



DEPARTMENT OF PLANNING, INDUSTRY & ENVIRONMENT

# Translocation operational policy



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# Abbreviations

AEC – animal ethics committee

ANPC – Australian Network for Plant Conservation

AR Act – Animal Research Act 1985 (NSW)

BAM – Biodiversity Assessment Method

BC Act – Biodiversity Conservation Act 2016 (NSW)

BC Regulation – Biodiversity Conservation Regulation 2017 (NSW)

CRA – Conservation risk assessment

DPI – NSW Department of Primary Industries

EAP Act – Exhibited Animals Protection Act 1986 (NSW)

EIA – Environmental impact assessment

EP&A Act – Environmental Planning and Assessment Act 1979 (NSW)

EPBC Act – Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)

FM Act – Fisheries Management Act 1994 (NSW)

IGAB – Intergovernmental Agreement on Biosecurity

IUCN – International Union for the Conservation of Nature

NPW Act – National Parks and Wildlife Act 1974 (NSW)

NPW Regulation – National Parks and Wildlife Regulation 2009 (NSW)

NPWS – National Parks and Wildlife Service

POCTA – Prevention of Cruelty to Animals Act 1979 (NSW)

REF – Review of environmental factors (see Environmental impact assessment)

SSC – Species Survival Commission

TP – Translocation proposal

## Introduction

Translocation is the intentional, human mediated movement of living organisms from one location to another, and includes reintroduction of captive bred animals or plants propagated *ex situ* to natural environments and the moving of individuals between naturally occurring populations.

Conservation translocation is an approach that may be associated with landscape restoration or threatened species conservation. Typically, the primary objective of conservation translocation is to conserve biodiversity at the population or species level. This may involve moving species outside their natural range (introduction), or to a location within their natural range where they formerly occurred but there is no extant population (reintroduction), or to a location within their natural range where an extant population exists (reinforcement). Mitigation translocations (also known as salvage) involve the intentional movement of animals and plants whose habitat will be destroyed through anthropogenic land–use change (IUCN/SSC 2013). The primary objective of mitigation translocation is to move individuals out of harm's way. Similar to conservation translocation, this may involve introduction, reintroduction or reinforcement. Further information on the types of translocation covered under this policy can be found in Appendix B.

The results of translocation actions are always uncertain and can have adverse outcomes for biodiversity (including through the undesirable movement of pathogens, parasites or disease as part of the translocation). This is partly due to a general lack of understanding of the ecological complexity and plasticity (i.e. ability to thrive under novel environmental conditions) of most species, and how ecosystems respond to alteration and intervention, as well as rapidly changing environmental conditions. Translocations, therefore, require a robust policy framework to ensure they are subject to appropriate planning, monitoring and evaluation.

# Objectives

The objectives of this translocation operational policy are to:

- maximise the conservation benefits and minimise the risks associated with translocation activities
- increase good practice in translocation initiatives by ensuring they:
  - are only undertaken where necessary or beneficial for conservation of the species or as part of an approved offset arrangement
  - are well planned
  - draw on sound scientific and technical expertise
  - consider foreseeable impacts at both the recipient site and source site
  - consider animal welfare
  - consider appropriate timescales (including consideration of climate change and habitat suitability/stability)
  - incorporate adequate resourcing for long-term monitoring, post-release management and reporting
  - are consistent with relevant legislation and policies
  - involve relevant community, private and government stakeholders
  - consider all biosecurity risks associated with the translocation
- promote the efficient and effective use of public resources for conservation
- encourage public reporting of results to maximise knowledge and learning gained from translocation initiatives
- provide guidance to NSW Department of Planning, Industry and Environment officers and decision-makers, other relevant government agencies (such as local governments), non-government organisations, and private individuals and community organisations on the Department approach to assessing translocation proposals.

## Scope and application

This policy provides a framework for the development of translocation proposals for threatened and protected plants and animals under the *Biodiversity Conservation Act 2016* (BC Act), where the Department is the approval authority.

This policy applies to translocation actions into or out of New South Wales where the Department authority is required. This includes moving organisms:

- from a captive bred animal population into an uncontained area, or large areas bound by exclusion fencing
- from one uncontained area, or large area bound by exclusion fencing, to another, including movements between extant populations
- from the wild to establish a captive breeding animal population or an *ex situ* plant population.

This policy does not apply to the following actions, though a biodiversity conservation licence or other authority may be required to undertake them:

- intentional movement of plants (including propagative material) or animals authorised under other legislation (see Appendix A or section 2.8 of the BC Act)
- intentional movement of plants (including propagative material) between *ex situ* plant populations
- intentional movement of privately owned plants (including propagative material) for amenity or ornamental purposes
- intentional movement of non-threatened, non-protected plants (including propagative material)
- intentional movement of animals between captive bred animal populations
- intentional movement of animals undertaken in accordance with a code of practice
- intentional movement of animals to a nearby location for the purpose of moving them out of harm's way
- intentional movement of individual animals for human life or property protection
- actions to encourage animals to move location that do not involve direct movement of the animals by humans
- intentional movement of animals in the specific circumstances addressed in the following documents:
  - Code of Practice for Injured, Sick and Orphaned Birds of Prey
  - Code of Practice for Injured, Sick and Orphaned Flying-Foxes
  - Code of Practice for Injured, Sick and Orphaned Koalas
  - Code of Practice for Injured, Sick and Orphaned Macropods
  - Code of Practice for Injured, Sick and Orphaned Protected Fauna
  - Code of Practice for Injured, Sick and Orphaned Wombats
  - Flying-fox Camp Management Policy 2015
  - Guidelines and Conditions for Marine Reptile Strandings, Rehabilitation and Release in New South Wales
  - Management of Native Birds that show Aggression to People 2003
  - Possum Management Policy 2011
- fish, defined under the *Fisheries Management Act 1994* (FM Act) as marine, estuarine or freshwater fish or other aquatic animal life at any stage of their life history, other than mammals, reptiles, birds or amphibians

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- marine vegetation, as defined in the FM Act, which includes all seaweeds, seagrasses and marine algae.

## General principles for translocation

- Translocation and *ex situ* conservation are no substitute for *in situ* conservation of extant ecosystems and populations, which may be irreplaceable if lost. Translocation and *ex situ* conservation efforts should, as far as possible, be integrated with *in situ* conservation actions.
- Translocation is not generally an appropriate measure to mitigate the impacts of development and may do more harm than good where impacts to recipient site(s)/ecosystem(s) are not appropriately assessed and addressed.
- Translocations should only be applied where:
  - proponents can demonstrate that benefits of the translocation are likely to outweigh the risks to the target species or population, and to the source and recipient ecosystem. The benefits of translocation should also consider the risks of not translocating
  - there are reasonable scientific grounds for concluding the action will not increase the extinction risk of any affected species, whether the target species or otherwise, both at the source and the recipient sites
  - they are rigorously planned, appropriately resourced, and managed and monitored over appropriate timescales
  - they represent a cost-effective use of available public conservation resources<sup>1</sup>.
- All translocation initiatives should actively contribute to learning and knowledge generation through transparency and public dissemination of results.
- Translocation efforts should aim to avoid significant adverse impacts on human communities (including domestic animals, agriculture and livestock), natural heritage, and social and cultural values at the source and recipient sites.

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<sup>1</sup> Applies to Department-funded translocation proposals only.

## Policy statement

This section contains the policy principles that determine when a translocation is likely to be supported by the Department. Proponents should address the relevant principles in their translocation proposal (see Appendix E).

### General

1. Translocation applications will only be supported where the likelihood of achieving the proposed objectives is favourable. Proponents should clearly identify the benefits for the target species and/or population. Proponents should clearly identify the risks to the target species or population, as well as the risks to non-target species, populations and ecological communities at the source and recipient sites. The benefits of the translocation must have a high probability of outweighing the risks.
2. Translocation must be undertaken in accordance with an approved translocation proposal. The translocation proposal should address the issues outlined in the template at Appendix E. Proponents must identify and engage affected stakeholders during the preparation of the translocation proposal.
3. The collection of founder individuals or vegetative material must not have significant adverse impacts on the source population (as well as other biota at the source site) unless that population faces potentially greater risks from another imminent threat (which the translocation seeks to address). Any impact on the source population caused by the collection of founders must have a high probability of being outweighed by the conservation benefit of the proposed action.
4. Selection of source population(s) and founder individuals should have a sound scientific basis and should be directly related to the translocation objectives. These should include robust population estimates of the source population, estimates of genetic diversity and comment on the ability of the organism(s) to adapt to environmental change. Where possible, this justification should be supported by data.
5. Characteristics of the recipient site(s) should, as much as possible, reflect the species' ecological requirements, but with an absence, or significant reduction, of threats to the target species or an increased manageability of those threats (except for some experimental translocations). Where the target species shares an obligate symbiotic relationship (e.g. with pollinators or mycorrhizal fungi), those symbionts must be present at the recipient site (or translocated with the target species). The recipient site must have the capacity to support the establishment of a self-sustaining population. Where climate change is a considerable contributing threat, proponents should ensure the recipient site is climatically suitable.
6. Where possible, identified threats at the recipient site(s) must be effectively ameliorated prior to undertaking a translocation. This should be supported by data. Where a threat cannot be effectively ameliorated, proponents must demonstrate reasons why the translocation should proceed.
7. Translocation proposals should have clear objectives and identify appropriate short- and long-term targets. An appropriate monitoring plan must be developed for the target species and recipient ecological community. Where appropriate, monitoring should be undertaken to assess impacts at the source site. Proponents must demonstrate a commitment to monitoring and recipient site management for the duration of the project and a statement of resources to deliver the project. An adaptive management approach should be adopted, incorporating triggers for intervention to ensure that long-term targets can be met.

8. Translocation proposals must detail the predicted ecological impacts to non-target species and ecological communities, including preventative measures, monitoring methods and triggers for mitigation actions.
9. If the proposed translocation involves collection, release, import or export to/from a different state or territory, the movement needs to be justified to the Department in advance and proponents must demonstrate that the appropriate authorising agency in that state or territory supports the translocation proposal. Where applicable, applicants must demonstrate that appropriate licences, permits or approvals have been granted or are in the process of being granted. A translocation of this kind will not be licensed if inter-jurisdictional licences, permits or approvals are refused.

## Plants

10. Proponents should consider consulting the Australian Network for Plant Conservation (ANPC) guidelines for the translocation of threatened plants in Australia (Commander et al. 2018) when developing their proposal.
11. Collection of whole plants, seeds or cuttings for translocation should be undertaken by, or under the supervision of, personnel with appropriate experience, using appropriate methods.

## Animals

12. Proponents must provide details of relevant animal ethics committee (AEC) approvals (granted or pending), where approval is required under the *Animal Research Act 1985* (AR Act).
13. Proponents must undertake a disease risk assessment to identify potential risks to the target species and recipient ecosystem and outline appropriate management strategies to address risks that are considered significant<sup>2</sup>. Where only a desktop assessment is undertaken, proponents must justify why a complete risk assessment was not required.
14. Proponents should demonstrate how they will maximise and report on animal welfare outcomes at each stage of the translocation process.

## Establishing a captive breeding animal or *ex situ* plant population

**Establishing a captive breeding animal population is not an appropriate mitigatory measure to offset the impacts of development.**

15. The primary objectives of establishing a captive breeding animal or *ex situ* plant population should be to contribute to the conservation of extant populations, to establish new populations or to safeguard the species against imminent extinction (i.e. within a few generations).
16. The translocation proposal must include relevant milestones, resources and monitoring required to achieve the project objectives.
17. Captive animal breeding facilities and methods must satisfy stated animal welfare standards. If the population is to be exhibited, advice must be sought from the NSW

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<sup>2</sup> Proponents should consult the *Manual of Procedures for Wildlife Risk Analysis* (Jakob-Hoff et al. 2014) and the *Guidelines for Wildlife Disease Risk Analysis* (OIE/IUCN 2014) when undertaking their assessment.

Department of Primary Industries (DPI) regarding obligations under the *Exhibited Animals Protection Act 1986* (EAP Act).

18. Where authority for a captive breeding animal population is not required under the AR Act or EAP Act, proponents will be required to undertake regular assessments and report on animal welfare to the Department.
19. Proposals to establish a captive breeding animal population should include a captive management plan, including thresholds that may trigger active management to prevent adverse consequences to animal health, genetic diversity and animal welfare.
20. It is recommended that proponents seeking to establish an *ex situ* population of threatened plants consult the ANPC germplasm conservation guidelines (Offord & Meagher 2009) when developing their proposal.

## Assisted colonisation due to the threat of climate change

21. Proposals to translocate species threatened by climate change may be considered if either:
  - a. there is evidence that the target species has experienced ongoing decline due to climate change or where climate change has exacerbated existing threats
  - b. there is evidence from multiple data sources that the target species is likely to experience significant decline or extinction due to climate change or a combination of climate change and the exacerbation of existing threats. Proponents should address the timeframes for decline/extinction in their proposal, with reference to the species' generation time, to justify why action should be taken immediately.
22. Proponents should demonstrate that either:
  - a. the proposed translocation represents a viable conservation option for the target species
  - b. the potential conservation or research benefit of the translocation outweighs the risks to the target species and recipient ecosystem.
23. Favourable recipient sites are those that are currently suitable and are predicted to remain suitable under multiple future climatic scenarios. Those sites should be selected with consideration to the speed of climate change and the generation time of the target species.

