survey 1	Victory Heights	Council	no	Trichosurus sp	recent	2,3,4	3.30 mins	scats	eucalyptus robusta	170cm	25m		quite fresh, pretty sure is koala		12.3.11	100	remnant	468312	7106996
98	19/09/2015	SC	11	timed survey	35-4	35	Victory Heights (northern lot) - Belvedere Rd, Survey 2	Victory Heights	Council	yes	confirmed koala		3,4	13.40 mins	scats	lophostemon confertus	55cm	7m		in other RE, note Victory heights (south) may be isolated from Stage D Highway. At the moment can climb fence at railway	74-75	12.11.5	100	remnant	468404	7106938
99	20/09/2015	SC	12	observation	23-9	23	Tin Can Bay Road, Tinana Bridge, Koala sighting on way to Rainbow	Goomboorian	Road Reserve	other				spotted while driving	scats and sighting	eucalyptus tereticornis			adult	in tree right beside TCB rd near bridge, many bats near veg	KOALA_TCB_rd	not mapped rem or regrowth			478005	7118601
100	20/09/2015	SC	12	timed survey	1-1	1	USL Cypress Avenue, Rainbow Beach	Rainbow Beach	USL	no				10 mins						lots of large dogs travelling in area, more melaleuca in 2nd RE, wetter		12.2.7 and 12.2.6	100	remnant both	508365	7135346
101	20/09/2015	SC	12	timed survey	2-1	2	Double Island Drive, Firebreak Council Reserve, Rainbow Beach	Rainbow Beach	Council	no				9 mins						recent controlled burn		12.2.8	100	remnant	509414	7134256
102	20/09/2015	SC	12	timed survey	2-2	2	End of Double Island Drive, Great Sandy NP, Rainbow Beach	Rainbow Beach	Protected Area Estate	no				10.45mins						very few scratches of any type, scribblies, banksias etc some recent controlled burnoff, may be mispresentative		12.2.6	100	remnant	509390	7133944
103	20/09/2015	SC	12	timed survey	3-1	3	Camp Mio Rd, Great Sandy NP	Cooloola	Protected Area Estate	no				16 mins						found blank military bullet, scribbly and a few spotted gums		12.2.6	100	remnant	507776	7124928
104	20/09/2015	SC	12	timed survey	36-1	36	Ascot Rd, Council	Victory Heights	Council	unsure	too old to confirm	v. old		27 mins	scats					remnant old scats, search a good majority of property, good habitat		12.11.14	100	mature regrowth	469810	7105031
105	20/09/2015	SC	12	timed survey	37-1	37	Spada Road, Side of road reserve	East Deep Creek	Road Reserve	yes		v.recent	2	4 mins	scats	eucalyptus major	100cm	6m		possibly young adult, small female	93-98	12.1.1.5	100	remnant	471213	7101057
106	21/09/2015	SC	13	timed survey	41-1	41	Noosa Rd, Council Reserve, Mothar Mountain (surveyed twice due to previous rainy day)	Mothar Mountain	Council	no				11 mins						good hab, some catsclaw, creek running through, sureyed majority of area west of creek, possible old koala scratches		12.3.11	100	remnant	471911	7099171
107	21/09/2015	SC	13	timed survey	39-1	39	Old Glenmire Sewage Treatment Plant (opposite Roadcraft), Drummond Drive	Glenmire	Council	yes		alot	3	4.47 mins	scats	corymbia intermedia	122cm	15m		found scat in very disturbed vegetation amongst piping, not too old	99-100	12.3.7	100	mature regrowth	470250	7098687
108	21/09/2015	SC	13	timed survey	40-1	40	Keefton Road (off Bruce Hwy), Woondum SF	Woondum	Protected Area Estate	yes			4	7.5 mins	scats	eucalyptus tereticornis	163cm	15m		good habitat, New Bruce Hwy may cut it off	101,102	12.11.3	100	remnant	470273	7097858

RTI RELEASE

Appendix E Mapping

- Map 1 (a-f) – Native Vegetation Extent
- Map 2 (a-f) – Land cover
- Map 3 – Koala Sightings and Scats by date
- Map 4 (a-f) – Koala Sightings and Scats by source and health
- Map 5 – Field Prioritisation and Results
- Map 6 – Pre-clear RE Ranking with patch upgrades
- Map 7 (a-f) – Core Habitats and Connectivity
- Map 8 (a-f) – Koala Habitat Values
- Map 9 – Wide Bay Plan
- Map 10 (a-f) – Koala Living Areas

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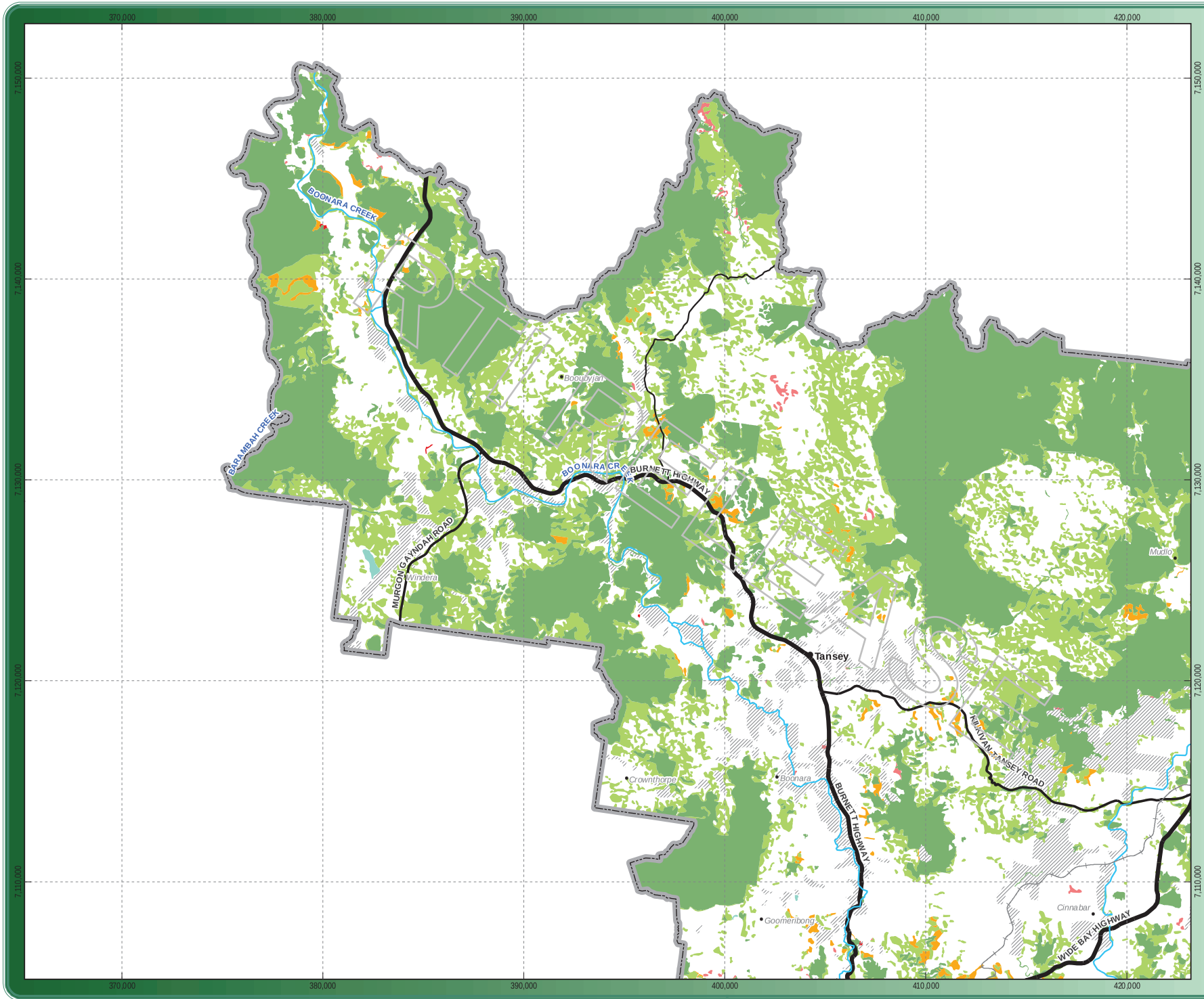

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N W E S

0 1 2 3 4 5
Kilometers

1:180,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Legend

- Locality
- Town
- **Rail**
- **Major Watercourse**
- Dam, Lake
- Generally Unsuitable (plantation, crop etc)

Native Vegetation Extent and Change

- Remnant - unchanged
- Regrowth - unchanged
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- Unverified vegetation/regrowth

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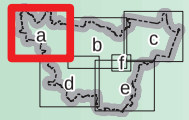

Gympie Koala
Habitat Mapping
Gympie Regional Council

Native Vegetation Extent and Change

Figure 1 a

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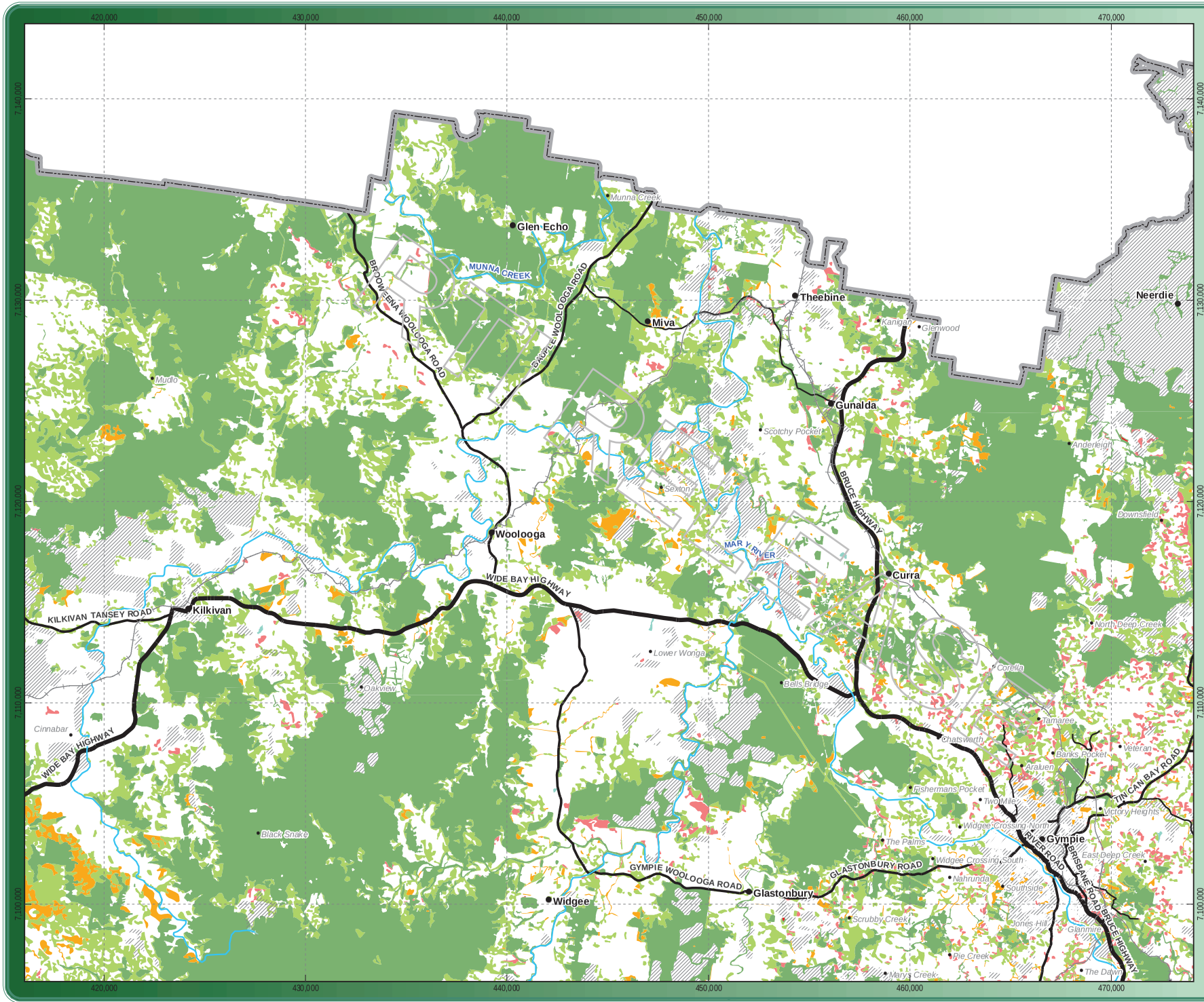
Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) DSITI: Biodiversity Status of pre-clearing and remnant regional ecosystems, DEHP: EPA 1994 - Mature Regrowth. © State of Queensland (DNRM, DEHP, DSITI)



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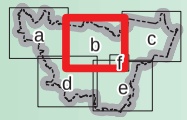

Gympie Koala
Habitat Mapping
Gympie Regional Council

Native Vegetation Extent and Change

Figure 1 b

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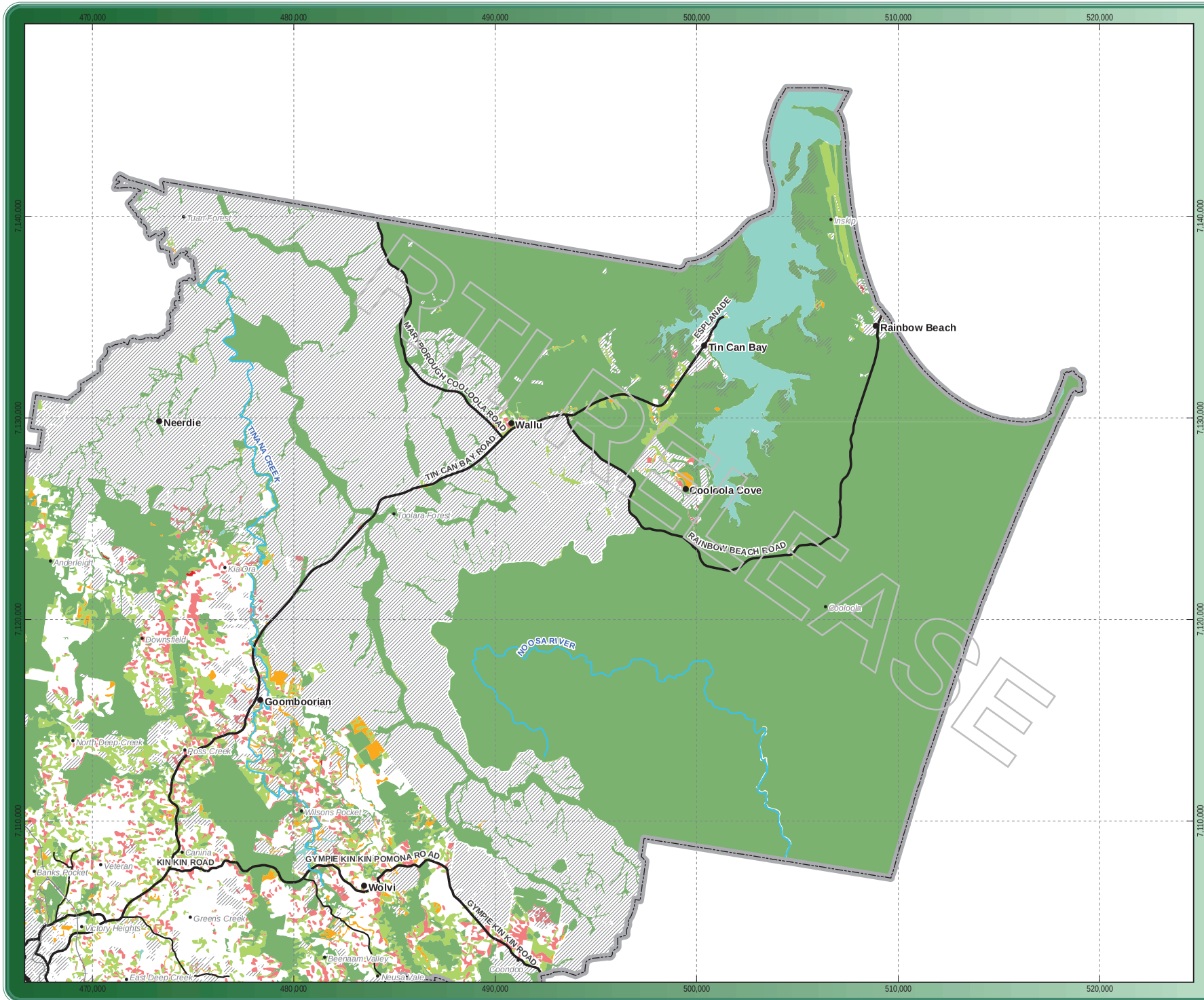

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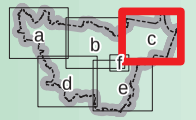

Gympie Koala
Habitat Mapping
Gympie Regional Council

Native Vegetation Extent and Change

Figure 1 c

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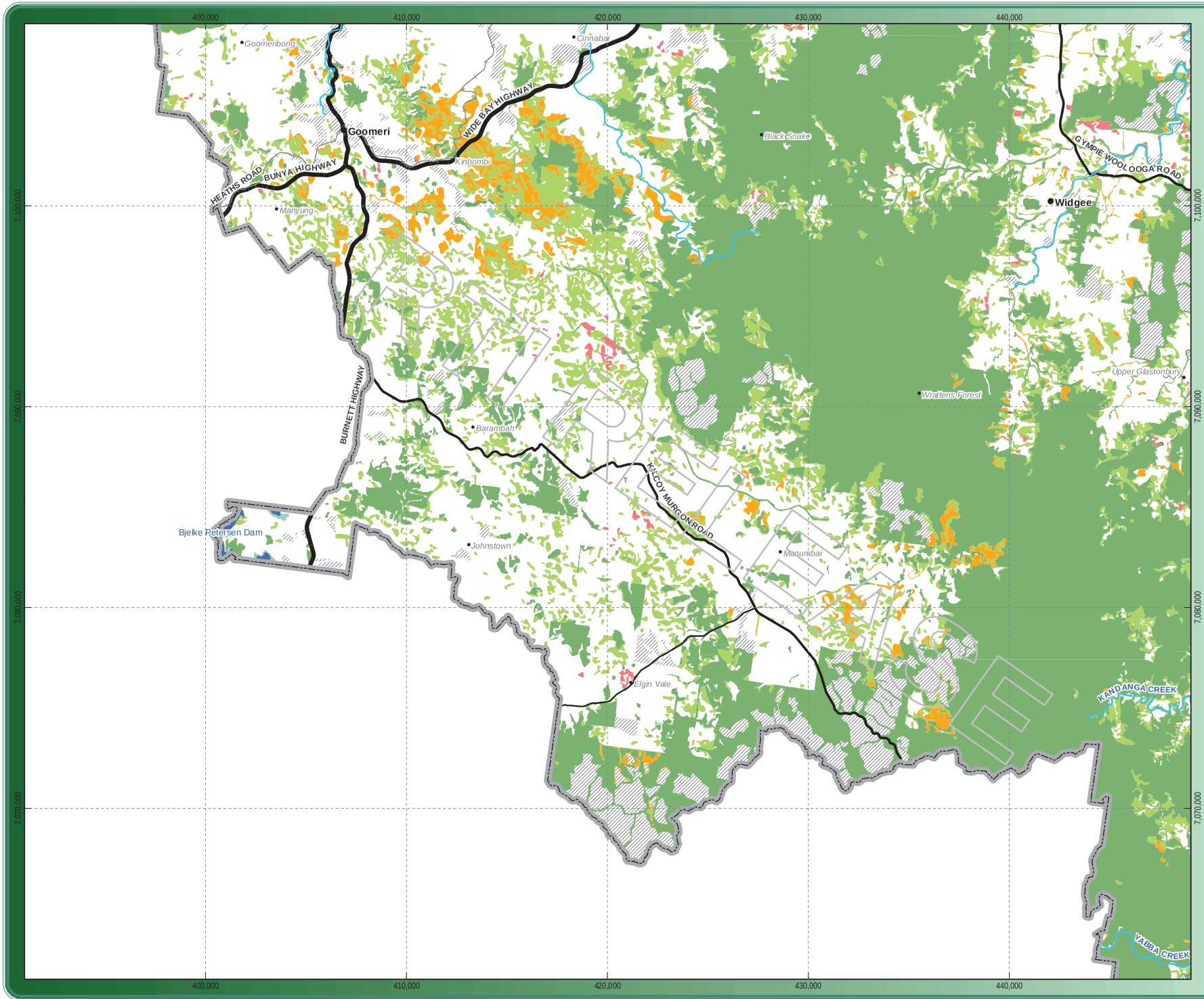

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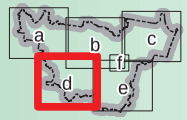

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Gympie Regional Council

Native Vegetation Extent and Change

Figure 1 d

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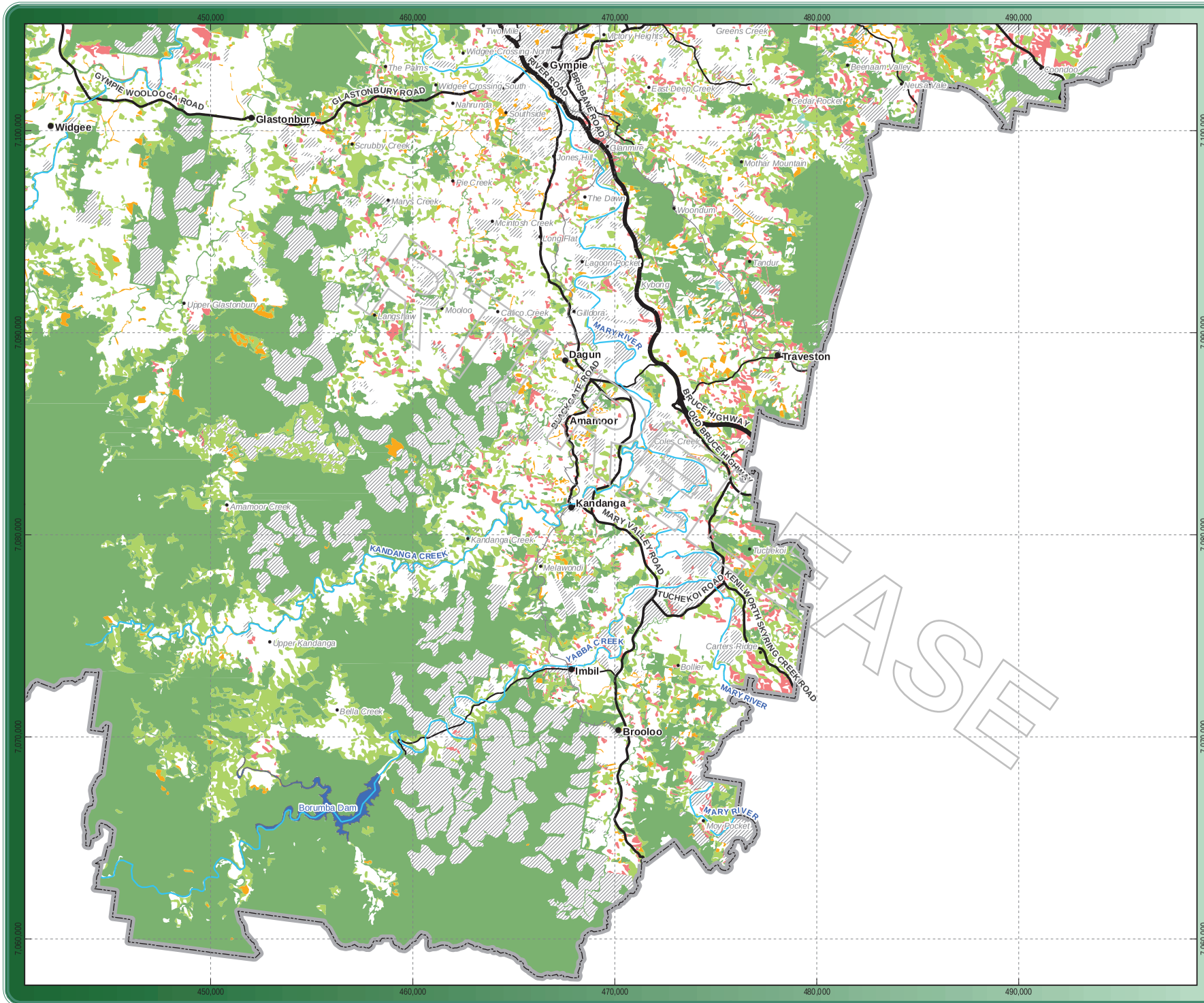

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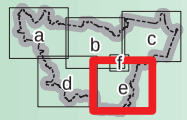

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Native Vegetation Extent and Change

Figure 1 e

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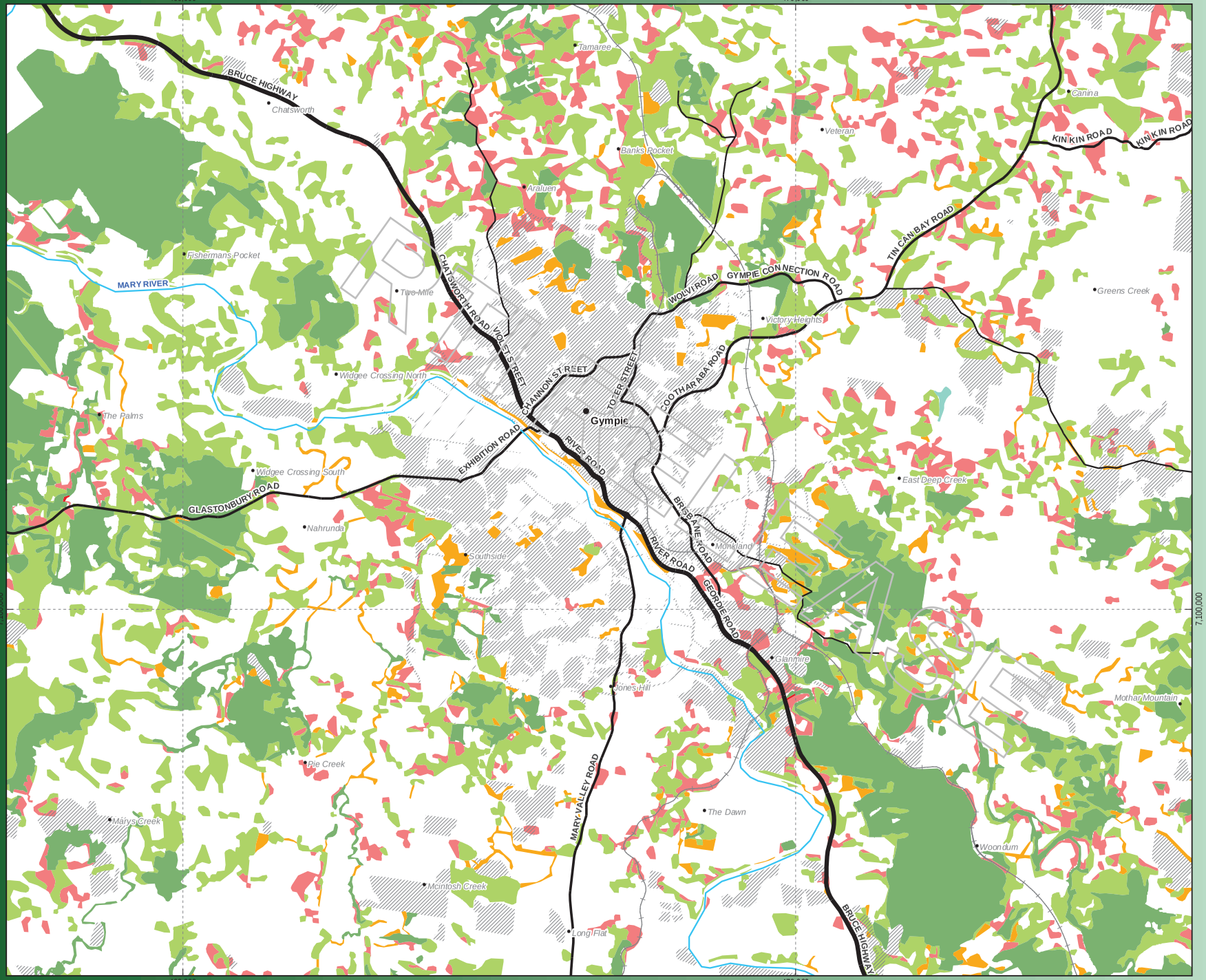

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Kilometers

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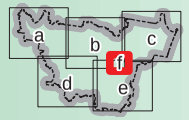

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Native Vegetation Extent and Change

