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Department for Environment and Water

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DEW Reference Number F0002489401

Mr Blair Boyer MP
Member for Wright
PO Box 1111
Golden Grove Village
SA 5125

Dear Mr Boyer,

RE: FREEDOM OF INFORMATION EXTERNAL REVIEW

I refer to your external review application made to the Ombudsman on 22 February 2016, pursuant to section 29 of the *Freedom of Information Act 1991* (the Act), concerning a determination made by the Department for Environment and Water (DEW). I understand the Ombudsman has provided you with a copy of his determination.

The external review determination relates to your request for access to:

> *"1. All reports and briefings relating to the current estimated numbers of Koalas in the Adelaide Hills and Mount Lofty Ranges. Timeline 09-05-2018 – 09-05-2019 (including both Great Koala Count in 2012 and Great Koala Count in 2016) to date.*
> *2. All reports and briefings relating to the current sterilisation plan of Koalas throughout South Australia (specifically Adelaide Hills, Mount Lofty Ranges and Kangaroo Island). Including specific data relating to dates, ear tags, location. Timeline 09-05-2018 – 09-05-2019.*
> *3. All documents relating to proposed or ongoing koala culling programs (legal or illegal) known to the Agency throughout South Australia. Timeline 09-05-2018 – 09-05-2019."*

The Ombudsman has advised that DEW should give effect to his determination following the statutory 30 day time period for appeal. As the time period for review has now concluded and no appeal was commenced, I enclose a copy of the documents, redacted as per the Ombudsman's determination.

As advised in the original acknowledgement email dated 9 May 2019, as part of the Government's Digital by Default Declaration, where the determination exceeds 100 pages, the Agency will provide the Determination electronically. As the information within the documents exceeds 100 pages, a USB drive has been provided.

In accordance with PC045 – Disclosure logs for Non-personal information a copy of this determination will be made available on our website https://www.environment.sa.gov.au/about-us/freedom-of-information/foi-disclosure-log/DEW-disclosure-log.

If you have any queries in relation to this application please contact a Freedom of Information Officer on telephone (08) 8463 6625 or email DEW.FOI@sa.gov.au.

Yours sincerely

Dylan Slape
ACCREDITED FREEDOM OF INFORMATION OFFICER

Freedom of Information application: F0002489401 - Blair Boyer MP

REDUCED SCOPE

"1. All reports and briefings relating to the current estimated numbers of Koalas in the Adelaide Hills and Mount Lofty Ranges. Timeline 09-05-2018 – 09-05-2019 (including both Great Koala Count in 2012 and Great Koala Count in 2016) to date.
2. All reports and briefings relating to the current sterilisation plan of Koalas throughout South Australia (specifically Adelaide Hills, Mount Lofty Ranges and Kangaroo Island). Including specific data relating to dates, ear tags, location. Timeline 09-05-2018 – 09-05-2019.
3. All documents relating to proposed or ongoing koala culling programs (legal or illegal) known to the Agency throughout South Australia. Timeline 09-05-2018 – 09-05-2019."

ORIGINAL SCOPE

"1. All documents relating to the current estimated numbers of Koalas in the Adelaide Hills and Mount Lofty Ranges. Timeline- 01/01/2012 (including both Great Koala Count in 2012 and Great Koala Count in 2016) to date.
2. All documents relating to the current sterilisation plan of Koalas throughout South Australia (specifically Adelaide Hills, Mount Lofty Ranges and Kangaroo Island). Including specific data relating to dates, ear tags, location. Timeline - 01/01/2018 to date.
3. All documents relating to proposed or ongoing koala culling programs (legal or illegal) known to the Agency throughout South Australia. Timeline - 01/01/2018 to date."

Document number	Date	Author	Document Description	Determination	Clause	Reason
1	10/05/2018	DEW	Draft notes	Exempt	8(1)	Documents affecting the conduct of research
2	1/06/2018	DEW (M Greig, B Grear)	Briefing	Full Release		
3	4/06/2018	DEW (R Molsher)	Great Koala Count 2 - Summary of Outcomes	Full Release		
4	5/06/2018	DEW (I. van Weenan)	Paper for Koala Steering Committee	Partial Release	Out of scope	Documents not relating to the scope of the request
5	29/06/2018	DEW (M Heinson)	Briefing DEWNRD-00015082	Partial Release	Out of scope	Documents not relating to the scope of the request
6	1/07/2018	DEW (Multiple)	Draft AMLR koala density report, replaced with document 31	Full Release		
7	9/07/2018	DEW (J van Weenen)	Draft Briefing - 18EW0001422, final version see document 22	Full Release		
8	7/08/2018	DEW (B Grear)	Draft Briefing DEW-D0000034, final version see document 26	Full Release		
9	20/08/2018	DEW (B Grear)	Draft Briefing DEW-D0000034, final version see document 26	Full Release		
10	27/08/2018	DEW (R Molsher)	Draft Project Closure and Evaulation Report (Services)KIKMP 2017-18	Full Release		
11	4/09/2018	DEW (K Hillyard)	Draft Briefing notes for Abundant Specieis - Koalas for NRC	Exempt	1(1)(e)	Cabinet Document
12	5/09/2018	DEW (B Grear)	Draft Briefing - DEW-D0000034, final version see document 26	Full Release		
13	14/09/2018	DEW (B Grear)	Interim Program Plan -SA Koala Conservation and Management Prog 2018-19	Full Release		
14	1/10/2018	DEW (R Molsher)	Kangaroo Island Koala Management Project Annual Summary 2017-18	Full Release		
15	4/10/2018	DEW (R Molsher)	Draft media release	Exempt	20(1)(b)	Documents otherwise available. Media articles published by Chris Russell, the Advertiser on 12 and 13 July titled 'Licence to kill' and 'Going east no quick fix to KI Koala problem'
16	10/10/2018	DEW (R Molsher)	Transcript with Min Speirs re koala overabundant species policy	Full Release		
17	18/10/2018	DEW (B Grear)	Briefing - 18EW0000906	Partial Release	Out of Scope 6(1)	Documents not relating to the scope of the request Documents affecting personal affairs
18	18/10/2018	DEW (R Molsher)	Koala catch data AMLR_summary2" Spreadsheet summarising koala catch data for AMLR 2017, 2018	Full Release	6(1)	Documents affecting personal affairs
19	26/10/2018	DEW (K Hillyard)	NRC submission	Refuse access	20(1)(b)	www.parliament.sa.gov.au/Committees/Pages/Committees.aspx?CTId=5&CId=341
20	26/10/2018	DEW (M Walter)	Koala website drafts	Refuse access	20(1)(b)	www.environment.sa.gov.au/topics/plants-and-animals/Living_with_wildlife/Koalas
21	26/10/2018	DEW (R Molsher)	NRComm submission from DEW	Exempt	1(1)(e)	Cabinet Document
22	29/10/2018	DEW (J van Weenen)	Briefing - 18EW0001422	Full Release		
23	5/11/2018	DEW (J van Weenen)	Draft Briefing - 18EW0002504, final version document 54	Partial Release	Out of Scope 6(1)	Documents not relating to the scope of the request Documents affecting personal affairs
24	7/12/2018	DEW (B Grear)	Draft briefing DEW-D000034, final version see document 26	Full Release		
25	13/12/2018	DEW (R Molsher)	Briefing DEW-D0001045	Exempt	1(1)(a)	Cabinet Document, document available https://www.parliament.sa.gov.au/en/Committees/Committees-Detail
26	31/12/2018	DEW (B Grear)	Briefing DEW-D0000034	Full Release		
27	20/01/2019	DEW (K Hillyard)	Briefing - 18EW0002566	Partial Release	Out of Scope 6(1)	Documents not relating to the scope of the request Documents affecting personal affairs
28	29/01/2019	DEW (R Molsher)	DEW catch data	Full Release		

Document number	Date	Author	Document Description	Determination	Clause	Reason
29	29/01/2019	DEW (K Hillyard)	Briefing -18EW0003112	Partial Release	Out of Scope 6(1)	Documents not relating to the scope of the request Documents affecting personal affairs
30	30/01/2019	The islander	Media article	Refuse access	20(1)(b)	www.theislanderonline.com.au/story/5874382/400-female-ki-koalas-will-receive-hormone-implants/
31	12/02/2019	DEW (Multiple)	Draft AMLR koala density report, replaced with document 53	Full Release		
32	13/02/2019	DEW (A Pestell)	Briefing seeking approval to consult on draft policy documents, never progressed	Full Release		
33	25/02/2019	DEW (C Booth)	Email	Full Release		
34	25/02/2019	DEW (M Heinson)	Email	Full Release		
35	25/02/2019	DEW (R Molsher)	Email	Partial Release	6(1)	Documents affecting personal affairs
36	26/02/2019	DEW (C Booth)	Draft media response	Full Release		
37	26/02/2019	DEW (R Molsher)	Draft media response	Full Release		
38	27/02/2019	DEW (D Rogers)	SA Koala Science Report	Full Release		
39	27/02/2019	DEW (D Rogers)	Draft media response	Full Release		
40	27/02/2019	DEW (M Grieg)	Draft media response	Full Release		
41	27/02/2019	DEW (K Hillyard)	Draft media response	Full Release		
42	1/03/2019	DEW (D Rogers)	PowerPoint presentation by Dan Rogers to KI NRM Board	Full Release		
43	7/03/2019	DEW (R Molsher)	Draft media response	Full Release		
44	7/03/2019	DEW (C Booth)	Email	Full Release		
45	13/03/2019	Multiple	Ecology and Evolution - Distribution models for koalas in South Australia using citizen science-collected data	Refuse access	20(1)(b)	www.researchgate.net/publication/261463940_Distribution_models_for_koalas_in_South_Australia_using_citizen_science-collected_data
46	13/03/2019	DEW (J van Weenen)	Email, attachment is doc 45	Full Release		
47	18/03/2019	DEW (A Pestell)	Draft briefing DEW-D0003075, briefing not progressed for approval	Full Release		
48	18/03/2019	DEW (A Pestell)	Draft briefing DEW-D0003075, briefing not progressed for approval	Full Release		
49	28/03/2019	DEW (M Heinson)	Draft briefing DEW-D0003075, briefing not progressed for approval	Full Release		
50	4/04/2019	DEW (B Grear)	Draft briefing DEW-D0003075, briefing not progressed for approval	Full Release		
51	4/04/2019	DEW (A Pestell)	Draft SA Koala Program Funding Strategy Proposal	Full Release		
52	11/04/2019	DEW (Multiple)	Draft AMLR koala density report	Full Release		
53	16/04/2019	DEW (A Pestell)	Draft text for Koalas Website	Refuse access	20(1)(b)	www.environment.sa.gov.au/topics/plants-and-animals/Living_with_wildlife/Koalas
54	30/04/2019	DEW (J van Weenen)	Briefing - 18EW0002504	Partial Release	Out of scope 6(1)	Documents not relating to the scope of the request Documents affecting personal affairs
55	3/05/2019	DEW (A Pestell)	Draft briefing - DEW-D0003558	Full Release		
56	7/05/2019	DEW (A Pestell)	Draft briefing - DEW-D0003558	Full Release		
57	7/05/2019	DEW (B Grear)	Draft briefing - DEW-D0003558	Full Release		
58	8/05/2019	DEW (A Pestell)	Draft briefing - DEW-D0003558	Full Release		
59	8/05/2019	DEW (A Pestell)	Draft briefing - DEW-D0003558	Full Release		
60	9/05/2019	DEW (Multiple)	Spreadsheet with koala density survey data analysis	Full Release		

MINUTE *forming* ENCLOSURE *to*

TO: **A/CHIEF EXECUTIVE FOR EXECUTIVE**

RE: **TRANSITIONING OF KANGAROO ISLAND KOALA MANAGEMENT AND STATEWIDE PROGRESSION OF HORMONE IMPLANT IMPLEMENTATION**

SUMMARY

The koala is an iconic Australian species with intense public interest (and strong sympathy) about its circumstances. Equally, the impact high density koala populations can have on native vegetation is well understood, from South Australia and Victoria. The *South Australian Koala Conservation and Management Strategy (2016)* rules out lethal management of koalas as a way of reducing density (in line with all other states). On Kangaroo Island, koala density has been effectively reduced through a combination of surgical sterilisation and, historically, translocation to SE South Australia. As the South Australian government and community is committed to maintaining a sustainable population of koalas on Kangaroo Island, ongoing management is required to ensure that densities stay below a sustainable level, above which they begin to negatively impact on habitat for koalas and other native species. Our scientific understanding and historic experience show that if management of koala density on Kangaroo Island were to cease, koala densities would ultimately reach levels where these negative impacts would be expressed.

While surgical sterilisation of koalas on Kangaroo Island was effective in reducing the population from 27,000 in 2001 to 13,000 in 2010 and in reducing overbrowsing impacts in high risk areas, it has become apparent that numbers have now significantly increased. This is in part due to the establishment of Tasmanian blue gum plantations. Surgical sterilisation is now no longer a viable option given the high numbers of koalas that need to be sterilised and the cost associated with this methodology.

Consequently, to maximise the cost effectiveness of koala management across the state, DEW has been:

- working on new technology to make koala fertility control increasingly cost effective (e.g. moving away from surgical sterilisation toward base of tree hormone implants on conscious koalas that do not require veterinary input),
- state wide coordination of koala management and policy through joint delivery of the *South Australian Koala Conservation and Management Strategy (2016),* and
- development of a state wide capability (technical and operational) to manage koalas across all affected regions.

Historically, the Kangaroo Island Koala Management Program (KIKMP) has been funded through the 'CE discretionary' budget on a three year timeframe, however this is no longer available. After consultation with the A/Group Executive Director

and A/Chief Executive the DEW Executive is now being asked to consider allocating funding to transition the KI Koala Management Project to a more cost effective state-wide approach and to progress state-wide implementation of the base of tree hormone implant approach.

BACKGROUND

The Kangaroo Island Koala Management Project was initiated in 1996 to reduce koala numbers in response to severe over-browsing impacts on native vegetation. Over time, targeted intervention (primarily surgical sterilisation and translocation to SE South Australia) has resulted in a reduction in koala density and an improvement in tree condition. The most recent survey of koalas shows that koala density has increased in some areas. While the reasons for these increases are uncertain, they are likely to involve the establishment of Tasmanian Blue Gum plantations and favourable weather conditions.

Reducing the impact of koalas on native vegetation on Kangaroo Island delivers on nine of the priority actions set out in the *South Australian Koala Conservation and Management Strategy (2016)*. This strategy responds to a growing public awareness of positive and negative implications of the state's koala populations and it demonstrates the South Australian Government's commitment to:

- Safeguarding the welfare of koalas,
- Increasing the social, educational and economic benefits of having koalas in South Australia, and
- Reducing the negative impacts that over-abundant koala populations may have on broader ecological communities.

Koala management on Kangaroo Island is specifically highlighted within the strategy and it sets out the State Government's commitment to this action: "*Continue to implement and refine management programs to regulate koala densities to a level below that which causes severe tree defoliation*".

DEW and the University of Adelaide have developed a model that predicts the impact of intervention (sterilisation of female koalas) on population size at local and island-wide scales. This model allows DEW to predict the relationship between the number of females sterilised per annum, and koala density (Attachment 2). We have used this model to understand the consequences of different sterilisation rates on koala density, including the option of doing nothing. This model was used to test the consequences of a number of scenarios, to guide the development of this paper.

In 2017 DEW established the SA Koala Projects Coordinating Committee, overseen by the SA Koala Steering Committee (Chair: Regional Director AMLR, Brenton Grear) to implement the *South Australian Koala Conservation and Management Strategy*. The Kangaroo Island Koala Management Project is now managed under these governance arrangements to ensure coordination in koala management across the State. This approach enables good working efficiencies in several areas including skills transfer between regions, centrally managed scientific research, a coordinated approach to developing new management techniques and joint delivery of the *South Australian Koala Conservation and Management Strategy.*

Delivery of this strategy does not fall to the State Government alone. On Kangaroo Island a significant number of koalas are found within commercial blue gum plantations. The costs of koala management prior to, and during, any timber harvest activity within blue gum plantations is the responsibility of the plantation owner. DEW, through NRKI staff, are actively working with the Kangaroo Island Plantation Timbers (KIPT) Operations Director to help them embed tenure-blind sustainable koala management into any future forest harvest operations. A potential example of this approach would be the use of appropriate KIPT plantations blocks as fenced habitat for sterilised/contracepted koalas, thus enabling an immediate density reduction in certain areas of high value native vegetation. KIPT have a business imperative to manage koalas through a joint approach with DEW on their land for two fundamental reasons: social licence to harvest, and their business model to replant commercial trees after harvest.

The South Australian Government, and the South Australian community, aspire to maintain a sustainable, healthy koala population on Kangaroo Island. For this to occur, ongoing management of koalas is required, in order to ensure densities do not get to a stage where the population impacts on their own habitat, and habitat for other native species and natural resources. In the past, fertility control has been achieved through surgical sterilisation which requires the animal to be anaesthetised. However, DEW are currently working with a range of partners (including Zoos SA and the University of Adelaide) to refine the hormone implant technique so that it can be applied by DEW staff at the base of the tree where they are caught (without the use of an anaesthetic). The relatively low cost of hormone implants and the possibility for it to be administered at the point of capture by trained (non-veterinary) personnel means that the technique has the potential to broaden delivery capacity, improve animal welfare outcomes and improve field efficiencies for population management activities in areas of need in SA.

The SA Koala Steering Committee have requested a proposal for funding the KI Koala management project for the 18/19 financial year from the SA Koala Projects Coordinating Committee. The coordinating committee were asked to be fiscally prudent and explore all practical options. Following discussions with the A/Group Executive Director and A/Chief Executive, we recommend that the KI Koala Management Project transition to the state-wide implementation of base of tree hormone implants, with appropriate storage of data and equipment from the existing program. As described below, this transition will result in improved efficiency of the program's objectives, while also allowing for the more efficient application of new contraceptive technologies as they become available.

Recommended approach: **Total cost: $275,000**

Transition Kangaroo Island koala management and progress statewide implementation of base of tree hormone implants.

Part A: Transition Kangaroo Island koala management and cease surgical sterilisation- $105,000.

- Cessation of surgical sterilisation and relocation of all infrastructure and equipment from the KI veterinary clinic to the Kingscote depot when completed.
- Project management- recruitment, supervision of field staff, budgets, Project Plan 2018-19, Closure and evaluation report

- Data storage- MEK template and upload to BDBSA
- Data management- collate 2018-19 KI monitoring and implant data.
- Tree collars- maintain (and remove if requested) tree collars on private properties that are protecting large old Manna gum trees from koala overbrowsing and which are now rare in the region.
- Monitor koala density at 26 core KI sites to ensure future population modelling is based on adequate data.
- Communication of key messages to the KI community

Funds include: NRKI Wildlife Program manager position (0.4 FTE), Field Officer (0.4 FTE), 50% vehicle costs, 50% corporate fees and operating costs.

Risks: KI veterinary clinic has a contract for sterilisation services with NRKI until 25/1/2021, however, recent discussions with the vet have indicated that he would likely agree to terminate services prior to this date if services were no longer required. Procurement unit have also advised that there would be minimal financial liability if the services are no longer required.

Benefits: Storing equipment and data appropriately will ensure that these are available for future state-wide implementation. Specialist skills would be retained by the Wildlife Program manager (ongoing position) and field officer which have collectively worked on the KI Koala management project for the last 23 years and will allow cross regional transfer of skills. The field officer is also a valuable member of the DEW Fire team (sector commander role). This approach also provides for adequate communication to the KI community.

Part B: Progress base of tree hormone implant implementation across the state- $170,000

- State-wide coordination and progression of base of tree hormone implant procedure and permitting.
- ~15 DEW staff approved on permit to use hormone implants to provide the required flexibility in program delivery
- ~10 DEW AMLR staff trained in ground koala catching techniques and EP staff invited to participate
- Base of tree hormone implants inserted in 300 koalas in the AMLR and 150 koalas in the KI region in priority areas. The focus of actions in the AMLR is a reflection of the unsustainably high koala densities observed at key sites within that region, the progression of the hormone implant technique and the need to train staff in this region. Should further funds become available throughout the year these will be prioritised to increase contraception effort in the Kangaroo Island region.
- AMLR koala catching trainees to join the catch team in the AMLR region to further enhance skills (total 30 person days).
- Monitor koala density at 10 core sites in the AMLR.
- Project management- supervision of field staff, budgets, Work, Health and Safety.

- Data management- collate 2018-19 AMLR monitoring and implant data.
- Communication of key messages to the AMLR community and engage stakeholders
- Support investigations into new koala fertility control technologies e.g. dart delivery and implant injections.

Funds include: NRKI Wildlife Program manager position (0.6 FTE), 3 Field Officers (0.25 FTE), AMLR catching staff (30 person days), 50% vehicle costs, 50% corporate fees and operating costs. It is expected that Parts A and B are funded together (total $275,000) as it may not be possible to separate the parts e.g. ongoing NRKI Wildlife Program manager position would be redeployed if only 0.6 FTE.

Contracepting 300 koalas in the AMLR and 150 koalas on KI is less than optimal from a purely population management point of view, however it will maintain DEW activity in koala management on Kangaroo Island and reduce the breeding capacity of koalas in critical areas (modelling for the KI population is presented in **Attachment 2**).

This approach allows the most cost effective koala management to be investigated and implemented across the state and facilitates support from existing co-investment e.g. NRM levy funded Koala Project Officer position, IKCE, University of Adelaide koala health checks and Flinders University population modelling.

Project direction and progress will be reviewed regularly by the SA KPCC to ensure the funds allocated will be used as wisely as possible and in the most cost effective manner. Should additional capacity become available throughout the year, KPCC will reassess priorities and ensure flexibility in approach. Any additional funds would be used to increase hormone implant implementation and to support research investigating koala movements in blue gum plantations and population modelling.

It is anticipated that the Project sponsor for this project is Brenton Grear (Chair of the SA Koala steering committee) and the Project manager is the NRKI Wildlife Program Manager.

<u>What happens if we stop koala management on Kangaroo Island? Zero investment</u>

This option is not desirable from many perspectives. The KI Koala population model suggests that, in the absence of any fertility control, the total population will more than double over 10 years, and koala density in high quality habitats (those most impacted by koalas) will be four times higher than desirable densities (Attachment 2). In high quality habitats, densities will approach those observed prior to the start of the KIKMP, where significant defoliation and death to preferred food trees was common.

There is a strong community expectation that koalas will be managed on Kangaroo Island, and without active koala management the calls for lethal management (a koala cull) would intensify over time. Ruling out culling koalas (through the *South Australian Koala Conservation and Management Strategy*) and then not funding any alternatives would be an untenable position.

As well, specialist skills and operational capacity would be lost within the department, at a time when it is clear other areas within the state including the Mount Lofty Ranges and the Eyre Peninsula will require access to skill and knowledge maintained through the KI Koala management project.

Participating landholders would be left “high and dry” without viable alternatives to manage over-abundant koalas on their land. There would also be a high burden on all staff responding to the inevitable social media questions, Ministerial and direct correspondence. Specialist equipment would not be de-commissioned properly and tree collars and guards would remain on private property.

Importantly, without an active koala management project on Kangaroo Island there would be very limited ability to motivate for external funds from potential partners such as the forestry industry to add value to the existing project. Staff from NRKI are in ongoing discussions with forestry and tourism interests to explore options for external funding of the koala management program where industry interests and the aims of the koala management project align.

The proposal also marks a clear intent to sustaining gains made from 20 years of fertility control on KI that has produced positive koala and conservation outcomes, but also highlights a clear statewide approach where high impact zones in other areas of SA are also prioritised.

PUBLIC VALUE

Our evidence indicates there is clear need to manage koalas on KI

It is clear from the 2015 population survey that the Kangaroo Island koala population continues to require active management to reduce population growth. Population modelling suggests koala management needs to be ongoing, targeting those areas where koalas are at unsustainable densities.

Over half the population still occurs at low density (<0.75 koalas per ha) in suboptimal habitat on the island. The risk of these low density populations increasing requires they continue to be monitored, and targeted intervention may be required in cases where there is evidence for koalas having an unsustainable impact on native vegetation. Background to the Kangaroo Island Koala Management Project is provided in **Attachment 1**.

Intense community interest in koala management on Kangaroo Island and statewide

Kangaroo Island is a tourist ‘jewel in the crown’, based on the natural environment and wildlife viewing opportunities. Businesses on KI have consistently called for adequate investment in koala management to enable a thriving tourist industry but limit damage to native vegetation. Stopping koala management may have several community and business implications including reduced tourism potential in the long term, strengthened community calls for lethal management and a loss of credibility for DEW on the island.

Communications on a state-wide basis will also need to be considered as we transition to a state-wide approach in koala management across multiple regions.

To seek external partner funding you need a functioning management project

The forestry industry on Kangaroo Island (through KIPT) and the tourism industry (through Hanson Bay Wildlife Sanctuary) have both been approached by senior staff in NRKI with 'early conversations' discussing potential contributions to funding. These early negotiations would likely be jeopardised by cessation of funds for KI koala management from DEW as a lead organisation.

OPERATIONAL CAPABILITIES

The koala management team on Kangaroo Island have over 21 years history of achieving annual targets on time and within budget and they possess a specialised skill set to deliver the outcomes. The required equipment is also in place. Retaining Kangaroo Island project staff and sharing resources statewide will result in efficiencies across KI, AMLR, EP and the SE. It is anticipated that a presence of skilled staff with good local knowledge are likely to be a baseline requirement for effective program delivery in any region.

LEGITIMACY AND SUPPORT

Funding through DEW Executive, if obtained, would demonstrate to the community that DEW is committed to addressing the significant koala population increase on the Island and impacts elsewhere. It will also assist in seeking co-investment from potential partners to fund a better resourced program across the State in the future. Transitioning to base of tree hormone implants and investigating other new technologies will ensure that the most cost effective koala management is implemented across the state. Confirmation of the available project budget for the next financial year as soon as possible will ensure adequate forward planning for project delivery and staff employment and minimise loss of skills and experience as staff are redeployed elsewhere. It is also critical that the KI veterinarian is informed of any new directions as he will be recruiting staff shortly for the 2018-19 KI koala sterilisation season.

RISKS

The risks associated with undertaking koala fertility control are operational risks and are managed through DEW work health and safety systems. The KI koala management project has maintained high standards of risk management over time.

The risks associated with not funding any koala management on Kangaroo Island include: reputational risk to DEW, loss of a specialist skill set that will be required in the future, loss of ability to seek funding from potential partners, loss of momentum in progressing cheaper sterilisation technologies and techniques, long term negative impacts on nature based tourism activities on Kangaroo Island (and in other parts of SA), as well as long term negative environmental impacts.

ENGAGEMENT

The *South Australian Koala Conservation and Management Strategy (2016)* and the significant community consultation and participation (through the Great Koala Counts 1 and 2) establishes very broad community support and the "social licence" for fertility control as the preferred management technique for over abundant koalas.

RECOMMENDATIONS

It is recommend that Executive:

1. Note the long term, on-going requirement for non-lethal koala management on Kangaroo Island.

2. Note that appropriate storage and transitioning of Kangaroo Island data and equipment and retention of specialist skills is necessary to ensure transferability across the state.

3. Acknowledge the current departmental budgetary circumstances and approve the $275,000 funding for 18/19 financial year by 25 May 2018 (to enable necessary pre-planning before the end of the financial year and extension of staff).

ATTACHMENTS

1. Background to the Kangaroo Island Koala Management Project
2. Population modelling for different scenarios

AUTHOR

Mike Greig, Manager Sustainable Development, Kangaroo Island.

Brenton Grear, Chair of the SA Koala Steering Committee

EXECUTIVE SPONSOR

Grant Pelton
A/Group Executive Director
Parks and Regions

ATTACHMENT 1: Background to the KI Koala Management Project

BACKGROUND:

- The Kangaroo Island Koala Management Project has been funded since 1996 from the Chief Executive Discretionary fund. Funding over the last three years has ranged from $390,000 to $430,000 which has allowed the sterilisation of about 350-400 female koalas each year.

- DEW initiated the Kangaroo Island Koala Management Project in 1996 to control koala numbers, in response to severe over-browsing impacts on native vegetation.

- The project is aimed at conserving native ecosystems by reducing the impact that high densities of koalas have on native vegetation. To achieve this, the program focuses on three strategies: koala population management (surgical sterilisation), habitat restoration (installation of tree collars and revegetation) and monitoring (koala density and tree condition).

- 12,785 koalas have been sterilised on Kangaroo Island since 1996 of which 3,800 have been translocated off the island at an overall cost of $8,631,000.

- To evaluate the effectiveness of the sterilisation, a population survey is carried out every five years (2000, 2006, 2010, 2015) in the native vegetation to estimate variation in koala density and population size. These surveys have shown that the koala population in the areas monitored declined steadily from 27,000 in 2001 to 14,000 in 2010. However, in 2015 the population was estimated at 25,000. In 2015, some surveys were also conducted in the blue gum plantations where our best estimate from this limited sampling was 26,000 koalas, giving an island wide estimate of 51,000 koalas in 2015.

- The significant increase in the koala population from 2010 to 2015 is most likely due to a combination of factors including i) the creation of additional habitat (13,198 ha of Tasmanian blue gum plantations), ii) improved rainfall since the drought in 2006, and iii) cessation of translocations in 2010.

- Based on what we know of koala movements however, additional blue gum habitat is not likely to have island-wide effects (although local effects are much more likely). For example, increases in density at Cygnet River are unlikely to be attributable to blue gum populations that are > 50 km away. Improved rainfall is likely to be a strong factor driving increased breeding performance.
- The relationship between sterilisation rate and population size is complex, particularly due to lags between sterilisation effort and population impact (sterilised animals are still alive and eating leaves). Spatial and temporal variation in sterilisation rate is a key factor, but the relationship is complex.

ATTACHMENT 2: Population modelling for different scenarios for the Kangaroo Island koala population

Modelling has been undertaken using an 'aspatial' model. This assumes that the koala management units are spatially independent - i.e. there is no immigration or emigration between each management unit. This is considered a reasonable assumption, based on the available mark-recapture and movement data. These scenarios also assume the same effort (number and location of koalas treated in every year) for 10 years. Here we present two alternative scenarios based on the number of koalas treated. However the number of koalas to be treated can be adapted, and we have the scientific capability to understand the likely population response to the scale of intervention.

Note that an equivalent population model does not yet exist for the Mt Lofty Ranges koala population.

Scenario 1: 0 female koalas treated

- population size will more than double in size over 10 years in native veg from ~20-25k, to ~50-60k (native veg only).

-This translates roughly into average densities in the most impacted management units (Cygnet River and Eleanor/Timber Creek) of ~2 koalas/ha, and up to 3 koalas/ha in high quality habitat.

-This is higher than the current target density of 0.75 koalas/ha. The remaining Management Units (South West, North Coast and Flinders Chase) reach target densities at 6 years, 3 years and 10 years respectively under this scenario.

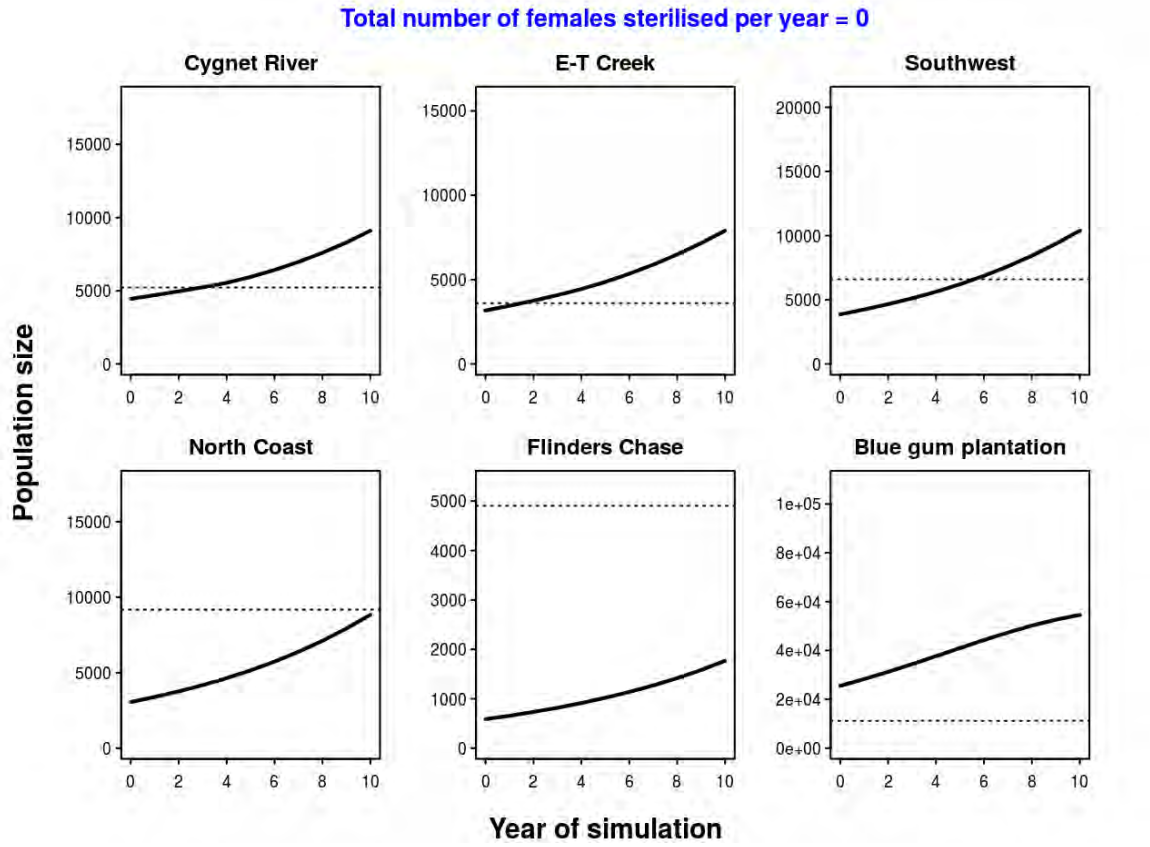

Figure 1. Modelled population size over 10 years in each of six 'management units', under the scenario of no female koalas treated. Dashed lines refer to the population size at which the average density is greater than the management threshold density of 0.75 koalas/ha

Scenario 2: 300 female koalas sterilised

This scenario is predicated on effort focused on the management units where koala densities are currently highest. This model also assumes that because of limited resources, there is no sterilisation activity undertaken in the remaining management units, therefore their numbers remain as in the previous scenario.

In this scenario, effort is split into 200 koalas in Cygnet and 100 koalas in ET Creek management units.

- total population size goes from ~20-25k to 45-50k

- density in Cygnet management unit increases from 0.9 to ~1.3 koalas/ha (~1.8 koalas/ha in high quality habitat), and ET Creek from 0.8 to ~1.3 koalas/ha. All other density increases as per above.

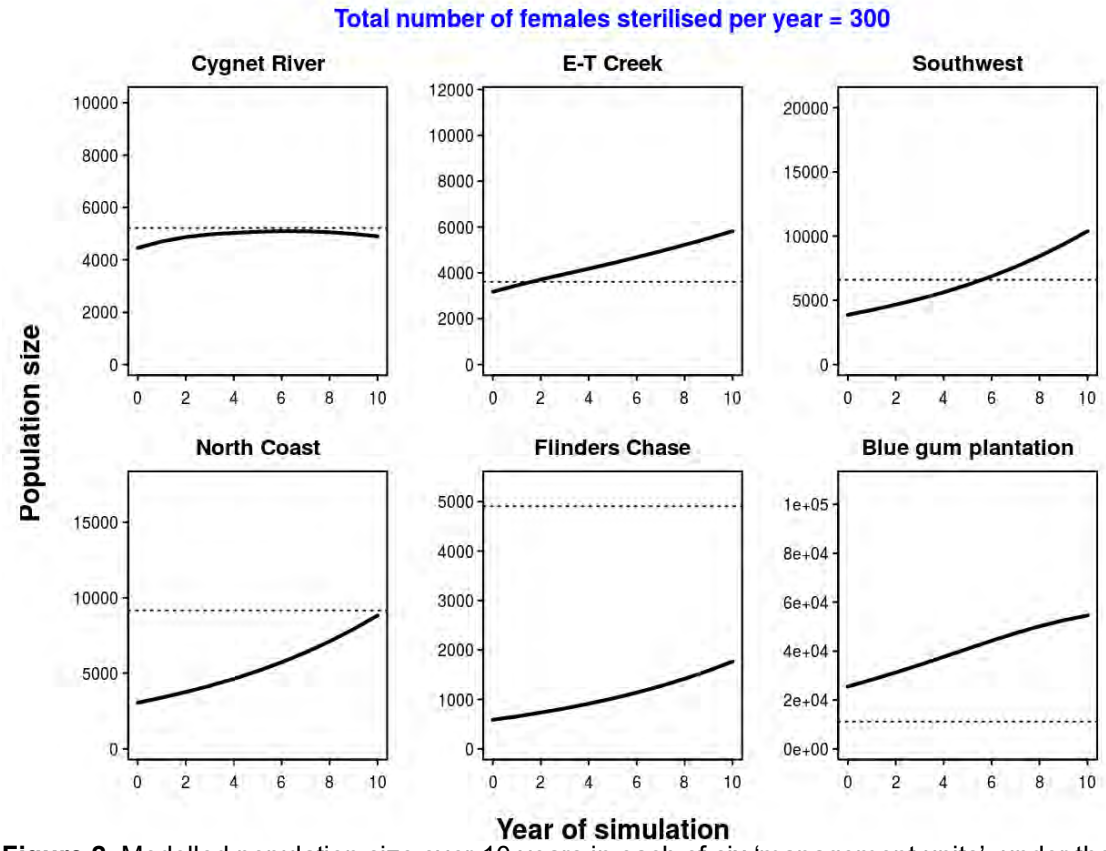

Figure 2. Modelled population size over 10 years in each of six 'management units', under the scenario of 200 female koalas treated p.a. in Cygnet River, and 100 koalas treated p.a. in E-T Creek. Dashed lines refer to the population size at which the average density is greater than the management threshold density of 0.75 koalas/ha

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GREAT KOALA COUNT 2 – SUMMARY OF OUTCOMES

BACKGROUND & OBJECTIVES

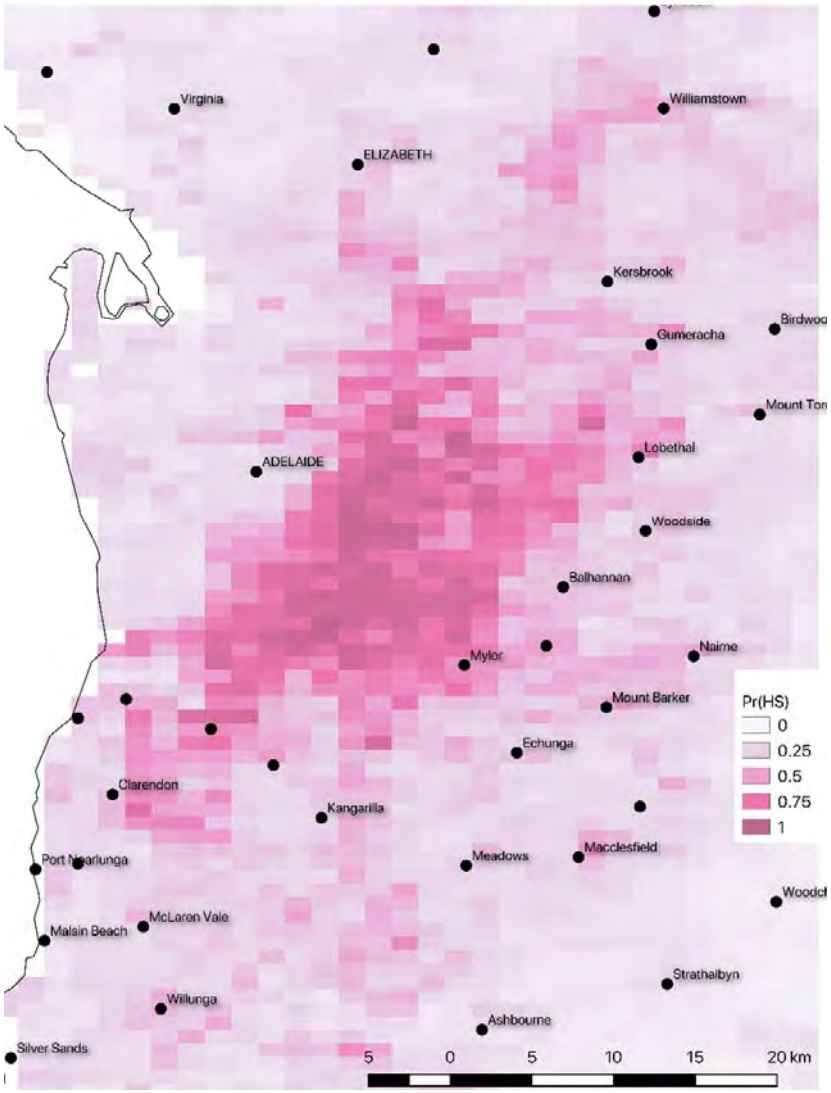
- Great Koala Count 1 used citizen science to record the location of koalas in the Mt Lofty Ranges, as well as community perceptions of koalas in South Australia
    - Limitations of method led to high uncertainty in population size
- Great Koala Count 2 established, using improved methods (including absence data) and taking advantage of technology (app developed to help counters)
- Also asked participants their perception of koala population trends, their impact on vegetation, and koala health issues. Participants were also given the opportunity to make general comments or ask questions relating to koalas in the Mt Lofty Ranges

RESULTS – ANALYSIS OF KOALA RECORDS

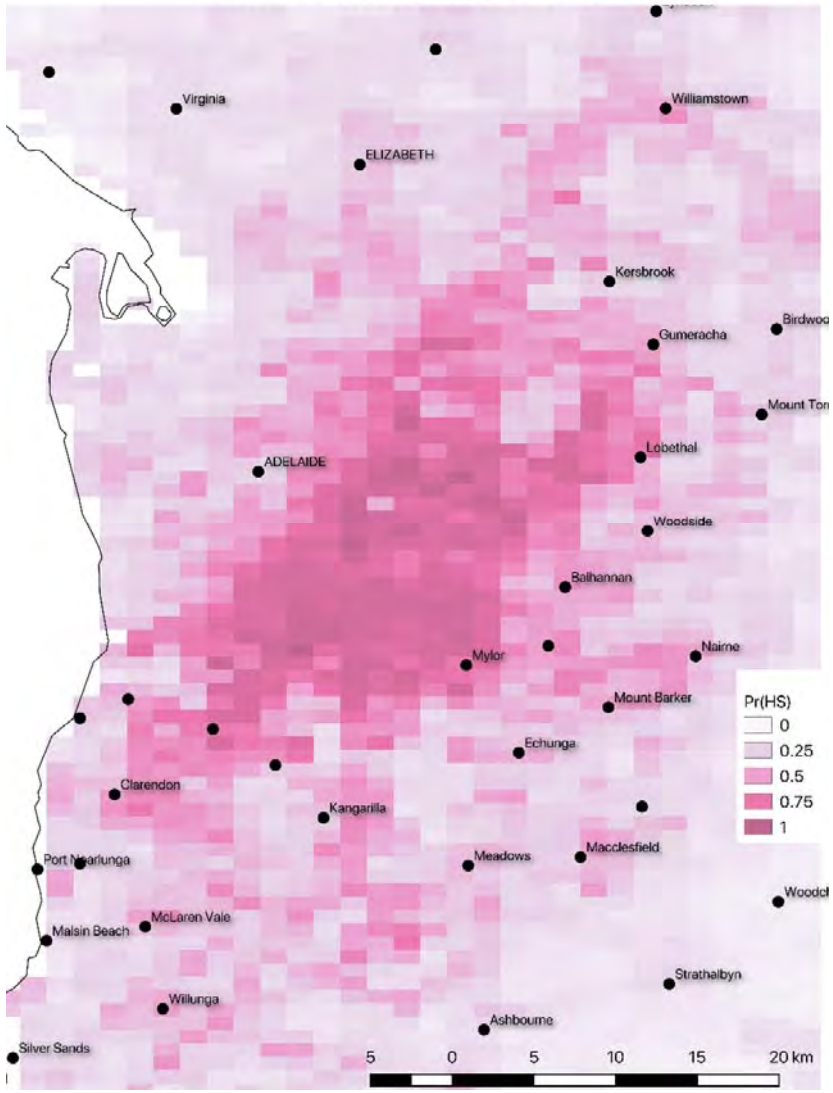
- 235 participants undertook searches for koalas
- ~ 800 koalas recorded
- Records use to model distribution, using a range of environmental variables as predictors (including cover of woody native vegetation; annual rainfall; topographic position)
- Modelled distribution then coupled with an estimate of maximum density to calculate a total population size

- For GCK2, median population size was estimated to be **158,020** (confidence interval 86,193 – 229,847)
- Same model was used to update estimates for GKC1 data, where median population size was recalculated to be **181,441** (98,968 – 263,914)
- Modelled distribution for GCK2 and GCK1 (using new model) are presented below

GREAT KOALA COUNT 2

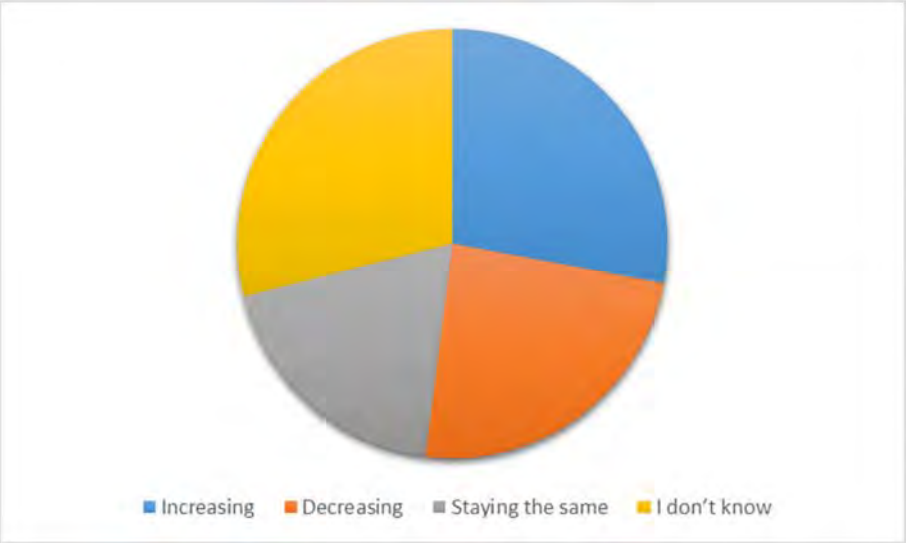


GREAT KOALA COUNT 1



RESULTS – COMMUNITY PERCEPTION SURVEY

- 368 respondents
- Demographics of respondents: 76% female; median age 50-59
- Perceptions of population trend:
    - When asked 'what do you think is happening to the number of koalas in SA', no strong community consensus (see below)



- Perceptions of impact:
    - 43% of respondents had noticed an impact of koalas on vegetation
        - Primarily scratches on trees or defoliation
        - Some respondents submitted photographic evidence (e.g. see below)

- Perception of koala health:
    - 39% had seen ‘unhealthy koalas’, primarily by seeing koalas sitting at the base of a tree for an extended period, or drinking lots of water

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USE OF HORMONE IMPLANTS FOR KOALA FERTILITY CONTROL

1. PURPOSE

It is recommended that the Steering Committee:

1. **Notes** the specific grounds upon which the proposed SA hormone implant technique is neither testing the hormone in use (Levonorgestrel) nor the method of conscious sub-dermal implant insertion**.**
2. **Notes** the current preferred stance that, should fertility control be utilised in SA, no additional testing is required to determine the specific impact of either the hormone implant or the conscious application method.
3. **Notes** that DEW is required to apply for a licence to possess the hormone implants from the Controlled Substances Licencing Unit of SA Health, and that such a licence requires robust internal processes to meet regulatory requirements.
4. **Notes** the required development of a DEW Policy and Procedure for the use of hormone implants for koala fertility control to meet SA Health licencing requirements.
5. **Approves** the use of hormone implants for koala fertility control as a koala management tool available to the SA Koala Program with the above mentioned considerations.

2. BACKGROUND

In February 2017, DEW KPCC representatives (Dan Rogers, Jennie Fluin, Robyn Molsher and Jason van Weenen) participated in a Koala Research Workshop in Melbourne that focussed on conservation and management research for koalas in south eastern Australia. Updates were provided on the Victorian hormone implant program, which has been running since 2003, where the basic procedure involves female koalas being captured, anaesthetised and then given a hormone implant. Scientific papers have been published on the efficacy of the use of particular hormones for managing breeding rates in koalas (see http://www.publish.csiro.au/wr/WR02052). Workshop participants were informed that koalas given implants appeared not to breed for the remainder of their lives. This was longer than most program managers had anticipated.

The relatively low cost of hormone implants (~$28 each) and the possibility for it to be administered at the point of capture by trained (non-veterinary) personnel meant that the technique had the potential to broaden delivery capacity for koala population management activities in SA. Importantly, it was also identified that the technique had the potential to negate the requirement for use of an anaesthetic (as it was proposed, based on previous microchipping experience, that implant delivery might be possible in a similar way to that of a microchip that are also delivered consciously). As a result, steps were promptly taken to progress an evaluation of the procedure (with key refinements) for potential use in SA.

On 9 March 2017, a briefing letter was sent to the DEW Wildlife Ethics Committee (WEC) informing them of the KPCC proposal to evaluate the use of conscious hormone implants delivery for the management of over-abundant koala populations in SA. On 24 March 2017, the WEC responded indicating that they could not consider any ethics application due to the “management” nature of the intended work (rather than research). Guidance on the ethics of the hormone implant evaluation was then sought from the Animal Welfare Advisory Committee (AWAC), with a presentation on the proposal provided to the AWAC committee by Jason van Weenen on 5 April 2017. At that meeting, the proposal was considered sound on ethical grounds and its progression was supported.

In June 2017, NRKI commissioned a literature review of the use of hormone implants for koalas in Victoria and collation of lessons learned (see link). Treatment with the current 50 mg Levenorgestrel implants has a failure rate of 2% (Ramsey *et al.* 2015). The reasons for the failure are currently unclear but are possibly due to the implant failing to release the appropriate amount of hormone or human error in administering the implants. Long-term monitoring of koalas at Mount Eccles National Park suggests that using two implants each of 50 mg Levenorgestrel cause infertility for at least ten years, however there was no evidence provided that suggested a single 70mg implant would not have the same result. Treatment with Levenorgestrel has no apparent effect on the long-term survival of koalas since there was no difference between the survival rates of control koalas and Levenorgestrel-treated koalas over a ten year period.

To determine if it would be possible for DEW staff to gain permission to manage Levonorgestrel, a meeting was held with KPCC members (Robyn Molsher, Jason van Weenen), staff from SA Health (Carolyn Lewis and Michael Cooper) and Adelaide University researcher Wayne Boardman on 26 July 2017. SA Health advised that there were two key avenues of gaining permission from a SA Health licencing perspective. Section 56 covers research permits and this would mean that the permit would be free of charge. The other option is permit under Section 18 of the Act where there would then be a three year licence fee of around $130. It was identified that the latter option would be the preferred approach as we were not undertaking research on the efficacy of the drug. Out of Scope

Given that Levonorgestrel is a Schedule 4 controlled substance (SA Health), Zoo's SA veterinarian Dr Ian Smith was approached to assist with the field evaluation work. DEW has a MOU with Zoos SA where partnerships are supported. This evaluation was added to the list of items reported on in the MOU and Ian was engaged to purchase the necessary equipment (namely the hormone implants and implant syringe) to conduct the evaluation. Due to existing veterinary links with Adelaide University School of Veterinary Science researchers (Wayne Boardman), Wayne was also included in key discussions due to his potential to assist with the implementation of the evaluation process.

The proposal to evaluate the effectiveness/appropriateness of the fertility control technique was presented to the Koala Steering Committee on 21 August 2017. The Committee endorsed the evaluation process and supported in principle the uptake of this management tool if the evaluation was successful.

Prior to conducting a field evaluation in SA, members of the KPCC (Robyn Molsher and Jason van Weenen) visited Mt Eccles in Victoria on 18 September 2017 to view hormone implant procedures first hand. Andrew Schofield from NR KI attended given his delivery role in current KI operations. Zoos SA veterinarian, Dr Ian Smith, also participated in the visit to observe how the procedure was currently undertaken in Victoria. The field visit proved highly beneficial for gaining an appreciation of procedures and liaison with Victorian koala managers and veterinarian personnel. In general, KPCC staff and ZoosSA staff were confident that improvements could be made on the current approach taken in Victoria.

On the 19 December 2017 the first phase of the field evaluation took place. A total of 10 female koalas were captured at Horsnell Gully Conservation Park, with the event enabling Dr Ian Smith and DEW staff to consider if the approach was suitable on both practical and animal welfare grounds. Despite some initial implant delivery issues and with some associated recommendations, Ian deemed the technique suitable for further application and investigation (see the evaluation report provided here). The speed at which koalas could be contracepted at the base of the tree (with the relevant training) and then released meant that the potential benefits of the approach were clearly evident.

A second presentation was provided to AWAC (by Jason van Weenen) on the progress of the evaluation exercise on 28 March 2018. It was discussed that the refined process of conscious "base of tree" hormone delivery method looked promising and a copy of the veterinary report was provided for discussion. The general continuation of the proposed implant technique was again endorsed by AWAC on animal welfare grounds.

Given the successful progress of the initial field evaluation, three key actions were then identified to progress the further development of the technique for use in SA.

1. Policy and Procedure documents were necessary in order to capture critical information on the deployment of hormone implants for managing koala breeding rates across SA. Importantly, these documents are to provide SA Health the assurances they require to permit the controlled substance "Levonorgestrel" to be used and managed by DEW staff. Peter Dean (acting on behalf of the Conservation, Susustainability and Wildlife management Unit) led the drafting of the policy and procedure documents starting in March 2018, with the support of the KPCC. The intent has been the completion of the Policy and Procedure documents by the end of June 2018.

2. DEW staff training on the implant procedure by a qualified veterinarian was required in order for personnel to be listed on SA Health permit. This is a critical step as only those DEW personnel listed on the permit have the capacity to administer and manage Levonorgestrel. During the week of the 9-14 April, DEW staff partnered with ZoosSA (Ian Smith) and Adelaide University School of Veterinary Science staff (Wayne Boardman) to conduct a DEW staff training exercise.

