Koala Habitat Preservation, Enhancement and Restoration Plan

for the South Gippsland Landcare Network 2012-2016

GUIDE TO IDENTIFY PRIORITY AREAS FOR HABITAT PROTECTION, ENHANCEMENT AND RESTORATION

SOUTH GIPPSLAND LANDCARE NETWORK
Communities for Nature
Department of Sustainability and Environment
Victoria

THE SOUTH GIPPSLAND LANDCARE NETWORK

The South Gippsland Landcare Network (SGLN) was formed in 1995 and today is made up of 18 groups and over 800 families who manage and farm the land. The success of the Network is due to the inspiring contributions made by the passionate individuals and volunteers.

The Network area covers 270,000 ha and is bordered by the Strzelecki Ranges to the north and the Bass Strait to the south. The south-western half of the catchment is part of the Gippsland Plains bioregion, characterized by lowland coastal and alluvial plains with gentle undulating terrain which rises to meet the Strzelecki Ranges to the north.

Compiled by Kathleen Bartlett for the South Gippsland Landcare Network, PO BOX 419 Leongatha, Victoria 3953. January 2013. For copies of this report please contact (03) 56625759.

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This plan is to be updated annually.

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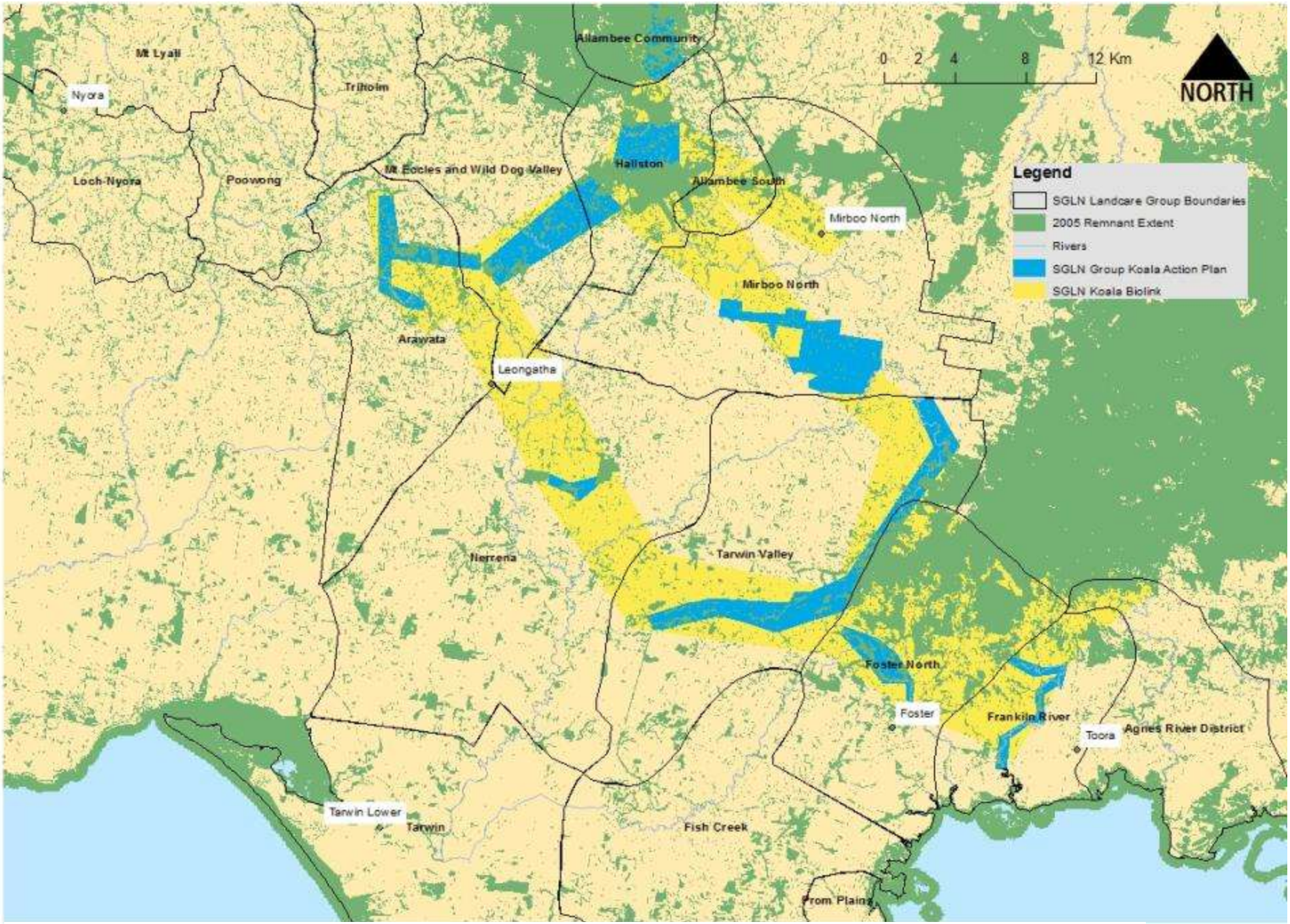