## Emergency collection

24. Emergency collection of an organism (or organisms) may be authorised without a translocation proposal where there are reasonable grounds to believe that it is threatened with death within a matter of months. A biodiversity conservation licence may be required, and proponents should contact the Department as early as possible.
25. An approved translocation proposal is required if it is decided that the organism(s) will be released/replanted in a location other than the place it was collected and not in accordance with a relevant code of practice. If unsure, proponents should seek advice from the Department.

## Mitigation translocation from development sites (salvage)

**This section applies specifically to translocation of organisms (of threatened or non-threatened species) from a development site, where the benefits are to the translocated individuals (rather than the population or species), and where the action is not covered by an *Environmental Planning and Assessment Act 1974* (EP&A Act) consent or approval.**

26. Salvage proposals must adhere to general policy principles 1 to 9.
27. The Department is more likely to support mitigation translocation from development sites where:
  - a. the target species is a threatened species
  - b. there is a strong case that the action will contribute to the creation of a viable, self-sustaining population OR the recipient population will benefit from reinforcement
  - c. the risks of not translocating (to the target species) are greater than the risks of translocating (to the target species and recipient ecosystem)
  - d. there are no other options to avoid impacts of the development.

## **Translocation of non-threatened (protected) animals**

28. Translocation of non-threatened fauna is more likely to be supported if either:
  - a. the action is likely to have positive outcomes for ecosystem restoration or functioning at the recipient site
  - b. the translocation is an action under the Biodiversity Conservation Program
  - c. there is a strong case that the translocation would be of high educational/research value or of Aboriginal cultural significance
  - d. inaction is likely to result in a significant reduction in animal welfare
  - e. translocation will mitigate the loss of genetic diversity due to artificial impairment of natural gene flow.

## **Review of translocation proposals**

29. All translocation proposals will be subject to peer review by a minimum of two scientists, including one Department scientist and one external independent scientist. In appointing reviewers, consideration will be given to their relevant experience and qualifications.

## **Review of this policy**

Reviews of this policy will be undertaken by the Department at least every five years, and more frequently if changes in legislation, policies or other areas require the amendment of this policy.

## **Related policies and documents**

### **Australian Network for Plant Conservation**

- Guidelines for the translocation of threatened plants in Australia
- Plant germplasm conservation in Australia: strategies and guidelines for developing, managing and utilising *ex situ* collections.

### **Department of Agriculture and Water Resources (Commonwealth)**

- National Policy Guidelines for the Translocation of Live Aquatic Animals
- National Policy Guidelines for Translocation of Domestic Bait and Berley

### **Department of Biodiversity, Conservation and Attractions (Western Australia)**

- Corporate Policy Statement no. 35: Conserving Threatened Species and Ecological Communities
- Corporate Guideline no. 36: Recovery of Threatened Species through Translocation and Captive Breeding or Propagation

### **Department of Environment and Heritage (South Australia)**

- Translocations of Native Fauna Procedure

### **Department of Environment, Land, Water and Planning (Victoria)**

- Procedure Statement for Translocation of Threatened Native Fauna in Victoria

### **Department of Planning, Industry and Environment (including the National Parks and Wildlife Service) (NSW)**

- Ancillary rules: Biodiversity conservation actions
- Biodiversity Assessment Method
- Code of Practice for Injured, Sick and Orphaned Birds of Prey
- Code of Practice for Injured, Sick and Orphaned Flying-Foxes
- Code of Practice for Injured, Sick and Orphaned Koalas
- Code of Practice for Injured, Sick and Orphaned Macropods
- Code of Practice for Injured, Sick and Orphaned Protected Fauna
- Code of Practice for Injured, Sick and Orphaned Wombats
- Flying-fox Camp Management Policy 2015
- Management of Native Birds that Show Aggression to People 2003

- Marine Wildlife Management Manual 2013–2014
- Possum Management Policy 2011
- Rehabilitation of Protected Fauna Policy 2010
- Wilderness Policy 2017

## **Department of Primary Industries (NSW)**

- Freshwater Fish Stocking Fishery Management Strategy 2005
- Policy and Guidelines for Fish Habitat Conservation and Management 2013

## **Department of Primary Industries, Parks, Water and Environment (Tasmania)**

- Policy and Procedures: Translocation of Native Animals and Plants for Conservation Purposes

## **Department of the Environment and Energy (Commonwealth)**

- Policy Statement: Translocation of Listed Threatened Species – Assessment under Chapter 4 of the EPBC Act

## **International Union for the Conservation of Nature/World Organisation for Animal Health**

- Foden WB and Young ED (eds) 2016, *IUCN SSC guidelines for assessing species' vulnerability to climate change*, version 1.0, Occasional paper of the IUCN Species Survival Commission no. 59, Cambridge (UK) and Gland (Switzerland).
- IUCN/SSC 1987, *The IUCN position statement on translocation of living organisms*, approved by the 22nd Meeting of the IUCN Council, 4 September 1987 (Gland, Switzerland).
- IUCN/SSC 2002, *IUCN technical guidelines on the management of ex situ populations for conservation*, approved at the 14th Meeting of the Programme Committee of Council, 10 December 2002 (Gland, Switzerland).
- IUCN/SSC 2013, *Guidelines for reintroductions and other conservation translocations*, version 1.0 (Gland, Switzerland).
- Jakob-Hoff RM, MacDiarmid SC, Lees C, Miller PS, Travis D and Kock R 2014, *Manual of Procedures for Wildlife Disease Risk Analysis*, OIE/IUCN, Paris.

## **National Health and Medical Research Council**

- Australian code for the responsible conduct of research
- Australian code for the care and use of animals for scientific purposes

## **Society for Ecological Restoration Australasia**

- National standards for the practice of ecological restoration in Australia



## Appendix A: Legislative context

This appendix provides a high level overview of legislation and requirements relevant to this policy. It is not a comprehensive guide to the legislation and, therefore, translocation proponents should seek further advice during the planning stage of their project.

### ***Biodiversity Conservation Act 2016 (NSW)***

The *Biodiversity Conservation Act 2016* (BC Act) is the primary piece of legislation that protects biodiversity in New South Wales. Division 1 of Part 2 of the BC Act creates offences for the following actions:

- harming an animal that is a threatened species, that is part of a threatened ecological community, or is a protected animal
- picking a plant that is a threatened species, that is part of a threatened ecological community, or is a protected plant
- liberating, without authority, any animal (other than a captured protected animal), or liberating a captured protected animal in a place other than the place of its capture.

Division 2 of Part 2 of the BC Act outlines defences against prosecution under these offences. These includes acts authorised by other legislation, acts authorised by regulations (including codes of practice), and acts authorised by a biodiversity conservation licence.

### **Acts authorised by other legislation: planning approvals**

The BC Act establishes that certain planning approvals under the *Environmental Planning and Assessment Act 1974* (EP&A Act) provide a defence against prosecution for BC Act offences. These include where an act was necessary for the carrying out of:

- development in accordance with a development consent (within the meaning of the EP&A Act) (BC Act s. 2.8(1)(a)(i))
- development that is exempt development under the EP&A Act (BC Act s. 2.8(1)(a)(ii))
- an activity by a determining authority (within the meaning of Part 5 of the EP&A Act) that was carried out after compliance with that Part (BC Act s. 2.8(1)(a)(iii))
- an activity authorised by an approval granted by a determining authority (within the meaning of Part 5 of the EP&A Act) that was carried out after compliance with that Part (BC Act s. 2.8(1)(a)(iv))
- an approved transitional Part 3A project under Schedule 6A to the EP&A Act (BC Act s. 2.8(1)(a)(v))
- state significant infrastructure approved under Part 5.1<sup>3</sup> of the EP&A Act (BC Act s. 2.8(1)(a)(vi)).

See below for further information related to the EP&A Act. For a full list of other legislative authorities that provide a defence against prosecution for BC Act offences, see s. 2.8 of the BC Act.

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<sup>3</sup> Part 5.2 of the EP&A Act as at 21 February 2019.

## Acts authorised by regulations: codes of practice and other relevant defences

Section 2.9 of the BC Act establishes that the Biodiversity Conservation Regulation 2016 (BC Regulation) can make provisions for additional defences against prosecution for BC Act offences.

Section 2.9 of the BC Regulation establishes a defence provided by codes of practice made by the Environment Minister in relation to animals and plants. The defence applies when a person establishes that the offence was authorised by, and done in accordance with, a code of practice.

Those codes of practice can authorise the capture of a sick, injured or orphaned animal for the purposes of rehabilitation. In addition, codes of practice can authorise 'liberation' of an animal within parameters set by the code's standards, and with consideration of its guidelines. Standards and guidelines may address factors such as suitability for release, timing of release, release site selection, and release techniques.

Additional defences established by the BC Regulation<sup>4</sup> that are relevant to this policy include:

- if the act was undertaken during an emergency response carried out in relation to a marine mammal
- if the act was done in accordance with an authority given under section 171 of the *National Parks and Wildlife Act 1974*
- if the act was carried out for the protection of a distressed animal, where the animal was not capable of fending for itself
- if the picking of a protected plant occurs on private land by or with consent of the landholder.

## Acts authorised by a biodiversity conservation licence

Division 3 of the BC Act creates provisions for the issue of biodiversity conservation licences, which provide a defence against offences under the Act. Permission to undertake translocation activities with conservation, scientific or educational value may be granted under a biodiversity conservation licence. The BC Act also provides for the refusal and cancellation or suspension of a licence, as well as establishing provisions for appeals against licensing decisions.

This policy provides the framework for assessing biodiversity conservation licence (BC licence) applications where the proposal is to undertake a translocation.

## Legal protection of translocated populations

Translocated plant and animal populations are generally subject to the same protections as naturally occurring populations under the BC Act and *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Where translocations include an experimental component, proponents may seek an authority to remove or destroy the translocated population during a specified period, after which the normal protections will apply.

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<sup>4</sup> Some of these defences apply only in specific circumstances. The relevant BC Regulation provisions should be thoroughly reviewed to determine when a defence applies. If a proponent is unsure, they should contact the Department for advice.

## **Biodiversity Assessment Method**

The Biodiversity Assessment Method (BAM) was established under the BC Act, in connection with the Biodiversity Offsets Scheme, to assess biodiversity on biodiversity stewardship sites, proposed development sites, state significant infrastructure and state significant development sites, and other sites where vegetation is cleared. BAM assessments can identify: how impacts on biodiversity may be avoided or minimised; potential serious and irreversible impacts; and the offset obligation required to offset the likely biodiversity impacts of the proposed action. The BAM is also used to estimate the gain in biodiversity values from management actions at a biodiversity stewardship site.

While translocation may be identified as a management action at a stewardship site or could be used in rehabilitation of mine sites, any such action not authorised by an approval under the EP&A Act, the *Local Land Services Act 2013*, a private land conservation agreement or a joint management agreement (BC Act, s. 2.8(1)(n)) would be subject to review under this policy.

## **National Parks and Wildlife Act 1974 and National Parks and Wildlife Regulation 2009 (NSW)**

The National Parks and Wildlife Regulation 2009 (NPW Regulation) establishes offences in relation to protection of plants and animals in national parks. These include (among others) offences for:

- taking and keeping animals
- carrying, trapping, snaring, pursuing, interfering with, and possessing an animal
- picking, possessing and introducing vegetation
- undertaking research.

Division 3 of Part 2 of the NPW Regulation provides that a person only undertakes an above action lawfully if they have the consent of the park authority. Consequently, any translocation proposal affecting a park (i.e. when a park is either used as the source or recipient site) will require the consent of the relevant park authority. Harm of animals on or off-park or picking of plants within national parks may also be authorised by the Secretary of the Department of Planning, Industry and Environment under section 171 of the *National Parks and Wildlife Act 1974* (NPW Act). Translocation proponents should contact the Department for further information.

## **Wilderness Act 1987 (NSW)**

The *Wilderness Act 1987* provides the framework for the nomination, assessment, declaration and management of wilderness in New South Wales. In New South Wales, wilderness is managed by the National Parks and Wildlife Service (NPWS) according to its wilderness policy. Like all actions on parks and reserves, any translocation that affects a wilderness area requires consent from the park authority. For further information, proponents should contact the relevant local NPWS office.

## **Animal Research Act 1985 (NSW)**

Animal translocations may require approval from an animal ethics committee (AEC) under the *Animal Research Act 1985*. Organisations undertaking captive breeding may also require an Animal Supplier's Licence from the NSW Department of Primary Industries (DPI), and breeding facilities may require accreditation by DPI. Where the project is collaborative across institutions, the Australian Code for the Responsible Conduct of Research requires

that a formal written agreement should be made, covering intellectual property, confidentiality and copyright issues; sharing commercial returns, responsibility for ethics and safety clearances; and reporting. Further advice should be sought from DPI, the relevant AEC or from the [Animal Ethics Infolink](#).

## ***Exhibited Animals Protection Act 1986 (NSW)***

Where captive bred animals are exhibited to the public, authority may be conferred by a licence under the [Exhibited Animals Protection Act 1986](#) (EAP Act). The EAP Act is administered by the NSW DPI, and regulates the conditions under which exhibited animals must be kept to maximise animal welfare. A licence is required for any establishment where animals are to be displayed. Further advice should be sought from DPI.

## ***Prevention of Cruelty to Animals Act 1979 (NSW)***

Proponents of animal translocations must, at all times, act in accordance with the [Prevention of Cruelty to Animals Act 1979](#) (POCTA). POCTA provides protections for animals by establishing offences for acts of cruelty to animals, which includes any act or omission as a consequence of which an animal is unreasonably, unnecessarily or unjustifiably:

- beaten, kicked, killed, wounded, pinioned, mutilated, maimed, abused, tormented, tortured, terrified or infuriated
- over-loaded, over-worked, over-driven, over-ridden or overused
- exposed to excessive heat or excessive cold
- inflicted with pain.

