The Department of Environment, Land, Water and Planning will consider applications to translocate wild populations of Eastern Grey Kangaroos in Victoria that are effectively isolated from other populations, providing the application meets the minimum requirements set out in this policy.

Introduction

The Eastern Grey Kangaroo (*Macropus giganteus*) has adapted well to European settlement in Victoria, due to the reliability of resources associated with human settlements and the significant decline of its natural predators. Population numbers are secure, and this species has also been able to increase its range.¹

As Victoria’s human population grows, and urban and agricultural development expands, the interface between urban, rural and natural areas is narrowing and kangaroo and human interactions are becoming more frequent. In some areas, the density of kangaroos is negatively impacting on agricultural production, compromising ecological values, and posing a risk to human safety.

The expansion of urban development is also resulting in instances where kangaroo populations become effectively isolated² (confined by a fence or on all sides by development). This situation makes them vulnerable to health issues related to the stress of overcrowding, reduced mobility, and limited or compromised food and water resources.³

Isolated populations will also generally diminish the ecological values of their environment by exerting intense grazing pressure on native vegetation, which impacts negatively on the vegetation itself, and alters the habitat structure and food availability for other native fauna species. These kangaroo populations inevitably crash and the welfare of the kangaroos prior to, and during, the population crash may be severely impacted mainly through starvation and high parasite loads. Furthermore, isolated kangaroos can also lead to an increase in vehicle collisions, death or injury by dog attacks, and confrontation with humans.⁴

In these situations, the management of kangaroo populations is often required to minimise their impacts and prevent animal welfare issues. The Department of Environment, Land, Water and Planning (DELWP) acknowledges the growing problem of development isolating some kangaroo populations and as such, is working closely with developers in Melbourne’s growth corridors to prevent kangaroos from becoming land-locked by housing and avoid increasing the risk of road collisions.

In 2016, DELWP established the Kangaroo Impacts Management Advisory Group (KIMAG) to provide advice on an improved approach to kangaroo management in Victoria. The role of KIMAG was to provide independent, evidence-based advice that could enhance DELWP’s approach to kangaroo management across a range of areas including agricultural lands, roads, natural vegetation, and peri-urban areas. Kangaroo welfare was considered across all areas. KIMAG’s key findings and advice were informed by views from a range of stakeholders, expert opinion, and a review of the scientific literature. KIMAG considered a wide range of hypothetical and actual responses to kangaroo management needs including lethal (shoot, dart and euthanase, oral baits) and non-lethal

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² The definition of ‘effectively isolated’ for the purposes of this policy is: confined by a fence or on all sides by development (including roads), which is preventing or significantly impeding the ability of a kangaroo population to safely disperse from a site.
³ *Managing Kangaroo Impacts in Victoria*, p. 11.
⁴ *Managing Kangaroo Impacts in Victoria*, pp. 11-12.
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(fencing, fertility control, translocation) responses. This policy was developed based on the KIMAG report (2017) and advice from experienced wildlife veterinarians, ecologists, and existing scientific literature.

Translocation is the deliberate human-assisted movement of animals from one area to another. It involves the capture, sedation, handling and transport of the animals, and their acclimatisation to the destination site. Translocation programs need to be carefully planned, implemented, monitored, and documented to ensure they have the highest chance of success, ensure a high standard of animal welfare, and to maximise their contribution to conservation.

KIMAG recommended that the translocation of kangaroos not be supported as a management option due to animal welfare and biodiversity concerns. However, the Victorian Government acknowledges that there may be some limited circumstances under which this may be appropriate and feasible, such as for small effectively isolated populations when suitable habitat is nearby, and if all the requirements outlined in this policy can be met.

Wildlife cannot be translocated either to another location or into captivity without an authorisation from DELWP. This policy has been developed to inform proponents of the requirements that must be met before DELWP will consider a proposal to translocate isolated wild grey kangaroos within Victoria and does not extend to situations where captivity is involved. Separate policy and procedures apply to the translocation of threatened native fauna.