Figure 1: South Gippsland Landcare Network Koala Habitat Preservation, Enhancement and Restoration Plan 2012- 2016

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INTRODUCTION

1. OVERVIEW

The South Gippsland Landcare Network (SGLN) initiated this plan as part of their Friends of Strzelecki Koala (FOSK) Habitat for Life Project, funded through the Department of Sustainability and Environment 2011/2012 Communities for Nature Funding Round.

The Strzelecki Koala population is unique in Victoria as they are believed to be a genetically intact example of a wild population of koalas, unlike other regions around the State which have been affected by repopulated translocations from island colonies with a low genetic base. It is therefore feasible that this population will better withstand threats such as disease and climate change than other populations in Victoria. Maintaining this population could be crucial to the future survival of koalas in Victoria.

The overall aim of this project is to protect, enhance and restore vegetation in South Gippsland as part of a strategic Network wide attempt to improve Strzelecki Koala Habitat. This will be done through the identification of priority areas for habitat preservation and revegetation activities that will enhance existing habitat and improve connectivity across the landscape.

Our approach is to not only to strategically identify areas of strong connectivity and quality habitat through mapping, but also to work with landholders and Landcare Groups to identify high priority remnant areas and potential corridors on a group scale. It is hoped that by working with Landcare Groups and landholders, projects will take a bottom up approach, creating group ownership and social benefit, as well as combine to be part of a much wider Landscape scale change.

The aim of the plan is to be a strategic document to guide onground works, the education program and monitoring and evaluation throughout the four year program.

"The overall aim of the FOSK Habitat for Life project is to protect, enhance and restore vegetation in South Gippsland as part of a strategic Network wide attempt to improve Strzelecki Koala Habitat"

2. AIMS

The overall aim of the FOSK Habitat for Life project is to protect, enhance and restore vegetation in South Gippsland as part of a strategic Network wide attempt to improve Strzelecki Koala habitat.

The table below outlines the project goals, objective and actions required to be completed to achieve the aim. They are matched by objectives that follow the S.M.A.R.T principle (specific, measurable, achievable, realistic and timely). Objectives are used as indicators of the achievement of goals (Society for Ecological Restoration, 2005) allowing the project to monitor and evaluate the ongoing success of the project. The actions below are needed in order to achieve an objective and therefore a goal.