Despite exceptionally hot and then cold conditions reducing the number of koalas captured for staff training purposes, 66 female koalas were captured in the AMLR for implant training purposes. Efforts were made to train ~15 DEW staff, however, due to climatic and practical challenges, no staff were fully trained in the procedure. For many participants, the only step not completed was the practical field component. Efforts are being made to complete the final training level for as many DEW personnel as possible by the end of June 2018. Clear logistical and training challenges were identified through the training process, with many staff not confident in the technique and/or their ability to implement it. Much of the lack of confidence was related to the difficulty in getting the syringe through the koala's thick skin. All such concerns were raised at a debrief meeting on 24 April 2017 (attended by Robyn Molsher, Jason van Weenen, Ian Smith and Wayne Boardman). At this meeting, veterinary staff conveyed that most of the problems encountered by trainees were related to technique (and experience), but that additional equipment would be obtained for the purposes of alleviating any equipment related concerns. Veterinary staff conveyed that they were suitably happy that the implant training module content and that it provided them with sufficient assurances to endorse trained DEW staff being added to a permit application to SA Health.

3. In order to train DEW staff in the hormone implant technique, a training program required development (by veterinary staff) to ensure that a minimum standard had been reached. ZoosSA veterinarian (Ian Smith) and Adelaide University's Wayne Boardman are comfortable that the training package they have developed is sufficient for getting trainees to an acceptable level for inclusion on an SA Health permit. Refinements to the training program are possible and modules will be reviewed, where necessary, following each training session.

Strategy Alignment

The South Australian Koala Conservation and Management Strategy 2016 commits the South Australian Government to:

- Safeguarding the welfare of koalas,
- Increasing the social, educational and economic benefits of having koalas in South Australia, and
- Reducing the negative impacts that over-abundant koala populations may have on broader ecological communities.

The use of hormone implants as a management tool to control koala fertility forms part of Commitment 1 (safeguarding the welfare of koalas) and Commitment 3 (to reduce the negative impacts of over-abundant koala populations).

3. DISCUSSION

Parks Victoria and the Department of Environment, Land, Water and Planning (DELWP) have been using hormone implants as a tool for controlling the breeding rates of koalas in areas of high koala densities since 2003. Given the increases in koala densities on Kangaroo Island (KI) and the Adelaide and Mt Lofty Ranges (AMLR), the Koala Projects Coordinating Committee (KPCC) investigated alternate fertility control techniques to determine the most appropriate and cost effective management methods to adopt in priority areas of South Australia (SA).

The abovementioned history to the development of the SA hormone implant technique is important as it aims to provide clarity and confidence in the foundation of the management procedure into the future. Critically, the SA hormone implant procedure is not aiming to trial any new procedure that has not been routinely used in the past.

Specifically, the long-term use of Levonorgestrel in Victoria means that the efficacy of this hormone, or it's placement beneath the skin of koalas, is not requiring testing in South Australia. We have high confidence that Levonorgestrel is safe and does not harm koalas, in fact it appears that the reduced reproductive effort actually increases the longevity of koalas contracepted. Knowing this is important when addressing community concerns that may relate to a) is it safe to use on koalas? or b) does the implant work?. *The only area where information is lacking relates to the effect of the hormone on koalas weighing less than 2kg. The work in Victoria has only been approved for koalas greater than 2kg in*

weight due to concerns the hormone may have on young developing individuals. Investigations into the contraception of younger animals is being considered in Victoria, however, until this is resolved it is intended that the weight cut off for hormone contraception in SA would also follow current Victorian thresholds.

In addition, the implantation of the hormone, via the use of a syringe, is also not in question. This is because the conscious subcutaneous implantation of microchips are a commonly used procedure for a wide variety of wildlife species, ranging from lizards, micro bats, to parrots and pygmy possums (note this includes species significantly smaller than koalas). As the gauge of needle used in hormone implant delivery is of similar size to that used for "conscious" animal microchipping purposes, the use of a syringe to consciously implant Levonorgestrel is also not in question. Despite this, the procedure was evaluated by ZoosSA veterinary staff (Ian Smith) to ensure that there was no unforeseen issues to consider. The veterinary report highlighted that the conscious delivery was appropriate and ethical, a view endorsed by AWAC.

It is very important to be clear that the procedure of conscious hormone implant delivery, like the conscious implantation of a microchip, does come with a level of discomfort for the individual koalas. They may clearly wriggle and or vocalise in objection. The ethical endorsement given to the conscious "base of tree" hormone implant technique is based on the significant welfare improvements that come from:

- significantly reduced overall handling time (compared with procedures where animals are carried back to vehicles or placed into or removed from pet packs)
- negating the requirement for the tubal ligation surgical procedure to sterilise individuals
- the removal of the requirement for caging animals whilst they await a surgical procedure.
- negating the need for animals to be put under anaesthetic which itself can come with risks

Key risks:

Koalas found sick with ear tags, as has already occurred in the AMLR, may raise community doubts about the safety of the procedure for koalas. In such instances, it is critical to have confidence that the hormone implant is not likely to cause any harm, nor the method of implant insertion. With the two that have been found to date, both females were euthanised for other reasons.

There are some operational challenges in the AMLR due to the higher visibility of the AMLR koalas and field operations (particularly catching). As a result, there is potential for all aspects of a program to come under public scrutiny.

To date there has been confusion, particularly with some stakeholder groups, around the delivery of the hormone implant program. It has been assumed by some that AMLR is now implementing a program when in fact the region has only been conducting a review of the procedure and undertaking some staff training exercises. It will be important to provide clarity to the community should any program officially begin using this technique, guided by a Communications and Community Engagement Plan.

Despite the clarity around the conscious hormone implant technique not testing the hormone or delivery technique, it will still be beneficial to be able to show the community that there are lots of koalas with hormone implants happily living out the rest of their lives with no ill effects. Given the variety of projects earmarked for the AMLR (IKCE, Adelaide University and Flinders University research proposals are being developed), it is clear that such survivorship information will be a readily available indirect product of future research programs.

4. RECOMMENDATION

It is recommended that the Steering Committee:

4.1 Notes the specific grounds upon which the proposed SA hormone implant technique is neither testing the safety or efficacy of the hormone in use (Levonorgestrel) nor the method of conscious sub-dermal implant delivery**.**

4.2 **Notes** the current preferred stance that, should the fertility control be utilised in SA, no additional testing is required to determine the specific impact of either the hormone implant or the conscious application method.

4.3 **Notes** that DEW is required to apply for a licence to possess the hormone implants from the Controlled Substances Licencing Unit of SA Health, and that such a licence requires robust internal processes to meet regulatory requirements.

4.4 **Notes** the required development of a DEW Policy and Procedure for the use of hormone implants for koala fertility control to meet SA Health licencing requirements.

4.5 **Approves** the use of hormone implants for koala fertility control as a koala management tool available to the SA Koala Program with the above mentioned considerations.

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TO **CHIEF EXECUTIVE**

FOR APPROVAL

RE: KOALA MANAGEMENT FUNDING BRIEFING

CC: **GROUP EXECUTIVE DIRECTOR, SCIENCE AND INFORMATION**
GROUP EXECUTIVE DIRECTOR, ECONOMIC AND SUSTAINABLE DEVELOPMENT

Critical Date:
Reason:

RECOMMENDATIONS

It is recommended that you:

1. Note the long term on-going requirement for non-lethal koala management on Kangaroo Island.

NOTED

2. Approve the transition away from surgical sterilisation of koalas on Kangaroo Island and the transition towards using base of tree contraceptive implants.

APPROVED / NOT APPROVED

Out of Scope

APPROVED or NOT APPROVED

Comments:	
Out of Scope	John Schutz **A/CHIEF EXECUTIVE** 29 / 6 / 2018 Out of Scope

PRIORITY

Routine

Contact: Michaela Heinson on 0428 940 725 or Michaela.heinson@sa.gov.au
Date: 22 June 2018

BACKGROUND

The koala is an iconic Australian species with intense public interest and strong sympathy about its circumstances. The impact high density koala populations can have on native vegetation is well understood, from South Australia and Victoria. The South Australian Koala Conservation and Management Strategy (2016) rules out lethal management of koalas as a way of reducing density (in line with all other states). On Kangaroo Island, koala density has been effectively reduced through a combination of surgical sterilisation and, historically, translocation to the South East of South Australia. As the South Australian government and community is committed to maintaining a sustainable population of koalas on Kangaroo Island, ongoing management is required to ensure that densities stay below a sustainable level, above which they begin to negatively impact on habitat for koalas and other native species. Scientific understanding and historic experience show that if management of koala density on Kangaroo Island were to cease, koala densities would ultimately reach levels where these negative impacts would be expressed.

While surgical sterilisation of koalas on Kangaroo Island was effective in reducing the population from 27,000 in 2001 to 13,000 in 2010 and in reducing over-browsing impacts in high risk areas, it has become apparent that numbers have now significantly increased. This is in part due to the establishment of Tasmanian blue gum plantations. Surgical sterilisation is now no longer a viable option given the high numbers of koalas that need to be sterilised and the cost associated with this methodology.

To maximise the cost effectiveness of koala management across the state, DEW has been:

- working on new technology to make koala fertility control increasingly cost effective (e.g. moving away from surgical sterilisation toward base of tree hormone implants on conscious koalas that do not require veterinary input),
- state wide coordination of koala management and policy through joint delivery of the South Australian Koala Conservation and Management Strategy (2016), and
- development of a state wide capability (technical and operational) to manage koalas across all affected regions.

Out of Scope

You are being asked to consider allocating funding to transition the KI Koala Management Project to a more cost effective state-wide approach and to progress state-wide implementation of the base of tree hormone implant approach.

DISCUSSION

The Kangaroo Island Koala Management Project was initiated in 1996 to reduce koala numbers in response to severe over-browsing impacts on native vegetation. Over time, targeted intervention, primarily surgical sterilisation together with some initial translocations to South-East South Australia has resulted in a reduction in koala density and an improvement in tree condition (translocation of koalas off Kangaroo Island have been stopped because they are expensive and there is very limited habitat available to receive koalas in the South East) . The

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Date: 22 June 2018

most recent survey of koalas shows that koala density has increased in some areas. While the reasons for these increases are uncertain, they are likely to involve the establishment of Tasmanian Blue Gum plantations and favourable weather conditions.

It is clear from the 2015 population survey that the Kangaroo Island koala population continues to require active management to reduce population growth. Population modelling suggests koala management needs to be ongoing, targeting those areas where koalas are at unsustainable densities.

Over half the population still occurs at low density (<0.75 koalas per ha) in suboptimal habitat on the island. The risk of these low density populations increasing requires they continue to be monitored, and targeted intervention may be required in cases where there is evidence for koalas having an unsustainable impact on native vegetation. Background to the Kangaroo Island Koala Management Project is provided in **Attachment 1**.

Reducing the impact of koalas on native vegetation on Kangaroo Island delivers on nine of the priority actions set out in the 2016 South Australian Koala Conservation and Management Strategy. This strategy responds to a growing public awareness of positive and negative implications of the state's koala populations and it demonstrates the South Australian Government's commitment to:

- safeguard the welfare of koalas,
- increase the social, educational and economic benefits of having koalas in South Australia, and
- reduce the negative impacts that over-abundant koala populations may have on broader ecological communities.

Koala management on Kangaroo Island is specifically highlighted within the strategy and it sets out the State Government's commitment to this action: "*Continue to implement and refine management programs to regulate koala densities to a level below that which causes severe tree defoliation*".

DEW and the University of Adelaide have developed a model that predicts the impact of intervention (sterilisation of female koalas) on population size at local and island-wide scales. This model allows DEW to predict the relationship between the number of females sterilised per annum, and koala density (Attachment 2). This model has been used to understand the consequences of different sterilisation rates on koala density, including the option of doing nothing.

In 2017 DEW established the SA Koala Projects Coordinating Committee, overseen by the SA Koala Steering Committee, chaired by Regional Director AMLR, Brenton Grear, to implement the *South Australian Koala Conservation and Management Strategy* (the Strategy). The Kangaroo Island Koala Management Project is now managed under these governance arrangements to ensure coordination in koala management across the State. This approach enables good working efficiencies in several areas including skills transfer between regions, centrally managed scientific research, a coordinated approach to developing new management techniques and joint delivery of the Strategy.

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Delivery of the Strategy does not fall to the State Government alone. On Kangaroo Island a significant number of koalas are found within commercial blue gum plantations. Out of Scope

A potential example of this approach would be the use of appropriate KIPT plantations blocks as fenced habitat for sterilised/implanted koalas, thus enabling an immediate density reduction in certain areas of high value native vegetation. Out of Scope

The South Australian Government, and the South Australian community, aspire to maintain a sustainable, healthy koala population on Kangaroo Island. In the past, fertility control has been achieved through surgical sterilisation which requires the animal to be anaesthetised. However, DEW are currently working with a range of partners (including Zoos SA and the University of Adelaide) to refine the hormone implant technique so that it can be applied by DEW staff at the base of the tree where they are caught (without the use of an anaesthetic). The relatively low cost of hormone implants and the possibility for it to be administered at the point of capture by trained (non-veterinary) personnel means that the technique has the potential to broaden delivery capacity, improve animal welfare outcomes and improve field efficiencies for population management activities in areas of need in SA.

Out of Scope

It is recommended that the KIKMP transition to the state-wide implementation of base of tree hormone implants, with appropriate storage of data and equipment from the existing program. This transition will result in improved efficiency of the program's objectives, while also allowing for the more efficient application of new contraceptive technologies as they become available.

Recommended approach: Out of Scope

Transition Kangaroo Island koala management and progress state wide implementation of base of tree hormone implants.

Part A: Transition Kangaroo Island koala management and cease surgical sterilisation- $105,000.

- Cessation of surgical sterilisation and relocation of all infrastructure and equipment from the KI veterinary clinic to the Kingscote depot. Project management- recruitment, supervision of field staff, budgets, Project Plan 2018-19, Closure and evaluation report
- Data storage- Managing Environmental Knowledge template and upload to Biological Database of South Australia (BDBSA)
- Data management- collate 2018-19 KI monitoring and implant data.

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- Tree collars- maintain (and remove if requested) tree collars on private properties that are protecting large old Manna gum trees from koala over-browsing and which are now rare in the region.
- Monitor koala density at 26 core KI sites to ensure future population modelling is based on adequate data.
- Communication of key messages to the KI community

Funds include: NRKI Wildlife Program manager position (0.4 FTE), Field Officer (0.4 FTE), 50% vehicle costs, 50% corporate fees and operating costs.

Risks: KI veterinary clinic has a contract for sterilisation services with NRKI until 25/1/2021, however, recent discussions with the vet have indicated that he would likely agree to terminate services prior to this date if services were no longer required. Procurement unit have also advised that there would be minimal financial liability if the services are no longer required.

Benefits: Storing equipment and data appropriately will ensure that these are available for future state-wide implementation. Specialist skills would be retained by the Wildlife Program manager (ongoing position) and field officer which have collectively worked on the KI Koala management project for over 20 years and will allow cross regional transfer of skills. This approach also provides for proactive communication of the change to the KI community.

Part B: Progress base of tree hormone implant implementation across the state- $170,000

- State-wide coordination and progression of base of tree hormone implant procedure and permitting.
- ~15 DEW staff approved on permit to use hormone implants to provide the required flexibility in program delivery
- ~10 DEW AMLR staff trained in ground koala catching techniques and EP staff invited to participate
- Base of tree hormone implants inserted in 300 koalas in the AMLR and 150 koalas in the KI region in priority areas. The focus of actions in the AMLR is a reflection of the unsustainably high koala densities observed at key sites within that region, the progression of the hormone implant technique and the need to train staff in this region. Should further funds become available throughout the year these will be prioritised to increase contraception effort in the Kangaroo Island region.
- AMLR koala catching trainees to work jointly with the catch team in the AMLR region to further enhance skills (total 30 person days).
- Monitor koala density at 10 core sites in the AMLR.
- Project management- supervision of field staff, budgets, Work, Health and Safety.
- Data management- collate 2018-19 AMLR monitoring and implant data.
- Communication of key messages to the AMLR community and engage stakeholders

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Date: 22 June 2018

- Support investigations into new koala fertility control technologies e.g. dart delivery and implant injections.

Funds include: NRKI Wildlife Program manager position (0.6 FTE), 3 Field Officers (0.25 FTE), AMLR catching staff (30 person days), 50% vehicle costs, 50% corporate fees and operating costs. For this approach to work it is expected that Parts A and B are funded together (total $275,000) as it is problematic to separate the parts e.g. ongoing NRKI Wildlife Program manager position would become a cost pressure for KI region if not funded by part A and B.

This approach allows the most cost effective koala management to be investigated and implemented across the state and facilitates support from existing co-investment e.g. NRM levy funded Koala Project Officer position, International Koala Centre of Excellence (IKCE), University of Adelaide koala health checks and Flinders University population modelling.

Delivering Contraceptives to 300 koalas in the AMLR and 150 koalas on KI is not optimal from a population management perspective, however it will maintain DEW activity in koala management on Kangaroo Island and reduce the breeding capacity of koalas in critical habitat areas (modelling for the KI population is presented in **Attachment 2**).

Project direction and progress will be reviewed regularly by the SA Koala Project Coordinating Committee (KPCC) to ensure the funds allocated will be used as wisely as possible and in the most cost effective manner. Should additional capacity become available throughout the year, KPCC will reassess priorities and ensure flexibility in approach. Any additional funds would be used to increase hormone implant implementation on Kangaroo Island and to support research investigating koala movements in blue gum plantations and population modelling.

<u>What happens if we stop koala management on Kangaroo Island? Zero investment.</u>

This option is not desirable from many perspectives. The KI Koala population model suggests that, in the absence of any fertility control, the total population will more than double over 10 years, and koala density in high quality habitats (those most impacted by koalas) will be four times higher than desirable densities (Attachment 2). In high quality habitats, densities will approach those observed prior to the start of the KI Koala Management project, where significant defoliation and death to preferred food trees was common.

There is a strong community expectation that koalas will be managed on Kangaroo Island, and without active koala management the calls for lethal management (a koala cull) would intensify over time. The Strategy has ruled out culling koalas. Not funding any alternatives would be an untenable position.

Specialist skills and operational capacity would be lost within the department, at a time when it is clear other areas within the state including the Mount Lofty Ranges and the Eyre Peninsula will require access to skill and knowledge maintained through the KI Koala management project.

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The current national position of no lethal management of koalas by either state agencies or private land holders means that, with zero investment in non-lethal management, landholders would be left "high and dry" without viable alternatives to manage over-abundant koalas on their land. There would also be a high burden on all staff responding to the inevitable social media questions, Ministerial and direct correspondence. Specialist equipment would not be de-commissioned properly.

Without an active koala management project on Kangaroo Island there would be very limited ability to motivate for external funds from potential partners such as the forestry industry to add value to the existing project. Staff from NRKI are in ongoing discussions with forestry and tourism interests to explore options for external funding of the koala management program where industry interests and the aims of the koala management project align. The discussion is currently about financial input rather than seeking in-principle support, in-kind support or actual funds to support NRKI programs.

The proposal also marks a clear intent to transition from 20 years of fertility control on KI that has produced positive conservation outcomes, to a clear statewide approach where high impact zones in other areas of SA are also prioritised.

Intense community interest in koala management on Kangaroo Island and statewide

Kangaroo Island is a tourist 'jewel in the crown', based on the natural environment and wildlife viewing opportunities. Businesses on KI have consistently called for alternative investment in koala management to enable a thriving tourist industry but limit damage to native vegetation. Stopping koala management may have several community and business implications including reduced tourism potential in the long term, strengthened community calls for lethal management and a loss of credibility for DEW on the island.

Communications on a state-wide basis will also need to be considered as we transition to a state-wide approach in koala management across multiple regions. A comms strategy has been developed and is provided at Attachment 1. A comms plan will be developed to support the transition.

Operational Capabilities

The team on Kangaroo Island have over 20 years experience, possess a highly specialised skill set and have necessary equipment to deliver koala management outcomes. Retaining Kangaroo Island project staff and sharing resources state-wide will result in efficiencies across KI, AMLR, EP and the SE. Staff in other regions including AMLR and Eyre Peninsula are having these skills embedded.

It is anticipated that a presence of skilled staff with good local knowledge are likely to be a baseline requirement for effective program delivery in any region.

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CONSULTATION

The *South Australian Koala Conservation and Management Strategy (2016)* and the significant community consultation and participation (through the Great Koala Counts 1 and 2) establishes very broad community support and the "social licence" for fertility control as the preferred management technique for over abundant koalas.

FINANCIAL IMPLICATIONS

Are there financial implications? Yes

The KI Koala Management Program has been funded through the "CE Discretionary Fund" for several decades with annual funding ranging from approximately $900,000 to $400,000 per annum depending on sterilisation rates. A revised project, coordination within the state wide program and more cost-effective contraception methodologies creates the opportunity to lower the cost per koala management on Kangaroo Island. As discussed John the question here is whether we fund this, not where it comes from.

The risks associated with not funding any koala management on Kangaroo Island include: reputational risk to DEW, loss of a specialist skill set that will be required in the future, loss of ability to seek funding from potential partners, loss of momentum in progressing cheaper sterilisation technologies and techniques, long term negative impacts on nature based tourism activities on Kangaroo Island (and in other parts of SA), as well as long term negative environmental impacts.

G. PRK

Grant Pelton
Group Executive Director
Parks and Regions
22 June 2018

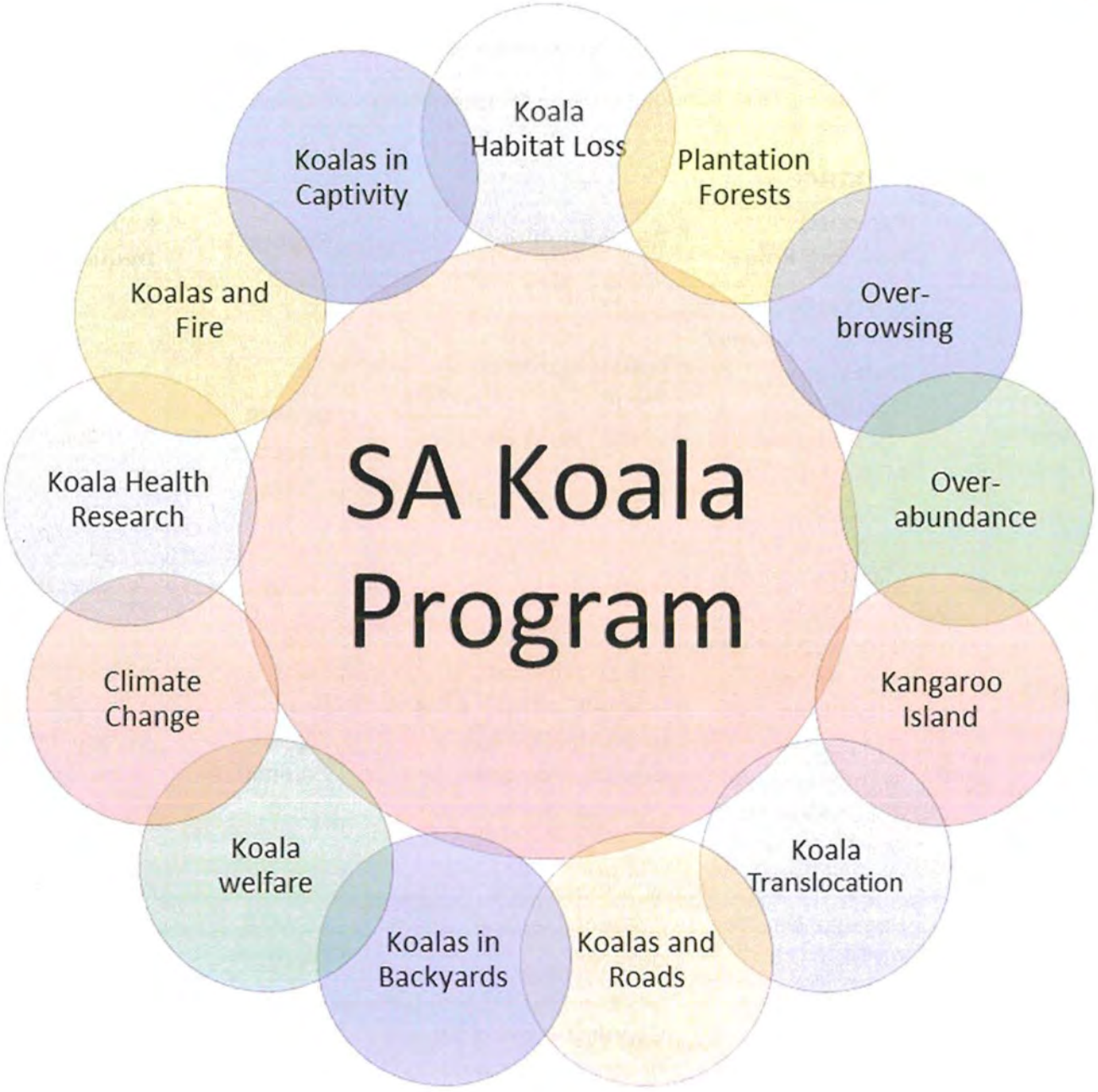
Attachment 1- SA Koala Management Comms Plan

Contact: Michaela Heinson on 0428 940 725 or Michaela.heinson@sa.gov.au
Date: 22 June 2018

SA Koala Program

Communications and Engagement Strategy

November 2017



Version Control:

#	Date	Author	Comments
0.1	06/04/17	Ange Pestell	SENSITIVE Draft confidential for SA Koala Project Coordinating Committee. Seeking feedback
0.2	04/0717	Ange Pestell	Draft, confidential for specialist Comms staff
0.3	20/11/17	Ange Pestell	Draft, confidential for SA Koala Steering Committee
1.0	10/1/18	Ange Pestell	Endorsed by SA Koala Steering Committee with edits.

Program governance

Role	Person(s) Fulfilling Role	Responsibilities	Reports to	Reporting frequency
Koala Steering Committee	Brenton Grear Sandy Carruthers Matt Ward Damian Miley Matt Johnson Michael Garrod Tim Collins Jonathon Clark Michaela Heinson	Ensure alignment of Program with priorities under the *SA Koala Conservation and Management Strategy*	DEWNR Executive	As required
Koala Projects Coordinating Committee	Michaela Heinson Jason Van Weenen Ange Pestell Jennie Fluin Dan Rogers Michele Walter Robyn Molsher Martine Kinloch Linda Brown	Ensure alignment of Program with priorities under the *SA Koala Conservation and Management Strategy*	Koala Steering Committee	As required
Program Sponsor	Regional Director, AMLR	Accountable for Program delivery	DEWNR Executive	Annually
Program Coordinator	Manager, Land, Marine & Biodiversity Services, AMLR	Coordination and delivery of program activities	Koala Projects Coordinating Committee	Bi-monthly
Program Comms Support	Regional and central comms staff	Engagement and communications advice and support	RMT / Director C&CE	As required

Introduction

In July 2016, the Minister for Sustainability, Environment and Conservation launched the *South Australian Koala Conservation and Management Strategy*, and in September 2016, DEWNR Executive endorsed a program approach to implementing this Strategy.

Background

Due to what was considered the over-exploitation by hunting of koalas in the early 20th century, koalas were introduced to Kangaroo Island (KI), the Adelaide Mount Lofty Ranges (AMLR), the Eyre Peninsula (EP) and the Riverland, near Renmark, as part of a conservation effort to protect the species from extinction. The success of these introduced koala populations means that the species is now well established beyond its former range in South Australia (SA), which was originally just the South East of the State. Given the number of these additional populations in SA, population trends and their abundance, koalas have been assessed as secure in this state.

Koalas are an iconic and well-loved species that are a significant tourism drawcard in South Australia (SA), especially for international tourists. Providing up-close wildlife experiences is a key component of the nature-based tourism industry in the state and has substantial economic value: in its lifetime, a trained "hold" koala at Cleland can generate a significant amount of revenue for the State (with current estimates at around $250,000 per koala). Tourism revenue provides a significant contribution to DEWNR through nature-based tourism of its protected areas with Cleland, Kelly Hill Caves and Seal Bay providing over $4.5 Million annually. A report by The Australia Institute estimates 9,000 jobs Australia-wide are directly accounted for by koalas, contributing between $1.1 - $2.5 billion annually to the Australian economy.

In 2012, as a result of habitat destruction and fragmentation, and disease the declining koala populations in New South Wales, Queensland and the Australian Capital Territory were listed as 'vulnerable' under the *Environment Protection and Biodiversity Conservation Act 1999*. However, SA was excluded from the listing as there was a lack of evidence for a significant decline in numbers of koalas in the State. In contrast to the northern population, koalas in some areas of Victoria and SA are regarded as abundant or over-abundant, and as such, they may contribute to the long-term persistence of koalas in Australia.

In recent years, koala numbers in parts of South Australia have been increasing to potentially unsustainable levels. Over-browsing by koalas has potentially catastrophic implications for the health of native ecosystems and the long-term persistence of koalas in the landscape. These consequences were demonstrated in Cape Otway, Victoria in 2013 and 2014, where more than 680 malnourished koalas were euthanized after the over-abundant population caused widespread tree death. The Victorian Government has since embarked on a significant koala management program to prevent further koala population crashes and to allow the habitat to recover by lowering koala densities.

Evidence from Cape Otway, as well as from KI, suggests that koalas tend not to move very quickly into other sites in search of food, even when their food source is depleted, resulting in starvation. Without management intervention in the AMLR and on KI, entire vegetation communities may be lost from the landscape altogether due to over-browsing by koalas.

Management intervention is critical to avoid catastrophes for animal welfare, international tourism and biodiversity conservation generally. The risks of not taking action include: loss of tourism jobs and revenue; impacts to the "clean green" image the food industry trades upon as a differentiator; severe damage to the state's reputation for wildlife experiences; decline in native vegetation and ecosystem function; an inevitable trajectory towards deaths of stressed and diseased koalas; and requirement for expensive emergency animal welfare interventions.

It is increasingly recognised that the presence of koalas in blue gum plantations in parts of southern Australia can lead to increased site management costs for the blue gum forest industry as well as potential impacts on surrounding native vegetation. Advances in managing koalas in plantations are being made and need to be incorporated into any plantation management strategies delivered in South Australia.

Effective koala conservation and management will secure the health of koala habitat, with flow-on effects to other iconic Australian native species that are important to biodiversity and tourism, unlocking further opportunities to promote respectful nature-based tourism experiences offered by Cleland Wildlife Park (CWP) and other koala tourism operators. The establishment of the International Koala Centre of Excellence at CWP will provide leadership and bring together expertise to improve our understanding of koala biology and ecology. The Centre will assist South Australia to become recognised as a leader in koala conservation and management.

Purpose and objectives of this strategy

This strategy will establish the key messages for use across the SA Koala Program. These key messages are necessarily high-level in nature and relate to the implementation of the *SA Koala Conservation and Management Strategy* and the South Australian Government's commitment to:

- Safeguarding the welfare of koalas;
- Increasing the social, education and economic benefits of having koalas in SA; and
- Reducing the negative impacts that over-abundant koala populations may have on broader ecological communities.

Detailed communications and engagement strategies will be developed for projects delivered through the Program, such as the KI Koala Management Project, and will be consistent with the key messages established by this strategy.

Specifically, the objectives of this strategy are:

- To proactively inform and coordinate communications about the program through the use of agreed, appropriate strategies and key messages and ensure that these are consistent with the SA Koala Conservation and Management Strategy
- To ensure there is stakeholder understanding of the opportunities and challenges in the delivery of the program
- To ensure there is broad community support and understanding for the program's key messages
- To encourage the involvement and support of partners, community groups and landholders in the program through a collaborative approach.

In keeping with the State Government's *Better Together* Principles of Engagement and commitment to 'joined-up' policy approaches, these objectives are guided by the International Association for Public Participation (IAP2) Goals, which are:

- To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.
- To partner with the public in certain aspects of decision-making, including the development of alternatives and the identification of the preferred solution.

Key Driver/s

The *SA Koala Conservation and Management Strategy* is the key driver for the SA Koala Program. The program also supports the following priorities under Goal 2 *Sustaining the natural resources of our state* of the DEWNR Corporate Plan:

- Monitor the condition of South Australia's natural resources to ensure the ongoing health of systems, communities and businesses that are dependent on them.
- Manage native species and natural systems to sustain biodiversity for future generations.
- Manage the impact of introduced pests and abundant native species on biodiversity, primary industries and communities.

The SA Koala Program contributes to the State Economic Priorities 'A Destination of Choice' and 'Best place to do business' by ensuring koalas remain a sustainable feature of the State's nature-based tourism industry, and by working with the plantation timber industry to minimise the impacts on koalas through co-designing best practice timber harvesting activities.

Other strategic drivers for this program are the community engagement and research agenda of the International Koala Centre of Excellence, the *Nature Like Nowhere Else* nature-based tourism strategy, as well as relevant subsidiary plans and DEWNR policies.

Target audiences

A detailed stakeholder analysis outlining needs, calls to action, barriers and key messages for each audience group is provided in **Appendix 1**. This analysis is high-level and to be used as a starting point for project-specific stakeholder analyses. The target audience for the Koala Program can be broadly described as:

Internal

Minister for Sustainability, Environment and Conservation

DEWNR Executive

Community engagement, policy and field-based staff across the Economic and Sustainable Development, Parks and Regions, and Science and Information Groups of DEWNR.

External

NRM Boards in the regions where koalas occur.

The International Koala Centre of Excellence.

Other State Government entities with a role in sustaining healthy koala populations (e.g. DPTI, SA Tourism Commission, PIRSA, ForestrySA, SA Health).

Industry bodies with a role in sustaining healthy koala populations (e.g. for forestry, tourism, SAVEM, research).

Local Government Association (LGA) and local councils in regions where koalas occur.

Environmental non-government organisations (Conservation Council SA, Nature Conservation Society of SA).

Zoos and Wildlife Parks/Sanctuaries offering koala experiences, including Ocean Park Hong Kong, the Gorge Wildlife Park, Mikkira Station, and Zoos SA.

Wildlife carer organisations, including Fauna Rescue of South Australia and the Adelaide Koala & Wildlife Hospital.

Landholders in the regions where koalas occur.

Community groups in the regions where koalas occur.

Local and international press/media organisations.

Key messages

The key messages that will inform communications with all stakeholders are:

- DEWNR has a Strategy to guide the conservation and management of koalas in South Australia. The aim of the Strategy is to sustain a healthy koala population through a mix of passive and active conservation and management activities.
- Sustaining a healthy koala population is a responsibility we all share. We are working with the South Australian community to identify shared opportunities to keep koalas and their habitats healthy for our continued enjoyment of this much-loved iconic species.
- We will partner with the International Koala Centre of Excellence to progress priority research and education to better understand koala biology and ecology. We will support the State Government's vision to revitalise Cleland Wildlife Park into an iconic, globally recognised nature-based tourism experience and work to increase awareness of the economic and cultural importance of koalas as a tourism icon for South Australia and the community.
- We will use the best available evidence to inform robust decision making. This includes partnering with experts to gain the advice we need to sustain the health of koalas and their habitats, and working with communities to develop and deliver solutions.
- In relation to over-abundance, tree health and/or koala density data will form the main basis on which conservation and management actions will be prioritised and undertaken.
- Conservation and management actions will include habitat restoration, individual tree guarding, sterilisation and fertility control of the koalas in areas of high density.
- The risks associated with doing nothing to curb high koala densities include large-scale deaths of koalas due to starvation and the loss of entire vegetation communities from the landscape, as well as risks to the State's reputation as a destination of choice for unrivalled wildlife experiences.
- The culling of koalas or the deliberate spread of disease will not be used to manage koalas in South Australia. This is a long-standing position with national agreement across state and federal governments and reflects the iconic status and public image of the koala.

Communications approach

While this strategy sets the direction and key messages to be used when talking about the SA Koala Program, detailed communications and engagement strategies will be developed for each project within the scope of the Program. Communications and engagement activities for the SA Koala Program will be based on the *Better Together* principles and should include a mix of approaches to maximise the reach of each community engagement campaign.

Promotion/Advertising

A list of frequently asked questions has been developed (**Appendix 2**) and should form the first point of call when responding to queries from the community. Depending on the project, promotion via the DEWNR website and regional social media channels should be included in project-specific plans.

Media/PR

Potential media and public relations activities are likely to be focused on the individual projects delivered through the program, such as the Great Koala Count 2 and the KI Koala Management Project. A proactive approach will be taken to media releases to support these individual projects through the use of key messages.

Social Media

A number of our partners, including Fauna Rescue SA, the Adelaide Koala & Wildlife Hospital, Discovery Circle, and Zoos SA, have active social media channels with highly-engaged followers/supporters. To grow support for the program, working with these partners through the mix of DEWNR-related social media channels will be critical. Cross-promotion of events and activities should be encouraged for project-specific activities.

Internal communication

Targeted internal communication will be critical for maintaining a high level of awareness and support for the program and associated projects. Briefings will be submitted to Executive for regular reporting on Program progress, and information will be shared more broadly via articles in The Weekly, iShare sites, and FAQs as necessary.

Proposed schedule of communication

Tactics	*Details*	*Evaluation*
EVENTS		
Community listening post	A community listening post with key agencies, community groups and industry groups will be held to recognise the work being done and gather information about the challenges each stakeholder faces. A secondary aim of the event is to demonstrate and recognise the shared nature of the experiences and opportunities presented by the Strategy and SA Koala Program.	No. of attendees Event feedback
MEDIA		
Minister's Media Release	A Ministerial media statement will be released when the results of the Great Koala Count 2 have been presented to DEWNR. This article will focus on the key message that we are working towards the shared vision of sustaining healthy koala populations.	Media articles including key messages
Region-specific media	Project-related media releases will be required, particularly for KI KMP, AMLR Great Koala Count, and EP koala management activities.	Media enquiries

Tactics	*Details*	*Evaluation*
EXTERNAL COMMUNICATIONS		
Brief key partners	Key partners (e.g. key land managers, carer groups, local government, local MPs) will be briefed as required to foster support and understanding of the program's focus of the shared responsibilities for sustaining healthy koala populations and habitats.	Feedback from key partners
Ad hoc key partner engagement	As the strategy and program outcomes are long-term and shared by us all, opportunities to engage with key partners, as listed above, are proactively sought and taken to increase support and understanding of the program's focus for sustaining healthy koala populations and habitats.	Proactive opportunities taken Feedback from key partners
National koala committee meetings	Ensure that SA Koala Program's aims and activities are clearly communicated at relevant national koala conservation and management meetings, as required.	Meeting feedback.
DIGITAL / SOCIAL MEDIA / WEBSITES		
DEWNR WEBSITE	Subject to further discussion, information regarding projects within the scope of the Program may be made available on the website. Current Koala Fact Sheets need to be updated to reflect current information and branding.	Page visits (Google analytics)
GOOD LIVING BLOG	Likely to have a blog-post explaining the Great Koala Count 2 results for AMLR.	Page visits (Google analytics)
VIDEO	Possible cross-promotional video with the Discovery Circle regarding Great Koala Count 2 results.	Video views
TWITTER	Cross-promotion of Great Koala Count 2 results, KI Koala Management Project (NRKI account?)	Social media analytics
FACEBOOK	As above. Also work with The Discovery Circle to utilise the Great Koala Count Facebook page for cross-promotional purposes.	
E-NEWSLETTER	Potential for articles related to specific projects, such as KI KMP for the NRKI newsletter & GKC2 for NRAMLR newsletter	MailChimp analytics, number of opens
INTERNAL COMMUNICATIONS		
DEWNR WEEKLY	An article in the *DEWNR Weekly* outlining the SA Koala Program to coincide with release of the GKC2 results	MailChimp analytics, number of opens
BRIEFINGS	Progress reports for the program, including Science Report & Business Case development, to be added to agenda for Executive meeting/s as required.	

Communications contact

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Issues management

Identify any issues that may impact on the rollout of the communications approach and achievement of objectives. Prioritise any action that is required in accordance with the potential impact and likelihood of the issue. Identify any costs associated with managing the issue/s.

Issue	Impact (high, medium, low)	Likelihood (high, medium, low)	Potential Consequences	Mitigation approach
Negative publicity and comments (KI based)	Low	Low for most stakeholders High for a small, vocal segment of local community	Loss of credibility	• Have responses prepared in advance for sensitive issues • Respond in a genuine and positive way with consistent and standardised messages • Build awareness, share information with CTOs and through other means listed above • If responses are ignored, or continue to fuel an issue, consider stopping engaging if appropriate
Negative publicity and comments on options outlined in the Strategy (State-wide)	Low to Medium *(could affect International Koala Centre of Excellence)*	Medium	Loss of credibility Impact on relationship with Ocean Park Hong Kong who may wish to distance themselves from SA	• Have responses prepared in advance for sensitive issues. • Respond in a genuine and positive way with consistent and standardised messages • Build awareness, share information with CTOs and through other means listed above • If our responses are ignored, or continue to fuel an issue, we may choose to stop engaging as appropriate

Issue	Impact (high, medium, low)	Likelihood (high, medium, low)	Potential Consequences	Mitigation approach
Capacity to respond to emerging issues in a timely fashion (i.e. someone else drives the narrative for that issue)	Medium	Medium – limited engagement recently has increased the likelihood of this issue emerging	Could create confusion & give the impression of inconsistent approach by the Program.	• Have key messages ready to go; scanning of media and other information sources
Insufficient resourcing to deliver the program	High	Low-medium	Loss of momentum; inconsistent implementation of the strategy; ad hoc and inconsistent messaging	• Business case to support ongoing future funding.
Varying level of knowledge in the community about koalas and their conservation status and threats. People also often have a poor understanding about koala behaviour and ecology.	Medium	Medium	Community confused by mixed-messaging. They hear about koalas being threatened and overabundant and don't know what's true. They may not accept or support the recommended actions.	• Clear education approach in messaging. • Factual basics included • Don't assume high level of knowledge or understanding of SA-specific circumstances. Make sure they clearly understand the differences between our situations and the East Coast populations.

Appendix 1: Target audience analysis

	Stakeholder / Partner	How the issue relates to them	Current perception of the issue	Primary concern/interest	Level of education on the issue	Level of influence on the outcome	Expectation regarding engagement
Program sponsor	• Minister for Sustainability, Environment and Conservation • DEWNR Chief Executive • DEWNR Executive • DEWNR Koala Steering Committee	Responsible for koala management legislation and policy. Political imperative to create a shift to community at the centre of natural resource management.	They are abundant & must be managed to minimise the negative impacts on broader ecological communities and on the welfare of the koalas themselves.	The environment is conserved, valued and enjoyed Recognition that koala management is a highly politically sensitive issue.	High	High – they will have final say on the proposed program.	High - They have final say on the engagement process. They will be provided with regular progress reports. They will have final say on the proposed program.
DEWNR	• Parks & Regions: (AMLR, EP, KI, SAMDB, SE Regions, Conservation, NRM & Protected Area Policy Branch) • Economic • and Sustainable Development: CWP, IKCE, Iconic Tourism Sites • Science and Information Group	Responsible for delivering koala management and upholding legislation. Required to ensure robust evidence informs decision-making. Responsible for providing outstanding nature-based tourism experiences. Necessity of achieving targets with fewer resources.	Mixed; contrasts between koalas as an overabundant species to be reduced in the landscape and koalas as a key attraction for our parks and icon sites. CWP traditionally viewed as centre of knowledge and management of koala issues.	Wildlife conservation and management, policy and planning advice on management of impact-causing species, excellence in conservation science, animal welfare, recovery of threatened plant and animal species and communities, promotion of nature-based tourism.	High	High – they are key expert stakeholders. They have broad understanding of regional issues. Face to face contact with broader community.	High - They will provide direct advice and be able to provide innovation in formulating solutions and recommendations for management options.

	Stakeholder / Partner	How the issue relates to them	Current perception of the issue	Primary concern/interest	Level of education on the issue	Level of influence on the outcome	Expectation regarding engagement
Boards, councils and advisory groups	• IKCE Advisory Board • AMLR NRM Board • SE NRM Board • KI NRM Board • Animal Welfare Advisory Committee • DEWNR Koala Projects Coordinating Committee	Engage with businesses, community, researchers & Govt to make CWP the home of the koala. Engage communities and work with the State Govt to decide priorities, develop regional plans, and resolve difficult challenges. Advise the Minister on any animal welfare matters	Koalas as a key economic and social benefit to SA. Landscape scale biodiversity management. Minimise negative impacts caused by over-browsing of koalas. Integrated and sustainable structures for managing the State's natural assets.	Engaging industry, researchers, landholders, land managers and members of the community in effective biodiversity management and sustainable development.	Medium	High. They have broad understanding of regional issues.	High. They will have direct advice and be able to provide innovation in formulating solutions and recommendations for management options. They have a high level of expertise, resources and services to offer other target audiences.
State government agencies	• Department of Planning, Transport and Infrastructure • Primary Industries and Regions – ForestrySA	Responsible for road safety and reducing vehicle-wildlife collisions through traffic management. Regulation of forestry industry, including compliance with guidelines to manage koalas in plantations.	Need to manage transport infrastructure that intersects koala habitat. Minimise negative impacts caused by koalas impacted by forestry harvesting.	Undertake fauna assessments as part of the EIA for infrastructure projects & install signs where needed. Work with industry to minimise koalas affected by harvest operations.	Medium	High. Involvement in decision making and agreement to implement any actions is vital as roads and forests can have big impacts on koalas (and vice versa).	High. They will have direct advice and be able to provide innovation in formulating solutions and recommendations for management options.

	Stakeholder / Partner	How the issue relates to them	Current perception of the issue	Primary concern/interest	Level of education on the issue	Level of influence on the outcome	Expectation regarding engagement
Interstate government agencies	• Environment, Land, Water and Planning & Parks Victoria • NSW Office of Environment and Heritage • Environment and Resource Management (QLD)	Responsible for delivering koala management policy and upholding legislation.	Thorough understanding of issues on a state and National level.	Qld and NSW have a conservation focus. Mainly limiting negative impact of development and forestry activities. Victoria has a mixed focus -includes management of abundant koala populations	High. Koala management is a key issue for the eastern states.	Low – Influence will be through national meetings and workshops aimed at conserving the species.	Low – Will be able to provide advice and guidance.
Federal government	• Department of the Environment and Energy	Responsible for implementing the Australian Government's policies to protect the national environment and heritage, and to promote a sustainable way of life.	Thorough understanding of issues on a state and National level.	Conservation of the species nationally.	High. Koala management is a key issue for consideration under the EPBC Act following listing of the 'northern' population in 2012.	Medium – will provide forums for discussion with interstate counterparts at national level.	Low-medium – Coordinating national meetings, research projects and monitoring implementation of agreed targets.
Local government	• Local Government Association of SA • Local councils in AMLR, EP, SE & KI	Responsibility for maintaining local roads, reserves and public amenity values, swimming pool and dog management by-laws.	Mixed, depending on extent of koalas, evidence of impacts and public interest in the issue.	Mixed, includes need to manage koalas in and around roads, council reserves, swimming pools and interactions with dogs.	Mixed	Mixed – will depend on spread of koalas in their area. Some willing to promote koalas and work with DEWNR to achieve program outcomes.	Mixed

	Stakeholder / Partner	How the issue relates to them	Current perception of the issue	Primary concern/interest	Level of education on the issue	Level of influence on the outcome	Expectation regarding engagement
NGOs	• Conservation Council SA • Trees for Life • RSPCA	Conservation and environmental groups concerned with conservation and protection of the environment A community based charity that works to prevent cruelty to animals by actively promoting their care and protection	Likely to focus on koalas as an introduced species that needs to be managed for conservation purposes. Main focus is on domestic pets and livestock.	Likely to be managing the impacts of over-browsing on native vegetation and flow-on effects to threatened species. Support for standards and guidelines to promote consistent management of wildlife	Mixed, depending on interests of members. Focus on welfare rather than management.	Low-medium depending on member interest and capacity to engage. Medium – have a public face and it would be good to get their support.	Unknown, but likely to expect some engagement on decision-making. Support for the Strategy would be good. But wildlife is not their primary focus.
Community interest groups	• Australian Koala Foundation	A not for profit organisation focusing on conservation and effective management of koalas and their habitats	The declining population of koalas in Qld and NSW.	Activist group calling on all governments to better protect koalas and halt habitat destruction.	Mixed as primarily focused on interstate issues & have little confidence in SA / Vic evidence of over-abundance.	Low	Unknown but likely to be against program due to fundamental disagreement that koalas are over-abundant in SA.
Veterinary providers	• Australian Veterinary Association – South Australia division • Dr Ian Hough • Dr Wayne Boardman • Dr Ian Smith • KI veterinary clinic	Professional organisation that represents vets across SA Vets with a special interest in koalas	Koalas are a specialist species. Koalas can be hard to diagnose and keep.	Guidelines for koala rescue and release. Skills of carers and welfare of animals. Research into dietary and kidney issues of wild koalas.	Medium. Very few koala specialist vets.	Medium – more koalas being rehabilitated. Greater number being taken to vets. More pressure on AVA to support this need.	Low - medium. Expert advice and guidance, particularly relating to sterilisation and/or fertility control as well as koala health research.

	Stakeholder / Partner	How the issue relates to them	Current perception of the issue	Primary concern/interest	Level of education on the issue	Level of influence on the outcome	Expectation regarding engagement
Wildlife carers and rescue groups	• Fauna Rescue SA • Native Animal Network • Koala and Wildlife Hospital • KI wildlife network	Registered charities with volunteers who rescue, rehabilitate and release wildlife.	More koalas needing rescue. Perception that koalas are declining in AMLR. Perception that DEWNR is or will start culling	Welfare of individual animals.	Medium – koala carers understand koala health and welfare issues well but some are unclear on detecting evidence of over-abundance	Medium - DEWNR is relying more and more on wildlife carers to provide a service. Fauna Rescue have a high social media profile and their support is important for engaging and educating the community.	Medium. Need to keep engaged in the process as their key messages re koalas may contradict our own messaging.
Wildlife parks	• Zoos SA • Gorge Wildlife Park • Warrawong Sanctuary • Australia Zoo	Organisations that display exotic and native species, provide conservation education, as well as supporting and conducting many conservation, breeding and research programs.	Koalas are an important native species and the tourists love them. Some rescued koalas are suitable for display.	Health and welfare of the individual animals. Research into disease status of wild population.	High	Medium	Medium - depending on management actions (e.g. sterilisation / fertility control / rescue)
Tourism operators	• SA Tourism Commission • Mikkira Station	Responsible for promoting the States' tourism industry. Promotes EP koalas as tourism opportunity for guests at the Station.	Koalas are an important draw card for tourists and an iconic symbol of Australia. Key attraction but know over-browsing needs management.	Koalas can be seen up close by visitors. Ensure ongoing security of koalas and their habitats	Low - Medium	Medium – koala interactions and images are a financial asset.	Medium – particularly relating to messaging about koalas.

	Stakeholder / Partner	How the issue relates to them	Current perception of the issue	Primary concern/interest	Level of education on the issue	Level of influence on the outcome	Expectation regarding engagement
Universities and research partners	• Discovery Circle (UniSA) • Dr Natasha Speight University of Adelaide • Dr Steven Cork • Prof Corey Bradshaw (FUSA) • Dr Steve Delean (University of Adelaide) • Dr Wayne Boardman (University of Adelaide)	Research into koala health (kidney dysfunction), social and biophysical sciences research, koala conservation research.	In depth understanding of challenges and issues facing koala conservation and management.	Health / disease status of koalas in the Adelaide Hills; influence of social and biophysical sciences on policy, understanding population dynamics and conservation genetics of koalas in SA.	High	High	High
Landowners and land managers	Landowners with koala habitat	The koala is a highly visible and well recognised symbol of Australia. Most people enjoy seeing koalas in the wild or in wildlife parks. Most people are concerned about the future conservation of the species. Some people are concerned about overbrowsing impacts. Most people like koalas.	May have been upset by media stories of koalas being burnt in bush fires or drinking water during recent heatwaves. May be aware of concerns for conservation of the species, and may be confused as to status of koalas in SA (not enough or plenty).	Welfare of individual animals. Concern about the dangers of koalas being hit by cars. May be annoyed by dogs barking at koalas. May have concerns about how koalas could impact negatively on their property (trees) or landscape generally.	Mixed	Medium - Involvement and support of the community for the program's activities is critical for its success.	High - involvement and support of the community for the program's activities is vital for its success.

	Stakeholder / Partner	How the issue relates to them	Current perception of the issue	Primary concern/interest	Level of education on the issue	Level of influence on the outcome	Expectation regarding engagement
Members of the public	• Identify specific target areas • Other interested residents within the Adelaide and Mount Lofty Ranges and South East • National / International public views	The koala is a highly visible, well recognised symbol of Australia. Most people enjoy seeing koalas in the wild or in wildlife parks. Most people like koalas.	Mixed - may be upset by stories of koalas burnt in bush fires or drinking water during heatwaves. May be aware of conservation concerns and may be confused about status of koalas in SA. Some may consider koalas an introduced pest for removal from landscape.	Welfare of individual animals. Concern about the dangers of koalas being hit by cars and burnt by bushfires. May be annoyed by dogs barking at koalas. Concern about over-browsing impacts on trees.	Medium - Most people know a little about the species.	High - Involvement and support of the community for the program's activities is vital for its success.	High - Involvement and support of the community for the program's activities is vital for its success.

Appendix 2: Possible questions and responses – State-wide response

What is the conservation status of koalas?

Koalas, a protected species under the *National Parks and Wildlife Act 1972*, are considered to be abundant in South Australia.

Koala populations in Queensland, New South Wales and the Australian Capital Territory are listed as 'vulnerable' to extinction under the national *Environment Protection and Biodiversity Conservation Act 1999*. The Federal Government is currently developing a Recovery Plan for these koala populations. Koalas in Victoria were excluded from the listing because of their abundance in the state, and there was limited evidence of their decline in SA. Koalas are of least conservation concern in SA because their traditional range was in the South East and they are now naturalised in other areas of the state, with secure populations across their range. In Australia, koalas have two different conservation statuses depending on their location. Northern koalas are considered as vulnerable and southern are not.

Why are you conserving koalas where they are introduced instead of just in their natural range?