Figure 1 f

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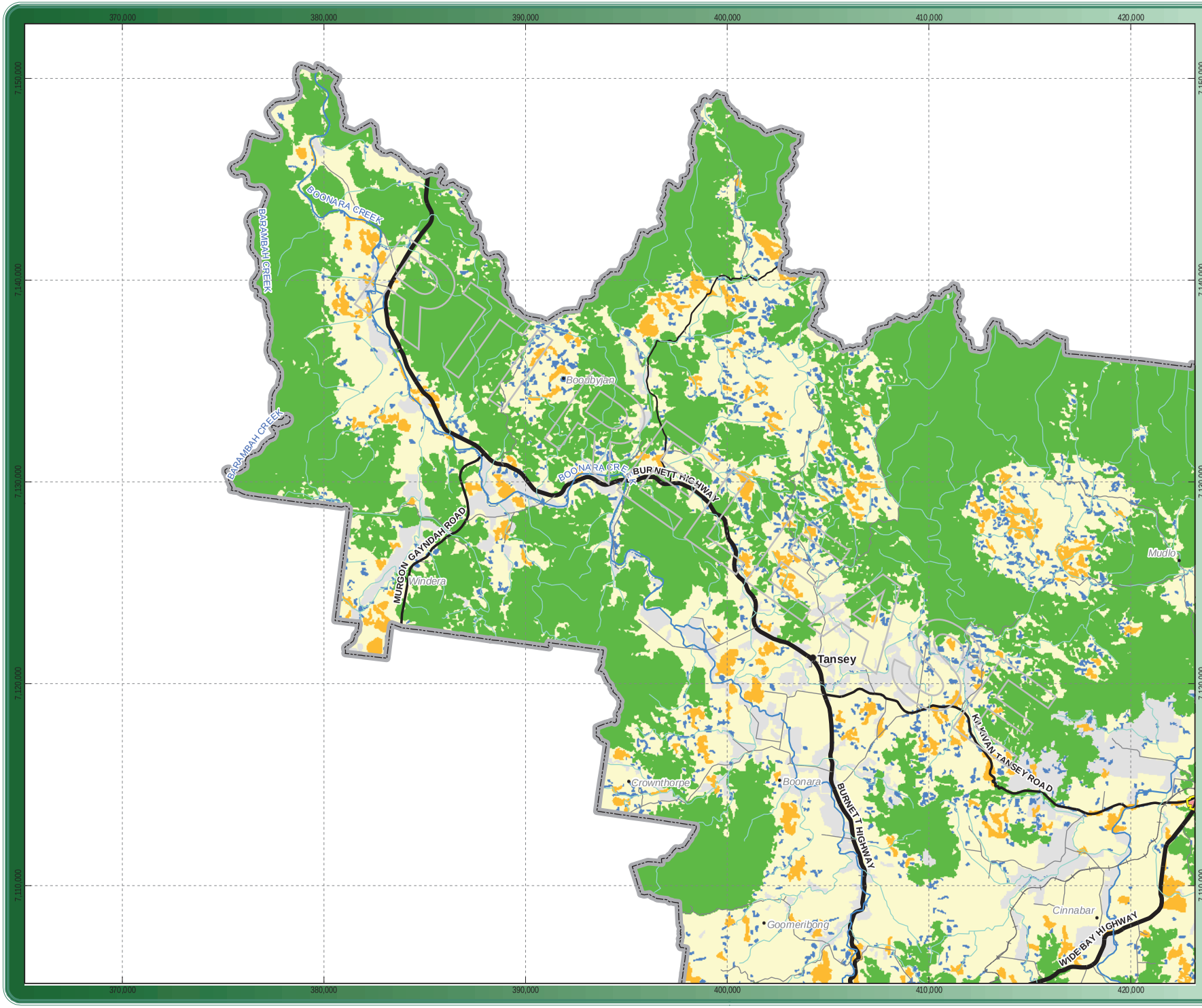

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Legend

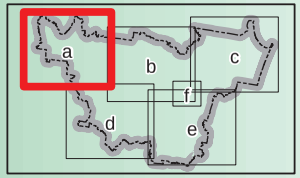
- **Locality**
- **Town**
- Major Watercourse
- Minor Watercourse
- **Rail**

Road Network

- Highways
- Secondary Roads
- Local Connector Road
- Street/ Local
- **Urban Footprint**
- **Gympie LGA Boundary**

Land cover

- Open Space (Rehab - 0)
- Water (100)
- Urban (200)
- Rural (300)
- Remnant Bushland (400)
- Bushland (500)
- Generally Unsuitable (plantation, crop etc)



Gympie Koala
Habitat Mapping
Gympie Regional Council

Land Cover

Figure 2 a

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Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) DILGP: Widebay Regional Plan (Sep 2011) DSITI: Biodiversity Status of pre-clearing and remnant regional ecosystems, Landuse Mapping Qld Current (May 2015) DEHP: EPA 1994 - Mature Regrowth

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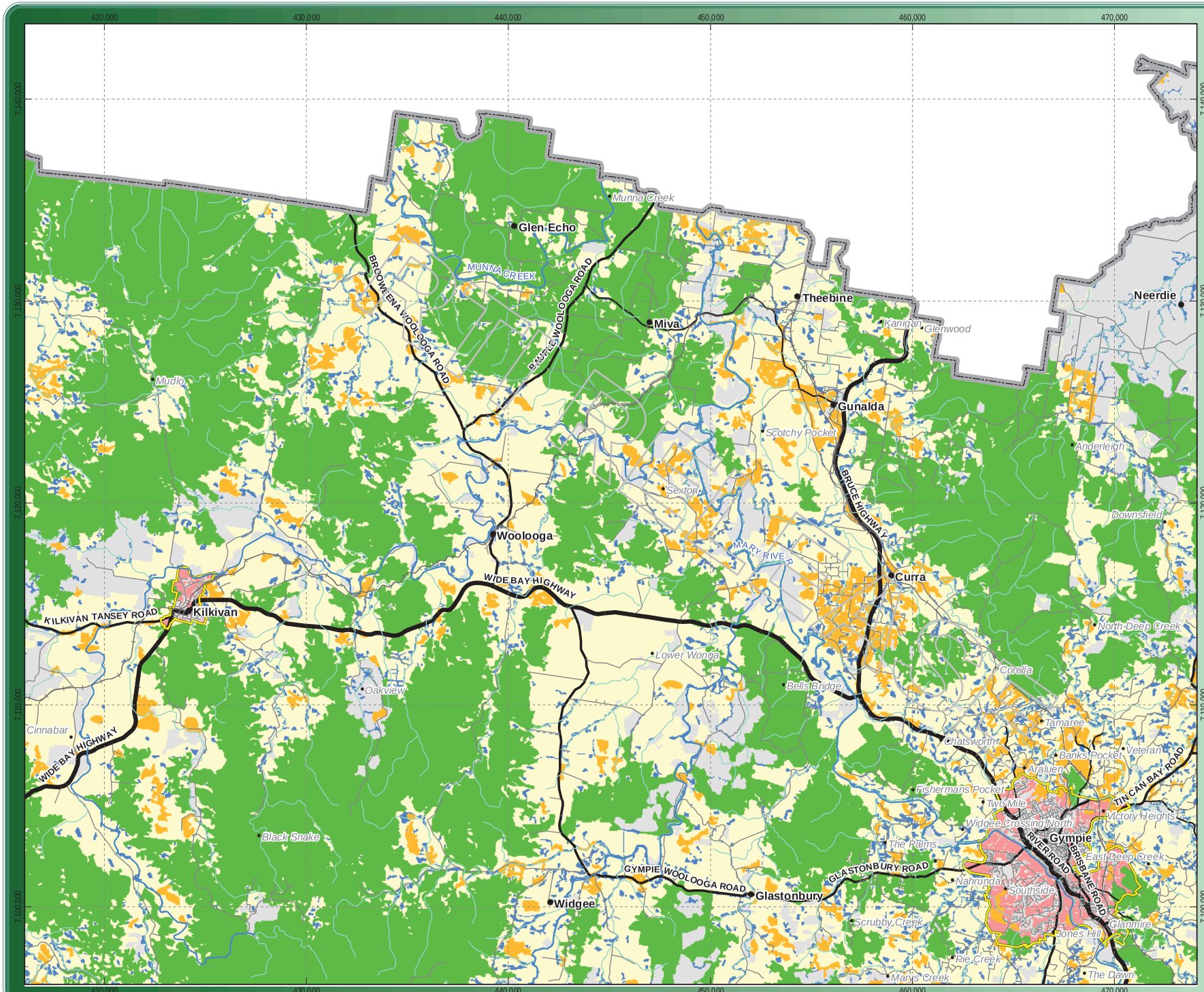

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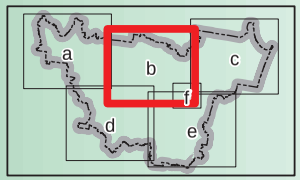


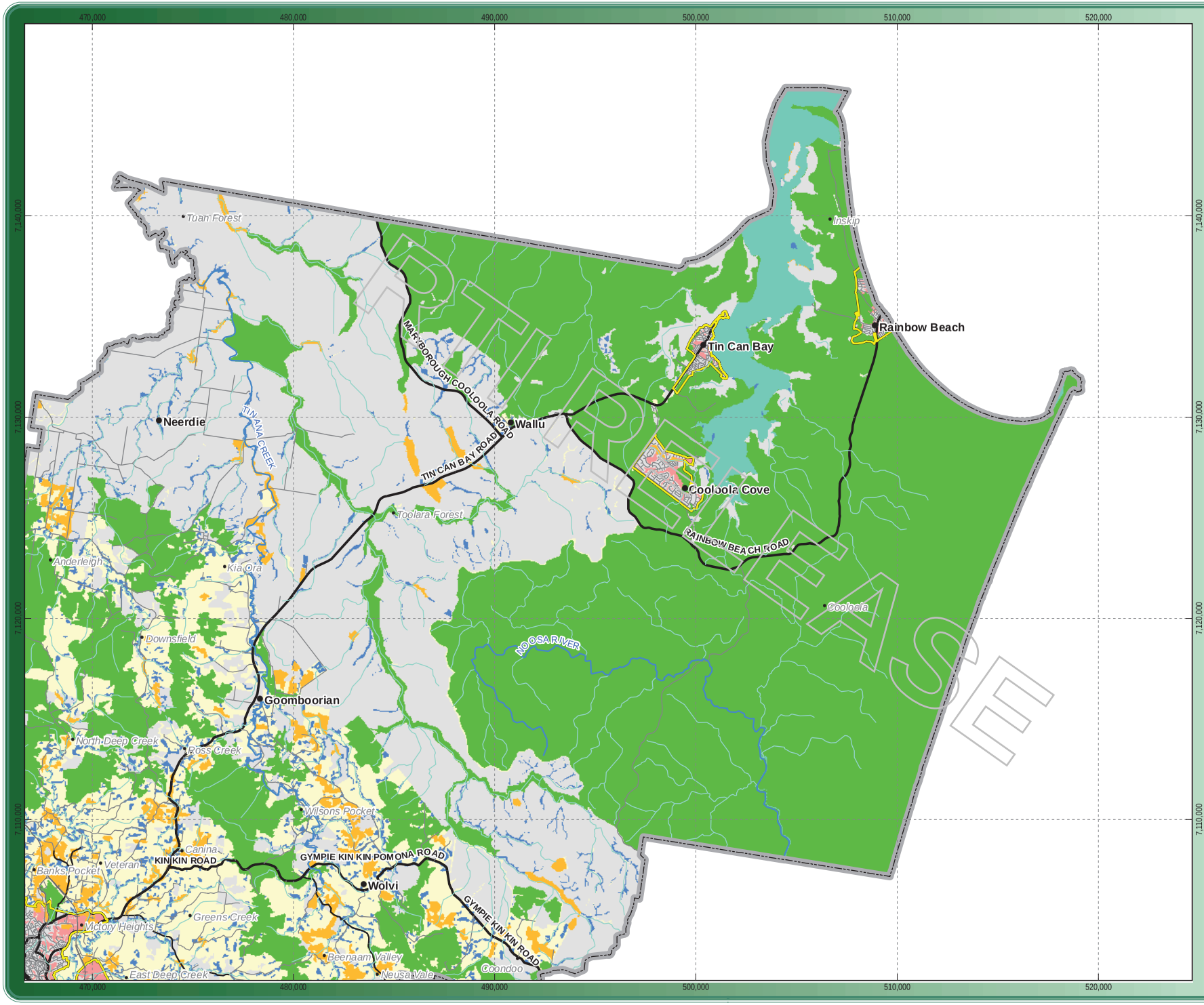
Gympie Koala
Habitat Mapping
Gympie Regional Council

Land Cover

Figure 2 b

03 May 2016 Z:\GIS\ECO15_0024\GIS\Final\maps\v6\ECO15_0024_02_landcover_v6.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) DILGP: Widebay Regional Plan (Sep 2011) DSITI: Biodiversity Status of pre-clearing and remnant regional ecosystems, Landuse Mapping Qld Current (May 2015) DEHP: EPA 1994 - Mature Regrowth
© State of Queensland (DNRM, DEHP, DSITI, DILGP)



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N W E S

0 1 2 3 4 5
Kilometers

1:180,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Legend

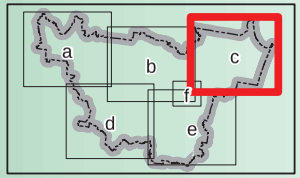
- Locality
- Town
- Major Watercourse
- Minor Watercourse
- Rail

Road Network

- Highways
- Secondary Roads
- Local Connector Road
- Street/ Local
- Urban Footprint
- Gympie LGA Boundary

Land cover

- Open Space (Rehab - 0)
- Water (100)
- Urban (200)
- Rural (300)
- Remnant Bushland (400)
- Bushland (500)
- Generally Unsuitable (plantation, crop etc)



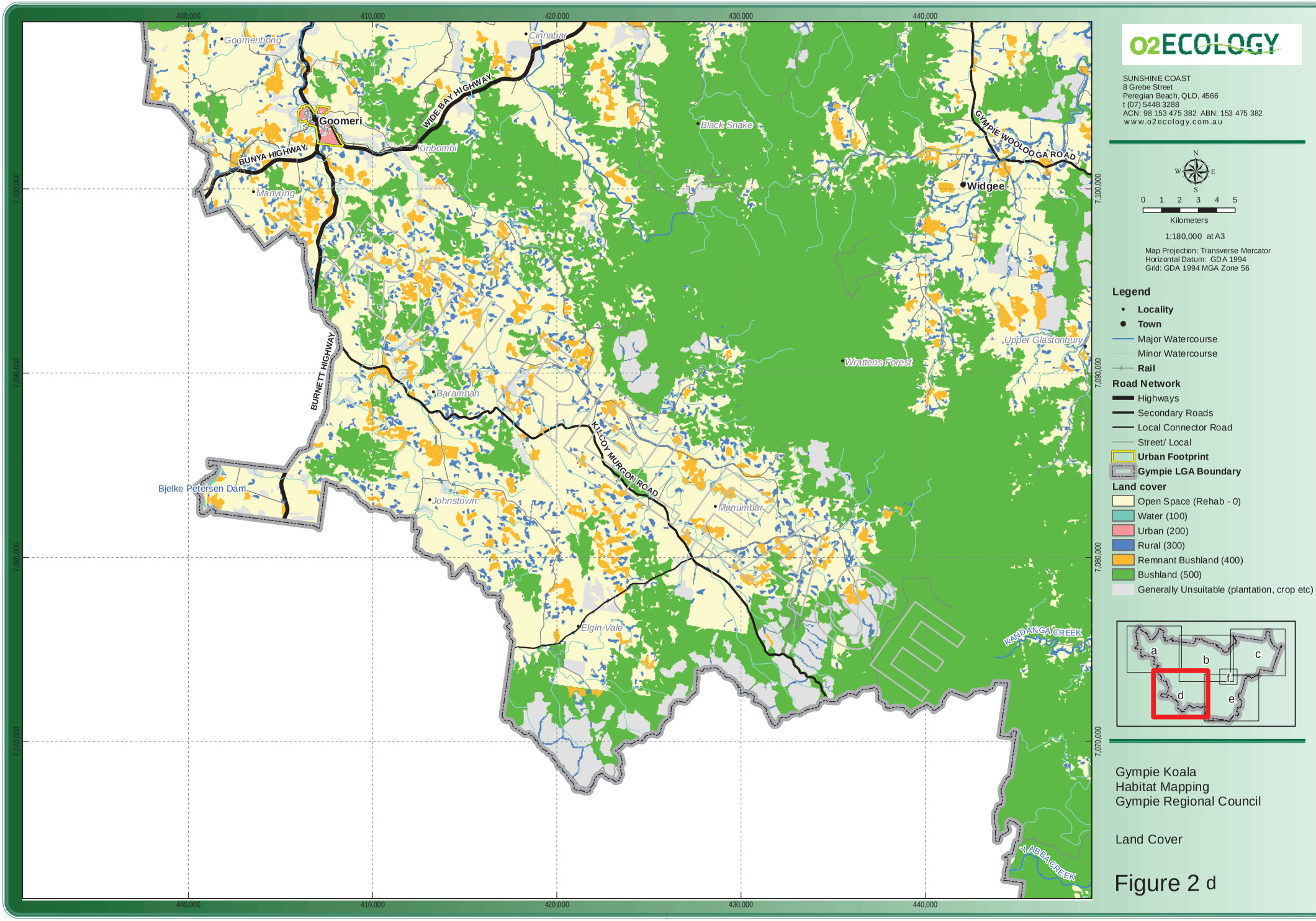
Gympie Koala
Habitat Mapping
Gympie Regional Council

Land Cover

Figure 2 c

03 May 2016 Z:\GIS\ECO15_0024\GIS\Final\maps\v6\ECO15_0024_02_landcover_v6.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) DILGP: Widebay Regional Plan (Sep 2011) DSITI: Biodiversity Status of pre-clearing and remnant regional ecosystems, Landuse Mapping Qld Current (May 2015) DEHP: EPA 1994 - Mature Regrowth
© State of Queensland (DNRM, DEHP, DSITI, DILGP)



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N W E S

0 1 2 3 4 5
Kilometers

1:180,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Legend

- Locality
- Town
- Major Watercourse
- Minor Watercourse
- Rail

Road Network

- Highways
- Secondary Roads
- Local Connector Road
- Street/ Local
- Urban Footprint
- Gympie LGA Boundary

Land cover

- Open Space (Rehab - 0)
- Water (100)
- Urban (200)
- Rural (300)
- Remnant Bushland (400)
- Bushland (500)
- Generally Unsuitable (plantation, crop etc)

Gympie Koala
Habitat Mapping
Gympie Regional Council

Land Cover

Figure 2 d

03 May 2016 Z:\GIS\ECO15_0024\GIS\Final\maps\v6\ECO15_0024_02_landcover_v6.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) DILGP: Widebay Regional Plan (Sep 2011) DSITI: Biodiversity Status of pre-clearing and remnant regional ecosystems, Landuse Mapping Qld Current (May 2015) DEHP: EPA 1994 - Mature Regrowth
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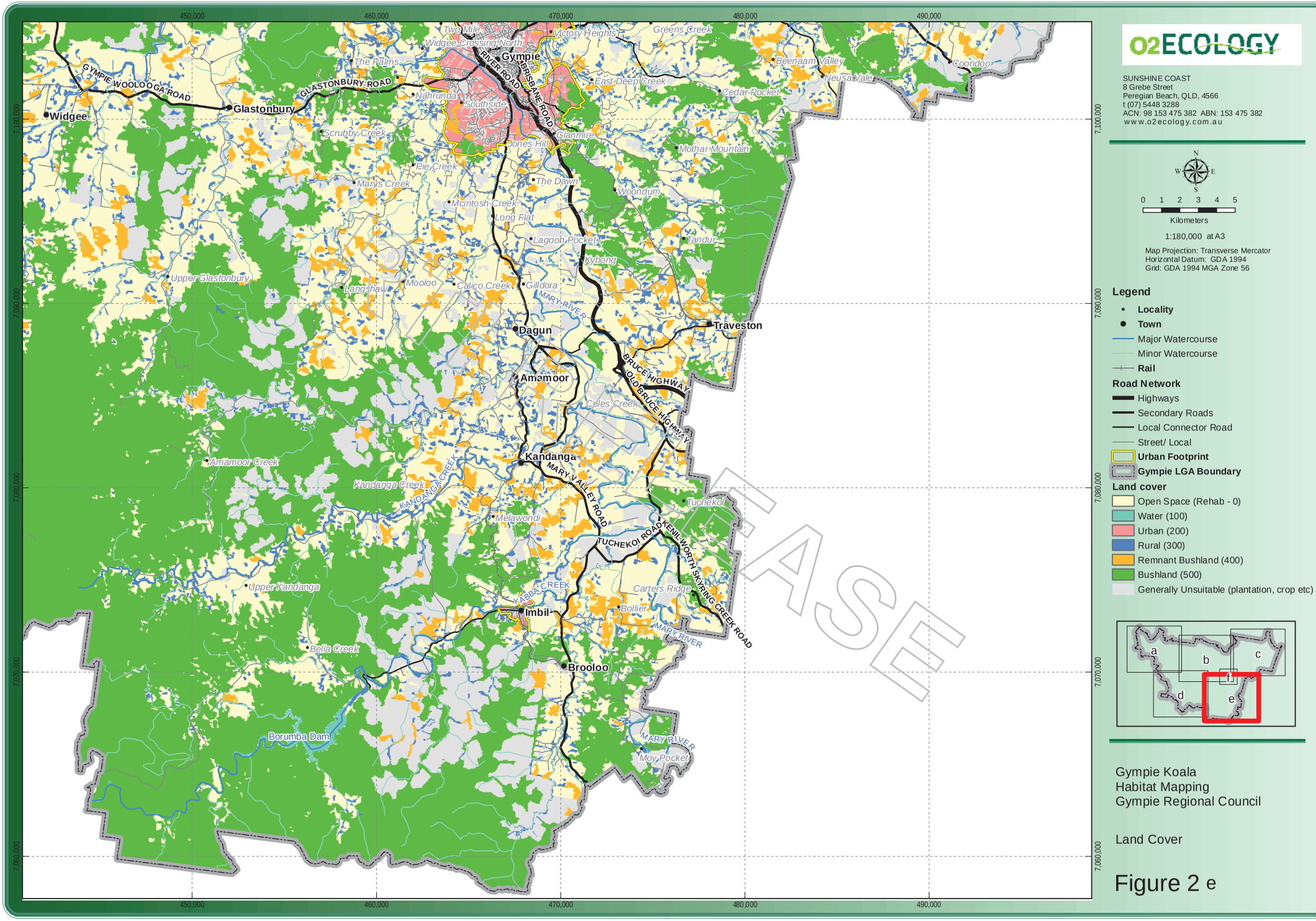

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0 1 2 3 4 5
Kilometers

1:180,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Legend

- Locality
- Town
- Major Watercourse
- Minor Watercourse
- Rail

Road Network

- Highways
- Secondary Roads
- Local Connector Road
- Street/ Local
- Urban Footprint
- Gympie LGA Boundary

Land cover

- Open Space (Rehab - 0)
- Water (100)
- Urban (200)
- Rural (300)
- Remnant Bushland (400)
- Bushland (500)
- Generally Unsuitable (plantation, crop etc)

Gympie Koala
Habitat Mapping
Gympie Regional Council

Land Cover

Figure 2 e

03 May 2016 Z:\GIS\ECO15_0024\GIS\Final\maps\v6\ECO15_0024_02_landcover_v6.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) DILGP: Widebay Regional Plan (Sep 2011) DSITI: Biodiversity Status of pre-clearing and remnant regional ecosystems, Landuse Mapping Qld Current (May 2015) DEHP: EPA 1994 - Mature Regrowth
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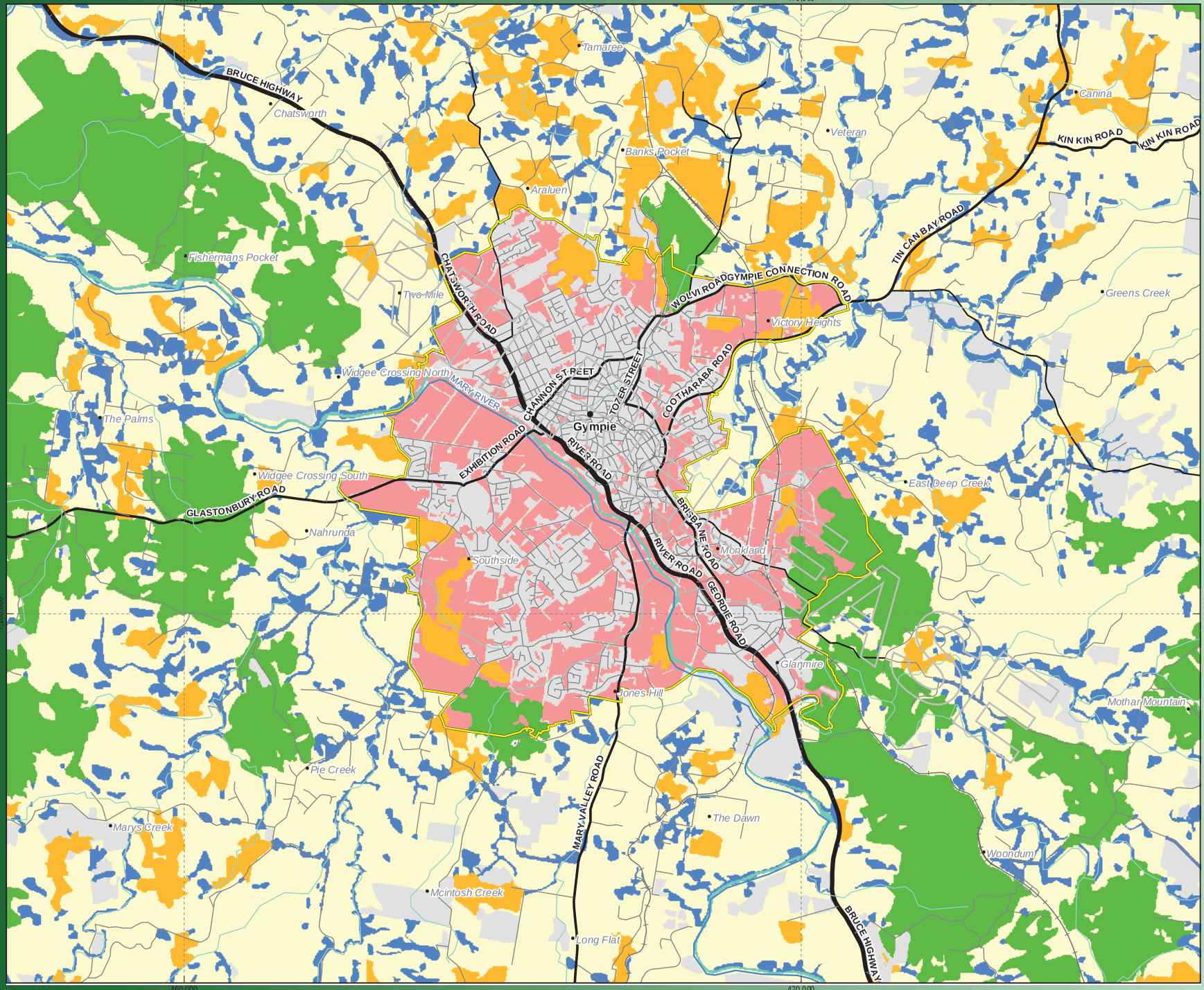

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N W E S

0 0.4 0.8 1.2 1.6 2

Kilometers

1:60,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Legend

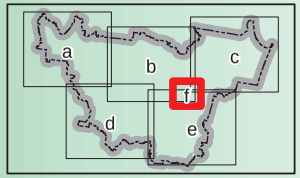
- Locality
- Town
- Major Watercourse
- Minor Watercourse
- Rail

Road Network

- Highways
- Secondary Roads
- Local Connector Road
- Street/ Local
- Urban Footprint
- Gympie LGA Boundary

Land cover

- Open Space (Rehab - 0)
- Water (100)
- Urban (200)
- Rural (300)
- Remnant Bushland (400)
- Bushland (500)
- Generally Unsuitable (plantation, crop etc)