The Eastern Grey Kangaroo is generally the most common kangaroo species in peri-urban environments, due to its widespread distribution and therefore, is the focus of this policy. This policy is not applicable to other species of Macropods such as the Western Grey Kangaroo (Macropus fuliginosus), Black Wallaby (Wallabia bicolor), Red Kangaroo (Macropus rufus), etc. It is also only applicable to effectively isolated populations that comprise of fifty individuals or less, and does not apply to situations where the relocation of an individual kangaroo is involved. This policy is applicable to all government and non-government (including not-for-profit) individuals or organisations.

Legislative framework

DELWP sets policy and strategy relating to wildlife management and administers the Wildlife Act 1975 (Wildlife Act) and its associated regulatory instruments. Land owners and land managers are responsible for managing wildlife on their property and they must comply with the Wildlife Act in doing so.

The Wildlife Act sets procedures to promote the protection and conservation of wildlife, the prevention of taxa of wildlife from becoming extinct, and the sustainable use and access to wildlife. It also regulates people who engage in activities related to wildlife. Section 28A of the Wildlife Act allows the Secretary (or a delegate) to issue an authorisation to allow a person to undertake a range of activities relating to wildlife, including the take (e.g. capture), possession (e.g. handling), and disposing of (translocating) wildlife, provided that the Secretary is satisfied that the authorisation is necessary for, amongst other things, protection, research, and/or management. It is illegal to translocate kangaroos without authorisation from DELWP. Authorisations include strict conditions to protect animal welfare and anyone acting under an authorisation must, by law, comply with these conditions.

DELWP requires that land owners/managers applying for authorisations involving kangaroos that are considered complex (such as translocation) or applying for the control of a large number of kangaroos, provide a Kangaroo Management Plan (KMP) to support their application.

DELWP prefers that land owners/managers attempt strategies that do not require intervention and allow kangaroos to disperse from an area on their own (e.g. provide access to entry/exit points along fencing). If this approach is impractical or ineffective, non-lethal management options (e.g. scaring, installing kangaroo proof fencing) must then be properly considered by the land owner/manager (note that certain scaring techniques such as the use of a gas gun, require an authorisation from DELWP). In some cases, translocation is another non-lethal option that may be considered in the context of small, effectively isolated populations only. Aspects of kangaroo behaviour, biology, and habitat requirements, create management challenges for these species and often render non-lethal control methods impractical and/or ineffective. In these cases, lethal control may be the most appropriate management option. For more information on managing wildlife, including how to apply for an authorisation from DELWP, please
Risk and considerations

Compared to other wildlife such as reptiles, the translocation of mammals is technically demanding and resource intensive, and is usually reserved for species that are rare and threatened with extinction. In these cases, even with expert practitioners and significant resources, the majority of attempts fail, i.e. the founder animals die without replacing themselves at the release site. This is partly because stressed animals are prone to succumb to a range of threats including predation, parasitism, disease and misadventure, such as collision with hazards, due to their unfamiliarity with their new surroundings or each other. Some of the translocations attempted with Eastern Grey kangaroos for research purposes or for conservation, include cases of failures.

There are risks associated with the translocation of kangaroos that must be properly considered when deciding if translocation is the appropriate management action. A full risk assessment must be undertaken by the proponent for all translocation proposals. This must include details of the contingencies that will be employed if the risks are realised during the translocation and must demonstrate that the benefits of the translocation outweigh the risks involved. These risks include:

- **Unavailable or unsuitable release site** – The most important requirement and probably the greatest challenge facing a kangaroo translocation translocation proposal is the identification of an appropriate and guaranteed release site. It is difficult to find release sites that are (a) highly suitable for the particular species, yet (b) not already at or near capacity with kangaroos, especially in areas of encroaching development, and (c) not below capacity with kangaroos because of ongoing kangaroo control in the nearby area.

  The release site needs to provide adequate water, food and habitat to support the translocated kangaroos as a wild population in perpetuity (the provision of supplementary feeding is prohibited). The land tenure of the site must ensure security from future development or conflicting land uses, and the surrounding land management should also not conflict with the addition of the translocated population. The translocated population must also be within the carrying capacity of the release site - taking account of any other grazing species that may be present, including wallabies, rabbits, deer, livestock, etc. In addition, the requirements of the existing flora and fauna such as threatened ground dwelling mammals, or threatened orchids that could be impacted by the additional grazing pressure on their habitat must also be considered.

