Plant translocations in Australia

Overview of the Translocation Guidelines

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Threatened plants

• 1355 threatened flora species in Australia (EPBC)
• Conservation actions to prevent extinction:
  • Habitat protection
  • Threat management
  • Ex-situ conservation
  • Translocation
Translocation

• The intentional transfer of plants or regenerative plant material from an ex situ collection or natural population to a new location.
  
  • Introduction
    • establish a population in a site where it has not previously occurred but is within the known range of the species
  
  • Reintroduction
    • establish a population in a site or habitat type where it no longer occurs (locally extinct).
  
  • Reinforcement (augmentation)
    • Adding individuals of a species into an existing population
  
  • Assisted migration
    • establish a species, for the purpose of conservation, outside its indigenous range in what is considered to provide appropriate habitat for the species based on climate change or habitat change predictions.
Translocation is an ancient practice

>50 species recorded as being deliberately translocated

Modern Translocations: Where and why?

Silcock et al, unpublished
Australian Plant Translocation Database

- **1001 translocations of 376 taxa**
- Difficult to predict translocation performance – importance of inherent traits of spp.
- Importance of long-term commitment and monitoring
- Success related to sufficient founder propagules (500)
- Second-generation recruitment major factor inhibiting success

Silcock et al, unpublished
Translocation Guidelines: need for an update

Best-practice guide on the why and how to do translocation


Increased number of translocations since 2004

Globally unique

Widely cited by conservation agencies

Threatened Species Recovery (TSR) Hub
The revision process

• TSR Hub Project 4.3
  • Improving threatened plant reintroduction success and species recovery

• ANPC Steering committee:
  • David Coates, Linda Broadhurst, Bob Makinson, Cathy Offord, Maria Matthes

• 1 project manager
• May 2017 – October 2018
• Guidelines workshop and information day in Sydney
• Genetic mixing workshop in Melbourne
• 30+ chapter authors
• Case study authors
What’s new

Decision making framework
Selecting source and recipient sites
Revised translocation proposal template
Updated references

23 new and updated case studies
New photos illustrating techniques
Foreword by Joyce Maschinski
The structure of the Guidelines

1. Introduction
2. Deciding
3. Assessment of biology & ecology
4. Site selection
5. Policy, approvals and proposals
6. Preparation
7. The translocation
8. Monitoring and evaluation
9. Community participation
## Workshop Program

**Session 1 – Introduction and context**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td>8:30</td>
<td>Registration</td>
</tr>
<tr>
<td>9:00</td>
<td>Lucy Commander: Welcome</td>
</tr>
<tr>
<td>9:15</td>
<td>Margaret Byrne: Introduction</td>
</tr>
<tr>
<td>9:30</td>
<td>Lucy Commander: Plant translocations in Australia and an overview of the Translocation Guidelines</td>
</tr>
<tr>
<td>10:00</td>
<td>Colin Yates: Ecology of Threatened Flora</td>
</tr>
<tr>
<td>10:20</td>
<td>Juliet Wege: Taxonomy for conservation – documenting Western Australia’s most vulnerable species</td>
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</tbody>
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**Session 2 – Pre-translocation preparation**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td>8:40</td>
<td>Morning Tea</td>
</tr>
<tr>
<td>11:00</td>
<td>Andrew Crawford: Collecting and storing seed of Threatened Flora for translocation</td>
</tr>
<tr>
<td>11:20</td>
<td>Shane Turner: Seed biology and nursery propagation of Threatened Flora for translocation</td>
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<tr>
<td>11:40</td>
<td>Eric Bunn: Micropropagation and cryobanking of Threatened Flora</td>
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<tr>
<td>12:00</td>
<td>Questions and discussion</td>
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<tr>
<td>12:15</td>
<td>Lunch</td>
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**Session 3 – Site selection, policy and proposals, implementation and assessment**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:15</td>
<td>David Coates: Genetics in planning and monitoring plant translocations</td>
</tr>
<tr>
<td>1:40</td>
<td>Melanie Smith: WA policy, legislation and approvals required for translocations</td>
</tr>
<tr>
<td>2:00</td>
<td>Tanya Llorens: Preparing a translocation proposal in Western Australia</td>
</tr>
<tr>
<td>2:20</td>
<td>Leonie Monks: Implementing and assessing translocations in Western Australia</td>
</tr>
<tr>
<td>2:50</td>
<td>Questions and discussion</td>
</tr>
<tr>
<td>3:00</td>
<td>Afternoon tea</td>
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</tbody>
</table>