Gympie Koala
Habitat Mapping
Gympie Regional Council

Land Cover

Figure 2 f

03 May 2016 Z:\GIS\ECO15_0024\GIS\Final\maps\v6\ECO15_0024_02_landcover_v6.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) DILGP: Widebay Regional Plan (Sep 2011) DSITI: Biodiversity Status of pre-clearing and remnant regional ecosystems, Landuse Mapping Qld Current (May 2015) DEHP: EPA 1994 - Mature Regrowth
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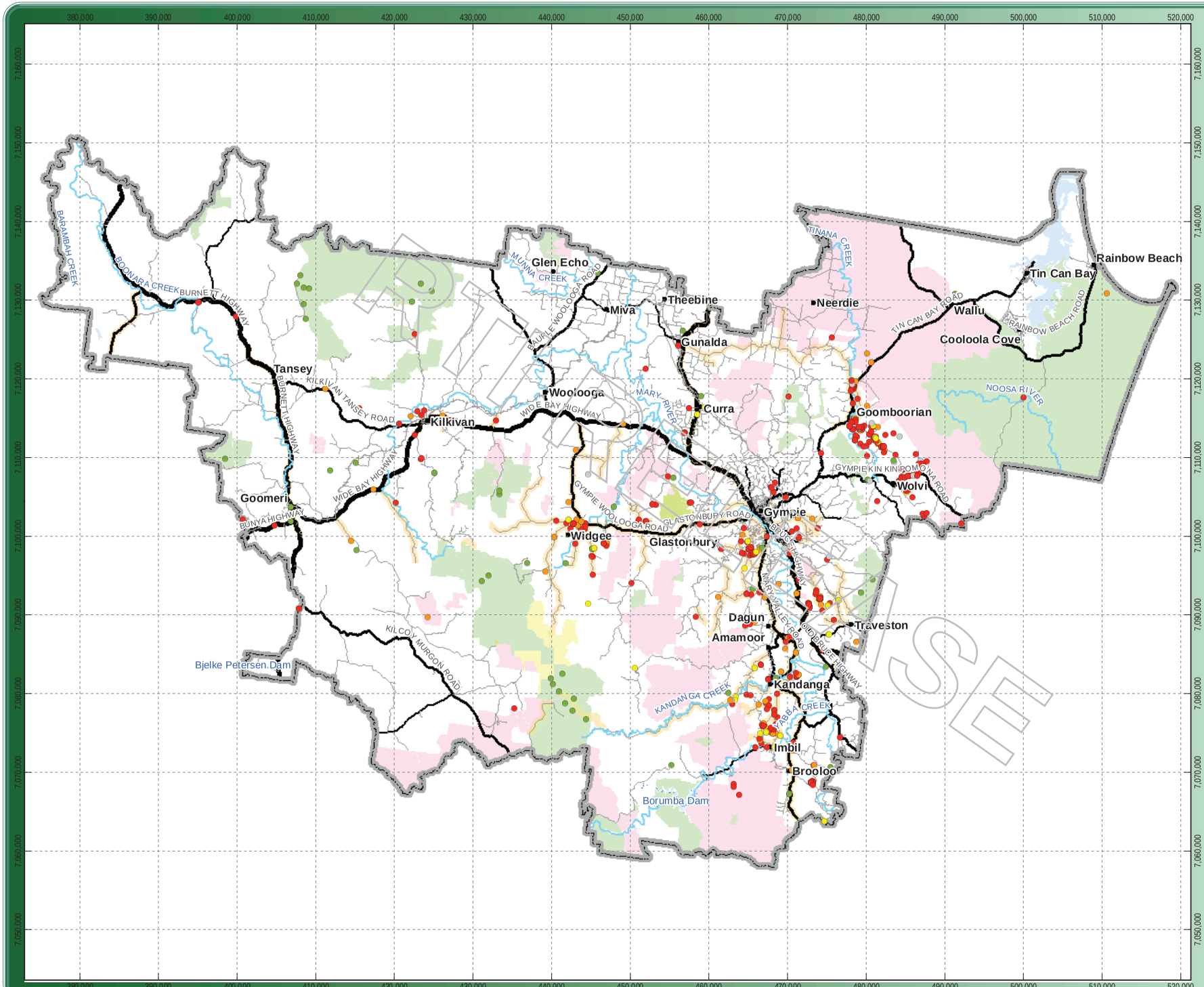

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N W E S

0 4 8 12 16
Kilometers

1:460,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Legend

- Town

Records of Koala Evidence (Current to March 2016)

- 0-3 years
- 3-6 years
- 6-9 years
- >9 years ago
- unknown
- Major Watercourse
- Rail

Road Network

- Highways
- Secondary Roads
- Local Connector Road
- Street/Local
- DEHP Hospital Records
- **Gympie LGA Boundary**

Protected Area Estates

- National Park
- National Park (recovery)
- Conservation Park
- Resources Reserve
- Forest Reserve
- State Forest

Note: DEHP hospital records are only accurate to road precision only

Gympie Koala Habitat Mapping Gympie Regional Council

Records of Koala Evidence by Date

Figure 3

03 May 2016 Z:\GIS\ECO15_0024\GIS\Final\maps\v6\ECO15_0024_03_sightings_dateoverall_v6.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) DNPSR: Protected Areas of Qld (Mar 2015) Sightings: Koala Tracker, O2 Ecology, MRCCC, Community Surveys, DEHP Hospital, AKF, Wildnet, ALA, Ecosure Bruce Hwy Upgrade Survey Studies (current to March 2016)
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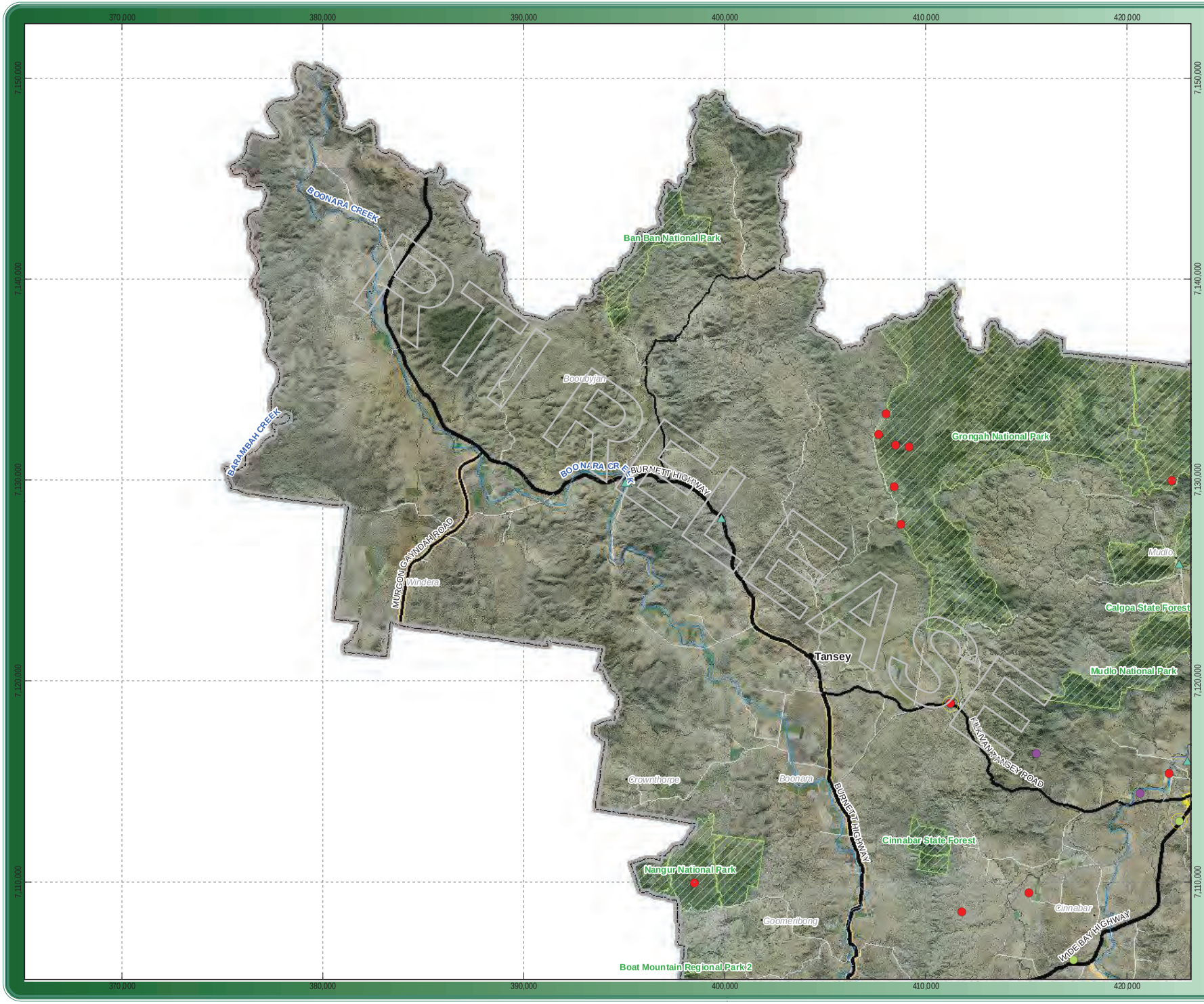

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N W E S

0 1 2 3 4 5
Kilometers

1:180,000 at A3
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Legend

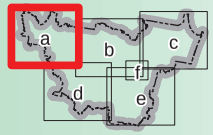
- Locality
- Town

Records of Koala Evidence (Current to March 2016)

- AKF
- ALA Sightings
- CCA Surveys
- Community Consultation
- Jones Hill Community
- Koala Action Group
- Koala Tracker
- MRCCC
- O2
- O2 Ecology Field Surveys, Sep
- SMEC report Bruce Hwy Sec
- Wildnet
- Major Watercourse
- Rail

Road Network

- Highways
- Secondary Roads
- Local Connector Road
- Street/ Local
- Proposed Hway Upgrade
- DEHP Hospital Records
- Protected Area
- Urban Expansion
- Urban Footprint



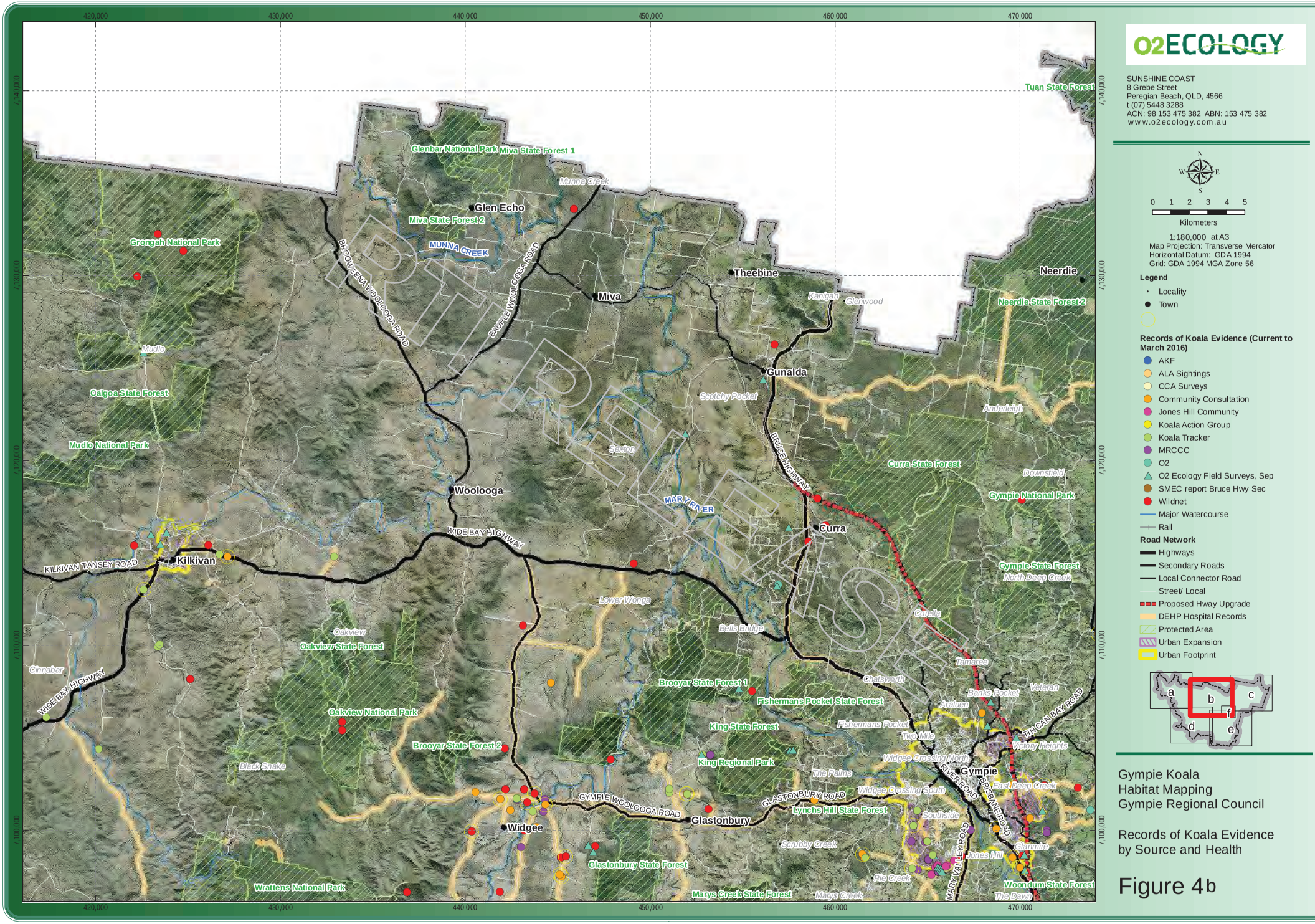
Gympie Koala
Habitat Mapping
Gympie Regional Council

Records of Koala Evidence
by Source and Health

Figure 4a

03 May 2016 Z:\GIS\ECO15_0024\GIS\Final\maps\v6\ECO15_0024_04_sightings_v6.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) DILGP: Widebay Regional Plan (Sep 2011), DNPSR: Protected Areas of Qld (Mar 2015) Sightings: Koala Tracker, O2 Ecology, MRCCC, Community Surveys, DEHP Hospital, AKF, Wildnet, ALA, Ecosure Bruce Hwy Upgrade Survey Studies (current to March 2016)
AAM: 2014 Orthophotos © State of Queensland (DNRM, DNPSR, DEHP, DILGP)



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0 1 2 3 4 5
Kilometers

1:180,000 at A3
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Legend

- Locality
- Town

Records of Koala Evidence (Current to March 2016)

- AKF
- ALA Sightings
- CCA Surveys
- Community Consultation
- Jones Hill Community
- Koala Action Group
- Koala Tracker
- MRCCC
- O2
- O2 Ecology Field Surveys, Sep
- SMEC report Bruce Hwy Sec
- Wildnet
- Major Watercourse
- Rail

Road Network

- Highways
- Secondary Roads
- Local Connector Road
- Street/ Local
- Proposed Hway Upgrade
- DEHP Hospital Records
- Protected Area
- Urban Expansion
- Urban Footprint

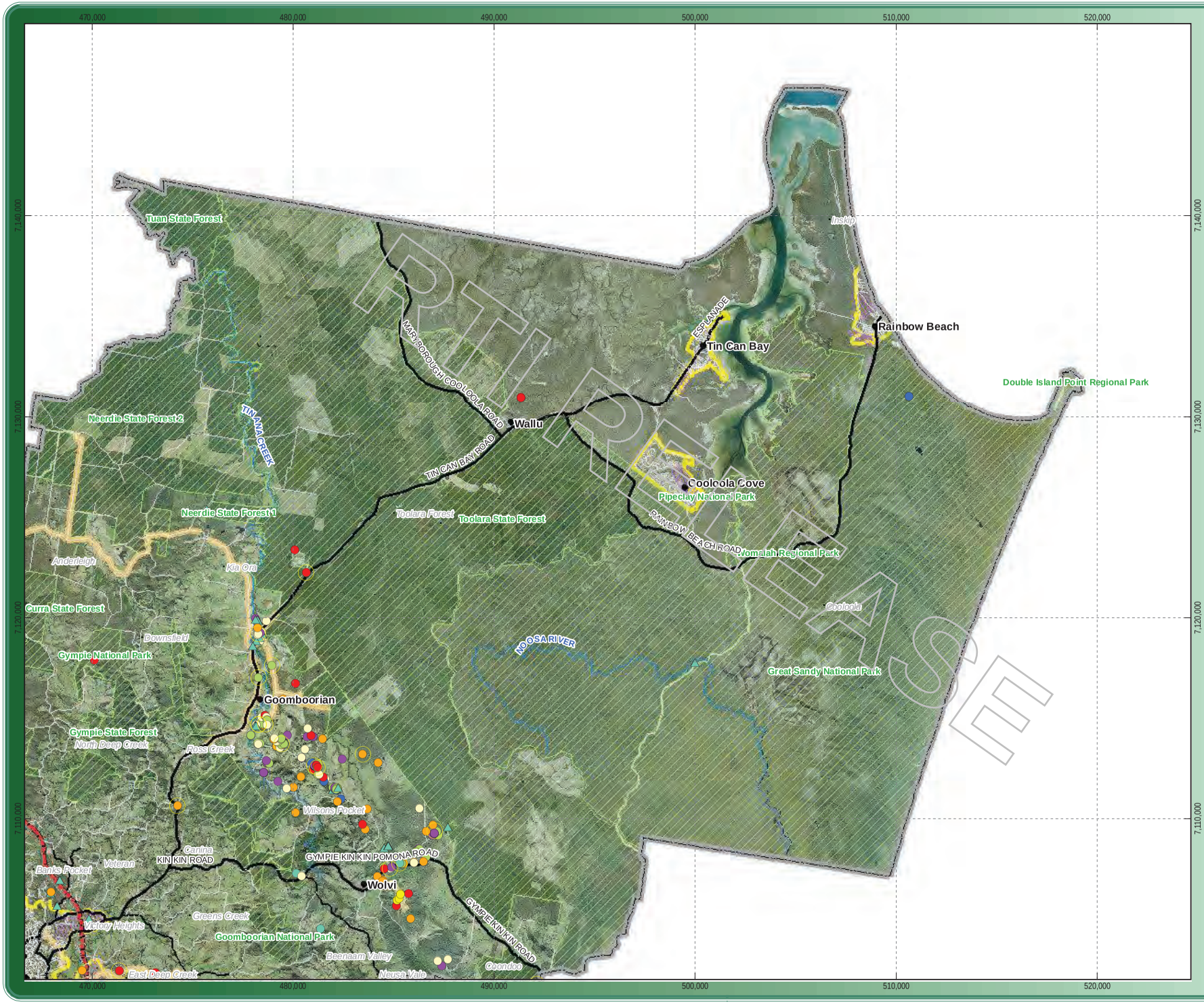
Gympie Koala
Habitat Mapping
Gympie Regional Council

Records of Koala Evidence
by Source and Health

Figure 4b

03 May 2016 Z:\GIS\ECO15_0024\GIS\Final\maps\v6\ECO15_0024_04_sightings_v6.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) DILGP: Widebay Regional Plan (Sep 2011), DNPSR: Protected Areas of Qld (Mar 2015) Sightings: Koala Tracker, O2 Ecology, MRCCC, Community Surveys, DEHP Hospital, AKF, Wildnet, ALA, Ecosure Bruce Hwy Upgrade Survey Studies (current to March 2016)
AAM: 2014 Orthophotos © State of Queensland (DNRM, DNPSR, DEHP, DILGP)



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N W E S

0 1 2 3 4 5
Kilometers

1:180,000 at A3
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Legend

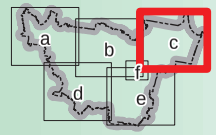
- Locality
- Town

Records of Koala Evidence (Current to March 2016)

- AKF
- ALA Sightings
- CCA Surveys
- Community Consultation
- Jones Hill Community
- Koala Action Group
- Koala Tracker
- MRCCC
- O2
- O2 Ecology Field Surveys, Sep
- SMEC report Bruce Hwy Sec
- Wildnet
- Major Watercourse
- Rail

Road Network

- Highways
- Secondary Roads
- Local Connector Road
- Street/ Local
- Proposed Hway Upgrade
- DEHP Hospital Records
- Protected Area
- Urban Expansion
- Urban Footprint



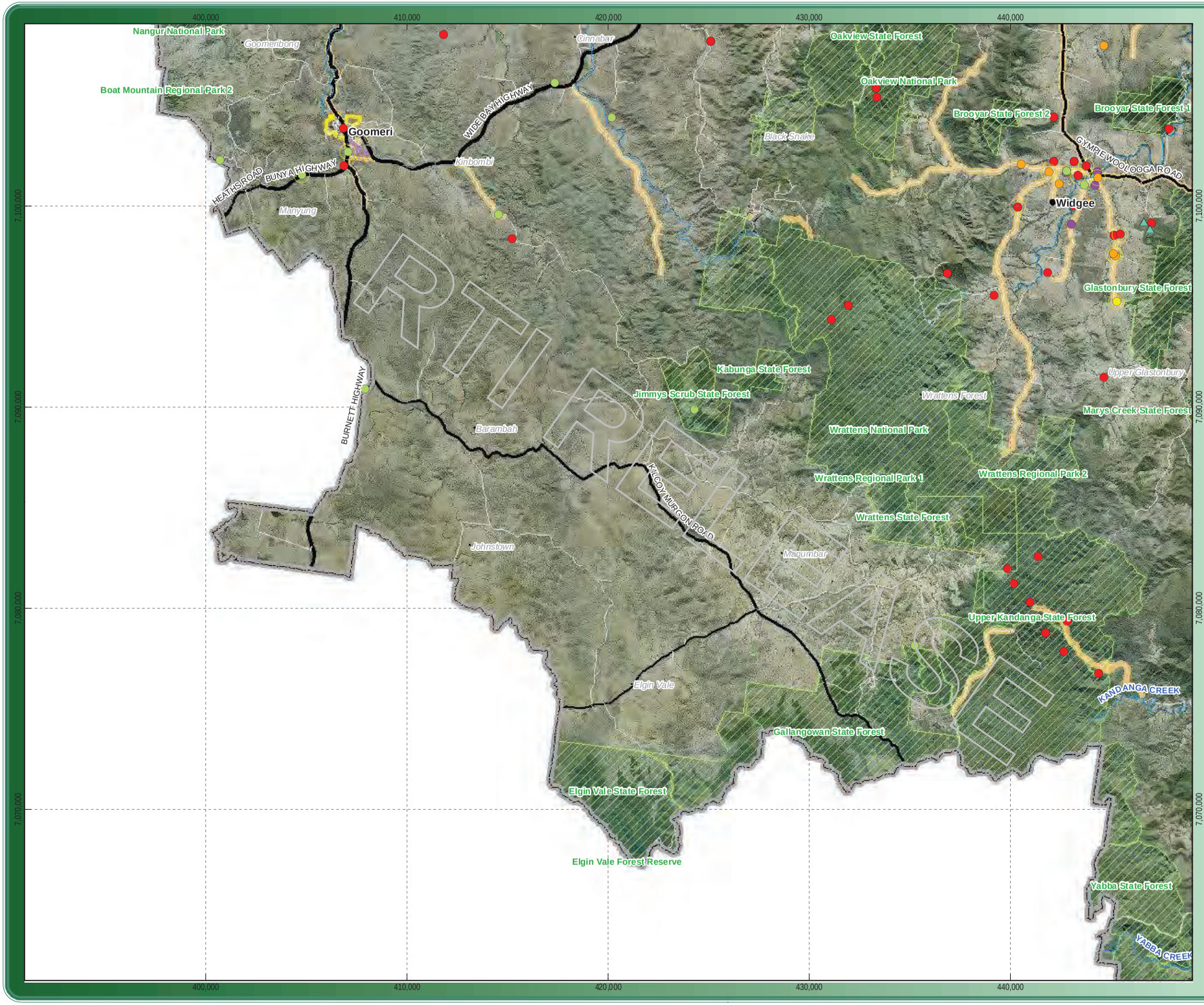
Gympie Koala
Habitat Mapping
Gympie Regional Council

Records of Koala Evidence
by Source and Health

Figure 4c

03 May 2016 Z:\GIS\ECO15_0024\GIS\Final\maps\v6\ECO15_0024_04_sightings_v6.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) DILGP: Widebay Regional Plan (Sep 2011), DNPSR: Protected Areas of Qld (Mar 2015) Sightings: Koala Tracker, O2 Ecology, MRCCC, Community Surveys, DEHP Hospital, AKF, Wildnet, ALA, Ecosure Bruce Hwy Upgrade Survey Studies (current to March 2016)
AAM: 2014 Orthophotos © State of Queensland (DNRM, DNPSR, DEHP, DILGP)



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0 1 2 3 4 5
Kilometers

1:180,000 at A3
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Legend

- Locality
- Town

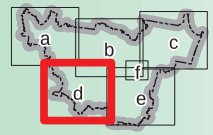
Records of Koala Evidence (Current to March 2016)

- AKF
- ALA Sightings
- CCA Surveys
- Community Consultation
- Jones Hill Community
- Koala Action Group
- Koala Tracker
- MRCCC
- O2
- O2 Ecology Field Surveys, Sep
- SMEC report Bruce Hwy Sec
- Wildnet

- Major Watercourse
- Rail

Road Network

- Highways
- Secondary Roads
- Local Connector Road
- Street/ Local
- Proposed Hway Upgrade
- DEHP Hospital Records
- Protected Area
- Urban Expansion
- Urban Footprint



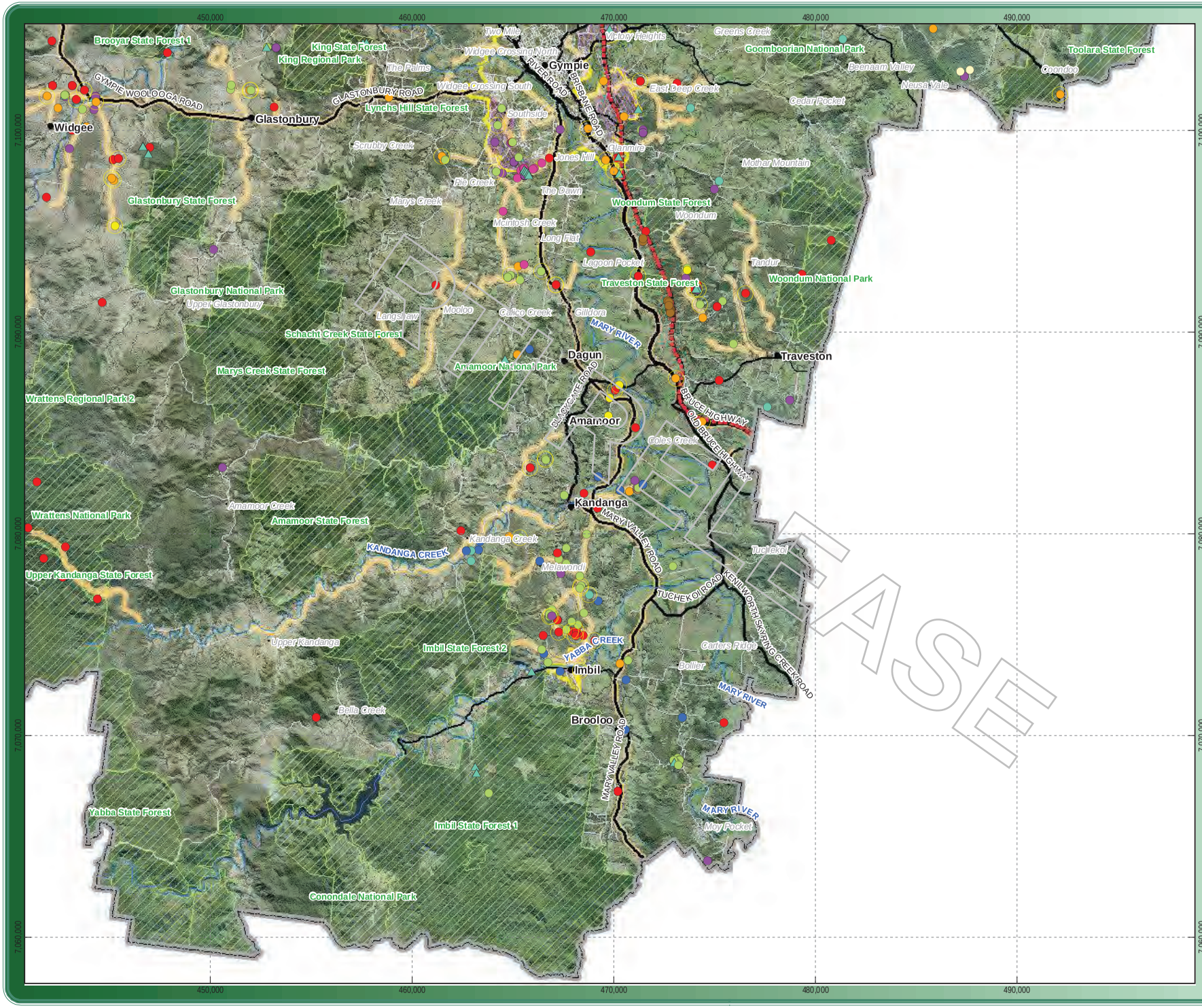
Gympie Koala
Habitat Mapping
Gympie Regional Council

Records of Koala Evidence
by Source and Health

Figure 4d

03 May 2016 Z:\GIS\ECO15_0024\GIS\Final\maps\v6\ECO15_0024_04_sightings_v6.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) DILGP: Widebay Regional Plan (Sep 2011), DNPSR: Protected Areas of Qld (Mar 2015) Sightings: Koala Tracker, O2 Ecology, MRCCC, Community Surveys, DEHP Hospital, AKF, Wildnet, ALA, Ecosure Bruce Hwy Upgrade Survey Studies (current to March 2016)
AAM: 2014 Orthophotos © State of Queensland (DNRM, DNPSR, DEHP, DILGP)



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Kilometers

1:180,000 at A3
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Legend

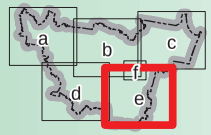
- Locality
- Town

Records of Koala Evidence (Current to March 2016)