- **Impacts to animal welfare** – The capture and translocation of kangaroos is difficult and stressful for the animals. Impacts to the kangaroos’ welfare should not be underestimated.

  Kangaroos that have experienced high levels of stress during any interactions relating to containment, capture, transport or release can suffer capture myopathy. This can cause death from cardiac or renal failure from several hours to several months after the event. Kangaroos can also be seriously injured or die from direct trauma following impact with fences or other fixed objects when trying to escape during capture or release. Kangaroos are agile, lightly built animals that are prone to fractures of the long bones and feet, dislocated hips, and other injuries requiring euthanasia if they are not directly fatal.

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In addition, the loss of a small percentage of animals is likely with the use of dart guns, as some may not recover from anaesthesia, and darting can injure animals e.g. fracturing bones requiring euthanasia. Other methods of capture such as nets, trap yards or oral drugs can also result in some losses, and losses during transport from injuries, hypothermia, and dehydration can also occur.\(^9\)

- **Leaving the destination site** – Kangaroos are known to have strong fidelity to their home ranges, which are tens to a few hundred hectares in size. Some may persist within their home range despite severe disruption during development.\(^10\) If translocated less than 20 kilometres away, a proportion of kangaroos are likely to try to return to their original location after translocation, and some individuals may seek to do so at any distance, therefore, measures are needed to manage this behaviour.\(^11\)

- **Impacts on human safety when translocating kangaroos** – Kangaroos can panic or try to defend themselves when attempts are made to handle them or they feel threatened. Large kangaroos are very strong (exceptionally large male Eastern Greys can weigh over 100kg) and can easily injure inexperienced handlers. Therefore, conscious or semi-conscious kangaroos must not be manually restrained due to safety risks for the handler and the associated welfare risks to the animal, such as capture myopathy.

There are several diseases carried by macropods that can be transmitted to humans (i.e. zoonosis such as Toxoplasmosis, Leptospirosis, Salmonella). Persons involved in handling macropods should protect themselves from such diseases, as well as from external parasites, such as ticks.\(^12\)

Due to the risks associated with translocation, zoological/ecological and veterinary expertise is required during all phases of a translocation program including sedation of the kangaroos and ensuring they recover unharmed. This expertise, coupled with the technical skills required, equates to a very high cost per animal translocated. The logistical requirements involved, in addition to these costs, make translocation programs resource intensive.\(^13\) It is important to note that DELWP is not responsible for any of the costs associated with translocation. These costs must be fully borne by and negotiated between the proponent and the owner/manager of the release site.

The costs and logistical requirements involved in translocation include:

- relevant preliminary approvals (e.g. authorisation under the *Wildlife Act 1975*, Public Place Permit under the *Firearms Act 1996* for use of a dart gun in a public place, permits under the *National Parks Act 1975*, etc.)
- skilled professional staff (including constant veterinary attendance and supervision, trained and licensed shooters for dart gun use, trained wildlife handlers experienced with kangaroos, ecological assessment of the release site, monitoring of the population post translocation)
- fertility control
- portable fences
- vehicles (including suitably enclosed and air-conditioned transport vehicles)
- sedative and euthanasia drugs
- capture equipment (e.g. dart guns and projectiles)

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\(^10\) Managing Kangaroo Impacts in Victoria, p. 11.


\(^12\) Grey kangaroo relocation using chemical immobilisation techniques, Perth, Department of Biodiversity, Conservation and Attractions, 2017, p.11.