## ***Environmental Planning and Assessment Act 1979 (NSW)***

The [Environmental Planning and Assessment Act 1979](#) (EP&A Act) sets out the framework for planning in New South Wales. It identifies planning approval pathways (including the relevant consent or determining authority) and prescribes required levels of environmental impact assessment (EIA) for various types of development and 'activities' defined by that Act. Planning approvals may be granted with conditions that seek to avoid or minimise environmental impacts of the proposed development. This may include undertaking a translocation. Consent authorities are strongly advised that translocation is generally not an appropriate measure to mitigate the impacts of a development and may do more harm than good where impacts to the recipient site(s)/ecosystem(s) are not appropriately assessed and addressed.

Impacts of development or activities on threatened species or ecological communities are considered under Part 7 of the BC Act, in accordance with section 1.7 of the EP&A Act. Where threatened entities are likely to be significantly affected, offset pathways must be defined in the development approval. Under the Biodiversity Offsets Scheme, translocation recipient sites may be covered by the relevant biodiversity stewardship agreement. The collection of non-threatened entities from development sites can be authorised by a development approval; however, the translocation recipient site may need to be covered by a BC licence. Proponents planning a translocation from a development site should contact the Department for advice during the planning stage.

## **BC Act defences**

The BC Act provides a defence against BC Act offences for certain actions authorised under the EP&A Act. This includes any action that is necessary for the carrying out of:

- development in accordance with a development consent under the EP&A Act
- development that is exempt development under the EP&A Act
- a Part 5 EP&A Act activity by a determining authority that was carried out following environmental assessment in the form of a determined review of environmental factors (REF)
- an activity authorised by an EP&A Act Part 5 approval
- an approved transitional Part 3A project under Schedule 6a to the EP&A Act
- State significant infrastructure approved under Part 5.1 of the EP&A Act.

## **Development and infrastructure (including environmental impact assessment)**

Development under Part 4 of the EP&A Act requires the consent of an appropriate authority, unless the development is declared by an environmental planning instrument to be exempt development.

Part 5.1 of the EP&A Act sets out the approval pathways and environmental assessment requirements for infrastructure projects that are not declared state significant infrastructure. The proponent must complete a REF. If the REF concludes there is likely to be a significant impact on the environment, an environmental impact statement (EIS) must be submitted to the determining authority.

Part 5.2 of the EP&A Act sets out the environmental assessment requirements and approval pathways for state significant infrastructure projects. All state significant infrastructure projects are subject to the development of an EIS and approval by the Minister for Planning.

## **Consultation and concurrence**

The Department has two distinct roles in EP&A Act Part 4 and Part 5 approvals. Except in the cases of state significant development or complying development:

- when the consent or determining authority is a Minister, the Minister for the Environment must be consulted for the purpose of determining whether an activity is likely to significantly affect threatened species
- when the consent or determining authority is not a Minister, the determining authority cannot carry out the activity, or grant approval to carry out the activity, if the activity is likely to affect threatened species, unless the determining authority has obtained concurrence from the Environment Agency Head.

Consultation or concurrence as described above is not required if the proponent has obtained a biodiversity development assessment report in accordance with Division 2 of Part 7 of the BC Act.

## **On-park process for environmental impact assessment**

Any person proposing to undertake an activity (as defined by s. 5.1 of the EP&A Act) may only do so following approval of an EIA by the relevant determining authority. 'Activity' includes the use of land, subdivision of land, erection of a building, carrying out of a work, demolition of building or work and any act, matter or thing defined as an activity by an applicable environmental planning instrument. It is the responsibility of the proponent to ensure all necessary approvals are identified and obtained prior to the activity proceeding.

The NPWS is the determining authority for Part 5 activities undertaken within national parks or reserves. Where a component of a translocation will occur on-park, proponents should read the NPWS Guidelines for preparing a review of environmental factors. In general, a

REF is not required for the translocation itself, but there may be preparatory or ancillary activities that trigger the requirements for a REF. For example, clearing of native vegetation (as defined in s. 60B of the *Local Land Services Act 2013*) is defined as an activity for the purpose of the *State Environmental Planning Policy (Infrastructure) 2007*. These could include creation of trails for access, landscape modification or change in land use (e.g. blocking public access to an area previously accessible to the public). The NPWS maintains the right to request a REF for any proposals on parks or reserves, whether or not actions in those proposals constitute Part 5 activities, especially where the actions proposed are likely to have significant adverse effects on a threatened species or its habitat. In those circumstances, the REF determination should consider all actions associated with the translocation to provide a more holistic assessment of ecological impact and avoid requirement for a separate licensing process.

Where a REF is requested (or required under the EP&A Act) for a translocation, proponents can download the [NPWS REF template](#). As per section 2.8(1)(a)(iv), an approved REF is a BC Act defence and a BC licence is, therefore, not required. In determining the REF, this policy will apply. In accordance with [exempt development procedures](#), where a REF is not required, the NPWS may request that the proponent undertakes a conservation risk assessment (CRA). A CRA is not a defence under the BC Act and, in these circumstances, proponents may need to obtain a BC licence if they are not subject to any other defence under the BC Act.

Proponents should contact their local NPWS regional office to discuss their proposal prior to beginning any applications or assessments. In-principle support from the relevant NPWS Area Office is a requirement for proceeding with any EIA on-park.

## ***Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)***

Actions, including translocation proposals, likely to result in significant impacts on matters protected by the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (including migratory species, threatened species or ecological communities), must be referred to the Commonwealth. The Minister for the Environment and Energy then has 20 business days in which to decide if the proposed action requires further assessment to decide if it should be approved.

Actions that result in killing, injuring, taking, moving, trading or keeping a listed threatened species or community, migratory species, and/or a listed marine species within a Commonwealth area, may require a separate permit under Part 13 of the EPBC Act.

For further information on referrals under the EPBC Act, visit the [Australian Government Department of the Environment and Energy website](#). For more information regarding the translocation of listed threatened species under the EPBC Act refer to the [\*Policy Statement: Translocation of Listed Threatened Species – Assessment under Chapter 4 of the EPBC Act\*](#).

## **Other threatened species legislation**

Each state and territory government protects native plants and animals under its own legislation. Those pieces of legislation make provisions for a relevant authority to grant permits or licences to undertake actions that would otherwise constitute offences, including the taking of protected species.

Proposals to undertake a translocation to or from another state or territory must comply with the relevant threatened species legislation in that jurisdiction. This may include obtaining a relevant import or export licence from that jurisdiction.

## **Biosecurity Act 2015 (NSW)**

Any person undertaking a translocation in New South Wales must comply with the general biosecurity duty established by the *Biosecurity Act 2015*. The general biosecurity duty requires that any person who has dealings with (e.g. moves) biosecurity matter (e.g. plants or animals) or a carrier, who knows, or ought to reasonably know, the biosecurity risk that a plant or animal poses has an obligation to ensure that – as far as is reasonably practicable – the biosecurity risk is prevented, eliminated or minimised. Failure to act in accordance with the general biosecurity duty is an offence.

Examples of ways a person could discharge their general biosecurity duty include:

- regularly monitor plants and animals for signs of pests or disease
- immediately notify relevant authorities of suspected prohibited matter or notifiable matter (see Part 6 of Biosecurity Regulation 2017)
- isolate potentially infected plants and animals, carriers or premises
- maintain records to assist pest and/or disease tracing.

Where a proponent considers that a translocation is likely to pose a biosecurity risk, they should contact the NSW DPI Biosecurity and Food Safety Division<sup>5</sup> to discuss the proposal and determine if a risk assessment is required, identify appropriate risk mitigation activities, and determine if a permit is required. Dealings with 'prohibited matter' are strictly prohibited, unless authorised by a prohibited matter permit. Permits issued under the Biosecurity Act, while requirements of that Act, are not an authority to undertake a translocation (see Appendix C for further information on authority to undertake a translocation).

## **Other biosecurity legislation and agreements**

The Commonwealth, state and territory governments enact legislation to protect their economies, environments and communities against biosecurity threats (i.e. pests and diseases). Translocation proponents are responsible for ensuring they act in accordance with relevant biosecurity legislation when undertaking translocation into or out of another jurisdiction.

The *Biosecurity Act 2015* (Commonwealth) provides authorised officers with powers to gather information, assess the level of biosecurity risk, undertake biosecurity measures, manage biosecurity risks and monitor biosecurity risks where a pest or disease is present in Australian territory. State and territory biosecurity legislation operates concurrently with the Commonwealth legislation.

The Intergovernmental Agreement on Biosecurity (IGAB) is an agreement between the Commonwealth, state and territory governments, with the exception of Tasmania. It was developed to improve the national biosecurity system by clarifying government roles and responsibilities and identifying opportunities for collaboration on biosecurity issues. The IGAB establishes arrangements, structures and frameworks that reduce the likelihood of exotic pests and diseases establishing in Australia, prepare for and respond to incursions of exotic pests and diseases into Australia, and ensure that significant pests and diseases present in Australia are appropriately managed.

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<sup>5</sup> NSW DPI Biosecurity Hotline: 1800 680 244

## Other guidelines

This policy was developed in accordance with the Guidelines for the translocation of threatened plants in Australia (Commander et al. 2018), the IUCN guidelines for reintroductions and other conservation translocations (2013), the IUCN position statement on translocation of living organisms (1987), and the IUCN technical guidelines for the management of *ex-situ* populations (2002). This policy prescribes the use of the following documents in preparing proposals for animal translocations:

- Manual of Procedures for Wildlife Disease Risk Analysis (Jakob-Hoff et al. 2014)
- Guidelines for Wildlife Disease Risk Analysis (OIE/IUCN 2014)

# Appendix B: Overview of translocation and *ex situ* conservation

## Overview

Translocation can be a conservation tool when associated with landscape restoration and threatened species conservation. For some species, translocation may be the only practical route to long-term viability, and for some ecosystems, it is the only means of re-establishing important component species.

In Australia, translocation efforts for animals are complicated by the prevalence of introduced predators, meaning translocations often take place in fenced, predator-free exclosures, on islands, or in intensively predator-controlled areas. Plant translocations present practitioners with unique challenges, such as seed propagation, sensitivity to environmental factors (e.g. soil characteristics), relationships with (and dependence on) microorganisms and pollinators, and long lifecycles, which can make determination of success difficult.

This short paper briefly discusses the different types of translocation and their applications, and other factors to consider when planning a translocation. It is by no means an extensive review of the scientific literature on translocation, and readers are encouraged to read more broadly on the topic.

## Translocation

Translocation is the intentional, human mediated movement of organisms to an area beyond where they could reasonably be expected to move without human intervention.

Translocation may include moving species to a new location (introduction), moving species to a location where they formerly occurred (reintroduction), moving species to locations where an extant population occurs (reinforcement) or establishing an *ex situ* population.

Conservation translocations are undertaken with the intent to provide a measurable conservation benefit at the population, species or ecosystem levels (i.e. not strictly benefitting translocated individuals; IUCN/SSC 2013). Mitigation translocations (also known as salvage translocations) are undertaken to move organisms out of harm's way, usually from a development site.

## Introduction

Introduction is the intentional release of an organism to an area outside its native range. This type of translocation may be undertaken to establish new populations of a threatened species when there are no remaining suitable (or insufficient) habitats within the organism's native range. It has also been proposed to address the threats posed by a rapidly changing climate (see below for further discussion on climate change).

A lack of suitable habitat within a species' contemporary range may occur due to a range of factors, including habitat destruction, pervasive invasive predator populations and climate change. There are, for example, ongoing, privately-undertaken efforts to introduce the US-native tree Florida torreya (*Torreya taxifolia*) into the Southern Appalachians and United States Cumberland Plateau (Barlow & Martin 2004) due to the threat of climate change. Twelve captive bred western swamp turtles (*Pseudemydura umbrina*) were translocated approximately 250 kilometres south of their native range in Western Australia because ongoing dry conditions threatened persistence in their native range. The goal of this project is to assist the migration of a declining species to regions that are climatically-suitable and will remain suitable for the foreseeable future. To date, these are the only two examples of

translocations of species outside their native range to save them from the threat of climate change.

Alternately, species introduction may be undertaken to attempt to fill an ecological role made vacant by the extinction of an ecologically similar species ('ecological replacement'; Seddon 2010; IUCN/SSC 2013). For example, the Australian Wildlife Conservancy (AWC) introduced the woylie (*Bettongia penicillata* subspecies *ogilbyi*) to fenced exclosures in New South Wales, where the brush tailed bettong (*B. penicillata* subspecies *penicillata*) – a close relative – is presumed extinct.

This type of translocation generally carries with it higher risks than reintroductions and reinforcement translocations. The IUCN states 'introductions of species outside their indigenous range can frequently cause extreme, negative impacts that can be ecological, social or economic, are often difficult to foresee, and can become evident only long after the introduction' (IUCN/SSC 2013).

## Reintroduction

Reintroduction is the intentional release of an organism to a location where it formerly occurred, but where there is no extant population. This type of translocation may be used to re-establish extinct populations or restore ecological functions and should only be undertaken after the cause of decline has been effectively ameliorated. Where the threats are unknown, trial translocations may provide a useful tool for better understanding factors causing decline (e.g. Priddel & Wheeler 1994, discussed at 11.2.2).