- AKF
- ALA Sightings
- CCA Surveys
- Community Consultation
- Jones Hill Community
- Koala Action Group
- Koala Tracker
- MRCCC
- O2
- O2 Ecology Field Surveys, Sep
- SMEC report Bruce Hwy Sec
- Wildnet
- Major Watercourse
- Rail

Road Network

- Highways
- Secondary Roads
- Local Connector Road
- Street/ Local
- Proposed Hway Upgrade
- DEHP Hospital Records
- Protected Area
- Urban Expansion
- Urban Footprint



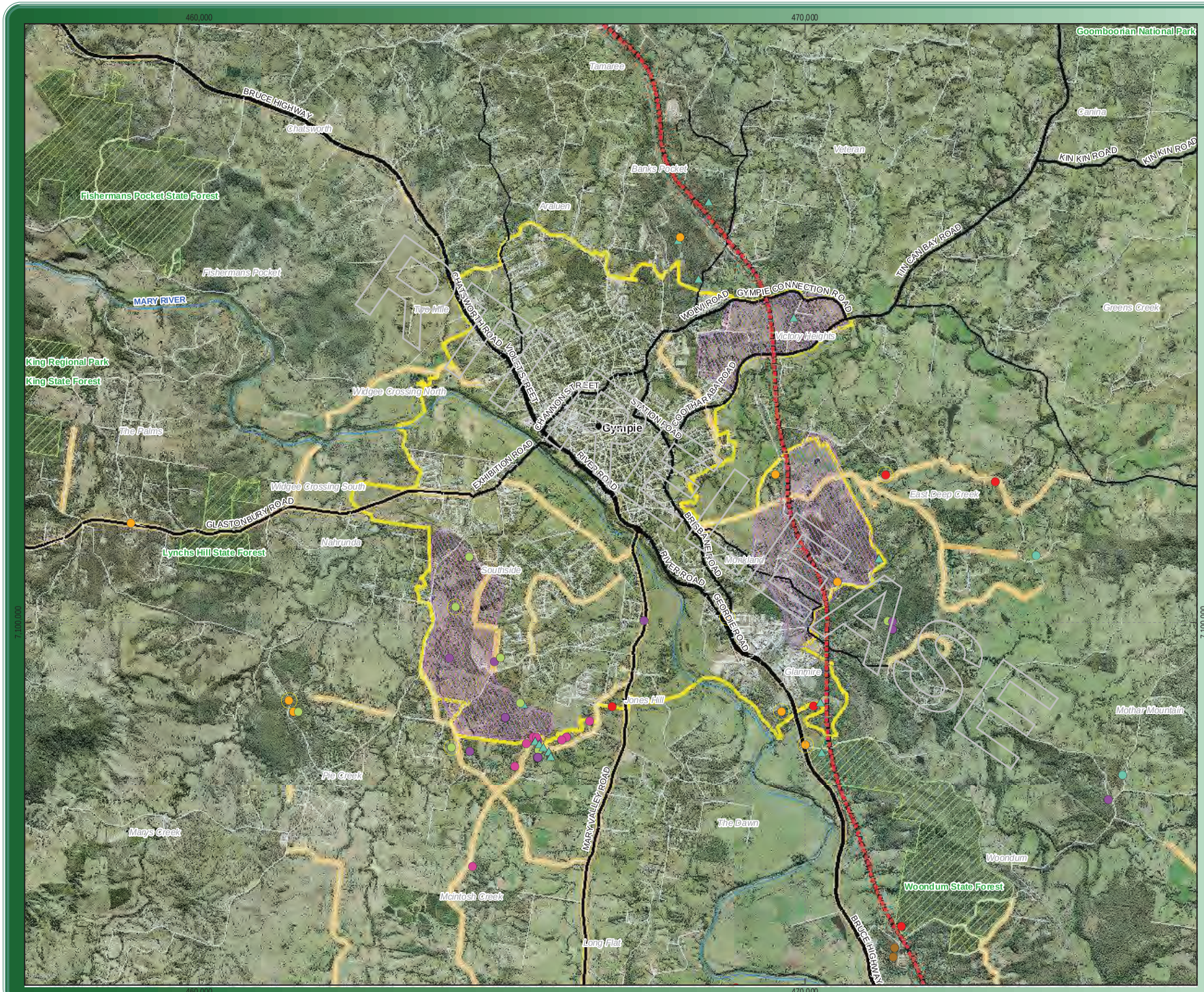
Gympie Koala
Habitat Mapping
Gympie Regional Council

Records of Koala Evidence
by Source and Health

Figure 4e

03 May 2016 Z:\GIS\ECO15_0024\GIS\Final\maps\v6\ECO15_0024_04_sightings_v6.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) DILGP: Widebay Regional Plan (Sep 2011), DNPSR: Protected Areas of Qld (Mar 2015) Sightings: Koala Tracker, O2 Ecology, MRCCC, Community Surveys, DEHP Hospital, AKF, Wildnet, ALA, Ecosure Bruce Hwy Upgrade Survey Studies (current to March 2016)
AAM: 2014 Orthophotos © State of Queensland (DNRM, DNPSR, DEHP, DILGP)



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N W E S

0 0.4 0.8 1.2 1.6 2
Kilometers

1:60,000 at A3
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Legend

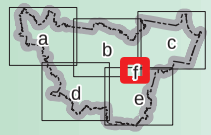
- Locality
- Town

Records of Koala Evidence (Current to March 2016)

- AKF
- ALA Sightings
- CCA Surveys
- Community Consultation
- Jones Hill Community
- Koala Action Group
- Koala Tracker
- MRCCC
- O2
- O2 Ecology Field Surveys, Sep
- SMEC report Bruce Hwy Sec
- Wildnet
- Major Watercourse
- Rail

Road Network

- Highways
- Secondary Roads
- Local Connector Road
- Street/ Local
- Proposed Hway Upgrade
- DEHP Hospital Records
- Protected Area
- Urban Expansion
- Urban Footprint



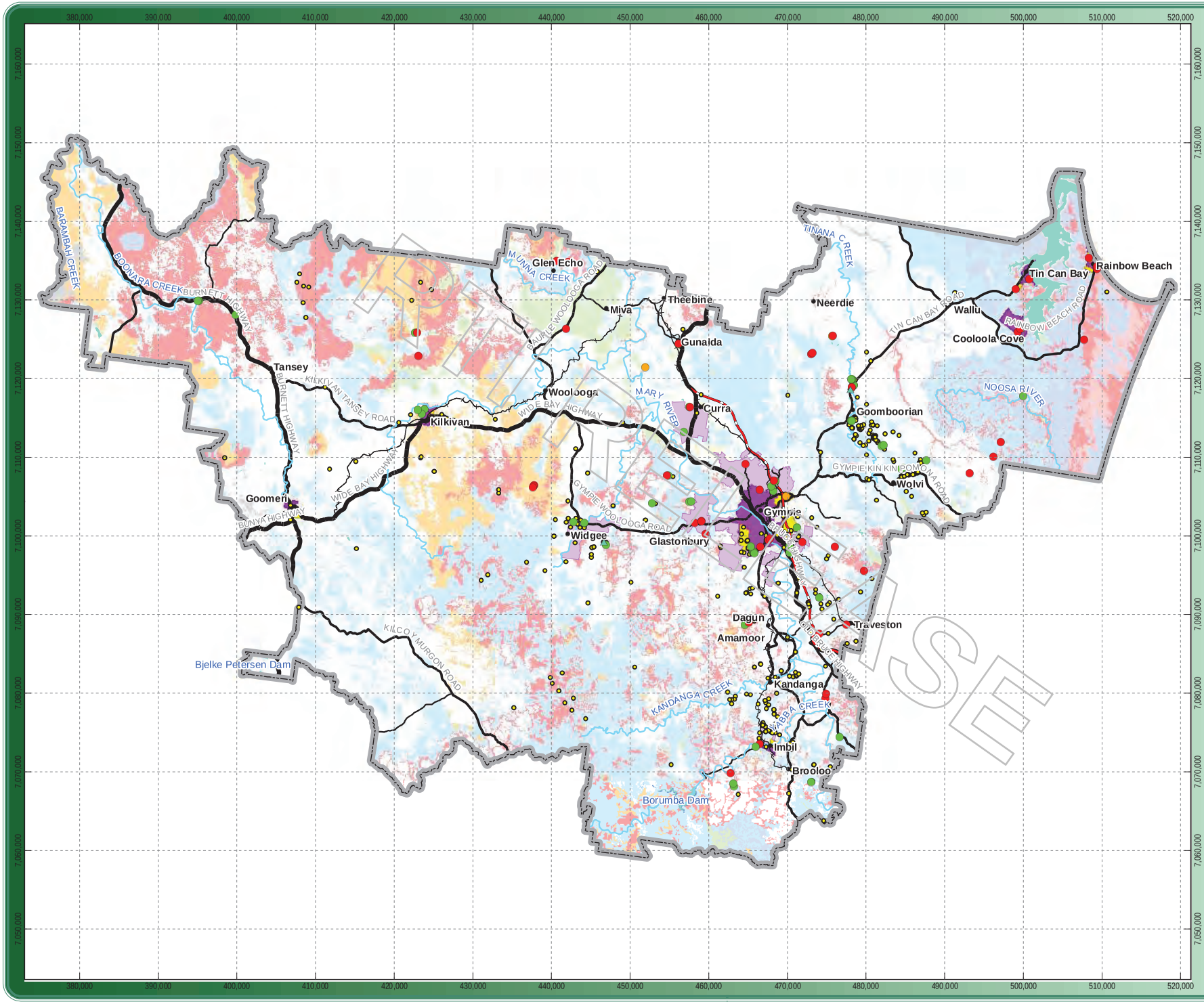
Gympie Koala
Habitat Mapping
Gympie Regional Council

Records of Koala Evidence
by Source and Health

Figure 4f

03 May 2016 Z:\GIS\ECO15_0024\GIS\Final\maps\v6\ECO15_0024_04_sightings_v6.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) DILGP: Widebay Regional Plan (Sep 2011), DNPSR: Protected Areas of Qld (Mar 2015) Sightings: Koala Tracker, O2 Ecology, MRCCC, Community Surveys, DEHP Hospital, AKF, Wildnet, ALA, Ecosure Bruce Hwy Upgrade Survey Studies (current to March 2016)
AAM: 2014 Orthophotos © State of Queensland (DNRM, DNPSR, DEHP, DILGP)



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ACN: 98 153 475 382 ABN: 153 475 382
www.o2ecology.com.au

N W E S

0 4.5 9 13.5 18
Kilometers

1:460,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Legend

- Town

Field Results - Scats

- Positive
- Negative
- Unsure/too old
- Sighting during field survey
- Recorded Sightings (Oct 2015)
- Major Watercourse
- Rail

Road Network

- Highways
- Secondary Roads
- Local Connector Road
- Proposed Hway Upgrade
- Gympie LGA Boundary
- Urban Expansion Area
- Estuary
- Rural Living Area
- Urban Footprint

Priority Survey RE Validation

- High Priority
- Medium-High Priority
- Medium Priority (Upgrade?)
- Medium Priority
- Low-Medium (Validate)
- Low
- Low (small area)
- Low (already validated)
- Not Practicable

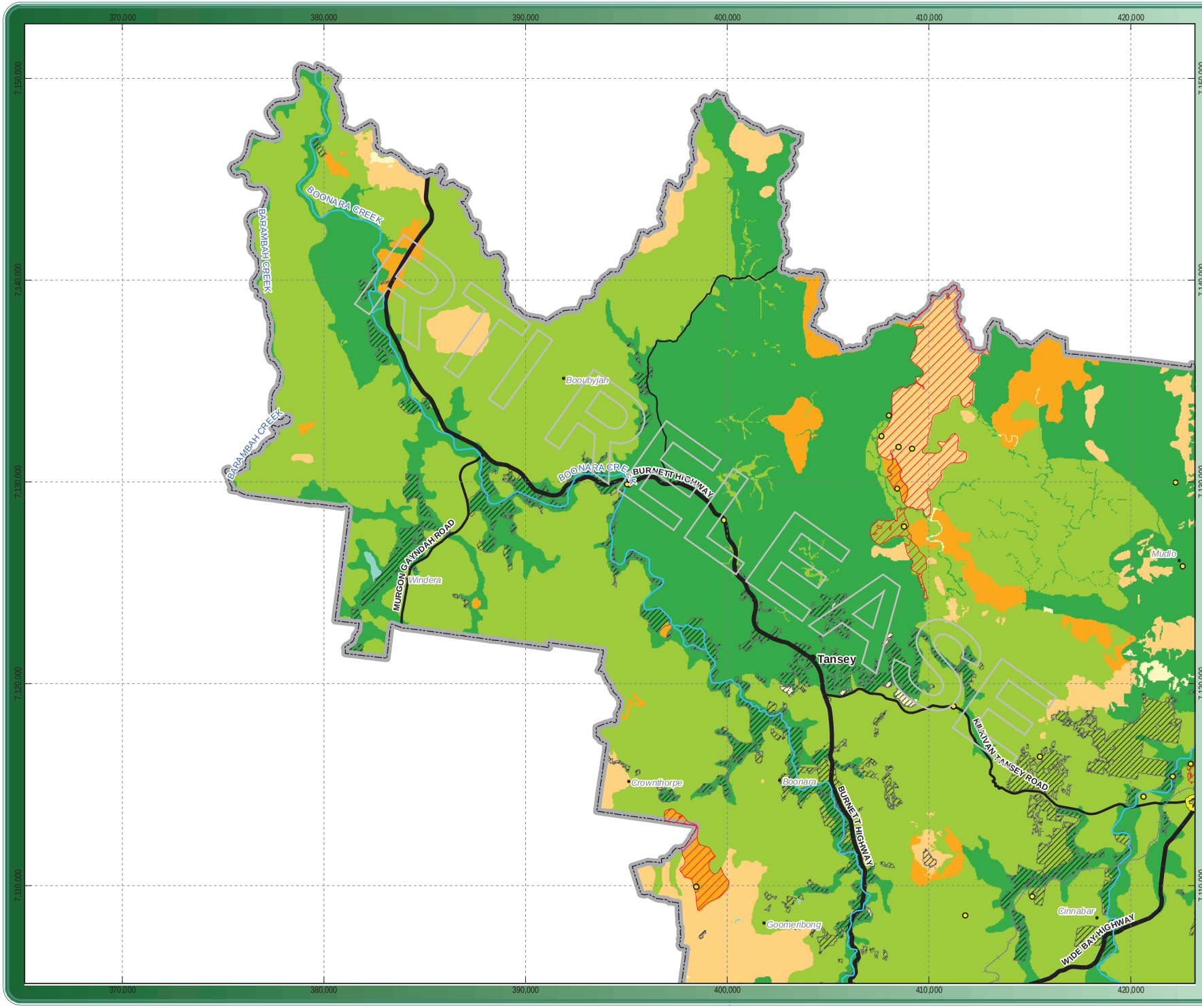
Gympie Koala
Habitat Mapping
Gympie Regional Council

Targeted Field Surveys
and Results

Figure 5

03 May 2016 Z:\GIS\ECO15_0024\GIS\Final\maps\v6\ECO15_0024_05_target_sites_fieldresults_v6.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) DILGP: Widebay Regional Plan (Sep 2011), Field Survey: O2 Ecology (Sep 2015) © State of Queensland (DNRM, DNPSR, DEHP, DILGP)



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N W E S

0 1 2 3 4 5
Kilometers

1:180,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Legend

- Records of Koala Evidence (Oct 2015)
- **Locality**
- **Town**
- Major Watercourse
- **Rail**

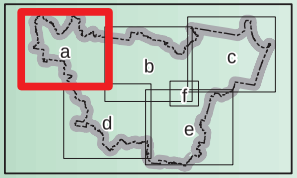
Road Network

- Highways
- Secondary Roads
- Local Connector Road
- **Urban Footprint**
- **Gympie LGA Boundary**
- Estuary
- Dam, Lake
- Generally Unsuitable (plantation, crop etc)
- Vegetation Patch Upgrade

Pre-clear (RE Ranking)

- High (5)
- Medium-High (4)
- Low-Medium (3)
- Low (2)
- None (1)

Note: 'vegetation patch upgrades' are RE patches that have been upgraded by one level in the model based on previous koala sightings regardless of vegetation type"



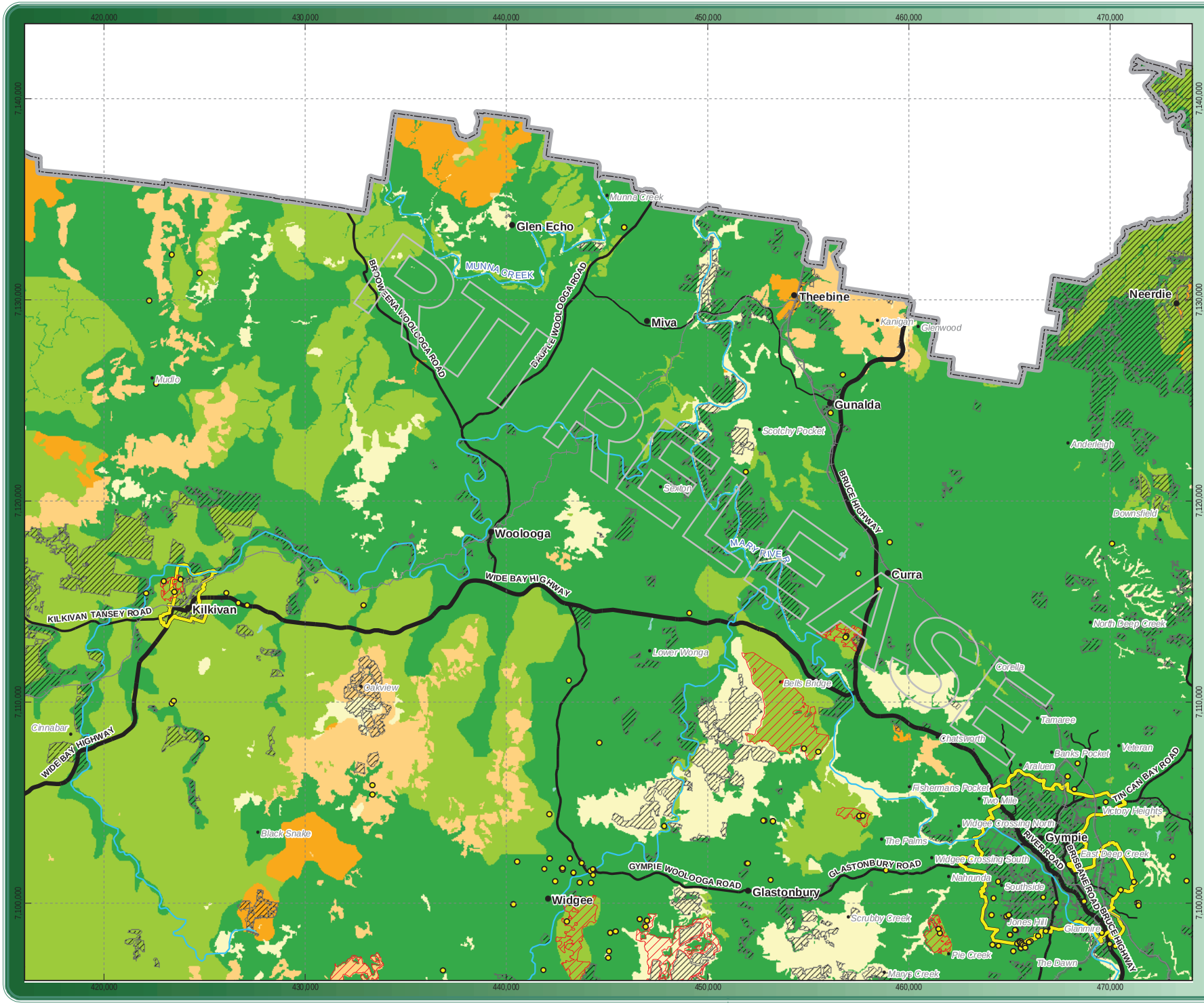
Gympie Koala
Habitat Mapping
Gympie Regional Council

Pre-clear RE Ranking
and Local Patch Upgrades

Figure 6 a

03 May 2016 Z:\GIS\ECO15_0024\GIS\Final\maps\v6\ECO15_0024_06_preclear_reranking_v6.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) DILGP: Widebay Regional Plan (Sep 2011), DSITI: Biodiversity Status of pre-clearing and remnant regional ecosystems, Landuse Mapping Qld Current (May 2015) DEHP: EPA 1994 - Mature Regrowth.
© State of Queensland (DNRM, DEHP, DSITI, DLIGP)



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N W E S

0 1 2 3 4 5
Kilometers

1:180,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Legend

- Records of Koala Evidence (Oct 2015)
- **Locality**
- **Town**
- Major Watercourse
- **Rail**

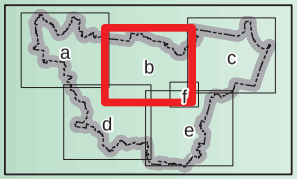
Road Network

- Highways
- Secondary Roads
- Local Connector Road
- **Urban Footprint**
- **Gympie LGA Boundary**
- Estuary
- Dam, Lake
- Generally Unsuitable (plantation, crop etc)
- Vegetation Patch Upgrade

Pre-clear (RE Ranking)

- High (5)
- Medium-High (4)
- Low-Medium (3)
- Low (2)
- None (1)

Note: 'vegetation patch upgrades' are RE patches that have been upgraded by one level in the model based on previous koala sightings regardless of vegetation type"



Gympie Koala
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Gympie Regional Council

Pre-clear RE Ranking
and Local Patch Upgrades

Figure 6 b

03 May 2016 Z:\GIS\ECO15_0024\GIS\Final\maps\v6\ECO15_0024_06_preclear_reranking_v6.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) DILGP: Widebay Regional Plan (Sep 2011), DSITI: Biodiversity Status of pre-clearing and remnant regional ecosystems, Landuse Mapping Qld Current (May 2015) DEHP: EPA 1994 - Mature Regrowth.
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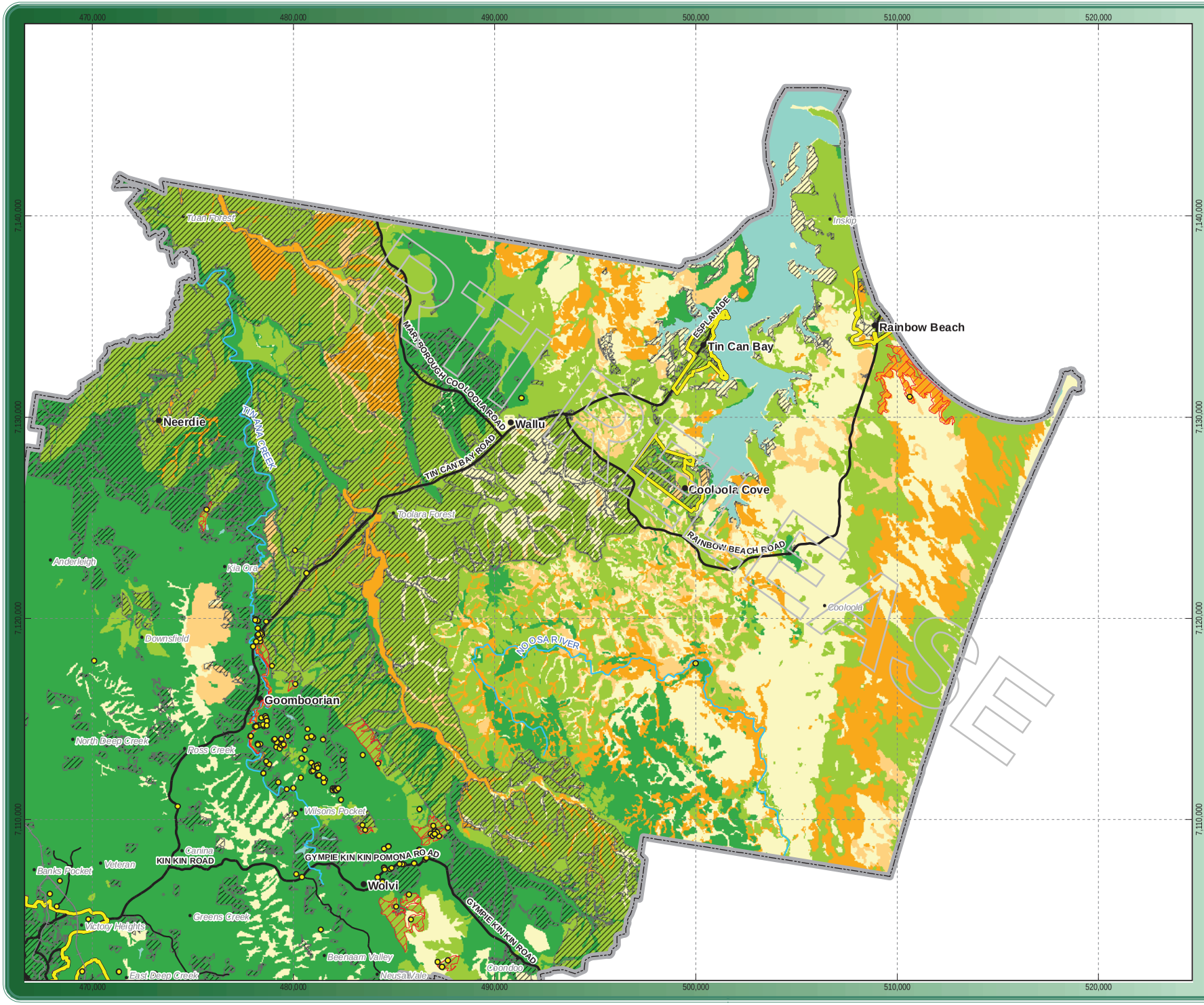

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N W E S

0 1 2 3 4 5
Kilometers

1:180,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Legend

- Records of Koala Evidence (Oct 2015)
- **Locality**
- **Town**
- Major Watercourse
- **Rail**

Road Network

- Highways
- Secondary Roads
- Local Connector Road
- **Urban Footprint**
- **Gympie LGA Boundary**
- Estuary
- Dam, Lake
- Generally Unsuitable (plantation, crop etc)
- Vegetation Patch Upgrade

Pre-clear (RE Ranking)

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- Low (2)
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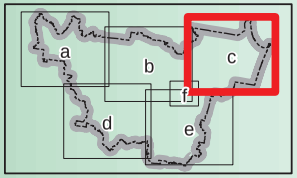

Gympie Koala
Habitat Mapping
Gympie Regional Council

Pre-clear RE Ranking
and Local Patch Upgrades

Figure 6 c

03 May 2016 Z:\GIS\EC015_0024\GIS\Final\maps\v6\EC015_0024_06_preclear_reranking_v6.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) DILGP: Widebay Regional Plan (Sep 2011), DSITI: Biodiversity Status of pre-clearing and remnant regional ecosystems, Landuse Mapping Qld Current (May 2015) DEHP: EPA 1994 - Mature Regrowth.
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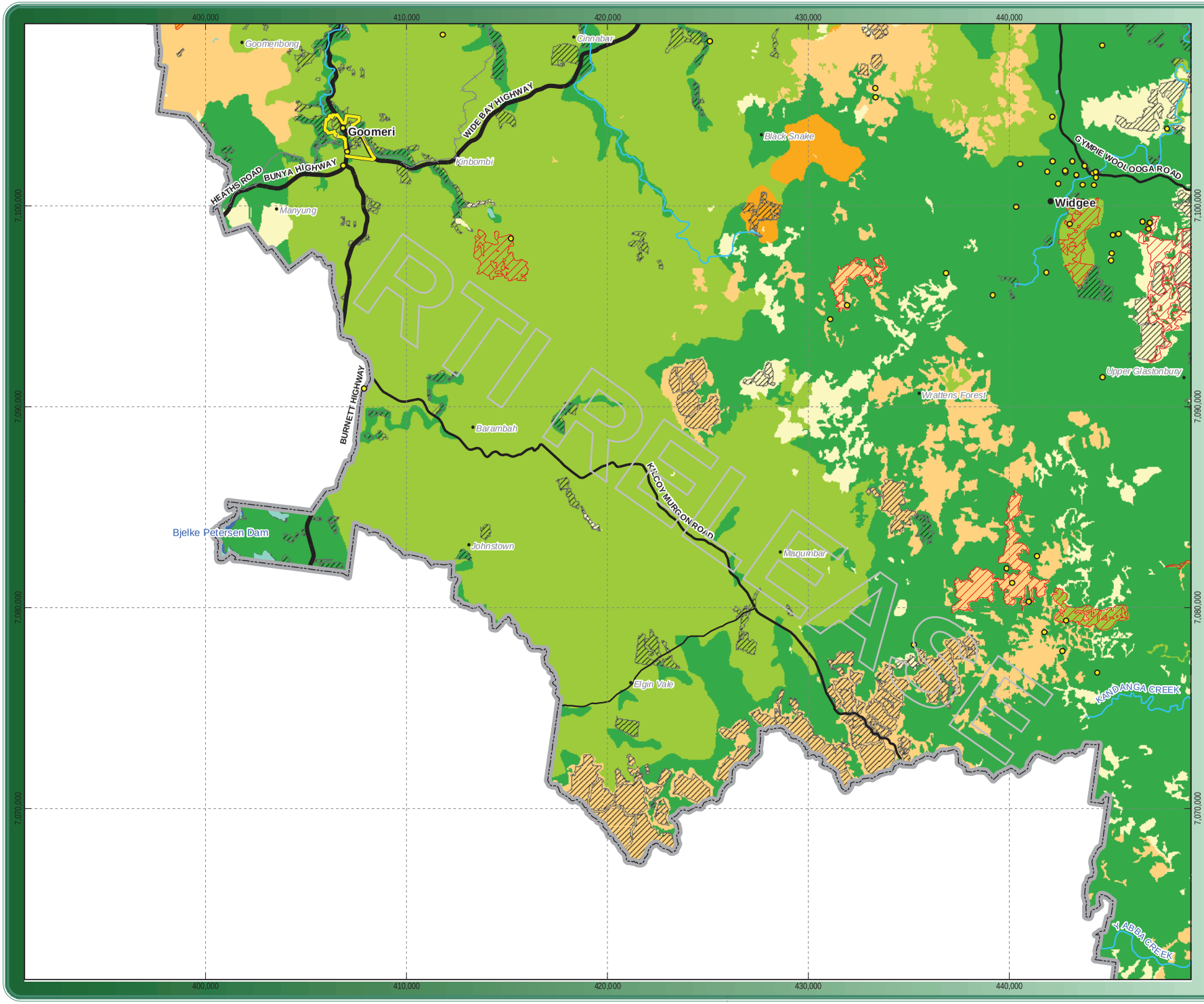