\(^13\) ACT Kangaroo Management Plan, p. 89.
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- monitoring devices (e.g. collars, ear-tags, Passive Integrated Transponder tags, remote cameras)
- security
- burial pits or other arrangements for disposing of any animals requiring euthanasia.\(^{14}\)

Translocation can only be considered for small effectively isolated populations. Translocation is not an effective management technique for reducing density in open populations as this cannot be undertaken at a faster rate than their capacity to increase. Large numbers of kangaroos (hundreds or even thousands depending on the specific site) would need to be translocated annually to achieve this. Considering the level of care needed for these species, and the numbers that need to be handled at once for effectiveness, resource requirements and time are prohibitive.\(^{15}\)

**Minimum requirements for the consideration of a translocation proposal**

A proposal for an authorisation to translocate kangaroos must have a supporting Kangaroo Management Plan (KMP) that meets the requirements set out below and describes in detail, how each requirement will be met. The KMP must also be prepared by a person suitably qualified and experienced in kangaroo management and the writing of a KMP (e.g. an ecologist, wildlife specialist, ecology/zoology academic).

1. **Suitable release site**

The most important requirement is a release site that will provide for the future survival and welfare of the translocated kangaroos, whilst not adversely impacting other kangaroos or other native species of fauna and flora already present at the release site. Kangaroos that are released in unfamiliar territory are at significant risk of suffering from stress, injury and predation when adjusting to their new surroundings.\(^{16}\) Therefore, the release site must be geographically close to and contain similar continuous habitat to the source site for the kangaroos to move through, as they must be free roaming and not captive. This will also ensure that the natural range and gene flow of the species is maintained. In addition, the land tenure of the release site must ensure security from future development and conflicting land uses.

The release site must be assessed for suitability in relation to both the future survival of the translocated kangaroos, and the biodiversity values of the release site, by a well-qualified agronomist or ecologist experienced with grazing systems. An endorsement by such a person is mandatory with any translocation proposal, and their assessment of the suitability of the release site must be detailed in the KMP.

The KMP must detail the size of the release site (hectares) and its kangaroo carrying capacity (kangaroos / ha), an approximate estimate of the density of kangaroos and other grazing animals already present (rabbits, wallabies, deer, livestock, etc.), the number of kangaroos proposed to be translocated, and the resulting density of translocated kangaroos. It must detail how the release site meets the known ecological requirements of the species for food, water, and shelter, as well as the long-term survival (as a wild population) of the kangaroos being translocated. The site must also be made free of man-made hazards such as old fencing material, broken glass and chemical contaminants. The implications of the release for the immediate and longer-term management of the site must also be considered in the assessment (e.g. any land management prescriptions that may impact or benefit the kangaroos such as predator control, fire management, visitor management, etc.).

Fertility control is a mandatory component of the translocation operation, and it must be fully described in the KMP. If a translocation is successful, at some stage the translocated population may reach either the ecological limits of

\(^{14}\) ACT Kangaroo Management Plan, p. 89.

\(^{15}\) ACT Kangaroo Management Plan, pp. 87-89.

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the site (usually set by kangaroo starvation) or the limit set by the land manager (usually set by a threshold of damage to vegetation being reached). Prior to reaching that stage, the population growth rate will be influenced by a range of potential factors, such as road mortality, predation of juveniles, individuals moving into or out of the area, and/or food supply. Fertility control is required to avoid situations where, despite these factors, the population growth exceeds the carrying capacity of the site, and will decrease the likelihood of the population being subjected to further direct management in the future.

Written evidence of agreement with the translocation by the controlling body or owner(s) of the release site (e.g. Parks Victoria, local council, land owner) must also be provided. The owner/manager of the release site may need to actively manage the translocated population (and accept the full cost of doing so) in perpetuity to keep the population at a sustainable level. Acknowledgment of this responsibility and how decisions will be made through time, and who will oversee those decisions, must be outlined in the owner/manager’s written evidence of agreement with the translocation. The owner/manager of the release site must also demonstrate that they have the appropriate resources for this long-term commitment available, or the strategies that they will employ to ensure ongoing funding.

2. Strategies to prevent the kangaroos returning to the source site

Kangaroos have small home ranges but experience in Canberra with large numbers of collared kangaroos shows that individuals can make long sustained movements when they want to, and are capable of navigating accurately back to their starting point by a different route from locations up to 10km away.¹⁷ There are too few studies of post-translocation movements that have been done to know what will happen when mixed-sex groups of adult kangaroos are moved more than a few kilometres but two issues are evident, the effect on neighbouring land holdings and attempts by the kangaroos to return to the source site.