Table 1: Project Goals, Objectives and Actions

Project Goals	Objectives	Actions
• **Increase the biodiversity and habitat values of key sites in the Strzelecki Ranges being the home of the unique Strzelecki Koalas** • **Protect key remnant vegetation areas and undertake revegetation activities to enhance existing habitat and increase the connectivity of the vegetation across the landscape** • **Improve fragmentation of Koala Habitat with strategic nature links.**	• 50 hectares of land will be managed as part of this project so that herbaceous weeds levels managed to not increase from current levels and control woody weeds over project lifespan contract by September 2016 • 50 hectares of remnant will be fenced and managed by landholders by September 2016 • 70 hectares of revegetation will be undertaken as part of the project by September 2016 Ensym • 100,000 will be planted by September 2016 • 100% of all projects to be completed by September each year. • 100% of projects are finished correctly and successfully by September 2016	• SGLN to develop a KHPER Plan for the South Gippsland Landcare Network identifying areas of connectivity and status of land use • DSE to create Ensym scenario ranking projects according to specified criteria and location • SGLN Project Officers to undertake site visits and Habitat Hectares assessment to assess habitat type, condition, and species for project ranking as well as map site • SGLN to provide landholders with management actions, guidelines and information on projects • SGLN Project Officers enter projects into Ensym to rank site according to project criteria • Landholders undertake on ground works after payment of subsidy for fencing, weed control and revegetation for landholders to undertake onground works • SGLN to undertake monitoring and evaluation of onground works
• **Raise community awareness, understanding and involvement in the importance of habitat preservation and enhancement**	• Increase in “new landholders” participating in project from year 1 to year 4 • Implementation of the “Sowing Seeds” school program in 10 schools by June 2016 • Returning the *Sowing Seeds School Program* in 5 schools by June 2016 • Recruit 80 citizen ecologists community members to improve understanding and awareness of Koalas by June 2016 • 100 sightings of koalas uploaded to our website by June 2016 • 12 information dissemination events (4 formal, 8 informal) hosted by June 2016	• SGLN development of *Citizen Ecologist Program* • Development of *Sowing Seeds School Program*" • SGLN creation of information packs for volunteers and schools • SGLN to run field days and information sessions • SGLN/HVP training of volunteers in koala counts • SGLN training volunteers to collect Koala scats • Monitor and evaluation of the citizen ecologist component of the project

3. A SNAPSHOT OF THE KOALA

Understanding the koala is important in order to strategically support habitat that is beneficial and suited to the needs of the koala.

3.1 THE KOALA

The koala is one of Australia's most iconic animals and yet its survival is by no means secure. Urbanisation and clearing has left its status in many parts of Australia as under threat.

Apart from being an important attractant for tourism (the value of the Koala as a tourism icon for Australia in 1996 has been estimated at $1.1 billion (Hamilton, 1997)) the koala also has important environmental value.

The koala (*Phascolarctos cinereus*) is the only living species of the Phascolarctidae family, an ancient family that reached maximum diversity in the Oligocene Epoch (34-24 million years ago). Six genera and 18 fossil species have been described but only the Koala remains (Black, 1999).

The Koala is an arboreal (tree dwelling) marsupial with large furry ears and a vestigial tail (Department of the Environment, Water, Heritage and the Arts, 2009). Its fur colour varies from pale grey in the northern parts of its range to grey-brown in the south. The koala also varies in size across its latitudinal range, from an average 6.5 kilograms in Queensland to 12 kilograms in Victoria. Male koalas can weigh up to 50 per cent more than females (Department of the Environment, Water, Heritage and the Arts, 2009).

3.2 DISTRIBUTION IN AUSTRALIA

Koala populations are distributed along eastern Australia including parts of south-eastern South Australia (Department of the Environment, Water, Heritage and the Arts, 2009). Their habitat consists of forests containing trees of the Eucalyptus genus.

Since European settlement, around 44% of eucalyptus forests and woodlands, and callitris forest and woodlands (potential koala habitat) have been cleared for farmland, towns and cities, and further areas have been devastated by drought and the effects of fragmentation such as dieback and bushfires (Australian Koala Foundation, 2012).