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N W E S

0 1 2 3 4 5
Kilometers

1:180,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Legend

- Records of Koala Evidence (Oct 2015)
- **Locality**
- **Town**
- Major Watercourse
- **Rail**

Road Network

- Highways
- Secondary Roads
- Local Connector Road
- **Urban Footprint**
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- Low (2)
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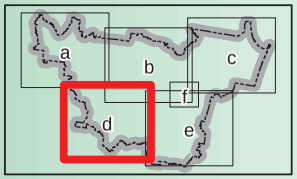

Gympie Koala
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Gympie Regional Council

Pre-clear RE Ranking
and Local Patch Upgrades

Figure 6 d

03 May 2016 Z:\GIS\ECO15_0024\GIS\Final\maps\v6\ECO15_0024_06_preclear_reranking_v6.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) DILGP: Widebay Regional Plan (Sep 2011), DSITI: Biodiversity Status of pre-clearing and remnant regional ecosystems, Landuse Mapping Qld Current (May 2015) DEHP: EPA 1994 - Mature Regrowth.
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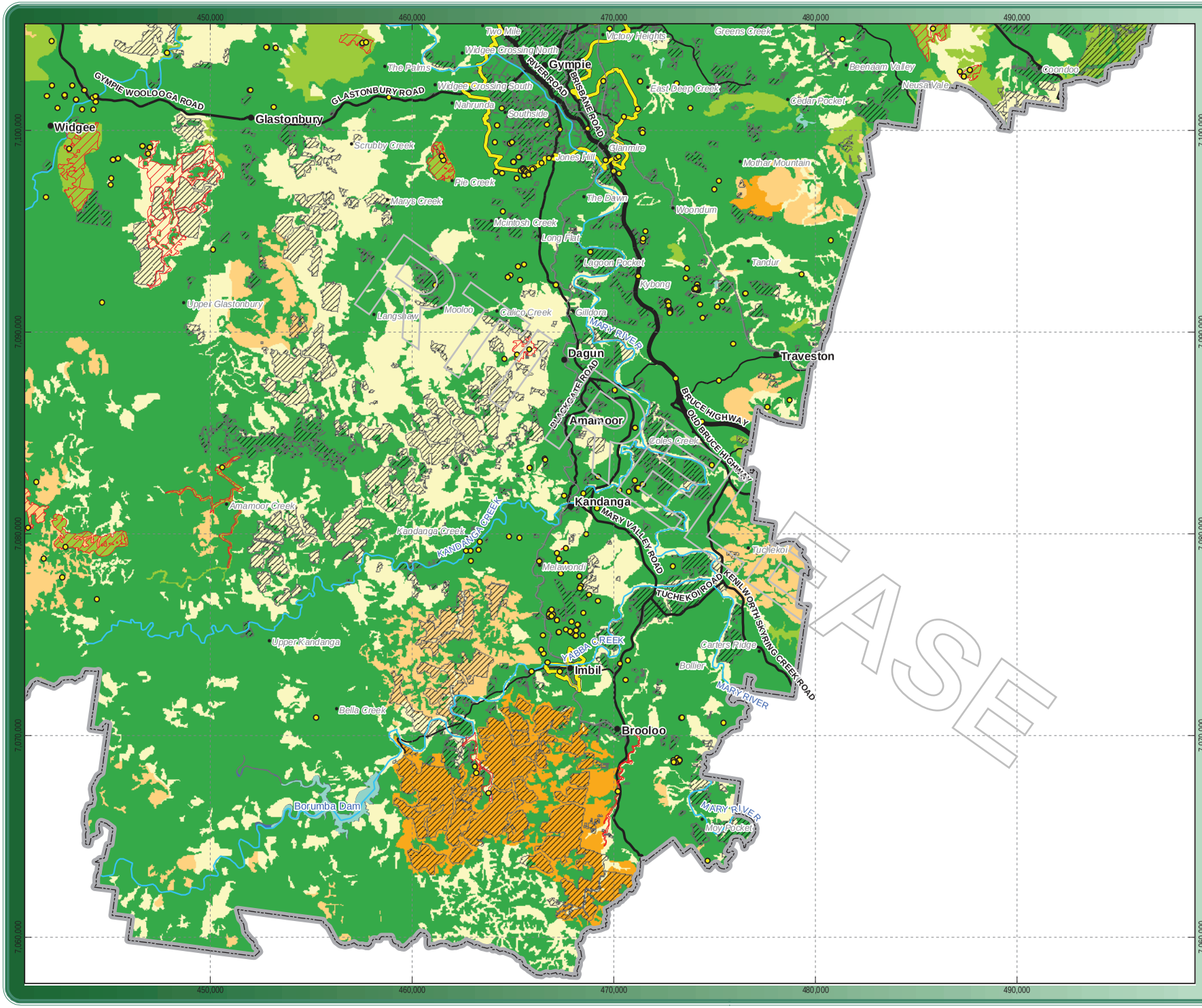

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N W E S

0 1 2 3 4 5
Kilometers

1:180,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Legend

- Records of Koala Evidence (Oct 2015)
- **Locality**
- **Town**
- Major Watercourse
- **Rail**

Road Network

- Highways
- Secondary Roads
- Local Connector Road
- **Urban Footprint**
- **Gympie LGA Boundary**
- Estuary
- Dam, Lake
- Generally Unsuitable (plantation, crop etc)
- Vegetation Patch Upgrade

Pre-clear (RE Ranking)

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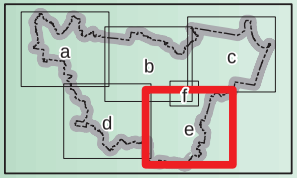
- Medium-High (4)
- Low-Medium (3)
- Low (2)
- None (1)

Note: 'vegetation patch upgrades' are RE patches that have been upgraded by one level in the model based on previous koala sightings regardless of vegetation type"



Gympie Koala
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Gympie Regional Council

Pre-clear RE Ranking
and Local Patch Upgrades

Figure 6 e

03 May 2016 Z:\GIS\ECO15_0024\GIS\Final\maps\v6\ECO15_0024_06_preclear_reranking_v6.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) DILGP: Widebay Regional Plan (Sep 2011), DSITI: Biodiversity Status of pre-clearing and remnant regional ecosystems, Landuse Mapping Qld Current (May 2015) DEHP: EPA 1994 - Mature Regrowth.
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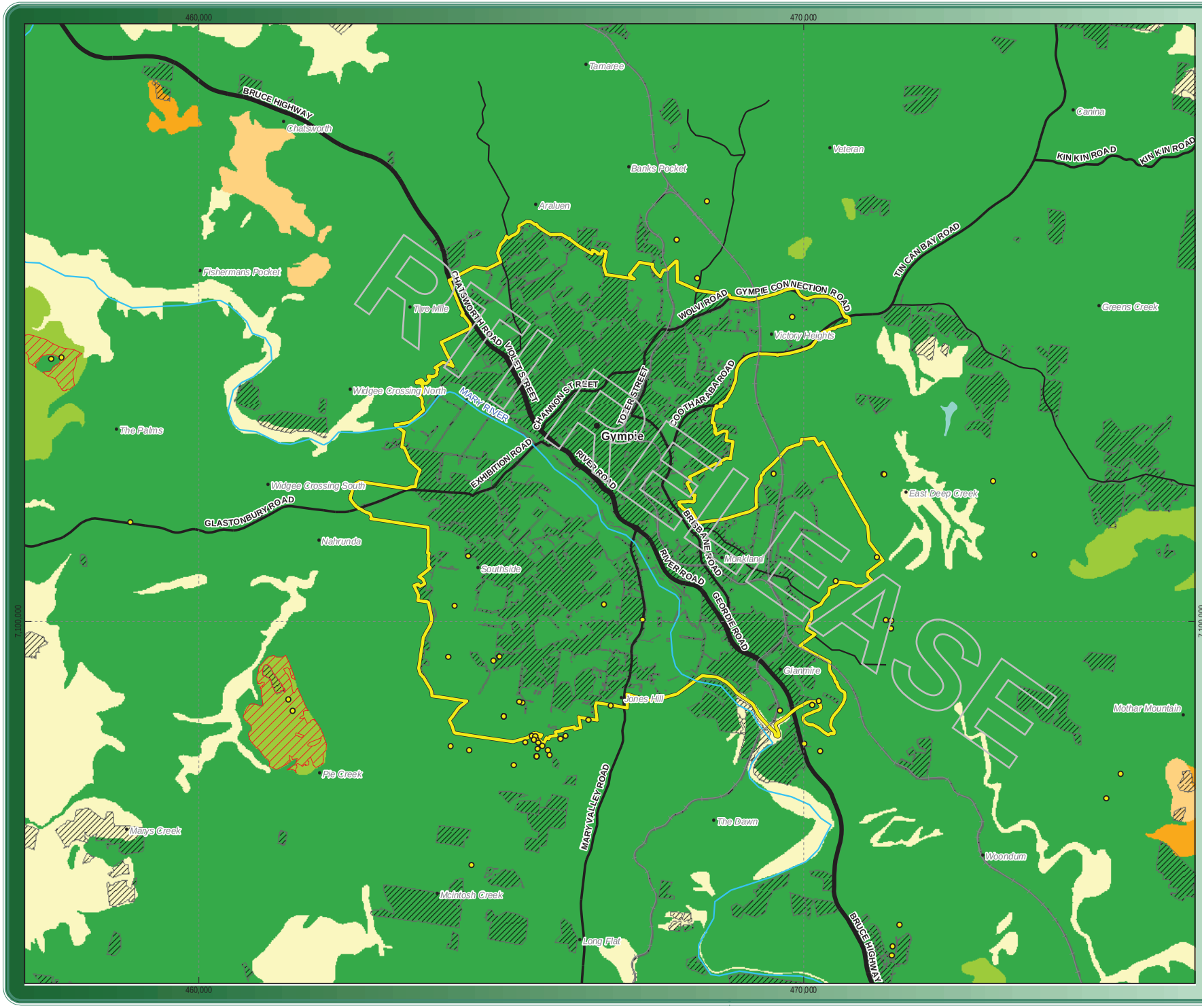

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N W E S

0 0.45 0.9 1.35 1.8 2.25

Kilometers

1:60,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Legend

- Records of Koala Evidence (Oct 2015)
- **Locality**
- **Town**
- Major Watercourse
- **Rail**

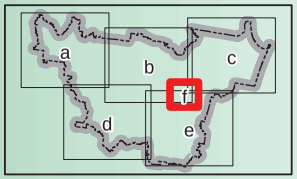
Road Network

- Highways
- Secondary Roads
- Local Connector Road
- **Urban Footprint**
- **Gympie LGA Boundary**
- Estuary
- Dam, Lake
- Generally Unsuitable (plantation, crop etc)
- Vegetation Patch Upgrade

Pre-clear (RE Ranking)

- High (5)
- Medium-High (4)
- Low-Medium (3)
- Low (2)
- None (1)

Note: 'vegetation patch upgrades' are RE patches that have been upgraded by one level in the model based on previous koala sightings regardless of vegetation type"



Gympie Koala
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Gympie Regional Council

Pre-clear RE Ranking
and Local Patch Upgrades

Figure 6 f

03 May 2016 Z:\GIS\ECO15_0024\GIS\Final\maps\v6\ECO15_0024_06_preclear_reranking_v6.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) DILGP: Widebay Regional Plan (Sep 2011), DSITI: Biodiversity Status of pre-clearing and remnant regional ecosystems, Landuse Mapping Qld Current (May 2015) DEHP: EPA 1994 - Mature Regrowth.
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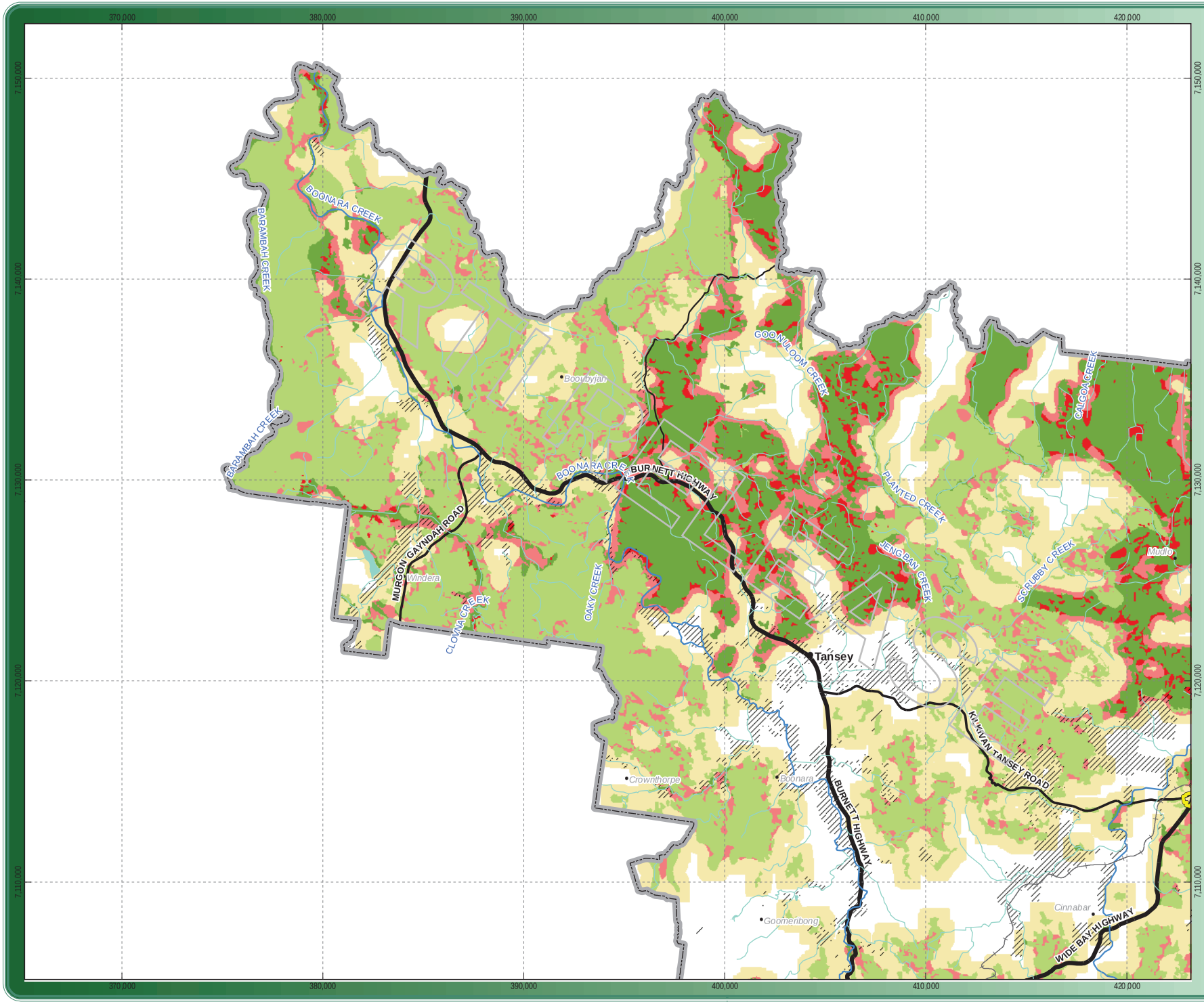

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N
W E
S

0 1 2 3 4 5
Kilometers

1:180,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Legend

- Locality
- Town
- Major Watercourse
- Minor Watercourse

Road Network

- Highways
- Secondary Roads
- Local Connector Road
- Rail
- Dam, Lake
- Estuary
- Gympie LGA Boundary
- Urban Footprint
- Generally Unsuitable (plantation, crop etc)

Core Habitat

- High Quality Core Habitat (4)
- Medium-High Quality Core Habitat

Connectivity

- High (3,000)
- Medium-High (2,000)
- Low-Medium (1,000)
- Low (0)

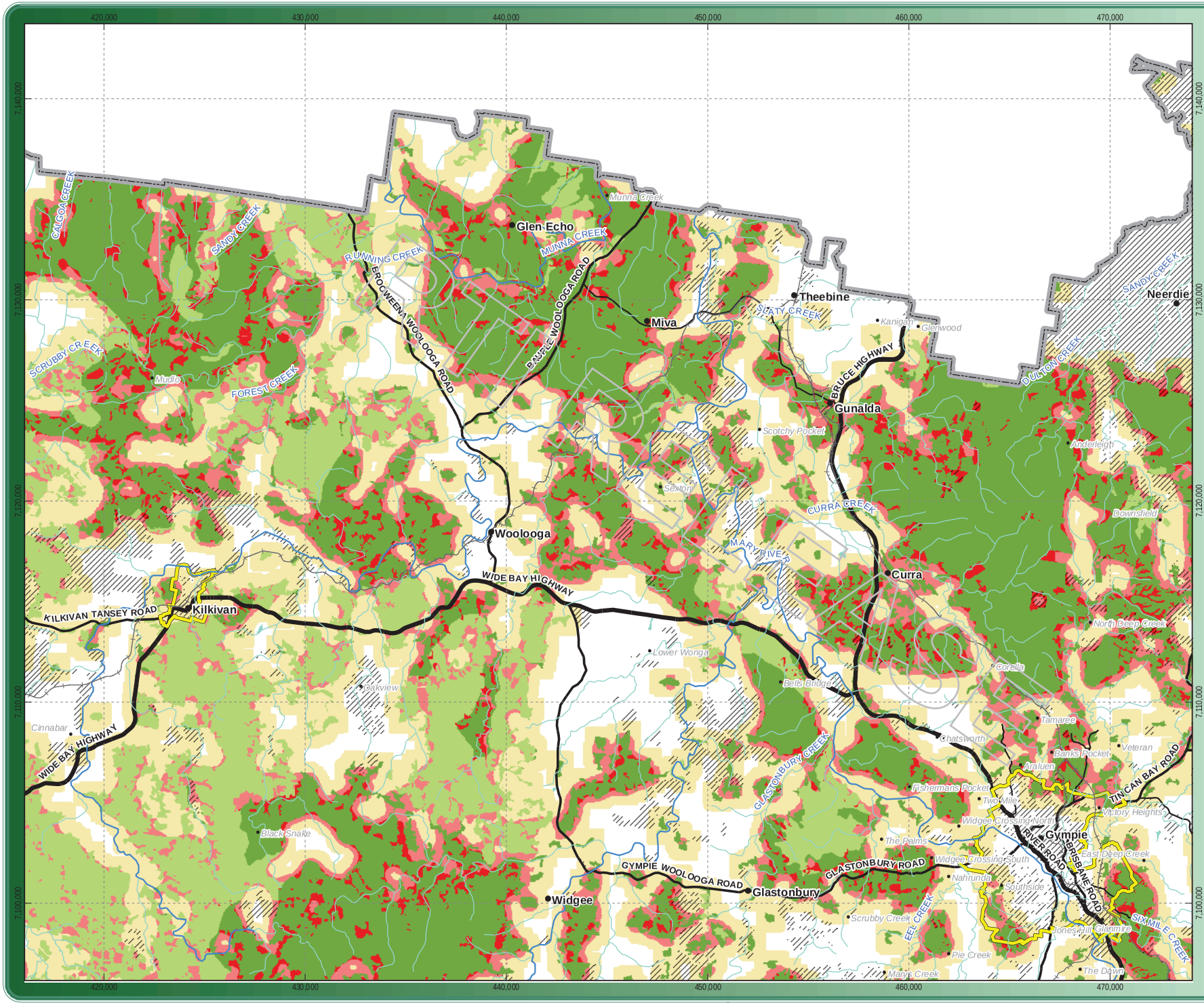
Gympie Koala
Habitat Mapping
Gympie Regional Council

Core Habtiats and
Connectivity

Figure 7a

03 May 2016 Z:\GIS\ECO15_0024\GIS\Final\maps\v6\ECO15_0024_07_corehabitat_connectivity_v6.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) DILGP: Widebay Regional Plan (Sep 2011), DNPSR: Protected Areas of Qld (Mar 2015) DSITI: Biodiversity Status of pre-clearing and remnant regional ecosystems, Landuse Mapping Qld Current (May 2015) DEHP: EPA 1994 - Mature Regrowth
© State of Queensland (DNRM, DEHP, DSITI, DNPSR, DILGP)



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N W E S

0 1 2 3 4 5
Kilometers

1:180,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Legend

- Locality
- Town
- Major Watercourse
- Minor Watercourse

Road Network

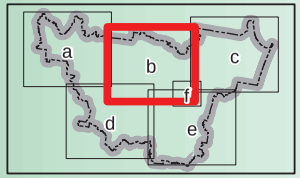
- Highways
- Secondary Roads
- Local Connector Road
- Rail
- Dam, Lake
- Estuary
- Gympie LGA Boundary
- Urban Footprint
- Generally Unsuitable (plantation, crop etc)

Core Habitat

- High Quality Core Habitat (4)
- Medium-High Quality Core Habitat

Connectivity

- High (3,000)
- Medium-High (2,000)
- Low-Medium (1,000)
- Low (0)



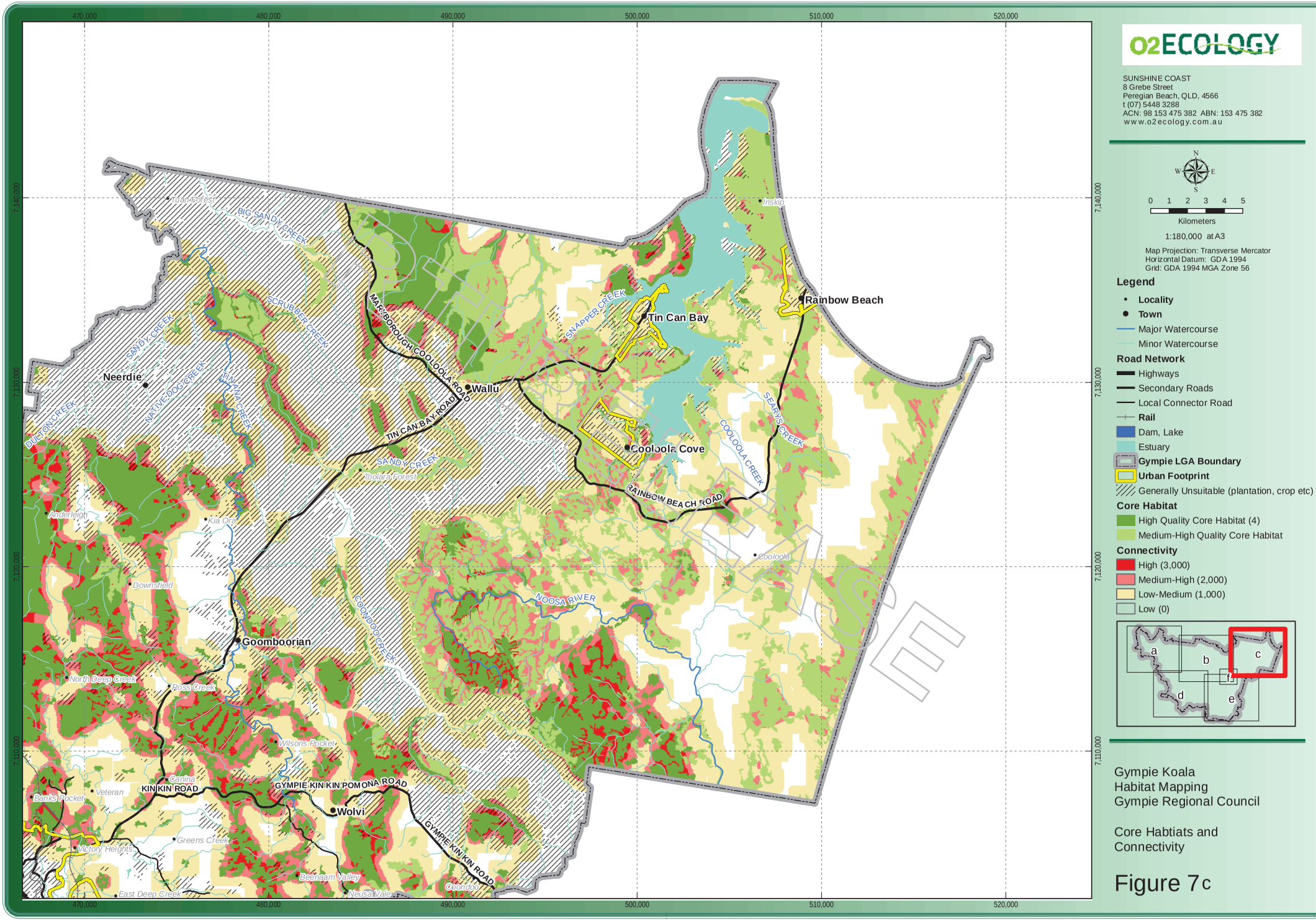
Gympie Koala
Habitat Mapping
Gympie Regional Council

Core Habtiats and
Connectivity

Figure 7b

03 May 2016 Z:\GIS\EC015_0024\GIS\Final\maps\v6\EC015_0024_07_corehabitat_connectivity_v6.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) DILGP: Widebay Regional Plan (Sep 2011), DNPSR: Protected Areas of Qld (Mar 2015) DSITI: Biodiversity Status of pre-clearing and remnant regional ecosystems, Landuse Mapping Qld Current (May 2015) DEHP: EPA 1994 - Mature Regrowth
© State of Queensland (DNRM, DEHP, DSITI, DNPSR, DILGP)



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N
W E
S

0 1 2 3 4 5
Kilometers

1:180,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Legend

- Locality
- Town
- Major Watercourse
- Minor Watercourse

Road Network

- Highways
- Secondary Roads
- Local Connector Road
- Rail
- Dam, Lake
- Estuary
- Gympie LGA Boundary
- Urban Footprint
- Generally Unsuitable (plantation, crop etc)

Core Habitat

- High Quality Core Habitat (4)
- Medium-High Quality Core Habitat

Connectivity

- High (3,000)
- Medium-High (2,000)
- Low-Medium (1,000)
- Low (0)