Koalas have been in South Australia for a very long time and we now have a global reputation for the wildlife experiences offered by their presence. Our landscapes and wildlife populations have changed significantly since European settlement and we are managing a legacy of conservation introductions across South Australia. Our aim in maintaining koalas at sustainable densities across their established range is to:

- safeguard the welfare of koalas from threats such as traffic, dogs, disease, bushfires and reduced food quality due to global climate change
- increase the social, educational and economic benefits of having koalas in South Australia by promoting opportunities to develop unique visitor experiences, strengthen private sector partnerships and optimise research initiatives
- reduce the negative impacts that over-abundant koala populations may have on their habitat and their food trees.

Why don't you catch koalas and translocate them to where they are threatened?

The South Australian Government does not generally support the translocation of koalas as a primary management tool for the following reasons.

Koalas found in South Australia and Victoria ("southern" koalas) have adapted to a cooler climate and are therefore heavier, and have thicker fur, than their northern counterparts in Queensland. Southern koalas also eat different species of Eucalypt and because koala joeys receive their food preferences (via gut flora) from their mothers, they may have difficulty adapting to the digestion of Eucalypts from other locations.

It would also be inappropriate to translocate southern koalas into a situation where the threats to koalas are still present and contributing to their decline; to do so would place undue pressure on the already limited habitat as well as the resident koalas. We know that koalas from South Australia would be placed under great physical stress and would be unlikely to survive if they were translocated to Queensland.

It should be noted that to translocate koalas, a number of decisions need to be made to achieve the best outcomes for the koalas. This includes the availability of release sites of adequate size, ongoing habitat quality and connectivity to accommodate an expanding koala population. Translocation is also expensive and much of the available habitat already contains koalas. There are also no guarantees that individual koalas will survive or adjust well to a new habitat.

Why don't you provide koalas to zoos?

DEWNR can, and has, transferred wild koalas into captivity within South Australia, and has a policy in place to guide this process as and when the required. DEWNR has also exported captive bred koalas overseas. As with translocation, exporting koalas is an extremely complex process that is regulated by federal and state legislation. The zoo receiving the koalas must go through a great deal of training and regulatory compliance to ensure they can care for the animals with appropriate holding facilities and have an adequate supply of specific Eucalypt species.

Koalas in zoos and wildlife parks are popular visitor attractions and make an important contribution to the State, national and international tourism industry. These facilities also play an important role in educating visitors about the conservation and management of koalas and their habitat. Through experiences and interpretation that engage visitors on a deeply emotional and even spiritual level, zoos and wildlife parks play an integral role in increasing people's sense of connection to the natural environment.

Koalas have specialist animal husbandry and veterinary needs. It is essential, therefore, that displays are maintained at high standards. ZoosSA and Wildlife Parks develop and distribute comprehensive information resources which promote better understanding of the koala, its status and actions needed for its conservation and management.

The State Government's Cleland Wildlife Park provides opportunities to offer unique visitor experiences, strengthens private sector partnerships and optimises community and science research initiatives.

Tourists want to see koalas and while you say they are over-abundant they are not very visible in the landscape, therefore we don't want their numbers reduced.

There are many places in South Australia where koalas can be easily seen in the wild. In fact many of our National Parks and other protected areas have resident koalas that can be spotted from walking tracks regularly used by local people and tourists. Koalas are prevalent in the landscape, and at high densities can over-browse trees. As much of the high quality koala habitat is on private land or difficult to access, we will be working with landholders, the tourism industry and other interested parties to determine how we can conserve the landscape as well as ensure that visitors have great koala-related experiences.

We also know that koalas offer great social, educational and economic value to South Australia. This is why the SA Koala Program is focused on sustaining a healthy population of koalas, which means making sure that koala habitat is free from the impacts of over-browsing, notably a decline in tree health and/or tree death. We will work with the community to find out what a healthy koala population looks like as well as what an unhealthy koala population looks like, and whether that changes or stays the same across the landscape. This will help us find solutions that are suitable for each situation and location.

Do possums also over-browse trees?

In some situations possums may over-browse trees. Impacted trees are likely to benefit from a period of no browse pressure to enable them to recover. Most possums appear to be a secondary driver of tree decline rather than a primary driver.

Are there going to be issues – including the injury of koalas - with harvesting blue gums due to koalas in the plantations?

The State Government is working with the timber industry to implement policies and guidelines that focus on protecting the welfare of koalas in plantations whilst maintaining the economic, environmental and social benefits of the plantation industry.

How many koalas are killed by cars each year?

The number of reported vehicle strikes with koalas is variable and increases during the koala breeding season, between September and February. This is a busy time, with male koalas more mobile, and young koalas becoming independent and moving away from their mother in search of their own territory. Much of this activity occurs during the evening and overnight. It is important that we all obey speed limits and slow down at dusk and at dawn as this makes roads safer for everyone, including wildlife.

How many koalas are killed by dogs each year?

The number of reported dog attacks on koalas increases during the koala breeding season, between September and February. This is a busy time, with male koalas more mobile, and young koalas becoming independent and moving away from their mother in search of their own territory. Much of this activity occurs during the evening and overnight.

Many dog owners may not realise that their dog poses a potential threat to koalas, with even the most obedient dog being capable (and likely) to protect its territory from other animals attempting to enter it, including koalas.

Keeping your dog under effective control will reduce the risk of injury to your dog and the koala. Early evening and hours of darkness are the times when koalas are most active, and the times when koalas may come down to the ground to move between trees. Many koalas are attacked by dogs in backyards at night. Safe passage for the koala will require keeping your dog inside your house or in an enclosed outdoor area away from the koala. Home owners are also able to install either 'koala proof' or 'koala friendly' fencing (which either keeps koalas out of the property altogether or, once in, allows them safe passage to get out quickly)

How many koalas are killed in prescribed burns / bushfires each year?

1. How many koalas died in recent bushfires?

We don't know exactly how many koalas are impacted by bushfires. In response to State Emergency incidents such as a major bushfire, Primary Industries and Regions SA activates South Australian Veterinary Emergency Management Inc. (SAVEM) to support and work in the emergency area alongside other agencies. SAVEM gets supplies and veterinary and non-veterinary volunteers into the area after it is re-opened by emergency services. Anyone who finds a koala that appears to be affected from a bushfire should contact a wildlife rescue group or a local veterinarian as soon as possible. Do not enter a recent fire-affected area as it may be unsafe.

2. How many koalas are killed in prescribed burns?

The State Government carries out prescribed burns to reduce the chance of large areas of vegetation being lost in bushfires and to protect surrounding homes and infrastructure. Prescribed burns are conducted in a patchwork or mosaic pattern, which aims to reduce the risk of a significant bushfire in parks and reserves while maintaining environmental values. This mosaic pattern also provides wildlife with safe refuge while the vegetation regrows. While it is anticipated that some animals may be impacted by prescribed burn programs, it is considered more favourable than losing many more animals in an uncontrollable bushfire.

It is not possible to remove wildlife from an area before a fire, either bushfire or prescribed burn. Following either incident, suitably qualified and experienced wildlife care organisations and rehabilitators can assist authorities with the recovery, treatment, and rehabilitation of wildlife affected by fire in a coordinated and safe way.

What diseases do koalas in SA suffer from?

Koalas in South Australia were once considered to be relatively free of disease. However, several cases of conjunctivitis associated with the bacterial organism Chlamydia were identified in 2012 in koalas in the Adelaide and Mount Lofty Ranges (AMLR) region, leading to a larger study in 2014 confirming a much higher prevalence of subclinical Chlamydia infection than initially thought. Koalas in the AMLR have been found[1] to have a high prevalence of kidney disease associated with deposits of calcium oxalate crystals accumulating in the kidneys. This is known as oxalate nephrosis and it can lead to a gradual loss of kidney function which progresses to kidney failure and death. The cause remains unclear. Research into oxalate nephrosis in South Australian koalas will be led by the International Koala Centre of Excellence.

Mange, due to the *Sarcoptes* mite, has also been detected in some koalas in AMLR, whilst koala retrovirus is present in both the AMLR and on Kangaroo Island. It is still unclear as to how much of an impact these conditions have, or will have, in South Australian koalas, but they are a cause of concern for the health and welfare of the koala populations and may create demands on the time of Government agency staff, veterinarians and voluntary wildlife carers.

How will koalas be affected by climate change?

Koalas are particularly vulnerable to the effects of elevated CO_2 levels on eucalyptus nutritional quality. As CO_2 levels continue to rise, koalas will need to cope with increasingly nutrient-poor and tannin-rich *Eucalyptus* leaves. Scientists therefore suggest that koalas could respond to climate change in two ways.

Firstly, koalas could meet their nutritional needs by spending more time feeding and thus eating more. However, there is a limit to how much koalas can increase the size of their guts. In addition, eating more leaves causes them to pass more quickly through the koala's digestive system, resulting in less thorough digestion and decreased nutrient uptake. This could also increase over-browsing pressure in areas where there is already a high density of koalas.

Secondly, koalas could develop a greater selectivity in leaf and tree choice. Younger, more nutritious leaves, however, also tend to possess more tannins. Koalas could also be more selective about the trees they select, though this would involve greater travelling time to find the best trees. Increasing temperatures are also likely to increase koala mortality rates.

Can I keep a koala as a pet?

No, the private keeping of koalas is not permitted in South Australia without a Zoo licence. Koalas have specialised needs and are difficult to care for and feed. Many koalas do not cope well with the stress of handling and being around people. They can be very picky with their food. This is why only wildlife parks, zoos, wildlife veterinarians or people with extensive experience in the rescue and rehabilitation of sick, injured or orphaned koalas, are permitted to care for them.

Where, when and how can rescued koalas be released?

People may become distressed when they find a sick, injured or orphaned koala and want it to be 'rescued', rehabilitated and released back into the wild, but koalas have specialised needs and can be difficult to care for.

In 2010 the Department of Environment, Water and Natural Resources implemented the '*Koala Intervention Policy*' which, for the first time in South Australia, allowed for a network of approved koala carers to take an active role in the rescue, rehabilitation and release of koalas across the State. These carers work in partnership with experienced veterinarians, zoos and wildlife parks to provide emergency

[1] Speight, KN, Boardman, W, Breed, WG, Taggart, DA, Woolford, L, Haynes, JI (2013) 'Pathological features of oxalate nephrosis in a population of koalas (Phascolarctos cinereus) in South Australia'. *Veterinary Pathology* **50**, 299-307

triage response and rehabilitative care for sick, injured or orphaned koalas. They also contribute to gathering intelligence on koala distribution, numbers, emerging diseases and disease patterns.

Preparations to release a rehabilitated koala starts at the time of rescue and continues throughout its rehabilitation period. Written permission from DEWNR must be sought to release a koala unless the rescue permit includes a special condition allowing for its release. Koalas must be released close to the point of its capture. The koala itself must be assessed as being physically and behaviourally ready for release and releasing koalas during heat waves and or storms should be avoided.

Approved koala carers are people who have been able to demonstrate that they have the necessary expertise and experience in caring for koalas. They have appropriate facilities and access to sustainable fresh supplies of at least three types of suitable koala food tree species daily. They can recognise the subtle signs of pain and ill-health in koalas and have agreed to abide by their permit conditions.

If you find a sick, injured or orphaned koala you should contact a wildlife rescue group or a local veterinarian as soon as possible. You could also volunteer at a wildlife rescue group. The Fauna Rescue Koala Hotline is Tel: (08) 7226 0017.

How do I become a koala carer?

If you are interested you should contact a wildlife carer group like Fauna Rescue. Since 2010 approved koala carers have taken an active role in the rescue, rehabilitation and release of koalas across the State. These carers work in partnership with experienced veterinarians, zoos and wildlife parks to provide emergency triage response and rehabilitative care for sick, injured or orphaned koalas. They also contribute to gathering intelligence on koala distribution, numbers, emerging diseases and disease patterns. Approved koala carers (permit holders) are people who have been able to demonstrate that they have the necessary expertise and experience in caring for koalas. They have appropriate facilities and access to sustainable fresh supplies of at least three types of suitable koala food tree species daily. They can recognise the subtle signs of pain and ill-health in koalas. Koalas have specialised needs and can be difficult to care for. Many do not cope well with the stress of sickness or injury and this is why only veterinarians or people with extensive experience in the rehabilitation of the species are permitted to care for them.

The '*Guidelines for the Captive Management of Koalas in SA*', developed by the Department of Environment, Water and Natural Resources sets minimum standards and conditions for captive koala management in South Australia. This document provides guidance about where care and rehabilitation should (and should not) be used, including the rehabilitation-for release of koalas. Koalas which are intended for eventual or immediate release should not be placed on public display without prior approval.

Why won't the Government provide funding to wildlife carer groups?

The Government does not have funding agreements with any of the wildlife rescue groups operating in SA. Small targeted amounts of funding have been provided to facilitate training for koala carers and DEWNR staff provide significant information and mentoring to support carer groups. DEWNR also supports these groups through the provision of technical advice and in-kind support. More broadly, the Department focuses its funding on supporting habitats and developing systems to assist in the long term survival of species rather than focusing on individual rescued animals.

What trees can I plant in my garden to attract koalas?

Koalas will eat up to 10 species of Eucalypts in SA. Manna gum is a favourite, but they will also eat SA blue gum, river red gum, grey box and stringybark. However, koala diet varies between areas, with koalas preferring different species in different areas and at different times of the year.

What species of tree do they eat?

See question above '**What trees can I plant in my garden to attract koalas?**'

Why won't the Government just plant more trees?

Habitat restoration is important for conserving koalas and other native species, but on its own it is unlikely to resolve all the issues.

How big is a koala's territory?

Koalas are generally solitary, only interacting during breeding season. Although they are not territorial, koalas have relatively well defined home ranges ranging from 1.2 to 1.7 hectares in ideal habitat. Home ranges of individual koalas often overlap; however, koalas do not normally share trees at the same time.

Why is that koala sitting in a non-eucalyptus tree?

Koalas use different kinds of trees depending on the weather. Koalas shield themselves from extreme weather events by sheltering in trees different to those they feed on. To cope with extreme heat, very wet or cold weather koalas need the right combination of shelter trees and eucalyptus trees. During hot weather they can show a preference to rest in bigger trees with dense foliage, situated in cooler low-lying areas even if those trees are exotic.

What should I do when I see a koala in my garden?

In South Australia it is common to see koalas in urban settings. Koalas appear to be adapting to life in the suburbs and negotiate many urban hazards. Capturing and relocating healthy koalas away from their home territory can be very stressful for the koala; it is best to leave them alone. To report a sick, injured or orphaned koala please contact the Fauna Rescue Koala Hotline on (08) 7226 0017. Restrain dogs in yards to allow the koala to move on.

Why won't you build a wildlife crossing over/under the South Eastern Freeway?

There is already a koala bridge over the freeway above the Heysen Tunnels and ladders help koalas cross barriers along the freeway. There is also very little evidence that koalas use wildlife bridges where they are in place. There are no plans to build more wildlife crossings over or under the South Eastern Freeway or Southern Expressway.

What can I do to help koalas in my area?

Koala conservation and management is something that we can all help to achieve; whether it be keeping our dogs under effective control or slowing down whilst driving on roads where koalas might be crossing. Private landowners can plant trees to contribute to wildlife corridors, others can volunteer as authorised koala carers and we can all try to live more sustainably to help reduce the broader impacts of climate change.

What is happening with koalas on Kangaroo Island?

Information about the Kangaroo Island Koala Management Project is available from the Natural Resources Kangaro Island website, including an extensive frequently asked questions document:

http://www.naturalresources.sa.gov.au/files/sharedassets/kangaroo_island/plants_and_animals/native_animals/koala/ki-koala-management-project-faq-nov17_1.pdf

What is happening with koalas on the Eyre Peninsula?

Natural Resources Eyre Peninsula has recently started the EP Koala Project to find out more about their koala population, and the health of their woodland habitats, including a citizen science component to report koala sightings. More information is available from their website.

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Koala density and overbrowsing impacts in the Adelaide, Mount Lofty Ranges

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Department for Environment and Water

July 2018

DRAFT ONLY

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Disclaimer

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All photos in this report are by Jason van Weenen (DEW).

Executive Summary

The South Australian Government recognises the koala's (*Phascolarctos cinereus*) national status as an iconic Australian animal and that key sub-populations are declining in distribution and abundance. However, in South Australia, koalas are for the most part an introduced species and, in some areas, are considered over-abundant because of their impact on eucalypt tree condition.

Koalas were first thought to be introduced In the Adelaide Mount Lofty Ranges (AMLR) in the 1920s and 1930s. Numbers have since expanded prompting increasing concern from the late 1990s that a koala overpopulation problem is emerging in the AMLR. Despite numerous anecdotal reports of increasing koala numbers and overbrowsing impacts on the vegetation in the AMLR, little quantitative information is available. Understanding koala density and overbrowsing impacts to vegetation is paramount to minimising overbrowsing impacts and ensuring a sustainable koala population remains. This report collates all known quantitative information on koala density and overbrowsing impacts of koalas in the AMLR.

Quantitative data for the AMLR has been obtained from the following:

1) **Koala density and tree condition surveys in 2003**. Mean density was 4.25 ± 0.98 koalas/ha (n = 6 sites) with koalas observed in a range of tree species, including Manna Gum, Blue Gum, Messmate Stringybark, Native Cherry, Blackwood Wattle and Swamp Wattle. The maximum density recorded was 8.9 koalas/ha at a site in Belair National Park. The proportion of trees in poor condition at the six sites was relatively high (mean 35% of trees in poor condition).
2) **Great Koala Counts 1 and 2 (citizen science).** The Great Koala Count was first held in 2012 and was not intended to measure koala density, but used directed observations of koalas from the public to predict the distribution of koalas across the Mt Lofty Ranges and subsequently estimate the population size from density estimates in nine published studies. The second Great Koala Count was held in 2016 to provide further clarity on the distribution of koalas and was supplemented with targeted surveys. Neither of the Great Koala Count programs were able to measure variation in koala density but produced an estimate of population size.
3) **Koala density surveys in 2016**. Mean koala density in native vegetation was 3.07 ± 1.57 koalas/ha (n = 8 sites) in winter and 3.79 ± 2.54 koalas/ha (n = 5 sites) in spring. The maximum density recorded was 13.67 koalas/ha at Horsnell Gully South. No koalas were detected in the Tasmanian blue gum plantations (n = 3 sites).

Koala numbers are increasing to unsustainable levels (> 0.75 koalas/ha) in parts of the AMLR and are higher than those recorded on Kangaroo Island, South Australia and Mt Eccles, Victoria where fertility control programs have been implemented. Management intervention in high koala density areas is critical to avoid catastrophes for animal welfare, international tourism, and biodiversity conservation generally. Recommendations for future monitoring and koala management are provided.

Contents

1. Introduction

The South Australian Government recognises the koala's (*Phascolarctos cinereus*) national status as an iconic Australian animal and that key sub-populations are declining in distribution and abundance. The koala is listed as vulnerable in Queensland, New South Wales and the Australian Capital Territory. However, in South Australia, koalas are for the most part an introduced species and, in some areas, are considered over-abundant because of their impact on eucalypt tree condition.

Koalas were first thought to be introduced In the Adelaide Mount Lofty Ranges (AMLR) in the 1920s and 1930s, presumably because of concern that they were facing extinction in the south-east of the state (where they naturally occurred) as a result of hunting and habitat destruction. In 1965, a further six koalas were introduced from Kangaroo Island and in the 1970s, further introductions occurred from escapees from the Cleland and Belair Wildlife Parks. Since then, numbers have expanded and spread into suburban areas which prompted increasing concern in the late 1990s that a koala overpopulation problem is emerging in the AMLR (e. g. Koala Management Task Force 1996, Bryan 1996, H. Possingham *The Advertiser 17/3/98*).

Recent evidence suggests that, in habitats that contain preferred food tree species (manna gum, blue gum, red gum), impacts are high. Observations of overbrowsing impacts in parts of the AMLR are similar to those observed in Victoria's Cape Otway before the collapse of the habitat (and the subsequent collapse of the local koala population) and on Kangaroo Island. If left unmanaged, overabundant or isolated populations of koalas could have a considerable impact on their habitat, other species and their own populations.

Despite numerous anecdotal reports, little quantitative information is available on koala density and overbrowsing impacts in the AMLR. Understanding these factors is paramount to minimising impacts and ensuring a sustainable koala population remains. This report collates all known quantitative information on koala density and overbrowsing impacts of koalas in the AMLR.

(Jason to choose photos to use and to add captions)

2. Koala density and tree condition surveys in 2003

In November 2003, the Department for Environment and Water (DEW) surveyed koala density and tree canopy condition at six sites in the AMLR. Sites where koalas had been frequently seen were deliberately targeted for this survey so as to gather information on the likely upper ranges of koala density in the region. Sites were 2.6 - 5.1 ha in size and located in Belair National Park, Cleland Conservation Park, Eagle Park and private land adjacent to a tributary of Brownhill Creek (Figure 1). Manna gum (*Eucalyptus viminalis*) was the dominant species at each site except for Workanda Creek and Long Gully where SA Blue gum (*E. leucoxylon*) and Messmate stringybark (*E. obliqua*) were dominant, respectively.

Koala density was estimated using the double count method (Caughley and Sinclair 1994) where two observers independently search a site for koalas. When a koala was seen by either observer, the tree was marked at the base. The other observer determined if a koala was a new sighting or a 'recapture'. For all sites, density estimates were derived by dividing the estimated number of koalas by the site area. The sex and presence of dependant young were recorded for each koala.

Tree canopy condition was estimated from at least 250 food trees per site using the defoliation class method (Molsher 2017a) on a scale of 1 (excellent) to 5 (dead) where:

- Class 1 Crown normal
- Class 2 Thinning of crown (up to 50% defoliation)
- Class 3 Crown very sparse (50–80% defoliation)
- Class 4 Greater than 80% defoliation, often predominantly epicormic[1] growth
- Class 5 Crown absent, tree dead.

[1] An epicormic shoot is a shoot growing from an epicormic bud which lies underneath the bark of a trunk, stem, or branch of a plant. Sprouting usually occurs after disturbance or stress.

Poor condition was defined as trees with a canopy condition in classes 3 to 5.

In 2003, high koala densities (> 0.75 koalas/ha) were recorded at all six sites, with densities ranging from 2.4 to 8.9 koalas per hectare (ha) (Table 1). Mean density was 4.25 ± 0.98 koalas/ha and median density was 3.35 koalas/ha. Koalas were observed in a range of tree species, including Manna Gum, Blue Gum, Messmate Stringybark, Native Cherry, Blackwood Wattle and Swamp Wattle. The maximum density recorded was 8.9 koalas/ha at a site in Belair National Park (Table 1).

The proportion of trees in poor condition (i.e. condition class 3 to 5) was relatively high at all sites, ranging from 22% of trees at Eagle Park to 48% at Workanda Creek (mean 35%) (Table 1). The site (Workanda Creek) with the highest % of trees in poor condition also had the highest koala densities.

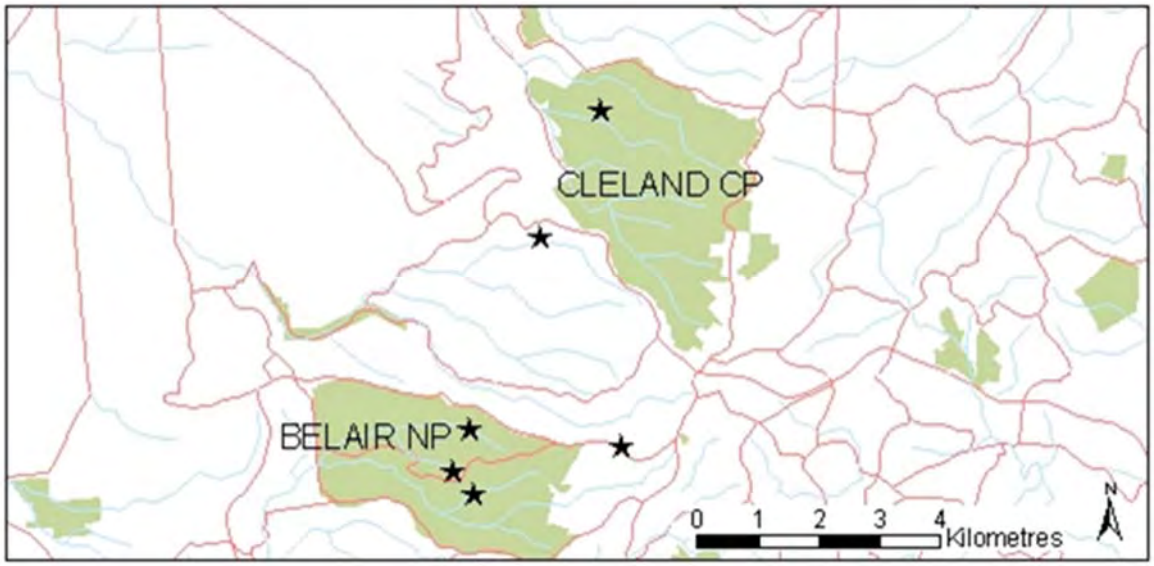

Figure 1: Location of the 2003 survey sites in the Mount Lofty Ranges

Table 1: Koala densities and tree condition in the Mt Lofty Ranges in 2003

Site	Area (ha)	koala density (no. koalas/ha)	% trees in poor condition
1. Workanda Creek, Belair NP	2.6	8.9	48%
2. Eagle on the Hill Park	5	4.6	22%
3. Long Gully, Belair NP	5	3.4	36%
4. Woolshed Gully, Cleland CP	5.1	3.3	34%
5. Tilti Track, Belair NP	5	2.9	30%
6. Sheoak Rd (tributary of Brownhill Creek)	4.4	2.4	38%
N		**6**	**6**
mean		**4.25**	**35%**
standard error		**0.98**	**3.5%**
median		**3.35**	**35%**

3. Great Koala Count 1 (2012) and 2 (2016) (citizen science)

The Great Koala Count was first held in 2012 as a 'citizen science' project to engage South Australians in koala conservation and management. The results of the count contributed to the development of the *South Australian Koala Conservation and Management Strategy* 2016, which set the direction for the long-term conservation and management of koalas in South Australia. This count was not intended to measure koala density, but used directed observations of koalas from the public to predict the distribution of koalas across the Mt Lofty Ranges and subsequently estimate the population size from density estimates in nine published studies (Sequeira et al. 2014, Hollow et al. 2015).

The second Great Koala Count was held in November 2016 to provide further clarity on the distribution of koalas, with a focus in the AMLR. This second count was supplemented with targeted surveys in spring 2016 by DEW staff (see below (4)). Neither of the Great Koala Counts were able to measure variation in koala density. Given the increasing focus on managing density and impact with respect to wild koala management, this limitation needs to be considered in future citizen science programs.

4. Koala density surveys in 2016

In winter 2016, koala density was surveyed by experienced DEW staff at eight sites in native vegetation (primarily *E. viminalis*) (Table 2) and at three sites in Tasmanian blue gum plantations (*E. globulus*) in the AMLR. Attempts were made to relocate the 2003 sites but specific location information was unavailable for some of the sites and some of the sites now had few *E viminalis* surviving. In spring 2016, five of the native vegetation sites were re-surveyed to improve koala density estimates during the Great Koala Count 2.

Sites ranged in size from 1.6 to 5.4 ha and were located across the AMLR (Figure 2). Sites were selected based on the presence of known koala habitat and/or observations of koalas in those sites from previous surveys. In the AMLR, known koala habitat is primarily Manna Gum (*Eucalyptus viminalis*) and SA Blue Gum (*E. leucoxylon*) woodlands and Tasmanian Blue Gum (*E. globulus*) plantations, with less preferred habitat including Mallee Box (*E. porosa*), Grey Box (*E. microcarpa*) and River Red Gum (*E. camaldulensis*) woodlands.

Koala density was estimated at each site using the double count method (Caughley and Sinclair 1994) as described for the 2003 surveys. For all sites, density estimates were derived by dividing the estimated number of koalas by the site area. The sex and presence of dependant young were recorded for each koala.

In 2016, mean koala density in the native vegetation was 3.07 ± 1.57 koalas/ha (n = 8 sites) in winter and 3.79 ± 2.54 koalas/ha (n = 5 sites) in spring (Table 2). The greater variation in densities between the winter and spring surveys may have been due to the use of multiple inexperienced koala surveyers in the spring compared to the winter counts where only two surveyers were used who were well experienced in koala surveying. The sample size was also smaller in spring than in winter. Median densities are therefore also provided to account for the skewness in the data (Table 2). The maximum density recorded in winter 2016 was 13.39 koalas/ha at a small site (1.6 ha) at Horsnell Gully South. No koalas were detected in the Tasmanian blue gum plantations (n = 3 sites).

Insert map of sites (Jason to do?)

Figure 2: Sites used in the 2016 koala surveys in the AMLR

Table 2: Koala densities in the AMLR in 2016

Site	Vegetation type	Area (ha)	Winter 2016 no. koalas/ha	Spring 2016 no. koalas/ha
Talisker CP	*E viminalis/E obliqua*	5.1	0	0
Mt Magnificent CP	*E viminalis*	5	0.2	-
Belair NP	*E viminalis/E leucoxylon/E camaldulensis*	5.3	2.93	3.55
Cleland CP	*E viminalis*	5.4	0.56	1.16
Horsnell Gully CP Sth	*E viminalis/E leucoxylon/Olive*	1.6	13.39	13.67
Horsnell Gully CP Nth	*E viminalis/E leucoxylon*	3.7	3.07	-
Morialta	*E leucoxylon/E camaldulensis*	5.1	3.83	0.59
Montacute CP	*E viminalis/E leucoxylon*	5	0.6	-
		N	**8**	**5**
		mean	**3.07**	**3.79**
		standard error	**1.57**	**2.54**
		median	**1.77**	**1.16**

5. Discussion

Koala density

Mean koala density in winter 2016 in the AMLR was 3.07 ± 1.57 koalas/ha (n = 8 sites) with a maximum recorded density of 13.39 koalas/ha. Similar high densities were recorded in spring 2003 and spring 2016. These densities are much higher than that recorded on Kangaroo Island and at Mt Eccles National Park where fertility control programs are implemented and lower than that recorded at Cape Otway prior to the population crash (Table 3). However, the densities reported for AMLR probably represent the upper range of koalas in this area as sites were selected where koalas were frequently seen. A sustainable density for koalas is estimated to be about 0.75 koalas/ha above which overbrowsing impacts are evident (Molsher 2017).

Table 3. Koala densities (number per ha) in southern Australia

Location	Year	Mean density	Maximum density	Range	Reference
Adelaide, Mt Lofty Ranges, South Australia	2016	3.07 ± 1.57	13.39	0-13.39	This report
Kangaroo Island, South Australia	2015	0.64 ± 0.07	4.19	0.05 - 1.3	Molsher 2017
Mt Eccles National Park, south –west Victoria	2011 2014 2016	0.65 ± 0.08 0.54 0.93 ± 0.08	2.17		Wood 2011 Ramsey et al. 2015 Wood 2016
French Island, Victoria	2013	8.4 ± 1.9	24.2	2.2 - 24.2	Lee 2013
Cape Otway, Victoria	2011 2013	10.1 ± 1.2 18.4 ± 2.5	-	-	Whisson et al. 2016

For future monitoring in the AMLR it is recommended that a large number of sites be established that are stratified across habitats to obtain a representative estimate of koala density across the landscape. Such a method would give a clearer picture of the distribution of koalas in the region, supplementing the data obtained in both Great Koala Counts, as well as densities across the range. Establishing long-term monitoring sites at key sites across the region will provide useful data for assessing changes in densities over time and enable strategic targeting of management intervention activities. Such surveys should also assess habitat condition, using tree condition as a proxy for koala impacts and use experienced koala surveyers with high detection rates to improve confidence in estimates. As noted in Whisson et al. (2016), the timing of surveys should be shifted to early spring (ideally September) and be consistent between years to maximise the observability of koalas during the breeding season when females with back-young can be more easily detected.

No koalas were detected in the three Tasmanian blue gum plantations surveyed in 2016. However, it is important that plantations continue to be monitored given the rate that koala populations can increase to unsustainable levels as has been observed in plantations on Kangaroo Island (Molsher 2017b) and in southwest Victoria (Hynes 2014).

Estimated Population Size

The only estimate available for total population size of koalas in the Mt Lofty Ranges was developed by Sequeira et al. (2014), based on the surveys conducted by volunteers as part of the first Great Koala Count in 2012. This analysis estimated that 113,704 koalas lived in the Mt Lofty Ranges in 2012. However, the uncertainty around this estimate was very high (95% confidence limits: 27,685-199,723). Furthermore, the total population size assumed that koala densities were similar to those estimates recorded in the national literature (mean density of 1.57 koalas/ha ± 1.19 SD). Other key limitations of this estimate were that koala surveys were not conducted in a stratified way across the range of environments and habitats in the Mt Lofty Ranges (largely limited to areas with high visitation by people) and only recorded locations where people saw koalas (i.e. presence only data).

The second Great Koala Count in 2016, was designed to overcome at least some of these design issues. The population estimate from the second Great Koala Count was 158,020 (95% confidence limits: 86,193-229,847) (add ref), which is at the upper end of the 2012 estimate. Given the range of the estimates it is not possible to determine if there has been an increase in koalas between the two counts but needless to say the high numbers of koalas reported supports the overbrowsing impacts observed in this AMLR.

Evidence of overbrowsing impacts by koalas

The impact of koalas on natural resources has largely been focused on the impact of defoliation of food trees (*Eucalyptus* sp.). High koala density leads to excessive defoliation of forage trees, which ultimately leads to the death of these trees, and the loss of values that these trees and woodlands provide (e.g. habitat for threatened species, streambank stabilisation, and aesthetic). Among the environmental risk associated with tree defoliation and death is the loss of habitat for the koalas themselves (Whisson et al., 2016), where high koala density can lead to loss of food habitat, and the koala population crashing. For example, in Cape Otway, Victoria, koala densities in manna gum forests reached densities of 18.1 koalas/ha (Whisson et al., 2016), resulting in significant tree defoliation and death. This, along with the high site fidelity exhibited by koalas (in spite of the availability of habitat nearby), led to a high number of koalas dying from starvation or being euthanized (Whisson et al., 2016, Ramsey et al., 2016), along with, presumably the broader environmental impacts of tree loss.

Koalas feed on a variety of Eucalypt species, but often prefer to feed on a small number of species where available. On Kangaroo Island, koalas have a wide and varied diet but the preferred food tree species are Rough-barked Manna Gum *Eucalyptus viminalis* ssp. *cygnetensis*, and South Australian Blue Gum *E. leucoxylon*. In the AMLR, known koala habitat is primarily Manna Gum (*Eucalyptus viminalis*) and SA Blue Gum (*E. leucoxylon*) woodlands and Tasmanian Blue Gum (*E. globulus*) plantations, with less preferred habitat including Mallee Box (*E. porosa*), Grey Box (*E. microcarpa*) and River Red Gum (*E. camaldulensis*) woodlands.

The 2003 surveys, although the sample size was small (n = 6 sites), confirmed that koalas were overabundant in some areas of the AMLR at that time and that overbrowsing impacts on the vegetation were detected. Overbrowsing impacts in the AMLR in 2003 (i.e. mean 35% poor condition) were similar to that recorded on Kangaroo Island during the same period (i.e. mean 44% Cygnet River sites) (Molsher 2015). In 2016, some of the trees at those six sites had subsequently died and the sites were relocated. Future koala density monitoring needs to also

measure tree condition at the same time as declines in koala density could be misinterpreted if food trees have died and koalas have moved elsewhere.

Conclusion

Koala numbers are increasing to unsustainable levels (>0.75 koalas/ha) in parts of the AMLR. Management intervention in these areas is critical to avoid catastrophes for animal welfare, international tourism, and biodiversity conservation generally. The risks of not taking action include:

- Increased likelihood of koala deaths from stress, disease and starvation
- Environmental damage from koala over-browsing
- Unacceptable and costly animal welfare implications
- Damage to the State's reputation for wildlife experiences, and
- Damage to the nature-based tourism sector.

Recommendations:

1. An improved region-wide understanding of koala density (and impacts on trees) is required to support strategic planning and management in the AMLR. Representative monitoring sites are to be randomly selected in key habitat types.
2. Better understand the relationship between tree condition and koala density, accounting for other key determinants of tree condition (such as climate);
3. Implement koala management activities in the AMLR in priority areas including fertility control, habitat management, monitoring and community engagement.
4. Understand the relationship between landscape connectivity (including Tasmanian blue gum plantations), koala density, and movement of local immigration and emigration of koalas so as to determine likely lags between management, local reduction in koala density, and subsequent immigration into managed areas.

6. References

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Government of South Australia
Department for Environment and Water

Document No. 18EW0001422

TO MINISTER FOR ENVIRONMENT AND WATER

FOR APPROVAL

RE: KOALA DEATHS ON THE SOUTH EASTERN FREEWAY

THROUGH: A/CHIEF EXECUTIVE 13.7.18

A/GROUP EXECUTIVE DIRECTOR, PARKS AND REGIONS 11/7

RECOMMENDATIONS

That you:

1. Note this briefing detailing correspondence from Ms Christine Venning regarding koala deaths on the South Eastern Freeway.

NOTED

2. Approve the attached draft response to Ms Christine Venning.

APPROVED / NOT APPROVED

Comments	
	---------- DAVID SPEIRS MP Minister for Environment and Water / / 2018

Contact: Jason van Weenen, Species Ecologist-Natural Resources. Telephone: 8130 9063.
Email: Jason.vanweenen@sa.gov.au
Date: 9 July 2018

PRIORITY

Routine.

BACKGROUND

You are in receipt of correspondence dated 21 June 2018 from Ms Christine Venning regarding koalas being killed by vehicles on the South Eastern Freeway. Ms Venning has enquired as to the possibility of a combination of Government agencies funding underpasses or overpasses to reduce the frequency of such incidents.

DISCUSSION

The Great Koala Count in 2012 provided a population estimate for the Adelaide Hills and Mount Lofty Ranges of approximately 114,000 koalas. In 2016 the Great Koala Count II was undertaken and the results are now being compiled, with an expected release date of mid 2018. Early indications are that there is not a decrease in the population of koalas between 2012 and 2016.

Whilst many koala populations in peri-urban areas face a variety of dangers, including being hit by cars, there is no evidence for any significant impact on the South Australian koala population.

The South Eastern Freeway passes through an extensive and continuous area of koala habitat between Glen Osmond and Crafers. Fencing has been installed along the lower sections of the freeway to prevent animals from reaching the carriageway, however officers from the Department of Planning, Transport and Infrastructure (DPTI) have observed koalas reaching the freeway from side roads, and it is probable that many animals climb existing fence structures. DPTI has advised that, when the freeway was constructed a concrete safety barrier was installed on the median and plastic mesh ladders were placed on the barrier at frequent intervals to allow koalas to climb over it. These ladders are spaced approximately 50-60 metres apart.

While the koala ladders make it easier and quicker for koalas to cross the median and exit the freeway, they are not foolproof and once a koala crosses onto the barrier, it is still necessary for the animal to cross three more lanes before it reaches safety. Unfortunately, due to the speed and volume of traffic on the freeway, it is inevitable that not all koalas that enter the freeway will manage to cross all six lanes safely.

DPTI does not record numbers of koalas killed on the carriageway, although it is estimated by wildlife care groups that approximately 250 are killed per annum. The existing koala ladders were installed in areas with the greatest potential for koalas to enter or cross the road, usually where adjacent land is at the same level as the road or adjacent to land containing suitable koala habitat (including both native and exotic vegetation).

Contact: Jason van Weenen on 0427277700 & Jason.vanweenen@sa.gov.au
Date: 9/7/18

The presence of animals on the freeway can cause loss of control to passenger vehicles, collisions resulting in serious injury and damage to vehicles and infrastructure. DPTI has installed traffic warning signs to alert road users to the possible presence of koalas. The primary purpose of the warning signs is for the safety of road users, not for the protection of the animals.

Options for installing wildlife over/underpasses were considered during the development of the recent upgrade of the Southern Expressway but were discounted due to geological considerations (the ground just would not support it), koalas are unlikely to use them and the additional expense of installing them was prohibitive.

The attached letter of response to Ms Venning provides technical detail so as to be transparent in our efforts to allay her concerns and a copy of the South Australian Koala Conservation and Management Strategy for her interest.

CONSULTATION

Michele Walter, Senior Policy Officer, Abundant Species and Sustainable Use, Department for Environment and Water.

Karl Hillyard, Senior Ecologist, Abundant Species and Sustainable Use, Department for Environment and Water.

Note: despite not being contacted for this briefing and response, Michael Bassford, Maintenance Co-ordinator, Department of Planning, Transport and Infrastructure has been consulted on the development of very similar responses to the community in the past, with the messaging in this response consistent with previous versions.

FINANCIAL IMPLICATIONS

Are there financial implications? No

Contact: Jason van Weenen on 0427277700 & Jason.vanweenen@sa.gov.au
Date: 9/7/18

ATTACHMENTS

Attachment 1 – Draft response letter to Ms Christine Venning regarding koalas on the South Eastern Freeway

Attachment 2 – The South Australian Koala Conservation and Management Strategy

Brenton Grear
Regional Director
Department for Environment and Water
18EW0001422

Date: 11 July 2018

Contact: Jason van Weenen on 0427277700 & Jason.vanweenen@sa.gov.au
Date: 9/7/18

18EW0001422

Ms Christine Venning
Secretary
S.A. Superannuants
GPO Box 2036
ADELAIDE SA 5001

Dear Ms Venning

Thank you for your letter dated 21 June 2018 regarding koala deaths on the South Eastern Freeway.

Koalas are very important to many South Australians and international visitors alike. South Australia is fortunate to have a relatively healthy, and in some areas, abundant population of koalas. This abundance is reflected in the correspondingly high frequency of road incidents across many parts of the central Mount Lofty Ranges.

The Department for Environment and Water (DEW) has made concerted efforts in recent years to gauge the size of the koala population in South Australia. In 2012 The Great Koala Count provided an estimate for the Adelaide Hills and Mount Lofty Ranges of approximately 114,000 koalas. In 2016 the Great Koala Count II was undertaken and the results, which are now being compiled, will be made available when completed.

Koalas living in close proximity to urban areas face a variety of dangers, including being hit by cars. However, unlike in the eastern States, there is no evidence for a significant decline in the South Australian koala population.

South Australia has a Koala Conservation and Management Strategy which I have enclosed for your information. The Strategy supports an integrated approach in response to the issue of koalas on roads, with a combination of signage, speed restrictions, exclusion fencing, ladders and driver education. The ladders placed on the central solid barriers of the South Eastern Freeway are there to help koalas negotiate the walls and avoid being trapped in the middle of the freeway. Ideally of course, koalas would be prevented from reaching the freeway in the first place, however despite significant fencing to exclude wildlife, koalas are still able to climb fences and enter the carriageway via the slip roads. Additional fencing or underpasses are unlikely to prevent this.

When developing the Strategy, DEW studied the option of providing over-or under-passes for koala crossings. However it was found that current interstate and national guidelines relating to koala (and other fauna) sensitive road designs all indicated that long underpasses, as would be required for the South Eastern Freeway, would likely not be used by the animals it is intended to help.

If you have any further questions, please feel free to contact Mr Jason van Weenen, Species Ecologist - Natural Resources within the Department for Environment and Water on phone 8130 9063 or email jason.vanweenen@sa.gov.au.

Yours sincerely

DAVID SPEIRS MP
Minister for Environment and Water

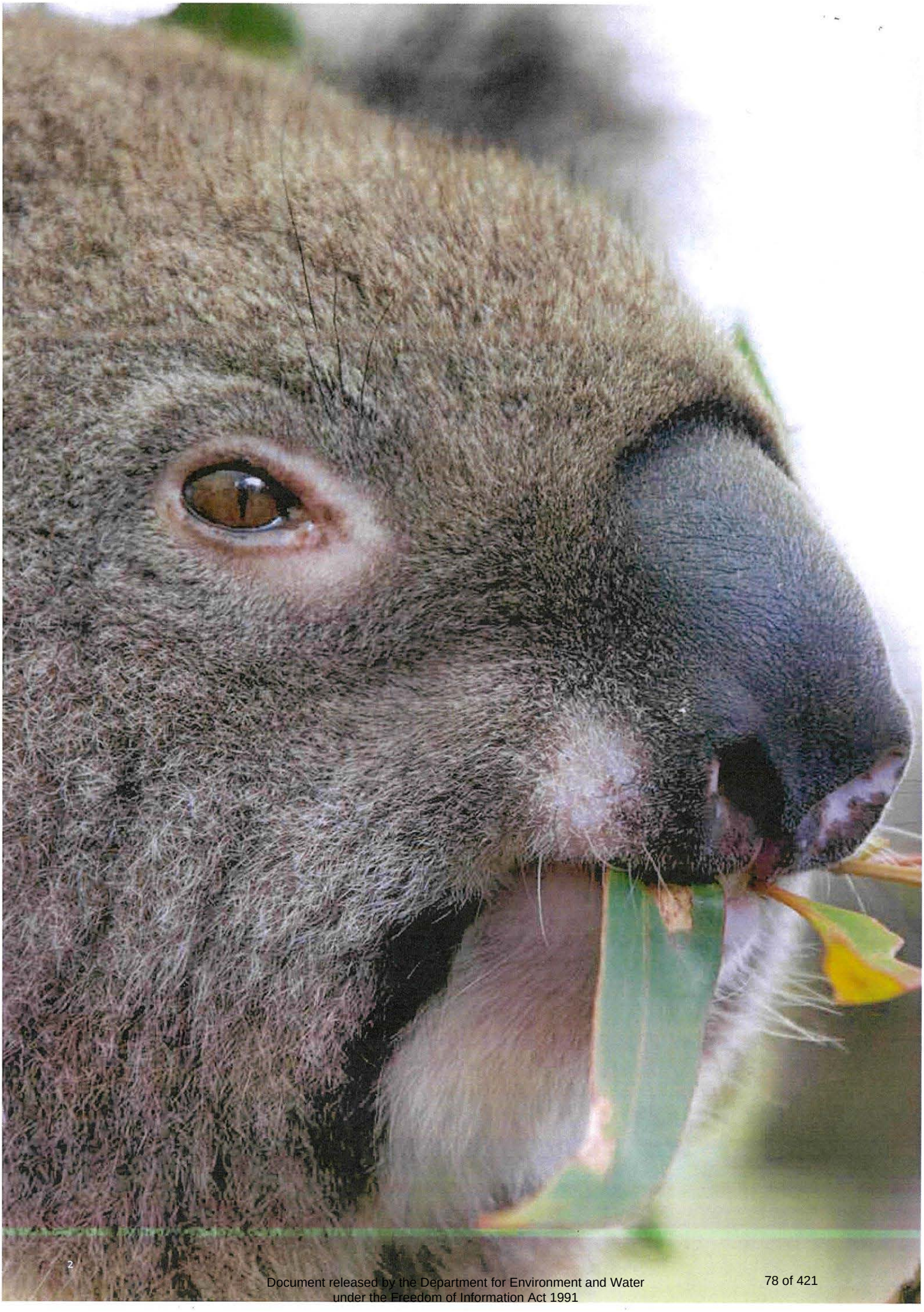
Date:

Encl: 1. SA Koala Conservation and Management Strategy

The South Australian Koala Conservation and Management Strategy

Government of South Australia
Department of Environment, Water and Natural Resources

National Parks South Australia



Contents

Minister's Foreword

Koalas are one of our best loved native species – for both locals and overseas visitors alike.

The *South Australian Koala Conservation and Management Strategy* aims to protect koalas from threats such as traffic, dogs, disease, bushfires and reduced food quality due to global warming.

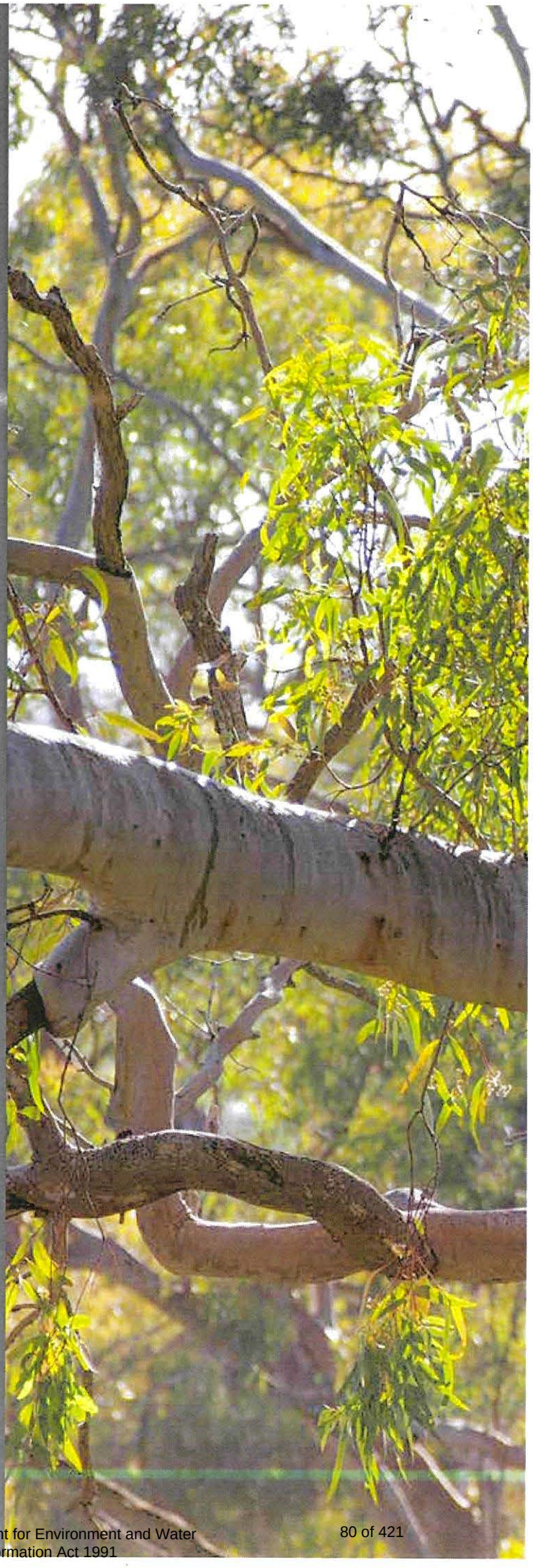
The Strategy is a positive step towards safeguarding the welfare of koalas in this State, increasing the social, educational and economic benefits of having koalas, and reducing the negative impacts that over-abundant koala populations may have on their habitat.

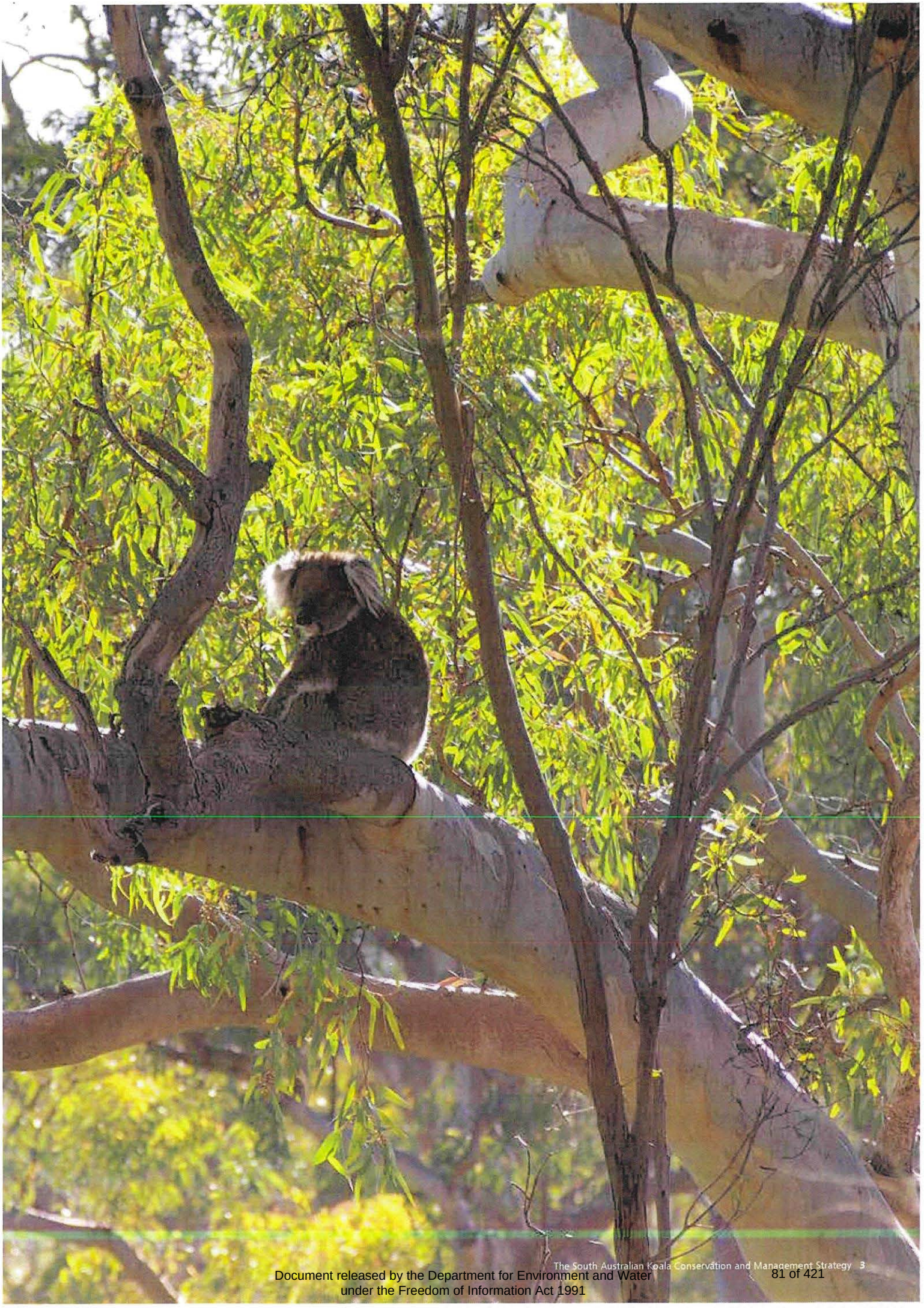
The South Australian Government is also working toward establishing an International Koala Centre for Excellence. This will provide opportunities for unique visitor experiences, strengthen private sector partnerships and optimise research initiatives.