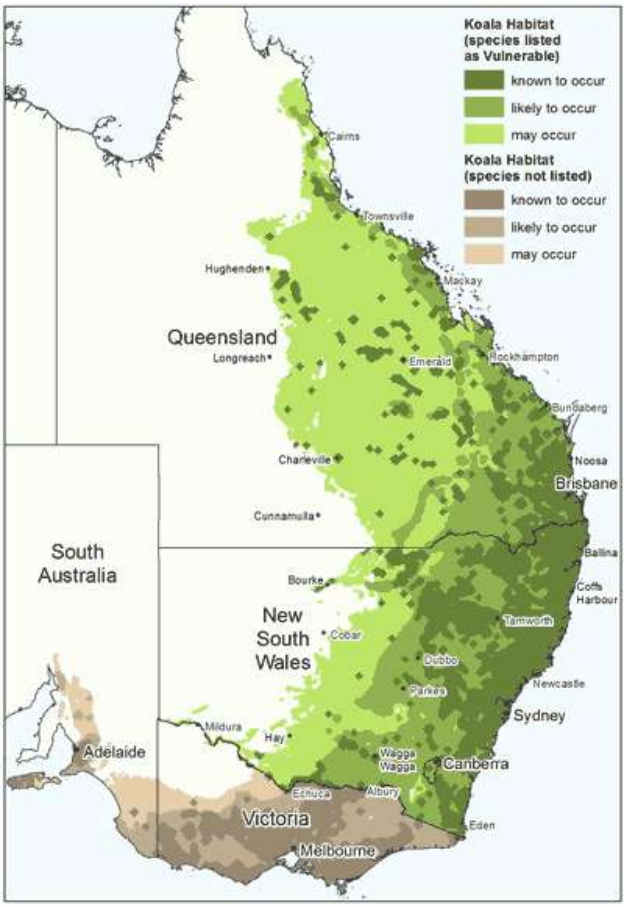

Figure 2: Distribution of Koalas in Australia (Department of Sustainability, Environment, Water, Population and Communities, 2012)

3.3 DIET

The diet of the koala dictates home ranges and habitat across the landscape.

The koala is an arboreal folivore and relies heavily on its Eucalyptus habitat for sustenance (Bryan, 2002). Eucalyptus leaves have many defensive mechanisms to deter herbivores, as well as low concentrations of nutrients, yet koalas have developed extremely specialised digestive system capable of digesting up to 90% of the nutrients contained in most eucalypt leaves (ISU, 2012).

The amount of energy obtained by koalas eating Eucalyptus leaves is also low, requiring koalas to not only eat more leaves, but also pick and choose the best leaves with higher nutrients and lower toxins.

Koalas extract a majority of their water requirements from their food and move between trees only around once every 24 hours, thus reducing their energy consumption (Martin & Handasyde, 1999).

3.4 HABITAT

Koalas are found across eastern Australia in a range of temperate, sub-tropical and tropical forest, woodland and semi-arid communities dominated by eucalypt species (Martin & Handasyde, 1999).

The greatest factor whether habitat supports a viable koala population is if the patch contains a eucalypt species that is not only utilised by koalas, but is the dominant tree present. What this species is varies from colony to colony however in the southern states this is likely to be manna gum (*E. viminalis*) (Bryan, 2002).Trees are described as primary, secondary or supplementary trees depending on whether koalas utilise them.

Habitat can then be described on the basis of what trees are present in the patch. Vegetation is broken down into primary and secondary habitat, characterised by habitat quality and not dependent on koala presence. If the area is dominated by tree species known to be preferred by koalas it is considered primary habitat (Licari & Phillips 2011).

If the forest is dominated by non-preferred tree species yet preferred tree species still occur it is considered secondary habitat (Licari & Phillips 2011). Koala populations depend on secondary habitat when primary habitat is severely fragmented, as well as for secondary browsing, resting, and general shelter.

3.5 BREEDING

Female Koalas will begin breeding at around three to four years age, usually producing one offspring per year. Factors such as quality of habitat, koala age, and stress levels all impact the chance of a koala conceiving (Australian Koala Foundation, 2012).

35 days after conception, a hairless, blind joey makes its way from the birth canal to the Koala pouch. Joeys are roughly 2 centimetres long and weighing less than 1 gram. The joey remains in the safety of the pouch, attaching itself to one of the two teats, which swells to fill its mouth (Australian Koala Foundation, 2012). Joey's remain with their mothers until the appearance outside the pouch of the next season's sibling (Australian Koala Foundation, 2012)

Breeding season occurs from August to February (Australian Koala Foundation, 2012). This is also when the young from the previous year are dispersing from their mothers, a perilous time as these young koalas cross roads and urban areas to find their own home range.

3.6 SOCIAL BEHAVIOUR AND HOME RANGES

Koalas are essentially solitary animals that live in well-defined home ranges (Wildcare Australia, 2012). The size of a koala's home range is hugely variable and dependent on many factors. In more arid habitat that has less dense forest areas or woodland, the home ranges tend to be larger than those of koalas living in coastal Eucalypt woodlands. Home ranges are also dictated by fences, roads and abundance and access to food trees.

Alpha males will often roam a home range that overlaps with several female koalas. Each female will have her own defined home range, with most of that overlapping another female. Non-dominant males can also overlap this area (Wildcare Australia, 2012).