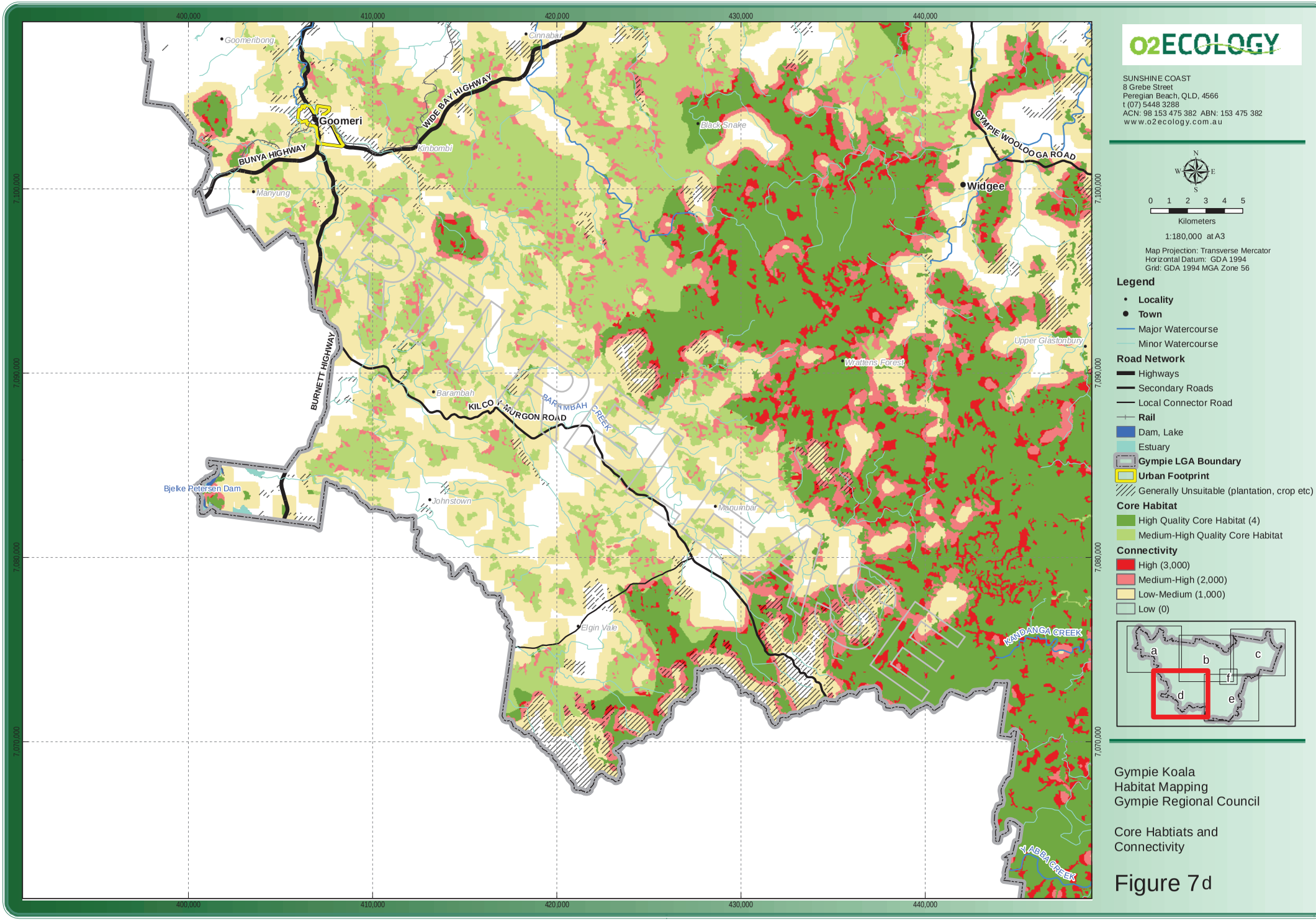
Gympie Koala
Habitat Mapping
Gympie Regional Council

Core Habtiats and
Connectivity

Figure 7c

03 May 2016 Z:\GIS\EC015_0024\GIS\Final\maps\v6\EC015_0024_07_corehabitat_connectivity_v6.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) DILGP: Widebay Regional Plan (Sep 2011), DNPSR: Protected Areas of Qld (Mar 2015) DSITI: Biodiversity Status of pre-clearing and remnant regional ecosystems, Landuse Mapping Qld Current (May 2015) DEHP: EPA 1994 - Mature Regrowth
© State of Queensland (DNRM, DEHP, DSITI, DNPSR, DILGP)



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N W E S

0 1 2 3 4 5
Kilometers

1:180,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Legend

- Locality
- Town
- Major Watercourse
- Minor Watercourse

Road Network

- Highways
- Secondary Roads
- Local Connector Road
- Rail
- Dam, Lake
- Estuary
- Gympie LGA Boundary
- Urban Footprint
- Generally Unsuitable (plantation, crop etc)

Core Habitat

- High Quality Core Habitat (4)
- Medium-High Quality Core Habitat

Connectivity

- High (3,000)
- Medium-High (2,000)
- Low-Medium (1,000)
- Low (0)

Gympie Koala
Habitat Mapping
Gympie Regional Council

Core Habtiats and
Connectivity

Figure 7d

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) DILGP: Widebay Regional Plan (Sep 2011), DNPSR: Protected Areas of Qld (Mar 2015) DSITI: Biodiversity Status of pre-clearing and remnant regional ecosystems, Landuse Mapping Qld Current (May 2015) DEHP: EPA 1994 - Mature Regrowth
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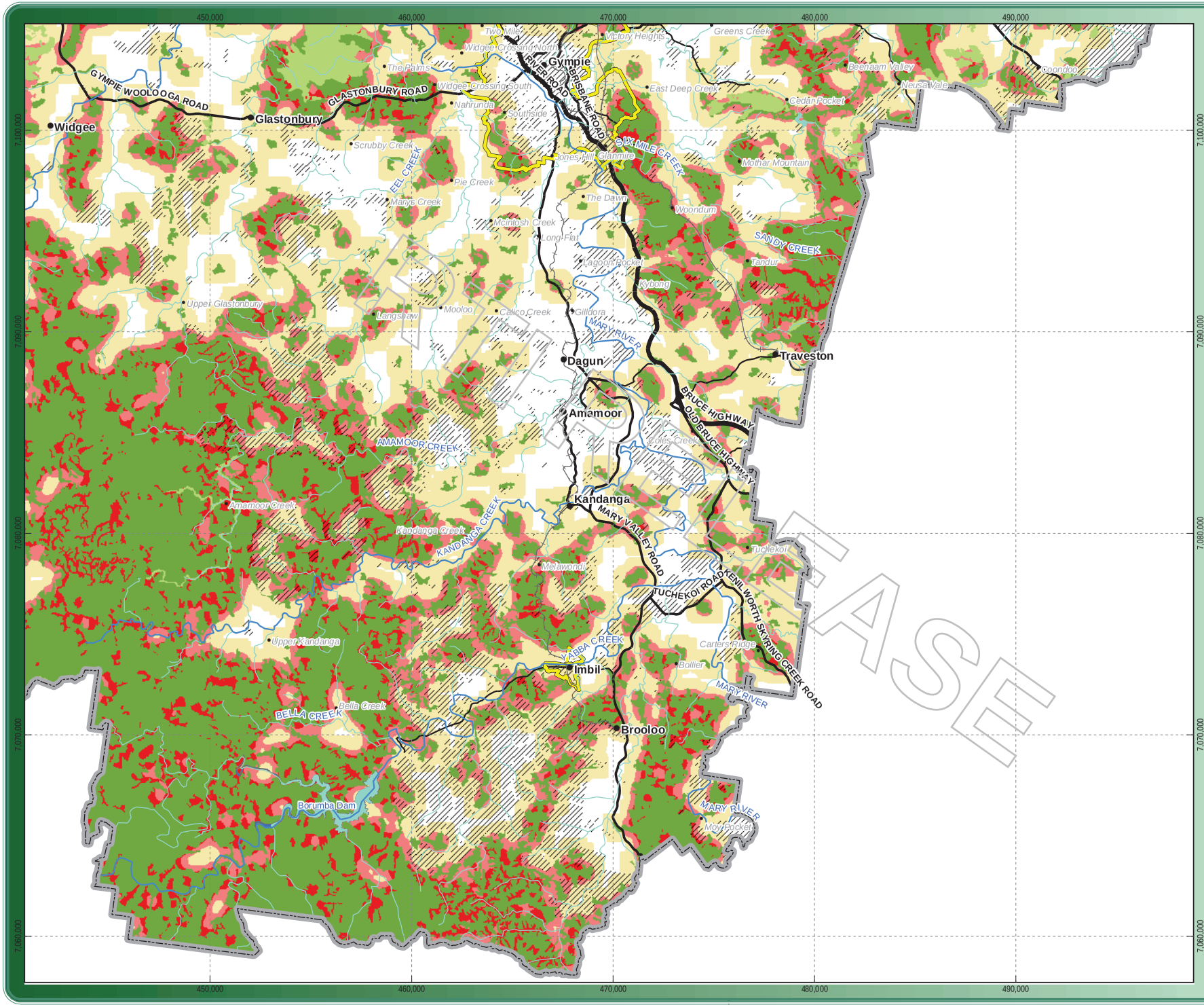

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N W E S

0 1 2 3 4 5
Kilometers

1:180,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Legend

- Locality
- Town
- Major Watercourse
- Minor Watercourse

Road Network

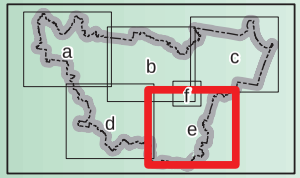
- Highways
- Secondary Roads
- Local Connector Road
- Rail
- Dam, Lake
- Estuary
- Gympie LGA Boundary
- Urban Footprint
- Generally Unsuitable (plantation, crop etc)

Core Habitat

- High Quality Core Habitat (4)
- Medium-High Quality Core Habitat

Connectivity

- High (3,000)
- Medium-High (2,000)
- Low-Medium (1,000)
- Low (0)



Gympie Koala
Habitat Mapping
Gympie Regional Council

Core Habtiats and
Connectivity

Figure 7e

03 May 2016 Z:\GIS\ECO15_0024\GIS\Final\maps\v6\ECO15_0024_07_corehabitat_connectivity_v6.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) DILGP: Widebay Regional Plan (Sep 2011), DNPSR: Protected Areas of Qld (Mar 2015) DSITI: Biodiversity Status of pre-clearing and remnant regional ecosystems, Landuse Mapping Qld Current (May 2015) DEHP: EPA 1994 - Mature Regrowth
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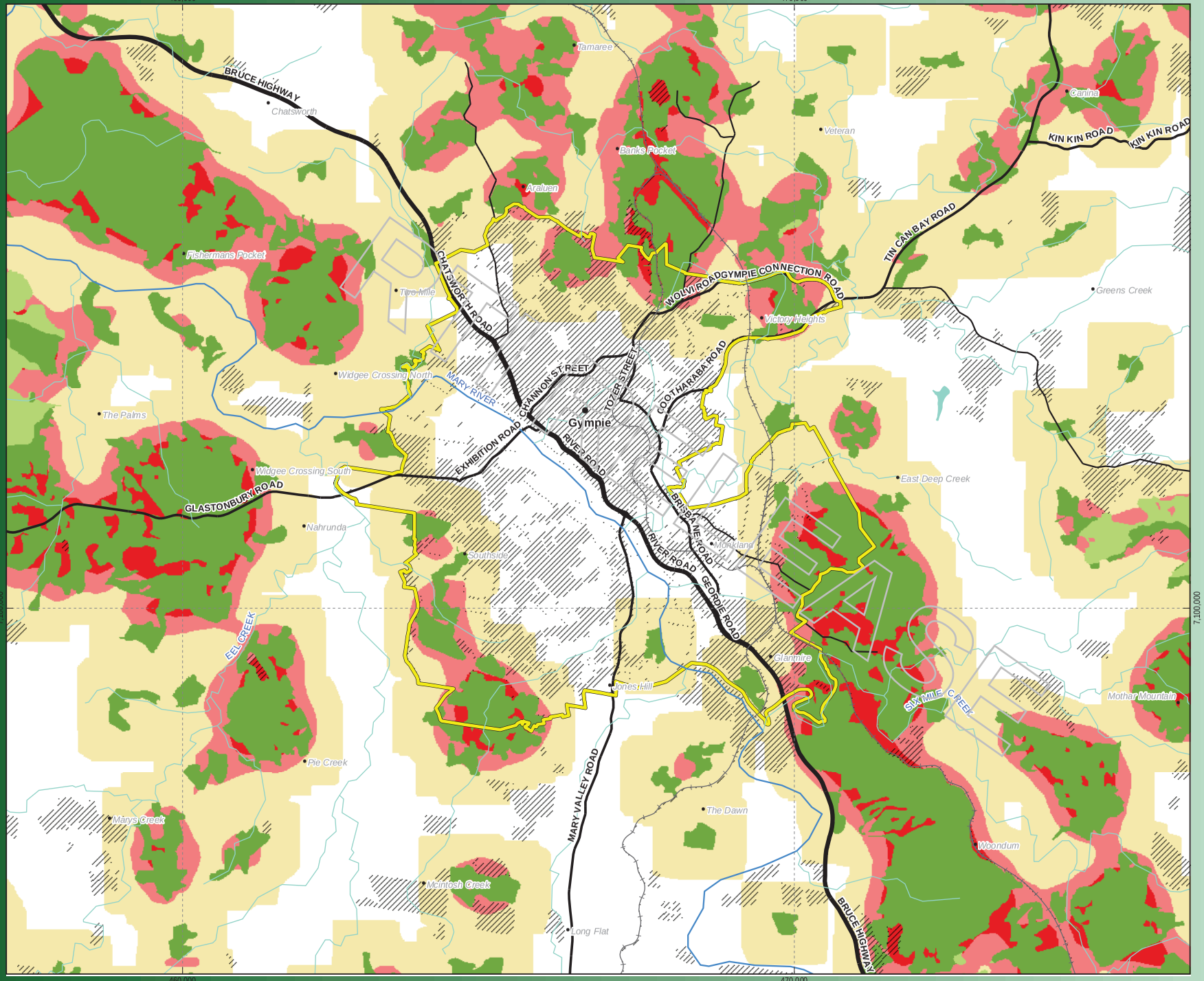

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N W E S

0 0.35 0.7 1.05 1.4 1.75

Kilometers

1:60,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Legend

- Locality
- Town
- Major Watercourse
- Minor Watercourse

Road Network

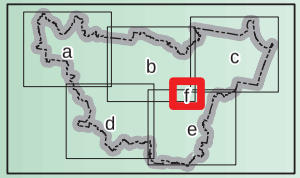
- Highways
- Secondary Roads
- Local Connector Road
- Rail
- Dam, Lake
- Estuary
- Gympie LGA Boundary
- Urban Footprint
- Generally Unsuitable (plantation, crop etc)

Core Habitat

- High Quality Core Habitat (4)
- Medium-High Quality Core Habitat

Connectivity

- High (3,000)
- Medium-High (2,000)
- Low-Medium (1,000)
- Low (0)



Gympie Koala
Habitat Mapping
Gympie Regional Council

Core Habtiats and
Connectivity

Figure 7f

03 May 2016 Z:\GIS\EC015_0024\GIS\Final\maps\v6\EC015_0024_07_corehabitat_connectivity_v6.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) DILGP: Widebay Regional Plan (Sep 2011), DNPSR: Protected Areas of Qld (Mar 2015) DSITI: Biodiversity Status of pre-clearing and remnant regional ecosystems, Landuse Mapping Qld Current (May 2015) DEHP: EPA 1994 - Mature Regrowth
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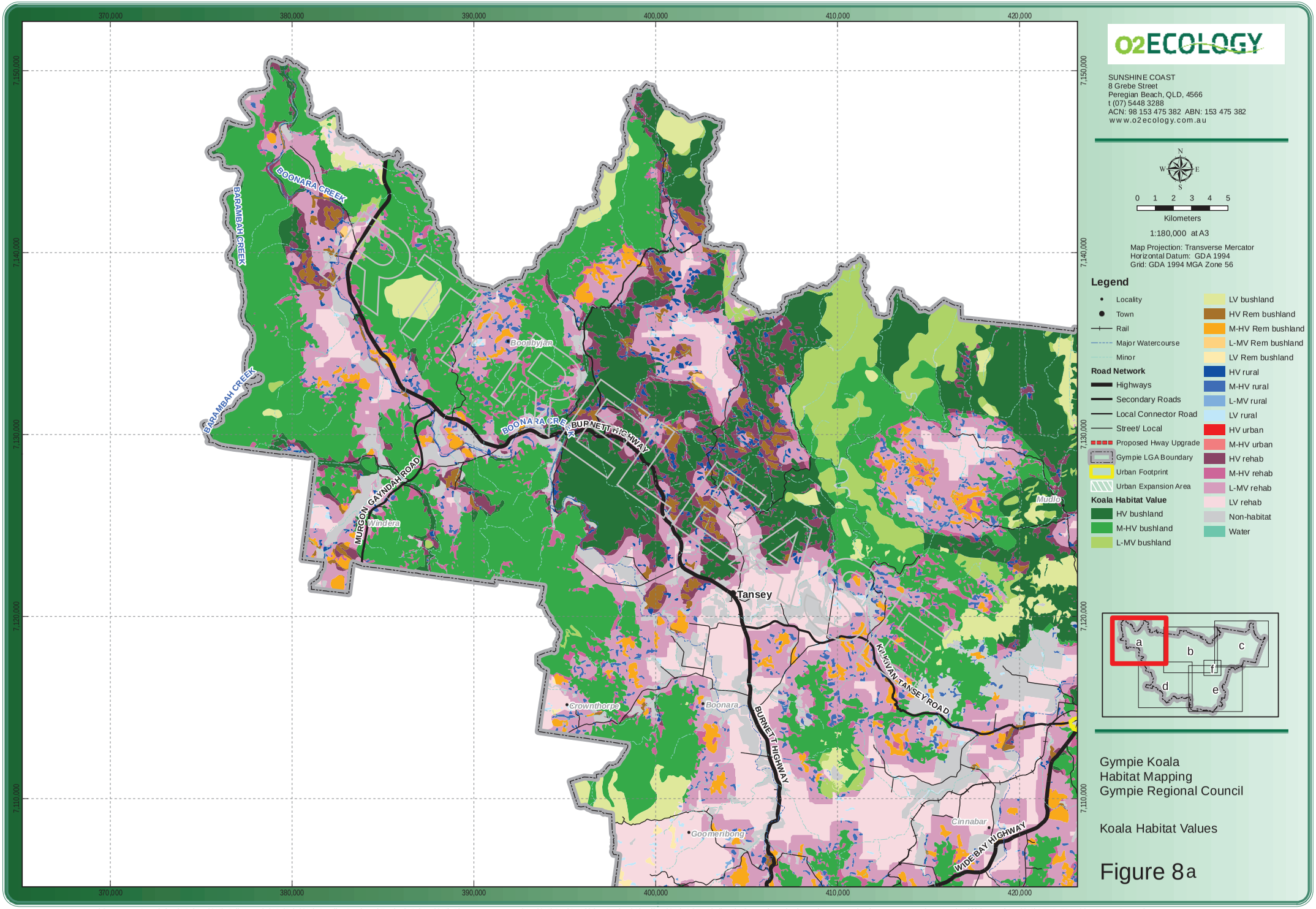

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N W E S

0 1 2 3 4 5
Kilometers

1:180,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Legend

- Locality
- Town
- Rail
- Major Watercourse
- Minor

Road Network

- Highways
- Secondary Roads
- Local Connector Road
- Street/ Local
- Proposed Hway Upgrade
- Gympie LGA Boundary
- Urban Footprint
- Urban Expansion Area

Koala Habitat Value

- HV bushland
- M-HV bushland
- L-MV bushland
- LV bushland
- HV Rem bushland
- M-HV Rem bushland
- L-MV Rem bushland
- LV Rem bushland
- HV rural
- M-HV rural
- L-MV rural
- LV rural
- HV urban
- M-HV urban
- HV rehab
- M-HV rehab
- L-MV rehab
- LV rehab
- Non-habitat
- Water

Gympie Koala
Habitat Mapping
Gympie Regional Council

Koala Habitat Values

Figure 8a

03 May 2016 Z:\GIS\ECO15_0024\GIS\Final\maps\v6\ECO15_0024_08_koala_habitat_values_v6.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) DILGP: Widebay Regional Plan (Sep 2011), DSITI: Biodiversity Status of pre-clearing and remnant regional ecosystems, Landuse Mapping Qld Current (May 2015) DEHP: EPA 1994 - Mature Regrowth
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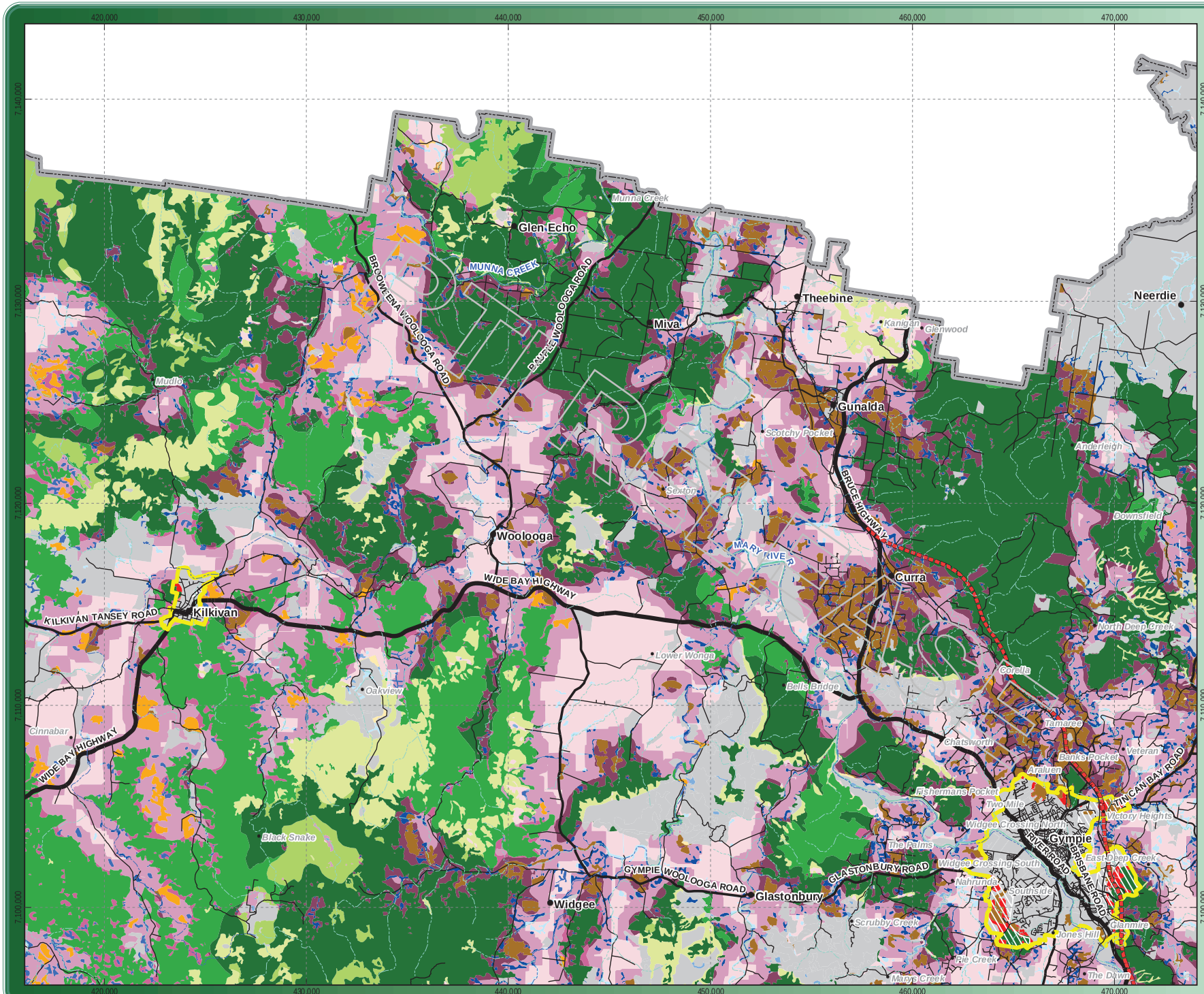

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0 1 2 3 4 5
Kilometers

1:180,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Legend

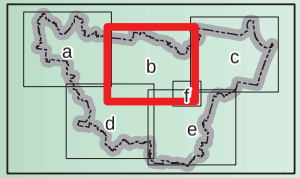
- Locality
- Town
- Rail
- Major Watercourse
- Minor

Road Network

- Highways
- Secondary Roads
- Local Connector Road
- Street/ Local
- Proposed Hway Upgrade
- Gympie LGA Boundary
- Urban Footprint
- Urban Expansion Area

Koala Habitat Value

- HV bushland
- M-HV bushland
- L-MV bushland
- LV bushland
- HV Rem bushland
- M-HV Rem bushland
- L-MV Rem bushland
- LV Rem bushland
- HV rural
- M-HV rural
- L-MV rural
- LV rural
- HV urban
- M-HV urban
- HV rehab
- M-HV rehab
- L-MV rehab
- LV rehab
- Non-habitat
- Water



Gympie Koala
Habitat Mapping
Gympie Regional Council

Koala Habitat Values

Figure 8b

03 May 2016 Z:\GIS\ECO15_0024\GIS\Final\maps\v6\ECO15_0024_08_koala_habitat_values_v6.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) DILGP: Widebay Regional Plan (Sep 2011), DSITI: Biodiversity Status of pre-clearing and remnant regional ecosystems, Landuse Mapping Qld Current (May 2015) DEHP: EPA 1994 - Mature Regrowth
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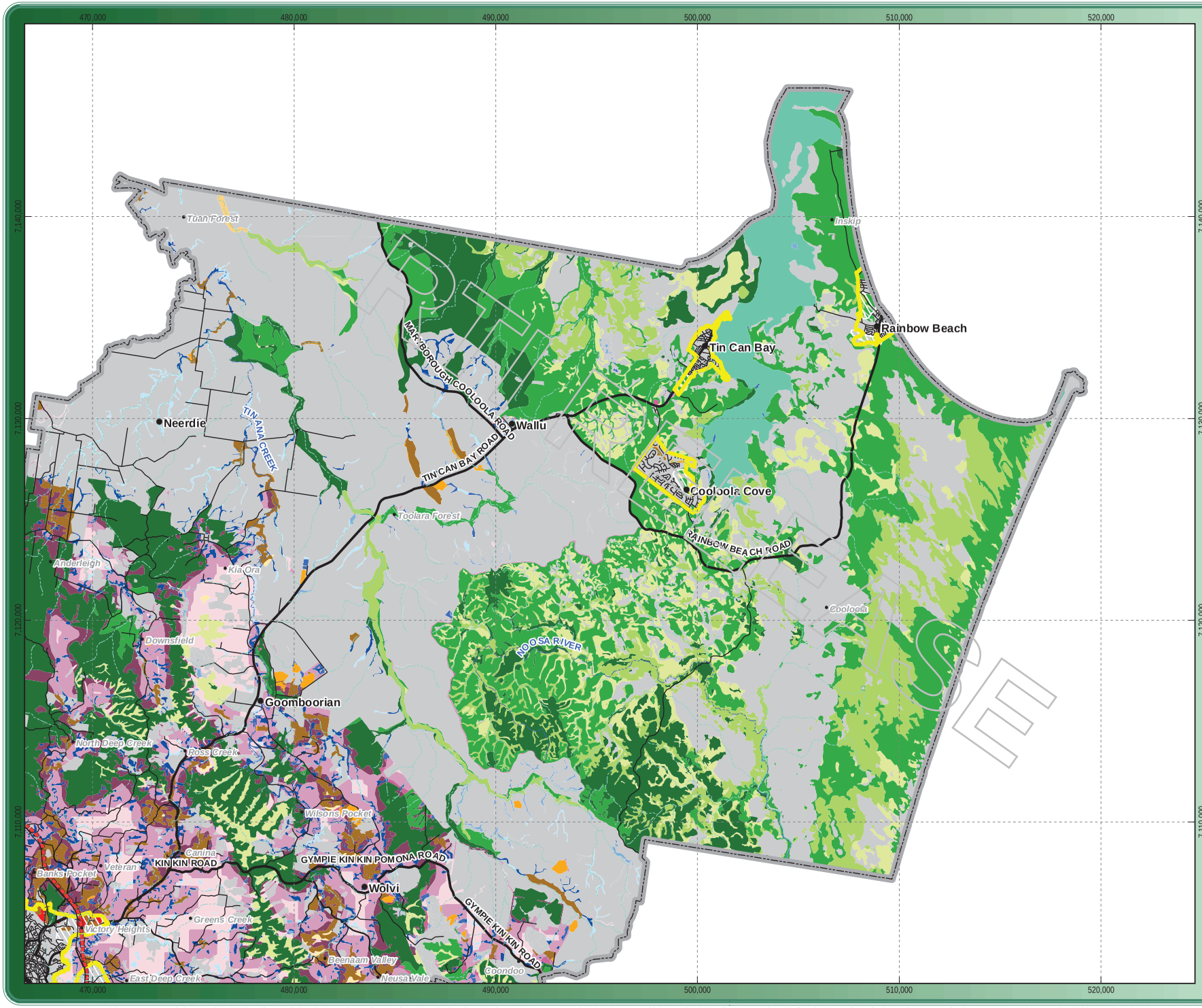

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0 1 2 3 4 5
Kilometers

1:180,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Legend

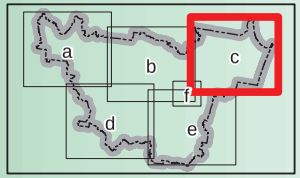
- Locality
- Town
- Rail
- Major Watercourse
- Minor

Road Network

- Highways
- Secondary Roads
- Local Connector Road
- Street/ Local
- Proposed Hway Upgrade
- Gympie LGA Boundary
- Urban Footprint
- Urban Expansion Area