**Session 4 – Case studies and breakout groups**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:30</td>
<td>Carole Elliott: Case studies of translocation in the mining sector</td>
</tr>
<tr>
<td>3:50</td>
<td>Siegy Krauss: Long term translocation monitoring: <em>Grevillea scapigera</em> case study</td>
</tr>
<tr>
<td>4:50</td>
<td>Final wrap up</td>
</tr>
<tr>
<td>5:00</td>
<td>Close</td>
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</tbody>
</table>

Optional drinks at the Como (cnr Canning Hwy and South Tce)
Chapter 2. Deciding whether to translocate

- Conservation actions available
- Benefits and risks
- Is it necessary?
- Goals and objectives
- Decision making framework
Benefits and risks

- **Benefits**
  - Only way for species to survive
  - Minimise extinction risk when few populations
  - Minimise effects of declining population size

- **Risks**
  - No survival = wasted resources
  - Negative consequences of genetic mixing
  - Introducing pests and diseases
  - Detrimental effects on other species (competition, disturbance)
  - Population may not persist due to absence of pollinators etc.
  - Additional risks for mitigation translocations
Is translocation necessary?

- Ensure taxonomic status is clear
- Target surveys for additional populations
- Are factors that limit distribution and abundance known?
  - Removal of threats may be sufficient
- Have previous translocations been successful?
Decision making

Can habitat management and threat abatement help recover the species?

Reconsider if translocation is essential

Is a translocation necessary to ensure the survival of the species?

Is a translocation required as a part of mitigation (e.g., offsetting or salvage)?

Is the taxonomy, distribution and ecology of the species well understood?

Are recipient sites available and have long-term security? Are the threats to the species understood and can they be mitigated at the recipient sites?

Are resources available to implement the translocation and ongoing maintenance? Are resources and a design for monitoring available?

Develop translocation plan
Recovery team / translocation working group

- Bring together people from a range of disciplines who have experience in conserving a species
- Experts and stakeholders

Photo: L Monks
Chapter 3. Pre-translocation assessment of biology and ecology

Collect all the information about the species that is needed for the translocation. This information will go in the translocation proposal.

Informs everything from site selection to monitoring.
How to collate the information?

- Literature
- Books
- Experts (see appendix)
- Related species
- Species with similar habitat
- Research plan
- Case studies in APC (available on ANPC website)
- Australian Plant Translocation Database (Jen Silcock and Laura Simmonds)
What do you need to know about the species?

- **Life history**
  - Longevity
  - Regeneration
  - Pollination
  - Seed maturation season
  - Seed dispersal
  - Seed viability, dormancy, germination
  - Seed bank type
  - Germination phenology

- **Disturbance and Threat**
  - Fire sensitivity
  - Response to flood
  - Disease susceptibility (e.g. *Phytophthora*, Myrtle Rust)
  - Resilience to grazing
  - Resilience to weeds
  - Effect of herbicides

- **Abiotic**
  - Soil
  - Water
  - Slope
  - Landform
  - Precipitation
  - Temperature

- **Biotic**
  - rhizobia
  - mycorrhizae
  - pollinators
  - seed dispersal vectors
  - habitat characteristics e.g. canopy cover

*Photo: L Monks*  
*Photo: M Jusaitis*
How do you source the plants?

• With propagation
• Propagation techniques
  • Seed
  • Cuttings
  • Tissue culture
• Pluses and minuses
• Costs and timing
Sourcing plants

• Without propagation
  • Direct seeding
  • Soil transfer
  • Transplantation
Chapter 4. Selecting source and recipient sites

• Selecting source population: issues to consider
  • Which source populations?
  • Should you mix populations?
  • How many individuals?
  • How many plants to propagate?