> **"IF THE AREA IS DOMINATED BY TREE SPECIES KNOWN TO BE PREFERRED BY KOALAS IT IS CONSIDERED PRIMARY HABITAT"**

4. THE STRZELECKI KOALA

Recent studies have now confirmed the Koala Population found in the Strzelecki Ranges (called the Strzelecki Koala) in Gippsland, Victoria has a higher genetic diversity compared to other south-eastern Australian populations (Lee, Zenger, Close, & Phalen, 2012).

4.1 HISTORY OF THE STRZELECKI KOALA

There is no current population estimate for the Koala in Victoria due to difficulty in monitoring the large population and its varied density across the state.

This was not always the case. The fur trade in the late 19th century greatly reduced Koala numbers in the state, with population estimates reaching as low as between 500-1000 (Lewis, 1934). Several koalas were moved onto French Island prior to this and grew to a flourishing population. In the 1920's, the Victorian Government gradually began to translocate populations back onto the mainland (Menkhorst, 2008) This program was hugely successful in reinvigorating koala numbers across Victoria to such an extent in some locations koala numbers became locally overabundant. These 'new' populations are believed to have a lower genetic diversity than koalas in the rest of Australia.

The exception to this low genetic diversity is the Strzelecki Koala population in South Gippsland. Thanks to the inaccessible steep country of the Strzelecki Ranges, the population is likely to have remained somewhat unscathed by the threats that impacted other populations (Menkhorst, 2008). Additionally, the area received only minimal numbers of translocated island animals (Department of Sustainability of Environment, 2004).The map below highlights the high number of sightings versus the low number of translocated release sites.

4.2 DISTRIBUTION

The distribution of the Strzelecki Koala population has not been fully investigated. Future research is required to summarize the reach of the Strzelecki Koalas population.