Koala Habitat Value

- HV bushland
- M-HV bushland
- L-MV bushland
- LV bushland
- HV Rem bushland
- M-HV Rem bushland
- L-MV Rem bushland
- LV Rem bushland
- HV rural
- M-HV rural
- L-MV rural
- LV rural
- HV urban
- M-HV urban
- HV rehab
- M-HV rehab
- L-MV rehab
- LV rehab
- Non-habitat
- Water



Gympie Koala
Habitat Mapping
Gympie Regional Council

Koala Habitat Values

Figure 8c

03 May 2016 Z:\GIS\ECO15_0024\GIS\Final\maps\v6\ECO15_0024_08_koala_habitat_values_v6.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) DILGP: Widebay Regional Plan (Sep 2011), DSITI: Biodiversity Status of pre-clearing and remnant regional ecosystems, Landuse Mapping Qld Current (May 2015) DEHP: EPA 1994 - Mature Regrowth
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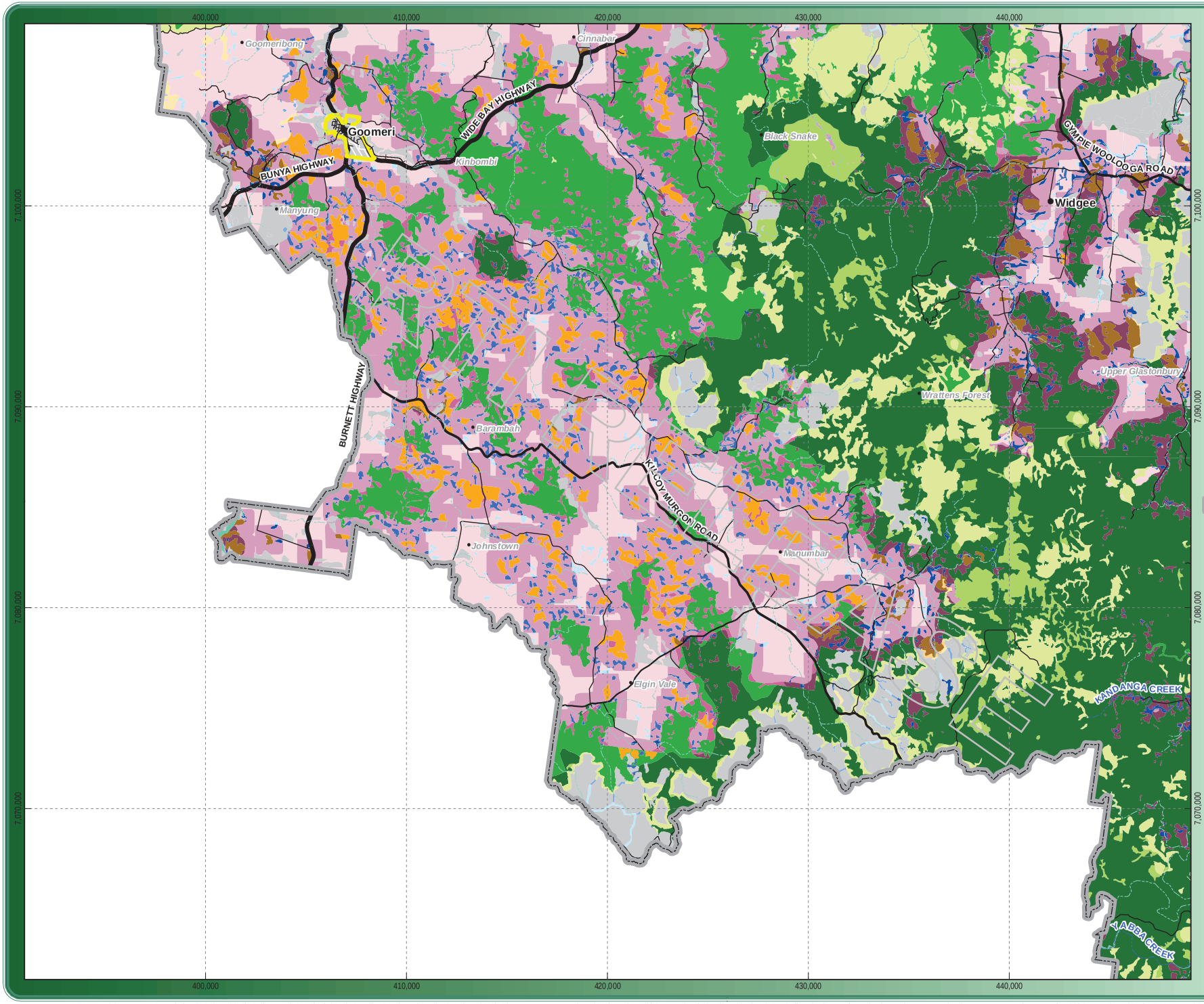

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0 1 2 3 4 5
Kilometers

1:180,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Legend

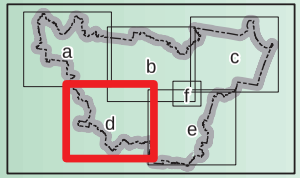
- Locality
- Town
- Rail
- Major Watercourse
- Minor

Road Network

- Highways
- Secondary Roads
- Local Connector Road
- Street/ Local
- Proposed Hway Upgrade
- Gympie LGA Boundary
- Urban Footprint
- Urban Expansion Area

Koala Habitat Value

- HV bushland
- M-HV bushland
- L-MV bushland
- LV bushland
- HV Rem bushland
- M-HV Rem bushland
- L-MV Rem bushland
- LV Rem bushland
- HV rural
- M-HV rural
- L-MV rural
- LV rural
- HV urban
- M-HV urban
- HV rehab
- M-HV rehab
- L-MV rehab
- LV rehab
- Non-habitat
- Water



Gympie Koala
Habitat Mapping
Gympie Regional Council

Koala Habitat Values

Figure 8d

03 May 2016 Z:\GIS\ECO15_0024\GIS\Final\maps\v6\ECO15_0024_08_koala_habitat_values_v6.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) DILGP: Widebay Regional Plan (Sep 2011), DSITI: Biodiversity Status of pre-clearing and remnant regional ecosystems, Landuse Mapping Qld Current (May 2015) DEHP: EPA 1994 - Mature Regrowth
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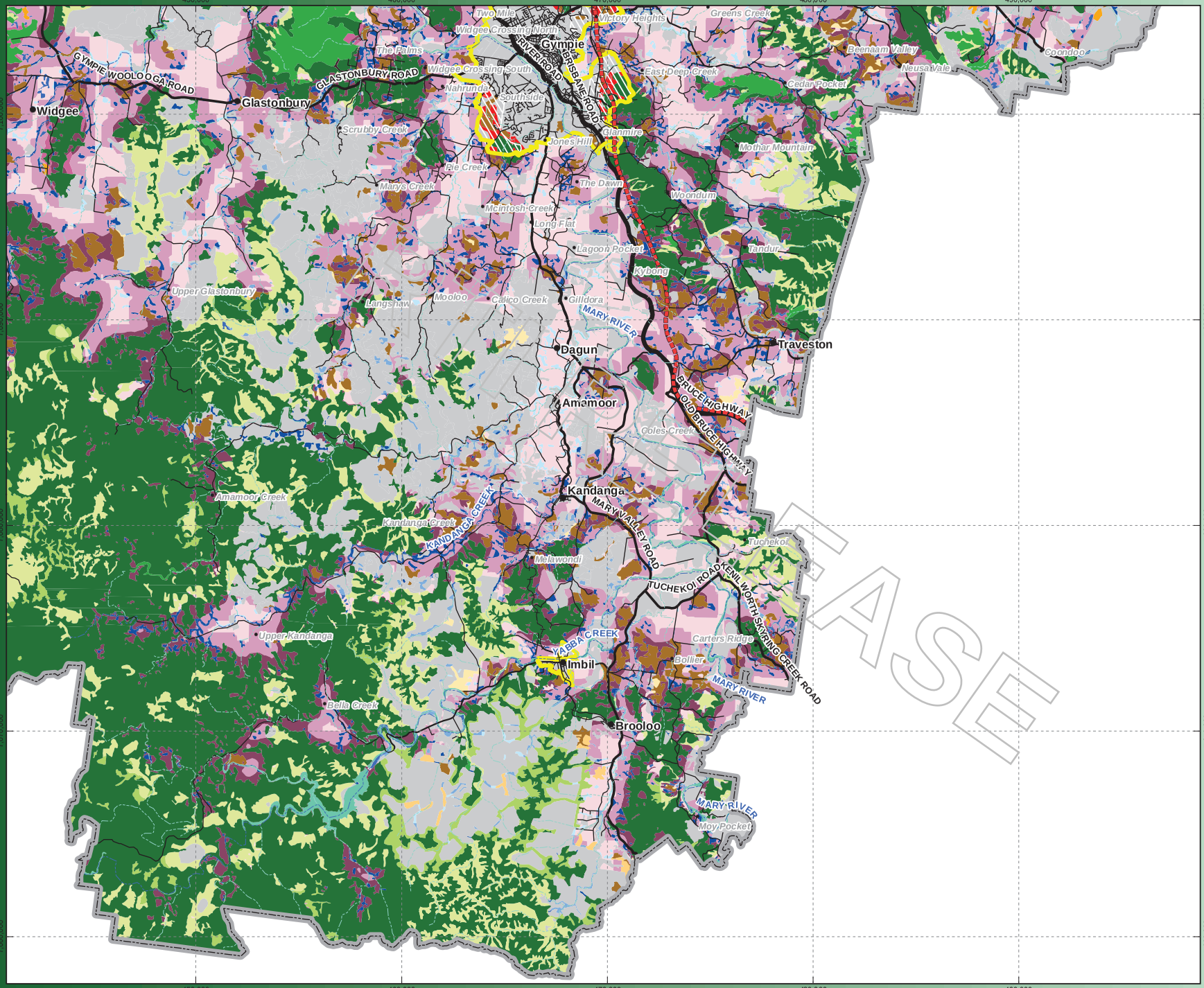

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0 1 2 3 4 5
Kilometers

1:180,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Legend

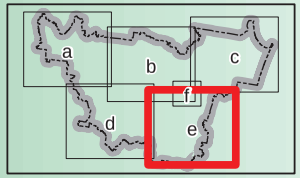
- Locality
- Town
- Rail
- Major Watercourse
- Minor

Road Network

- Highways
- Secondary Roads
- Local Connector Road
- Street/ Local
- Proposed Hway Upgrade
- Gympie LGA Boundary
- Urban Footprint
- Urban Expansion Area

Koala Habitat Value

- HV bushland
- M-HV bushland
- L-MV bushland
- LV bushland
- HV Rem bushland
- M-HV Rem bushland
- L-MV Rem bushland
- LV Rem bushland
- HV rural
- M-HV rural
- L-MV rural
- LV rural
- HV urban
- M-HV urban
- HV rehab
- M-HV rehab
- L-MV rehab
- LV rehab
- Non-habitat
- Water



Gympie Koala
Habitat Mapping
Gympie Regional Council

Koala Habitat Values

Figure 8e

03 May 2016 Z:\GIS\ECO15_0024\GIS\Final\maps\v6\ECO15_0024_08_koala_habitat_values_v6.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) DILGP: Widebay Regional Plan (Sep 2011), DSITI: Biodiversity Status of pre-clearing and remnant regional ecosystems, Landuse Mapping Qld Current (May 2015) DEHP: EPA 1994 - Mature Regrowth
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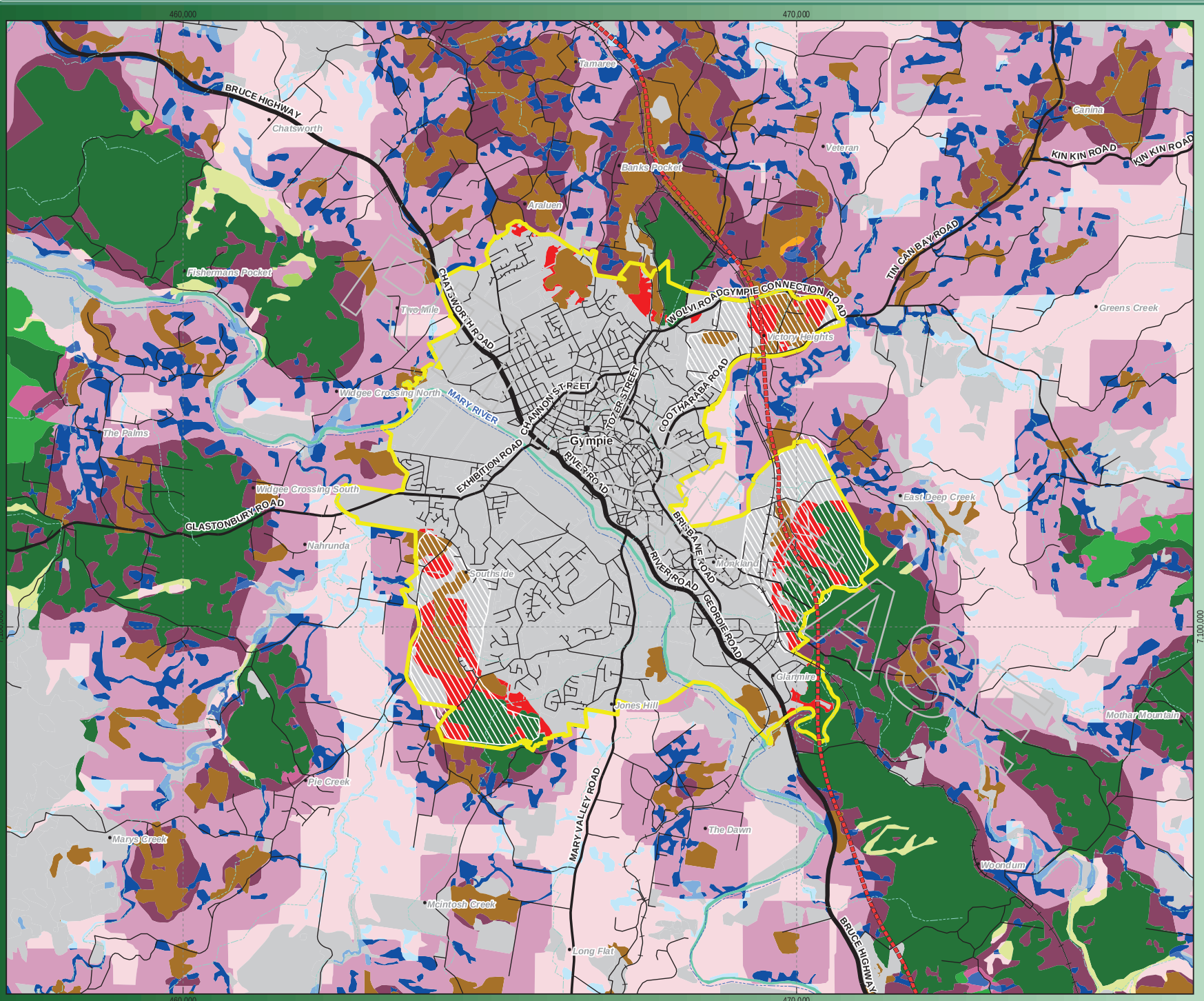

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N W E S

0 0.45 0.9 1.35 1.8 2.25

Kilometers

1:60,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Legend

- Locality
- Town
- Rail
- Major Watercourse
- Minor

Road Network

- Highways
- Secondary Roads
- Local Connector Road
- Street/ Local
- Proposed Hway Upgrade
- Gympie LGA Boundary
- Urban Footprint
- Urban Expansion Area

Koala Habitat Value

- HV bushland
- M-HV bushland
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- LV bushland
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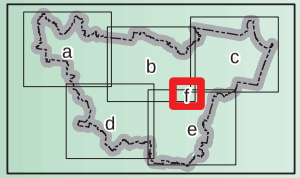
- M-HV Rem bushland
- L-MV Rem bushland
- LV Rem bushland
- HV rural
- M-HV rural
- L-MV rural
- LV rural
- HV urban
- M-HV urban
- HV rehab
- M-HV rehab
- L-MV rehab
- LV rehab
- Non-habitat
- Water



Gympie Koala
Habitat Mapping
Gympie Regional Council

Koala Habitat Values

Figure 8f

03 May 2016 Z:\GIS\ECO15_0024\GIS\Final\maps\v6\ECO15_0024_08_koala_habitat_values_v6.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) DILGP: Widebay Regional Plan (Sep 2011), DSITI: Biodiversity Status of pre-clearing and remnant regional ecosystems, Landuse Mapping Qld Current (May 2015) DEHP: EPA 1994 - Mature Regrowth
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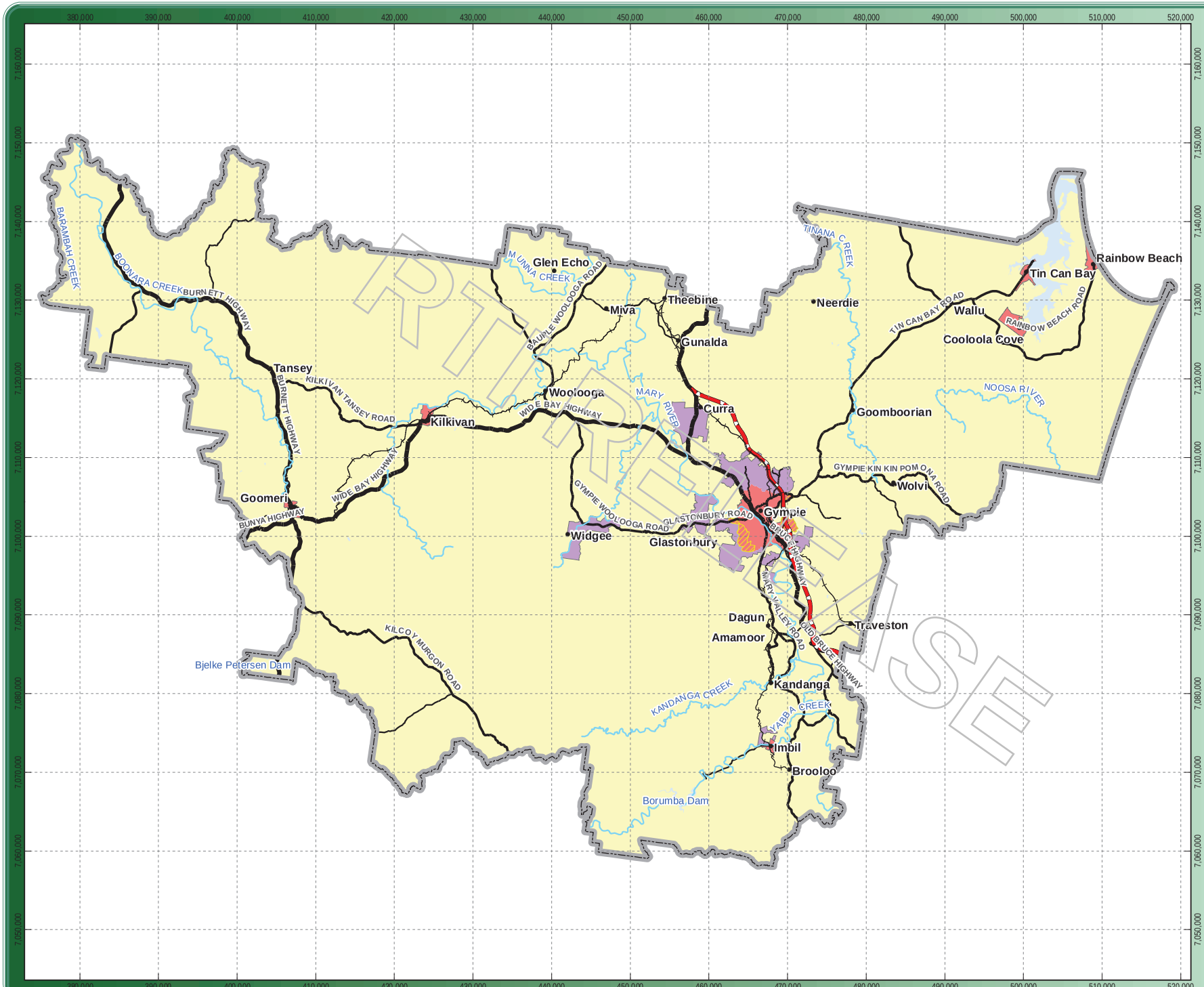

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N W E S

0 3 6 9 12 15
Kilometers

1:460,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Legend

- Town
- Major Watercourse
- Rail

Road Network

- Highways
- Secondary Roads
- Local Connector Road
- Proposed Hway Upgrade
- Gympie LGA Boundary

Wide Bay Regional Plan

- Urban Footprint
- Regional Landscape and Rural Production
- Rural Living
- Local Regional Development

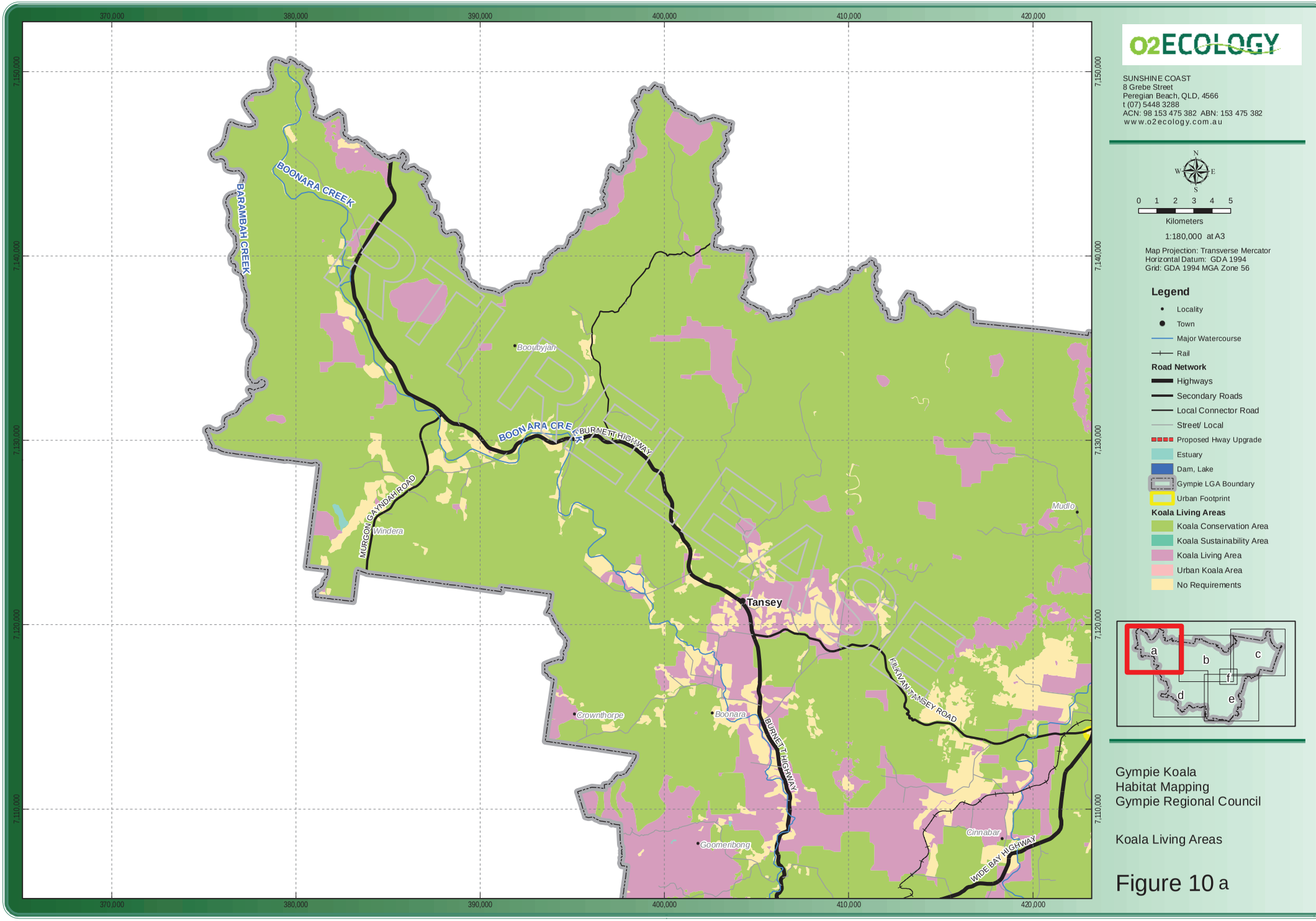
Gympie Koala
Habitat Mapping
Gympie Regional Council

Wide Bay Regional Plan

Figure 9

03 May 2016 Z:\GIS\ECO15_0024\GIS\Final\maps\v6\ECO15_0024_09_widebayregionalplan_v6.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015), DILGP: Widebay Regional Plan (Sep 2011) © State of Queensland (DNRM, DILGP)



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N W E S

0 1 2 3 4 5
Kilometers

1:180,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Legend

- Locality
- Town
- Major Watercourse
- Rail

Road Network

- Highways
- Secondary Roads
- Local Connector Road
- Street/ Local
- Proposed Hway Upgrade
- Estuary
- Dam, Lake
- Gympie LGA Boundary
- Urban Footprint

Koala Living Areas

- Koala Conservation Area
- Koala Sustainability Area
- Koala Living Area
- Urban Koala Area
- No Requirements

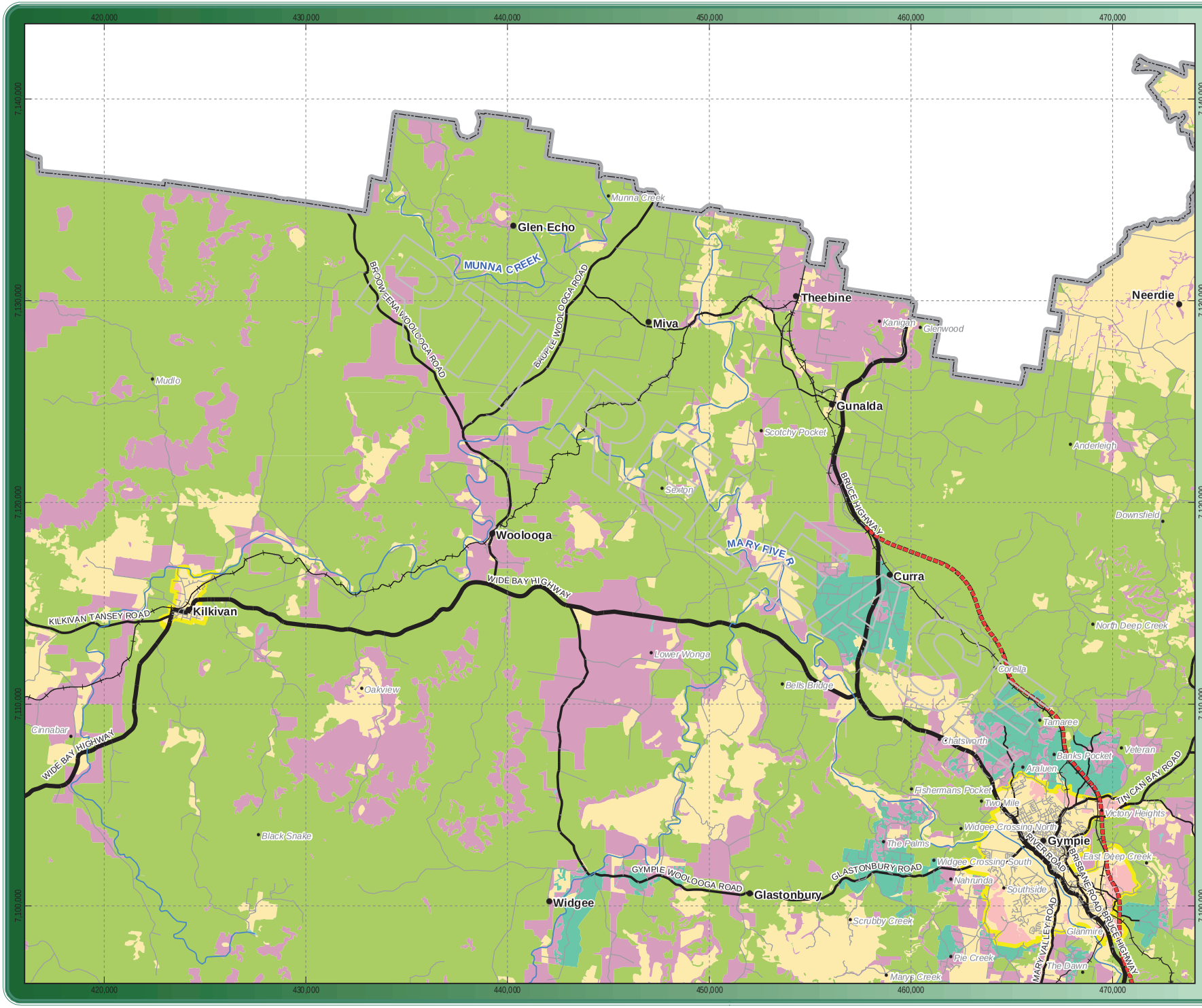
Gympie Koala
Habitat Mapping
Gympie Regional Council