One key area of research will be to investigate ways to minimise the negative impacts of global warming on koalas by using our State's substantial experience in tackling global warming.

This Strategy brings together government, the community, natural resources managers, experts and scientists to look at ways of working together to manage and conserve our koala population long into the future.

The Hon Ian Hunter MLC
Minister for Sustainability, Environment and Conservation





What will this Strategy do?

This Strategy has been developed to identify and acknowledge the key conservation and management issues which are having, or could have, an impact on the health and welfare of koalas and on their habitat across the State.

It provides actions and timeframes to guide what needs to be done to manage and/or reduce these impacts.

The South Australian Government is committed to:

- **Safeguarding the welfare of koalas,**
- **Increasing the social, educational and economic benefits of having koalas in South Australia, and**
- **Reducing the negative impacts that over-abundant koala populations may have on broader ecological communities.**

The Strategy is designed to be accessible by anyone who has an interest in koalas and their habitat, or is looking for a sense of direction about what the issues are and what needs to be done to conserve and manage koalas in South Australia.

It is not designed to be a step-by-step technical field guide to koala management. It does not outline detailed scientific data or complex ecological restoration criteria.

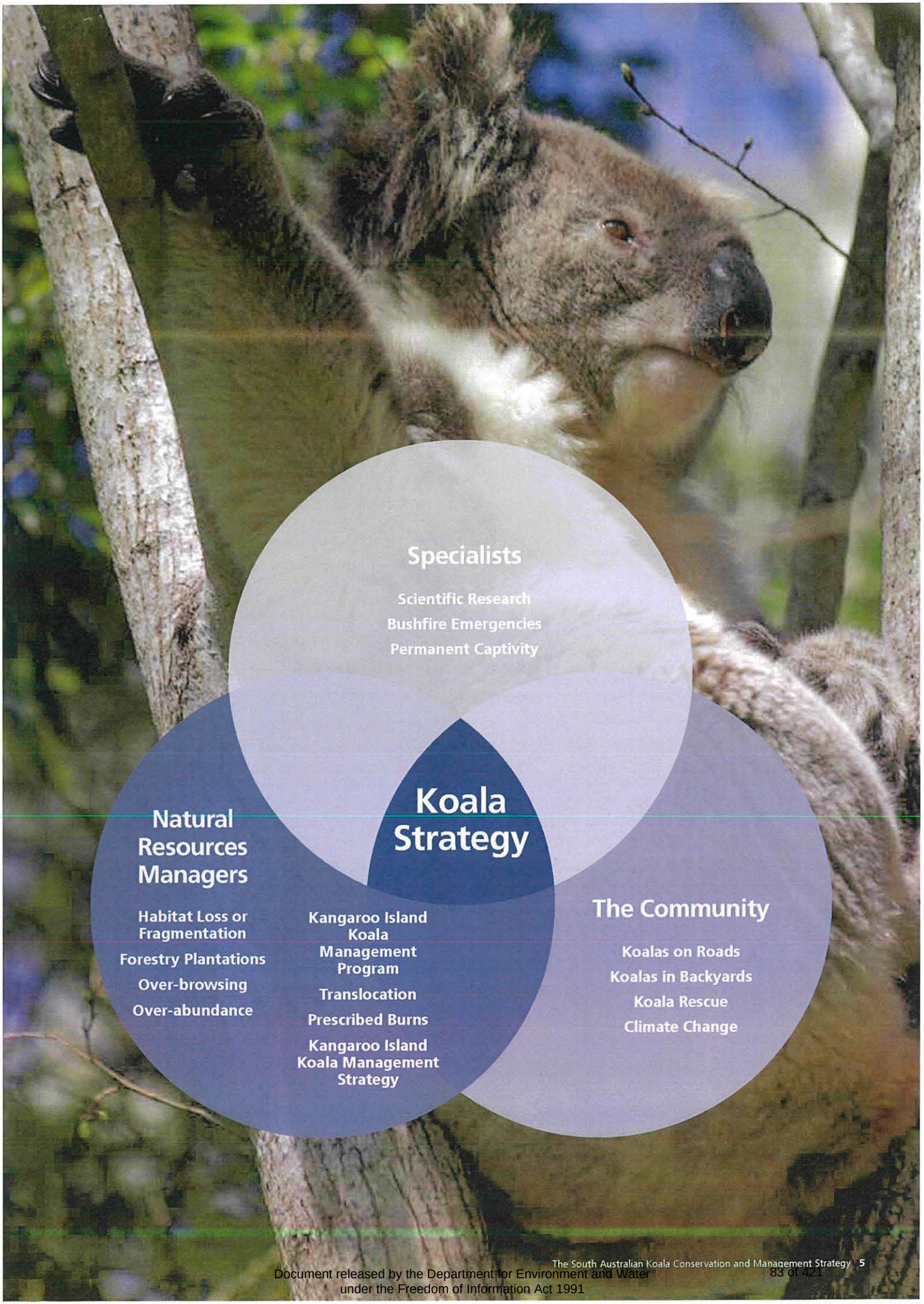
Land managers, non-government organisations, industry, scientific researchers and individuals are all encouraged to get involved in activities to manage the State's natural resources.

Koala conservation and management issues covered by this Strategy

The successful implementation of this Strategy depends on sustained commitment by a variety of stakeholders, ongoing and timely exchange of information between land managers, researchers, and community groups; and regular monitoring and reporting on progress to enable land managers to alter their plans where required.

Stakeholders who will be involved in, or responsible for, actions include State and local governments, industry, research scientists, veterinarians, non-government organisations, zoos and wildlife parks, community groups; and individual members of the community. Outcomes benefiting koalas may also be delivered by Natural Resources Managers through conservation activities that are undertaken on a landscape scale or for other species. In implementing the Strategy there will leading stakeholders that will need to ensure that attention is given to the most effective use of resources.

The culling of koalas in the wild and/or the deliberate introduction of disease are not supported by this Strategy as a means of koala population control.



How was this Strategy developed?

Through collaboration, consultation, partnerships, expert advice and citizen science.

This Strategy was developed through an extensive community and expert consultation process during which people said:

- Koalas are of great importance to the people of South Australia;
- The natural environment in which koalas live is fundamental to everyone's health, wellbeing and way of life;
- Koalas should be protected and the landscape should be managed to provide enough food and shelter, not only for koalas but for all native animals and plants which depend upon it;
- Where koalas occur in over-abundant numbers they need to be managed appropriately so that they do not significantly damage the trees upon which they depend;
- If sick and injured koalas are rescued they should be provided with veterinary treatment;
- Community education is needed to help to reduce the number of koalas being hit by cars bitten by dogs or drowning in swimming pools; and
- More research is needed into the health status of koalas in South Australia.

The Great Koala Count

The Citizen Science project: The Great Koala Count was conducted on 28 November 2012. It was a joint initiative between the Department of Environment, Water and Natural Resources, the Barbara Hardy Institute of the University of South Australia, the Adelaide and Mount Lofty Ranges Natural Resources Management Board, the Commonwealth Scientific and Industrial Research Organisation and ABC 891 Adelaide.

Koala sightings were recorded using a Smartphone 'App' with GPS technology or online via a website. The Community were also invited to complete a survey and talk about their views about what they liked or didn't like about koalas; and what they thought should happen with koalas.

- About 1,000 South Australians participated in the Great Koala Count,
- More than 1,500 koala sightings were recorded, and
- Over 1,000 photographs of koalas were submitted.

The Great Koala Count provided valuable information which helped to inform this Strategy. Results of the count showed that temperature range, elevation and rainfall were the best predictors of koala occurrence, with most suitable habitats in Kangaroo Island, the Adelaide Mount Lofty Ranges and the tips of South Australia's three peninsulas. The population estimate of koalas in the Adelaide Hills and Mount Lofty Ranges was approximately 114,000.

GREAT KOALA COUNT

Implementation of this Strategy

The State Government can't implement this Strategy alone. We all need to get involved; it will only work if we all play our part!

The Strategy is divided into sections. Each section, relating to a different koala conservation or management issue, defines the ***Desired outcome*** for that issue, sets out the ***Strategy actions*** which will be undertaken to address the issue, identifies ***Progress indicators*** which will be used to measure level of success in implementation of those actions, identifies the ***Stakeholders*** who will primarily be responsible for carrying out those actions and sets ***Timeframes*** for when the actions should be addressed. Each section also contains supporting ***Background information*** which explains the issue and discusses some of the current, or possible, conservation and management approaches.

Koala conservation and management are things that we can all help to achieve; whether it be keeping our dogs under effective control or slowing down whilst driving on roads where koalas might be crossing. Private landowners can plant trees to contribute to wildlife corridors, others can volunteer as authorised koala carers and we can all try to live more sustainably to help reduce the broader impacts of climate change.

Implementation of this Strategy will have financial costs and benefits for government, industry, business and the community, resulting in:

- increased costs from improved measures to meet the desired outcomes of the Strategy;
- lower cost over time because the future costs of koala conservation and management will be substantially reduced by timely investment, and
- benefits from natural resources management including conservation of co-occurring species and ecosystems, sustainable land use practices and increased opportunities for ecotourism.

Resources from State and local governments will be supplemented by ongoing and potentially increased commitments from community organisations, the private sector and philanthropists to assist in the achievement of the Strategy's objectives. Outcomes benefiting koalas may also be delivered through conservation activities which are undertaken for other species. In implementing the Strategy there will need to be attention given to the most effective use of resources.

How will the BIG decisions be made?

The Department of Environment, Water and Natural Resources will provide advice across government and work with the community, industry, landowners and stakeholders to establish relevant strategic direction and policies which will guide landscape and koala conservation and management. South Australia's eight regional Natural Resources Management (NRM) Boards play a central role in engaging communities and working with the State Government to decide NRM priorities, develop regional plans, and help resolve difficult challenges. State Government and the Natural Resources Management Boards play an important role by coordinating community leadership and community consultations to determine how wildlife issues are best managed in their region. This will lead to productive and integrated partnerships that foster the conservation and welfare of koalas.

Progress review

The Department of Environment, Water and Natural Resources will coordinate a review, including public consultation, of the Strategy after a period of seven years.

Timeframes

The timeframes nominated for each issue within the Strategy are indicative only.

Short-term objectives should be adopted within three years of the release of this Strategy, medium-term objectives within five years, and long-term within ten years.

Habitat loss, fragmentation and land management

Desired Outcomes:
To conserve and manage koala habitat.

Strategy Actions:
1. Manage, restore and monitor areas of koala habitat within broad wildlife corridors.
2. Develop and implement options to protect koala habitat on public and private land.
3. Develop standard koala monitoring/habitat assessment protocols.
4. Develop Codes of Practice and best practice guidelines to minimise negative impact on koalas of works, such as urban development and land clearance.

Progress Indicators:
1. Koala habitat is effectively managed and incorporated into existing multi-species conservation and land management programs.
2. Increased consideration of koalas and their habitat is demonstrated in planning processes.

Stakeholders:
State and Local Governments, Natural Resources Management Boards, Land Managers, Industry and the Community.

Timeframe:
Short to medium-term.

Background information

Koalas in South Australia live on public and private land, including national parks, forestry reserves, agricultural land, in urban street trees and in people's backyards.

Loss or fragmentation of habitat can have a negative impact on koala conservation and management. Koalas have a specialised, low-energy, low-nutrient diet. This means that they have a limited amount of energy available for travel between patches of preferred food trees. Loss of favoured trees or broader habitat across these various land types can lead to koalas becoming isolated in small pockets of trees surrounded by open areas or urban development. The removal of trees can cause stress to individual koalas and where koalas occur in over-abundant numbers, or they cannot naturally disperse into neighbouring habitat, they can damage their food trees through over-browsing.

If left unmanaged over-abundant, or isolated, populations of koalas could have a considerable impact on their habitat, other species and their own populations. Active management is required in order to prevent habitat degradation and, in severe cases, the starvation of koalas.

Habitat mapping is an important tool to develop a clear understanding of the potential distribution of the koalas, and the quality of their habitat, across the State.

Where land uses require significant changes to be made to koala habitat, such as timber harvesting and urban development, land managers and companies are encouraged to adopt relevant policies and best practice guidelines or procedures to minimise welfare impacts on koalas.

Favoured Eucalyptus food trees for koalas in South Australia include:

- Rough-barked Manna Gum (*E. viminalis*),
- SA Blue Gum (*E. leucoxylon*),
- River Red Gum (*E. camaldulensis*),
- Swamp Gum (*E. ovata*),
- Messmate Stringybark (*E. obliqua*),
- Brown Stringybark (*E. baxteri*), and
- Peppermint Box (*E. odorata*).

Koalas and Plantation Forests

Desired Outcomes:
The risk of koala injury from forestry operations is minimised.

Strategy Actions:
1. Adoption of industry standards for best practice koala management in planation forests.Best practice in koala management through internationally recognised and independently accredited processes such as Forest Stewardship Council and Australian Standards.
2. Compliance action taken if koalas are harmed during forest harvest.

Progress Indicators:
1. Increased awareness and improvement of koala management issues in plantation forests.
2. Industry standards developed and adopted by Forest Managers.
3. Reduced number of incidents of harm to koalas during forest harvesting.

Stakeholders:
Industry, Independent Auditors, State Government, Wildlife Rescue Groups and Veterinarians.

Timeframe:
Short term.

Background information

In 2013 concerns were raised about the impact of plantation harvesting on koalas. Since that time the State Government, the timber industry and wildlife care groups have worked together to address the issues. There have been very few instances of harm to koalas reported in South Australia. Timber harvested in South Australia is generally sourced from managed plantations. The Department of Primary Industries and Regions South Australia's Forestry division supports the growth of South Australia's forestry and wood products industries. South Australia's largest plantation area is located in the Green Triangle area, in the state's South East. The Green Triangle forests, which include the Gambier, Mount Burr and Penola Forest districts, are South Australia's largest area of wood production and contain many unique areas of native forest. Other major regions for commercial plantations are located on Kangaroo Island, Mount Lofty Ranges and the Mid-North.

All major forest plantation managers in South Australia demonstrate their commitment to sustainable forest and land management through sustainability certification programs that are independently audited. This is achieved through voluntary participation in internationally recognized certification programs such as ISO 14001 Environmental Management Systems, the Australian Forest Certification Scheme and the Forest Stewardship Council. This includes identifying the potential impact of forest operations on the environment, wildlife, associated communities or the viability of the business; developing forest operation policy and plans that address these potential impacts. This gives consumers the option of supporting responsible forestry by purchasing products with an independent, global and credible label for forest products.

The Green Triangle Regional Plantations Committee has launched industry-wide policy and guidelines designed to protect koalas living in Blue Gum plantations. The industry-wide guidelines were developed by an industry working group in consultation with Government and local wildlife carers and aimed to find a zero harm outcome for koalas while maintaining the economic, environmental and social benefits of plantation forestry. While a consistent approach within the Green Triangle is supported, koala management occurs in a different context on Kangaroo Island. Aspects of the Green Triangle approach may be adapted on the Island in consultation with local stake holders in recognition of the specific challenges associated with management the Kangaroo Island Koala population.

The State Government will continue to work with the industry to implement policies and guidelines with a focus on improved planning, identification, monitoring and protection of koalas in plantations.

Over-browsing pressure by koalas

Desired Outcomes:
Browsing of Eucalyptus trees by koalas is kept to sustainable levels.

Strategy Actions:
1. Assess koala abundance and the extent of crown defoliation to identify potential over-browsing at an early stage.
2. Protect favoured trees and re-vegetate, where appropriate, provide additional food sources, facilitate koala dispersal, and reduce the effect of fragmentation.

Progress Indicators:
1. Monitoring indicates a reduction in the extent of over-browsing.
2. Native vegetation is protected where over-browsing is at risk of causing significant impacts.

Stakeholders:
State Government, Land Managers and Community groups.

Timeframe:
Short to medium-term.

Background information

South Australia has only relatively small areas that contain suitable koala habitat with the right mix of preferred food trees. This puts pressure on those areas where koalas are present in high densities, such as in the Adelaide Hills and Mount Lofty Ranges and on Kangaroo Island.

Overbrowsing is usually a result of an over-abundance of koalas in an area (e.g. more koalas than the habitat can support) and sometimes can be as a result of habitat fragmentation which does not allow adequate dispersal of the koalas. This can be the case in peri-urban areas, or isolated stands of trees, where surrounding land use makes it difficult for animals to move between suitable food trees.

Monitoring and early detection of overbrowsing by koalas leading to tree canopy depletion is essential for successful long-term habitat management. Some evidence of overbrowsing of stands of Manna and Blue Gum trees is emerging in the Adelaide Hills area. Monitoring of these areas will help to establish if this dieback is a direct result of overbrowsing by koalas or not and to rule out any other causes.

A method for scoring tree condition (to record scale of damage) can be used when assessing over-browsing impacts, and changes in condition over time.

Land managers can monitor and replant as part of broader conservation and landscape management plans. Isolated trees which are being damaged can be protected by banding the trunk or main branches with a one metre high ring of sheet tin.

Where severe over-browsing is a direct result of over-abundance of koalas in a particular location consideration may need to be given to manage the number of koalas in that location over time in order to attain an environmentally sustainable koala population (see section on: 'over-abundant populations of koalas').

Individual landowners may choose to revegetate their property to facilitate koala dispersal and reduce the effect of fragmentation.

Further research into ecological and tree physiological factors that are associated with koala distribution and over-browsing impacts and monitoring the impact of climate change on koalas is required.

Over-abundant populations of koalas

Desired Outcomes:
Management programs are developed and implemented to maintain koala populations at sustainable densities.

Strategy Actions:
1. Develop methods for determining where over-population of koalas is causing, or could cause, unacceptable risks to vegetation and/or other species.
2. Develop strategies to protect priority areas of native vegetation to prevent koalas becoming established or to allow recovery from koalas over-browsing.
3. Investigate and apply non-lethal means to reduce koala populations or impact.

Progress Indicators:
1. Over-abundant koala populations are stabilized or are reducing.
2. Native vegetation is protected from over-browsing pressure by koalas.

Stakeholders:
State Government, Land Managers, Wildlife Rescue Groups and Veterinarians.

Timeframe:
Short to medium-term.

Background information

Koala numbers are declining in parts of their natural range. However across South Australia koala populations are mostly stable or increasing. In some regions (such as in the Adelaide Hills and Mount Lofty Ranges) koala numbers are increasing and may become over-abundant and as a result begin to over-browse their food trees.

Over-abundance of koalas means that koala numbers in a particular area have increased to such an extent that their habitat can no longer support them. They basically become at risk of eating themselves out of house and home, they strip the trees of leaves and the trees die. In these extreme cases it's not a matter of just planting more trees or reducing the fragmentation of the landscape, there needs to be a coordinated management approach to gradually reduce the number of koalas in the area over time to a sustainable level (see next section on Kangaroo Island Koala Management Program).

The culling of koalas in the wild and/or the deliberate introduction of disease are not supported by this Strategy as a means of koala population control.

Surgically sterilising koalas (as has been done successfully on Kangaroo Island) or using slow-release hormone implants to prevent conception (as has been done successfully in Victoria) are both expensive and intrusive management options to control koala numbers and they may not be practicable over large areas. However environmentally sustainable koala population management through habitat restoration in conjunction with the surgical sterilisation of koalas in critically damaged natural areas can be considered as an option for addressing issues of locally over-abundant koalas. The following key points need to be considered when developing a strategy to manage numbers of koalas at any given site:

1. Early detection of high koala population levels and signs of canopy depletion is essential for successful management. Other potential causes need to be investigated and ruled out as the cause of canopy depletion.
2. Where canopy depletion is apparent in 50% or more of food trees favoured by koalas in the area under consideration, a population control strategy, including an ecological rationale, may be prepared by the Department of Environment, Water and Natural Resources.

Any management action should estimate a sustainable population density, or the desired population level, for a particular location using a koala population model. Such models enable koala population numbers and densities to be compared between the same location at different times and between different locations.

Kangaroo Island Koala Management Program

Desired Outcomes:
The number of koalas on Kangaroo Island maintained at sustainable densities.

Strategy Actions:
1. Continue to implement and refine management programs to regulate koala densities to a level below that which causes severe tree defoliation.

Progress Indicators:
1. Sustainable populations of koalas (0.75 koalas / ha) and restoration of damaged habitat.

Stakeholders:
State Government and Land Managers.

Timeframe:
Long-term.

Background information:

Koalas were introduced to Kangaroo Island in the 1920s when 18 animals from Victoria were released in Flinders Chase National Park at the western end of the island. The releases were intended to safeguard the species from extinction on the mainland. Their numbers increased significantly and the Kangaroo Island Koala Management Program began in 1997, following an independent assessment of the increasing koala population on the island and its impact upon the survival of certain Eucalypt species on which the koalas were selectively feeding.

In 2001, a further comprehensive Island-wide survey revealed that the koala population was around 27,000 koalas on the Island. This over-abundance of koalas placed immense pressure on the limited areas of suitable koala habitat.

The program is based on the management of an environmentally sustainable koala population through habitat restoration and the surgical sterilisation and translocation of koalas from critically damaged natural areas. The Kangaroo Island Koala Management Program identifies a sustainable density of koalas to be 0.75 koalas/ha and it utilises non-lethal management options and involves no culling of koalas. The program has been effective in reducing koala numbers through non-lethal measures, resulting in an improvement in tree condition in areas where management has been undertaken.

Since the program began, over 10,000 koalas have been sterilised, of which nearly 4,000 have been relocated to the South East of the state making it one of the largest wildlife fertility control programs in the world. In addition tree condition is monitored annually to determine the effectiveness of the program and to inform management as to where and when further habitat restoration and koala management is required.

Ongoing management is critical to ensure the koala densities reach a sustainable level.

To apply fertility control techniques at the population level it is necessary to be able to predict population trends under various levels of fertility control, so that the most effective program can be devised and implemented. This is achieved through construction of a computer model that simulates koala population fluctuations under a range of recruitment and mortality levels.

A regular koala population census is being conducted on the island. The census shows significant reductions in koala density in areas where management has been focused. Two issues are emerging (1) koala population numbers building up in commercial blue gum plantations where management is difficult; and (2) an increasing number of landholders restricting access to their properties now that the koala population is smaller.

Koala translocation

Desired Outcomes:
Koalas handled during translocation actions have good welfare outcomes.

Strategy Actions:
1. Develop and implement a Code of Practice for the translocation of Protected Wildlife, including koalas, in South Australia.
2. Adopt national guidelines for the translocation of koalas when developed.

Progress Indicators:
1. Minimised incidents of harm to koalas during translocation.

Stakeholders:
State Government.

Timeframe:
Short to medium-term.

Background information:

Translocation is defined as the deliberate movement of wild individuals from one area with free release in another. The South Australian Government does not generally support the translocation of koalas as a primary management tool. It should only be undertaken following considerable discussion and investigation due to the potentially high level of mortality of animals.

Translocation of koalas is expensive, and much of the available koala habitat in South Australia contains koalas. There can be no guarantees that individual koalas will adjust well to a new habitat. Translocation is logistically complex, and requires detailed protocols for the different component tasks.

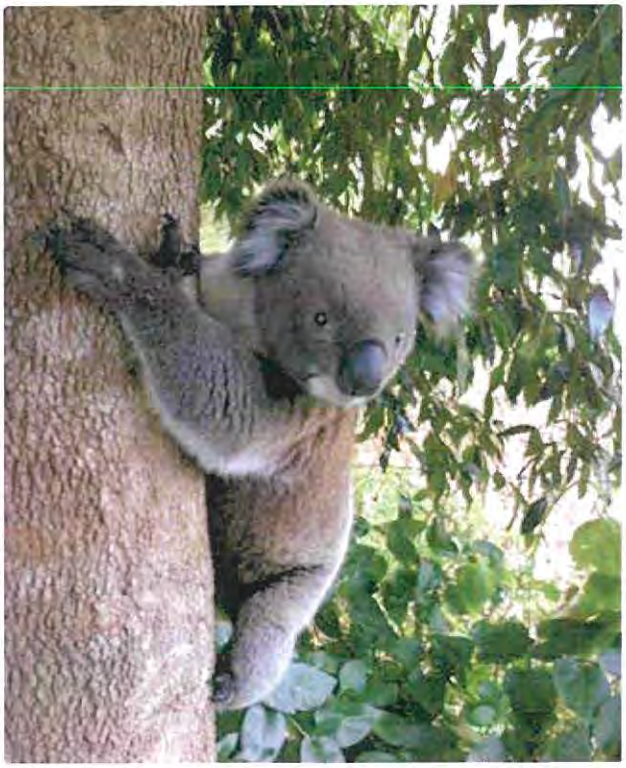
The decision to translocate should be based upon a combination of the feasibility of fertility control, the known history of defoliation at the site, the current extent and severity of defoliation, animal health status, information on the trend in koala numbers at the site, potential impact on other species and the availability of suitably large areas of appropriate habitat. Koalas must not be translocated into habitat close to managed eucalypt plantations as this may increase the probability of adverse interactions during harvest.

When undertaking translocations, the decision on whether to include fertility control will depend partly on the availability of release sites of adequate size, habitat quality and connectivity to accommodate an expanding population.

Sterilisation or contraception of animals to be translocated gives greater flexibility in selection of release sites by allowing release into smaller habitat patches, and greater confidence that future over-browsing problems will not be set in train.

Consideration should be given to the issue of how quickly an area may become re-populated by the influx of neighboring koalas from surrounding areas where there may be abundant koala populations – the vacuum affect.

Translocation can only be considered as part of an integrated program to manage a population, not as a means to dealing with excess animals. All translocation programs should include an on-going program of fertility control in the population remaining at the over-browsed site. The control strategy will consider an estimate of the maximum sustainable population density, or the desired population level for the site. This can be achieved by either translocation or fertility control, or a combination of both, depending on the alternatives available in each case. The habitat quality at the proposed release site and the density of resident koala populations must also be taken into consideration.



Koalas and roads

Desired Outcomes:
The number of koalas hit by cars is reduced.

Strategy Actions:
1. Encourage safe driver behaviours and increase awareness of wildlife crossing roads through the placement of warning signs.
2. Provide ladders for koalas to climb over dividing walls on freeways and expressways.
3. Adopt national guidelines for road design in koala habitat when developed.

Progress Indicators:
1. Fewer incidents of koalas being hit by cars.

Stakeholders:
State and Local Governments, Wildlife Rescue Groups, Veterinarians and the Community.

Timeframe:
Short-term.

Background information

While koalas spend much of their time feeding or sleeping in trees, they also need to come to the ground to move between trees within their home range. This on-ground movement mostly occurs at night but koalas can be active any time. In the breeding season (September - February) koalas will start spending more time moving on the ground as adult males seek mates and juveniles disperse into new home ranges.

For koalas living in or near urban areas much of their habitat is criss-crossed by roads. On-ground movement across roads places these koalas at great risk of being hit by cars, particularly at night. This risk increases where traffic volume and speed are greater and where road position and road design create 'black spots' where koalas are hard to see. When an animal appears from nowhere in front of a car there is often little that can be done by the driver to avoid it.

Obeying speed limits makes roads safer for everyone, including wildlife. Wildlife warning/crossing signs can be placed at sites where koalas are known to cross roads to warn drivers to be extra vigilant and watch out for koalas.

Personal safety, and the safety of other drivers, should always be thought about before attempting to help an injured animal. Anyone who finds a sick, injured or orphaned koala should contact a wildlife rescue group or a local veterinarian as soon as possible. Drivers should not stop and get out of their car on busy roads or close to hazardous bends.

The Department of Environment, Water and Natural Resources will continue to work with the Department of Planning, Transport and Infrastructure (DPTI) to consider design options to minimise the access of large wildlife (koalas, kangaroos etc.) onto freeways, expressways and railways and to allow animals that do enter the area to exit as quickly and safely as possible. These Departments will assess the viability and effectiveness of measures including, but not limited to, speed limits, ladders over barriers on freeways and expressways and exclusion fences.

DPTI has the responsibility for installing signs to warn road users of animals which can cause 'significant damage or loss of control to passenger vehicles or serious injury to road users resulting from collisions'.

The primary purpose of the warning signs is to enhance the safety of drivers.

National guidelines for road design in koala habitat will be adopted as and when they are developed.

Koalas in backyards (dogs and swimming pools)

Desired Outcomes:
The number of koalas being bitten or harassed by dogs or drowning in swimming pools is reduced.

Strategy Actions:
1. Encourage responsible dog ownership and koala safe fencing.

Progress Indicators:
1. Fewer incidents of koalas being injured by dogs or drowning in swimming pools.

Stakeholders:
The Community, Wildlife Rescue Groups and Veterinarians.

Timeframe:
Short-term.

Background information

Koalas and Dogs: Koalas come to the ground and move between trees mostly at night. They are good climbers and can easily climb over fences into backyards where dogs may be present. Dogs can be curious, aggressive or fearful when a koala enters into their territory. They may challenge the koala and this can lead to confrontation. Koalas have sharp claws and teeth and will defend themselves. Many koalas which are challenged by dogs sustain bite wounds. Even relatively minor bite wounds can lead to the koala needing to be euthanized. Most cases of conflict between koalas and dogs occur in the breeding season (September – February). This is when koalas are most actively moving around between trees.

It is not possible to stop wild koalas moving around between trees. However, there are things which dog owners can do to reduce the likelihood of their pet getting into conflict with a koala. Dogs are capable of seriously harming a koala. Responsible dog ownership means dog owners accepting that this is a possibility and being prepared to take a few simple steps to minimise interaction between their dogs and koalas. These steps may include keeping the dog inside the house overnight, fencing off a dog play area with koala exclusion fencing, installing either 'koala proof' or 'koala friendly' fencing (which either keeps koalas out of the property altogether or, once in, allows them safe passage to get out quickly) and training the dog to remain calm when koalas are nearby. Keeping dogs under effective control when away from home, on public or private land and especially in 'off-leash' areas, is equally important. Dogs must not be allowed to roam or chase wildlife. Roaming dogs pose a significant threat to koalas. Not only is this against the law but it keeps pet dogs safe and away from koalas.

Koalas and Swimming pools: Most people have heard that the name 'koala' is thought to come from a word meaning 'no drink' derived from an Aboriginal dialect of eastern New South Wales. It is true that most koalas generally get enough water from the gum leaves that they eat which usually contain about 50% water or from dew or rainwater on the surface of leaves. However koalas do drink water if, due to heat or prolonged drought, the water content of the leaves is reduced. In periods of hot weather it is not uncommon to see koalas seeking a cooling drink from backyard ponds, swimming pools or pet's water bowls and some have even learnt to seek water from people carrying water bottles. Koalas can fall into backyard swimming pools and drown. Although koalas can swim (when they have to) they can have difficultly latching on to the smooth, vertical sides of pools and cannot pull themselves back out. When a pool is not in use, it is a good practice use a pool cover that is tight, secure and will not sink if a koala walks on it. Installation of pool fencing with a design of transparent glass, Perspex or vertical steel posts will keep koalas out of the pool area. Some new pool designs incorporate a beach-type access where the water is shallow and level with part of the pavement, or have large steps rather than a ladder, these allow koalas to get out of the water easily.

Sick, injured or orphaned koalas

Desired Outcomes:
Sick, injured or orphaned koalas receive appropriate care and attention.

Strategy Actions:
1. Approve koala carers to hold the necessary permits to provide an effective intervention response.
2. Adopt state and national guidelines for all aspects of care, handling and management of captive, sick, injured or orphaned koalas as they are developed.

Progress Indicators:
1. Increased community capacity to drive koala conservation and care.

Stakeholders:
State Government, Wildlife Rescue Groups, Veterinarians and the Community.

Timeframe:
Short-term.

Background information

Many people get upset when they find a sick, injured or orphaned koala. Where possible they want it to be 'rescued', rehabilitated and released back into the wild. But koalas have specialised needs and can be difficult to care for. Many do not cope well with the stress of sickness or injury and this is why only veterinarians, or people with extensive experience in the rehabilitation of this species, are permitted to care for them. In 2010 the Department of Environment, Water and Natural Resources implemented the *'Koala Intervention Policy'* which, for the first time in South Australia, allowed for a network of approved koala carers to take an active role in the rescue, rehabilitation and release of koalas across the State. These carers work in partnership with experienced veterinarians, zoos and wildlife parks to provide emergency triage response and rehabilitative care for sick, injured or orphaned koalas. They also contribute to gathering intelligence on koala distribution, numbers, emerging diseases and disease patterns.

Release criteria. A koala is 'ready' for release back into the wild when:

Physically ready: The koala is fully weaned, has fully recovered from injury and/or disease. Its weight and condition is within the appropriate range for its age and sex. It has appropriate fitness levels and it has acclimated to prevailing climatic conditions. The koala is not considered to be a biosecurity risk.

Behaviourally ready: The koala can recognise and consume appropriate naturally-available food and it is not attracted to sights, sounds or smells that are specific to captivity.

Approved koala carers are people who have been able to demonstrate that they have the necessary expertise and experience in caring for koalas. They have appropriate facilities and access to sustainable fresh supplies of at least three types of suitable koala food tree species daily. They can recognise the subtle signs of pain and ill-health in koalas and have agreed to abide by the protocols described in the Department of Environment, Water and Natural Resources' permit conditions and the *'Guidelines for the Captive Management of Koalas in South Australia'*.

- Koalas cannot be kept as pets in South Australia so the koala carers take care to not tame koalas to the point that they cannot be released.
- Each koala must be assessed by a veterinarian, experienced koala carer, Warden or other nominated DEWNR Officer and certified as fit to return to the wild before it is released.
- Koalas must not be released until they are *'physically'* and *'behaviourally ready'* (see box).
- Koalas must be released close to the point-of capture, unless the environment is unsuitable.

If you find a sick, injured or orphaned koala you should contact a wildlife rescue group or a local veterinarian as soon as possible. You could also volunteer at a wildlife rescue group.

Climate change and 'CO_2 fertilisation'

Desired Outcomes:
Transition to a low carbon economy to safeguard the environment.

Strategy Actions:
1. State Government initiatives to transition to a low carbon economy.

Progress Indicators:
1. Implementation of adaption and mitigation measures against climate change which capitalize on opportunities for growth in green industries.

Stakeholders:
State Government, Business Sector, Industry and the Community.

Timeframe:
Short to medium-term.

Background information

In 2009 the International Union for the Conservation of Nature published the 'Red List' of species around the world destined to be hardest hit by climate change. This list included the koala. Koalas are particularly vulnerable to the effects of elevated CO_2 levels on eucalyptus nutritional quality. Increased atmospheric CO_2 levels tend to result in faster plant growth through a process known as 'CO_2 fertilisation'.

However, while plants grow faster, experiments have shown that it also reduces protein levels and increases tannin levels in plants' leaves. As CO_2 levels continue to rise, koalas will need to cope with increasingly nutrient-poor and tannin-rich *Eucalyptus* leaves.

The difficulties of digesting *Eucalyptus* leaves, combined with limitations on how much koalas can increase the size of their gut, means that koalas may no longer be able to meet their nutritional demands.

Scientists suggest that koalas could respond in two ways:

- Firstly, koalas could meet their nutritional needs by spending more time feeding and thus eating more. However, there is a limit to how much koalas can increase the size of their guts. In addition, eating more leaves causes them to pass more quickly through the koala's digestive system, resulting in less thorough digestion and decreased nutrient uptake. This could also increase over-browsing pressure in areas where there is already a high density of koalas.
- Secondly, koalas could develop a greater selectivity in leaf and tree choice. Younger, more nutritious leaves, however, also tend to possess more tannins. Koalas could also be more selective about the trees they select, though this would involve greater travelling time to find the best trees.

All South Australians are responsible for adapting to climate change impacts where they have the capability to do so. Living a more sustainable lifestyle by reducing individual carbon footprints can go some way to actively contributing to preserving the environment for future generations and the wildlife which depend upon it. Changing current patterns of consumption, taking public transport, installing solar panels or a rain water tank, recycling more waste or simply turning lights off when not needed can help to reduce energy consumption and greenhouse pollution.

At the Climate Change Conference in Paris in December 2015, South Australia was recognised as a world leader in fighting climate change with our commitment to a low carbon economy. In 2006 South Australia became the first State to pass legislation committing to renewable energy and emissions reduction targets. In 2013 the Government committed to low carbon generation by 2025 in recognition of the economic development potential of this industry. In 2014 the State's renewable energy targets were increased by 50% by 2025.

Adaptation actions minimise the negative impacts of climate change and maximise the opportunities that may arise from this change.

Research into health status / genetic structure

Desired Outcomes:
The health status and genetic structure of koala populations in South Australia is better understood.

Strategy Actions:
1. Promote and encourage research into the health status and genetic structure of koalas and develop appropriate strategies to reduce vulnerability of koala populations to disease.
2. Implement standardised protocols for data collection and sharing of research findings.

Progress Indicators:
1. The prevalence and clinical features of koala diseases are determined.
2. The role that genetics and environmental factors play in the development of koala diseases are determined.

Stakeholders:
Research agencies, Universities and State Government.

Timeframe:
Short to medium-term.

Background information

Koalas in South Australia have generally been considered to be free of disease. However, several cases of conjunctivitis associated with the bacterial organism Chlamydia were identified in 2012 in koalas in the Adelaide Hills and Mount Lofty Ranges (AMLR) region, leading to a larger study in 2014 confirming a much higher prevalence of subclinical Chlamydia infection than initially thought. Koalas in the AMLR also appear to have a higher prevalence of kidney failure than koalas in other states due to deposits of oxalate accumulating in the kidneys, however the cause remains unclear. Mange, due to the Sarcoptes mite, has also been detected in some koalas in AMLR, whilst Koala retrovirus is present in both the AMLR and on Kangaroo Island. It is still unclear as to how much of an impact these conditions have, or will have, in South Australian koalas, but they are a cause of concern for the health and welfare of the koala populations and may create demands on the time of Government agency staff, veterinarians and voluntary wildlife carers.

Koalas in South Australia are not genetically diverse. This is because they were originally introduced from a small number of animals brought from Victoria so they are very closely related (in-bred) and, as a result, have a very low genetic variability. A lack of genetic mix can lead to the development of physical abnormalities, increased health issues and a reduction in ability to adapt to change. The presence of diseases may be indicative of South Australian koala populations, and habitat, being under increasing stress.

Further research is required to investigate the prevalence and impact of diseases, such as Chlamydia, in the South Australian koala population. Strategies can then be developed to reduce the vulnerability of koalas to these diseases. For instance, researchers have developed a vaccine that could help prevent further spread of Chlamydia infection and whilst vaccinating every koala across the State would be near impossible, it may be possible to vaccinate rescued (sick, injured or orphaned) koalas during rehabilitation, prior to release back into the wild.

The State Government is working toward reinvigorating Cleland Wildlife Park including developing it as a koala 'Centre for Excellence'. This will provide opportunities to offer unique visitor experiences, strengthen private sector partnerships and optimize community and science research initiatives.

Other research priorities identified to date include:

- The relationship between the low genetic diversity of South Australian koalas and population fitness.
- Surveys of genetic diversity in koalas in the South East of the State to see if there is any indication that the remnant genotype is geographically restricted within that area and investigation into the practicality and value of artificially disseminating the diverse genotype(s) more widely through the South Australian population.
- Investigation into the role of genetics and environment in the development of kidney diseases.
- Investigation of infectious pathogens in South Australian koalas such as Chlamydia, koala retrovirus and mange.
- Research into ecological and tree physiological factors that are associated with regional koala distribution and over-browsing impacts.
- Monitoring the impact of climate change on koalas and their ability to adapt.

Bushfires and prescribed burns

Desired Outcomes:
Veterinary intervention is provided for koalas that have been affected by State Emergencies.

Strategy Actions:
1. Coordinate efficient and safe responses to intervene with koalas impacted by bushfires.
2. Fire management planning.

Progress Indicators:
1. Effective responses to emergency incidents involving koalas.
2. The role that genetics and environmental factors play in the development of koala diseases are determined.

Stakeholders:
State and Local Governments, non-Government organisations, Wildlife Care Groups and the Community.

Timeframe:
Short to long-term.

Background information

Bushfires: Large landscape bushfires are a major threat to individual koalas. Crown fires (a fire that burns and spreads through the canopy of trees) are a particular problem because koalas can become trapped at the top of trees and cannot escape. They have exposed skin areas on their hands, feet and face which will be impacted first by radiant heat. They also succumb to smoke inhalation.

Prescribed burns: Authorised and coordinated fire management strategies (prescribed burns) are implemented by the State Government to minimise the risks associated with the frequency, size, intensity and frequency of large landscape bushfires. Prescribed burns are conducted in a patchwork or mosaic pattern, which aims to reduce the risk of a significant bushfire in parks and reserves while maintaining environmental values. This mosaic pattern also provides wildlife with safe refuge whilst the vegetation regrows.

No unauthorised personnel can enter the incident controlled bushfire zone, or an area which has been subject to a prescribed burn, BEFORE they get the all-clear from the Emergency Service which is the designated Control Agency, for example, the Country Fire Service is the Control Agency for a bushfire.

It is not possible to remove wildlife from an area before a fire (bushfire or prescribed burn). But following either incident it is possible for suitably qualified and experienced wildlife care organisations and rehabilitators to assist authorities with the recovery, treatment, and rehabilitation of wildlife affected by fire in a coordinated and safe way.

Authorised response in a State Emergency: In response to a State Emergency incident such as a major bushfire the State Government's Department of Primary Industries and Regions South Australia will activate the South Australian Veterinary Emergency Management Inc. (SAVEM) to support and work in the emergency area alongside other agencies. SAVEM will get supplies and veterinary and non-veterinary volunteers into the area after it is re-opened by the Controlling emergency services.

Do not enter a recent fire-affected area as it may be unsafe.

If you find a koala which appears to be affected from a bushfire you should contact a wildlife rescue group or a local veterinarian as soon as possible.

Koalas in captivity

Desired Outcomes:
The welfare of koalas held in Zoos, Wildlife Parks, travelling exhibitions and other public displays is a priority.

Strategy Actions:
1. Develop and implement a Code of Practice for the Public Exhibition and Demonstration of Protected Wildlife in South Australia.
2. Promote the social, educational and economic benefits of having koalas in South Australia.

Progress Indicators:
1. Minimise the number of incidents where the welfare of koalas are impacted in captivity.

Stakeholders:
State Government, Zoos South Australia and Wildlife Parks.

Timeframe:
Short to medium-term.

Background information

Koalas may be held in captivity for several reasons. They may be held for short periods following rescue from injury or disease, or for research. They may be held for long periods for public display or because, post- rehabilitation, they are unlikely to be able to survive in the wild. In any case, it is important to ensure that they are cared for in an appropriately humane manner.

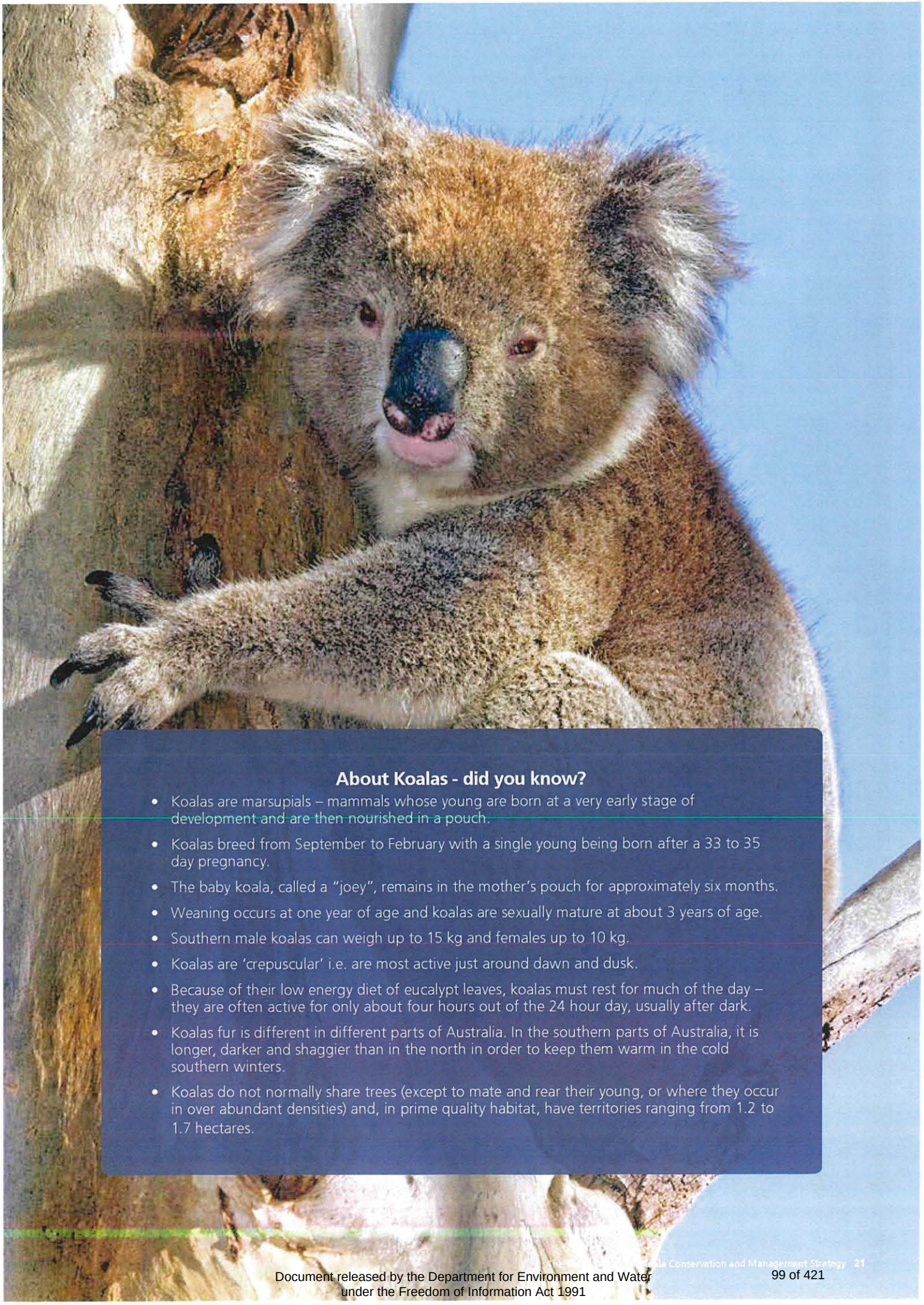
Koalas in zoos and wildlife parks are popular visitor attractions and make an important contribution to the State, national and international tourism industry. These facilities also play an important role in educating visitors about the conservation and management of koalas and their habitat.

Koalas have specialist animal husbandry and veterinary needs. It is essential, therefore, that displays are maintained at high standards. ZoosSA and Wildlife Parks develop and distribute comprehensive information resources which promote better understanding of the koala, its status and actions needed for its conservation and management.

The *'Guidelines for the Captive Management of Koalas'*, developed by the Department of Environment, Water and Natural Resources sets minimum standards and conditions for captive koala management in South Australia. This document provides guidance about where care and rehabilitation should (and should not) be used, including the rehabilitation-for-release of koalas. Koalas which are intended for eventual or immediate release should not be placed on public display without prior approval.

Through experiences and interpretation that engage visitors on a deeply emotional and even spiritual level, zoos and wildlife parks play an integral role in increasing people's sense of connection to the natural environment.

The State Government's Cleland Wildlife Park provides opportunities to offer unique visitor experiences, strengthens private sector partnerships and optimises community and science research initiatives.



About Koalas - did you know?

- Koalas are marsupials – mammals whose young are born at a very early stage of development and are then nourished in a pouch.
- Koalas breed from September to February with a single young being born after a 33 to 35 day pregnancy.
- The baby koala, called a "joey", remains in the mother's pouch for approximately six months.
- Weaning occurs at one year of age and koalas are sexually mature at about 3 years of age.
- Southern male koalas can weigh up to 15 kg and females up to 10 kg.
- Koalas are 'crepuscular' i.e. are most active just around dawn and dusk.
- Because of their low energy diet of eucalypt leaves, koalas must rest for much of the day – they are often active for only about four hours out of the 24 hour day, usually after dark.
- Koalas fur is different in different parts of Australia. In the southern parts of Australia, it is longer, darker and shaggier than in the north in order to keep them warm in the cold southern winters.
- Koalas do not normally share trees (except to mate and rear their young, or where they occur in over abundant densities) and, in prime quality habitat, have territories ranging from 1.2 to 1.7 hectares.

Source Documents

South Australian Legislation and Administrative subordinate Policies

- *National Parks and Wildlife Act 1972* and subordinate Regulations
- *Animal Welfare Act 1985* and subordinate Regulations
- *Native Vegetation Act 1991*
- *Natural Resources Management Act 2004*
- DEWNR Koala Intervention Policy and Procedure
- DEWNR Kangaroo Island Koala Management Program

Koala Strategies Guidelines & Reports

- National Koala Conservation and Management Strategy 2009 – 2014
- Guidlines for the Captive Management of Koalas in South Australia 2010
- Victoria's Koala Management Strategy 2004
- Senate Committee Report – Environment and Communications Reference Committee – 'The Koala – saving our national icon'. 2011.
- "A framework and guideline for strategic thinking and decision-making about koala management in the Adelaide and Mount Lofty Region" by Steven Cork, EcoInsights
- Green Triangle Koala Management Guidelines for Plantation Harvest Operations
- Lismore City Council – Koalas in our backyard
- Queensland State Government Fact Sheet – Koalas and Car

Books

- 'Koala – Origins of an Icon' by Stephen Jackson
- 'Reducing the Impacts of Development on Wildlife' by James Gleeson and Deborah Gleeson

Research

Funnell O, Johnson L, Woolford L, Boardman W, Polkinghorne A & McLelland D 2013,. Conjunctivitis associated with Chlamydia pecorum in three koalas (*Phascolarctos cinereus*) in the Mount Lofty Ranges, South Australia. *Journal of Wildlife* Diseases, vol. 49, pp. 1066-1069.

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Speight KN, Polkinghorne A, Penn R, Boardman W, Timms P, Fraser T, Johnson K, Faull R, Bate S & Woolford L (In press), The prevalence and impact of *Chlamydia pecorum* infections on South Australian koalas (*Phascolarctos cinereus*), *Journal of Wildlife Diseases*, accepted 11 August 2015.

For further information please contact

Department for Environment, Water and Natural Resources Information line on (08) 8204 1910, or see SA White Pages for your local Department of Environment, Water and Natural Resources office.

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Government of South Australia
Department of Environment, Water and Natural Resources

National Parks South Australia

Document No.: DEW-D0000034

TO MINISTER FOR ENVIRONMENT AND WATER

FOR APPROVAL

RE: STATE-WIDE KOALA MANAGEMENT PROGRAM

THROUGH: A/CHIEF EXECUTIVE

A/GROUP EXECUTIVE DIRECTOR, PARKS AND REGIONS

Priority: Routine

RECOMMENDATIONS

It is recommended that you:

1. Note the achievements of the Kangaroo Island Koala Management Project and the on-going requirement for management.

   NOTED

2. Note the emerging need for koala management in other parts of the state.

   NOTED

3. Note all methods available for koala management in South Australia

   NOTED

4. Note the proposal to allocate up to $275,000 for the 2018-19 financial year to transition away from surgical sterilisation of koalas to the more cost effective use of base of tree contraceptive implants and implementing koala management in priority areas across the state.

   NOTED

5. Note the development of a three year plan for 2019-2022 to implement coordinated koala management in priority areas in the state.

   NOTED

Comments:	---------- **David Spiers MP** **Minister for Environment and Water** / / 2018

PRIORITY

Routine

Contact: Brenton Grear on 0428 823 622 or brenton.grear@sa.gov.au
Date: 7 August 2018

BACKGROUND

The koala is an iconic Australian species with intense public interest and strong sympathy about its circumstances. On Kangaroo Island (KI), where koalas were introduced in the 1920s, koala density has been effectively reduced from levels that were severly damaging native vegetation/habitat. As the South Australian government and community is committed to maintaining a sustainable koala population on Kangaroo Island, ongoing management is required to prevent negative impacts on habitat for koalas and other native species.

To maximise the cost effectiveness of koala management across the state, DEW has been:

- working on new technology to make koala fertility control increasingly cost effective,
- state wide coordination of koala management and policy through joint delivery of the South Australian Koala Conservation and Management Strategy (2016), and
- development of state wide technical and operational capability to manage koalas.

You are being asked to support the allocation of funding to transition the KIKMP to a more cost effective state-wide approach and to progress state-wide implementation of the base of tree hormone implant approach. Consideration of a longer term approach for koala management 2019-2022 is also requested to facilitate forward planning.

DISCUSSION

The KIKMP was initiated in 1996 to reduce koala numbers in response to severe over-browsing of native vegetation. Over time, targeted intervention through surgical sterilisation and limited translocation reduced koala density and improved tree condition. Translocations have stopped due to expense and limited available habitat in the South East.

The most recent koala survey shows that density has again increased in some areas of KI. These increases are likely related to the establishment of Tasmanian Blue Gum plantations and favourable weather conditions. It is clear from the 2015 population survey and subsequent modelling that the KI koala population requires continued active management. Over half the population still occurs at low density in suboptimal habitat. The risk of these low density populations increasing requires continued monitoring; targeted intervention may be required.

South Australian Koala Conservation and Management Strategy

In 2016, the Minister for Sustainability, Environment and Conservation launched the *South Australian Koala Conservation and Management Strategy* (the Strategy) and DEW Executive subsequently endorsed a program approach to implementing this Strategy through the SA Koala Steering Committee. The KIKMP is now managed under these governance arrangements to ensure coordination across the State. This approach enables efficiencies in several areas including skills transfer between regions, centrally managed scientific research, a coordinated approach to developing new management techniques and joint delivery of the Strategy.

Reducing koalas' impacts on native vegetation on KI delivers on nine of the priority actions set out in the Strategy. This strategy responds to a growing public awareness of implications of the State's koala populations and demonstrates the Government's commitment to:

- safeguard the welfare of koalas,

Contact: Brenton Grear on 0428 823 622 or brenton.grear@sa.gov.au
Date: 7 August 2018

- increase the social, educational and economic benefits of having koalas in South Australia, and
- reduce the broader ecological negative impacts of over-abundant koala populations.