The AWC has undertaken multiple reintroductions into privately owned sanctuaries from which introduced predators have been intensively controlled. For example, in 2004 and 2005, burrowing bettongs (*Bettongia lesueur*), brush tailed bettongs (*B. penicillata*), greater bilbies (*Macrotis lagotis*) and bridled nailtail wallabies (*Onychogalea fraenata*) were reintroduced to Scotia Sanctuary in western NSW, following the removal of foxes, cats, goats and rabbits (Finlayson et al. 2008). That study – aimed at exploring habitat use of cohabiting marsupials – revealed distinct diurnal resting habitats, but more or less random nocturnal foraging site preferences, among the four study species.

Smith et al. (2009) reintroduced an endangered orchid, *Diuris fragrantissima*, to sites within its native range in Melbourne, and found that the addition of symbiotic mycorrhizal fungus, together with soil aeration, improved the success of plants reintroduced during spring, but not of those reintroduced during autumn.

## Reinforcement

Reinforcement (sometimes referred to as 'augmentation', 'supplementation', 'enhancement', or 're stocking') is the intentional release of an organism(s) into existing populations of the same species. This type of translocation is often undertaken to increase local population size and counter the adverse effects of reduced genetic diversity in small or isolated populations.

Ongoing work in the Snowy Mountains aims to maintain and strengthen populations of the southern corroboree frog (*Pseudophryne corroboree*) (Hunter et al. 1999; Hunter et al. 2010a), which is threatened by chytrid fungus (Hunter et al. 2010b). Experiments have shown that releasing tadpoles into artificial tubs in the field reduces their risk of acquiring a chytrid fungus infection. Furthermore, the release of four-year-old captive bred frogs also increases the likelihood of translocated individuals reaching sexual maturity.

The Nielsen Park she oak (*Allocasuarina portuensis*) was discovered in 1986, with a population of only 10 individuals (NSW National Parks and Wildlife Service 2000). Efforts to conserve the species have focused on the maintenance of an *ex situ* plant population, which has been used to reinforce the natural population. All 10 of the original naturally occurring

population have since died and the existing population is made up entirely of individuals propagated *ex situ*.

## Genetic rescue

Genetic rescue is a type of reinforcement translocation where the objective is to increase genetic diversity in the recipient population. This can generally be achieved by introducing individuals from a more genetically diverse or genetically-distinct population. Genetic rescue has been a contentious issue due to debate about the risks of outbreeding depression (Tallmon et al. 2004), though the risks are predictable and small compared to those of inbreeding depression (discussed further under 'Population genetic considerations'). With populations becoming increasingly fragmented due to anthropogenic disturbance, genetic rescue has been suggested as a tool for ongoing genetic management of plants and animals (Ralls et al. 2018).

Frankham et al. (2017) identified 29 threatened species and populations that have been subject to reinforcement for genetic rescue. Following its discovery in 1996, the Mount Buller mountain pygmy possum (*Burramys parvus*) population experienced rapid decline (Heinze et al. 2004) and loss of genetic diversity (Mitrovski et al. 2008). Subsequent reinforcement with healthy males from a genetically divergent population (along with habitat restoration, predator control and environment protection) led to population growth and an increase in genetic variation within a few generations (Weeks et al. 2017).

Pickup and Young (2008) demonstrated the benefits of genetic rescue in the self-incompatible button wrinklewort (*Rutidosia leptorhynchoides*). Small populations with reduced genetic diversity can experience reduced genetic variation at the self-incompatibility locus; a gene that affects the ability of the plants to self-pollinate or pollinate among related individuals, having significant demographic consequences in small populations. The authors found that fertilisation success in small populations increased dramatically when crossed with individuals from divergent populations.

## Ex situ conservation

'*Ex situ*' conservation is difficult to define, given that many conservation management programs involve some level of intervention (e.g. provision of food and water, threat management, etc). IUCN/SSC (2014) places conservation actions on a spectrum, with completely unmanaged populations at one (*in situ*) end and populations completely dependent on management at the other (*ex situ*) end. Management actions at the extreme *ex situ* end of the spectrum include the storage of seeds in a seedbank, seed propagation in facilities such as laboratories or greenhouses, or maintaining and breeding animal populations in a laboratory.

While *in situ* conservation is generally favoured over *ex situ* conservation, many translocations are undertaken using a combination of the two, due to the potential impacts of the removal and movement of whole plants from naturally occurring populations (Menges 1991). Monks and Coates (2002) translocated *Acacia aprica* and *A. cochlocarpa* subspecies *cochlocarpa* in Western Australia using treated seeds germinated on agar plates. Importantly, *ex situ* techniques can be refined to increase the probability of germination (e.g. Cochrane et al. 2002) and offer a unique opportunity to improve understanding of species' seed biology.

Efforts to conserve the southern corroboree frog (discussed under 'Reinforcement') involve an *ex situ* component, whereby frogs are raised in captivity prior to release. This reduces the risks associated with chytrid exposure during development and prior to sexual maturity.

## Motivations for translocation

### Conservation of threatened species

The IUCN (2013) states ‘the beneficiaries [of conservation translocation] should be the populations of the translocated species, or the ecosystems that it occupies ... not only ... translocated individuals’. There are many strategies that can be employed for conservation translocations (Seddon 2010), including introductions, reintroductions and reinforcement, and individuals may be sourced from naturally occurring, or captive bred animal or *ex situ* plant populations.

Proponents of conservation translocations must weigh the potential conservation benefits of the translocation against the potential impacts of removing individuals from the source population, risk of negative impacts at the source site (e.g. introduction of disease, human disturbance) and at the recipient site, and the potential disadvantage of diverting resources from other conservation actions that may achieve higher levels of success (Bennett et al. 2017).

### Scientific research and trial translocation

Translocations may be undertaken to improve knowledge of the factors influencing translocation outcomes. These may be undertaken as trial translocations (i.e. small-scale translocations undertaken to inform larger, subsequent projects) or experimental translocations (i.e. controlled and replicated manipulative experiments) (Kemp et al. 2015). Trial translocations are more common and often more feasible than experimental translocations because of the limited availability of individuals of threatened species. As these translocations aim to improve knowledge, it may be pertinent to set explicit short-, medium- and long-term goals to allow proponents to establish and test key hypotheses.

Priddel and Wheeler (1994) reintroduced and monitored malleefowl (*Leipoa ocellata*) in Yathong Nature Reserve (NSW) in a trial translocation to identify the original cause of decline in natural local populations, which had been attributed to habitat loss, predation by invasive species, overgrazing, and predation by native raptors. Their study found that 94% of individuals released were killed by (mostly introduced) predators.

Most plant translocations reported in the scientific literature are undertaken as scientific experiments. For example, experimental translocations helped to identify microsite properties influencing successful establishment of *Prostanthera eurybioides*, and herbivore grazing and weed competition as important factors for *Acacia cretacea* and *A. whibleyana* reintroduction (Jusaitis 2005).

The potential increase in scientific understanding from these types of translocations needs to be considered against the potential impacts on source populations and recipient ecosystems.

### Climate change

Assisted colonisation has been proposed as a conservation strategy for species for which the pace of adaptation or colonisation may not match that of climate change (Hoegh-Guldberg et al. 2008). Given the unprecedented nature of climate threats to species, assisted colonisation may be considered for species with a broad range of conservation statuses (IUCN/SSC 2013). Gallagher et al. (2015) identified habitat loss, changing restoration priorities, exposure to stressors, and replacement of a lost ecosystem function or service as scenarios that could predispose species to the need for assisted colonisation under climate change.

Moving species to combat threats posed by climate change is a contentious issue due to the unknown and potentially harmful impacts at the recipient site (Schlaepfer et al. 2009; McLachlan et al. 2007; Ricciardi & Simberloff 2009a; Sax et al. 2009; Schwartz et al. 2009) and the threat of introduced species becoming invasive (Wilcove et al. 1998; Butchart et al. 2010). However, the risks associated with inaction are particularly pertinent in this context due to the impending widespread loss of suitable habitats for many species (Ricciardi & Simberloff 2009b; Sax et al. 2009; Schwartz et al. 2009).

Burbidge et al. (2011) suggested that some policy and procedural considerations would be required to facilitate widespread adoption of assisted colonisation as common practice in Australia. These include improvements to:

- risk analysis (e.g. risk of invasiveness, moving beyond the area of suitable climate, failure to establish)
- genetic management
- monitoring and determinants of success
- consideration of associated species (e.g. pollinators, symbiotic microorganisms)
- consistency in evaluation and approval processes.

Although this strategy for conserving species threatened by climate change is expected to become more important in the future (Gallagher et al. 2015), it is still considered by some researchers and practitioners as far less desirable than other strategies, based on a survey by Hancock and Gallagher (2014). This reflects a general lack of understanding of the risks and uncertainties associated with assisted colonisation. A precautionary, case by case, experimental approach is, therefore, the most appropriate way to consider proposals for assisted colonisation until a better understanding of the risks and consequences is developed or data are available as evidence of the cause of decline.

### Translocation of (non-threatened) protected animals

Translocation of protected fauna is sometimes proposed to deal with locally over-abundant animal populations, or pest or nuisance animals or populations. Jones and Neelson (2003), for example, documented the translocation of 141 Australian magpies that showed aggressive behaviour towards humans.

Translocations are typically unsuccessful when used to deal with problem animals (Fischer & Lindenmayer 2000). This is often due to competition with resident populations at carrying capacity but can also be the result of human interactions, stress, or even dispersal and homing behaviour of translocated individuals.

Translocation of protected fauna may also be proposed to improve or restore ecosystem health/function. This could involve reintroducing a species to restore ecosystem function or translocating a species to fill an ecological niche left vacant by the local extinction of a closely related species. The latter was the motivation for the AWC introduction of the woylie (*B. penicillata* subspecies *ogilbyi*) to Scotia Sanctuary following local extinction of the closely related subspecies, the brush tailed bettong (*B. penicillata* subspecies *penicillata*; see 'Introduction' above). Alternately, a non-threatened species could be reintroduced to a site they formerly occupied to improve ecosystem health. In 2017, the AWC began a project to reintroduce brown antechinus (*Antechinus stuartii*) to North Head in Sydney.

Proponents for the translocation of non-threatened fauna need to consider animal welfare outcomes for translocated animals, detrimental impacts on recipient populations and ecosystems, and whether translocation is a sensible use of resources, given the likelihood of success.

## Mitigation translocation (salvage)

Mitigation translocation, or salvage, of plants or animals from development sites is sometimes authorised in development consents and approvals. This may involve the movement of plants or animals from a development site to a location with largely intact habitat.

Germano et al. (2015) argue that mitigation translocations are generally inappropriately planned and executed, poorly documented and fail to align with broader, strategic conservation goals. Consequently, they often do not adhere to scientific best practice and do not provide learning opportunities. Nevertheless, there are examples of apparent successes. An ongoing example is the large-scale effort to translocate *Cycas megacarpa* as part of the Australia Pacific Liquefied Natural Gas Project in south-east Queensland. In addition, translocation of koalas from habitat in the construction path for the Oxley Highway on the NSW mid-north coast was deemed successful following a four-year monitoring program.

While there are examples of successful mitigation translocations in the short-term, there have been very few known long-term successes. It is difficult, however, to determine whether this is due to a lack of monitoring and documentation or actual failed translocations.

Proponents of mitigation translocations need to consider: whether it is the most appropriate use of resources, given the historically low likelihood of success; habitat suitability and carrying capacity of the recipient site; and maximising welfare outcomes for translocated animals.

## Emergency collections

Emergency collections involve the removal of individuals or populations of threatened species that are in danger from a serious imminent threat (e.g. wildfire, disease outbreak, oil spill). Collected individuals may be held until the threat has been ameliorated. By their nature, emergency collections require an immediate response and a detailed plan is not always practical; though the eventual release of individuals should be preceded by careful planning.

Emergency collections need to consider whether the perceived threat warrants action and whether appropriate *ex situ* facilities and techniques are available to ensure positive conservation outcomes.

## Other important considerations

### Population genetic considerations

Population genetics of translocated populations is becoming a key priority for conservation biologists, as evidenced by the evolution of genetic considerations in the IUCN guidelines for reintroductions and translocations (IUCN/SSC 1987; 1998; 2013). Failure to adequately manage the genetics of translocated populations can have adverse short-term effects (e.g. spread of disadvantageous genes) and long-term effects (e.g. loss of evolutionary potential). Population genetic tools can be utilised to select founder individuals for translocated populations (Pacioni et al. 2013; IUCN/SSC 2013); identify the potential need for genetic management of an extant population and identify populations and individuals to use for population reinforcement (Frankham et al. 2017); and complement other demographic measures (e.g. population size) in assessing translocation success (Goossens et al. 2002; IUCN/SSC 2013). In the future, new genomic technologies and techniques, such as CRISPR/Cas9 and introgression of advantageous transgenes (e.g. American chestnuts; Popkin 2018), may be able to help conservationists better manage the genetics of translocated populations.