The KMP must detail the strategies that will be employed to moderate the homing drive. For example, fencing may be used temporarily, and then removed after a suitable period when the risk of the kangaroos returning to the source site has passed. If temporary fencing is used, the type of fencing selected must minimise the risk that fencing poses to the welfare of wildlife (i.e. it must be wildlife friendly) and allow for the movement of the local native fauna. The temporary fencing must also be routinely checked and maintained for the duration of its placement to ensure that its condition does not deteriorate and create hazards that can compromise the welfare of wildlife.

The surrounding land use of the release site must be detailed in the KMP and must not conflict with the translocated population. Information about the neighbours’ attitudes to kangaroos is also required for any release site with less than 3000ha of grazing land. In addition, the proximity of roads to the release site must be considered, as only a few minor roads (light to moderately trafficked) in close proximity of the release site would be acceptable.

3. Animal welfare

Zoological/ecological and veterinary expertise is required during all phases of the translocation program to manage risks to animal welfare and ensure the program is executed successfully. All personnel to be involved in the translocation program must be identified, along with their qualifications/experience and what their responsibilities will be during the program.

A detailed description of the methods to be implemented and the equipment utilised for the capture, handling, transport, release, and monitoring of the kangaroos must be provided, and specific requirements for joeys must also be included.

¹⁷ D. Fletcher, ‘Re: Peer review of draft Victorian kangaroo translocation policy’ [email to DELWP], 30 May 2018.
The use of anaesthetics and tranquiliser drugs can reduce the risk of the kangaroos becoming injured or developing capture myopathy, whilst also reducing the risk to human safety. Anaesthesia and sedation may both be necessary during capture, handling, transport, and release of adult kangaroos.

Kangaroos are vulnerable to injury during their recovery from sedation. At the release phase the kangaroos must be appropriately protected during recovery from sedation and the measures implemented to address this must be detailed. For example, release sites should be clear of hard objects and kangaroos must be well separated to avoid disturbance to each other.

There are strict laws that govern the use of veterinary drugs in Victoria. Only an authorised person can possess and administer substances covered by the Drugs, Poisons and Controlled Substances Regulations 2017, therefore, it is mandatory that a veterinarian supervises the anaesthesia and sedation. Experience with anaesthesia using capture drugs is also necessary. In addition, skilled professional staff including trained and licensed shooters for dart gun use and trained wildlife handlers experienced with kangaroos must also be engaged to undertake the translocation.

To manage risks to animal welfare, every kangaroo must be assessed by a veterinarian prior to translocation to ensure that they are in good condition and have no signs of disease. Only healthy animals may be translocated.

Criteria and the process and responsibilities for treating or euthanising kangaroos that are injured, stressed, or identified as suffering from disease or severe malnutrition during the translocation, must be developed using zoological/ecological and veterinary expertise, and described in detail in the KMP.

4. Human safety

All requirements under the Occupational Health and Safety Act 2004 and the Occupational Health and Safety Regulations 2007 must be adhered to during the planning and implementation of the translocation program. All associated documentation (e.g. Safe Operating Procedure, Safe Work Method Statement, etc.) must be presented as part of the KMP.

5. Transport requirements

Being confined in a vehicle can be stressful for kangaroos and may result in injuries and even death. Transporting kangaroos can also pose significant safety risks to people, if adequate measures are not taken to ensure that they are properly contained and cared for. The KMP must detail how the kangaroos will be transported and what measures will be put in place to address risks to the kangaroos and people during the translocation. Prolonged periods of unconsciousness can be associated with difficult recoveries and this must be considered and mitigated for as well.

Most anaesthetics used for capture-darting tend to reduce the animal’s ability to thermoregulate, therefore, the risk of hypothermia and hyperthermia is increased. The KMP must detail how this will be mitigated, including the type of vehicles proposed to be used, whether they have adjustable climate control facilities, protection from direct sunlight and adequate ventilation.