Koala Living Areas

Figure 10 a

03 May 2016 Z:\GIS\ECO15_0024\GIS\Final\maps\v6\ECO15_0024_10_koala_living_areas_v6.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) DILGP: Widebay Regional Plan (Sep 2011) DSITI: Biodiversity Status of pre-clearing and remnant regional ecosystems © State of Queensland (DNRM, DEHP, DSITI, DILGP)



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0 1 2 3 4 5
Kilometers

1:180,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Legend

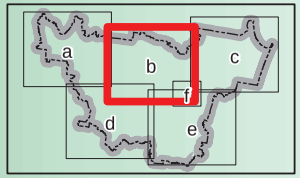
- Locality
- Town
- Major Watercourse
- Rail

Road Network

- Highways
- Secondary Roads
- Local Connector Road
- Street/ Local
- Proposed Hway Upgrade
- Estuary
- Dam, Lake
- Gympie LGA Boundary
- Urban Footprint

Koala Living Areas

- Koala Conservation Area
- Koala Sustainability Area
- Koala Living Area
- Urban Koala Area
- No Requirements



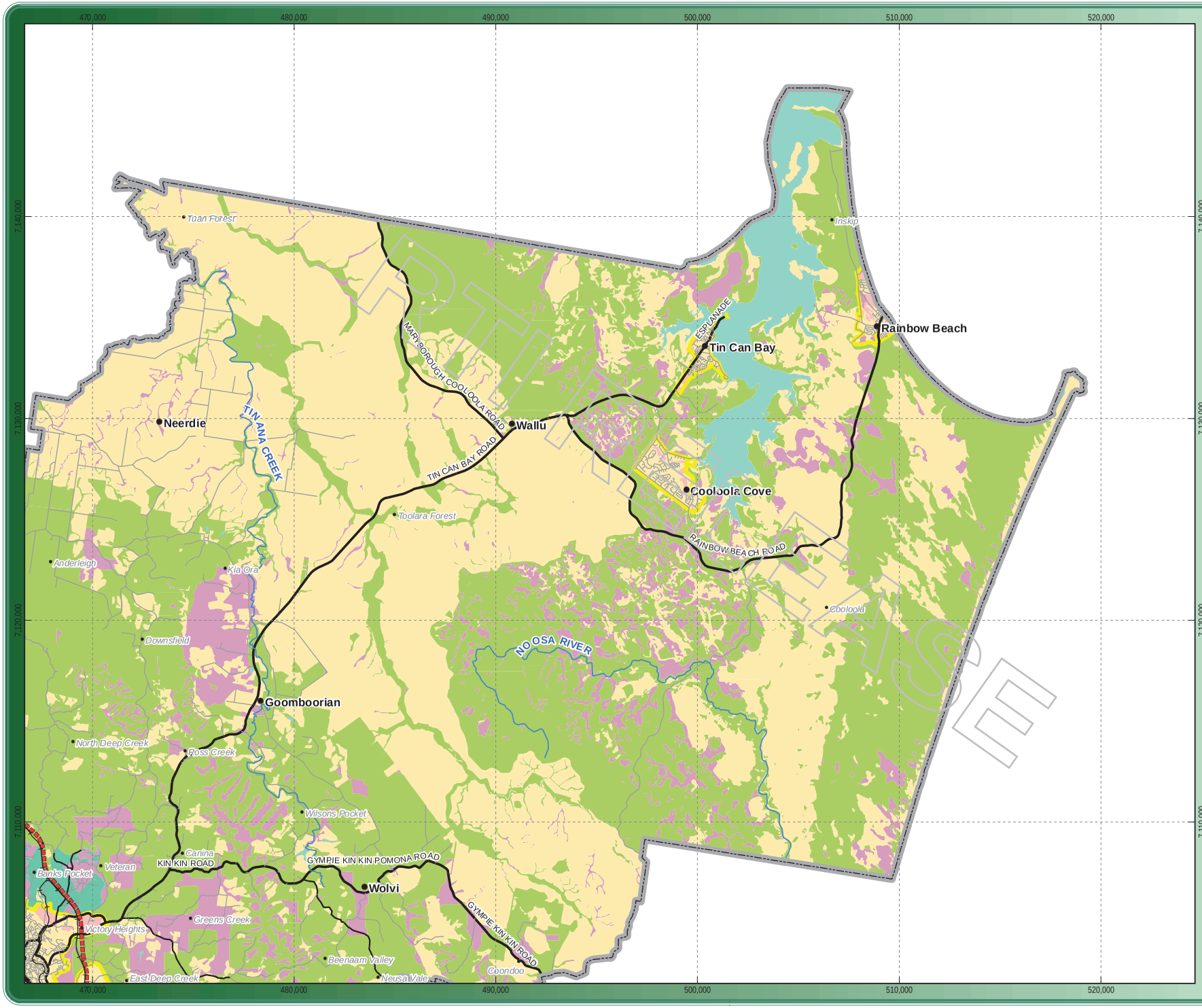
Gympie Koala
Habitat Mapping
Gympie Regional Council

Koala Living Areas

Figure 10 b

03 May 2016 Z:\GIS\ECO15_0024\GIS\Final\maps\v6\ECO15_0024_10_koala_living_areas_v6.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) DILGP: Widebay Regional Plan (Sep 2011) DSITI: Biodiversity Status of pre-clearing and remnant regional ecosystems © State of Queensland (DNRM, DEHP, DSITI, DILGP)



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N W E S

0 1 2 3 4 5
Kilometers

1:180,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Legend

- Locality
- Town
- Major Watercourse
- Rail

Road Network

- Highways
- Secondary Roads
- Local Connector Road
- Street/ Local
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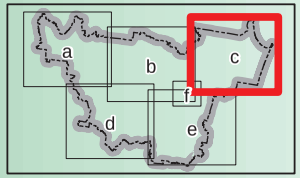


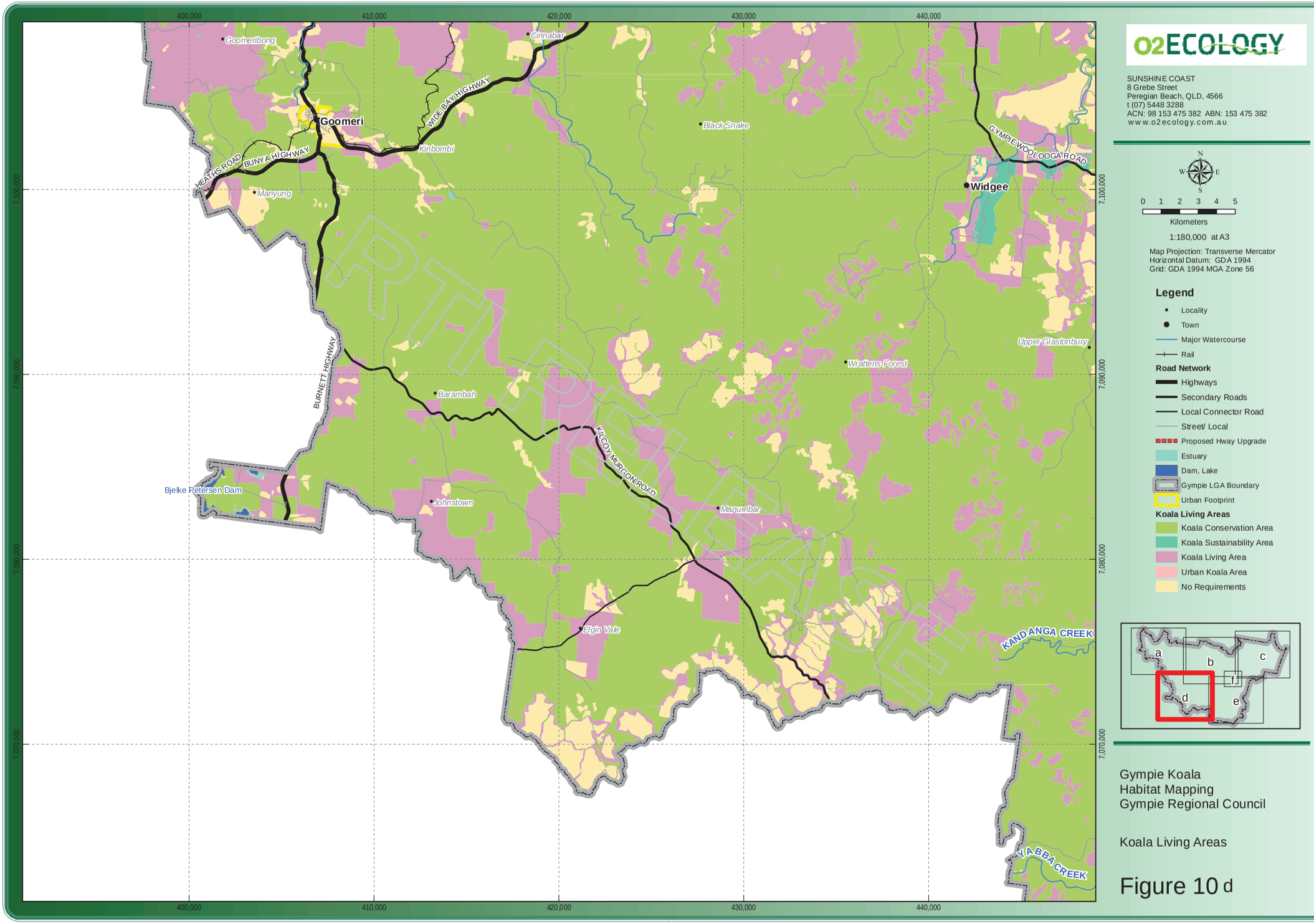
Gympie Koala
Habitat Mapping
Gympie Regional Council

Koala Living Areas

Figure 10 c

03 May 2016 Z:\GIS\ECO15_0024\GIS\Final\maps\v6\ECO15_0024_10_koala_living_areas_v6.mxd

Data source: DNRM: Local Government Boundaries QLD (Mar 2015), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2015), Place name gazetteer (Mar 2015) DILGP: Widebay Regional Plan (Sep 2011) DSITI: Biodiversity Status of pre-clearing and remnant regional ecosystems © State of Queensland (DNRM, DEHP, DSITI, DILGP)



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Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

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Habitat Mapping
Gympie Regional Council

Koala Living Areas

Figure 10 d

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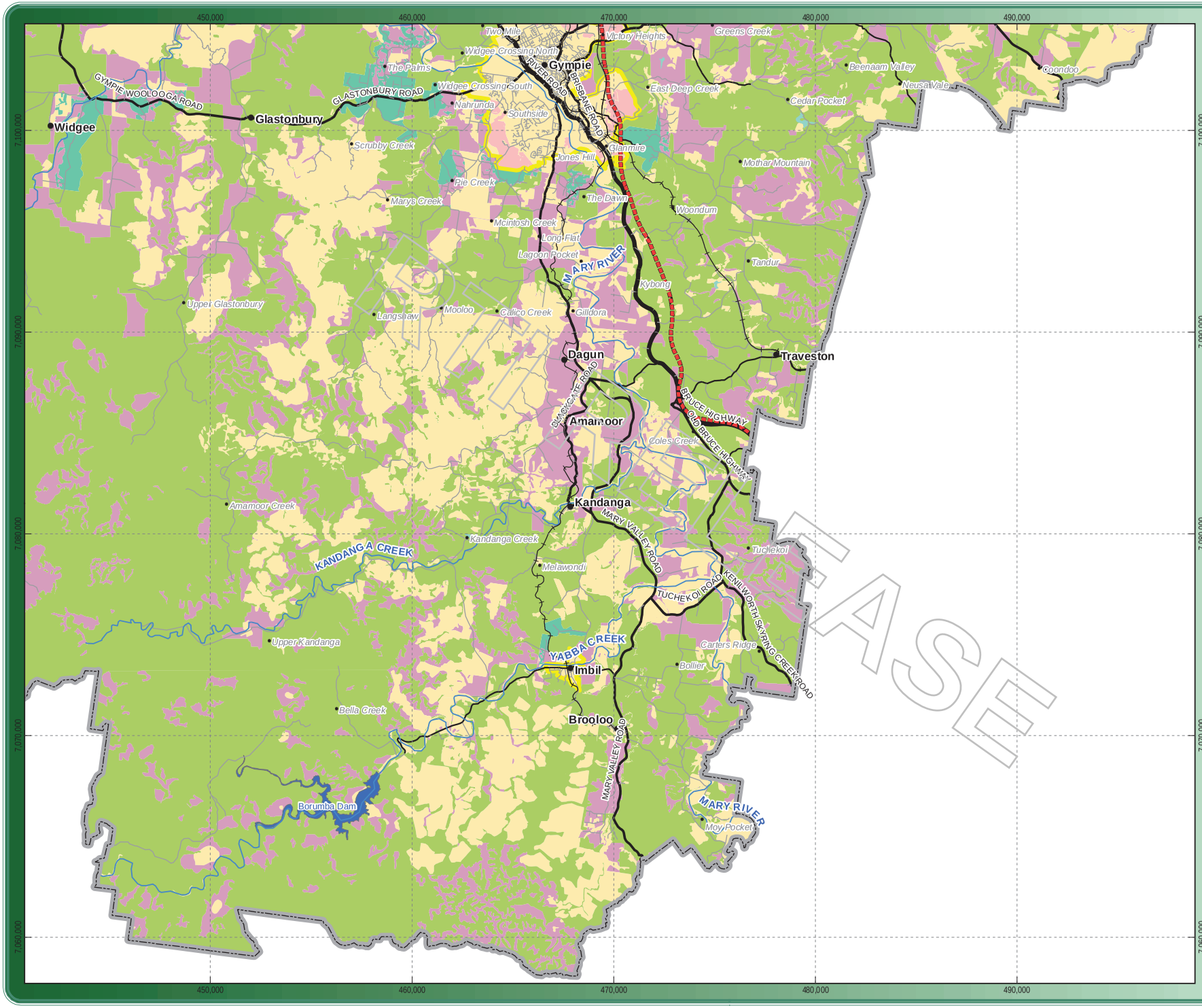

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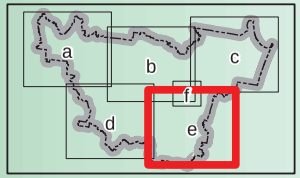

Gympie Koala
Habitat Mapping
Gympie Regional Council

Koala Living Areas

Figure 10 e

03 May 2016 Z:\GIS\ECO15_0024\GIS\Final\maps\v6\ECO15_0024_10_koala_living_areas_v6.mxd

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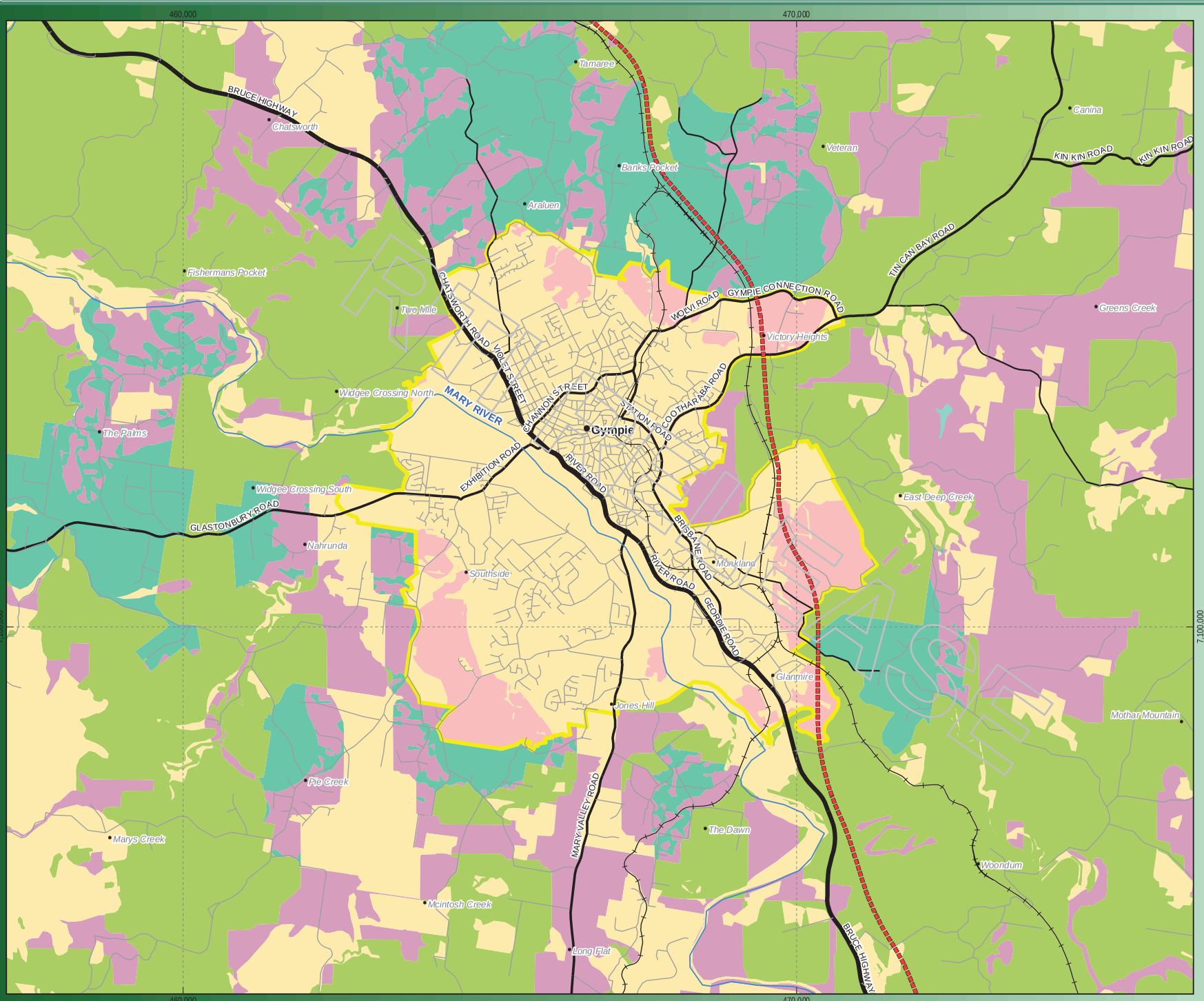

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Kilometers

1:60,000 at A3

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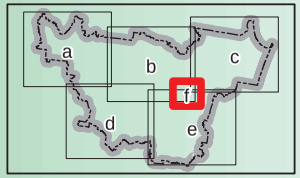

Gympie Koala
Habitat Mapping
Gympie Regional Council

Koala Living Areas

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03 May 2016 Z:\GIS\ECO15_0024\GIS\Final\maps\v6\ECO15_0024_10_koala_living_areas_v6.mxd

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From: s. 73(2) - Not rel
To: Holly Sorohan
Cc: s. 73(2) - Luke Lankowski
Subject: FW: TLPI-00067 - Temporary Local Planning Instrument 2 - Protection of biodiversity values - Paused
Date: Thursday, 9 January 2020 9:28:16 AM
Attachments: image001.jpg
Gympie TLPI - Pause notice - 24 January 2020 (003).pdf
Importance: High

Hi Holly,
I hope you had a lovely Christmas break.
I was just looking at timeframes and know we're getting closer to the pause notice end date so wanted to touch base and see if you've had a chance to lock in a meeting date/time with DES for Council to meet with them to discuss the mapping methodology for the whole-of-region TLPI?
Kind Regards

s. 73(2) - Not relevant/ Ou
Coordinator - Planning Scheme Program
PLANNING STRATEGY AND MAJOR PROJECTS
cid:image003.jpg@01D5AB73.485C3990
Gympie Regional Council
29 Channon Street (PO Box 155)
Gympie Qld 4570
s. 73(2) - Not releva
@gympie.qld.gov.au

From: s. 73(2) - Not relevant/ O
Sent: Thursday, 19 December 2019 2:12 PM
To: 'Holly Sorohan' <Holly.Sorohan@dsdmip.qld.gov.au>
Cc: s. 73(2) - Not relevant/ Out @gympie.qld.gov.au>; s. 73(2) - Not relevant/ Out of scop @gympie.qld.gov.au>; s. 73(2)
s. 73(2) - Not relevant/ Out gympie.qld.gov.au>
Subject: FW: TLPI-00067 - Temporary Local Planning Instrument 2 - Protection of biodiversity values - Paused
Thanks Holly.
Council looks forward to meeting with DSDMIP and DES in the new year to discuss the mapping methodology.
If you could send through a meeting request once you've been able to lock in a date and time that'd be appreciated.
Kind Regards

s. 73(2) - Not relevant/ Ou
Coordinator - Planning Scheme Program
PLANNING STRATEGY AND MAJOR PROJECTS
cid:image003.jpg@01D5AB73.485C3990
Gympie Regional Council
29 Channon Street (PO Box 155)
Gympie Qld 4570
s. 73(2) - Not releva
@gympie.qld.gov.au

From: DSDMIP Email <noreply@email.dsdmip.qld.gov.au>
Sent: Thursday, 19 December 2019 1:58 PM
To: Bernard Smith <Bernard.Smith@gympie.qld.gov.au>; s. 73(2) - Not relevant/ Out @gympie.qld.gov.au>; Luke Lankowski <Luke.Lankowski@dilgp.qld.gov.au>; Nathan Rule <Nathan.Rule@dilgp.qld.gov.au>; s. 73(2) - N
s. 73(2) - Not relevant/ Out of scope @gympie.qld.gov.au>
Subject: TLPI-00067 - Temporary Local Planning Instrument 2 - Protection of biodiversity values - Paused

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Dear s. 73(2)

TLPI-00067 - TLPI - Temporary Local Planning Instrument 2 - Protection of biodiversity values has been paused by the department. Click here to view the details or refer to the copy attached.

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From: s. 73(2) - Not rele
To: Holly Sorohan
Cc: s. 73(2) - N uke Lankowski; s. 73(2) - N
Subject: Temporary Local Planning Instrument 2 - Protection of biodiversity values
Date: Tuesday, 28 January 2020 9:52:37 AM
Attachments: image001.jpg
Importance: High

Good morning Holly,
Thank you for taking the time to discuss with me on Friday the current stage at where both proposed Temporary Local Planning Instruments are at.
In regards to the proposed Temporary Local Planning Instrument 2 – Protection of biodiversity values (TLPI), whilst Council appreciates the resource limitations the State are currently experiencing around being able to assess the proposed Koala Habitat Mapping for the region (with a meeting not being able to be held till mid-March), the reasons a Temporary Local Planning Instrument is proposed for this matter under the current sitting Council as opposed to progressing the work as a Major Amendment in the first instance are significant. The identified significant risk to biodiversity values should not be prolonged due to limitations of State resources.
There is a significant risk to biodiversity values, including significant koala habitat, due to the lack of regulation of vegetation clearing under the current Gympie Regional Council Planning Scheme 2013, as well as State government exemptions. As stated in the material submitted with the proposed TLPI, a land owner can clear their entire lot of proposed mapped significant vegetation (including koala habitat) in an urban zone (which includes Rural Residential zoned land of which there is a significant quantity of in the Gympie region) and the Planning Scheme does not regulate this.
A considerable amount of work was undertaken with the current Councillors to set the policy direction within the proposed TLPI which is why it is important that the resolution to adopt the proposed TLPI occurs under the Councillors who were involved in setting this policy, and subsequently endorsed the policy to progress to the State as a TLPI.
Should the resolution not occur under the current Council, this will result in a significant delay in the adoption of the proposed TLPI by a new Council. Once a new Council is in place (after the Local government elections), there is an on-boarding process where the first one to two Council meetings focus on educating the Councillors on various matters before significant matters involving the Planning Scheme are discussed. As the elections are in March, it is anticipated a discussion on the proposed TLPI with a new Council would not be able to occur until at least May 2020. Therefor it is vital adoption occurs under the current Council who set this policy.
Council are happy to discuss the urgency of this further with relevant DSDMIP representatives if you believe this is required to facilitate the urgent progression of the proposed TLPI.
Please don't hesitate to contact me on s. 73(2) - Not re or via email to discuss the above further.
Kind Regards

s. 73(2) - Not relevant/ Out
Coordinator - Planning Scheme Program
PLANNING STRATEGY AND MAJOR PROJECTS
cid:image001.jpg@01D5C9EB.BE57A490
Gympie Regional Council
29 Channon Street (PO Box 155)
Gympie Qld 4570
s. 73(2) - Not releva
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From: Luke Lankowski
To: s. 73(2) - Not relevant/ Out of scope
Cc: Holly Sorohan
Subject: TLPI 02/2019 & TLPI 03/2019
Date: Friday, 7 February 2020 3:56:37 PM
Attachments: caretaker-period-factsheet.pdf
image001.png
image002.png
image003.jpg
image004.jpg
image005.jpg
image006.jpg
image007.jpg
image008.jpg
image009.jpg
image010.jpg

Hi s. 73(2) - Not relevant/ Out

Thank you for your time this afternoon.

I confirm I will provide an update on Monday after my discussions with the Department of Environment and Science, and otherwise look forward to your advice regarding council's decision on the proposed amendment, and any decision relating to delegations for the consideration of TLPI 02/2019 and TLPI 03/2019.

Should you require any further information about the process for seeking an exemption for a major policy decisions during the caretaker period there is information in the factsheet attached which may be of assistance.

Please feel free to contact me on the details below should you require any further information.

Regards,

Luke

Luke Lankowski
Manager (Wide Bay Burnett)
Planning and Development Services
Department of State Development,
Manufacturing, Infrastructure and Planning

P 07 4331 5602 **M** Sch. 4(4)(6) - □
Level 1, 7 Takalvan Street, Bundaberg QLD 4000
PO Box 979, Bundaberg QLD 4670
www.dsdmip.qld.gov.au

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RTI RELEASE

From: Luke Lankowski
To: s. 73(2) - Not relevant/ Out o
Cc:
Subject: RE: TLPI 02/2019 & TLPI 03/2019
Date: Monday, 10 February 2020 9:59:00 AM
Attachments: image012.png
image015.jpg
image016.jpg
image017.jpg
image018.jpg
image019.jpg
image020.jpg
image021.jpg
image022.jpg
image001.png
image002.png
image006.jpg
image007.png

Hi s. 73(2
Thank you for the update and I'll await your further advice after the council meeting
I will also provide an update on the discussions with the Department of Environment and Science as soon as possible in relation to TLPI 03/2019. Hopefully we can reach an agreement about the benefits of the temporary protections shortly, to enable us to progress the assessment further.
Please feel free to contact me if you require any further information or there are any matters you would like me to follow up on council's behalf.
Regards,
Luke

Luke Lankowski
Manager (Wide Bay Burnett)
Planning and Development Services
Department of State Development,
Manufacturing, Infrastructure and Planning
P 07 4331 5602 **M** Sch. 4(4)(6) - I
Level 1, 7 Takalvan Street, Bundaberg QLD 4000
PO Box 979, Bundaberg QLD 4670
www.dsdmip.qld.gov.au

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From: s. 73(2) - Not relevant/ Out of scop gympie.qld.gov.au>
Sent: Monday, 10 February 2020 9:43 AM
To: Luke Lankowski <Luke.Lankowski@dsdmip.qld.gov.au>
Cc: s. 73(2) - Not relevant/ Out o @gympie.qld.gov.au>; s. 73(2) - Not relevant/ O
s. 73(2) - Not relevant/ O @gympie.qld.gov.au>
Subject: RE: TLPI 02/2019 & TLPI 03/2019

Hi Luke,
s. 73(2 and I spoke to Bernard on Friday afternoon and explained the situation. As I expected he did not think a special meeting would be achievable, however he is comfortable with the option of having decisions on both TLPIs delegated to him.
While that gives us a way forward, I am still quite concerned noting there are a number of Councillors who have challenged the level of delegation given to the CEO on previous occasions so this is not a certain outcome. Therefore, I'm also hoping the discussion isn't side-tracked to an election issue about 'the power of the CEO' rather than dealing with the importance of the TLPIs!
I'm briefing the Mayor and our Planning Portfolio Councillor this afternoon so they are clear on the reasons etc. and subject to any updated advice you provide later today, s. 73(2 has prepared

RTI RELEASE

an email to update all Councillors which will be issued late this afternoon.
Thanks again for your efforts on our behalf,
Regards

s. 73(2) - Not relevant
DIRECTOR PLANNING AND DEVELOPMENT
Gympie Regional Council
Address (PO Box 155)
Gympie Qld 4570
s. 73(2) - Not rel gympie.qld.gov.au
www.gympie.qld.gov.au

From: Luke Lankowski <Luke.Lankowski@dsdmip.qld.gov.au>
Sent: Friday, 7 February 2020 3:56 PM
To: s. 73(2) - Not relevant/ Out of scop@gympie.qld.gov.au>; s. 73(2) - Not relevant/ Out of @gympie.qld.gov.au>; s. 73(2) - Not relevant/ Out of scope @gympie.qld.gov.au>
Cc: Holly Sorohan <Holly.Sorohan@dsdmip.qld.gov.au>
Subject: TLPI 02/2019 & TLPI 03/2019

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Department of State Development,
Manufacturing, Infrastructure and Planning
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