Maximising genetic diversity to facilitate adaptation is critical for translocation and *ex situ* management, whether that involves augmenting naturally occurring populations or capturing genetic diversity in captive animal or *ex situ* plant populations. This does not mean, however, that other important ecological factors can be overlooked in planning a reinforcement. Efforts to increase genetic diversity in the large, genetically depauperate Wedge and St Peter Island woylie (*B. penicillata* subspecies *ogilbyi*) populations, for example, likely failed because the release habitats were at maximum carrying capacity. For captive bred animal populations, maintenance of genetic diversity and minimisation of genetic adaptation should be addressed in captive management plans. Frankham (2008) reviewed means to minimise genetic adaptation to captivity, including minimising the number of generations in captivity, delaying reproduction, equalising family sizes to minimise selection and deliberate fragmentation to reduce genetic diversity and thereby minimising the effectiveness of selection in captivity. Following a subsequent review, Williams and Hoffman (2009) concluded that minimising the number of generations in captivity is likely the most effective way to reduce genetic adaptation in captivity. When this is not possible, they suggest delaying reproduction, and then cryopreservation of germplasm (i.e. gene banking). Genetic diversity of plant populations may be maximised through reinforcement using diverse seed sourcing regimes (Neale 2012). Where possible, experimental approaches (such as common garden experiments) should be considered to determine appropriate source populations or vegetative material for translocation.

Professional organisations like the Zoo and Aquarium Association (animals) and the Australian Network for Plant Conservation (plants), produce useful resources for *ex situ* conservation.

### **Inbreeding and outbreeding depression**

There are inherent genetic risks associated with establishing new populations or introducing new individuals to existing populations. When establishing a new population, failure to capture sufficient genetic diversity of the source population and failure to maintain steady population growth may result in inbreeding depression. Inbreeding depression occurs when pervasive mating between relatives leads to a decrease in heterozygosity (i.e. the presence of different gene copies within an individual) and subsequent decrease in fitness resulting from increased frequency of individuals homozygous for deleterious genes (Keller & Waller 2002). The magnitude of inbreeding effects can vary among populations in different environments (Frankham et al. 2017). Even when inbreeding depression is not observed, however, inbred species and populations are at risk from reduced adaptive potential (Hoffmann et al. 2017).

While inbreeding depression is an important consideration for translocated populations, naturally-occurring populations are also subject to its effects. In the Barrow Island black footed rock wallaby (*Petrogale lateralis*) population, for example, inbreeding resulted in reduced female fecundity, skewed sex ratio and fluctuating levels of bilateral symmetry, albeit over 8000 years (Eldridge et al. 1999), though altered sex ratios and asymmetry are not reliable indicators of the impacts of inbreeding (Vøllestad et al. 1999; Gilligan et al. 2000; Frankham & Wilcken 2006). Populations under stress are more likely to experience higher levels of inbreeding depression (Armbruster & Reed 2005), putting translocated populations at risk (see section below on animal welfare).

When reinforcing threatened populations, it may seem advantageous to translocate genetically diverse, and perhaps divergent, individuals to avoid inbreeding depression. Introduction of new genes into a population may, however, introduce incompatibilities that reduce fitness, especially if the source and recipient populations exhibit a high level of local adaptation (Templeton et al. 1986). This effect is called outbreeding depression and has led to an assumption that individuals (particularly plants) should be sourced from as near the recipient site as possible. Generally, though, it has been suggested that the risks of

outbreeding depression resulting from translocation have been overstated (Frankham et al. 2011; Weeks et al. 2011). Frankham et al. (2011) developed a decision tree that predicts the probability of outbreeding depression from crosses between two populations with an accuracy of over 90% (Frankham 2015) and subsequently showed that benefits of genetic rescue are observed until at least the F3 generation (and beyond) (Frankham 2016). Genetic rescue benefits have been observed in generations up to F5 or F10 (Bijlsma et al. 2010), even up to F16 (Frankham et al. 2017), in outbreeding species; but persistence of those benefits is not expected in habitual selfing species (Frankham et al. 2017; Frankham 2018).

Empirical evidence of local seed source (provenance) superiority is equivocal (Pickup et al. 2012; Hancock et al. 2013; Hancock & Hughes 2014; Breed et al. 2016; Gellie et al. 2016) and is often performed under local conditions, rather than being future-focused. Provenance strategies are increasingly looking to maximise genetic diversity and adaptive capacity (Broadhurst et al. 2008, Breed et al. 2013, Prober et al. 2015). These strategies recommend the inclusion of non-local provenance with local provenance germplasm for better restoration outcomes, especially over broad geographic scales and under climate change.

### **Legal protection of hybrid plants and animals**

Any introduction translocation should consider the potential for hybridisation between the translocated species and species at the recipient site. Hybrids are not recognised under NSW or Commonwealth threatened species legislation. The legal protections of translocated threatened plants may be compromised if hybridisation becomes pervasive. In contrast, hybrid animals are still considered 'protected animals' under the BC Act, and still afforded legal protections.

### **Animal welfare**

Welfare issues span all aspects of vertebrate animal translocation; from even before moment of capture to captive breeding and following release (Dickens et al. 2010). Translocation may expose animals to multiple, continuous novel stressors which may cumulatively have a negative impact (Parker et al. 2012). Animals may also have existing health conditions that can become worse with stress, and these may not always be apparent at the time of capture. Actions likely to induce stress include capture, health screening, holding, transport and release (including adaptation to a new environment), and it is important to understand how they affect animal welfare and translocation success, and how best to support the animals throughout the entire translocation process (Parker 2017).

Holding an animal post-capture may induce both acute and chronic stress (Dickens et al. 2010). Proponents seeking to capture animals for translocation or to establish captive breeding animal populations must consider a range of potential stressors, including sensory stimuli and those specific to the confinements. For example, the emission of ultrasonic and infrasonic sound in laboratories has the potential to cause distress in captive animals (Morgan & Tromborg 2007). Ideally, holding environments should mimic the natural environment of the animal population as much as possible and reduce exposure to stress inducing situations and stimuli. This is not always possible, but practitioners must adhere to the *Prevention of Cruelty to Animals Act 1979*, which prohibits acts that cause harm or distress to animals.

Even once released, stress may continue to affect translocated individuals. For example, stress induced emaciation caused one-fifth of post-release deaths in elk released in Ontario, Canada (Rosatte et al. 2002). Post-release stress may be managed by considering a number of factors, including time of release (day/night, weather conditions, etc.), method of release, releasing animals in social groups, and release site selection. Appropriate site selection, for example, can mean the availability of food and shelter. Monitoring and

documentation of welfare outcomes allows for continued improvement in ethical translocation practices and increased translocation success.

In the past decade or so, there has been a rapid increase in public awareness and concern over animal welfare. This is evidenced by an increase in animal rights groups and scientific endeavour in this field (Marchante-Forde 2015). As translocation actions are typically carried out by (or in partnership with) organisations dependent on public funding (e.g. government agencies, non-government organisations), they are also dependent on public support. Ensuring favourable welfare outcomes for translocated individuals is, therefore, crucial.

### **Animal ethics committees**

The maintenance of welfare for animals subject to research is regulated in New South Wales by the *Animal Research Act 1985* (AR Act) and the Australian code for the care and use of animals for scientific purposes (the Code; National Health and Medical Research Council 2013). While the AR Act provides the legislative framework for animal research, the Code provides an ethical framework and governing principles to guide decisions and actions of all those involved in animal research.

Proponents seeking to undertake research that involves an animal translocation or establishing a captive breeding animal population must first gain approval from an animal ethics committee (AEC). Most accredited research institutions have their own AEC, which must be comprised of at least:

- one veterinarian
- one animal researcher
- one person with a commitment to animal welfare who is not associated with animal research
- one independent person who has no association with animal research or the proposing research establishment.

The Department is serviced by an AEC comprised of two members from each of the above categories. For approved projects, approval from the AEC is granted for 12 months and an annual report is required to determine whether approval should be extended for another 12 months (to a maximum of three years, when a new application is required). Proponents are encouraged to engage the relevant AEC in the early stages of planning to ensure all aspects of the project comply with the AR Act and the Code.

### **Removal of threats and co-dependence of associated species**

Reintroduction proposals should be supported by strong evidence that the cause of the local extinction has been removed or reduced (IUCN/SSC 2013). Failure to address the cause of the initial decline will almost certainly result in an unsuccessful reintroduction. For example, Short et al. (1992) showed that fox and cat predation was responsible for multiple failed marsupial translocations in Western Australia and New South Wales. Where the cause of decline is not known, trial translocations may provide a useful mechanism to better understand the causative factors.

Translocation success in some species might require the (natural or human mediated) presence of co-dependent species at the translocation site. Many plant species depend on pollinating insects for reproduction, for example. Orchids share obligate relationships with mycorrhizal fungi (which aid the acquisition of nutrients from the soil) and highly host specific pollinator species. A review of global orchid translocations by Reiter et al. (2016) suggested that while translocated orchids can survive in the absence of mycorrhizae and pollinators, they are unlikely to reproduce. These factors need to be considered when planning a

translocation, particularly when developing criteria for success (which usually include reproducing, self-sustaining populations).

## Determining translocation success

Translocation success should be measured against defined criteria set out by the proponent. These criteria will tend to be highly specific to projects due to inherent differences between species, ecosystems and translocation purpose. For example, translocation success criteria in species with longer generation times will generally require more time to be met when compared to species with shorter generation times. Trial or experimental translocations may set out explicit questions or goals that vary markedly from those that could be expected for conservation translocations. Importantly, an experimental translocation where all organisms die may still be considered successful if it addresses specific questions or hypotheses raised in the proposal. Consequently, success criteria should be tailored for each translocation, based on defined objectives.

Criteria for translocation success need to address all aspects of a translocation and an exit strategy should be developed before implementing a translocation. Of particular importance to an exit strategy is the clear definition of translocation failure. This should link back to the objectives of the translocation and identify thresholds for intervention and triggers for implementing the exit strategy. Developing appropriate criteria for success is crucial for enhancing conservation outcomes. A common criterion for success is population establishment; however, there is a clear distinction between population establishment and population persistence, which should be recognised in translocation planning (Armstrong & Seddon 2007). Failure to recognise this distinction may lead practitioners to incorrectly determine that a translocation has been successful; for example, Drayton and Primack (2000) reported the successful translocation of eight perennial wildflower populations in North America after five years, only to find that all had died within 15 years of translocation (Drayton & Primack 2012).

The goal of most translocations should be population persistence, i.e. a viable, self-sustaining population which reproduces through continuous generations without intervention (Fischer & Lindenmayer 2000; Commander et al. 2018; IUCN/SSC 2013). An exception to this is experimental translocation (see Priddel & Wheeler 1994 and Zimmer et al. 2016 for examples). An often-overlooked factor of translocation success is whether there are persistent impacts or benefits to other biota at the source and translocation sites. Determining success in this aspect requires long-term data to (1) establish baseline measures and (2) monitor biotic responses to the translocation.

The determination of translocation success necessitates the identification of short- and long-term goals and structured monitoring regimes to directly address success criteria or research questions (Fischer & Lindenmayer 2000; Commander et al. 2018; Armstrong & Seddon 2007). This would allow practitioners to track the progression of translocated populations over discrete timeframes and even assess how the prescribed criteria relate to long-term outcomes, if at all. Perhaps most importantly, it may allow practitioners to identify potential causes of translocation failure (e.g. Bennett et al. 2012) and inform future translocation efforts.

## Notable threatened species translocations in New South Wales

Translocation is complex with an historically high rate of failure (Fischer & Lindenmayer 2000; Godefroid et al. 2011). This is likely due to a lack of careful planning (including a lack of clear objectives) and understanding of the factors that contribute to translocation success

and failure. While translocation continues to be pursued as a viable conservation strategy, there should be an ongoing focus on meticulous planning, monitoring and evaluation.

Some notable threatened species translocations undertaken in New South Wales include:

- establishment of propagated Tumut (*Grevillea wilkinsonii*) and Wee Jasper (*G. iaspicula*) grevilleas within known habitat in south-east NSW
- ongoing reinforcement of spotted tree frog (*Litoria spenceri*) populations in south-east NSW using captive bred individuals
- maintenance of the Nielsen Park she oak (*Allocasuarina portuensis*) population using material propagated artificially
- introduction and successful establishment of Gould's petrel (*Pterodroma leucoptera*) on Boondelbah Island (Priddel et al. 2006)
- reintroduction of the bridled nailtail wallaby, greater bilby, woylie, greater stick nest rat (*Leporillus conditor*) and numbat (*Myrmecobius fasciatus*) within the Scotia Sanctuary in western NSW
- failed attempts to establish populations of bridled nailtail wallaby and parma wallaby (*Macropus parma*) on Pulbah Island in Lake Macquarie, and brush tailed rock wallaby near Wombeyan Caves (Short et al. 1992)
- experimental translocation of Wollemi pine (*Wollemia nobilis*) in the Blue Mountains (Zimmer et al. 2016)
- introduction of Coastal Fontainea (*Fontainea oraria*) in north-east NSW
- reintroduction of eastern bristlebird (*Dasyornis brachypterus*) in Jervis Bay and the Illawarra (Baker et al. 2012)
- salvage translocation of the purple copper butterfly (*Paralucia spinifera*) following road construction near Lithgow (Mjadwesch & Nally 2008).

#### Authorisation for translocation

The BC Act is the key piece of legislation offering protections to native plants and animals in New South Wales. The BC Act establishes offences in relation to biodiversity. These acts include:

- harming an animal that is (1) of a threatened species, (2) part of a threatened ecological community, or (3) a protected animal
- picking a plant that is (1) of a threatened species, (2) part of a threatened ecological community, or (3) a protected plant
- damaging declared areas of outstanding biodiversity value
- damaging habitat of a threatened species or ecological community
- liberating (1) an animal other than a captured protected animal, or (2) a captured protected animal in a place other than the place of its capture.