Transport over long distances or for long periods of time increases the risks and technical challenges and should be minimised. During transport, the animals must be regularly monitored for any signs of over-heating or stress. Any animals showing signs of overheating or stress should be attended to immediately and the animals should never be left unattended at any stage during transportation.

The kangaroos must be able to maintain a relaxed and safe position for the duration of transportation. Any form of receptacle used to contain individuals must be safe and appropriate for the age and size of the animal. Specific requirements associated with the transportation of joeys must also be detailed.

Capture and transportation must be avoided at environmental temperatures less than 10°C and greater than 25°C to reduce the risk of myopathy. Cold or wet animals may cool down further during travel and additional measures may be needed to maintain their temperature.

The kangaroos should be placed in a manner so that their movement due to motion of the vehicle is minimised and without compromising the other requirements necessary for their transportation. The kangaroos must also not be exposed to excessive noise during transport (e.g. vehicle radios should be turned off, talking should be kept to a minimum, etc.).

The logistics of the transportation phase of the program and how the requirements for transport will be met, must be detailed in the KMP.

6. Monitoring

The translocated population must be monitored by a zoologist/ecologist for a minimum of 2 years post translocation and this must assess the general health and survival of the translocated population. Monitoring should be frequent (e.g. daily or weekly) initially after release, so that problems can be detected and addressed where possible. Longer-term monitoring can be less frequent (e.g. seasonal).

Further means of monitoring that involve detecting each of the translocated kangaroos using tracking collars should also be considered. Tracking collars will allow dead animals to be found and dispersing animals to be detected. DELWP may require that tracking devices be included in the monitoring program.

An appropriate form of long-term individual identification must be provided for each kangaroo translocated (e.g. numbered and coloured ear-tags, identification collars, microchips). This needs to be considered during the planning phase and detailed in the KMP.

Monitoring must be adequate to measure the success of the translocation and must relate to indicators of success defined during the planning of the translocation program. A full description of what will be monitored, methods (direct i.e. radio tracking versus indirect i.e. observational methods), when/how often, the duration of the monitoring, and the key indicators of success and failure must be provided in the KMP.

If a proposal for translocation is considered and approved by DELWP, the results from all phases of the translocation program will need to be documented and copies of these reports must be provided to DELWP. The translocation must be followed by a post release report (recording and evaluating the translocation and any improvements through lessons learnt in the process), and an annual monitoring report for the duration of the monitoring. These reporting requirements must be prepared by the zoological/ecological consultants involved in the program.

Process for translocation proposal consideration

A KMP supporting a proposal for translocation must fulfil the minimum requirements outlined above to be considered for authorisation by DELWP. The controlling body or owner(s) of the site on which the kangaroos to be translocated reside, is responsible for the proposal and the associated KMP.

A pre-planning meeting with DELWP will be required to discuss the proposal and the requirements of this policy. A DELWP officer may also conduct an inspection of the source site and the proposed release site. It is recommended that proponents contact DELWP a minimum of three months prior to when a proposed translocation is intended to occur, to ensure that there is sufficient time for the pre-planning, preparation and review required for the KMP and the associated authorisation. This will ensure that the management of kangaroos is proactive and that they are not subjected to prolonged exposure to stress or other risks associated with being effectively isolated.

During the review process, DELWP may refer the KMP to the Independent Panel of Experts (IPE) for further advice. The IPE provide independent advice on complex wildlife matters to DELWP and is made up of representatives that have expertise in a range of areas including wildlife management, animal welfare, veterinary science, planning, community engagement, and public policy.
DELWP may also request that additional requirements be included in a translocation proposal, such as additional monitoring requirements. At the conclusion of the assessment process, in line with the legislation, DELWP will either ‘accept’ the KMP or ‘not accept’ the KMP. The applicant for the authorisation will be notified of the assessment outcome in writing. If the KMP is accepted, the proponent can then apply for an authorisation under the Wildlife Act on the basis of the approved KMP. They will be responsible, by law, for strictly complying with the conditions of the authorisation and ensuring that the translocation complies with all other relevant legislation.

The translocation proposal may also require prior approval by a legally constituted Animal Ethics Committee and will also require a research permit from DELWP under the Wildlife Act if it is attributed to scientific research.