Koalas in Tasmanian Blue Gum Plantations

Delivery of the Strategy does not fall to the State Government alone. The costs of koala management associated with timber harvest within blue gum plantations is the responsibility of the plantation owner. DEW, through Natural Resources KI staff, are working with the Kangaroo Island Plantation Timbers (KIPT) Operations Director to embed tenure-blind sustainable koala management into future forest harvest operations. KIPT have a business imperative to cooperatively manage koalas with DEW to maintain their social licence to harvest, and their business model to replant commercial trees after harvest. Effective public-private partnership and cross-tenure management is likely to lead to cost efficiencies in reducing the impact of koalas on both commercial operations and native vegetation.

Are there other koala management options?

Culling overabundant koala populations has been raised as a cost effective management option by the community, the KI NRM Board and the Koala Taskforce (1996). However, culling is not permitted in the Strategy or by any state in Australia and would generate substantial local and international opposition. The intentional spread of chlamydia was rejected by the Taskforce as a management tool due to animal welfare consequences. Fertility control and translocation are the primary tools to reduce overabundant koala populations.

Previously, fertility control was achieved through surgical sterilisation, requiring animals to be anaesthetised. However, DEW are working with a range of partners to refine the hormone implant technique so that it can be applied without anaesthetic by DEW staff at the base of the tree. The relatively low cost of hormone implants and its administration at the point of capture by non-veterinary personnel means promises improved delivery capacity, animal welfare outcomes and field efficiencies for population management.

In October 2017, the International Koala Centre of Excellence, with support from DEW, hosted a workshop of researchers and managers to identify opportunities for innovative and effective management and research programs around overabundant koalas. These inter-state collaborations will allow South Australia to further advance strategic and operational knowledge and management, that a state-wide koala program is well placed to implement.

What happens if we stop koala management on Kangaroo Island? Zero investment.

This option is undesirable. The KI Koala population model suggests that, in the absence of fertility control, koala numbers will more than double over 10 years. Koala density in high quality habitats would be four times higher than desirable, approaching pre-KIKMP densities, where significant defoliation and death to preferred food trees was common.

There is a strong community expectation that koalas will be managed on KI, and without active fertility management the calls for lethal management (a cull) would likely intensify. Not funding any alternatives to culling would be an untenable position. Landholders would be left without viable alternatives to manage over-abundant koalas on their land and staff would be burdened with responding to the inevitable questions from the community and media,

Contact: Brenton Grear on 0428 823 622 or brenton.grear@sa.gov.au
Date: 7 August 2018

Ministerial and direct correspondence. Additionally, specialist skills and operational capacity would be lost within DEW, at a time when other Regions such as Adelaide and Mount Lofty Ranges (AMLR) and the Eyre Peninsula (EP) will require access to skills and knowledge.

Without an active koala management project on KI there would be limited leverage for external funds from potential partners such as the forestry industry to add value to the existing project. Staff from Natural Resources KI are in ongoing discussions with forestry and tourism interests to explore options for external funding of the koala management program.

Community interest in koala management on Kangaroo Island and statewide
Kangaroo Island is a major tourist drawcard, based on the natural environment and wildlife. Businesses on KI have consistently called for investment in koala management to support a thriving tourist industry but limit damage to native vegetation. Cessation of koala management may have implications including reduced long-term tourism potential, strengthened community calls for lethal management and a loss of credibility for DEW on KI.

Broader communication will also need to be considered in the transition to state-wide koala management. A communications strategy and plan will support the transition.

Are koalas overabundant in other areas of the state?
Koala populations are increasing in the AMLR and on the EP. Koala density in areas of AMLR are higher than ever recorded on KI, highlighting the need for statewide management.

CONSULTATION

The Strategy and significant associated community consultation and participation (through the Great Koala Counts 1 and 2) establishes broad community support and "social licence" for fertility control as the preferred management technique for over abundant koalas.

FINANCIAL IMPLICATIONS

Are there financial implications? Yes

The KIKMP has been funded previously through an annual funding arrangement ranging between $400,000 and $900,000 with the last two years being just under $400,000. A revised KIKMP, state-wide coordination and cost-effective contraception methodologies provides opportunities to lower costs of koala management on KI.

The risks associated with not funding any koala management on KI include: reputational risk to DEW, loss of necessary specialist skills, reduced potential for funding from external partners, loss of momentum in progressing sterilisation technologies, long term negative impacts on nature based tourism activities for KI and other Regions, and long term negative environmental impacts.

Brenton Grear
Chair, Department for Environment and Water Koala Steering Committee
Regional Director AMLR, Department for Environment and Water
Date:

Contact: Brenton Grear on 0428 823 622 or brenton.grear@sa.gov.au
Date: 7 August 2018

File No.:
Document No.:

TO A/GROUP EXECUTIVE DIRECTOR, PARKS AND REGIONS

FOR APPROVAL

RE: GOVERNANCE OF THE SA KOALA CONSERVATION AND MANAGEMENT PROGRAM 2018-19

THROUGH: REGIONAL DIRECTOR, KANGAROO ISLAND

CC: Jodie Bowles Organisational Performance

RECOMMENDATIONS **PRIORITY Routine**

It is recommended that you:

1. Approve a one year transitional arrangement for the management of the South Australian Koala Conservation and Management Program by NR AMLR in 2018-19.

APPROVED / NOT APPROVED

2. Note that the existing NRKI PO2 ongoing position will relocate to AMLR to manage the state wide program including coordinating the Kangaroo Island Koala Management Project, based on mutual agreement between the two Regional Directors.

NOTED

3. Note that governance for 2019-2020 is yet to be determined and future opportunities will be considered as part of the DEW reform process and funding outcomes.

NOTED

4. Note that Kangaroo Island will continue to hold the cost pressure for the PO2 position associated with the transition from 1 July 2019 unless new funding is secured, or alternative arrangements met.

NOTED

Comments:	--- **Grant Pelton** **A/GROUP EXECUTIVE DIRECTOR, PARKS AND REGIONS** / / 2018

Contact: Robyn Molsher on 0428113027 robyn.molsher@sa.gov.au
Date: 20 August 2018

BACKGROUND

- Temporary funding for the South Australian Koala Conservation and Management Program (the program) has been provided by the A/Chief Executive until 30 September 2018, pending notification from the Department for Treasury of DEW's total annual funding allocation and endorsement by the Minister.
- If confirmed, funding will be allocated to progress base-of-tree hormone implant implementation in both the Adelaide Mount Lofty Ranges (AMLR) and Kangaroo Island regions as an alternative to surgical sterilisation with other state-wide activities outlined in the approved Koala management funding Brief (DEWNRD-00015082).
- A DEW Program Plan will be forwarded to the SA Koala Steering Committee by 14 September 2018 for approval. The Committee oversees the delivery of the South Australian Koala Conservation and Management Program with policy development and delivery.

DISCUSSION

- The Steering committee supports the management of program delivery being coordinated through the AMLR region and note that this may be used as a model to address other impact causing species. The program sponsor is Brenton Grear, Regional Director NR AMLR and Chair of the SA Koala steering committee.
- The PO2 NRKI Wildlife Program Manager (Robyn Molsher) will relocate to the NRAMLR region from 1 October 2018 with salaries coming from Koala project funding which will be confirmed in September 2018. Note that Kangaroo Island will continue to hold a cost pressure for the PO2 ongoing position associated with the transition after 30 June 2019 unless new funding is secured. The incumbent has been on higher duties at the PO3 level but this will need to be further negotiated with AMLR.
- Both the steering committee and the two Regional Directors support the transfer.
- Kangaroo Island will continue to have presence (subject to Koala project funding approval). This includes casual, locally skilled arborists, overseen by Dr Molsher targeting base-of-tree hormone implant implementation, and tree maintenance; and communication and liaison with the Kangaroo Island forestry industry, community and stakeholders led by Mike Greig Manager (Sustainable Economic development KI). Martine Kinloch Manager (Science and Program Planning) will contribute to koala science through the Koala Project Coordinating Committee.
- Dr Molsher's knowledge base will be beneficial to state-wide attention. The majority of the functions of this new role will now be delivering state-wide koala management program activities, and will report to the NRAMLR Species Ecologist, Jason van Weenen.

CONSULTATION

SA Koala Steering Committee

Contact: Robyn Molsher on 0428113027 robyn.molsher@sa.gov.au
Date: 20 August 2018

FINANCIAL IMPLICATIONS

Are there financial implications? No

Brenton Grear

Chair, SA Koala Steering Committee
Regional Director AMLR
Department for Environment and Water
Date:
ATTACHMENTS: nil

Contact: Robyn Molsher on 0428113027 robyn.molsher@sa.gov.au
Date: 20 August 2018

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Project Closure and Evaluation Report

Kangaroo Island Koala Management Project 2017-18

Version: 0.2
Date: August 2018

Document history

File details

File location	R/hb/KI/CPU/koala/reports/project plans/ 2017-18/
File Reference	Project Closure Report (Services) KIKMP_2017-18.doc

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Version	Date	Summary of changes	Author/Editor	Quality review
0.1	18/7/18	Orginal version	Robyn Molsher	KPCC
0.2	9/8/18	KPCC edits incorporated	Robyn Molsher	NRKI RMT
1.0		Endorsed by NRKI RMT	Robyn Molsher	Final version

Distribution

This document has been distributed to the following people:

Name and position title	Signature	Date	Purpose
KPCC			Review and endorsement
Damian Miley- NRKI RMT			Endorsement

Target audience for this document

Name	Position title	Nature of interest
Damian Miley	Regional Director	Accountable to DEW Koala Steering Committee for successful project delivery
Regional Management Team	Unit Managers	Deliverables
Brenton Grear Sandy Carruthers Matt Ward Damian Miley Matt Johnson Michael Garrod Tim Collins Jonathan Clark	DEW Koala Steering Committee members	Deliverables and budget
Michaela Heinson Jason van Weenen Ange Pestell Jennie Fluin Dan Rogers Michele Walter Karl Hillyard Robyn Molsher Martine Kinloch Linda Brown Ross Anderson Andrew Freeman	DEW Koala Project Coordinating Committee members	Deliverables

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Project details

Project name	Kangaroo Island Koala Management Project 2017-18
Start date	1 July 2017
Completion date	30 June 2018
Program link	
Business Owner	Martine Kinloch
Project Sponsor	Damian Miley
Project Manager	Robyn Molsher

Overview

Summary

Koalas have been managed adaptively on Kangaroo Island through the Kangaroo Island Koala Management Program (KIKMP) since 1996, with project delivery varying according to new information and priorities. As a result of new information in 2015 on koala abundance, including the realisation that koalas are increasing significantly across the landscape, the KIKMP focussed in 2016-17 on a major review and reform process, and on filling critical knowledge gaps. KIKMP 2017-18 built on the learnings from 2016-17 to contribute to the long term objective of the project which is to protect native vegetation from over-browsing by reducing koala densities to sustainable levels.

Major objectives for KIKMP 2017-18 were:

1) to improve the condition of priority bushland habitats (native vegetation).
2) to monitor the effectiveness of koala management activities.
3) to improve community awareness and understanding of KI koala management.
4) to summarise the outputs and achievements of the KIKMP since its origin in 1997.
5) to contribute to state-wide koala management.

Background

The introduced koala population on Kangaroo Island SA has been managed through fertility suppression since 1996, during which time more than 12,700 koalas have been sterilised, and 3,800 translocated off-island. The long-term objective of the KI Koala Management Project (KIKMP) is to reduce over-browsing impacts on native vegetation on Kangaroo Island by reducing koala densities to a sustainable level.

Regular monitoring has shown that the koala population declined steadily from an estimated 27,000 in 2001 to 14,000 in 2010. However, in 2015, a regular five-yearly census of koalas demonstrated an unexpected and significant increase in the population in native vegetation as well as in unmanaged commercial blue gum plantations. Population modelling based on the updated koala population numbers predict that, in order to maximise the probability of a declining koala population, nearly double the number of koalas need to be sterilised each year compared with annual targets for the past five years.

A major review and reform process of koala management in South Australia in 2016-17 led to the addressing of critical gaps in our knowledge and understanding of koala population dynamics, distribution in the landscape (including movements and use of habitat) and environmental impacts in different vegetation communities. Learnings from these reviews will be integrated into project delivery for KIKMP 2017-18 where appropriate.

Project Outcomes

The long-term objective of the KI Koala Management Project (KIKMP) is to conserve native vegetation on Kangaroo Island by reducing koala densities to a sustainable level in order to mitigate over-browsing impacts.

This project will support that objective by delivering the following outcomes:

No.	Outcome	Deliverables	Evaluation	Reporting for 2017-18
1	Density of koalas reduced in key native vegetation communities	330 sterilised female koalas in priority areas	Local koala density is estimated and declines in the long-term	475 female koalas sterilised in the Eleanor and Timber Creek and Cygnet Management Units. Koala density was measured at 26 established monitoring sites. Tree condition has improved in the Cygnet River MU where koala management has been focussed.
2	Threshold koala densities established for key vegetation communities[DM1]	The relationship between tree condition and koala density is further examined for a range of food trees.	Target population density values are used in the koala population model to forecast spatially explicit annual sterilisation targets	A KPCC sub group met on three occasions to further investigate the most appropriate way to measure tree condition. Awaiting further analysis of the relationship between koala density and tree condition. Awaiting koala spatial model.

3	Improved community awareness and understanding of koala issues	KIKMP Engagement strategy implemented	Number of visits to the NRKI website for koala related information and the number of Facebook responses to koala media[DM2].	The KIKMP engagement strategy was implemented where possible but lack of certainty on future funding has hampered communication. Approval to release information on the KI koala population increase was received in August 2017. Since then the following communication activities have been undertaken: o Updated koala and KI KMP fact sheets were posted on the NRKI website (August 2017) o A FAQ dealing with the population increase was released and placed on the NRKI website (September 2017) o Media release in *The Islander* (September 2017) o Science in the Pub Parndana Hotel (October 2017) o Science in the Pub Parndana Hotel (February 2018) o Science in the Pub Kingscote (February 2018) o Media release *in The Islander* (May 2018) Little feedback was received from the community at these events with most comments questioning why koalas are not being culled.

No.	Outcome	Deliverables	Evaluation	Reporting for 2017-18
				Responses to koala media on Facebook were: • January 2018 - Science in the pub event posts – 543 people reached, 7 reactions (likes, etc), 1 share • March 2018 – KIKMP host Fauna Rescue story – 356 people reached, 9 reactions, 2 shares • May 2018- Koala project completes latest catch season story – 467 people reached, 11 reactions, 1 share
4	Technical Report produced	Data summarised and analysed for KIKMP 1997-2018.	Review by the SAKPCC.	Not supported by the NRKI Regional Director so action not progressed. RD has requested all available funds spent on koala sterilisation and for a university to progress the Technical report[DM3].
5	New technologies assessed/evaluated to improve project efficiency	Support development and improvement of hormone implant techniques and participate in the SAKPCC.	Assessment of the techniques and outcomes by the SAKPCC.	Hormone implant training was conducted in the AMLR in April 2018 and all available KI koala staff assisted in the catching of koalas for the training. WPM attends and participates in KPCC meetings monthly.

Additional achievements for 2017-18 that were not planned:

1. Koala catching season was extended to increase the number of koalas sterilised. Salary savings allowed this from WPM undertaking a three month acting position in state-wide koala management.
2. Koala catching for hormone implant evaluation in December 2017 and April 2018.
3. Presentations on KIKMP given to:
    - Islands of the World conference July 2017
    - Fauna Rescue SA- Adelaide- August 2017
    - SA/Victoria koala managers and researchers meeting- December 2017
    - KINRM Board- December 2017
    - Fauna Rescue SA- Kingscote- February 2018
    - Science in the pub- Kingscote and Parndana- February 2018
    - NRM conference- April 2018

Reason for closing the project

KIKMP 2017-18 is being closed as KIKMP 2018-19 has now been initiated with a budget allocation of $68,000 (July- September) and is awaiting the full allocation of $275,000 for 2018-19 subject to A/Chief Executive approval post state government budget in September 2018.

Closure activities

Project deliverables handover

Any outstanding deliverables identified in the KIKMP 2017-18 Project Plan will be handed over to the next KIKMP 2018-19 Project Plan.

Contract closure

All contracts in the KIKMP 2017-18 Project Plan are complete with final payments delivered. One final report for the Koala spatial model by The University of Adelaide is still outstanding and is being managed by DEW Science Group.

Administrative closure

Hard copies and electronic copies of the KIKMP 2017-18 Project Plan, Closure and Evaluation Report will be provided to the Business owner (Martine Kinloch).

Aboriginal engagement

No targeted Aboriginal engagement was undertaken for this project.

Project performance

Performance against strategic alignment

This project assisted in implementing a range of different strategies outlined in the 2017-18 KIKMP project plan as described below:

Strategic Alignment	Implementation
South Australian NRM Plan: Our Place Our Future 2012-2017	Condition of native vegetation was improved in areas where koala management was focussed.
The South Australian Koala Conservation and Management Strategy 2016	Koala densities were maintained at or below sustainable densities in some areas.
DEW Corporate Plan 2016-2019	Koala management reduced impacts of overbrowsing on native vegetation in areas where koala management was focussed.
NRKI Business Plan 2017-18	Implementation and delivery of KIKMP 2017-18.
KI NRM Strategic Plan 2009-2019	Native vegetation protected from overbrowsing where koala densities are maintained at sustainable levels.

Performance against outcomes

See "Reporting for 2017-18" column in Table on pages 3-6 in this report.

Performance against deliverables

See "Reporting for 2017-18" column in Table on pages 3-6 in this report.

Budget

	Predicted expenditure	Actual expenditure
Salaries		
Project Manager	$94,068	
Senior Field Officer/ Wildlife Operations Officer	$69,840	
Casual Field Officers (2)– monitoring 15 days	$4,050	
Field Officers (4.5) - catching 4 months Senior Field Officers (2) – catching 4 months Casual Field Officer – catching 10 days	$85,722 $41,120 $2,700	
DEW regional administration fee	$25,000	
SUBTOTAL SALARIES	**$322,500**	**$290,000**
Operating		
Project materials: PPE, field equipment, ear tags, microchips, sundry etc.	$10,000	
Vehicles (2) and trailers (3)- registration, fuel, lease, repairs	$24,000	
Training	$2,000	
Travel	$4,000	
Veterinary services and equipment	$27,500	
SUBTOTAL OPERATING	**$67,500**	**$100,518**
TOTAL	**$390,000**	**$390,518**

Schedule

Activity/ Milestone	Steps	Responsible Officer (lead)	Scheduled Start	Expected Completion Date
KIKMP Project Plan 2017-18	1. Prepare draft plan for review 2. Finalise plan for endorsement by SAKPCC	R Molsher R Molsher	July 2017 September 2017	~~August 2017~~ ~~October 2017~~
Fertility control (sterilisation program)	1. Recruit koala field staff 2. Identify target areas for management 3. Organise logistics and prepare fieldwork plan 4. Induct and train staff 5. Catch and sterilise koalas	R Molsher R Molsher A Schofield A Schofield A Schofield	August 2017 September 2017 October 2017 November 2017 November 2017	~~October 2017~~ ~~November 2017~~ ~~November 2017~~ ~~November 2017~~ ~~March 2018~~
Monitoring program	1. Measure koala density at 26 core sites 2. Input data to data base 3. Analyse data 4. Report results	A Schofield R Molsher R Molsher R Molsher	September 2017 November 2017 January 2018 March 2018	~~November 2017~~ ~~November 2017~~ ~~March 2018~~ ~~June 2018~~
Habitat management program	1. Install tree collars on 25 large trees	A Schofield	July 2017	~~June 2018~~ 38 tree collars installed ~~June 2018~~

Activity/ Milestone	Steps	Responsible Officer (lead)	Scheduled Start	Expected Completion Date
	2. Retrieve guards and adjust tree collars where needed.	A Schofield	July 2017	
Data analysis and management	1. Re-analyse tree condition data 2. Correct any identified errors in existing databases 3. Analyse data for the Technical report 1997-2018.	D Rogers R Molsher R Molsher	September 2017 March 2018 January 2018	December 2017 Not completed ~~June 2018~~ June 2018 Not commenced as not supported by the RD
Communication and community engagement	1. Develop schedule of communication activities for 2017-18. 2. Identify, produce and disseminate communication products 3. Facilitate community engagement with stakeholders. 4. Evaluate KIKMP communication activities- number of nrki website visits and facebook responses.	P Holden P Holden P Holden P Holden	August 2017 September 2017 September 2017 May 2018	~~November 2017~~ ~~June 2018~~ ~~June 2018~~ ~~June 2018~~
Reporting program	1. Scientific paper on koala census results 2. Draft Technical report 1997-2018 3. Final Technical Report 1997-2018	R Molsher R Molsher R Molsher	November 2017 November 2017 May 2018	February 2018 Awaiting DR comments May 2018 Not initiated June 2018 Not initiated
Project evaluation and reporting	1. Update MEK template at project completion. 2. Prepare DEW PMF Evaluation and Closure Report for KIKMP 2017-18.	R Molsher R Molsher	May 2018 May 2018	~~June 2018~~ ~~June 2018~~
State-wide koala management	1. Assist in the trial of hormone implants in AMLR region. 2. Participate in and contribute to SAKPCC. 3. Seek funding for KIKMP 2018-2023.	R Molsher& J van Weenen R Molsher R Molsher	December 2017 July 2017 October 2017	~~April 2018~~ ~~June 2018~~ ~~April 2018~~ attempted but currently unsuccessful

Project management performance

Scope management

Scope changes were identified and managed through the SA Koala Projects Coordinating Committee.

Budget versus actual

The project was implemented within 0.01% variation of the total budget ($390,000) experiencing only a $518 overspend at project completion.

Schedule management

The schedule was useful to ensure tasks were completed within agreed timelines.

Communication management

Uncertainty of funding for KIKMP 2018-19 reduced the ability for KIKMP communication activities in the latter part of the year to be implemented.

Risk management

Identified risks were realistic with some becoming actualised. The project's mitigation strategies were appropriate. Some tasks that were not completed were outside the control of the project.

The relationship with the KI Vet closing the vet component was amicable and is part due to a good relationship between the department staff and vet.

Human resources management

The project was coordinated through the SA Koala Projects Coordinating Committee under the direction of the SA Koala steering committee which provided access to a wide range of staff skills.

Procurement management

The project's procurement strategy was adequate.

Quality management

The project manager ensured quality management was adhered to under the direction of the SA Koala steering committee.

Integration management

Monthly meetings by the SA Koala Projects Coordinating committee facilitated the coordination of various elements of the project.

Project Evaluation

The SAKPCC will be convened at the end of the project to review outcomes and develop a closure and evaluation report that will be delivered to the SA Koala Steering Committee. The review process will be guided by a series of key evaluation questions:

1. **Was the sterilisation target of 330 koalas reached?**

The sterilisation target was exceeded and 475 female koalas sterilised in the Eleanor and Timber Creek and Cygnet Management Units. Salary savings from WPM acting role provided the extra funds for this.

2. **Has the relationship between tree condition and koala density between established with sufficient confidence?**

Awaiting analysis –Science and Information Branch

3. **Have known data errors in the Access databases been corrected in preparation for the next BDBSA upload?**

Yes data errors from previous upload (1996-2015) were corrected and all data uploaded to BDBSA.

4. **Has community understanding of KI koala management improved?**

There is no formal way of evaluating this question but anecdotal data and conversations with people suggest that the community understands the issues around koala management and the koala management project on the island fairly well (P. Holden pers. comm.).

5. **What has been learned from the project that can inform future management strategies?**

- Kangaroo Island's koala population is *Chlamydia pecorum* free and needs to instigate biosecurity measures to prevent an incursion.
- In 2017-18, catch effort was focussed in an area that had not been managed before as were stringbarks and koala numbers were unexpectedly high. Historically, management has been focussed in high quality habitats.
- Anecdotal observations suggest that plantings of manna gums can act as a management tool by drawing koalas into them and thereby protecting the surrounding native vegetation (T Welz and M Barth pers. comm.).
- Koalas appear to be spreading into habitats not previously occupied. Landholders are reporting koalas in new habitats and koala rescues have expanded into coastal areas and increased significantly compared to previous years which has increased the incidence of dog attacks (T. Welz and A. Maguire pers. comm.).
- Koala catching in the AMLR is more difficult than on KI given the number of public that view each koala catch, lack of support from some community members for koala management, blackberries preventing access to trees, hilly terrain, high number of landholders to contact for access and on smaller properties, temperature extremes and high number of days> 30 C, more extreme fire danger days requiring modification of procedures, and the need to reduce spread of mange and chlamydia.
- Tree collars may be doing more harm than good on Manna Gum trees as the shedding of bark underneath the collar gets wet and creates habitat for fungi which can ring bark a tree and promotes termite invasion. Manna gum tree collars need to be checked every three years and be placed as loosely as

possible around the tree. SA blue gum collars can be checked less frequently (about every 5-10 years).

- Koalas appear to avoid flowering eucalypts and do not eat flowering stems when in cages. Koalas were not found in flowering stringybarks in 2016 which required a change in catch focus (A. Schofield, T Welz, M. Barth pers. comm.). This may have been due to a change in palatability of leaves rather than the presence of bees.

Project successes

Knowledge gained in this project will be useful for koala management on the island and projects establishing elsewhere in the state.

Areas for improvement

Three year project plans would reduce the need for multiple reports (project plan, evaluation report, closure report) that have a large degree of overlap. Three year funding would allow skills and expertise of staff to be retained and improve the ability for the program to plan activities.

Recommendations

1. Long term (3-5 year) budgets are critical to allow planning and retention of experienced staff and to build trust in the community.
2. DEW needs to continue to work with KI Plantation Timbers to minimise impacts from koalas on the native vegetation when plantations are harvested.
3. The Koala Project ~~C~~Coordinating Committee and SA Koala steering committee are critical to ensure integrated and coordinated koala management across the state.

Project closure summary

The project will be considered closed when:

1. All reports documenting research and management outcomes are complete.

Product	Publishing details
i. KIKMP Annual summary 2017-18	In progress
ii. KIKMP census report 2015	Finalised and uploaded to the NRKI website.
iii. KI koala population scientific paper	Awaiting submission to journal (Wildlife Research)
iv. KIKMP Evaluation and closure report	This report

2. All project data are stored and documented in accordance with DEW Managing Environmental Knowledge (MEK) protocols and relevant datasets are uploaded to corporate databases (*e.g.* BDBSA).

- The KIKMP database was uploaded to BDBSA in 2015-16 and again in 2017-18

- DEW MEK template completed
- Koala density monitoring data and koala catch data for 2017-18 was input to the respective Access database.

Sponsor approval of project closure

Sponsor name	Position title	Signature
Damian Miley	**Regional Director**	
Comments		

Business Owner acceptance of deliverables

Business Owner name	Position title	Signature
Martine Kinloch	**Manager, Science and Program Planning**	
Comments		

Government of South Australia
Department for Environment and Water

Document No.: DEW-D0000034

TO MINISTER FOR ENVIRONMENT AND WATER

FOR APPROVAL

RE: STATE-WIDE KOALA MANAGEMENT PROGRAM

THROUGH: A/CHIEF EXECUTIVE

A/GROUP EXECUTIVE DIRECTOR, PARKS AND REGIONS 5/9/18

Priority: Routine

RECOMMENDATIONS

That you:

1. Note the achievements of the Kangaroo Island Koala Management Project (KIKMP) and the on-going requirement for management.

   NOTED include

2. Note the emerging need for koala management in other parts of the state.

   NOTED include

3. Note all methods available for koala management in South Australia

   NOTED include

4. Note the proposal to allocate up to $275,000 for the 2018-19 financial year to transition away from surgical sterilisation of koalas to the more cost effective use of base of tree contraceptive implants and implementing koala management in priority areas across the state.

   NOTED don't include no $ for 18/19

5. Note the development of a three year plan for 2019-2022 to implement coordinated koala management in priority areas in the state.

   NOTED include

Comments:	
We should brief Minister We want to spend $ on KI koalas Need to develop State wide Strategy for guide future action and investment	---------- **DAVID SPIERS MP** **Minister for Environment and Water** / / 2018

Contact: Brenton Grear on 0428 823 622 or brenton.grear@sa.gov.au
Date: 7 August 2018

PRIORITY

Routine.

BACKGROUND

The koala is an iconic Australian species with intense public interest and strong sympathy about its circumstances. On Kangaroo Island (KI), where koalas were introduced in the 1920s, koala density has been effectively reduced from levels that were severly damaging native vegetation/habitat. As the South Australian government and community is committed to maintaining a sustainable koala population on Kangaroo Island, ongoing management is required to prevent negative impacts on habitat for koalas and other native species.

To maximise the cost effectiveness of koala management across the state, DEW has been:

- working on new technology to make koala fertility control increasingly cost effective,
- coordinating statewide koala management and policy through joint delivery of the South Australian Koala Conservation and Management Strategy (2016),
- developing state wide technical and operational capability to manage koalas, and
- considering a longer term approach to koala management for 2019-2022.

DISCUSSION

The KIKMP was initiated in 1996 to reduce koala numbers in response to severe over-browsing of native vegetation. Over time, targeted intervention through surgical sterilisation and limited translocation to the South East of South Australia reduced koala density and improved tree condition. Translocations have stopped due to expense and limited available habitat in the South East.

The most recent koala survey shows that density has again increased in some areas of KI. These increases are likely related to the establishment of Tasmanian Blue Gum plantations and favourable weather conditions. It is clear from the 2015 population survey and subsequent modelling that the KI koala population requires continued active management. Over half the population still occurs at low density in suboptimal habitat. The risk of these low density populations increasing requires continued monitoring; targeted intervention may be required.

South Australian Koala Conservation and Management Strategy

In 2016, the Minister for Sustainability, Environment and Conservation launched the *South Australian Koala Conservation and Management Strategy* (the Strategy) and DEW Executive subsequently endorsed a program approach to implementing this Strategy through the SA Koala Steering Committee. The KIKMP is now managed under these governance arrangements to ensure coordination across the State. This approach enables efficiencies in several areas including skills transfer between regions, centrally managed scientific research, a coordinated approach to developing new management techniques and joint delivery of the Strategy.

Reducing koalas' impacts on native vegetation on KI delivers on nine of the priority actions set out in the Strategy. This strategy responds to a growing public awareness of implications of the State's koala populations and demonstrates the Government's commitment to:

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Date: 7 August 2018

- safeguard the welfare of koalas,
- increase the social, educational and economic benefits of having koalas in South Australia, and
- reduce the broader ecological negative impacts of over-abundant koala populations.

Koalas in Tasmanian Blue Gum Plantations

Delivery of the Strategy does not fall to the State Government alone. The costs of koala management associated with timber harvest within blue gum plantations is the responsibility of the plantation owner. DEW, through Kangaroo Island staff, are working with the Kangaroo Island Plantation Timbers (KIPT) Operations Director to embed sustainable koala management into future forest harvest operations. KIPT have a business imperative to cooperatively manage koalas with DEW to maintain their social licence to harvest, and their business model to replant commercial trees after harvest. Effective public-private partnership and cross-tenure management is likely to lead to cost efficiencies in reducing the impact of koalas on both commercial operations and native vegetation.

Are there other koala management options?

Culling over-abundant koala populations has been raised as a cost effective management option by the community, the KI NRM Board and the Koala Taskforce (1996). However, culling is not permitted in the Strategy or by any state in Australia and would generate substantial local and international opposition. The intentional spread of chlamydia was rejected by the Taskforce as a management tool due to animal welfare consequences. Fertility control and translocation are the primary tools to reduce overabundant koala populations.

Previously, fertility control was achieved through surgical sterilisation, requiring animals to be anaesthetised. However, DEW are working with a range of partners to refine the hormone implant technique so that it can be applied without anaesthetic by DEW staff at the base of the tree. The relatively low cost of hormone implants and its administration at the point of capture by non-veterinary personnel means improved delivery capacity, animal welfare outcomes and field efficiencies for population management.

In October 2017, the International Koala Centre of Excellence, with support from DEW, hosted a workshop of researchers and managers to identify opportunities for innovative and effective management and research programs around over-abundant koalas. These inter-state collaborations will allow South Australia to further advance strategic and operational knowledge and management, that a state-wide koala program is well placed to implement.

What happens if we stop koala management on Kangaroo Island? Zero investment.

This option is undesirable. The KI Koala population model suggests that, in the absence of fertility control, koala numbers will more than double over 10 years. Koala density in high quality habitats would be four times higher than desirable, approaching pre-KIKMP densities, where significant defoliation and death to preferred food trees was common.

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Date: 7 August 2018

There is a strong community expectation that koalas will be managed on KI, and without active fertility management the calls for lethal management (a cull) would likely intensify. Not funding any alternatives to culling would be an untenable position. Landholders would be left without viable alternatives to manage over-abundant koalas on their land and there would be an increase in community, media and Ministerial correspondence. Additionally, specialist skills and operational capacity would be lost within DEW, at a time when other Regions such as Adelaide and Mount Lofty Ranges (AMLR) and the Eyre Peninsula (EP) will require access to skills and knowledge.

Without an active koala management project on KI there would be limited leverage for external funds from potential partners such as the forestry industry to add value to the existing project. DEW staff from KI are in ongoing discussions with forestry and tourism interests to explore options for external funding of the koala management program.

Community interest in koala management on Kangaroo Island and statewide

Kangaroo Island is a major tourist drawcard, based on the natural environment and wildlife. Businesses on KI have consistently called for investment in koala management to support a thriving tourist industry but limit damage to native vegetation. Cessation of koala management may have implications including reduced long-term tourism potential, strengthened community calls for lethal management and a loss of credibility for DEW on KI.

Broader communication will also need to be considered in the transition to state-wide koala management. A communications strategy and plan will support the transition.

Are koalas over-abundant in other areas of the state?

Koala populations are increasing in the AMLR and on the EP. Koala density in areas of AMLR are higher than ever recorded on KI, highlighting the need for statewide management.

CONSULTATION

The Strategy and significant associated community consultation and participation (through the Great Koala Counts 1 and 2) establishes broad community support and "social licence" for fertility control as the preferred management technique for over abundant koalas.

FINANCIAL IMPLICATIONS

Are there financial implications? Yes

The KIKMP has been funded previously through an annual funding arrangement ranging between $400,000 and $900,000 with the last two years being just under $400,000. A revised KIKMP, state-wide coordination and cost-effective contraception methodologies provides opportunities to lower costs of koala management on KI.

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Date: 7 August 2018

The risks associated with not funding any koala management on KI include: reputational risk to DEW, loss of necessary specialist skills, reduced potential for funding from external partners, loss of momentum in progressing sterilisation technologies, long term negative impacts on nature based tourism activities for KI and other Regions, and long term negative environmental impacts.

Brenton Grear
Chair, Department for Environment and Water Koala Steering Committee
Regional Director AMLR, Department for Environment and Water
Date:

Contact: Brenton Grear on 0428 823 622 or brenton.grear@sa.gov.au
Date: 7 August 2018

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Interim Program Plan

SA Koala Conservation and Management Program 2018-19

Version: 0.2

Date: 14 September 2018

Background

The Kangaroo Island Koala Management Project was initiated in 1996 to reduce koala numbers in response to severe over-browsing impacts on native vegetation. Over time, targeted intervention, primarily surgical sterilisation together with some initial translocations to South-East, South Australia, has resulted in a reduction in koala density and an improvement in tree condition (translocations of koalas off Kangaroo Island have been stopped due to expense and very limited habitat available to receive koalas in the South East). The most recent survey of koalas shows that koala density has increased in some areas of Kangaroo Island. While the reasons for these increases are uncertain, they are likely to involve the establishment of Tasmanian Blue Gum plantations and favourable weather conditions. Increasing koala populations have also been recorded in the AMLR region and on the Eyre Peninsula. Koala density in some areas of the AMLR have now reached densities above the highest ever recorded on Kangaroo Island, SA. This has highlighted the need to ensure a state-wide approach to koala management. Surgical sterilisation is now no longer a viable option given the high numbers of koalas that need to be sterilised and the cost associated with this methodology.

To maximise the cost effectiveness of koala management across the state, DEW has been:

- working on new technology to make koala fertility control increasingly cost effective (e.g. moving away from surgical sterilisation toward base of tree hormone implants on conscious koalas that do not require veterinary input),
- implementing state-wide coordination of koala management and policy through joint delivery of the South Australian Koala Conservation and Management Strategy (2016), and
- developing a state wide capability (technical and operational) to manage koalas across all affected regions.

This interim program plan for the SA Koala Conservation and Management Program 2018-19 comprises:

1. Specific deliverables for the program in 2018-19 identified in the funding brief (DEWNRD-00015082) which is awaiting confirmation by DEW A/Chief Executive of $275,000.
2. Program logic for the *SA koala conservation and management strategy* which guides program direction.
3. SA Koala Projects Coordinating Committee workplan for 2018-19 with funded koala management activities highlighted in yellow.

Section 1: Deliverables for 2018-19 identified in DEW funding brief ($275,000)

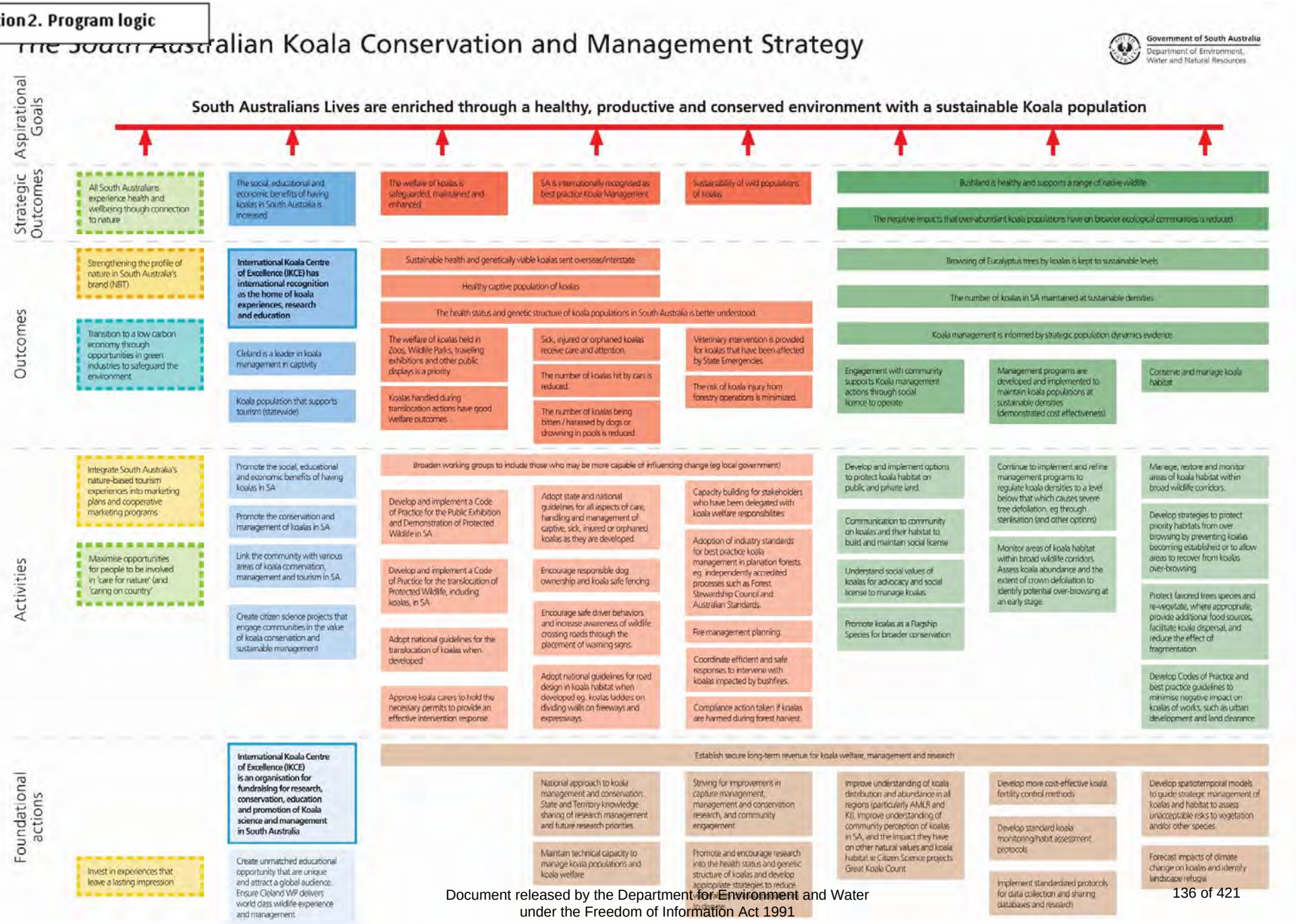
Part A: Transition Kangaroo Island koala management and cease surgical sterilisation- $105,000.

- Cessation of surgical sterilisation and relocation of all infrastructure and equipment from the KI veterinary clinic to the Kingscote depot. Project management- recruitment, supervision of field staff, budgets, Project Plan 2018-19, Closure and evaluation report
- Data storage- Managing Environmental Knowledge template and upload to Biological Database of South Australia (BDBSA)
- Data management- collate 2018-19 KI monitoring and implant data.
- Tree collars- maintain or remove.
- Monitoring of koala density at 26 core sites on Kangaroo Island.
- Communication of key messages to the KI community.

Part B: Progress base of tree hormone implant implementation across the state $170,000.

- State wide coordination and progression of base of tree hormone implant procedure and permitting.
- ~15 DEW staff approved on permit to use hormone implants to provide the required flexibility in program delivery
- ~10 DEW AMLR staff trained in ground koala catching techniques
- Base of tree hormone implants inserted in 300 koalas in the AMLR and 150 koalas in the KI region in priority areas. The focus of actions in the AMLR is a reflection of the unsustainably high koala densities observed at key sites within that region, the progression of the hormone implant technique and the need to train staff in this region. Should further funds become available throughout the year these will be prioritised to increase contraception effort in the Kangaroo Island region.
- AMLR koala catching trainees to join the catch team in the AMLR region to further enhance skills (total 30 person days).
- Monitor koala density at 10 core sites in the AMLR.
- Project management- supervision of field staff, budgets, Work, Health and Safety.
- Data management- collate 2018-19 AMLR monitoring and implant data.
- Communication of key messages to the AMLR community and engage stakeholders.
- Support investigations into new koala fertility control technologies e.g. dart delivery and implant injections.

Section 2. Program logic



The South Australian Koala Conservation and Management Strategy

Government of South Australia
Department of Environment, Water and Natural Resources

Assumption 1: Assume population will persist in face of climate change.

Assumption 2: Engaging stakeholders

Assumption 3: A MER plan supports adaptive management

Invest in experiences that leave a lasting impression

Knowledge Needs and Research Questions

State knowledge needs

- Koala habitat condition assessment for intervention (eg. Vic)
- Koala welfare genetics, reproduction, fertility, disease (Victoria and Qld)
- Health of small fragmented populations / habitat management for managing koalas as a threatened species (as per Qld research)
- Managing koalas as an overabundant species
- Koala population census analysis, translocation (Vic)

SA koala conservation knowledge needs:

- What is the status of Victorian genetic source population
- What is the role of the SA population in achieving National koala conservation objectives

Wild koala population knowledge synthesis (for KI + AMLR)

- How many are there and where are they?
- What is the evidence of impact?
- What is the management impact?
- What is stand condition?
- What is the target density for given tree condition?
- What is the sterilisation rate to achieve target densities over time?

Regional knowledge needs

- SE overabundance baseline knowledge requirement
- KI sterilisation hormone treatment and translocation
- KI population density model

DEWNR Policy colour guide

Healthy Parks, Healthy People 2016–2021

Carbon Neutral Adelaide

Activating Nature Based Tourism

Themes

Socio-economic

Koala and native vegetation conservation

Koala welfare

Foundational knowledge

Section 3: SA Koala Projects Coordinating Committee Actions 2018-19

	Task	Lead	Dependencies	Start	End
1	SE lean canvas workshop and documentation of regional priorities	MH	nil	started	31/08/2019
2	State-wide- project scope for the next 3-5 years 2019-2022	RM*	1, 3	1/08/2018	30/12/2018
3	KPCC input to the IKCE research program	JF	nil	15/07/2018	ongoing
4	Great Koala Count 2 report and communication strategy	DR & JVW	nil	started	30/07/2018
5	Hormone implants-				
	5.1 Finalise and endorse policy and procedure (and JSA and SWP)	JvW & KH	nil	started	30/08/2018
	5.2 Finish training DEW staff	JvW & RM	nil	started	30/08/2018
	5.3 Submit SA health permit	JvW	5.1 and 5.2	1/08/2018	14/08/2018
	5.4 Communicate prior to hormone implant implementation & FAQ	JvW & RM	5.3	1/08/2018	30/09/2018
	5.5 Implement hormone implant at base of tree	JvW & RM	5.2, 5.3 and 5.4	1/10/2018	30/04/2019
6	KPCC input to KIPT harvest plan	MG & RM	harvest plan	started	30/06/2019
7	Implement Eyre peninsula koala management plan incl. contracept approximately 50 koalas if identified as a priority by the community	AF	nil	1/08/2018	30/06/2019
8	Update Koala Intervention policy	MW	nil	1/09/2018	30/04/2019
9	KIKMP closure and evaluation report 2017-18	RM	nil	20/06/2018	14/08/2018
10	State-wide Koala Program Plan 2018-2019	RM	nil	14/07/2018	30/08/2018
11	Koala Stakeholder meeting/listening post- issues	RM & JvW	nil	1/08/2018	30/11/2018
12	Koala Summit (IKCE)	LB	nil	postponed	30/06/2019
13	SA Koala summit- stakeholders and art exhibition	KPCC	nil	19/07/2018	30/01/2019

Yellow highlights indicate those activities that will be funded by DEW funding (awaiting confirmation)

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KANGAROO ISLAND KOALA MANAGEMENT PROJECT ANNUAL SUMMARY 2017-18

Author: Robyn Molsher
October 2018

Summary

Project targets and achievements for 2017-18 (budget $390,000) were:

Aim	Performance target	Achievement
1. Koala population management	1.1. Sterilise 330 female koalas	1.1. 475 female koalas sterilised
2. Monitoring	2.1. Assess koala density at 25 sites	2.1. koala density assessed at 26 sites.
3. Habitat management	3.1. No target	3.1. 19 tree collars installed and existing guards maintained/removed

Koala population management

Selection of specific MUs for koala sterilisation in 2017-18 was based on four factors: (1) % koala density increase since the previous census, (2) MU sterilisation rate (3) length of time since previous management and (4) tree condition. This prioritisation process led to the selection of Eleanor River and Timber Creek MU for the focus of koala management in 2017-18. Two field teams, each with a team leader and three field assistants, searched suitable habitat in the selected MUs (primarily in high and medium quality habitats) for koalas. Only female koalas were targeted for capture as this maximises the effectiveness of population control.

A total of 501 koalas were captured in 64 days over a 16 week period (Figure 1) representing an average catching rate of 7.8 koalas/day, up from 5.6 koalas per day in the previous year. Of those koalas captured, 473 (94%) (all female) were sterilised and 25 (5%) were recaptures that had lost their ear tag and were assumed to be unsterilised or were found dead (usually on roadside) and the location entered into the database. Three koalas were euthanized by the vet due to poor condition.

Of the 473 female koalas sterilised, 66% were reproductively active (i.e. pregnant or with pouch young or back young) compared to 75% in the previous year. Some koalas were both pregnant, and carrying back young, and pouch young.

An additional 473 koalas were observed but not caught and sterilised primarily because they were male (73%) includes those male backyoung caught with their mothers. In other cases, koalas were already sterilised (i.e. ear tag visible) (23%) or the tree could not be climbed because of bees (1%). This was similar to numbers observed in previous years.

In 2017-18, koalas were captured primarily in the Eleanor River and Timber Creek and Cygnet River MU's (Figure 2). Some captures were made outside this MU when adverse weather conditions restricted catching to roadside verges. Of the 621 female koalas found in 2017-18 (observed plus captures), 132 were already sterilised representing a 21% sterilisation rate for the area searched. Last year, 16% of females observed or caught were sterilised in another area of this MU.

Monitoring- koala density

Mean koala densities have continued to increase in medium quality sites but decline in the high and low quality sites (Figure 3). In the Cygnet River and Birchmore Lagoon MU (where management has previously been intensified) koala densities in high and medium quality sites combined were lower than in the previous year and significantly lower in 2017-18 (1.00 ± 0.20 koalas/ha, 17 sites) than at the start of the program in 1996 (3.01 koalas/ha) ($P < 0.05$) (Figure 4).

As in previous years, koala densities were generally lower in low quality habitats and below the target density (<0.75 koalas /ha) compared with densities in medium and high quality habitats (Figure 3). Overall, mean koala density in 2017-18 was 1.00 ± 0.16 koalas/ha (n = 26 sites) and the maximum was 2.08 koalas/ha (Cygnet River MU) down from 4.55 koalas/ha in the previous year. Koala densities were above the target level (0.75 koalas per ha) at 50% of sites in 2017 down from 57% in 2016 (excludes Dudley Peninsula MU).

Of the 140 koalas observed during the surveys 57% were female, 40% male and 3% unknown and 34% of observed female koalas were sterilised. Dependant young were observed with 36% of unsterilised females, which is similar to that reported in the previous year (i.e. 31%).

Habitat restoration

Protective iron collars were placed on 19 manna gum trees in the Cygnet River and Birchmore lagoon MU to prevent koala overbrowsing. Existing tree collars were maintained or removed on a number of manna gum and blue gum trees.

Discussion

Catching rates were higher in 2017-18 compared to the previous year primarily because all the catchers were experienced and the area has received limited management in the past. Number sterilized exceeded the target as funds were redirected from salary savings to this component.

Koala density was generally lower in 2017-18 than in the previous year with 50% of sites above sustainable density compared to 57% in 2016-17. Ongoing monitoring will determine if this trend is long term.

Recommendations

1. Continue sterilising koalas in high priority areas as per Delean et al. koala spatial model (in preparation).
2. Maximise the sterilisation rate within given budgets.
3. Monitor koala density annually at the 26 core sites to improve confidence in the koala spatial model and to control for temporal variability.
4. Monitor tree condition every three years to assess changes and assess the effectiveness of koala management. Set up paired collared trees to identify impacts caused by koalas experimentally.
5. Repeat the 12 historic photopoints every five years to monitor changes in tree condition on a landscape scale.

Acknowledgements

We sincerely thank the numerous landholders who allowed access to their properties to monitor and manage koalas and the Kangaroo Island Veterinary Clinic for conducting the koala sterilisations and for providing animal husbandry facilities. Thanks also to Andrew Schofield, who managed the field program, and all other 2017-18 KIKMP staff (Tyson Brookhart, Michelle Le Duff, Dave Dowie, Brie Sloggett, Mike Barth, Darcy Watchorn, and Torran Welz) who worked hard to achieve the targets.