Division 2 of Part 2 of the BC Act outlines defences against the offences prescribed under the Act. This includes a defence if the act was necessary for the carrying out of development in accordance with a development consent. Division 3 of Part 2 of the BC Act contains provisions for the issue of biodiversity conservation licences, which can provide a defence against acts that would otherwise constitute offences.

The Department of Planning, Industry and Environment issues biodiversity conservation licences in New South Wales. A biodiversity conservation licence may be granted to undertake actions related to translocation and the establishment of captive breeding animal or *ex situ* plant populations. Importantly, each licence is issued for specific actions undertaken over specified timeframes.

Where related to a development, authority to undertake a translocation may be provided through a development approval. Further information on authorisation to undertake a translocation can be found in Appendices A and C.

## Appendix C: Is a translocation proposal required by the Department and what is the appropriate authority?

The tables below outline when a translocation proposal (TP) is required by the Department to determine applications to undertake a translocation. They also identify the appropriate authority under different circumstances.

Note that **all** translocations to or from national parks require park authority consent under Division 3 of Part 2 of the NPW Regulation, regardless of authority and whether a TP is required from the Department.

**Table 1**      **Animal translocations**

Purpose or circumstance of translocation	TP required?	Relevant authority
Research, conservation, science	Yes	Biodiversity Conservation (BC) licence
Staff implementing a <i>Saving our Species</i> strategy	Yes	BC Act (s. 2.8(1)(o))
Problem animals managed using proven methods	No	BC licence
Problem animals where no proven methods are available	Yes	BC licence
Emergency collection	No <sup>6</sup>	BC licence
Captive breeding program	Yes <sup>7</sup>	BC licence <sup>8</sup>
Development proposal	No	Development consent, approval or authority <sup>9</sup>

<sup>6</sup> Release of animals collected in response to an emergency will require a translocation proposal if the site of release is not consistent with release site considerations in a relevant code of practice.

<sup>7</sup> A separate or amended translocation proposal is required for the release of captive bred animals.

<sup>8</sup> An authority under the *Animal Research Act 1985* or the *Exhibited Animals Protection Act 1986* may also be required. Proponents should contact the Department of Primary Industries for advice.

<sup>9</sup> However, a BC licence may be required if the release site is not covered by the development consent, approval or authority.

**Table 2 Plant translocations**

Purpose or circumstance of translocation	TP required?	Relevant authority
Research, education or conservation where vegetative material is already in the proponent’s possession or where vegetative material will not be sourced from the wild	No	None required under the BC Act <sup>10</sup>
Research, education or conservation where vegetative material will be sourced from the wild	Yes	BC licence <sup>11</sup>
Staff implementing a <i>Saving our Species</i> strategy	Yes	BC Act (s. 2.8(1)(o))
Emergency collection	No	BC licence
Establishment of an <i>ex situ</i> threatened plant population	Yes	BC licence <sup>11</sup>
Development proposal	No	Development consent, approval or authority (EP&A Act)

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<sup>10</sup> Land owner/manager consent may be required. For example, see information on the National Parks and Wildlife Regulation in Appendix A.

<sup>11</sup> Authority to pick and propagate must consider the risks and potential impacts of the translocation.

# Appendix D: Process for applying to undertake a translocation

## Step 1: Read this policy and relevant legislation

## Step 2: Scope your translocation

### Authorisation by a development consent or approval

If the translocation action is authorised by a development consent or approval, proceed with the action in accordance with the consent or approval conditions. If the action is not approved by a development consent or approval, consider whether the action is an emergency collection.

### Emergency collections

If the action is an emergency collection, apply for a biodiversity conservation licence; a translocation proposal is not required. If the action is not an emergency collection, consider whether the purpose of the action is establishing a captive breeding or *ex situ* population.

### Captive breeding or *ex situ* populations

If the purpose of the action is establishing a captive breeding or *ex situ* population, consider whether the target species is listed as either threatened or protected under the BC Act. If it is, proceed to Step 3. If it is not, a licence is not required for the action. Approvals under other legislation may still be required.

If the purpose of the action is not to establish a captive breeding population or *ex situ* population, consider whether the target species is a plant or an animal.

### Plants

If the target species is a plant, consider whether it is listed as threatened or protected under the BC Act. If it is not, a biodiversity conservation licence is not required. Approvals under other legislation may still be required.

If the target plant species is listed as threatened or protected under the BC Act, consider whether the vegetative material will be sourced from a wild population. If not, a biodiversity conservation licence is not required. Approvals under other legislation may still be required. If vegetative material will be sourced from a wild population, proceed to Step 3.

### Animals

If the target species is an animal, consider whether the purpose of the action is conservation or to manage human-wildlife interactions. If the purpose is conservation, proceed to Step 3.

If the purpose of the action is to manage human-wildlife interactions, consider whether the action will employ methods that have been tested and proven to be effective. If so, apply for a biodiversity conservation licence; a translocation proposal is not required. If the action will not employ tested and proven methods, proceed to Step 3.

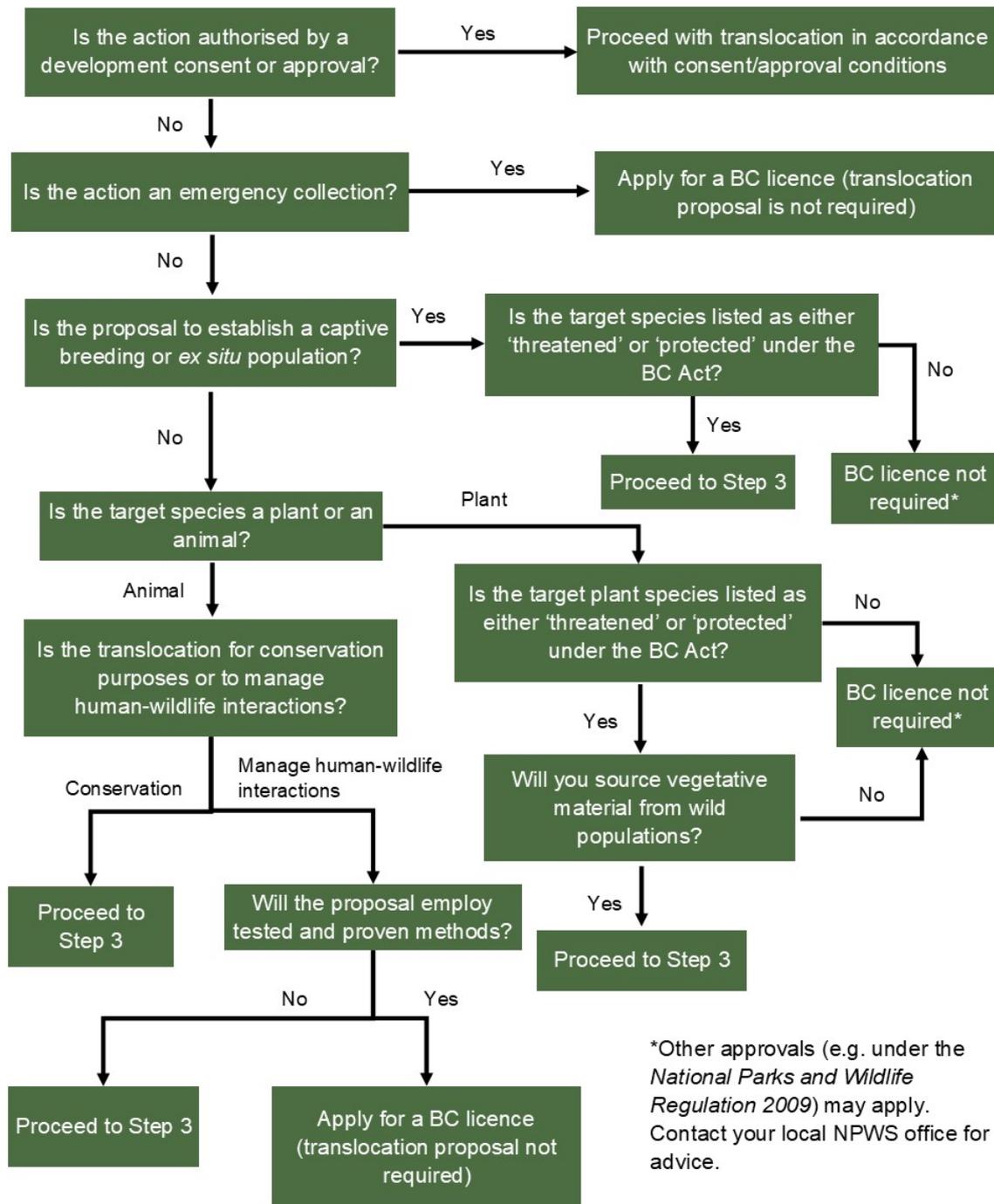


Figure 1 The process for scoping a translocation

## Step 3: Develop your translocation proposal and apply for a BC licence

### Develop the proposal

Use the information in this policy, including the template in Appendix E, to develop your translocation proposal. Obtain an animal research authority from your animal ethics committee, if required under the Animal Research Act.

## Submit the proposal

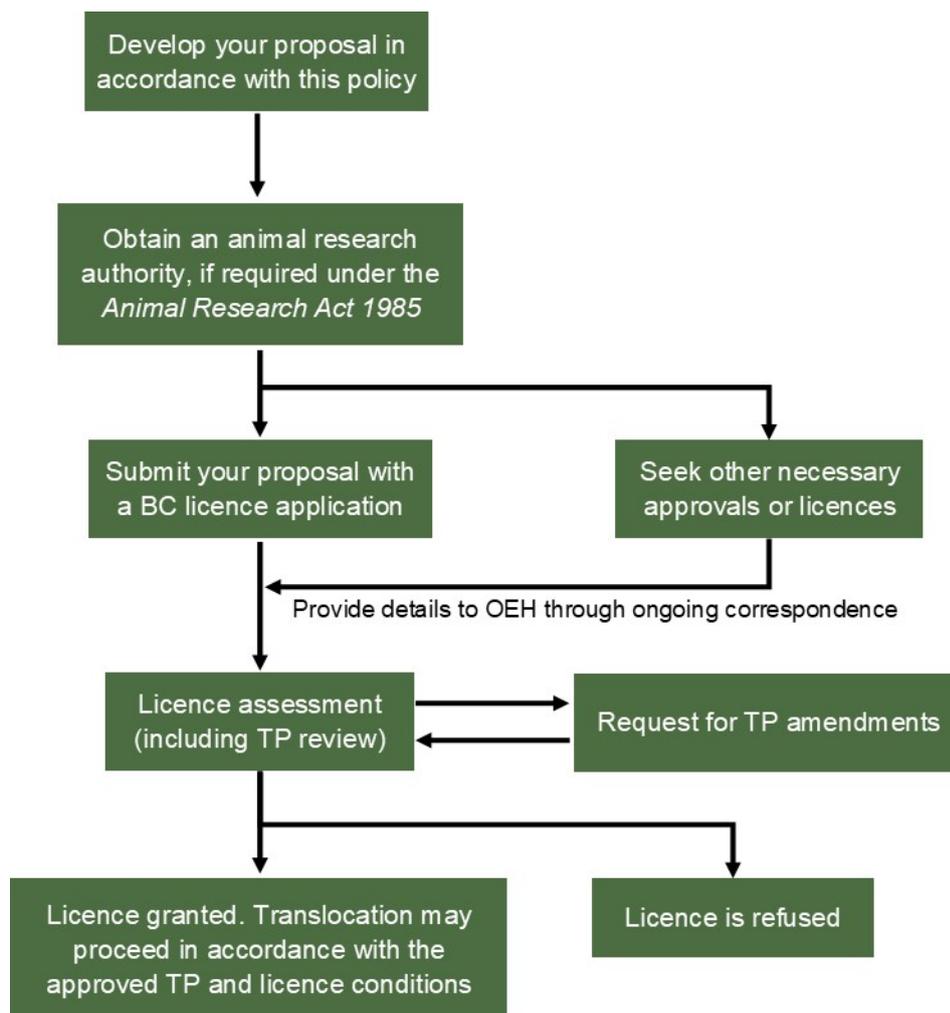
Submit your proposal with a biodiversity conservation licence application. At the same time, you should seek any other approvals necessary for the action. Outcomes of other approval or licensing processes should be communicated to the Department as they become available.

## Assessment of the licence application and translocation proposal

The Department will assess the licence application, which will include a review of your translocation proposal by two scientists. The Department may request amendments to the proposal based on the review process.

## Determination

Following the review, the Department will make a determination. If a licence is granted, you may undertake your translocation in accordance with the approved translocation proposal and the licence conditions. Alternatively, the Department may refuse a licence. Applicants may request a statement of reasons for a refusal and can appeal to the Land and Environment Court against a licensing decision, in accordance with section 2.30 of the BC Regulation.