• Selecting recipient sites
  • Decreasing extinction risk
  • How many sites?
  • Site assessment
    • Habitat, climate, tenure, threat management, size

• Selecting sites beyond the known range – assisted migration
  • Abiotic and biotic suitability, pollinators
  • Potential for use of predictive tools

Photo: D Coates
Site selection to decrease extinction risk

• Extinction risk for plants includes:
  • rate of decline
  • reduction in geographic distribution
  • reduction in population abundance

• Introduction, reintroduction or reinforcement?

Preventing unintended consequences

- Do a risk assessment
- Disturbance
  - Introduction of weeds, pathogens, pests
  - Trampling of existing vegetation
- Ecological impacts
  - Competition, invasion
- Cultural values
  - Engage with Traditional Owners in the co-design of the translocation process, especially the selection of the recipient site(s) to consider potential impacts on cultural values

Grassy weeds around translocated *Acanthocladium dockeri* (grey leaf) (Photo: M Jusaitis)
Chapter 5. Policy, approvals and translocation proposals

Translocation policies

- Explains or guides how a government authority or agency will process or consider proposals to translocate
- Other policies may be relevant, such as those for threatened species

Requirements for approval

- Licences and permits may be required.
- May need multiple approvals from different authorities
- Consent from traditional owners
- Can be time consuming – start applying early!
Translocation Proposal

Essential information necessary to understand who, what, why, where, how, and when a translocation is proposed.

Management plan

Provide information for a decision whether or not to proceed

Reference document to monitor progress and determine success.
Chapter 6. Pre-translocation preparation

- People and resources
- Timelines
- Collecting material
- Ex-situ collections
- Experimental design
- Planning for management, monitoring and evaluation
- Site preparation

Photo: R Snashall

Photo: D Coates

Photo: M Jusaitis
Chapter 7. Implementing the translocation and ongoing maintenance

- Timing
  - Rainfall
  - Plant age, health, acclimatisation

- Preparing plants

- Planting
  - Hygiene, layout, labelling

- After-planting care
  - Watering, guards
  - Site management
Chapter 8. Translocation monitoring and evaluation

- **Document** what you’re trying to achieve (goals, objectives).
- Give yourself the best chance to explain the results (explanatory variables – management, environment).
- Permanently tag and **census** all plants.
- Monitor **frequently** in year one, and then **annually**. Compare like with like.
- Be **clear** on what you’re measuring, but look out for **surprises**.
Chapter 9. Community participation and support

• ‘Community’ consists of
  • NRM bodies, local gvt, consultants, nursery, friends groups, traditional owners, native plant societies, local environmental centres

• Practical support
  • Surveys
  • Reducing threats
  • Local contacts

• Raising the profile

• Citizen Science

• Celebrate achievements and recognise community

Photo: C Tourenq
Where to find more

• Translocation Guidelines
  • Purchase
    • http://www.anpc.asn.au/translocation
  • Download

• Case Studies
  • https://www.anpc.asn.au/translocation-case-studies-2/

• Australasian Plant Conservation
  • https://www.anpc.asn.au/apc/

• Join the ANPC
  • https://www.anpc.asn.au/membership/
Thanks and Acknowledgements

• Threatened Species Recovery Hub
  • Rachel Morgain, Jaana Dielenberg, Mary Cryan and Heather Christensen

• Australian Network for Plant Conservation
  • Steering Committee, Jo Lynch

• All the authors, case study authors, and workshop participants

• Authors of the previous editions

• Royal Botanic Gardens Sydney and Royal Botanic Gardens Victoria for hosting workshops.

• DBCA for desk space, hosting this workshop
  • David Coates, Leonie Monks, Margaret Byrne, Melissa Millar

• ‘Plant conservation is awesome work. I offer sincere thanks to those who strive to save plants across the world.’
  - Joyce Maschinski