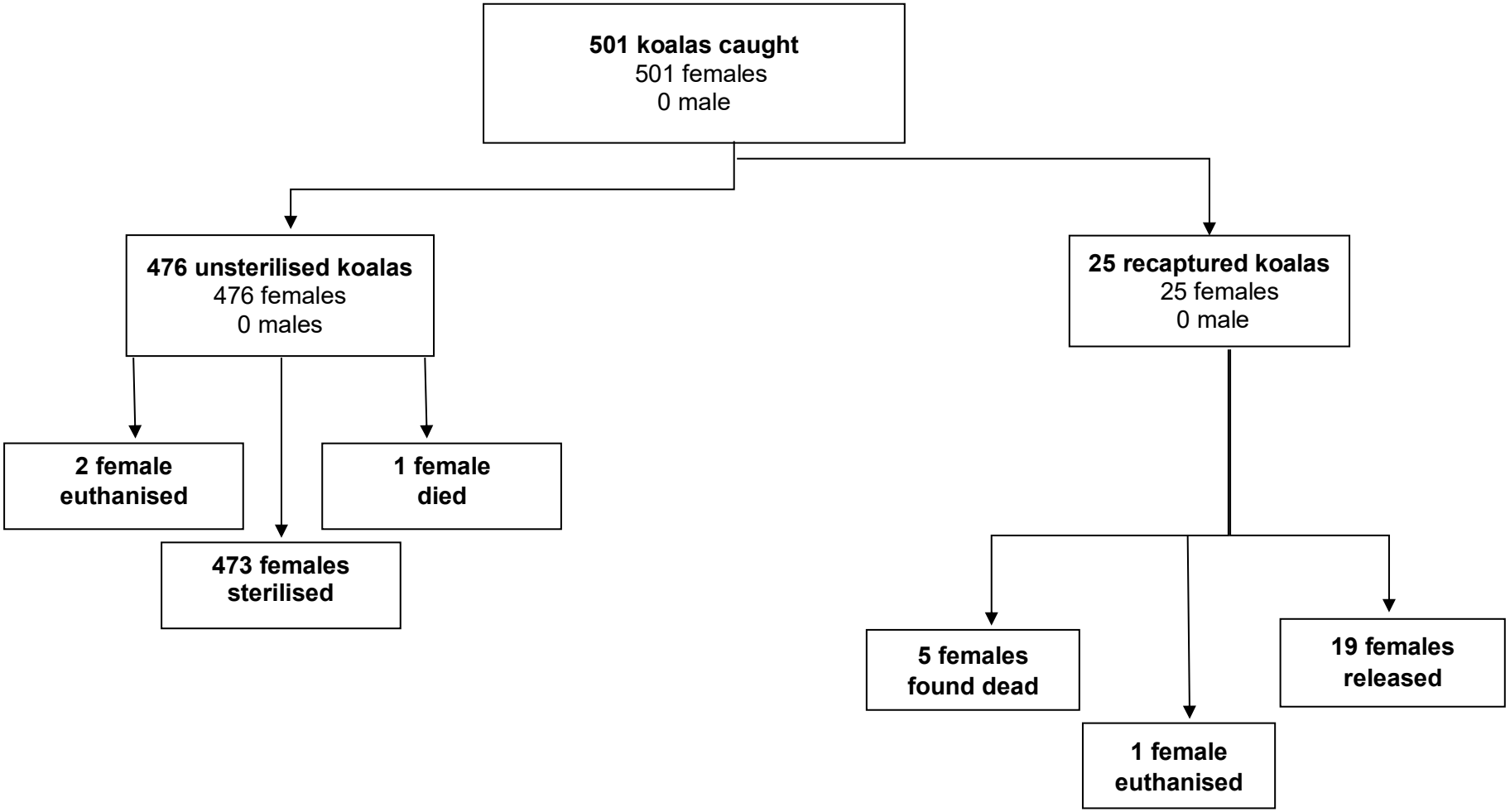

Figure 1. Numbers of koalas captured and sterilised in 2017-18

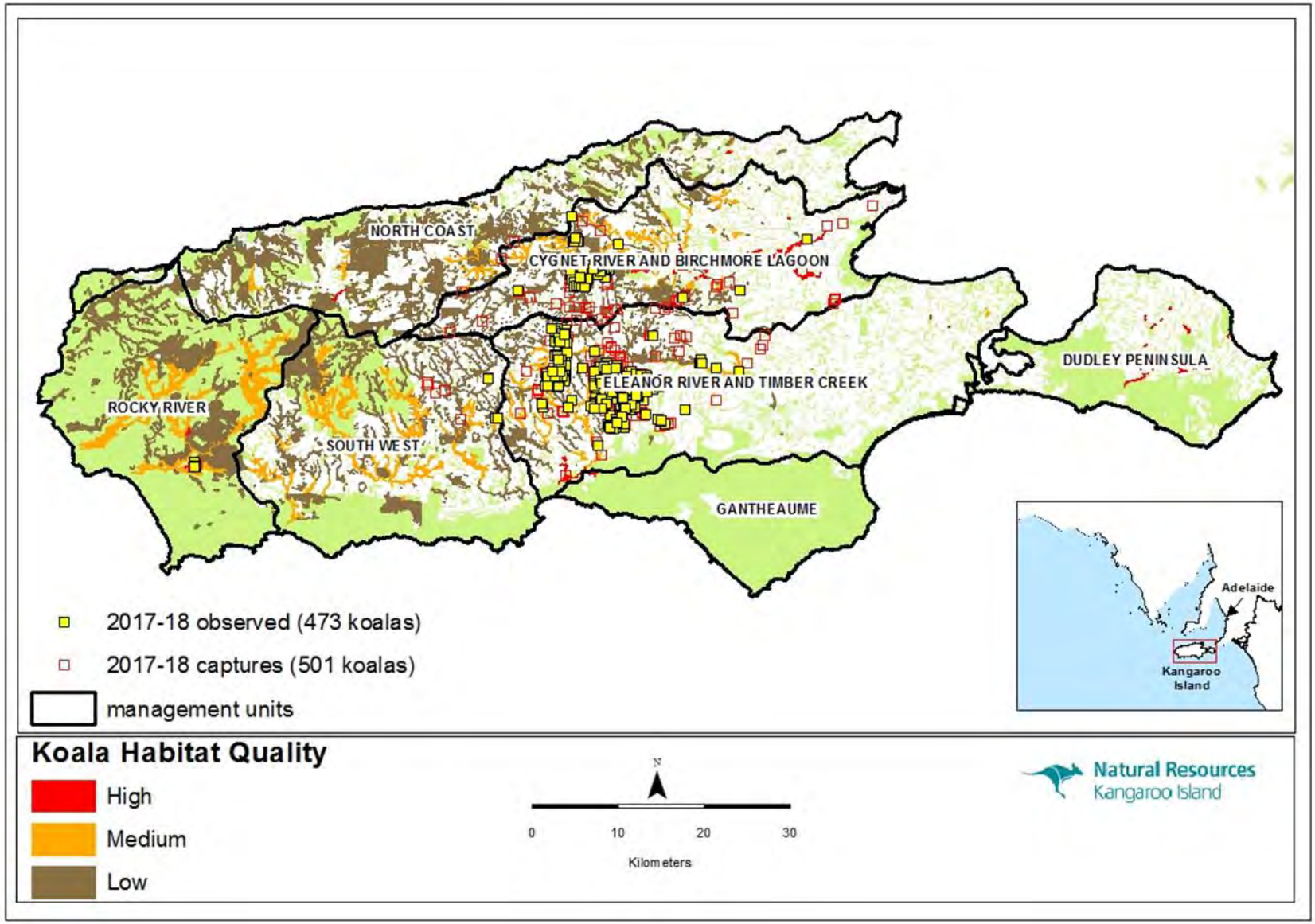

Figure 2. Koala capture locations 2017-18

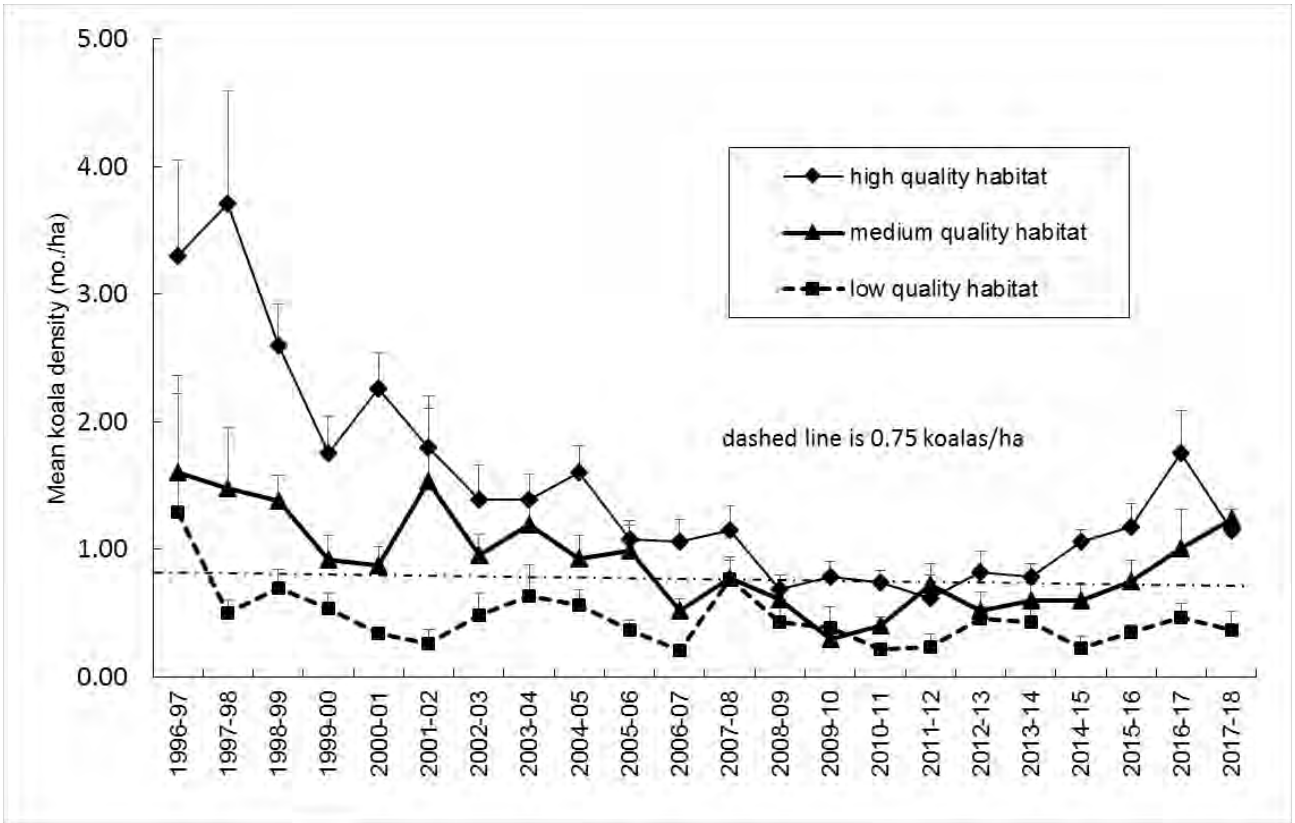

Figure 3. Mean koala density (± S.E.) per habitat type 1996–2018. Number of sites assessed varied among years (*n* = 2–56)

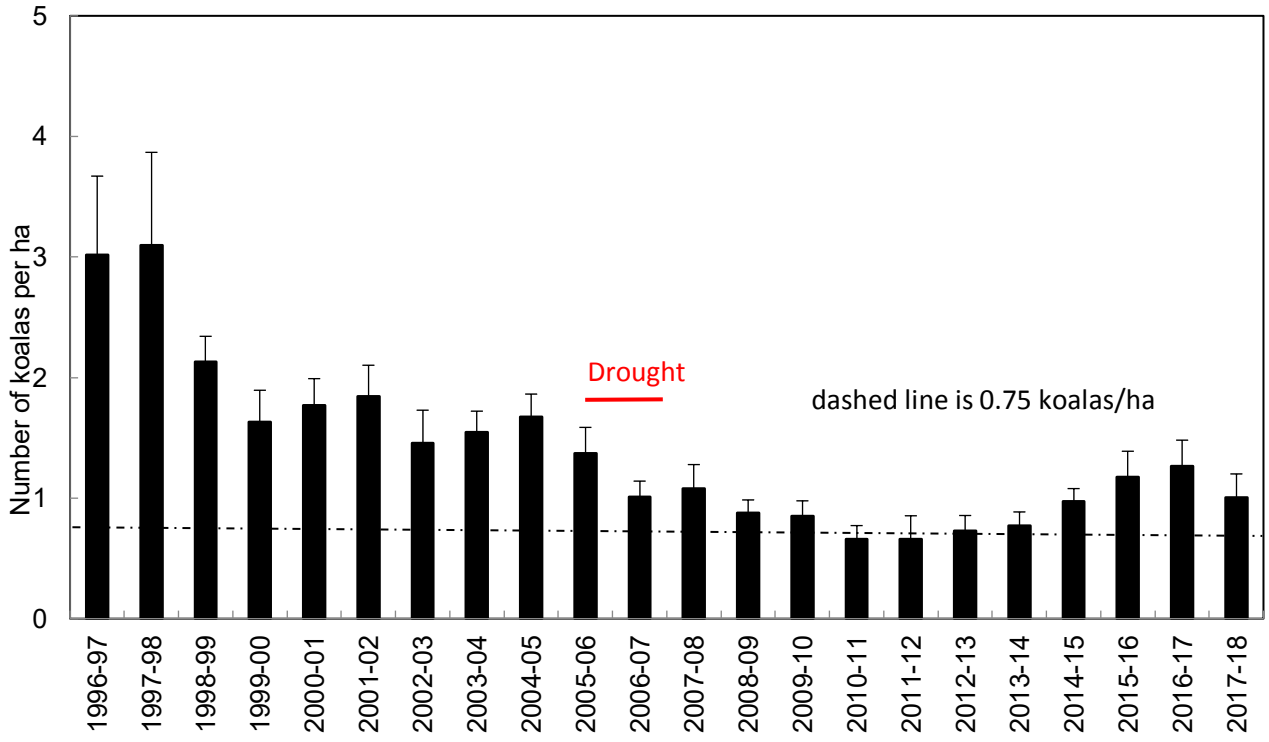

Figure 4. Mean koala density (± S.E.) in the Cygnet River and Birchmore Lagoon MU (high and medium quality sites combined, n = 15)

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From: Molsher, Robyn (DEW)
Sent: Wednesday, 10 October, 2018 2:49 PM
To: VanWeenen, Jason (DEW)
Subject: FW: Transcript with Min Speirs re. koala overabundant species policy [DLM=For-Official-Use-Only]

For Official Use Only

Yes great to see the Minister so interested in it and recognising koala overabundance on KI- appears he has read his briefings- may be a request for more info soon.
Would be good to get a hold of the KI NRM Board's submission re culling- Ill have a go to get a copy.
Cheers Robyn

From: Hillyard, Karl (DEW)
Sent: Wednesday, 10 October 2018 2:07 PM
To: Kondylas, Stella (DEW) ; Linton, Vicki (DEW) ; Ward, Matthew (DEW) ; Walter, Michele (DEW) ; Velzeboer, Renate (DEW) ; Fuhlbohm, Fiona (DEW)
Cc: Rogers, Daniel (DEW) ; Molsher, Robyn (DEW) ; VanWeenen, Jason (DEW)
Subject: FW: Transcript with Min Speirs re. koala overabundant species policy [DLM=For-Official-Use-Only]

For Official Use Only

FYI – apologies if you've already seen this.

From: Martin, Melissa (DEW)
Sent: Wednesday, 10 October, 2018 2:03 PM
To: Hillyard, Karl (DEW) <xxxx.xxxxxxxx@xx.xxx.xx>
Subject: Transcript with Min Speirs re. koala overabundant species policy

Live from Cleland Wildlife Park on 9.10.18

David Speirs, Minister for Environment (ABC RADIO ADELAIDE 9.06-9.24) South Australian koalas and combats moving to Longleat Safari Park in the UK / Possible redevelopment of Cleland Wildlife Park / Overabundant species policy

(Bevan: The reason we're broadcasting from Upper Cleland this morning is that in the next ... week or so ... a group of koalas that have the right stuff are going to go to the Longleat Safari Park in the UK ... our listeners have been on this journey right from the very beginning ... it's a huge thing for Cleland to actually give up half a dozen of their precious, precious marsupials ... about five or six koalas and a couple of wombats that will be going to ... Longleat ... so we're coming up here to mark this occasion and we are also fortunate to have the Environment Minister, David Speirs with us and he's come up with announcements of his own. Good morning David Speirs.) Good morning David. *(Bevan: ... first of all, the koalas, it's a big deal isn't it?)* It is. It's the first time koalas have ever gone to England. There's a couple of koalas at Edinburgh Zoo in Scotland which ended up there from America but the first time that Australian koalas have gone to England, it is a great cultural opportunity and an environmental opportunity to raise awareness around koalas around their conservation status and also to use the opportunity to raise money for the International Centre for Koala Excellence which is our research institute which is going to be based here at Cleland going forward. *(Bevan: Minister, there's been a lot of talk about development up here at Cleland. The former Government under Jay Weatherill had ... I think it was an Asian businessman who speculated about investing quite a lot of money up here.)* That's correct. *(Bevan: You're open to quite a large development going on up here?)* Absolutely. So the previous Government initiated an initial market process to look at the feasibility of what a redeveloped, revitalised Cleland Wildlife Park could look like. It's an absolutely strategic site, fairly close to Adelaide, incredible views over the metropolitan area and incredible wildlife experiences ... the previous Government undertook some market testing to see what that could look like as an initial masterplan was put together and the new Government has continued with that work

and we are now in a position to announce today that we're going to go out to market to really see if there are private enterprises that want to come on-board in partnership with the State Government to deliver a revamped Cleland Wildlife Park over the coming years. *(Bevan: Now what would that involve, a hotel?)* It could. *(Bevan: Casino?)* Not a casino ... we're trying to get that balance between really revitalising Cleland and maximising the geographical location and all the beauty that comes with that. We don't want to drift into sort of Gold Coast style glitzy koala theme park. *(Bevan: So the hotel won't be in the shape of a large koala?)* I would hope not ... but we're going to see what the market comes up with. We're going to go out to the market in a very structured way, provide them with this opportunity to come on-board and partner with the Government. The facilities up here are quite tired. There's lots of opportunity to reinvigorate them as well as increase tourism in our state ... modelling has shown that there is an opportunity to substantially increase the visitation here. It is close to Adelaide ... lots of opportunity to get people up here fairly easily and so the site lends itself to some very significant work. *(Bevan: So ... somebody's sat down and worked out ... there are cashed up tourists who want an experience which could be delivered here but in order to get them here, you'd have to have certain things in place and that's where this plan comes in?)* That's exactly right. The facilities here have not really been updated since the 1970s, 1980s. They're tired. They mean a lot to many South Australians but they're not as attractive as what they could be. We see the opportunity, the previous Government saw this as well to reinvigorate this site and so today we're announcing that we're going out to the private sector and saying "Would you like to partner with us, what are the opportunities here?" *(Bevan: Okay, so a hotel. Your release says $150m development ... where does $150m come from?)* So the master-planning exercise that has been undertaken has said that ... it's been a fairly thorough process and it has said that it is thought that the private sector with the right circumstances would be willing to invest up to $150m. That might involve a partnership with the State Government but we want it to be led by the private sector because we think they have the know-how and the goods to deliver this project. *(Bevan: ... where would you put the hotel?)* No specific site has been picked for that. There are some existing areas of development footprint up here. We certainly wouldn't be clearing any of the existing Cleland Wildlife Park for the hotel. We would be looking for existing footprints where there's already development where this could be done and it's about activating the wider Mount Lofty precinct. We've obviously got Mount Lofty House down the road ... the lookout and the summit ... the Botanic Gardens, the old St Michael's monastery site which is an opportunity which could be looked at in the future ... a whole range of connected sites up here. It's not Cleland Wildlife Park itself, it's the wider precinct. *(Bevan: ...we have a text: "Finally we will get a cable car" ... the cable car is mentioned in your release. Are you pinning your hopes on a cable car?)* The cable car idea's been bandied around a lot longer than I've been around. *(Bevan: I think ... we are due for a Rex Jury cable car column.)* No doubt ... the cable car is something we will pitch to the private sector and say, do they think that's feasible? I'm not pinning the whole project on the viability of a cable car coming up from Adelaide to Cleland, that's for sure. But it is something that we want to test with the market, is that a viable option? I understand it's been around for many years ... but let's take a good look at it. *(Bevan: I think it was probably first raised when you were in high school.)* Potentially before that. *(Bevan: ... and the idea was that it would stretch from Cleland or Mount Lofty down to Waterfall Gully which puts it in Vickie Chapman territory ... ?)* The Deputy Premier is the Member for that area and this is something I've talked to the Deputy Premier about ... there are a number of potential routes for that cable car and we don't want to be closed minded to any of them. *(Bevan: What about Belair?)* ... you could bring it from around the side of the Belair train station ... there's Wittunga Botanic Gardens over there ... you could link the whole precinct together that way. I don't want to get too distracted on the cable car. It is an option ... something we want to test with the market but is it financially viable? That remains to be seen. *(Bevan: ... one person says, "God no, it is a conservation park, it does not need hordes of people stuffing it up, leave nature natural.")* We often get that view when it comes to proposed development in conservation parks ... I think you've got to strike the balance. I'm very much of the view, if you don't get people into nature to enjoy nature, to learn ... they won't want to protect it. So my attitude as the Minister is we need to give people as many opportunities, particularly younger people to love nature so that they will fight for it in the future. *(Bevan: ... this development that you're asking people to focus on today, what's the timetable? ... major new facilities here, major investment from the private sector ... leverage private money to increase public facilities but it would be a hotel as well ... what's the timetable?)* ... Cabinet signed off on this project going to the next stage yesterday and the next six months or so will see us test the market properly ... we'll go out and say we've got a site here, we're keen to see private sector money, are you interested? We think there will be interested parties, we've done a fair bit of work in the lead-up to this. Stage one of this process really did a big market analysis, spoke to a lot of key tourism providers and wildlife operators and asked would you be interested ... so we do think there is interest. We'll go out on a proper market process now, that'll take about six months and we would then spend probably the rest of 2019

really working through that with the private sector to test their ideas and ensure that they're viable. *(Bevan: So it might be eighteen months before we actually get a decision ...)* That's what I'd be aiming for, an announcement, if this is a viable process going forward, I'd like to do a detailed announcement in a year to eighteen months. *(Bevan: ... Brenton from Woodville asks, "Can you please ask the Minister if he plans to remove entry fees for national parks?")* No I don't. National parks in many ways have to pay their way to an extent ... they don't make a profit by any means. We raise about $14m across the whole state through entry fees to national parks. We try to keep them as low as possible, only raise them by around about CPI ... we don't charge for our conservation parks or recreation parks. National parks are that added level of protection, often come with more facilities, if you think about Belair and the facilities ... I think a modest contribution by people who drive into the national parks and it usually is those that drive, people who live in the immediate area can usually walk in for free ... I think the balance is about right with the modest entry fees. *(Bevan: The koalas – there's an irony here ... this is the koala equivalent of a good life here at Cleland. If you had to be a koala and you'd pick a place, you'd pick Cleland because you're absolutely pampered ... keepers around the clock making sure you're absolutely happy ... but over on KI they're in pest proportions ...)* I think the official term is 'over abundant' ... there's around 50,000 koalas jammed into a fairly small space in Kangaroo Island which is ... not sustainable in the longer term ... *(Bevan: So what's going to happen?)* I think we have to have a really serious discussion about how they're dealt with in the future. I've spoken to people like the Conservation Council about this over the last year or so ... the Conservation Council spoke to your show ... last August and said we do need to look at major control of koalas in Kangaroo Island if they're eating themselves out of house and home and end up with no food. It's a major welfare issue for koalas over on Kangaroo Island. The unique situation there is they've gone in to forests which were never on Kangaroo Island, the blue gum plantations are now creating a whole range of problems over there for themselves more than anyone else ... we can't have koalas dropping out of trees due to malnourishment. We're going to have to bite the bullet at some point- *(Bevan: Does that mean using a bullet?)* Well we're going to have to look at some sort of control measures around the koalas in Kangaroo Island. *(Bevan: ... we raised this issue with you a year ago ... you were the potential Environment Minister, that was your answer. And then when you got the gig soon after March and we raised this issue with you and that was your answer. It's now ... seven, eight months on, still your answer ... it's a very difficult issue ... and quickly we're going to get onto how many kangaroos we've got ... how many seals ...)* Absolutely and we discuss this often, this idea that when humankind and the animal kingdom meet, sometimes things get out of balance and that's a tragedy in some respects ... my job is to try and find ways to humanely control the populations of animals where they're going to have a major impact on themselves, on the environment as they often do ... or on economic outcomes as well. All those things have to be taken into consideration. There has never been an overabundant species policy in South Australia. I do think this was something the previous Government squibbed because it is a difficult issue but we're developing one at the moment. We need to get in place the triggers, environmental, social and economic that could result in government making a decision to undertake a controlled population strategy for particular species, whether that be kangaroos in drought affected parts of the state which are having a big impact on agricultural landscapes and native vegetation, whether that be corellas ... we've talked about seals in the Coorong ... there are multiple problems here, it's the fault of humankind but we do have to come up with solutions. *(Bevan: And when are you going to do that?)* ... I'm working on that all the time ... in talks with councils who need to help with the ... corellas ... we're in talks regularly about the koalas on Kangaroo Island ... getting the scientific community involved. It is hard. *(Bevan: Do you have a plan? You know what you're going to do with the koalas ... with the corellas and the seals and the ... kangaroos ... goats ... well the goats are the easiest one aren't they?)* Well the goats are feral ... *(Bevan: You can go out and shoot the goats.)* ... we've got native species which we class as overabundant in certain circumstances and then we've got feral animals ... you can do anything with feral animals so long as it's humane, so cats, foxes, rabbits, goats. We need to be doing all we can to get those out ... because they're causing big problems. It's more difficult with the native animals ... *(Bevan: But do you know what you're going to do with these overabundant native species, but the best way to do it is in a low key way, you're not drawing attention to it. You're not going to tell me, you're not going to tell our listeners, there might be something in the Government register somewhere, but you're not going to make a big deal about it?)* Well ... I don't think we should be making a big deal but I'm not going to be secret about it either or tricky about it. We're working through each of these animals trying to get a strategy in place and I don't have all the answers today but as I said ... as soon as I do I'm happy to come on your show and talk about it and explain to the South Australian public why some of these native species and particular places need to be dealt with. *(Bevan: ... there are a number of texts ... people worried about development up here at Cleland ... it does have a sort of early 80s feel about it, I'll grant you that but clearly a number of people ... are worried that you're going to turn it into Disneyland.)* Well I can assure you

that while I'm the Minister, we won't have a koala theme park here. It's not going to be like that. We want sensitive, environmentally sustainable design for anything, it's going to touch the earth lightly, it's going to be gentle but we do think there is a real opportunity to upgrade this site. It is tired ... we've got fairly accessible walkways around here for people in wheelchairs but when they get up to the enclosures in their wheelchairs, the walls around the enclosures are too high so people can't see over them. So they can get to the enclosure but they can't see over the walls to see the ... bandicoots behind it. *(Bevan: So it's just an insult to disabled people?)* Absolutely and we've got to get better at making the environment more accessible and sites like this are easier to do that to. So those are the sorts of benefits we can have from having a major private sector led upgrade in partnership with the State Government and I think there's so much opportunity here because of the proximity to Adelaide, because of its unique views ... the history and the love that people have for this site. There is an incredible opportunity and I will reassure your listeners this is not going to be an over-the-top glitzy koala theme park. *(Bevan: David Speirs, thanks for coming in.)* Thank you David. *(Bevan: Well I'm saying thank you for coming ... it's your park isn't it, well it belongs to the people but you're the Minister. Minister, thank you for coming to our outside broadcast.)* Thank you, David.

Melissa Martin
Senior Media Advisor

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Government of South Australia
Department for Environment and Water

Document No. 18EW0000906

TO MINISTER FOR ENVIRONMENT AND WATER

FOR APPROVAL AND NOTING

RE: CORRESPONDENCE FROM 6 - Documents affecting personal affairs REGARDING KOALA POPULATION SECURITY AND STERILISATION

THROUGH: A/CHIEF EXECUTIVE 22.6.18
A/GROUP EXECUTIVE DIRECTOR, PARKS AND REGIONS 18/6/18
GROUP EXCEUTIVE DIRECTOR, ECONOMIC AND SUSTAINABLE DEVELOPMENT 15.06.18

Priority: Routine
Critical Date: N/A

RECOMMENDATIONS

That you:

1. Note this briefing about South Australian koala population security and koala sterilisation programs.

~~NOTED~~

2. Approve the attached draft response to 6 - Documents affecting personal affairs regarding South Australian koala population security and sterilisation programs.

~~APPROVED~~ / NOT APPROVED

Comments	
	DAVID SPEIRS MP Minister for Environment and Water 18 / 10 / 2018

PRIORITY

Routine.

BACKGROUND

You are in receipt of correspondence dated 22 May 2018 from 6 - Documents affecting personal affairs regarding South Australian koala population security and sterilisation programs.

6 - Documents affecting personal affairs raises concerns about the security of koalas in South Australia, the methods used to estimate koala population size in SA, and Department for Environment and Water (DEW) programs to sterilise koalas. 6 - Documents affecting personal affairs also suggests that declining condition of eucalypts ascribed to koala over-browsing may instead be caused by climate change and pollution.

6 - Documents affecting personal affairs also requests the opportunity for a group from Fauna Rescue SA to meet with you to discuss their concerns.

DISCUSSION

South Australian koala abundance and threats

Koalas (*Phascolarctos cinereus*) are a protected species under the South Australian *National Parks and Wildlife 1972 Act*, but are not scheduled as an endangered, threatened or rare species. Similarly, the koalas in South Australia (and Victoria) are not considered as threatened by the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This contrasts with the listing of koala populations in Queensland, New South Wales and the Australian Capital Territory as threatened by the EPBC Act in 2012.

Koalas occur in five general locations in South Australia, with koalas found in significant numbers on Kangaroo Island (KI) and in the Adelaide and Mount Lofty Ranges (AMLR) region. Populations on KI and in the AMLR are considered strong (c. 50,000 and 110,000 respectively) and increasing. These assessments are based on surveys undertaken by DEW staff, university researchers and volunteers. The census methods used to estimate these abundances have been refined by university staff, highly competent in ensuring the methods are reliable and defendable.

One of the biggest threats to koala populations in the KI and AMLR regions comes from the degradation of koala habitat (over-browsing of eucalyptus species) caused by an over-abundance of koalas themselves (in core areas). While there are a variety of threats to eucalypts, strong evidence exists that koalas can denude favoured trees of leaves resulting in a loss of resources and ultimately starvation. DEW is seeking to avoid catastrophic population and habitat collapse that has been observed in Victoria by ensuring koala numbers remain sustainable. Habitat loss through weed invasion, disease, being hit by cars, and bitten by dogs are the other threats to koalas.

Contact: Karl Hillyard, Senior Ecologist Abundant Species & Sustainable Use on 0417 111 361 or
Date: 25 May 2018

Koala fertility control to address overabundance

On KI, the koala management program has been operating for over 20 years. The program is based on the management of an environmentally sustainable koala population (density) through the surgical sterilisation and translocation of koalas from critically damaged natural areas and through habitat restoration (i.e. tree planting and guarding). Tree health has significantly improved due to reductions in koala densities in critical areas. Importantly, the work to date has not seen the loss of koalas from any areas on the island. In fact, the koala population is considered to be increasing and expanding its range relative to when the program began, highlighting that it is possible to manage high density areas (to reduce impacts on eucalypts) and conserve koalas simultaneously.

To maximise the cost effectiveness of koala management across the State, DEW has been:

- working on new technology to make koala fertility control increasingly cost effective,
- statewide coordination of koala management and policy through joint delivery of the South Australian Koala Conservation and Management Strategy,
- development of a state wide capability (technical and operational) to manage koalas across all affected regions.

DEW is currently considering recasting the koala management program to have a state-wide focus, with the key outcome to address overabundance of koalas. The proposed program reassesses how abundant koalas are managed, with fertility control to be rolled out in problem areas.

No fertility control program currently occurs in the AMLR region. However, a field evaluation of hormone implants is currently underway in the AMLR, utilising less-invasive methods of koala contraception than the current surgical method used on KI. The method being evaluated in the AMLR involves injection of a long-lasting hormonal implant at the point of capture, a method intended to reduce stress to koalas and costs to DEW, while maintaining necessary animal welfare and population management outcomes. It is intended that this method will be applied in future fertility control programs across SA. While evaluation of the hormone implant technique remains ongoing, Fauna Rescue SA have recently reported koalas, involved in the evaluation, requiring rescue and being found to be in poor condition necessitating their euthanasia. To DEW's knowledge, of the 66 koalas implanted in April 2018, two have subsequently died. The University of Adelaide have advised that, for one koala, the most likely cause of death was kidney disease (oxalate nephrosis) which is a known cause of mortality in AMLR koalas. The second koala appears to have been euthanased due to a dental problem (despite presenting with a range of ailments).

6 - Documents affecting personal affairs also mentions culling of koalas in her email. Culling is not permitted as a management option in the *National Koala Conservation and Management Strategy 2009–2014* and the *SA Koala Conservation and Management Strategy 2016*.

Considerations regarding Fauna Rescue and the requested meeting

There are internal issues within Fauna Rescue SA, particularly relating to their role with

Contact: Karl Hillyard, Senior Ecologist Abundant Species & Sustainable Use on 0417 111 361 or karl.hillyard@sa.gov.au
Date: 25 May 2018

koalas. DEW will continue to work with Fauna Rescue SA to increase understanding and address these concerns. DEW does not recommend you meet with Fauna Rescue at this time.

DEW have met with 6 - Documents affecting personal affairs as part of a dedicated attempt to increase Fauna Rescue's awareness of koala conservation and management issues across SA. To date, this has involved:

1) an AMLR field visit to help Fauna Rescue differentiate koala impacts from other tree health issues,
2) a workshop discussion on koala conservation and management issues on KI and in the AMLR, and
3) a field visit to KI to look at how the KI koala management program operations have been undertaken.

It has become apparent that regular discussions with Fauna Rescue (and a refined communications strategy) are likely to prove beneficial in maintaining a shared understanding of key koala conservation and management priorities across SA.

The assertion by 6 - Documents affecting personal affairs that much of the tree health problems in the Mt Lofty Ranges are likely to be caused by other issues is misguided. Trees guarded to exclude koalas have recovered as expected, indicating that koala over browsing is the major issue. The ability to be clear on what are koala impacts and what are other impacts on tree health appear to have been taken on board by some members of Fauna Rescue but not others.

International Koala Centre of Excellence

The International Koala Centre of Excellence (IKCE) will provide an opportunity to strengthen science research initiatives, including into koala disease. Three research project streams have currently been progressed by IKCE, focusing on koala health and wellbeing, koalas in the landscape and people and koalas. Research into the renal disease, oxalate nephrosis has been identified as a high priority by the IKCE Advisory Board. Dr Natasha Speight, University of Adelaide is currently developing an ARC linkage application for a significant research project into oxalate nephrosis supported by IKCE. The project abstract is attached (Attachment 2).

CONSULTATION

Dr Robyn Molsher, Wildlife Program Manager Natural Resources KI and Mr Jason VanWeenen, Species Ecologist Natural Resources AMLR have provided information on the population status of koalas in South Australia, the current sterilisation program on KI, and the hormone implant evaluation in the AMLR. 6 - Documents affecting personal affairs, Out of Scope

Professor Chris Daniels, Chair of the International Koala Centre of Excellence Advisory Board has been consulted in preparation of this response.

Contact: Karl Hillyard, Senior Ecologist Abundant Species & Sustainable Use on 0417 111 361 or karl.hillyard@sa.gov.au
Date: 25 May 2018

FINANCIAL IMPLICATIONS

Are there financial implications? No

There are no specific financial implications from this correspondence, although 6 - Documents affecting personal affairs calls for funding to be allocated to koala research.

It is expected that an International Koala Centre of Excellence, part of the potential redevelopment of the Cleland Wildlife Park, will provide an opportunity to strengthen science research initiatives.

ATTACHMENTS

Attachment 1 – Draft letter of response to 6 - Documents affecting personal affairs.
Attachment 2 – University of Adelaide Oxalate Nephrosis Abstract.

Dr Matthew Ward
Director, Conservation, NRM and Protected Area Policy
Department for Environment and Water
18EW0000906

Date:

Contact: Karl Hillyard, Senior Ecologist Abundant Species & Sustainable Use on 0417 111 361 or karl.hillyard@sa.gov.au
Date: 25 May 2018

18EW0000906

Government of South Australia

Office of the Minister for Environment and Water

81-95 Waymouth Street
Adelaide SA 5000

GPO Box 1047
Adelaide SA 5001

Tel 08 8463 5680
minister.speirs@sa.gov.au

6 - Documents affecting personal affairs

Dear 6 - Documents affecting personal affairs

Thank you for your email dated 22 May 2018 regarding koalas in South Australia.

6 - Documents affecting personal affairs I appreciate your concerns about the impact to koalas from habitat loss, motor vehicles, dog attacks and disease.

I understand that koalas in Queensland, New South Wales and the Australian Capital Territory are currently recognised as threatened. However, based on rigorous scientific methods of assessment, koala populations in South Australia are considered secure and are indeed increasing in the Adelaide Hills and Mount Lofty Ranges, and on Kangaroo Island.

I am advised that where high koala densities exist, over-browsing by koalas is well recognised as being detrimental to eucalypt trees and ultimately koalas themselves. Over-browsing of eucalypts by koalas has led to the loss of food resources and catastrophic collapse of koala populations from starvation on a number of occasions in areas of Victoria. To reduce the likelihood of this occurring in South Australia, the Department for Environment and Water (DEW) has undertaken a koala management program on Kangaroo Island which includes surgical sterilisation. DEW is currently evaluating hormone implant fertility control methods which require less koala handling and improved animal welfare outcomes.

The Kangaroo Island Koala Management Program has been successful in reducing the density of koalas in areas impacted by their over-browsing, with improvements to eucalypt condition following the reduction in koala density. Importantly, the koala population on Kangaroo Island has not been lost following these management activities, showing that the impacts of koalas can be successfully managed without loss of the population.

The International Koala Centre of Excellence (IKCE) will provide an opportunity to strengthen science research initiatives, including into koala disease. The IKCE, an independent, national research organisation, will raise research funds to support Australian scientists to conserve koalas and their habitat. I am informed by Professor Chris Daniels, Chair of the IKCE Board that research into the renal disease, oxalate nephrosis has been identified as a high priority by the Board. The University of Adelaide is currently developing a significant research project into oxalate nephrosis which will be supported by IKCE.

I appreciate the time you have taken to write to me 6 - Documents affecting personal affairs . Unfortunately, due to many commitments already scheduled over the coming months, I am unable to meet with you at this time. If you require further information on this matter, please feel free to contact Dr Karl Hillyard, Senior Ecologist Abundant Species & Sustainable Use within the Department for Environment and Water on karl.hillyard@sa.gov.au or 8436 6587.

Yours sincerely

DAVID SPEIRS MP
Minister for Environment and Water

Date: 18/10/2018

Apologies for the delay on this, and thank you for your commitment to caring for our natural world

DAVID

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AMLR captures

Date	No. koalas caught	No. implanted	Location	Ear tag colour	
2016	74	0		orange	Jess Fabijan- health checks- no implants
Dec-17	10	10		Green	First implants
Apr-18	91	66		blue and orange	Jess Fabijan- health checks and implants in females (blue tag) only
Nov-18	43	42		blue	hormone implant evaluation
May-19		59		blue	hormoneimplant implementation
TOTAL	**218**	**177**			

Column1 Date	Column2 Tag Colour	Column3 Eartag Number	Column4 Recapture	Column5 Re-tagged?	Column6 Previous Tag Colour/#	Column7 Location	Column8 On Park?	Column9 Start Time	Column10 End Time	Column11 Zone	Column12 Catch Easting	Column13 Catch Northing	*Column14 Tree Species*	Column15 Microchip#	Column16 Sex	Column17 Weight (kg)	Column18 Body Condition	Column19 Hormone Implant Administered	Column20 Back Young? (BY)	Column21 BY Sex	Column22 Female BY Weight	Column23 Back Young Tag#	Column24 Mother Tag#	Column25 Pouch Young? (PY)	Column26 Outcome	Column27 Release Date	Column28 Release Location	Column29 Zone	Column30 Release Easting	Column31 Release Northing	Column32 Release Time	Column33 Health/Catch/Release Comments	Column34	Column35 Date observed subsequently	Column36 Location	Column37 easting	Column38 northing	Column39 long	Column40 lat	Column41 Outcome	Column42 Comments	Column43	Column44
19/12/2017	green	976		no	n/a	Horsnell Gully (CP)	yes			54	289775	6131951	*E leucoxylon*	991001001117356	F	no		yes									Released at capture site																
19/12/2017	green	983		no	n/a	Horsnell Gully (CP)	yes			54	289918	6131731	*E leucoxylon*	991001001117452	F	no		yes									Released at capture site																
19/12/2017	green	981		yes	1117354; Tag colour =	Horsnell Gully (CP)	yes			54	289822	6131878		991001001117354	f	no		yes									Released at capture site																
19/12/2017	green	921		no	n/a	Horsnell Gully (CP)	yes			54	289785	6132079	*E leucoxylon*	991001001117348	F	no		yes									Released at capture site																
19/12/2017	green	982		no	n/a	Horsnell Gully (CP)??	yes			54	267324	6065582	*E leucoxylon*	991001001117352	f	no		yes									Released at capture site																
19/12/2017	green	984		no	n/a	Horsnell Gully (CP)	yes			54	289870	6131592	*E leucoxylon*	991001001117450	f	no		yes									Released at capture site																
19/12/2017	green	985		no	n/a	Horsnell Gully (CP)	yes			54	289574	6132207		991001001117449	f	no		yes									Released at capture site																
19/12/2017	green	980		no	n/a	Horsnell Gully (CP)	yes			54	289815	6131762		991001001117353	f	no		yes									Released at capture site																
19/12/2017	green	978		no	n/a	Horsnell Gully (CP)	yes			54	289830	6131997	*E leucoxylon*	991001001117349	f	no		yes									Released at capture site																
19/12/2017	green	979		no	n/a	Horsnell Gully (CP)	yes			54	289773	6132041	*E leucoxylon*	991001001117351	F	no		yes									Released at capture site																
9/04/2018	Blue	1		no	n/a	Cleland	yes			54	289766	6128634	*E.leucoxylon*	991001001624575	F	8.22		yes						no	release																		
9/04/2018	Blue	2		no	n/a	Cleland	yes			54	289766	6128638	*E.leucoxylon*	991001001624577	F	7.20		yes						no	release																		
9/04/2018	Blue	3		no	n/a	Cleland	yes			54	289765	6128640	*E.leucoxylon*	991001001624576	F	6.79		yes						no	release																		
9/04/2018	Blue	4		no	n/a	Cleland	yes			54	289766	6128640	*E.leucoxylon*	991001001624572	F	9.20		yes						no	release																		
9/04/2018	Blue	5		no	n/a	Cleland	yes			54	289767	6128638	*E.leucoxylon*	991001001624574	F	7.69		yes						no	release																		
9/04/2018	Blue	6		no	n/a	Cleland	yes			54	289771	6128636	*E.leucoxylon*	991001001624578	F	7.50		yes						yes	release																		
9/04/2018	Blue	7		no	n/a	Cleland	yes			54	289416	6128822	*E. fasciculosa*	991001001624571	F	8.55		yes						no	release																		
9/04/2018	Orange	76		no	n/a	Cleland	yes			54	289407	6128827	*E.leucoxylon*	n/a	M	9.10		no						n/a	release																		
9/04/2018	Blue	8		yes	orange 12	Cleland	yes			54	289416	6128822	*E. fasciculosa*	991001001624573	F	8.05		yes						no	release									25/04/2018	Long Ridge track Cleland			-34.9621079	138.696272	euthanased	reported by 6 - Documents affecting personal affairs animal in poor condition 7.5 kg and mucky eyes. No food in gut. Body kept 6 - Documents affecting personal affairs		
9/04/2018	Blue	9		no	n/a	Cleland	yes			54	289405	6128837	*E. obliqua*	991001001624580	F	7.79		yes						no	release																		
9/04/2018	Blue	10		no	n/a	Cleland	yes			54	288743	6129283	*E.leucoxylon*	991001001624579	F	8.34		yes						no	release																		
9/04/2018	n/a	n/a		no	n/a	Cleland	yes			54	288740	6129286	*E.leucoxylon*	n/a	F	9.02		no						no	death																		
9/04/2018	Blue	11		no	n/a	Cleland	yes			54	289210	6129066	*E.leucoxylon*	991001001623601	F	8.20		yes						yes	release																		
9/04/2018	Blue	12		no	n/a	Cleland	yes			54	289211	6129069	*E.leucoxylon*	991001001623609	F	3.60		yes						no	release																		
9/04/2018	Blue	13		no	n/a	Cleland	yes			54	289771	6128634	*E.leucoxylon*	991001001623610	F	5.60		yes						no	overnight care and release																		
9/04/2018	Blue	14		no	n/a	Cleland	yes			54	289771	6128642	*E.leucoxylon*	991001001523607	F	7.26		yes						no	release																		
10/04/2018	Blue	15		no	n/a	Cleland	yes			54	289781	6129379	*E.leucoxylon*	991001001624176	F	8.65		yes						yes	release																		
10/04/2018	Orange	78		no	n/a	Cleland	yes			54	298778	6129379	*E.leucoxylon*	n/a	M	2.90		no						n/a	release																		
10/04/2018	Orange	77		no	n/a	Cleland	yes			54	289783	6129380	*E.leucoxylon*	n/a	M	10.96		no						n/a	release																		
10/04/2018	Blue	16		no	n/a	Cleland	yes			54	289778	6129379	*E. fasciculosa*	991001001624177	F	7.76		yes						no	release																		
10/04/2018	Orange	79		no	n/a	Cleland	yes			54	289780	6129379	*E.leucoxylon*	n/a	M	10.85		no						n/a	release																		
10/04/2018	Blue	17		no	n/a	Cleland	yes			54	289774	6129379	*E.leucoxylon*	991001001624179	F	10.04		yes						yes	release																		
10/04/2018	Blue	18		no	n/a	Cleland	yes			54	289753	6129402	*E.viminalis*	991001001624180	F	7.91		yes						no	release																		
10/04/2018	Blue	19		no	n/a	Cleland	yes			54	289752	6129403	*E.viminalis*	991001001624178	F	8.54		yes						no	release																		
10/04/2018	Blue	20		no	n/a	Cleland	yes			54	289752	6129400	*E.viminalis*	991001001624175	F	8.47		yes						yes	release																		
10/04/2018	Blue	22		no	n/a	Cleland	yes			54	289953	6129431	*E.viminalis*	991001001624173	F	7.80		yes						yes	release																		
10/04/2018	Blue	21		no	n/a	Cleland	yes			54	289764	6129396	*E.viminalis*	991001001624171	F	9.00		yes						no	release									10/04/2018	Cleland Gunbower Track			-34.9552315	138.6961142	euthanased	Found in poor condition and taken to AKAWH 10/4 weighing 9kg then on 30/4 euthanased at 6.1 kg		
11/04/2018	Blue	23		no	n/a	Cleland	yes			54	289473	6129327	*E.viminalis*	991001001623604	F	9.92		yes						yes	release																		
11/04/2018	Blue	24		no	n/a	Cleland	yes			54	289471	6129636	*E.leucoxylon*	991001001624220	F	8.03		yes						no	release																		
11/04/2018	Blue	25		no	n/a	Cleland	yes			54	289472	6129639	*E.viminalis*	991001001624172	F	8.63		yes						no	release																		
11/04/2018	Orange	81		no	n/a	Cleland	yes			54	289765	6129596	*E.viminalis*	n/a	M	6.80		no						n/a	release																		
11/04/2018	Blue	26		no	n/a	Cleland	yes			54	289763	6129595	*E.viminalis*	991001001624174	F	7.83		yes						no	release																		
11/04/2018	Orange	82		no	n/a	Cleland	yes			54	289428	6129708	*E. obliqua*	n/a	M	9.42		no						n/a	release																		
11/04/2018	Blue	27		no	n/a	Cleland	yes			54	289360	6129887	*E.viminalis*	991001001623606	F	8.47		yes						no	release																		
11/04/2018	Blue	28		no	n/a	Cleland	yes			54	289354	6129904	*E.viminalis*	991001001623602	F	7.10		yes						no	release																		
11/04/2018	Blue	29		no	n/a	Cleland	yes			54	289079	6129908	*E.viminalis*	991001001623605	F	9.40		yes						yes	release																		
11/04/2018	Orange	84		no	n/a	Cleland	yes			54	289359	6129887	*E.viminalis*	n/a	M	11.15		no						n/a	release																		
11/04/2018	Orange	83		no	n/a	Cleland	yes			54	289359	6129880	*E.viminalis*	n/a	M	3.76		no						n/a	release																		
11/04/2018	Orange	85		no	n/a	Cleland	yes			54	289359	6129887	*E.viminalis*	n/a	M	8.70		no						n/a	release																		
12/04/2018	Orange	86		no	n/a	Belair	yes			54	286335	6122566	*E.viminalis*	n/a	M	8.56		no						n/a	release																		
12/04/2018	Blue	30		no	n/a	Belair	yes			54	286333	6122564	*E.leucoxylon*	991001001623603	F	8.47		yes						no	release																		
12/04/2018	Blue	31		no	n/a	Belair	yes			54	286247	6122509	*E. camaldulensis*	991001001623935	F	8.50		yes						no	release																		
12/04/2018	Blue	32		no	n/a	Belair	yes			54	286298	6122571	*E.viminalis*	991001001623932	F	8.20		yes						no	release																		
12/04/2018	Orange	91		no	n/a	Belair	yes			54	286489	6122712	*E.viminalis*	n/a	F	1.72		no						n/a	release																		
12/04/2018	Blue	33		no	n/a	Belair	yes			54	286489	6122712	*E.viminalis*	991001001623938	F	8.31		yes						no	release																		
12/04/2018	Blue	34		no	n/a	Belair	yes			54	286491	6122712	*E.viminalis*	991001001623933	F	8.30		yes						no	release																		
12/04/2018	Orange	92		no	n/a	Belair	yes			54	286491	6122712	*E.viminalis*	n/a	M	9.65		no						n/a	release																		
12/04/2018	Blue	35		no	n/a	Belair	yes			54	286512	6122717	*E.viminalis*	991001001623931	F	7.29		yes						no	release																		
12/04/2018	Blue	36		no	n/a	Belair	yes			54	286492	6122724	*E.viminalis*	991001001623934	F	6.16		yes						yes	release																		
12/04/2018	Blue	37		no	n/a	Belair	yes			54	286488	6122729	*E.viminalis*	991001001623608	F	8.05		yes						no	release																		
12/04/2018	Blue	38		no	n/a	Belair	yes			54	286388	6122731	*E.leucoxylon*	991001001623937	F	8.38		yes						yes	release																		
12/04/2018	Orange	87		no	n/a	Belair	yes			54	286565	6122904	*E.viminalis*	n/a	M	10.90		no						n/a	release																		
12/04/2018	Blue	39		no	n/a	Belair	yes			54	287898	6123141	*E.viminalis*	991001001623940	F	8.26		yes						no	release																		
12/04/2018	Orange	89		no	n/a	Belair	yes			54	287979	6123117	*E.viminalis*	n/a	M	8.96		no						n/a	release																		
12/04/2018	Orange	88		no	n/a	Belair	yes			54	287616	6123045	*E.viminalis*	n/a	M	9.69		no						n/a	release																		
12/04/2018	Orange	90		no	n/a	Belair	yes			54	287014	6122351	*E.viminalis*	n/a	M	10.70		no						n/a	release																		
12/04/2018	Blue	40		no	n/a	Belair	yes			54	287653	6122015	*E.viminalis*	991001001623939	F	8.66		yes						no	release																		
12/04/2018	Blue	41		no	n/a	Belair	yes			54	287653	6122015	*E.viminalis*	991001001117355	F	5.80		yes						no	release																		
12/04/2018	Blue	42		no	n/a	Belair	yes			54	287654	6122009	*E.viminalis*	991001001623827	F	9.04		yes						no	release																		
12/04/2018	Blue	43		no	n/a	Belair	yes			54	287539	6121983	*E.leucoxylon*	991001001623829	F	8.77		yes						no	release																		
12/04/2018	Blue	44		no	n/a	Belair	yes			54	287543	6121990	*E.leucoxylon*	991001001117456	F	8.14		yes						yes	release																		
12/04/2018	Orange	93		no	n/a	Belair	yes			54	287534	6121983	*E.leucoxylon*	n/a	M	2.50		no						n/a	release																		
12/04/2018	Blue	45		no	n/a	Belair	yes			54	287465	6121977	*E. obliqua*	991001001623822	F	7.73		yes						no	release																		
12/04/2018	Blue	46		no	n/a	Belair	yes			54	287469	6121973	*E.leucoxylon*	991001001623821	F	8.67		yes						no	release																		
12/04/2018	Blue	47		no	n/a	Belair	yes			54	287462	6121971	*E.leucoxylon*	991001001623826	F	8.00		yes						no	release																		
12/04/2018	Blue	48		no	n/a	Belair	yes			54	287462	6121971	*E.leucoxylon*	991001001623830	F	7.87		yes						no	release																		
12/04/2018	Blue	49		no	n/a	Belair	yes			54	287464	6121975	*e. obliqua*	991001001623825	F	6.50		yes						no	release																		
12/04/2018	Orange	94		no	n/a	Belair	yes			54	287462	6121971	*E.leucoxylon*	n/a	M	10.70		no						n/a	release																		
13/04/2018	Orange	95		no	n/a	Morialta	yes			54	289312	6125846	*E.leucoxylon*	n/a	M	10.50		no						n/a	release									22/01/2019	Wandilla Drive Rostrevor					euthanased by vet		drank copius water and poor condition and couldn't climb wt 9kg 50c coin puncture wound under armpit. Details provided by 6 - Documents affecting personal affairs	
13/04/2018	Blue	50		no	n/a	Morialta	yes			54	2			991001001624498	F	7.99		yes						no	release																		
13/04/2018	Orange	96		yes	red 0215	Morialta	yes			54	290039	6135279	*E. camaldulensis*	n/a	M	10.79		no						n/a	release																		
13/04/2018	Orange	97		no	n/a	Morialta	yes			54	290045	6135273	*dead tree*	n/a	M	5.58		no						n/a	release																		
13/04/2018	Blue	51		no	n/a	Morialta	yes			54	290044	6135275	*E. camaldulensis*	991001001624499	F	4.50		yes						no	release																		
13/04/2018	Blue	52		no	n/a	Morialta	yes			54	290047	6135259	*E.leucoxylon*	991001001624494	F	8.00		yes						no	release																		
13/04/2018	Blue	53		no	n/a	Morialta	yes			54	290043	6135275	*E. camaldulensis*	991001001624491	F	9.03		yes						yes	release																		
13/04/2018	Blue	54		no	n/a	Morialta	yes			54	290043	6135275	*E.leucoxylon*	991001001624495	F	8.95		yes						yes	release																		
13/04/2018	Blue	55		yes	orange 001	Morialta	yes			54	290034	6135282	*E. camaldulensis*	991001001624497	F	8.30		yes						yes	release																		
13/04/2018	Blue	56		no	n/a	Morialta	yes			54	289985	6135398	*olive*	991001001624493	F	7.80		yes						no	release									28/05/2018	Morialta NP- between stone hut and toilet block in creek.					euthanased	6 - Documents affecting personal affairs Digit on Left foreleg dislocated with significant swelling. Unable to climb. Severe dental disease, when touching gums they bleed, fouls smell from mouth. Large volume of saliva under chin and neck. Jaw severe malocclusion, cannot guarantee the longevity of the ability to eat in the wild.		
13/04/2018	Blue	57		yes	orange 009	Morialta	yes			54	289960	6135441	*E.leucoxylon*	991001001624500	F	7.99		yes						no	release																		
13/04/2018	Blue	58		yes	orange 004	Morialta	yes			54	289955	6135448	*E. camaldulensis*	991001001624492	F	8.54		yes						no	release																		