**Figure 2** The process for developing your translocation proposal and applying for a biodiversity conservation licence

## Appendix E: Translocation proposal template

Section	Description
<b>1. Summary</b>	
1.1 Project title	Provide a descriptive name that includes key details of the project (e.g. target species, source/release location, etc.).
1.2 Project team	Names and affiliation(s) of translocation team members. You should identify core team members and their relevant experience and qualifications.
1.3 Contact details	Name, email address and phone number of project lead.
1.4 Species name and conservation status	State the scientific name, common name (if applicable) and legal conservation status (threatened species listing). If there are multiple species, list the above information for each one.
1.5 Nature of translocation	<p>State the type of translocation proposed (and whether or not it is experimental):</p> <ul style="list-style-type: none"> <li>• Introduction (recipient site is outside the known range of the target species)</li> <li>• Reintroduction (recipient site represents a former site within the known range of the target species)</li> <li>• Reinforcement (species already exists at the recipient site). If the reinforcement is for genetic rescue, you should state it here</li> <li>• Establishment of a captive breeding animal or <i>ex situ</i> plant population</li> </ul>
1.6 Background information	<p>Provide relevant background information.</p> <p>Include information on the species' current range (i.e. number of populations and population size, geographic area occupied, etc.), biological and ecological characteristics (e.g. lifecycle), key biotic (e.g. pollinators, mutualistic or dependent species dispersal agents, habitat requirements, vegetation types) and abiotic (e.g. soils, climate, aspect, and disturbance regimes, such as fire and floods) factors influencing persistence, and major pressures and threats.</p> <p>Identify why the translocation is being proposed and whether it is identified as an action in a management or conservation plan.</p> <p>You may wish to highlight key research that lends support (or otherwise) to the likelihood of success of the proposed translocation. You may also wish to identify research questions associated with the translocation.</p>
1.7 Justification (benefits versus risks)	<p>Describe the threat(s) the species/population/organism(s) faces. Justify why the proposal represents the best conservation action for the target species, with attention to how the action will benefit the target species.</p> <p>For proposals to translocate from a development site, justify why the actions to harm the species cannot be avoided.</p> <p>For proposals, proponents must show that the proposed action is a cost-effective conservation option for the target species.</p> <p>To address the above requirements, proponents should consider the species threat status and the factors driving the threat status (e.g. is the species critically endangered, and does translocation represent a last resort or a necessary back-up of a single known population?), long- and short-term demographic trends (e.g. is the species/population experiencing rapid decline?), and manageability of threats <i>in situ</i> (e.g. are there any <i>in situ</i> management options?), as well as the risks associated with not translocating the organism(s).</p> <p>Where the proposal is to translocate a species that is likely to experience decline or extinction due to climate change, proponents should include</p>

Section	Description
	multiple lines of evidence for the severity and rapidity of the impending threat. This may include a species vulnerability assessment (see Appendix F for references containing examples). Proponents should provide a statement on the urgency of the action to justify why it needs to be undertaken at this point in time.
1.8 Stakeholder consultation	<p>Provide evidence that relevant stakeholders have been identified and engaged on the proposal. Include the names and contact details of those stakeholders. Identify and briefly explain any issues raised by stakeholders and if/how they were addressed (if applicable).</p> <p>Consulted stakeholders must include landholders (at source, recipient and <i>ex situ</i> sites), experts and staff (in particular, the Accountable Officer and Species Project Coordinator for threatened species, and the relevant Conservation and Regional Delivery/Communities and Greater Sydney Senior Team Leader for protected species). Proponents may also consult the broader community.</p> <p>For establishment of captive breeding animal populations, proponents should consult the NSW Department of Primary Industries to identify any obligations under the <i>Exhibited Animals Protection Act 1986</i> and the <i>Prevention of Cruelty to Animals Act 1979</i>.</p>
1.9 Other approvals/authorities	Provide details of other approvals, licences or authorities relevant to the project. These may include licences or approvals under the <i>Biodiversity Conservation Act 2016</i> , <i>National Parks and Wildlife Act 1974</i> , <i>Animal Research Act 1985</i> , <i>Exhibited Animals Protection Act 1986</i> , <i>Biosecurity Act 2015</i> , etc., and may relate to specific components of the project.
1.10 Risk assessment	<p>Identify the risks associated with the project and, where appropriate, outline strategies to mitigate those risks.</p> <p>Risks to the source population could include reduction in population size and long-term viability of the source population, effects on non-target organisms and break-up of family/social groups.</p> <p>For captive breeding animal populations or <i>ex situ</i> plant populations, proponents should consider risks to genetic diversity, escape from managed facilities, limitation of facilities for holding surplus organisms and resourcing limitations.</p> <p>For animal translocations, proponents should consider welfare risks relevant to each stage of the translocation (capture, handling, holding and release).</p> <p>Include a risk assessment that identifies potential disease risks and mitigation strategies to address those risks.</p> <p>Proponents should consult the NSW DPI Biosecurity and Food Safety Division for advice when undertaking a disease risk assessment. The NSW DPI Biosecurity Hotline number is 1800 680 244.</p>
<b>2. Source population</b>	
2.1 Source site	<p>Describe where the plants, propagative material, or animals are being sourced from, and describe the sampling strategy. Sampling may be from one or multiple sites or from a captive bred animal or <i>ex situ</i> plant population. State if the collection was an emergency collection.</p> <p>Where known, the following information about the source site should be included:</p> <ul style="list-style-type: none"> <li>• geographic location</li> <li>• land management</li> <li>• vegetation community/habitat</li> <li>• known interspecific interactions</li> <li>• pest and disease status.</li> </ul>

Section	Description
2.2 Source population	<p>Provide details of the source population, including:</p> <ul style="list-style-type: none"> <li>• robust estimates of population size and density</li> <li>• population sex and age structure</li> <li>• population demographics and trajectory</li> <li>• presence of social groups (animals)</li> <li>• for plants, type of material (seeds, cuttings, other)</li> <li>• genetic variability and background (is this a representative sample?)</li> <li>• disease assessment and profile.</li> </ul> <p>With reference to the information provided for the above dot points, proponents should comment on the ability of the source population and ecosystem to withstand the proposed removal of individuals.</p>
2.3 Composition of population for translocation	<p>Provide proposed details of the collection of individuals to be moved, including:</p> <ul style="list-style-type: none"> <li>• number of individuals (including why this number was selected)</li> <li>• age structure</li> <li>• sex ratio</li> <li>• whether there are mating pairs or mothers with young</li> <li>• genetic variability and background (particularly important where animals will be/are captive bred prior to translocation)</li> <li>• disease assessment and profile.</li> </ul> <p>Explain the rationale for this composition and how it will help achieve the objectives of the project.</p> <p>Consideration should be given to social groups/structures, and number of individuals required to establish a viable population with normal social interactions and mating behaviours.</p>
<p><b>Note:</b> Complete Section 3a if the proposal is to undertake a translocation. Complete Section 3b if the proposal is to establish a captive breeding animal or <i>ex situ</i> plant population. Complete both sections if the proposal is to undertake a translocation with a captive or <i>ex situ</i> component.</p>	
<p><b>3a. Recipient site</b></p>	
3a.1 Location	<p>Describe the geographic location of the proposed release site, in comparison to the range of known sites (including source site) for the species. You should include the geographic name, GPS coordinates, and a statement on whether the site is within or outside the current distribution of the target species. If possible, provide a map or photograph of the site.</p>
3a.2 Land management	<p>Describe the details of current land tenure/zoning and current land management and use. Where applicable, provide written evidence that the land manager (or appropriate authority) agrees to the proposed action.</p> <p>Where possible, identify proposed future land management strategies (e.g. establishment of a biodiversity stewardship site). The manager of the recipient site should demonstrate a long-term commitment to conservation and the proposed translocation.</p>
3a.3 Ecological suitability	<p>Justify the selection of this site with reference to the target species' ecology.</p> <p><b>Animals</b></p> <p>Proponents should consider habitat suitability in terms of:</p> <ul style="list-style-type: none"> <li>• climate (current and future)</li> <li>• food and water availability (quality and quantity)</li> </ul>

Section	Description
	<ul style="list-style-type: none"> <li>• habitat connectivity (in general, sites with low or medium connectivity with other suitable habitats lead to higher translocation success)<sup>12</sup></li> <li>• shelter (quality and quantity)</li> <li>• carrying capacity of the site</li> <li>• breeding requirements</li> <li>• predators</li> <li>• likelihood of implementing an appropriate disturbance regime (e.g. fire, flood), if required.</li> </ul> <p><b>Plants</b></p> <p>Proponents should consider:</p> <ul style="list-style-type: none"> <li>• climate (current and future)</li> <li>• presence/absence of pollinators</li> <li>• dispersal agents</li> <li>• soil/geology and hydrological characteristics</li> <li>• symbionts, such as mycorrhizae or nitrogen-fixing bacteria (if relevant)</li> <li>• presence of appropriate vegetation community and structure (competition and light availability)</li> <li>• climate and rainfall</li> <li>• topography and aspect</li> <li>• likelihood of implementing an appropriate disturbance regime (e.g. fire, flood), if required.</li> </ul> <p><b>Reintroductions</b></p> <p>If the translocation is a reintroduction, provide evidence that the release site is a location formerly occupied by the target species within its native range.</p> <p><b>Introductions</b></p> <p>If the translocation is an introduction, provide justification for moving the species outside its native range (strong justification will be required). If the proposal is to translocate a species threatened by climate change, justify site selection based on current climate and climatic conditions projected under multiple scenarios.</p> <p><b>Reinforcement</b></p> <p>If the proposal is to reinforce an existing population, justify selection of individuals to translocate, with reference to:</p> <ul style="list-style-type: none"> <li>• population genetics</li> <li>• sex/age structure</li> <li>• provenance (climate suitability).</li> </ul> <p><b>Threats</b></p> <p>Include information on the threats at the recipient site and how they have been managed (e.g. pest eradication, predator-proof fencing). Detail what impacts the translocation will have on other species at the recipient site, including other threatened species that may be impacted. Detail how any disturbance impacts are to be mitigated while the new population establishes.</p>
3a.4 Ecological impacts	<p><b>Interactions at recipient site</b></p> <p>Comment on any likely significant interactions of translocated organisms with other native species at the recipient site (e.g. predation, competition).</p>

<sup>12</sup> New Zealand Department of Conservation: <https://www.doc.govt.nz/get-involved/run-a-project/translocation/translocation-success/basics/> (accessed 5 September 2018).

Section	Description
	<p>If the area for release/planting is to be fenced, include the interactions occurring due to installation of the fence.</p> <p>For animals, comment on the risk of overabundance on (a) local vegetation and (b) population sustainability where appropriate.</p> <p>Outline your strategies to monitor and manage these impacts (including triggers for intervention). State how you will decide when impacts are unacceptable and if/how the translocated organisms can be removed from the recipient site if required.</p> <p><b>Impacts on ecosystem function</b></p> <p>Comment on any significant impacts that the addition of the translocated species might have on the functioning of the ecosystem of the recipient site.</p> <p>Outline your strategies to monitor and manage these impacts.</p> <p>This is particularly important for translocation of organisms to a site outside of their known range.</p> <p><b>Biosecurity risks</b></p> <p>With reference to the disease risk assessment, comment on the potential for inadvertent introduction of pests, pathogens and parasites with/to the target species and transmission to/from other individuals or species.</p> <p><b>Movement of other non-target species</b></p> <p>Comment on the potential for other non-pathogenic species to be inadvertently moved during the translocation (e.g. through seeds or fungi in birds or mammals' guts, soil on shoes or boxes, seeds in bedding/food). If there is significant potential to introduce other novel organisms, you will need to outline your strategy for managing this risk.</p> <p><b>Other ecological impacts</b></p> <p>Comment on the potential for other impacts not referenced above (e.g. impact of fences on movement of non-target species).</p>
<b>3b. Captive breeding animal or <i>ex situ</i> plant population</b>	
3b.1 Existing captive or <i>ex situ</i> populations	Provide details of existing captive breeding animal or <i>ex situ</i> plant population(s), if any.
3b.2 Long-term objective	<p>Justify the need to establish the captive breeding animal or <i>ex situ</i> plant population and identify the long-term goals of the proposal, including indicative timeframes and the scale of the program (i.e. target number of individuals).</p> <p>Proponents should detail how the captive breeding animal or <i>ex situ</i> plant population will contribute to this goal and to broader conservation of the species.</p>
3b.3 Strategy	<p>If an Animal Supplier's Licence has been obtained from DPI for this project, include that licence as an attachment with your proposal. If there is no Animal Supplier's Licence for the project, justify why that licence is not required.</p> <p>In addition, provide the following information:</p> <ul style="list-style-type: none"> <li>• rearing conditions (e.g. size of holding facility, provision of food and water)</li> <li>• breeding strategy (how will reproduction be facilitated?). For animals and non-clonal/selfing plants, include information on genetic provenance)</li> <li>• monitoring (e.g. what factors will be monitored to ensure the health of the population is kept optimal?)</li> <li>• quarantine/biosecurity measures that will be enforced in the event of disease or pest outbreak</li> </ul>