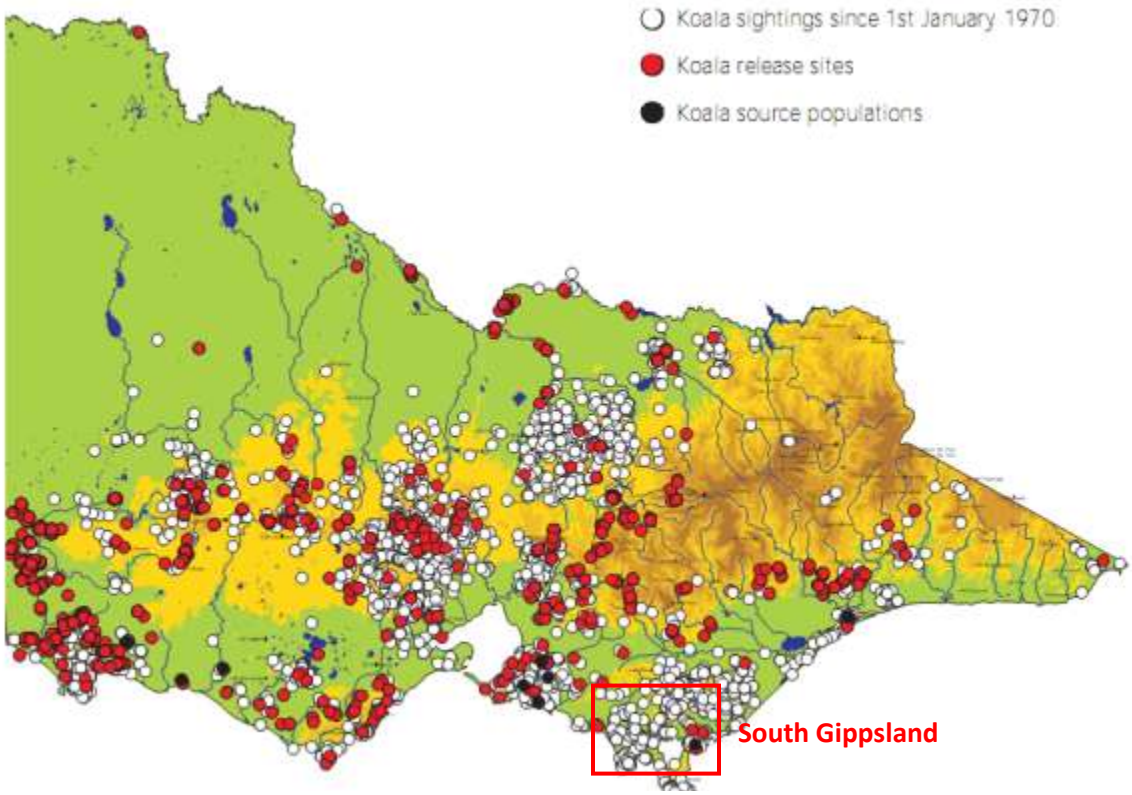

Figure 3 The distribution of sightings of Koalas in Victoria since 1970, the distribution of Koala release sites, and the locations of populations that have been a source of Koalas for translocation. Data from Atlas of Victorian Wildlife, 2004.

4.3 GENETICALLY UNIQUE

Advances in genetic technology have given scientists a better understanding of the biology of wild populations. These technologies have been used in various studies to determine the genetic diversity of Strzelecki Koalas in comparison to the rest of the Victorian Koala population. Techniques such as sequencing the mitochondrial genome provides an insight into the evolutionary history of populations, whilst microsatellite markers (located in the nuclear genome) have become the marker of choice for studies of intraspecific variation in wild populations (De Woody, 2005)

The genetic diversity found in South Gippsland koalas is comparable with the highest level of genetic diversity in any koala population reported so far in Australia (Lee et al., 2011) Victorian populations derived from translocated animals have an average reported allelic diversity of around 3 alleles per locus (Houlden et al, 1996) compared with populations in New South Wales that have up to 6.83 alleles per locus (Lee et al, 2010). Lee et al, (2012) found the South Gippsland population to have a mean of 6.44 alleles per locus. In the same study genetic and genotypic analysis discriminated between South Gippsland Koalas and those studied on French Island and the Mornington Peninsula.

Other studies have also found the Strzelecki Koalas to be more genetically diverse than other populations across South Eastern Australia, including island populations on French and Kangaroo Island (such as Houlden et al 2001).

> **“THE GENETIC DIVERSITY FOUND IN SOUTH GIPPSLAND KOALAS IS COMPARABLE WITH THE HIGHEST LEVEL IN ANY KOALA POPULATION REPORTED SO FAR IN AUSTRALIA”**

4.4 WHY IS IT IMPORTANT TO LOOK AFTER STRZELECKI KOALAS?

The low genetic diversity of other Victorian Koalas could make them more vulnerable to habitat and climate change and other survival pressures in the future. The South Gippsland Koala may be required to support and rebuild populations in the future.

The South Gippsland population should be considered as a separate management unit and will need specific management plans tailored to the conservation issues and priorities for the region (Lee et al, 2012). The most effective and simplest solution for conservation of koalas in the South Gippsland region would appear to be preventing or limiting any further loss of population connectivity, especially within part of the relatively undisturbed Strzelecki Ranges.

Although the Victorian State Government has identified the South Gippsland population as a priority population for study, there are no management plans specific to koalas in the South Gippsland region. The Strzelecki Koala also achieves no listing under State or Federal policy.

5. POLICY

This plan is influenced by a wide variety of Federal Government, State and local government policies, regulations and programs.

5.1 FEDERAL POLICY

National Koala Conservation Strategy (2009 to 2014)

The strategy provides the overarching approach to protecting and supporting Koalas in Australia. The aim of the National Strategy is to conserve koalas by retaining viable populations in the wild throughout their natural range. This influences the KHPER Plan as the strategy's desired short term outcomes (0-10 years) guides several of the plan's objectives. This includes a focus on increased community capacity to drive koala conservation and care and productive and integrated partnerships that foster the conservation and welfare of koalas.

The Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

The Environment Protection and Biodiversity Conservation Act 1999 (the EPBC Act) is the Australian Government's central piece of environmental legislation. It provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places — defined in the EPBC Act as matters of national environmental significance. As the koala is currently not listed in this act it therefore provides minimal guidance to the KHPER Plan.