13/04/2018	Orange	98		no	n/a	Moralta	yes			54	290050	6135284	*E.viminalis*	n/a	M	3.00		no										n/a	release						
13/04/2018	Blue	59		no	n/a	Moralta	yes			54	290052	6135283	*E.viminalis*	991001001624496	F	8.59		yes										no	release						
13/04/2018	Blue	60		no	n/a	Moralta	yes			54	289688	6135613	*E. camaldulensis*	991001001624541	F	8.59		yes										no	release						
13/04/2018	Blue	61		no	n/a	Moralta	yes			54	289789	6134972	*unknown*	991001001624549	F	5.63		yes										no	release						
14/04/2018	Blue	62		yes	orange 057	Moralta	yes			54	289410	6132318	*exotic Eucalypt*	991001001624547	F	8.34		yes										no	release						
14/04/2018	Blue	63		no	n/a	Moralta	yes			54	289353	6132365	*E.viminalis*	991001001624546	F	8.10		yes										no	release						
14/04/2018	Blue	64		no	n/a	Moralta	yes			54	289361	6132349	*E.viminalis*	991001001624548	F	8.93		yes										yes	release						
14/04/2018	Orange	99		no	n/a	Moralta	yes			54	289353	6132366	*E.viminalis*	n/a	M	11.68		no										n/a	release						
14/04/2018	Blue	65		no	n/a	Moralta	yes			54	289695	6132103	*E.viminalis*	991001001624543	F	8.53		yes										no	release						
14/04/2018	Blue	66		yes	orange 072	Moralta	yes			54	289695	6132103	*E.viminalis*	991001001624542	F	7.88		yes										yes	release						
14/04/2018	Orange	100		no	n/a	Moralta	yes			54	289353	6132366	*E.viminalis*	n/a	M	9.75		no										n/a	release						
14/11/2018	Blue	66	yes	no	n/a	Horsnell - North	yes	11:20	11:30	54	289789	6131861	*E.viminalis*	991001001624542	F	7.70	good	yes	yes	F	1.1	na	n/a	unk	release	14/11/2018	Horsnell - North	54	289789	6131861	11:40		
14/11/2018	Blue	k1	no	n/a	n/a	Horsnell - North	yes	15:20	15:25	54	290380	6132364	*E.viminalis*	991001001624256	F	8.70	good	yes	no	n/a	n/a	n/a	n/a	unk	release	14/11/2018	Horsnell - North	54	290380	6132364	18:15		
14/11/2018	Blue	k2	no	n/a	n/a	Horsnell - South	yes	13:45	13:50	54	289708	6132036	*E.viminalis*	991001001624257	F	9.70	good	yes	no	n/a	n/a	n/a	n/a	unk	release	14/11/2018	Horsnell - South	54	289708	6132036	17:25		
14/11/2018	Blue	k3	no	n/a	n/a	Horsnell - South	yes	10:45	11:00	54	289659	6131831	*E.viminalis*	991001001624259	F	8.00	good	yes	yes	m	n/a	n/a	n/a	unk	release	14/11/2018	Horsnell - South	54	289659	6131831	17:45		
15/11/2018	Blue	k13	no	n/a	n/a	Cleland - North	yes	14:00	14:15	54	289843	6129566	*E.viminalis*	991001001624212	F	8.80	good	yes	yes	m	n/a	n/a	n/a	unk	release	15/11/2018	Cleland - North	54	289843	6129566	17:55	Chambers Track	
15/11/2018	Blue	k12	no	n/a	n/a	Cleland - North	yes	13:05	13:15	54	289091	6129916	*E.viminalis*	991001001624254	F	9.20	good	yes	no	n/a	n/a	n/a	n/a	unk	release	15/11/2018	Cleland - North	54	289091	6129916	20:07	Kilto Loop	
15/11/2018	Blue	k11	no	n/a	n/a	Cleland - Workshop	yes	17:20	17:30	54	290246	6127797	*E.obliqua*	991001001624219	F	7.30	good	yes	no	n/a	n/a	n/a	n/a	unk	release	15/11/2018	Cleland - Workshop	54	290246	6127797	18:20		
15/11/2018	Blue	k10	no	n/a	n/a	Cleland - North	yes	12:20	12:35	54	288944	6129684	*E.viminalis*	991001001624217	F	8.60	good	yes	no	n/a	n/a	n/a	n/a	unk	release	15/11/2018	Cleland - North	54	288944	6129684	20:17	Chambers Gully at bottom junction	
15/11/2018	Blue	k9	no	n/a	n/a	Cleland - North	yes	12:00	12:10	54	288952	6129677	*E.viminalis*	991001001624218	F	9.20	good	yes	no	n/a	n/a	n/a	n/a	unk	release	15/11/2018	Cleland - North	54	288952	6129677	20:20	Chambers Gully at bottom junction	
15/11/2018	Blue	k8	no	n/a	n/a	Cleland - North	yes	11:00	11:15	54	289229	6129838	*E.viminalis*	991001001624253	F	7.80	good	yes	no	n/a	n/a	n/a	n/a	unk	release	15/11/2018	Cleland - North	54	289229	6129838	19:58	Chambers Gully	
15/11/2018	Blue	k7	no	n/a	n/a	Cleland - North	yes	9:50	10:00	54	289750	6129613	*Unk*	991001001624255	F	8.80	good	yes	no	n/a	n/a	n/a	n/a	unk	release	15/11/2018	Cleland - North	54	289750	6129613	19:48	Greenhill	
15/11/2018	Blue	k6	no	n/a	n/a	Cleland - North	yes	Unk	Unk	54	289763	6129367	*E.viminalis*	991001001624251	F	7.40	good	yes	no	n/a	n/a	n/a	n/a	unk	release	15/11/2018	Cleland - North	54	289763	6129367	19:40		
15/11/2018	Blue	k5	no	n/a	n/a	Cleland - North	yes	8:00	8:20	54	289814	6129365	*E.viminalis*	991001001624260	F	5.90	good	yes	no	n/a	n/a	n/a	n/a	unk	release	15/11/2018	Cleland - North	54	289814	6129365	19:37		
15/11/2018	Blue	k4	no	n/a	n/a	Cleland - North	yes	7:40	7:50	54	290039	6129435	*E.obliqua*	991001001624258	F	8.40	good	yes	no	n/a	n/a	n/a	n/a	unk	release	15/11/2018	Cleland - North	54	290039	6129435	19:30	~100m S of gate	
16/11/2018	Blue	36	yes	no	n/a	Belair	yes	12:30	12:45	54	286711	6122580	*E. camaldulensis*	991001001623934	F	7.40	good	no- recapture	yes	f	1.1	n/a	n/a	unk	release	16/11/2018	Belair	54	286711	6122580	12:50	Saddle Ridge	
16/11/2018	Blue	k17	no	n/a	n/a	Belair	yes	8:15	8:30	54	286196	6122493	*E.viminalis*	991001001117454	F	7.40	good	yes	no	n/a	n/a	n/a	n/a	unk	release	16/11/2018	Belair	54	286196	6122493	16:45	Near Volunteer Centre	
16/11/2018	Blue	k24	no	n/a	n/a	Belair	yes	14:00	14:20	54	286245	6122517	*E.viminalis*	991001001624213	F	6.80	good	yes	no	n/a	n/a	n/a	n/a	unk	release	16/11/2018	Belair	54	286245	6122517	19:20	Volunteer Centre	
16/11/2018	Blue	k23	no	n/a	n/a	Belair	yes	11:40	12:00	54	287080	6122699	*E.leucoxylon*	991001001624211	F	7.40	good	yes	no	n/a	n/a	n/a	n/a	unk	release	16/11/2018	Belair	54	287080	6122699	19:30	Goat trap, Saddle Hill Track	
16/11/2018	Blue	k22	no	n/a	n/a	Belair	yes	11:55	12:20	54	286938	6122636	*E.viminalis*	991001001624214	F	8.00	good	yes	no	n/a	n/a	n/a	n/a	unk	release	16/11/2018	Belair	54	286938	6122636	19:40	Released within 100m of catch location	
16/11/2018	Blue	k21	no	n/a	n/a	Belair	yes	11:10	11:40	54	287178	6122749	*E.viminalis*	991001001624215	F	7.00	good	yes	yes	m	n/a	n/a	n/a	unk	release	16/11/2018	Belair	54	287178	6122749	19:20	Saddle Hill Track	
16/11/2018	Blue	k20	no	n/a	n/a	Belair	yes	10:20	10:45	54	287516	6123074	*E.leucoxylon*	991001001624252	F	6.80	good	yes	no	n/a	n/a	n/a	n/a	unk	release	16/11/2018	Belair	54	287516	6123074	18:15		
16/11/2018	Blue	k19	no	n/a	n/a	Belair	yes	9:25	9:35	54	286640	6122770	*E.viminalis*	991001001623936	F	9.10	good	yes	no	n/a	n/a	n/a	n/a	unk	release	16/11/2018	Belair	54	286640	6122770	18:10		
16/11/2018	Blue	k18	no	n/a	n/a	Belair	yes	9:00	9:15	54	286539	6122690	*E.viminalis*	991001001117447	F	7.10	good	yes	no	n/a	n/a	n/a	n/a	unk	release	16/11/2018	Belair	54	286539	6122690	18:00		
16/11/2018	Blue	k16	no	n/a	n/a	Belair	yes	14:35	14:55	54	286202	6122508	*A.melanoxylon*	991001001623824	F	7.90	good	yes	yes	m	n/a	n/a	n/a	unk	release	16/11/2018	Belair	54	286202	6122508	16:50	MBY left in tree and reunited	
16/11/2018	Blue	k15	no	n/a	n/a	Belair	yes	11:00	11:20	54	287705	6123067	*E.leucoxylon*	991001001623823	F	9.00	good	yes	yes	f	2.8	k14	n/a	unk	release	16/11/2018	Belair	54	287705	6123067	18:30	Saddle Hill Road, 50m above Saddle Hill Track	
16/11/2018	Blue	k14	no	n/a	n/a	Belair	yes	11:00	11:20	54	287705	6123067	*E.leucoxylon*	991001001117455	F	2.80	good	yes	no	n/a	n/a	n/a	k15	no	release	16/11/2018	Belair	54	287705	6123067	18:30	Saddle Hill Road, 50m above Saddle Hill Track	
27/11/2018	Blue	k27	no	n/a	n/a	Belair	yes	10:00	10:10	54	286188	6122552	*E.viminalis*	991001001624285	F	8.70	good	yes	no	n/a	n/a	n/a	n/a	unk	release	27/11/2018	Belair	54	286188	6122552	14:55	behind volunteer centre	
27/11/2018	Blue	k26	no	n/a	n/a	Belair	yes	9:35	9:40	54	286173	6122449	*E.viminalis*	991001001624290	F	8.10	good	yes	no	n/a	n/a	n/a	n/a	unk	release	27/11/2018	Belair	54	286173	6122449	15:10	Long Gully - 175m sw of volunteer centre	
27/11/2018	Blue	k25	no	n/a	n/a	Belair	yes	9:20	9:30	54	286173	6122449	*E.viminalis*	991001001624284	F	8.80	good	yes	no	n/a	n/a	n/a	n/a	unk	release	27/11/2018	Belair	54	286173	6122449	15:10	Long Gully - 175m sw of volunteer centre	
28/11/2018	Blue	k32	yes	yes	orange 035	Belair	yes	9:30	9:40	54	286228	6122542	*E.viminalis*	991001001624289	F	9.30	good	yes	no	n/a	n/a	n/a	n/a	unk	release	28/11/2018	Belair	54	286228	6122542	15:35	behind volunteer centre	
28/11/2018	Blue	k28	no	n/a	n/a	Belair	yes	11:00	11:20	54	287068	6122385	*E.viminalis*	991001001624287	F	8.20	good	yes	no	n/a	n/a	n/a	n/a	unk	release	28/11/2018	Belair	54	287068	6122385	13:30	Melville Track (Cherry Plantation)	
28/11/2018	Blue	k30	no	n/a	n/a	Belair	yes	11:30	11:40	54	287191	6122557	*E.viminalis*	991001001624283	F	8.50	good	yes	no	n/a	n/a	n/a	n/a	unk	release	28/11/2018	Belair	54	287191	6122557	15:55	Melville Track	
28/11/2018	Blue	k33	no	n/a	n/a	Belair	yes	13:50	13:55	54	287481	6122427	*E.viminalis*	991001001624281	F	9.00	good	yes	no	n/a	n/a	n/a	n/a	unk	release	28/11/2018	Belair	54	287481	6122427	16:00	Melville Track	
28/11/2018	Blue	k31	no	n/a	n/a	Belair	yes	11:50	11:55	54	287688	6122367	*E.viminalis*	991001001624282	F	8.50	good	yes	no	n/a	n/a	n/a	n/a	unk	release	28/11/2018	Belair	54	287688	6122367	16:00	Melville Track	
28/11/2018	Blue	k34	no	n/a	n/a	Belair	yes	14:20	14:35	54	287404	6122476	*E.obliqua*	991001001623832	F	9.00	good	yes	yes	m	n/a	n/a	n/a	unk	release	28/11/2018	Belair	54	287404	6122476	16:10	Melville Track	
29/11/2018	Blue	k35	no	n/a	n/a	Belair	yes	9:15	9:25	54	286162	6122245	*E.viminalis*	991001001623839	F	9.40	good	yes	no	n/a	n/a	n/a	n/a	unk	release	29/11/2018	Belair	54	286162	6122245	16:10	Kooloola Track	
29/11/2018	Blue	k36	yes	yes	orange 037	Belair	yes	9:30	9:45	54	286160	6122163	*E.viminalis*	991001001623838	F	9.40	good	yes	no	n/a	n/a	n/a	n/a	unk	release	29/11/2018	Belair	54	286160	6122163	16:07	Kooloola Track	
29/11/2018	Blue	k37	no	n/a	n/a	Belair	yes	11:40	11:55	54	284859	6123916	*E.viminalis*	991001001623837	F	8.00	good	yes	yes	f	<2kg	n/a	n/a	unk	release	29/11/2018	Belair	54	284859	6123916	17:20	Pines Rd.	
29/11/2018	Blue	k38	no	n/a	n/a	Belair	yes	12:00	12:15	54	284866	6123919	*E.viminalis*	991001001623833	F	7.20	good	yes	yes	f	<2kg	n/a	n/a	unk	release	29/11/2018	Belair	54	284866	6123919	17:25	Pines Rd.	
29/11/2018	Blue	k39	no	n/a	n/a	Belair	yes	12:50	13:05	54	285204	6123980	*E.viminalis*	991001001623831	F	9.00	good	yes	no	n/a	n/a	n/a	n/a	unk	release	29/11/2018	Belair	54	285204	6123980	18:35	Pines Rd.	
29/11/2018	Blue	k42	no	n/a	n/a	Belair	yes	13:10	13:25	54	284941	6124027	*E.viminalis*	991001001624365	F	8.40	good	yes	yes	f	2.7	k41	n/a	unk	release	29/11/2018	Belair	54	284941	6124027	18:45	Pines Rd.	
29/11/2018	Blue	k41	no	n/a	n/a	Belair	yes	13:10	13:25	54	284941	6124027	*E.viminalis*	991001001623840	F	2.70	good	yes	no	n/a	n/a	n/a	k42	no	release	29/11/2018	Belair	54	284941	6124027	18:45	Pines Rd.	
29/11/2018	Blue	k44	no	n/a	n/a	Belair	yes	13:25	13:45	54	284903	6124009	*E.viminalis*	991001001623834	F	7.30	good	yes	yes	f	<2kg	n/a	n/a	unk	release	29/11/2018	Belair	54	284903	6124009	18:40	Pines Rd.	

	Koala Identification							Capture				Treatment						Koala data						Reproductive data			Outcome
Date	Koala number	Tag colour	Tag number	if retagged	Previous tag colour/number	Capture Park	Zone	easting	Northing	Tree species	Contraceptive training	Microchip	Fluids	Vit AEDC	nufl ox	Sex	Weight	TWC	BCS	Coat condition	Hydration	Back young	Joey	Pouch Young	Joey/PY sex	PY head length	Outcome
19/12/2017	1	green	976	no	n/a	Horsnell Gully (CP)	54	289775	6131951	E leucoxylon	yes	991001001117356				F	no					no					
19/12/2017	2	green	983	no	n/a	Horsnell Gully (CP)	54	289918	6131731	E leucoxylon	yes	991001001117452				F	no					no					
19/12/2017	3	green	981	yes	Orange tag removed (#89	Horsnell Gully (CP)	54	289822	6131878		yes	991001001117354				f	no					no					
19/12/2017	4	green	921	no	n/a	Horsnell Gully (CP)	54	289785	6132079	E leucoxylon	yes	991001001117348				F	no					no					
19/12/2017	5	green	982	no	n/a	Horsnell Gully (CP)??	54	267324	6065582	E leucoxylon	yes	991001001117352				f	no					no					
19/12/2017	6	green	984	no	n/a	Horsnell Gully (CP)	54	289870	6131592	E leucoxylon	yes	991001001117450				f	no					no					
19/12/2017	7	green	985	no	n/a	Horsnell Gully (CP)	54	289574	6132207		yes	991001001117449				f	no					no					
19/12/2017	8	green	980	no	n/a	Horsnell Gully (CP)	54	289815	6131762		yes	991001001117353				f	no					no					
19/12/2017	9	green	978	no	n/a	Horsnell Gully (CP)	54	289830	6131997	E leucoxylon	yes	991001001117349				f	no					no					
19/12/2017	10	green	979	no	n/a	Horsnell Gully (CP)	54	289773	6132041	E leucoxylon	yes	991001001117351				F	no					no					
9/04/2018	KMLR-18-001	Blue	1	no	n/a	Cleland	54	289766	6128634	*E.leucoxylon*	yes	991001001624575	60mL SC	0.5mL IM	yes	F	8.22	4	2.5	good	good		no	no	n/a	n/a	release
9/04/2018	KMLR-18-002	Blue	2	no	n/a	Cleland	54	289766	6128638	*E.leucoxylon*	yes	991001001624577	60mL SC	0.5mL IM	yes	F	7.2	2	4	good	good		no	no	n/a	n/a	release
9/04/2018	KMLR-18-003	Blue	3	no	n/a	Cleland	54	289765	6128640	*E.leucoxylon*	yes	991001001624576	60mL SC	0.5mL IM	yes	F	6.79	3	3	good	good		no	no	n/a	n/a	release
9/04/2018	KMLR-18-004	Blue	4	no	n/a	Cleland	54	289766	6128640	*E.leucoxylon*	yes	991001001624572	60mL SC	0.5mL IM	yes	F	9.2	3	3.5	good	good		no	no	n/a	n/a	release
9/04/2018	KMLR-18-005	Blue	5	no	n/a	Cleland	54	289767	6128638	*E.leucoxylon*	yes	991001001624574	60mL SC	0.5mL IM	yes	F	7.69	2	4	good	good		no	no	n/a	n/a	release
9/04/2018	KMLR-18-006	Blue	6	no	n/a	Cleland	54	289771	6128636	*E.leucoxylon*	yes	991001001624578	60mL SC	0.5mL IM	yes	F	7.5	3	3	good	okay		no	yes	male	36	release
9/04/2018	KMLR-18-007	Blue	7	no	n/a	Cleland	54	289416	6128822	*E. fasciculosa*	yes	991001001624571	60mL SC	0.5mL IM	yes	F	8.55	3	3.5	good	good		no	no	n/a	n/a	release
9/04/2018	KMLR-18-008	Orange	76	no	n/a	Cleland	54	289407	6128827	*E.leucoxylon*	no	n/a	60mL SC	no	no	M	9.1	2.5	4	good	okay		n/a	n/a	n/a	n/a	release
9/04/2018	KMLR-18-009	Blue	8	yes	orange 12	Cleland	54	289416	6128822	*E. fasciculosa*	yes	991001001624573	60mL SC	0.5mL IM	yes	F	8.05	4	3	good	good		no	no	n/a	n/a	release
9/04/2018	KMLR-18-010	Blue	9	no	n/a	Cleland	54	289405	6128837	*E. obliqua*	yes	991001001624580	60mL SC	0.5mL IM	yes	F	7.79	3.5	3.5	good	good		no	no	n/a	n/a	release
9/04/2018	KMLR-18-011	Blue	10	no	n/a	Cleland	54	288743	6129283	*E.leucoxylon*	yes	991001001624579	60mL SC	0.5mL IM	yes	F	8.34	3	4.5	good	good		no	no	n/a	n/a	release
9/04/2018	KMLR-18-012	n/a	n/a	no	n/a	Cleland	54	288740	6129286	*E.leucoxylon*	no	n/a	n/a	no	no	F	9.02	2	2.5	good	good		no	no	n/a	n/a	death
9/04/2018	KMLR-18-013	Blue	11	no	n/a	Cleland	54	289210	6129066	*E.leucoxylon*	yes	991001001623601	60mL SC	0.5mL IM	yes	F	8.2	3	4	good	good		no	yes	Male	25	release
9/04/2018	KMLR-18-014	Blue	12	no	n/a	Cleland	54	289211	6129069	*E.leucoxylon*	yes	991001001623609	60mL SC	0.5mL IM	yes	F	3.6	1	4	good	good		no	no	n/a	n/a	release
9/04/2018	KMLR-18-015	blue	13	no	n/a	cleland	54	289771	6128634	*E.leucoxylon*	yes	991001001623610	120mL SC	0.5mL IM	yes	F	5.6	3	2.5	okay	okay		no	no	n/a	n/a	overnight care and release
9/04/2018	KMLR-18-016	blue	14	no	n/a	cleland	54	289771	6128642	*E.leucoxylon*	yes	991001001523607	60mL SC	0.5mL IM	yes	F	7.26	4	2.5	good	good		no	no	n/a	n/a	release
10/04/2018	KMLR-18-017	Blue	15	no	n/a	cleland	54	289781	6129379	*E.leucoxylon*	yes	991001001624176	60mL SC	0.5mL IM	yes	F	8.65	4.5	3.5	good	good		no	yes	unknown	4	release
10/04/2018	KMLR-18-018	orange	78	no	n/a	cleland	54	298778	6129379	*E.leucoxylon*	no	n/a	60mL SC	no	no	M	2.9	1	4	good	good		n/a	n/a	n/a	n/a	release
10/04/2018	KMLR-18-019	orange	77	no	n/a	cleland	54	289783	6129380	*E.leucoxylon*	no	n/a	60mL SC	no	no	M	10.96	3	4.5	good	good		n/a	n/a	n/a	n/a	release
10/04/2018	KMLR-18-020	blue	16	no	n/a	cleland	54	289778	6129379	*E. fasciculosa*	yes	991001001624177	60mL SC	0.5mL IM	yes	F	7.76	4	4	Good	Good		no	no	n/a	n/a	release
10/04/2018	KMLR-18-021	Orange	79	no	n/a	cleland	54	289780	6129379	*E.leucoxylon*	no	n/a	60mL SC	no	no	M	10.85	2.5	4.5	good	good		n/a	n/a	n/a	n/a	release
10/04/2018	KMLR-18-022	blue	17	no	n/a	cleland	54	289774	6129379	*E.leucoxylon*	yes	991001001624179	60mL SC	0.5mL IM	yes	F	10.04	3	4.5	good	good		no	yes	female	32	release
10/04/2018	KMLR-18-023	Blue	18	no	n/a	cleland	54	289753	6129402	*E.viminalis*	yes	991001001624180	60mL SC	0.5mL IM	yes	F	7.91	4	3.5	good	good		no	no	n/a	n/a	release
10/04/2018	KMLR-18-024	Blue	19	no	n/a	cleland	54	289752	6129403	*E.viminalis*	yes	991001001624178	60mL SC	0.5mL IM	yes	F	8.54	4	4	good	good		no	no	n/a	n/a	release
10/04/2018	KMLR-18-025	Blue	20	no	n/a	cleland	54	289752	6129400	*E.viminalis*	yes	991001001624175	60mL SC	0.5mL IM	yes	F	8.47	5	4	good	good		no	yes	female	32	release
10/04/2018	KMLR-18-026	Blue	22	no	n/a	cleland	54	289953	6129431	*E.viminalis*	yes	991001001624173	60mL SC	0.5mL IM	yes	F	7.8	3	4.5	good	good		no	yes	unknown	12	release
10/04/2018	KMLR-18-027	Blue	21	no	n/a	cleland	54	289764	6129396	*E.viminalis*	yes	991001001624171	60mL SC	0.5mL IM	yes	F	9	3.5	4	good	good		no	no	n/a	n/a	release
11/04/2018	KMLR-18-028	Blue	23	no	n/a	cleland	54	289473	6129327	*E.viminalis*	yes	991001001623604	60mL SC	0.5mL IM	yes	F	9.92	3.5	5	good	good		no	yes	male	38	release
11/04/2018	KMLR-18-029	Blue	24	no	n/a	cleland	54	289471	6129636	*E.leucoxylon*	yes	991001001624220	60mL SC	0.5mL IM	yes	F	8.03	2	3.5	good	good		no	no	n/a	n/a	release
11/04/2018	KMLR-18-030	Blue	25	no	n/a	cleland	54	289472	6129639	*E.viminalis*	yes	991001001624172	60mL SC	0.5mL IM	yes	F	8.63	3	4	good	good		no	no	n/a	n/a	release
11/04/2018	KMLR-18-031	orange	81	no	n/a	cleland	54	289765	6129596	*E.viminalis*	no	n/a	60mL SC	no	no	M	6.8	2	4.5	good	good		n/a	n/a	n/a	n/a	release
11/04/2018	KMLR-18-032	Blue	26	no	n/a	cleland	54	289763	6129595	*E.viminalis*	yes	991001001624174	60mL SC	0.5mL IM	yes	F	7.83	4	4	good	good		no	no	n/a	n/a	release
11/04/2018	KMLR-18-033	orange	82	no	n/a	cleland	54	289428	6129708	*E. obliqua*	no	n/a	60mL SC	no	no	M	9.42	2	4	okay	okay		n/a	n/a	n/a	n/a	release
11/04/2018	KMLR-18-034	blue	27	no	n/a	cleland	54	289360	6129887	*E.viminalis*	yes	991001001623606	60mL SC	0.5mL IM	yes	F	8.47	3	4.5	good	good		no	no	n/a	n/a	release
11/04/2018	KMLR-18-035	blue	28	no	n/a	cleland	54	289354	6129904	*E.viminalis*	yes	991001001623602	60mL SC	0.5mL IM	yes	F	7.1	2	3.5	good	good		no	no	n/a	n/a	release
11/04/2018	KMLR-18-036	blue	29	no	n/a	cleland	54	289079	6129908	*E.viminalis*	yes	991001001623605	60mL SC	0.5mL IM	yes	F	9.4	4	5	good	good		no	yes	male	42	release
11/04/2018	KMLR-18-037	orange	84	no	n/a	cleland	54	289359	6129887	*E.viminalis*	no	n/a	60mL SC	no	no	M	11.15	3	3	good	good		n/a	n/a	n/a	n/a	release
11/04/2018	KMLR-18-038	Orange	83	no	n/a	cleland	54	289359	6129880	*E.viminalis*	no	n/a	30mL SC	no	no	M	3.76	1	5	good	good		n/a	n/a	n/a	n/a	release
11/04/2018	KMLR-18-039	orange	85	no	n/a	cleland	54	289359	6129887	*E.viminalis*	no	n/a	60mL SC	no	no	M	8.7	2	5	good	good		n/a	n/a	n/a	n/a	release
12/04/2018	KMLR-18-040	orange	86	no	n/a	Belair	54	286335	6122566	*E.viminalis*	no	n/a	60mL SC	no	no	M	8.56	2	3	good	good		n/a	n/a	n/a	n/a	release
12/04/2018	KMLR-18-041	blue	30	no	n/a	belair	54	286333	6122564	*E.leucoxylon*	yes	991001001623603	60mL SC	0.5mL IM	yes	F	8.47	3	4.5	good	good		no	no	n/a	n/a	release
12/04/2018	KMLR-18-042	blue	31	no	n/a	belair	54	286247	6122509	*E. camaldulensis*	yes	991001001623935	60mL SC	0.5mL IM	yes	F	8.5	4	2.5	good	good		no	no	n/a	n/a	release
12/04/2018	KMLR-18-043	blue	32	no	n/a	belair	54	286298	6122571	*E.viminalis*	yes	991001001623932	60mL SC	0.5mL IM	yes	F	8.2	3	4	good	good		no	no	n/a	n/a	release
12/04/2018	KMLR-18-044	orange	91	no	n/a	belair	54	286489	6122712	*E.viminalis*	no	n/a	30mL SC	no	no	F	1.72	1	4	good	good		n/a	n/a	n/a	n/a	release
12/04/2018	KMLR-18-045	blue	33	no	n/a	belair	54	286489	6122712	*E.viminalis*	yes	991001001623938	60mL SC	0.5mL IM	yes	F	8.31	4	3.5	good	good		yes	no	female	n/a	release
12/04/2018	KMLR-18-046	blue	34	no	n/a	belair	54	286491	6122712	*E.viminalis*	yes	991001001623933	60mL SC	0.5mL IM	yes	F	8.3	3	4	good	okay		no	no	n/a	n/a	release
12/04/2018	KMLR-18-047	orange	92	no	n/a	belair	54	286491	6122712	*E.viminalis*	no	n/a	60mL SC	no	no	M	9.645	3	4	good	good		n/a	n/a	n/a	n/a	release
12/04/2018	KMLR-18-048	blue	35	no	n/a	belair	54	286512	6122717	*E.viminalis*	yes	991001001623931	60mL SC	0.5mL IM	yes	F	7.29	3	4	good	okay		no	no	n/a	n/a	release
12/04/2018	KMLR-18-049	blue	36	no	n/a	belair	54	286492	6122724	*E.viminalis*	yes	991001001623934	60mL SC	0.5mL IM	yes	F	6.16	2	4	good	good		no	yes	female	46	release
12/04/2018	KMLR-18-050	blue	37	no	n/a	belair	54	286488	6122729	*E.viminalis*	yes	991001001623608	60mL SC	0.5mL IM	yes	F	8.05	4	3.5	good	good		no	no	n/a	n/a	release
12/04/2018	KMLR-18-051	blue	38	no	n/a	belair	54	286388	6122731	*E.leucoxylon*	yes	991001001623937	60mL SC	0.5mL IM	yes	F	8.38	2	3.5	good	good		no	yes	male	49	release
12/04/2018	KMLR-18-052	orange	87	no	n/a	belair	54	286565	6122904	*E.viminalis*	no	n/a	60mL SC	no	no	M	10.9	3	4	good	good		n/a	n/a	n/a	n/a	release
12/04/2018	KMLR-18-053	blue	39	no	n/a	belair	54	287898	6123141	*E.viminalis*	yes	991001001623940	60mL SC	0.5mL IM	yes	F	8.26	3.5	3.5	good	good		no	no	n/a	n/a	release
12/04/2018	KMLR-18-054	orange	89	no	n/a	belair	54	287979	6123117	*E.viminalis*	no	n/a	60mL SC	no	no	M	8.96	2	2.5	good	good		n/a	n/a	n/a	n/a	release
12/04/2018	KMLR-18-055	orange	88	no	n/a	belair	54	287616	6123045	*E.viminalis*	no	n/a	60mL SC	no	no	M	9.69	3	3	okay	okay		n/a	n/a	n/a	n/a	release
12/04/2018	KMLR-18-056	orange	90	no	n/a	belair	54	287014	6122351	*E.viminalis*	no	n/a	60mL SC	no	no	M	10.7	2.5	3.5	good	good		n/a	n/a	n/a	n/a	release
12/04/2018	KMLR-18-057	blue	40	no	n/a	belair	54	287653	6122015	*E.viminalis*	yes	991001001623939	60mL SC	0.5mL IM	yes	F	8.66	4	3.5	okay	okay		no	no	n/a	n/a	release
12/04/2018	KMLR-18-058	blue	41	no	n/a	belair	54	287653	6122015	*E.viminalis*	yes	991001001117355	60mL SC	0.5mL IM	yes	F	5.8	1	2.5	good	good		no	no	n/a	n/a	release
12/04/2018	KMLR-18-059	blue	42	no	n/a	belair	54	287654	6122009	*E.viminalis*	yes	991001001623827	60mL SC	0.5mL IM	yes	F	9.035	4	3	okay	good		no	no	n/a	n/a	release
12/04/2018	KMLR-18-060	blue	43	no	n/a	belair	54	287539	6121983	*E.leucoxylon*	yes	991001001623829	60mL SC	0.5mL IM	yes	F	8.77	2.5	4	good	okay		no	no	n/a	n/a	release
12/04/2018	KMLR-18-061	blue	44	no	n/a	belair	54	287543	6121990	*E.leucoxylon*	yes	991001001117456	60mL SC	0.5mL IM	yes	F	8.14	2	3	good	good		no	yes	female	43	release
12/04/2018	KMLR-18-062	orange	93	no	n/a	belair	54	287534	6121983	*E.leucoxylon*	no	n/a	30mL SC	no	no	M	2.5	1	4	good	good		n/a	n/a	n/a	n/a	release
12/04/2018	KMLR-18-063	blue	45	no	n/a	belair	54	287465	6121977	*E. obliqua*	yes	991001001623822	60mL SC	0.5mL IM	yes	F	7.73	4	4.5	good	good		no	no	n/a	n/a	release
12/04/2018	KMLR-18-064	blue	46	no	n/a	belair	54	287469	6121973	*E.leucoxylon*	yes	991001001623821	60mL SC	0.5mL IM	yes	F	8.67	3	2.5	good	good		no	no	n/a	n/a	release
12/04/2018	KMLR-18-065	blue	47	no	n/a	belair	54	287462	6121971	*E.leucoxylon*	yes	991001001623826	60mL SC	0.5mL IM	yes	F	8	4	3	okay	okay		no	no	n/a	n/a	release
12/04/2018	KMLR-18-066	blue	48	no	n/a	belair	54	287462	6121971	*E.leucoxylon*	yes	991001001623830	60mL SC	0.5mL IM	yes	F	7.87	4	2	good	good		no	no	n/a	n/a	release
12/04/2018	KMLR-18-067	blue	49	no	n/a	belair	54	287464	6121975	*e. obliqua*	yes	991001001623825	60mL SC	0.5mL IM	yes	F	6.5	1	3	good	good		no	no	n/a	n/a	release
12/04/2018	KMLR-18-068	orange	94	no	n/a	belair	54	287462	6121971	*E.leucoxylon*	no	n/a	60mL SC	no	no	M	10.7	5	4.5	good	good		n/a	n/a	n/a	n/a	release
13/04/2018	KMLR-18-069	orange	95	no	n/a	Morialta	54	289312	6125846	*E.leucoxylon*	no	n/a	60mL SC	no	no	M	10.5	3	2	good	good		n/a	n/a	n/a	n/a	release
13/04/2018	KMLR-18-070	blue	50	no	n/a	Morialta	54	2			yes	991001001624498	60mL SC	0.5mL IM	yes	F	7.99	4	2.5	good	good		no	no	n/a	n/a	release
13/04/2018	KMLR-18-071	orange	96	yes	red 0215	Morialta	54	290039	6135279	*E. camaldulensis*	no	n/a	60mL SC	no	no	M	10.79	2	4	good	good		n/a	n/a	n/a	n/a	release
13/04/2018	KMLR-18-072	orange	97	no	n/a	Morialta	54	290045	6135273	dead tree	no	n/a	60mL SC	no	no	M	5.575	1	4	good	good		n/a	n/a	n/a	n/a	release
13/04/2018	KMLR-18-073	blue	51	no	n/a	Morialta	54	290044	6135275	*E. camaldulensis*	yes	991001001624499	60mL SC	0.5mL IM	yes	F	4.5	1	3.5	good	good		no	no	n/a	n/a	release
13/04/2018	KMLR-18-074	blue	52	no	n/a	Morialta	54	290047	6135259	*E.leucoxylon*	yes	991001001624494	60mL SC	0.5mL IM	yes	F	8	2	4.5	good	good		no	no	n/a	n/a	release
13/04/2018	KMLR-18-075	blue	53	no	n/a	Morialta	54	290043	6135275	*E. camaldulensis*	yes	991001001624491	60mL SC	0.5mL IM	yes	F	9.03	3	3.5	good	good		no	yes	female	40	release
13/04/2018	KMLR-18-076	blue	54	no	n/a	Morialta	54	290043	6135275	*E.leucoxylon*	yes	991001001624495	60mL SC	0.5mL IM	yes	F	8.95	3	3.5	good	good		no	yes	female	31	release
13/04/2018	KMLR-18-077	blue	55	yes	orange 001	Morialta	54	290034	6135282	*E. camaldulensis*	yes	991001001624497	60mL SC	0.5mL IM	yes	F	8.3	3	4	good	good		no	yes	male	29	release
13/04/2018	KMLR-18-078	blue	56	no	n/a	Morialta	54	289985	6135398	olive	yes	991001001624493	60mL SC	0.5mL IM	yes	F	7.795	3	4	good	good		no	no	n/a	n/a	release
13/04/2018	KMLR-18-079	blue	57	yes	orange 009	Morialta	54	289960	6135441	*E.leucoxylon*	yes	991001001624500	60mL SC	0.5mL IM	yes	F	7.99	3	2.5	good	good		no	no	n/a	n/a	release
13/04/2018	KMLR-18-080	blue	58	yes	orange 004	Morialta	54	289955	6135448	*E. camaldulensis*	yes	991001001624492	60mL SC	0.5mL IM	yes	F	8.54	4	2.5	good	good		no	no	n/a	n/a	release
13/04/2018	KMLR-18-081	orange	98	no	n/a	Morialta	54	290050	6135284	*E.viminalis*	no	n/a	30mL SC	no	no	M	2.995	1	5	good	good		n/a	n/a	n/a	n/a	release
13/04/2018	KMLR-18-082	blue	59	no	n/a	Morialta	54	290052	6135283	*E.viminalis*	yes	991001001624496	60mL SC	0.5mL IM	yes	F	8.59	3	3	okay	poor		no	no	n/a	n/a	release
13/04/2018	KMLR-18-083	blue	60	no	n/a	Morialta	54	289688	6135613	*E. camaldulensis*	yes	991001001624541	60mL SC	0.5mL IM	yes	F	8.585	2	4	good	good		no	no	n/a	n/a	release
13/04/2018	KMLR-18-084	blue	61	no	n/a	Morialta	54	289789	6134972	unknown	yes	991001001624549	60mL SC	0.5mL IM	yes	F	5.63	2	1.5	okay	okay		no	no	n/a	n/a	release
14/04/2018	KMLR-18-085	blue	62	yes	orange 057	Morialta	54	289410	6132318	exotic Eucalypt	yes	991001001624547	60mL SC	0.5mL IM	yes	F	8.34	4	4.5	good	good		no	no	n/a	n/a	release
14/04/2018	KMLR-18-086	blue	63	no	n/a	Morialta	54	289353	6132365	*E.viminalis*	yes	991001001624546	60mL SC	0.5mL IM	yes	F	8.1	3	4	good	good		no	no	n/a	n/a	release
14/04/2018	KMLR-18-087	blue	64	no	n/a	Morialta	54	289361	6132349	*E.viminalis*	yes	991001001624548	60mL SC	0.5mL IM	yes	F	8.925	2.5	5	good	good		no	yes	female	44	release
14/04/2018	KMLR-18-088	orange	99	no	n/a	Morialta	54	289353	6132366	*E.viminalis*	no	n/a	60mL SC	no	no	M	11.68	2	5	good	good		n/a	n/a	n/a	n/a	release
14/04/2018	KMLR-18-089	blue	65	no	n/a	Morialta	54	289695	6132103	*E.viminalis*	yes	991001001624543	60mL SC	0.5mL IM	yes	F	8.53	3	4	good	good		no	no	n/a	n/a	release
14/04/2018	KMLR-18-090	blue	66	yes	orange 072	Morialta	54	289695	6132103	*E.viminalis*	yes	991001001624542	60mL SC	0.5mL IM	yes	F	7.875	2	4.5	good	good		no	yes	female	32	release
14/04/2018	KMLR-18-091	orange	100	no	n/a	Morialta	54	289353	6132366	*E.viminalis*	no	n/a	60mL SC	no	no	M	9.75	3	4	good	good		n/a	n/a	n/a	n/a	release
	Total orange tags	24			Total captures	91									66	68	8.1	2.8	3.7	83	79		1	16	9	33.4	89
	Total blue tags	66			Total implants	66										23				8	11				6		1
	No. retagged	6																		0	1				2		0
	No. fauna rescue	0																									0
	No. koala hospital	1																									1
																Female				good	good		joeys	pouch young	Female	average	Total released
																Male				okay	okay				Male		Total into overnight care
	Cleland	39																		poor	poor				unknown		Total into Veterinary care
	Belair	29																									Total euthanased
	Morialta	23																									Total died
		91																									

Subsequent information if resighted

Koala number	Date observed	Location	easting	northing	long	lat	Outcome	Comments
KMLR-18-009	25/04/2018	Long Ridge track Cleland			-34.9621079	138.696272	euthanased	reported by 6 - Documents affecting personal affairs animal in poor condition 7.5 kg and mucky eyes. No food in gut. Body kep 6 - Documents affecting personal affairs
KMLR-18-027	10/04/2018	Cleland Gunbower Track			-34.9552315	138.6961142	euthanased	Found in poor condition and taken to AKAWH 10/4 weighing 9kg then on 30/4 euthanased at 6.1 kg
KMLR-18-078	28/05/2018	etween stone hut and toilet block in creek.					euthanased	6 - Documents affecting personal affairs "Digit on Left foreleg dislocated with significant swelling. Unable to climb. Severe dental disease, when touching gums they bleed, fouls smell from mouth. Large volume of saliva under chin and neck Jaw severe malocclusion, cannot guarantee the longevity of the ability to eat in the wild. Discussed dental to remove rotten teeth and the possibility of amputation for the digit but after discussion with fauna rescue and vets decided not in the koala's best long term interests for release." 6 - Documents affecting personal affairs replied that most likely cause of death is car accident as dislocated digits and broken teeth.

Government of South Australia
Department for Environment and Water

Document No. 18EW0001422

TO MINISTER FOR ENVIRONMENT AND WATER

FOR APPROVAL

RE: KOALA DEATHS ON THE SOUTH EASTERN FREEWAY

THROUGH: A/CHIEF EXECUTIVE 13.7.18

A/GROUP EXECUTIVE DIRECTOR, PARKS AND REGIONS 11/7

RECOMMENDATIONS

That you:

1. Note this briefing detailing correspondence from Ms Christine Venning regarding koala deaths on the South Eastern Freeway.

~~NOTED~~

2. Approve the attached draft response to Ms Christine Venning.

~~APPROVED~~ / NOT APPROVED

Comments	
	DAVID SPEIRS MP Minister for Environment and Water 29/10/2018

Contact: Jason van Weenen, Species Ecologist-Natural Resources. Telephone: 8130 9063.
Email: Jason.vanweenen@sa.gov.au
Date: 9 July 2018

PRIORITY

Routine.

BACKGROUND

You are in receipt of correspondence dated 21 June 2018 from Ms Christine Venning regarding koalas being killed by vehicles on the South Eastern Freeway. Ms Venning has enquired as to the possibility of a combination of Government agencies funding underpasses or overpasses to reduce the frequency of such incidents.

DISCUSSION

The Great Koala Count in 2012 provided a population estimate for the Adelaide Hills and Mount Lofty Ranges of approximately 114,000 koalas. In 2016 the Great Koala Count II was undertaken and the results are now being compiled, with an expected release date of mid 2018. Early indications are that there is not a decrease in the population of koalas between 2012 and 2016.

Whilst many koala populations in peri-urban areas face a variety of dangers, including being hit by cars, there is no evidence for any significant impact on the South Australian koala population.

The South Eastern Freeway passes through an extensive and continuous area of koala habitat between Glen Osmond and Crafers. Fencing has been installed along the lower sections of the freeway to prevent animals from reaching the carriageway, however officers from the Department of Planning, Transport and Infrastructure (DPTI) have observed koalas reaching the freeway from side roads, and it is probable that many animals climb existing fence structures. DPTI has advised that, when the freeway was constructed a concrete safety barrier was installed on the median and plastic mesh ladders were placed on the barrier at frequent intervals to allow koalas to climb over it. These ladders are spaced approximately 50-60 metres apart.

While the koala ladders make it easier and quicker for koalas to cross the median and exit the freeway, they are not foolproof and once a koala crosses onto the barrier, it is still necessary for the animal to cross three more lanes before it reaches safety. Unfortunately, due to the speed and volume of traffic on the freeway, it is inevitable that not all koalas that enter the freeway will manage to cross all six lanes safely.

DPTI does not record numbers of koalas killed on the carriageway, although it is estimated by wildlife care groups that approximately 250 are killed per annum. The existing koala ladders were installed in areas with the greatest potential for koalas to enter or cross the road, usually where adjacent land is at the same level as the road or adjacent to land containing suitable koala habitat (including both native and exotic vegetation).

Contact: Jason van Weenen on 0427277700 & Jason.vanweenen@sa.gov.au
Date: 9/7/18

The presence of animals on the freeway can cause loss of control to passenger vehicles, collisions resulting in serious injury and damage to vehicles and infrastructure. DPTI has installed traffic warning signs to alert road users to the possible presence of koalas. The primary purpose of the warning signs is for the safety of road users, not for the protection of the animals.

Options for installing wildlife over/underpasses were considered during the development of the recent upgrade of the Southern Expressway but were discounted due to geological considerations (the ground just would not support it), koalas are unlikely to use them and the additional expense of installing them was prohibitive.

The attached letter of response to Ms Venning provides technical detail so as to be transparent in our efforts to allay her concerns and a copy of the South Australian Koala Conservation and Management Strategy for her interest.

CONSULTATION

Michele Walter, Senior Policy Officer, Abundant Species and Sustainable Use, Department for Environment and Water.

Karl Hillyard, Senior Ecologist, Abundant Species and Sustainable Use, Department for Environment and Water.

Note: despite not being contacted for this briefing and response, Michael Bassford, Maintenance Co-ordinator, Department of Planning, Transport and Infrastructure has been consulted on the development of very similar responses to the community in the past, with the messaging in this response consistent with previous versions.

FINANCIAL IMPLICATIONS

Are there financial implications? No

Contact: Jason van Weenen on 0427277700 & Jason.vanweenen@sa.gov.au
Date: 9/7/18

ATTACHMENTS

Attachment 1 – Draft response letter to Ms Christine Venning regarding koalas on the South Eastern Freeway

Attachment 2 – The South Australian Koala Conservation and Management Strategy

Brenton Grear
Regional Director
Department for Environment and Water
18EW0001422

Date: 11 July 2018

Contact: Jason van Weenen on 0427277700 & Jason.vanweenen@sa.gov.au
Date: 9/7/18

Government
of South Australia

Office of the Minister for
Environment and Water

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Adelaide SA 5000
GPO Box 1047
Adelaide SA 5001

Tel 08 8463 5680
minister.speirs@sa.gov.au

18EW0001422

Ms Christine Venning
Secretary
S.A. Superannuants
Email: venncm@gmail.com

Dear Ms Venning

Thank you for your letter dated 21 June 2018 regarding koala deaths on the South Eastern Freeway.

Koalas are very important to many South Australians and international visitors alike. South Australia is fortunate to have a relatively healthy, and in some areas, abundant population of koalas. This abundance is reflected in the correspondingly high frequency of road incidents across many parts of the central Mount Lofty Ranges.

The Department for Environment and Water (DEW) has made concerted efforts in recent years to gauge the size of the koala population in South Australia. In 2012 The Great Koala Count provided an estimate for the Adelaide Hills and Mount Lofty Ranges of approximately 114,000 koalas. In 2016 the Great Koala Count II was undertaken and the results, which are now being compiled, will be made available when completed.

Koalas living in close proximity to urban areas face a variety of dangers, including being hit by cars. However, unlike in the eastern states, there is no evidence for a significant decline in the South Australian koala population.

South Australia has a Koala Conservation and Management Strategy which I have enclosed for your information. The strategy supports an integrated approach in response to the issue of koalas on roads, with a combination of signage, speed restrictions, exclusion fencing, ladders and driver education. The ladders placed on the central solid barriers of the South Eastern Freeway are there to help koalas negotiate the walls and avoid being trapped in the middle of the freeway. Ideally of course, koalas would be prevented from reaching the freeway in the first place, however despite significant fencing to exclude wildlife, koalas are still able to climb fences and enter the carriageway via the slip roads. Additional fencing or underpasses are unlikely to prevent this.

When developing the strategy, DEW studied the option of providing over-or under- passes for koala crossings. It was found that current interstate and national guidelines relating to koala (and other fauna) sensitive road designs all indicated that long underpasses, as would be required for the South Eastern Freeway, would likely not be used by the animals it is intended to help.

If you have any further questions, please feel free to contact Mr Jason van Weenen, Species Ecologist - Natural Resources within the Department for Environment and Water on phone 8130 9063 or email jason.vanweenen@sa.gov.au.

Yours sincerely

DAVID SPEIRS MP
Minister for Environment and Water

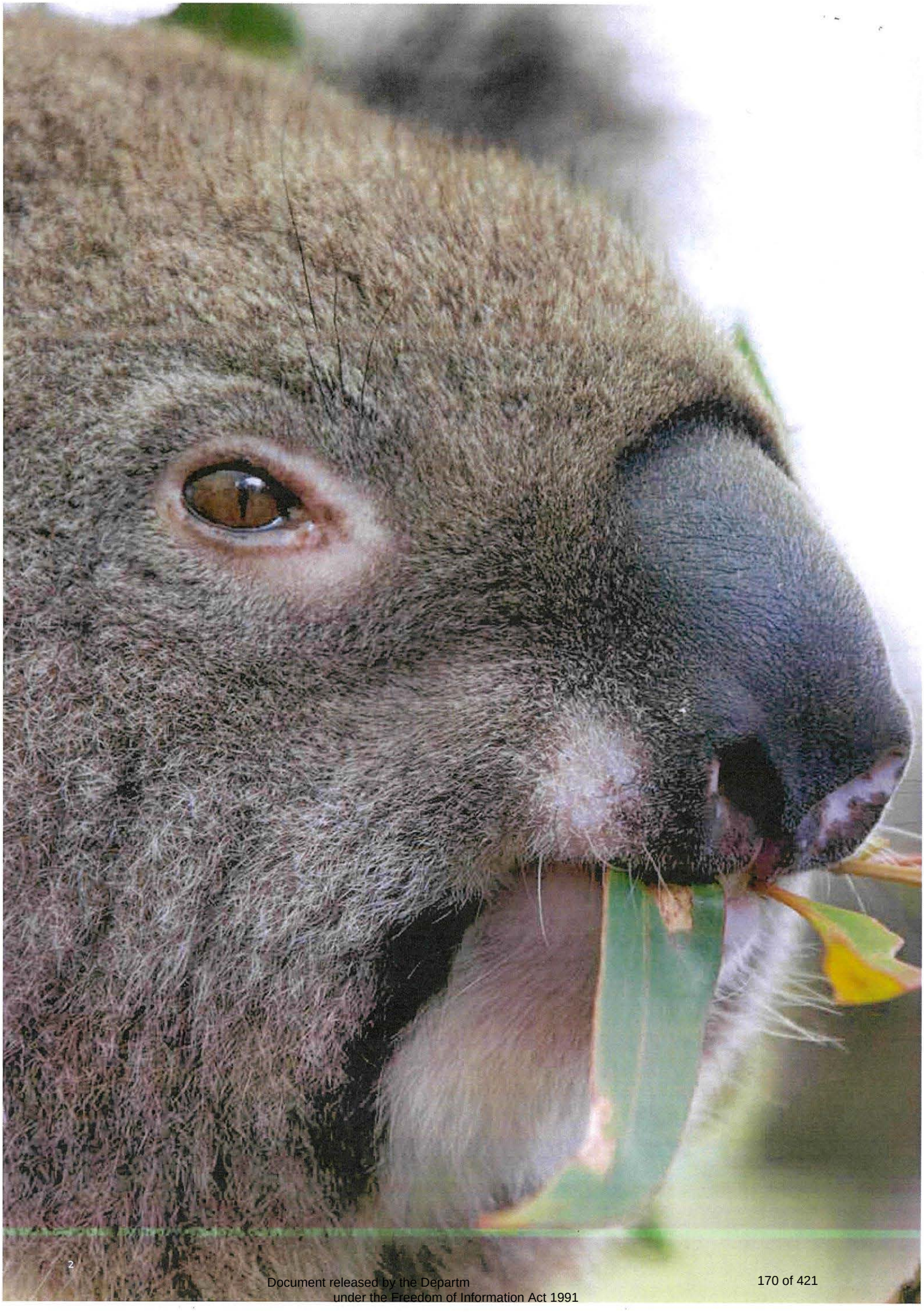
Date: 25/10/2018

Encl: 1. SA Koala Conservation and Management Strategy

The South Australian Koala Conservation and Management Strategy

Government of South Australia
Department of Environment, Water and Natural Resources

National Parks South Australia



Contents

Minister's Foreword

Koalas are one of our best loved native species – for both locals and overseas visitors alike.

The *South Australian Koala Conservation and Management Strategy* aims to protect koalas from threats such as traffic, dogs, disease, bushfires and reduced food quality due to global warming.

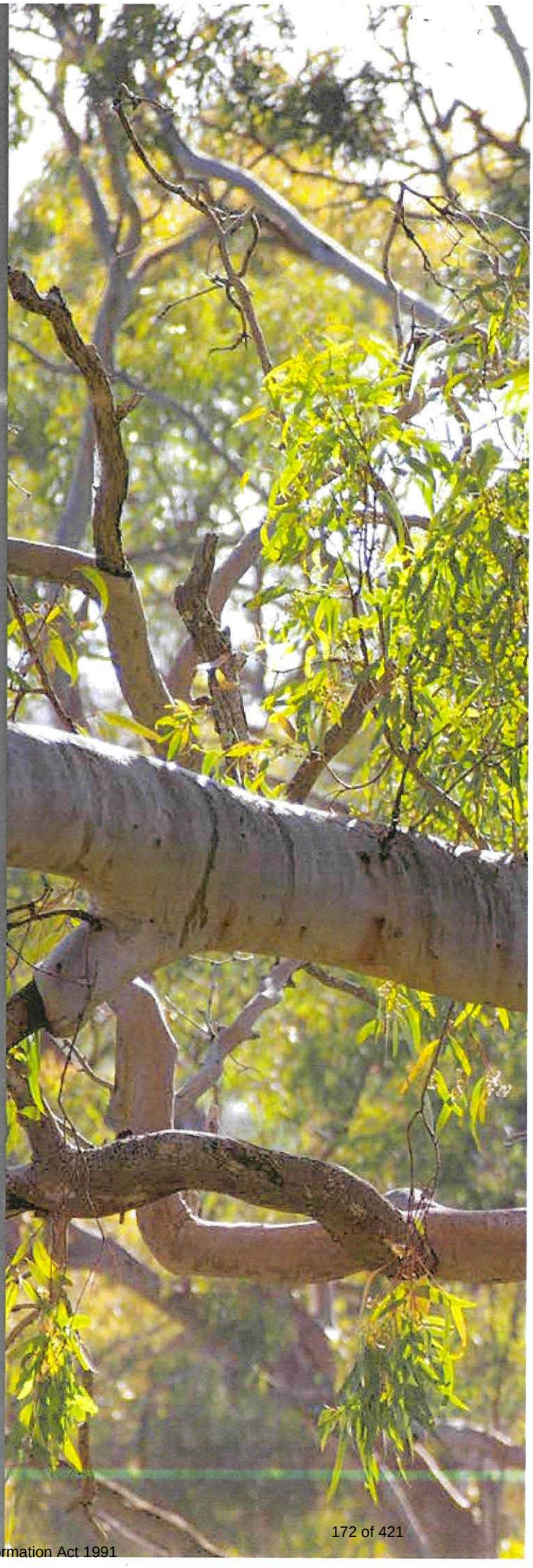
The Strategy is a positive step towards safeguarding the welfare of koalas in this State, increasing the social, educational and economic benefits of having koalas, and reducing the negative impacts that over-abundant koala populations may have on their habitat.