Section	Description
	<ul style="list-style-type: none"> <li>genetic typing and management strategy (how will genetic diversity be estimated and maintained/increased?)</li> <li>for animals, will the population be exhibited, and, if so, have appropriate licences been granted by NSW DPI?</li> </ul>
<b>4. Objectives and targets</b>	
4.1 Objectives	<p>Define the overarching objectives of the translocation (e.g. increase number of populations, increase population size, etc.).</p> <p>If the translocation is experimental, proponents should include the research questions in this section.</p>
4.2 Targets and criteria for success and failure	<p>Identify the specific targets that will be met to help achieve the objectives. Targets should consider the species' biology and ecology, the purpose of the translocation (e.g. conservation, research) and social acceptance of the action(s).</p> <p>These should be broken down into short-term and long-term targets. (Definitions of timeframes will be species- and project-dependent.)</p> <p>Targets should be specific, measurable, attainable, relevant (to the objectives) and timely. They should also include measurement techniques for survival, growth and reproduction of their offspring.</p> <p>If the translocation is experimental, the targets may relate to the experimental process, rather than conservation outcomes.</p> <p>With respect to the targets, identify clear criteria for success of the project. Those criteria may be broken down into short- and long-term success.</p> <p>Proponents should also identify clear criteria for failure. It may be useful to specify triggers for intervention to improve the trajectory of the project (i.e. away from failure and towards success).</p>
<b>5. Methods</b>	
5.1 Timeline	<p>State the intended date and time of major activities relevant to this project (e.g. collection from source site, movement from captive breeding facility, release at recipient site, monitoring, etc.).</p> <p>Provide justification for the timeline with reference to seasonality, weather conditions, availability of resources, risk of fire and flood, population dynamics, etc.</p>
5.2 Capture, holding, transport and release	<p>Describe the methods of capture, holding, transport and release. Identify which team members will be undertaking each task and highlight their relevant experience (a veterinarian should be involved, especially if drugs are to be administered). Include provisions made to minimise stress, maximise welfare, prevent transmission of pathogens, and increase overall survivorship, as well as what welfare indicators will be monitored. If animals are to be held in cages or on substrate, describe those here.</p> <p>Identify potential triggers for quarantine to reduce the likelihood of pests/diseases spreading between the organisms to be translocated and throughout the recipient site.</p> <p>Proponents should consider whether there are post-release support needs to promote self-sufficiency in the translocated animals (e.g. nest boxes, supplementary feeding).</p> <p>For captive bred animals, describe any pre-release strategies to increase survivorship, such as acclimation and behavioural training.</p> <p><b>Plants</b></p> <p>Describe how materials will be collected/propagated (including simulated climate conditions, where appropriate), proposed watering regime (if any),</p>

Section	Description
	<p>and the planting design. Detail phytosanitary measures that will be taken to avoid pathogen (e.g. <i>Phytophthora</i>) impacts.</p> <p><b>Release/planting site</b></p> <p>If the area is to be fenced, explain what alternative options have been considered, and why fencing was determined to be appropriate. Explain how the fence design considers the conservation objectives of the project. Describe the structure of the fence, the area to be fenced, non-target impacts and who will be responsible for ongoing maintenance. For plants, describe any tree guards (or similar) to be used.</p>
5.3 Monitoring	<p>Describe the monitoring strategy. Include:</p> <ul style="list-style-type: none"> <li>• objectives</li> <li>• methodology (including who will undertake monitoring)</li> <li>• frequency and duration of surveys</li> <li>• what you will be monitoring and why (if there is no intention of undertaking genetic monitoring, justify why it does not need to be undertaken)</li> <li>• any other relevant information.</li> </ul> <p>To thoroughly and accurately assess the outcomes, benefits and impacts of the translocation action, proponents should consider implementing a Before–After, Control–Impact (BACI) monitoring/sampling regime.</p>
5.4 Pest and disease management	<p>Identify relevant quarantine/biosecurity/hygiene procedures that will be undertaken to reduce the introduction or spread of associated pests and pathogens (these can be taken from the disease risk assessment at 1.10). State who will implement those procedures and describe their relevant experience and/or qualifications, where appropriate. This should include post-capture/collection screening procedures, measures to prevent transmission from and to translocated individuals, and treatments to be applied at any stage of the project.</p>
5.5 Genetic management	<p>For animal translocations, describe how population genetic data will be captured in your monitoring strategy. Identify potential actions to address pervasive inbreeding and loss of genetic variation. This is particularly important for translocations into predator-proof enclosures.</p>
5.6 Research questions or opportunities	<p>Outline identified or potential research questions to be addressed by the project.</p> <p>As in 5.3, consider if a BACI approach is appropriate.</p>
5.7 Assumptions and limitations	<p>Describe the assumptions and limitations of the translocation.</p>
<b>6. Project management</b>	
6.1 Roles and responsibilities	<p>Outline the roles and responsibilities of project team members listed at 1.2.</p>
6.2 Volunteer, contractor or community engagement	<p>Provide details of any external parties engaged in the translocation. Any individuals directly involved in translocation actions will need to be listed as an associate on relevant biodiversity conservation licence applications.</p>
6.3 Evaluation	<p>Detail when/how project evaluation will take place. Evaluation should consider the methods used to meet proposed targets, how they were implemented, whether they were successful in meeting targets, and lessons learned. Evaluation results should be included in relevant reports provided to the Department.</p>
6.4 Reporting	<p>Define the frequency of reporting to the Department. State whether there is an intention to publish the outcomes in a scientific journal. If there is no</p>

Section	Description
	intention to publish outcomes, a final report will be submitted to the Department.
6.5 Contingency plan and exit strategy	<p>Describe what will be done if the project fails to meet the targets at Section 4.2.</p> <p>Identify when and how project success/failure will be declared (acknowledging that success may take 10+ years to determine for some species), and any management strategies to be applied thereafter (if applicable).</p> <p>Identify any triggers for review of the project, as well as the process for determining whether to initiate the exit strategy.</p> <p>Proponents should identify what they intend to do with animals under the exit strategy (including how they intend to maintain the welfare of the animals). Those actions should be agreed by an animal ethics committee.</p>
6.6 Budget	<p>Attach a budget that includes:</p> <ul style="list-style-type: none"> <li>• item description</li> <li>• budgeted cost</li> <li>• funding source.</li> </ul> <p>Proponents must demonstrate they have considered all likely costs, including (as relevant) community engagement, transport, materials, expert advice, staffing, etc.</p>
6.7 Funding	<p>Identify all current sources of funding (cash and in-kind).</p> <p>Describe the strategy to be used to source funds in the future (e.g. potential funding sources, outreach). Proponents should include a costed action plan.</p>

## Appendix F: Useful references for species vulnerability assessments

Species vulnerability assessments are a useful tool to assess the likelihood that a species will suffer significant adverse consequences due to climate change. There are a variety of approaches and data sources that can be utilised in making those assessments. Where species are proposed to be translocated outside their native range because of the impending threat of climate change, proponents should consult the IUCN SSC guidelines for assessing species' vulnerability to climate change:

- Foden WB and Young ED (eds) 2016, *IUCN SSC guidelines for assessing species' vulnerability to climate change*, version 1.0, occasional paper of the IUCN Species Survival Commission no. 59, Cambridge (UK) and Gland (Switzerland).

Foden and Young (eds) (2016) acknowledge the growing consensus that combining approaches may produce more reliable models. In addition, they provide real examples of how those approaches (including a combination approach) have been applied.

Listed below are references containing examples of species vulnerability assessments undertaken on a range of taxa:

- Cabrelli A, Stow AJ and Hughes L 2014, A framework for assessing the vulnerability of species to climate change: a case study of the Australia elapid snakes, *Biological Conservation*, vol.23, pp.3019–3034.
- Cabrelli A and Hughes L 2015, Assessing the vulnerability of Australian skinks to climate change, *Climatic Change*, vol.130. no.2, pp.22–233.
- Foden WB, Butchart SHM, Stuart SN, Vié J-C, Akçakaya HR, Angulo A, DeVantier LM, Gutsche A, Turak E, Cao L, Donner SD, Katariya V, Bernard R, Holland RA, Hughes AF, O'Hanlon SE, Garnett ST, Şekercioğlu CH and Mace GM 2013, Identifying the world's most climate change vulnerable species: a systematic trait-based assessment of all birds, amphibians and corals, *PLoS ONE*, vol.8, no.6, e65427.
- Garnett ST, Franklin DC, Ehmke G, VanDerWal JJ, Hodgson L, Pavey C, Reside AE, Welbergen JA, Butchart SHM, Perkins GC and Williams SE 2013, *Climate change adaptation strategies for Australian birds*, National Climate Change Adaptation Research Facility, Gold Coast.
- Hagger V, Fisher D, Schmidt S and Blomberg A 2013, Assessing the vulnerability of an assemblage of subtropical rainforest vertebrate species to climate change in south-east Queensland, *Austral Ecology*, vol.38, pp.465–475.
- Reside AE, VanDerWal J, Garnett ST and Kutt AS 2016, Vulnerability of Australian tropical savanna birds to climate change, *Austral Ecology*, vol.41, pp.106–116.

## Glossary

**Adaptive management** is a structured decision-making process whereby data collected through ongoing monitoring is used to inform future decisions.

**Animal** means any animal, whether vertebrate or invertebrate and in any stage of biological development, but does not include humans, or fish, within the meaning of the *Fisheries Management Act 1994* (as per the BC Act).

**Biodiversity Conservation Program** (i.e. *Saving our Species* program) is the program legislated in Part 4, Division 6 of the BC Act, consisting of (1) strategies to achieve objectives in relation to threatened species and threatened ecological communities, (2) a framework to guide the setting of priorities for implementing the strategies, (3) a process for monitoring and reporting on overall outcomes and effectiveness, and (4) strategies to minimise the impacts of key threatening processes on biodiversity.

**Captive bred animal population** refers to a group of animals bred to contribute to the conservation of an extant population, establish a new population or protect the species against imminent extinction. A captive animal population maintained as insurance against *in situ* threats is considered a captive bred animal population for the purpose of this policy.

**Captive breeding** means the human mediated breeding of animals to contribute to the conservation of an extant population, establish a new population or protect the species against imminent extinction. The maintenance of animals as insurance against *in situ* threats is considered captive breeding for the purpose of this policy.

**Compensation or compensatory measures** are measures taken to compensate for impacts on biodiversity in connection with a development, typically at a site other than the development site.

**Ecosystem restoration** means the introduction or reintroduction of a species to restore an ecosystem function degraded by the local extinction of that species or a related species with a similar ecological niche.

**Ecological community** means an assemblage of species of plants and/or animals occupying a particular area (as per the BC Act).

**Emergency collections** are collections of threatened animals or plants, or those from endangered populations, justified by the objective of removing individuals from a situation of imminent serious threat in the wild; situations may include where a remnant population is in serious decline and the threat cannot be adequately ameliorated.

**Endangered population** is a population specified in Part 2, Division 4 of Schedule 1 of the BC Act.

**Experimental translocation** is a translocation undertaken using controlled manipulations and replicates to answer specific scientific hypotheses related to the establishment and persistence of an organism.

**Ex situ conservation** is conservation of biodiversity that has been removed from its natural environment by human intervention. This includes conservation actions in zoos, aquaria, seedbanks, or botanic gardens. Importantly, *ex situ* conservation encompasses a range of actions with a high degree of variation in terms of the level of management intervention.

**Ex situ plant population** means a collection of plants propagated or maintained by humans in a controlled setting, usually to contribute to conservation of an extant population, establish a new population or protect the species from imminent extinction.

**Habitat** means an area where the environmental (biotic and abiotic) conditions are suitable for a species' survival.

**Harm** an animal includes kill, injure or capture the animal, but does not include harm by changing the habitat of the animal, and attempt to harm an animal includes hunting or pursuing, or using anything, for the purpose of harming the animal (as per the BC Act).

**In situ conservation** is the conservation of biodiversity within naturally occurring environments.

**Introduction** is the intentional, human mediated release of an organism (or organisms) to an area outside its known range but within an appropriate habitat and bio-climatic region. Also referred to as conservation introduction, assisted colonisation or managed relocation. This does not include the introduction of plants and/or animals for reasons other than for the benefit of those organisms.

**Mitigation translocation** means the movement of plants (propagative/genetic material) or animals from locations where they are to be destroyed (e.g. from development sites) to a different location. Also referred to as salvage translocation.

**Pathogen** is an organism capable of causing disease (e.g. bacterium, virus, fungus, parasite).

**Pick** a plant includes gather, take, cut, remove from the ground, destroy, poison, crush or injure the plant or any part of the plant.

**Plant** means any plant, whether vascular or non-vascular and in any stage of biological development, and includes fungi and lichens, but does not include marine vegetation (but see s. 14.7(1)(b) of the BC Act) (as per the BC Act).

**Population** means a group of organisms, all of the same species, occupying a particular area (as per the BC Act).

**Protected animal** means an animal of a species listed or referred to in Schedule 5 of the BC Act.

**Protected plant** means a plant of a species listed or referred to in Schedule 6 of the BC Act.

**Recipient site/location** is the geographic area where a translocated population is to be released/planted.

**Reinforcement** is the intentional, human mediated release of an organism (or organisms) to a location within their current range where a population of the same species currently exists. Also referred to as augmentation, supplementation, enhancement, enrichment or restocking.

**Reintroduction** is the intentional, human mediated release of an organism (or organisms) to a location where it formerly occurred, but where there is no extant population.

**Source population** is the population from which individuals are to be taken for a translocation.

**Species** includes a defined subspecies, a taxon below subspecies, and a recognisable variant of a subspecies or taxon.

**Threatened ecological community** means a critically endangered ecological community, an endangered ecological community or a vulnerable ecological community listed in Schedule 2 of the BC Act.

**Threatened species** means a critically endangered species, an endangered species or a vulnerable species listed in Schedule 1 of the BC Act (see also the definition of 'species').

**Translocation** is the intentional, human mediated movement of living organisms from one location to another location. Some intentional, human mediated movements of animals are not included in the definition of translocation for the purposes of this policy. See the 'Scope and application' section for further information.

**Translocation proposal** is a document prepared in accordance with this policy that outlines the justification and implementation plan for a translocation. The translocation proposal is reviewed and assessed by the Department of Planning, Industry and Environment for determining a licence application.

**Trial translocation** is a preliminary, relatively small-scale translocation that is undertaken to inform subsequent translocations. These translocations provide insights and generate hypotheses related to the establishment and persistence of an organism.

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