National Wildlife Corridors Plan (2012)

The National Wildlife Corridors Plan (Corridors Plan) is the Australian Government's framework to retain, restore and manage ecological connections in the Australian landscape. This influences the KHRER Plan as it supports the use of corridors to achieve resilience in ecological community. This plan also highlights the importance of building corridors across private land, connecting importance environmental sites.

5.2 VICTORIAN POLICY

Victoria's Koala Management Strategy (2004)

Victoria's Koala Management Strategy provides guidance towards achieving the aim of the National Koala Conservation Strategy and meeting its six objectives in the State of Victoria. This strategy recognises the importance of the Strzelecki Koala population:

"Further, very little Koala habitat in South Gippsland is reserved for conservation purposes. Most is highly fragmented, and some is threatened by unsympathetic land uses. Therefore, if significant remnant genetic resources persist in South Gippsland it is imperative to ensure that habitat is protected as far as possible (Objective 2) (Department of Sustainability of Environment, 2004)"

Wildlife Act (1975)

This Act provides for the management of wildlife, and research into wildlife and its habitat. It also provides for the control of wildlife in situations where wildlife may be causing damage to vegetation or property. The Koala is 'protected wildlife' under the Wildlife Act. It is illegal to take, interfere with or destroy Koalas without authorisation. Actions to control Koala populations that have been authorised under the Wildlife Act include translocation and fertility control.

Victoria's Biodiversity Strategy (1997)

Provides a commitment and a framework to incorporate flora and fauna conservation goals into all activities. A key concept of the strategy is the use of bioregions as a planning framework, and the production of Biodiversity Action Plans in each bioregion. The Koala is not listed in this act.

Victorian Flora and Fauna Guarantee Act (1998)

Under Victoria's Flora and Fauna Guarantee Act 1988 (FFG Act), provision is made to ensure that all Victoria's native flora and fauna can survive, flourish and retain its potential for evolutionary development in the natural environment.

Figure 4: A property in Jeetho combining agriculture with biodiversity plantings

Victoria's Native Vegetation Management - A Framework for Action (NRE 2002a)

This Framework establishes the strategic direction for the protection, enhancement and restoration of native vegetation across the State. The Framework addresses native vegetation management from a whole of catchment perspective but necessarily focuses primarily on private land where the critical issues of past clearing and fragmentation exist gains in habitat quality by improved management of threatening processes within existing native vegetation, through voluntary and funded projects on both public and private land; gains through supplementary plantings into existing depleted vegetation; and gains in habitat quantity through new areas of revegetation for biodiversity, and those for land protection and greenhouse amelioration that have sufficient locally indigenous species and appropriate diversity and structure to be considered part of the native vegetation.

5.3 REGIONAL POLICY

West Gippsland Native Vegetation Plan (2003)

This Plan provides a framework that will assist in helping our region move towards protecting and enhancing native vegetation communities and the species that live there. It also contains actions and measures that will help protect and re-create their habitat as well as reduce the problem of habitat fragmentation. In addition, it will also address many of the other catchment issues that have resulted from the loss of native vegetation across the region.

Biodiversity Action Planning Strzelecki Ranges Bioregion (2004)

This Strategic Overview for Biodiversity Action Planning for the Strzelecki Ranges Bioregion translates the statewide biodiversity strategy to the regional scale, and provides the foundation for producing landscape-scale biodiversity action plans to direct on-ground works by private landholders, community groups, corporations and all levels of Government, with the ultimate aim of achieving broadscale conservation of native biodiversity across the region

West Gippsland Regional Catchment Strategy (2012-2018

This Strategy provides an overview of key assets and waterways in the West Gippsland Catchment for the next 4 years. The strategy supports this plan is identifying key areas of remnant bush and waterways in the South Gippsland Landcare Network.

6. PARTNERS

South Gippsland Landcare Network is part of a wider community effort to protect Strzelecki Koalas. We acknowledge this plan is influenced by the work of:

- Monash University and its work mapping the reach of the Strzelecki Koalas.
- The South Gippsland Shire and its support of the program. This includes the support of bequest funds towards the project.
- HVP and its mapping of koala habitat in plantation sites in the Strzelecki Ranges.
- West Gippsland Catchment Management Authority and its efforts to protect biodiversity across the Catchment.
- The South Gippsland Koala Working Group and its efforts to coordinate a regional wide approach to Strzelecki Koala preservation.