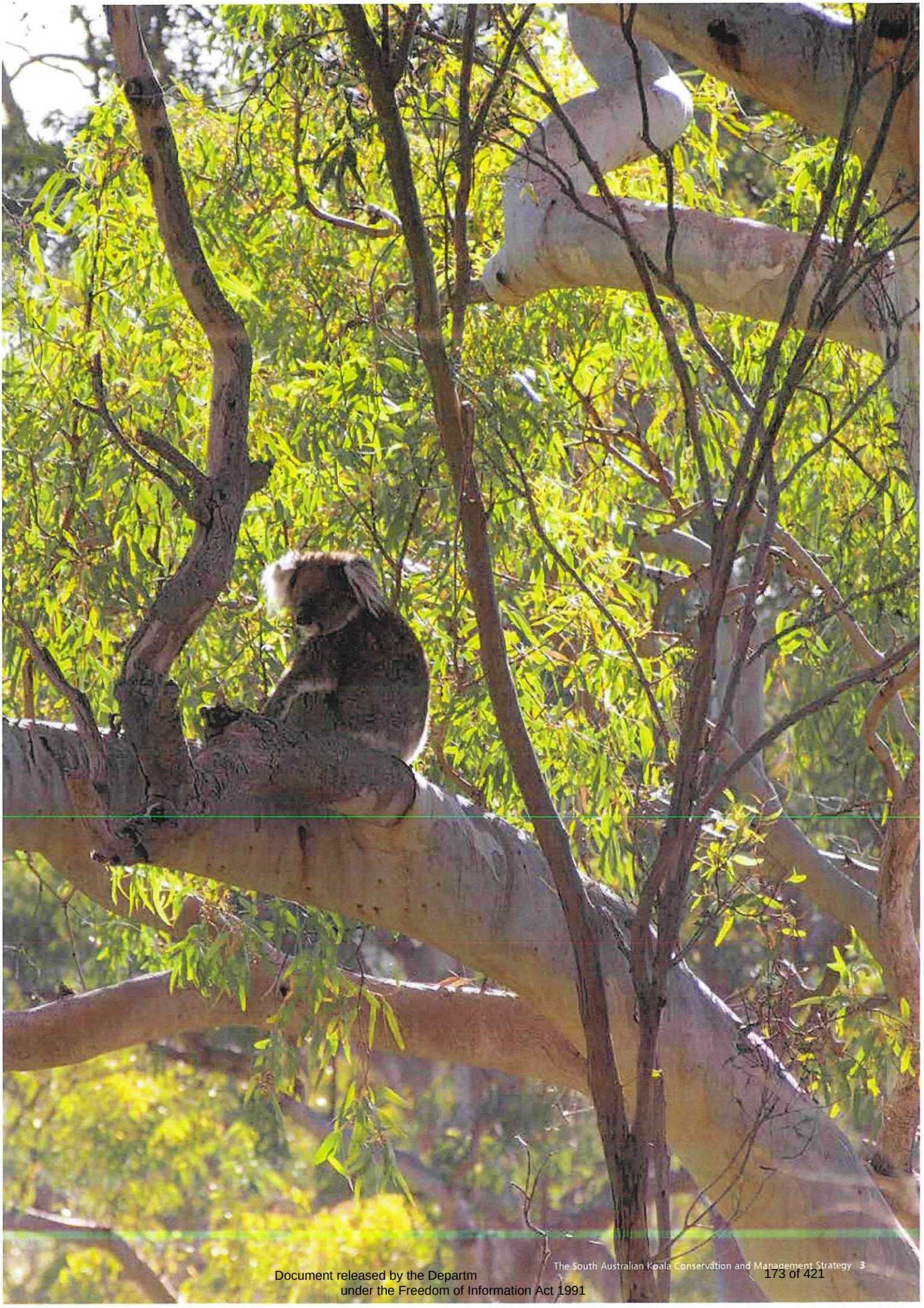
The South Australian Government is also working toward establishing an International Koala Centre for Excellence. This will provide opportunities for unique visitor experiences, strengthen private sector partnerships and optimise research initiatives.

One key area of research will be to investigate ways to minimise the negative impacts of global warming on koalas by using our State's substantial experience in tackling global warming.

This Strategy brings together government, the community, natural resources managers, experts and scientists to look at ways of working together to manage and conserve our koala population long into the future.

The Hon Ian Hunter MLC
Minister for Sustainability, Environment and Conservation





What will this Strategy do?

This Strategy has been developed to identify and acknowledge the key conservation and management issues which are having, or could have, an impact on the health and welfare of koalas and on their habitat across the State.

It provides actions and timeframes to guide what needs to be done to manage and/or reduce these impacts.

The South Australian Government is committed to:

- **Safeguarding the welfare of koalas,**
- **Increasing the social, educational and economic benefits of having koalas in South Australia, and**
- **Reducing the negative impacts that over-abundant koala populations may have on broader ecological communities.**

The Strategy is designed to be accessible by anyone who has an interest in koalas and their habitat, or is looking for a sense of direction about what the issues are and what needs to be done to conserve and manage koalas in South Australia.

It is not designed to be a step-by-step technical field guide to koala management. It does not outline detailed scientific data or complex ecological restoration criteria.

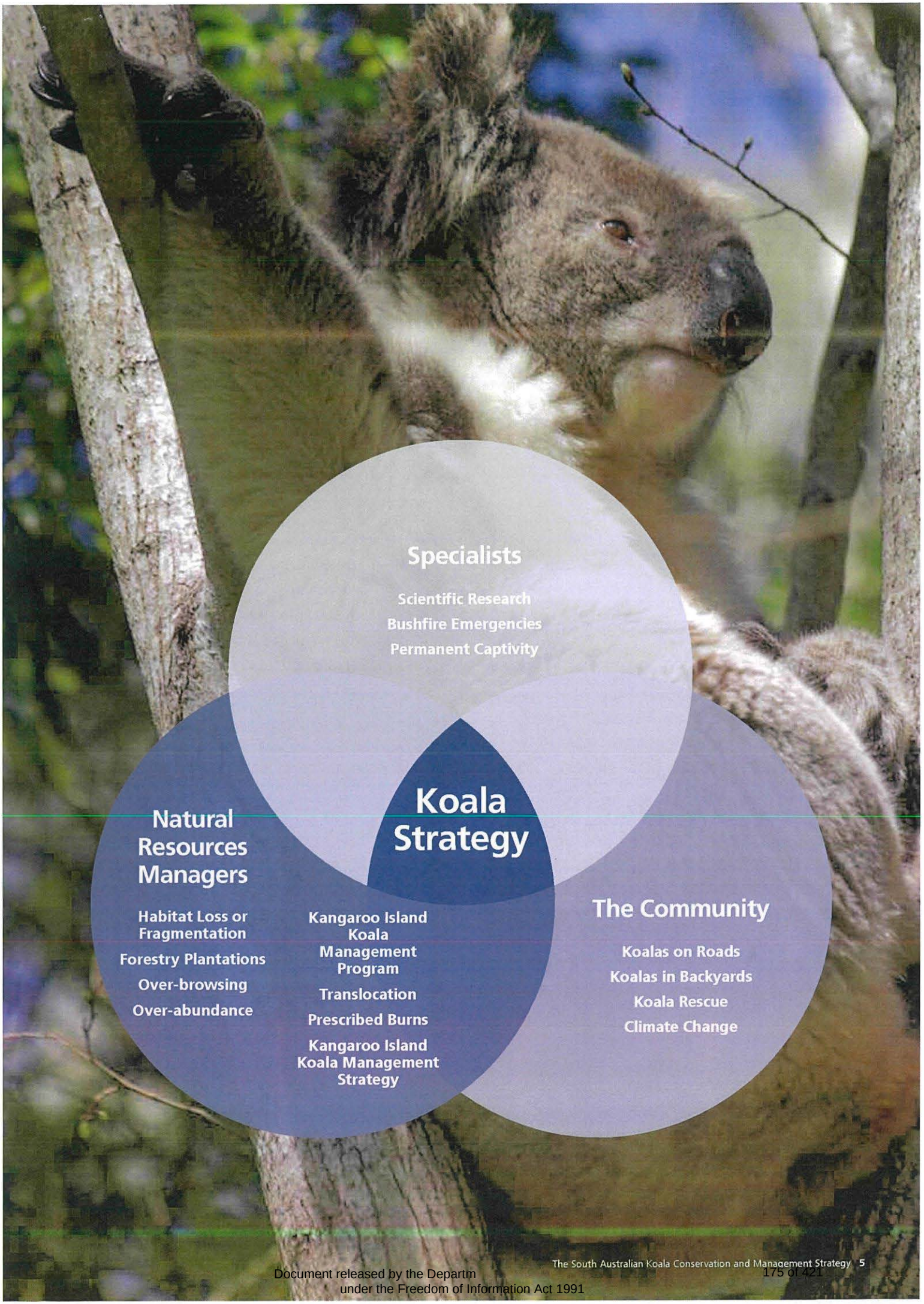
Land managers, non-government organisations, industry, scientific researchers and individuals are all encouraged to get involved in activities to manage the State's natural resources.

Koala conservation and management issues covered by this Strategy

The successful implementation of this Strategy depends on sustained commitment by a variety of stakeholders, ongoing and timely exchange of information between land managers, researchers, and community groups; and regular monitoring and reporting on progress to enable land managers to alter their plans where required.

Stakeholders who will be involved in, or responsible for, actions include State and local governments, industry, research scientists, veterinarians, non-government organisations, zoos and wildlife parks, community groups; and individual members of the community. Outcomes benefiting koalas may also be delivered by Natural Resources Managers through conservation activities that are undertaken on a landscape scale or for other species. In implementing the Strategy there will leading stakeholders that will need to ensure that attention is given to the most effective use of resources.

The culling of koalas in the wild and/or the deliberate introduction of disease are not supported by this Strategy as a means of koala population control.



How was this Strategy developed?

Through collaboration, consultation, partnerships, expert advice and citizen science.

This Strategy was developed through an extensive community and expert consultation process during which people said:

- Koalas are of great importance to the people of South Australia;
- The natural environment in which koalas live is fundamental to everyone's health, wellbeing and way of life;
- Koalas should be protected and the landscape should be managed to provide enough food and shelter, not only for koalas but for all native animals and plants which depend upon it;
- Where koalas occur in over-abundant numbers they need to be managed appropriately so that they do not significantly damage the trees upon which they depend;
- If sick and injured koalas are rescued they should be provided with veterinary treatment;
- Community education is needed to help to reduce the number of koalas being hit by cars bitten by dogs or drowning in swimming pools; and
- More research is needed into the health status of koalas in South Australia.

The Great Koala Count

The Citizen Science project: The Great Koala Count was conducted on 28 November 2012. It was a joint initiative between the Department of Environment, Water and Natural Resources, the Barbara Hardy Institute of the University of South Australia, the Adelaide and Mount Lofty Ranges Natural Resources Management Board, the Commonwealth Scientific and Industrial Research Organisation and ABC 891 Adelaide.

Koala sightings were recorded using a Smartphone 'App' with GPS technology or online via a website. The Community were also invited to complete a survey and talk about their views about what they liked or didn't like about koalas; and what they thought should happen with koalas.

- About 1,000 South Australians participated in the Great Koala Count,
- More than 1,500 koala sightings were recorded, and
- Over 1,000 photographs of koalas were submitted.

The Great Koala Count provided valuable information which helped to inform this Strategy. Results of the count showed that temperature range, elevation and rainfall were the best predictors of koala occurrence, with most suitable habitats in Kangaroo Island, the Adelaide Mount Lofty Ranges and the tips of South Australia's three peninsulas. The population estimate of koalas in the Adelaide Hills and Mount Lofty Ranges was approximately 114,000.

GREAT KOALA COUNT

Implementation of this Strategy

The State Government can't implement this Strategy alone. We all need to get involved; it will only work if we all play our part!

The Strategy is divided into sections. Each section, relating to a different koala conservation or management issue, defines the ***Desired outcome*** for that issue, sets out the ***Strategy actions*** which will be undertaken to address the issue, identifies ***Progress indicators*** which will be used to measure level of success in implementation of those actions, identifies the ***Stakeholders*** who will primarily be responsible for carrying out those actions and sets ***Timeframes*** for when the actions should be addressed. Each section also contains supporting ***Background information*** which explains the issue and discusses some of the current, or possible, conservation and management approaches.

Koala conservation and management are things that we can all help to achieve; whether it be keeping our dogs under effective control or slowing down whilst driving on roads where koalas might be crossing. Private landowners can plant trees to contribute to wildlife corridors, others can volunteer as authorised koala carers and we can all try to live more sustainably to help reduce the broader impacts of climate change.

Implementation of this Strategy will have financial costs and benefits for government, industry, business and the community, resulting in:

- increased costs from improved measures to meet the desired outcomes of the Strategy;
- lower cost over time because the future costs of koala conservation and management will be substantially reduced by timely investment, and
- benefits from natural resources management including conservation of co-occurring species and ecosystems, sustainable land use practices and increased opportunities for ecotourism.

Resources from State and local governments will be supplemented by ongoing and potentially increased commitments from community organisations, the private sector and philanthropists to assist in the achievement of the Strategy's objectives. Outcomes benefiting koalas may also be delivered through conservation activities which are undertaken for other species. In implementing the Strategy there will need to be attention given to the most effective use of resources.

How will the BIG decisions be made?

The Department of Environment, Water and Natural Resources will provide advice across government and work with the community, industry, landowners and stakeholders to establish relevant strategic direction and policies which will guide landscape and koala conservation and management. South Australia's eight regional Natural Resources Management (NRM) Boards play a central role in engaging communities and working with the State Government to decide NRM priorities, develop regional plans, and help resolve difficult challenges. State Government and the Natural Resources Management Boards play an important role by coordinating community leadership and community consultations to determine how wildlife issues are best managed in their region. This will lead to productive and integrated partnerships that foster the conservation and welfare of koalas.

Progress review

The Department of Environment, Water and Natural Resources will coordinate a review, including public consultation, of the Strategy after a period of seven years.

Timeframes

The timeframes nominated for each issue within the Strategy are indicative only.

Short-term objectives should be adopted within three years of the release of this Strategy, medium-term objectives within five years, and long-term within ten years.

Habitat loss, fragmentation and land management

Desired Outcomes:
To conserve and manage koala habitat.

Strategy Actions:
1. Manage, restore and monitor areas of koala habitat within broad wildlife corridors.
2. Develop and implement options to protect koala habitat on public and private land.
3. Develop standard koala monitoring/habitat assessment protocols.
4. Develop Codes of Practice and best practice guidelines to minimise negative impact on koalas of works, such as urban development and land clearance.

Progress Indicators:
1. Koala habitat is effectively managed and incorporated into existing multi-species conservation and land management programs.
2. Increased consideration of koalas and their habitat is demonstrated in planning processes.

Stakeholders:
State and Local Governments, Natural Resources Management Boards, Land Managers, Industry and the Community.

Timeframe:
Short to medium-term.

Background information

Koalas in South Australia live on public and private land, including national parks, forestry reserves, agricultural land, in urban street trees and in people's backyards.

Loss or fragmentation of habitat can have a negative impact on koala conservation and management. Koalas have a specialised, low-energy, low-nutrient diet. This means that they have a limited amount of energy available for travel between patches of preferred food trees. Loss of favoured trees or broader habitat across these various land types can lead to koalas becoming isolated in small pockets of trees surrounded by open areas or urban development. The removal of trees can cause stress to individual koalas and where koalas occur in over-abundant numbers, or they cannot naturally disperse into neighbouring habitat, they can damage their food trees through over-browsing.

If left unmanaged over-abundant, or isolated, populations of koalas could have a considerable impact on their habitat, other species and their own populations. Active management is required in order to prevent habitat degradation and, in severe cases, the starvation of koalas.

Habitat mapping is an important tool to develop a clear understanding of the potential distribution of the koalas, and the quality of their habitat, across the State.

Where land uses require significant changes to be made to koala habitat, such as timber harvesting and urban development, land managers and companies are encouraged to adopt relevant policies and best practice guidelines or procedures to minimise welfare impacts on koalas.

Favoured Eucalyptus food trees for koalas in South Australia include:

- Rough-barked Manna Gum (*E. viminalis*),
- SA Blue Gum (*E. leucoxylon*),
- River Red Gum (*E. camaldulensis*),
- Swamp Gum (*E. ovata*),
- Messmate Stringybark (*E. obliqua*),
- Brown Stringybark (*E. baxteri*), and
- Peppermint Box (*E. odorata*).

Koalas and Plantation Forests

Desired Outcomes:
The risk of koala injury from forestry operations is minimised.

Strategy Actions:
1. Adoption of industry standards for best practice koala management in planation forests.Best practice in koala management through internationally recognised and independently accredited processes such as Forest Stewardship Council and Australian Standards.
2. Compliance action taken if koalas are harmed during forest harvest.

Progress Indicators:
1. Increased awareness and improvement of koala management issues in plantation forests.
2. Industry standards developed and adopted by Forest Managers.
3. Reduced number of incidents of harm to koalas during forest harvesting.

Stakeholders:
Industry, Independent Auditors, State Government, Wildlife Rescue Groups and Veterinarians.

Timeframe:
Short term.

Background information

In 2013 concerns were raised about the impact of plantation harvesting on koalas. Since that time the State Government, the timber industry and wildlife care groups have worked together to address the issues. There have been very few instances of harm to koalas reported in South Australia. Timber harvested in South Australia is generally sourced from managed plantations. The Department of Primary Industries and Regions South Australia's Forestry division supports the growth of South Australia's forestry and wood products industries. South Australia's largest plantation area is located in the Green Triangle area, in the state's South East. The Green Triangle forests, which include the Gambier, Mount Burr and Penola Forest districts, are South Australia's largest area of wood production and contain many unique areas of native forest. Other major regions for commercial plantations are located on Kangaroo Island, Mount Lofty Ranges and the Mid-North.

All major forest plantation managers in South Australia demonstrate their commitment to sustainable forest and land management through sustainability certification programs that are independently audited. This is achieved through voluntary participation in internationally recognized certification programs such as ISO 14001 Environmental Management Systems, the Australian Forest Certification Scheme and the Forest Stewardship Council. This includes identifying the potential impact of forest operations on the environment, wildlife, associated communities or the viability of the business; developing forest operation policy and plans that address these potential impacts. This gives consumers the option of supporting responsible forestry by purchasing products with an independent, global and credible label for forest products.

The Green Triangle Regional Plantations Committee has launched industry-wide policy and guidelines designed to protect koalas living in Blue Gum plantations. The industry-wide guidelines were developed by an industry working group in consultation with Government and local wildlife carers and aimed to find a zero harm outcome for koalas while maintaining the economic, environmental and social benefits of plantation forestry. While a consistent approach within the Green Triangle is supported, koala management occurs in a different context on Kangaroo Island. Aspects of the Green Triangle approach may be adapted on the Island in consultation with local stake holders in recognition of the specific challenges associated with management the Kangaroo Island Koala population.

The State Government will continue to work with the industry to implement policies and guidelines with a focus on improved planning, identification, monitoring and protection of koalas in plantations.

Over-browsing pressure by koalas

Desired Outcomes:
Browsing of Eucalyptus trees by koalas is kept to sustainable levels.

Strategy Actions:
1. Assess koala abundance and the extent of crown defoliation to identify potential over-browsing at an early stage.
2. Protect favoured trees and re-vegetate, where appropriate, provide additional food sources, facilitate koala dispersal, and reduce the effect of fragmentation.

Progress Indicators:
1. Monitoring indicates a reduction in the extent of over-browsing.
2. Native vegetation is protected where over-browsing is at risk of causing significant impacts.

Stakeholders:
State Government, Land Managers and Community groups.

Timeframe:
Short to medium-term.

Background information

South Australia has only relatively small areas that contain suitable koala habitat with the right mix of preferred food trees. This puts pressure on those areas where koalas are present in high densities, such as in the Adelaide Hills and Mount Lofty Ranges and on Kangaroo Island.

Overbrowsing is usually a result of an over-abundance of koalas in an area (e.g. more koalas than the habitat can support) and sometimes can be as a result of habitat fragmentation which does not allow adequate dispersal of the koalas. This can be the case in peri-urban areas, or isolated stands of trees, where surrounding land use makes it difficult for animals to move between suitable food trees.

Monitoring and early detection of overbrowsing by koalas leading to tree canopy depletion is essential for successful long-term habitat management. Some evidence of overbrowsing of stands of Manna and Blue Gum trees is emerging in the Adelaide Hills area. Monitoring of these areas will help to establish if this dieback is a direct result of overbrowsing by koalas or not and to rule out any other causes.

A method for scoring tree condition (to record scale of damage) can be used when assessing over-browsing impacts, and changes in condition over time.

Land managers can monitor and replant as part of broader conservation and landscape management plans. Isolated trees which are being damaged can be protected by banding the trunk or main branches with a one metre high ring of sheet tin.

Where severe over-browsing is a direct result of over-abundance of koalas in a particular location consideration may need to be given to manage the number of koalas in that location over time in order to attain an environmentally sustainable koala population (see section on: 'over-abundant populations of koalas').

Individual landowners may choose to revegetate their property to facilitate koala dispersal and reduce the effect of fragmentation.

Further research into ecological and tree physiological factors that are associated with koala distribution and over-browsing impacts and monitoring the impact of climate change on koalas is required.

Over-abundant populations of koalas

Desired Outcomes:
Management programs are developed and implemented to maintain koala populations at sustainable densities.

Strategy Actions:
1. Develop methods for determining where over-population of koalas is causing, or could cause, unacceptable risks to vegetation and/or other species.
2. Develop strategies to protect priority areas of native vegetation to prevent koalas becoming established or to allow recovery from koalas over-browsing.
3. Investigate and apply non-lethal means to reduce koala populations or impact.

Progress Indicators:
1. Over-abundant koala populations are stabilized or are reducing.
2. Native vegetation is protected from over-browsing pressure by koalas.

Stakeholders:
State Government, Land Managers, Wildlife Rescue Groups and Veterinarians.

Timeframe:
Short to medium-term.

Background information

Koala numbers are declining in parts of their natural range. However across South Australia koala populations are mostly stable or increasing. In some regions (such as in the Adelaide Hills and Mount Lofty Ranges) koala numbers are increasing and may become over-abundant and as a result begin to over-browse their food trees.

Over-abundance of koalas means that koala numbers in a particular area have increased to such an extent that their habitat can no longer support them. They basically become at risk of eating themselves out of house and home, they strip the trees of leaves and the trees die. In these extreme cases it's not a matter of just planting more trees or reducing the fragmentation of the landscape, there needs to be a coordinated management approach to gradually reduce the number of koalas in the area over time to a sustainable level (see next section on Kangaroo Island Koala Management Program).

The culling of koalas in the wild and/or the deliberate introduction of disease are not supported by this Strategy as a means of koala population control.

Surgically sterilising koalas (as has been done successfully on Kangaroo Island) or using slow-release hormone implants to prevent conception (as has been done successfully in Victoria) are both expensive and intrusive management options to control koala numbers and they may not be practicable over large areas. However environmentally sustainable koala population management through habitat restoration in conjunction with the surgical sterilisation of koalas in critically damaged natural areas can be considered as an option for addressing issues of locally over-abundant koalas. The following key points need to be considered when developing a strategy to manage numbers of koalas at any given site:

1. Early detection of high koala population levels and signs of canopy depletion is essential for successful management. Other potential causes need to be investigated and ruled out as the cause of canopy depletion.
2. Where canopy depletion is apparent in 50% or more of food trees favoured by koalas in the area under consideration, a population control strategy, including an ecological rationale, may be prepared by the Department of Environment, Water and Natural Resources.

Any management action should estimate a sustainable population density, or the desired population level, for a particular location using a koala population model. Such models enable koala population numbers and densities to be compared between the same location at different times and between different locations.

Kangaroo Island Koala Management Program

Desired Outcomes:
The number of koalas on Kangaroo Island maintained at sustainable densities.

Strategy Actions:
1. Continue to implement and refine management programs to regulate koala densities to a level below that which causes severe tree defoliation.

Progress Indicators:
1. Sustainable populations of koalas (0.75 koalas / ha) and restoration of damaged habitat.

Stakeholders:
State Government and Land Managers.

Timeframe:
Long-term.

Background information:

Koalas were introduced to Kangaroo Island in the 1920s when 18 animals from Victoria were released in Flinders Chase National Park at the western end of the island. The releases were intended to safeguard the species from extinction on the mainland. Their numbers increased significantly and the Kangaroo Island Koala Management Program began in 1997, following an independent assessment of the increasing koala population on the island and its impact upon the survival of certain Eucalypt species on which the koalas were selectively feeding.

In 2001, a further comprehensive Island-wide survey revealed that the koala population was around 27,000 koalas on the Island. This over-abundance of koalas placed immense pressure on the limited areas of suitable koala habitat.

The program is based on the management of an environmentally sustainable koala population through habitat restoration and the surgical sterilisation and translocation of koalas from critically damaged natural areas. The Kangaroo Island Koala Management Program identifies a sustainable density of koalas to be 0.75 koalas/ha and it utilises non-lethal management options and involves no culling of koalas. The program has been effective in reducing koala numbers through non-lethal measures, resulting in an improvement in tree condition in areas where management has been undertaken.

Since the program began, over 10,000 koalas have been sterilised, of which nearly 4,000 have been relocated to the South East of the state making it one of the largest wildlife fertility control programs in the world. In addition tree condition is monitored annually to determine the effectiveness of the program and to inform management as to where and when further habitat restoration and koala management is required.

Ongoing management is critical to ensure the koala densities reach a sustainable level.

To apply fertility control techniques at the population level it is necessary to be able to predict population trends under various levels of fertility control, so that the most effective program can be devised and implemented. This is achieved through construction of a computer model that simulates koala population fluctuations under a range of recruitment and mortality levels.

A regular koala population census is being conducted on the island. The census shows significant reductions in koala density in areas where management has been focused. Two issues are emerging (1) koala population numbers building up in commercial blue gum plantations where management is difficult; and (2) an increasing number of landholders restricting access to their properties now that the koala population is smaller.

Koala translocation

Desired Outcomes:
Koalas handled during translocation actions have good welfare outcomes.

Strategy Actions:
1. Develop and implement a Code of Practice for the translocation of Protected Wildlife, including koalas, in South Australia.
2. Adopt national guidelines for the translocation of koalas when developed.

Progress Indicators:
1. Minimised incidents of harm to koalas during translocation.

Stakeholders:
State Government.

Timeframe:
Short to medium-term.

Background information:

Translocation is defined as the deliberate movement of wild individuals from one area with free release in another. The South Australian Government does not generally support the translocation of koalas as a primary management tool. It should only be undertaken following considerable discussion and investigation due to the potentially high level of mortality of animals.

Translocation of koalas is expensive, and much of the available koala habitat in South Australia contains koalas. There can be no guarantees that individual koalas will adjust well to a new habitat. Translocation is logistically complex, and requires detailed protocols for the different component tasks.

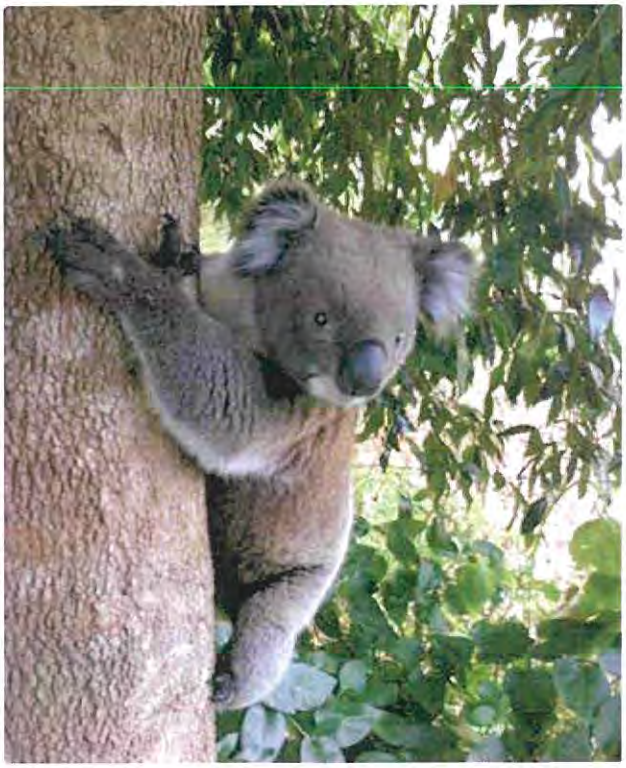
The decision to translocate should be based upon a combination of the feasibility of fertility control, the known history of defoliation at the site, the current extent and severity of defoliation, animal health status, information on the trend in koala numbers at the site, potential impact on other species and the availability of suitably large areas of appropriate habitat. Koalas must not be translocated into habitat close to managed eucalypt plantations as this may increase the probability of adverse interactions during harvest.

When undertaking translocations, the decision on whether to include fertility control will depend partly on the availability of release sites of adequate size, habitat quality and connectivity to accommodate an expanding population.

Sterilisation or contraception of animals to be translocated gives greater flexibility in selection of release sites by allowing release into smaller habitat patches, and greater confidence that future over-browsing problems will not be set in train.

Consideration should be given to the issue of how quickly an area may become re-populated by the influx of neighboring koalas from surrounding areas where there may be abundant koala populations – the vacuum affect.

Translocation can only be considered as part of an integrated program to manage a population, not as a means to dealing with excess animals. All translocation programs should include an on-going program of fertility control in the population remaining at the over-browsed site. The control strategy will consider an estimate of the maximum sustainable population density, or the desired population level for the site. This can be achieved by either translocation or fertility control, or a combination of both, depending on the alternatives available in each case. The habitat quality at the proposed release site and the density of resident koala populations must also be taken into consideration.



Koalas and roads

Desired Outcomes:
The number of koalas hit by cars is reduced.

Strategy Actions:
1. Encourage safe driver behaviours and increase awareness of wildlife crossing roads through the placement of warning signs.
2. Provide ladders for koalas to climb over dividing walls on freeways and expressways.
3. Adopt national guidelines for road design in koala habitat when developed.

Progress Indicators:
1. Fewer incidents of koalas being hit by cars.

Stakeholders:
State and Local Governments, Wildlife Rescue Groups, Veterinarians and the Community.

Timeframe:
Short-term.

Background information

While koalas spend much of their time feeding or sleeping in trees, they also need to come to the ground to move between trees within their home range. This on-ground movement mostly occurs at night but koalas can be active any time. In the breeding season (September - February) koalas will start spending more time moving on the ground as adult males seek mates and juveniles disperse into new home ranges.

For koalas living in or near urban areas much of their habitat is criss-crossed by roads. On-ground movement across roads places these koalas at great risk of being hit by cars, particularly at night. This risk increases where traffic volume and speed are greater and where road position and road design create 'black spots' where koalas are hard to see. When an animal appears from nowhere in front of a car there is often little that can be done by the driver to avoid it.

Obeying speed limits makes roads safer for everyone, including wildlife. Wildlife warning/crossing signs can be placed at sites where koalas are known to cross roads to warn drivers to be extra vigilant and watch out for koalas.

Personal safety, and the safety of other drivers, should always be thought about before attempting to help an injured animal. Anyone who finds a sick, injured or orphaned koala should contact a wildlife rescue group or a local veterinarian as soon as possible. Drivers should not stop and get out of their car on busy roads or close to hazardous bends.

The Department of Environment, Water and Natural Resources will continue to work with the Department of Planning, Transport and Infrastructure (DPTI) to consider design options to minimise the access of large wildlife (koalas, kangaroos etc.) onto freeways, expressways and railways and to allow animals that do enter the area to exit as quickly and safely as possible. These Departments will assess the viability and effectiveness of measures including, but not limited to, speed limits, ladders over barriers on freeways and expressways and exclusion fences.

DPTI has the responsibility for installing signs to warn road users of animals which can cause 'significant damage or loss of control to passenger vehicles or serious injury to road users resulting from collisions'.

The primary purpose of the warning signs is to enhance the safety of drivers.

National guidelines for road design in koala habitat will be adopted as and when they are developed.

Koalas in backyards (dogs and swimming pools)

Desired Outcomes:
The number of koalas being bitten or harassed by dogs or drowning in swimming pools is reduced.

Strategy Actions:
1. Encourage responsible dog ownership and koala safe fencing.

Progress Indicators:
1. Fewer incidents of koalas being injured by dogs or drowning in swimming pools.

Stakeholders:
The Community, Wildlife Rescue Groups and Veterinarians.

Timeframe:
Short-term.

Background information

Koalas and Dogs: Koalas come to the ground and move between trees mostly at night. They are good climbers and can easily climb over fences into backyards where dogs may be present. Dogs can be curious, aggressive or fearful when a koala enters into their territory. They may challenge the koala and this can lead to confrontation. Koalas have sharp claws and teeth and will defend themselves. Many koalas which are challenged by dogs sustain bite wounds. Even relatively minor bite wounds can lead to the koala needing to be euthanized. Most cases of conflict between koalas and dogs occur in the breeding season (September – February). This is when koalas are most actively moving around between trees.

It is not possible to stop wild koalas moving around between trees. However, there are things which dog owners can do to reduce the likelihood of their pet getting into conflict with a koala. Dogs are capable of seriously harming a koala. Responsible dog ownership means dog owners accepting that this is a possibility and being prepared to take a few simple steps to minimise interaction between their dogs and koalas. These steps may include keeping the dog inside the house overnight, fencing off a dog play area with koala exclusion fencing, installing either 'koala proof' or 'koala friendly' fencing (which either keeps koalas out of the property altogether or, once in, allows them safe passage to get out quickly) and training the dog to remain calm when koalas are nearby. Keeping dogs under effective control when away from home, on public or private land and especially in 'off-leash' areas, is equally important. Dogs must not be allowed to roam or chase wildlife. Roaming dogs pose a significant threat to koalas. Not only is this against the law but it keeps pet dogs safe and away from koalas.

Koalas and Swimming pools: Most people have heard that the name 'koala' is thought to come from a word meaning 'no drink' derived from an Aboriginal dialect of eastern New South Wales. It is true that most koalas generally get enough water from the gum leaves that they eat which usually contain about 50% water or from dew or rainwater on the surface of leaves. However koalas do drink water if, due to heat or prolonged drought, the water content of the leaves is reduced. In periods of hot weather it is not uncommon to see koalas seeking a cooling drink from backyard ponds, swimming pools or pet's water bowls and some have even learnt to seek water from people carrying water bottles. Koalas can fall into backyard swimming pools and drown. Although koalas can swim (when they have to) they can have difficultly latching on to the smooth, vertical sides of pools and cannot pull themselves back out. When a pool is not in use, it is a good practice use a pool cover that is tight, secure and will not sink if a koala walks on it. Installation of pool fencing with a design of transparent glass, Perspex or vertical steel posts will keep koalas out of the pool area. Some new pool designs incorporate a beach-type access where the water is shallow and level with part of the pavement, or have large steps rather than a ladder, these allow koalas to get out of the water easily.

Sick, injured or orphaned koalas

Desired Outcomes:
Sick, injured or orphaned koalas receive appropriate care and attention.

Strategy Actions:
1. Approve koala carers to hold the necessary permits to provide an effective intervention response.
2. Adopt state and national guidelines for all aspects of care, handling and management of captive, sick, injured or orphaned koalas as they are developed.

Progress Indicators:
1. Increased community capacity to drive koala conservation and care.

Stakeholders:
State Government, Wildlife Rescue Groups, Veterinarians and the Community.

Timeframe:
Short-term.

Background information

Many people get upset when they find a sick, injured or orphaned koala. Where possible they want it to be 'rescued', rehabilitated and released back into the wild. But koalas have specialised needs and can be difficult to care for. Many do not cope well with the stress of sickness or injury and this is why only veterinarians, or people with extensive experience in the rehabilitation of this species, are permitted to care for them. In 2010 the Department of Environment, Water and Natural Resources implemented the *'Koala Intervention Policy'* which, for the first time in South Australia, allowed for a network of approved koala carers to take an active role in the rescue, rehabilitation and release of koalas across the State. These carers work in partnership with experienced veterinarians, zoos and wildlife parks to provide emergency triage response and rehabilitative care for sick, injured or orphaned koalas. They also contribute to gathering intelligence on koala distribution, numbers, emerging diseases and disease patterns.

Release criteria. A koala is 'ready' for release back into the wild when:

Physically ready: The koala is fully weaned, has fully recovered from injury and/or disease. Its weight and condition is within the appropriate range for its age and sex. It has appropriate fitness levels and it has acclimated to prevailing climatic conditions. The koala is not considered to be a biosecurity risk.

Behaviourally ready: The koala can recognise and consume appropriate naturally-available food and it is not attracted to sights, sounds or smells that are specific to captivity.

Approved koala carers are people who have been able to demonstrate that they have the necessary expertise and experience in caring for koalas. They have appropriate facilities and access to sustainable fresh supplies of at least three types of suitable koala food tree species daily. They can recognise the subtle signs of pain and ill-health in koalas and have agreed to abide by the protocols described in the Department of Environment, Water and Natural Resources' permit conditions and the *'Guidelines for the Captive Management of Koalas in South Australia'*.

- Koalas cannot be kept as pets in South Australia so the koala carers take care to not tame koalas to the point that they cannot be released.
- Each koala must be assessed by a veterinarian, experienced koala carer, Warden or other nominated DEWNR Officer and certified as fit to return to the wild before it is released.
- Koalas must not be released until they are *'physically'* and *'behaviourally ready'* (see box).
- Koalas must be released close to the point-of capture, unless the environment is unsuitable.

If you find a sick, injured or orphaned koala you should contact a wildlife rescue group or a local veterinarian as soon as possible. You could also volunteer at a wildlife rescue group.

Climate change and 'CO_2 fertilisation'

Desired Outcomes:
Transition to a low carbon economy to safeguard the environment.

Strategy Actions:
1. State Government initiatives to transition to a low carbon economy.

Progress Indicators:
1. Implementation of adaption and mitigation measures against climate change which capitalize on opportunities for growth in green industries.

Stakeholders:
State Government, Business Sector, Industry and the Community.

Timeframe:
Short to medium-term.

Background information

In 2009 the International Union for the Conservation of Nature published the 'Red List' of species around the world destined to be hardest hit by climate change. This list included the koala. Koalas are particularly vulnerable to the effects of elevated CO_2 levels on eucalyptus nutritional quality. Increased atmospheric CO_2 levels tend to result in faster plant growth through a process known as 'CO_2 fertilisation'.

However, while plants grow faster, experiments have shown that it also reduces protein levels and increases tannin levels in plants' leaves. As CO_2 levels continue to rise, koalas will need to cope with increasingly nutrient-poor and tannin-rich *Eucalyptus* leaves.

The difficulties of digesting *Eucalyptus* leaves, combined with limitations on how much koalas can increase the size of their gut, means that koalas may no longer be able to meet their nutritional demands.

Scientists suggest that koalas could respond in two ways:

- Firstly, koalas could meet their nutritional needs by spending more time feeding and thus eating more. However, there is a limit to how much koalas can increase the size of their guts. In addition, eating more leaves causes them to pass more quickly through the koala's digestive system, resulting in less thorough digestion and decreased nutrient uptake. This could also increase over-browsing pressure in areas where there is already a high density of koalas.
- Secondly, koalas could develop a greater selectivity in leaf and tree choice. Younger, more nutritious leaves, however, also tend to possess more tannins. Koalas could also be more selective about the trees they select, though this would involve greater travelling time to find the best trees.

All South Australians are responsible for adapting to climate change impacts where they have the capability to do so. Living a more sustainable lifestyle by reducing individual carbon footprints can go some way to actively contributing to preserving the environment for future generations and the wildlife which depend upon it. Changing current patterns of consumption, taking public transport, installing solar panels or a rain water tank, recycling more waste or simply turning lights off when not needed can help to reduce energy consumption and greenhouse pollution.

At the Climate Change Conference in Paris in December 2015, South Australia was recognised as a world leader in fighting climate change with our commitment to a low carbon economy. In 2006 South Australia became the first State to pass legislation committing to renewable energy and emissions reduction targets. In 2013 the Government committed to low carbon generation by 2025 in recognition of the economic development potential of this industry. In 2014 the State's renewable energy targets were increased by 50% by 2025.

Adaptation actions minimise the negative impacts of climate change and maximise the opportunities that may arise from this change.

Research into health status / genetic structure

Desired Outcomes:
The health status and genetic structure of koala populations in South Australia is better understood.

Strategy Actions:
1. Promote and encourage research into the health status and genetic structure of koalas and develop appropriate strategies to reduce vulnerability of koala populations to disease.
2. Implement standardised protocols for data collection and sharing of research findings.

Progress Indicators:
1. The prevalence and clinical features of koala diseases are determined.
2. The role that genetics and environmental factors play in the development of koala diseases are determined.

Stakeholders:
Research agencies, Universities and State Government.

Timeframe:
Short to medium-term.

Background information

Koalas in South Australia have generally been considered to be free of disease. However, several cases of conjunctivitis associated with the bacterial organism Chlamydia were identified in 2012 in koalas in the Adelaide Hills and Mount Lofty Ranges (AMLR) region, leading to a larger study in 2014 confirming a much higher prevalence of subclinical Chlamydia infection than initially thought. Koalas in the AMLR also appear to have a higher prevalence of kidney failure than koalas in other states due to deposits of oxalate accumulating in the kidneys, however the cause remains unclear. Mange, due to the Sarcoptes mite, has also been detected in some koalas in AMLR, whilst Koala retrovirus is present in both the AMLR and on Kangaroo Island. It is still unclear as to how much of an impact these conditions have, or will have, in South Australian koalas, but they are a cause of concern for the health and welfare of the koala populations and may create demands on the time of Government agency staff, veterinarians and voluntary wildlife carers.

Koalas in South Australia are not genetically diverse. This is because they were originally introduced from a small number of animals brought from Victoria so they are very closely related (in-bred) and, as a result, have a very low genetic variability. A lack of genetic mix can lead to the development of physical abnormalities, increased health issues and a reduction in ability to adapt to change. The presence of diseases may be indicative of South Australian koala populations, and habitat, being under increasing stress.

Further research is required to investigate the prevalence and impact of diseases, such as Chlamydia, in the South Australian koala population. Strategies can then be developed to reduce the vulnerability of koalas to these diseases. For instance, researchers have developed a vaccine that could help prevent further spread of Chlamydia infection and whilst vaccinating every koala across the State would be near impossible, it may be possible to vaccinate rescued (sick, injured or orphaned) koalas during rehabilitation, prior to release back into the wild.

The State Government is working toward reinvigorating Cleland Wildlife Park including developing it as a koala 'Centre for Excellence'. This will provide opportunities to offer unique visitor experiences, strengthen private sector partnerships and optimize community and science research initiatives.

Other research priorities identified to date include:

- The relationship between the low genetic diversity of South Australian koalas and population fitness.
- Surveys of genetic diversity in koalas in the South East of the State to see if there is any indication that the remnant genotype is geographically restricted within that area and investigation into the practicality and value of artificially disseminating the diverse genotype(s) more widely through the South Australian population.
- Investigation into the role of genetics and environment in the development of kidney diseases.
- Investigation of infectious pathogens in South Australian koalas such as Chlamydia, koala retrovirus and mange.
- Research into ecological and tree physiological factors that are associated with regional koala distribution and over-browsing impacts.
- Monitoring the impact of climate change on koalas and their ability to adapt.

Bushfires and prescribed burns

Desired Outcomes:
Veterinary intervention is provided for koalas that have been affected by State Emergencies.

Strategy Actions:
1. Coordinate efficient and safe responses to intervene with koalas impacted by bushfires.
2. Fire management planning.

Progress Indicators:
1. Effective responses to emergency incidents involving koalas.
2. The role that genetics and environmental factors play in the development of koala diseases are determined.

Stakeholders:
State and Local Governments, non-Government organisations, Wildlife Care Groups and the Community.

Timeframe:
Short to long-term.

Background information

Bushfires: Large landscape bushfires are a major threat to individual koalas. Crown fires (a fire that burns and spreads through the canopy of trees) are a particular problem because koalas can become trapped at the top of trees and cannot escape. They have exposed skin areas on their hands, feet and face which will be impacted first by radiant heat. They also succumb to smoke inhalation.

Prescribed burns: Authorised and coordinated fire management strategies (prescribed burns) are implemented by the State Government to minimise the risks associated with the frequency, size, intensity and frequency of large landscape bushfires. Prescribed burns are conducted in a patchwork or mosaic pattern, which aims to reduce the risk of a significant bushfire in parks and reserves while maintaining environmental values. This mosaic pattern also provides wildlife with safe refuge whilst the vegetation regrows.

No unauthorised personnel can enter the incident controlled bushfire zone, or an area which has been subject to a prescribed burn, BEFORE they get the all-clear from the Emergency Service which is the designated Control Agency, for example, the Country Fire Service is the Control Agency for a bushfire.

It is not possible to remove wildlife from an area before a fire (bushfire or prescribed burn). But following either incident it is possible for suitably qualified and experienced wildlife care organisations and rehabilitators to assist authorities with the recovery, treatment, and rehabilitation of wildlife affected by fire in a coordinated and safe way.

Authorised response in a State Emergency: In response to a State Emergency incident such as a major bushfire the State Government's Department of Primary Industries and Regions South Australia will activate the South Australian Veterinary Emergency Management Inc. (SAVEM) to support and work in the emergency area alongside other agencies. SAVEM will get supplies and veterinary and non-veterinary volunteers into the area after it is re-opened by the Controlling emergency services.

Do not enter a recent fire-affected area as it may be unsafe.

If you find a koala which appears to be affected from a bushfire you should contact a wildlife rescue group or a local veterinarian as soon as possible.

Koalas in captivity

Desired Outcomes:
The welfare of koalas held in Zoos, Wildlife Parks, travelling exhibitions and other public displays is a priority.

Strategy Actions:
1. Develop and implement a Code of Practice for the Public Exhibition and Demonstration of Protected Wildlife in South Australia.
2. Promote the social, educational and economic benefits of having koalas in South Australia.

Progress Indicators:
1. Minimise the number of incidents where the welfare of koalas are impacted in captivity.

Stakeholders:
State Government, Zoos South Australia and Wildlife Parks.

Timeframe:
Short to medium-term.

Background information

Koalas may be held in captivity for several reasons. They may be held for short periods following rescue from injury or disease, or for research. They may be held for long periods for public display or because, post- rehabilitation, they are unlikely to be able to survive in the wild. In any case, it is important to ensure that they are cared for in an appropriately humane manner.

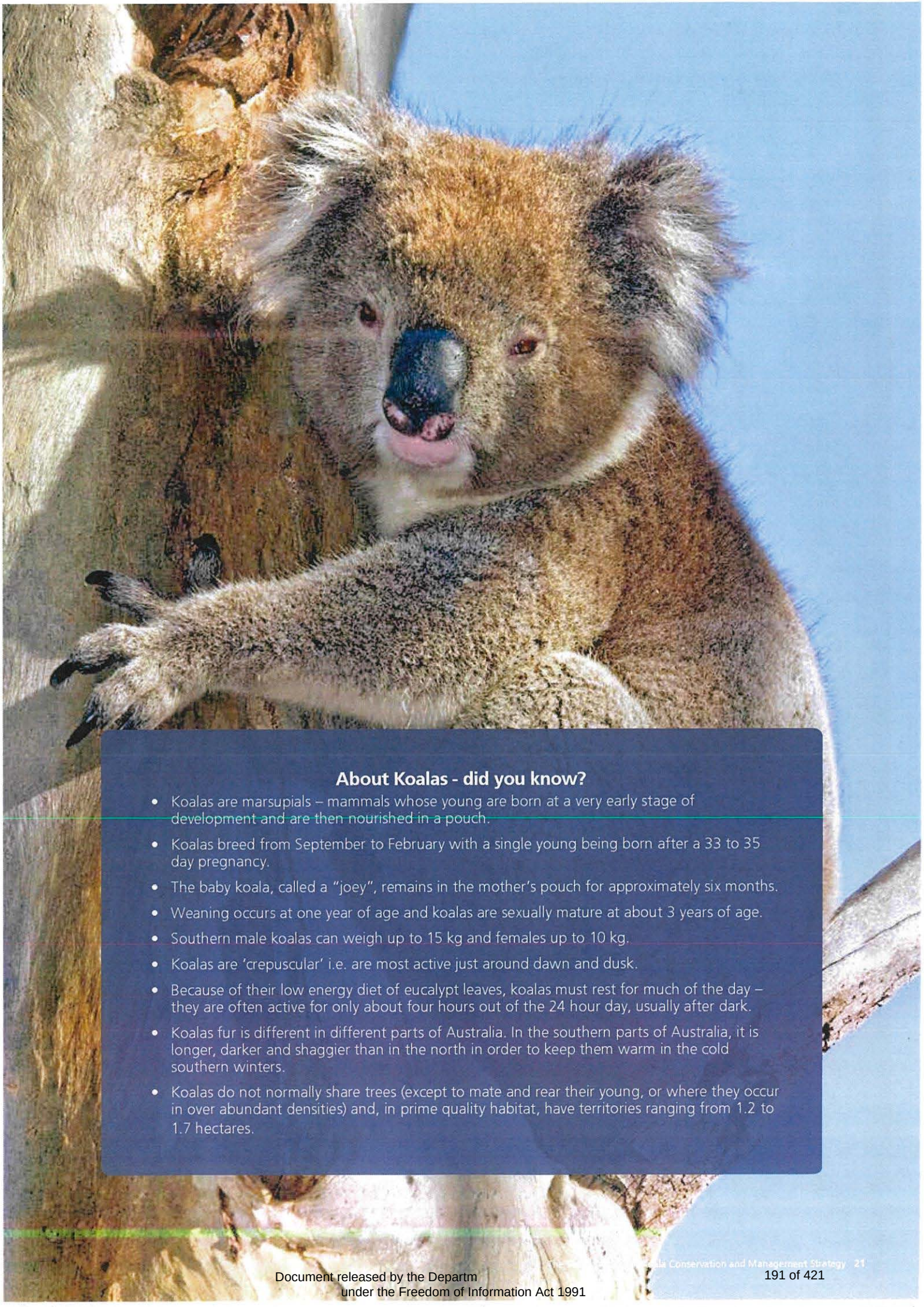
Koalas in zoos and wildlife parks are popular visitor attractions and make an important contribution to the State, national and international tourism industry. These facilities also play an important role in educating visitors about the conservation and management of koalas and their habitat.

Koalas have specialist animal husbandry and veterinary needs. It is essential, therefore, that displays are maintained at high standards. ZoosSA and Wildlife Parks develop and distribute comprehensive information resources which promote better understanding of the koala, its status and actions needed for its conservation and management.

The *'Guidelines for the Captive Management of Koalas'*, developed by the Department of Environment, Water and Natural Resources sets minimum standards and conditions for captive koala management in South Australia. This document provides guidance about where care and rehabilitation should (and should not) be used, including the rehabilitation-for-release of koalas. Koalas which are intended for eventual or immediate release should not be placed on public display without prior approval.

Through experiences and interpretation that engage visitors on a deeply emotional and even spiritual level, zoos and wildlife parks play an integral role in increasing people's sense of connection to the natural environment.

The State Government's Cleland Wildlife Park provides opportunities to offer unique visitor experiences, strengthens private sector partnerships and optimises community and science research initiatives.



About Koalas - did you know?

- Koalas are marsupials – mammals whose young are born at a very early stage of development and are then nourished in a pouch.
- Koalas breed from September to February with a single young being born after a 33 to 35 day pregnancy.
- The baby koala, called a "joey", remains in the mother's pouch for approximately six months.
- Weaning occurs at one year of age and koalas are sexually mature at about 3 years of age.
- Southern male koalas can weigh up to 15 kg and females up to 10 kg.
- Koalas are 'crepuscular' i.e. are most active just around dawn and dusk.
- Because of their low energy diet of eucalypt leaves, koalas must rest for much of the day – they are often active for only about four hours out of the 24 hour day, usually after dark.
- Koalas fur is different in different parts of Australia. In the southern parts of Australia, it is longer, darker and shaggier than in the north in order to keep them warm in the cold southern winters.
- Koalas do not normally share trees (except to mate and rear their young, or where they occur in over abundant densities) and, in prime quality habitat, have territories ranging from 1.2 to 1.7 hectares.

Source Documents

South Australian Legislation and Administrative subordinate Policies

- *National Parks and Wildlife Act 1972* and subordinate Regulations
- *Animal Welfare Act 1985* and subordinate Regulations
- *Native Vegetation Act 1991*
- *Natural Resources Management Act 2004*
- DEWNR Koala Intervention Policy and Procedure
- DEWNR Kangaroo Island Koala Management Program

Koala Strategies Guidelines & Reports

- National Koala Conservation and Management Strategy 2009 – 2014
- Guidlines for the Captive Management of Koalas in South Australia 2010
- Victoria's Koala Management Strategy 2004
- Senate Committee Report – Environment and Communications Reference Committee – 'The Koala – saving our national icon'. 2011.
- "A framework and guideline for strategic thinking and decision-making about koala management in the Adelaide and Mount Lofty Region" by Steven Cork, EcoInsights
- Green Triangle Koala Management Guidelines for Plantation Harvest Operations
- Lismore City Council – Koalas in our backyard
- Queensland State Government Fact Sheet – Koalas and Car

Books

- 'Koala – Origins of an Icon' by Stephen Jackson
- 'Reducing the Impacts of Development on Wildlife' by James Gleeson and Deborah Gleeson

Research

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For further information please contact

Department for Environment, Water and Natural Resources Information line on (08) 8204 1910, or see SA White Pages for your local Department of Environment, Water and Natural Resources office.

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21 June 2018

The Hon David Speirs
Minister for the Environment
GPO Box 1047
ADELAIDE 5001

Dear Mr Speirs

My Association is extremely concerned at the number of koalas (over 500 annually) being killed on the South Eastern Freeway.

We thought your department along with that of Tourism and Transport could share costs to build an underpass or overpass somewhere between the Heysen Tunnels and the Bridgewater exit to protect these valuable animals.

We hope you will give serious consideration to our request and save these icons of Australian wildlife.

Christine Venning

Christine Venning
Secretary
SA Superannuants

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