PROJECT PHOENIX

NATIVE SEED TRANSFER ZONES IN AUSTRALIA

HOW FAR CAN SEED GO?

PROJECT SUMMARY

JUNE 2021

Across all of our Project Phoenix activities and actions we pay respect to the Traditional Owners and Custodians of the lands and waters on which we work. We honour the resilience and continuing connection to country, culture and community of all Aboriginal and Torres Strait Islander people across Australia. We recognise the decisions we make today will impact the lives of generations to come.

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EXECUTIVE SUMMARY

About the project

This project explores how (or if) the industry is changing its seed collection practice from using only narrow provenance genetic material (often referred to as 'local') to one that incorporates seed from further afield, so as to ensure both genetic diversity within a source population and potential to assist adaptation to a changing climate.

Knowledge of currently perceived or practised seed transfer zones (STZs) will contribute to greater certainty for seed suppliers and increase confidence in investing in seed supply.

Scope

The scope of this project was to gather information by searching the grey literature and also interviewing key personnel from governments, practitioners and academia. The project was split into two sections:

1. Gather information on the following aspects of native seed movements (seed sourcing) in Australia and internationally:
   - level of prescription (i.e., enforced policy/code of conduct/guidance)
   - basis of the prescription
   - underpinning research
   - benefits and issues (if applicable)
   - examples of STZs and assess whether similar approaches would be suitable in Australia
   - the sole use of 'local provenance' and the definition of that term (Australia only).
2. In preparation for a future stakeholders' meeting, identify and report on what further actions or information, including issues associated with seed movement across jurisdictions, is required to generate consensus on the implementation of STZs in Australia. Part of the activity was to identify and report on what current actions or research may assist in developing STZs within Australia.

Introduction

Concerns regarding a lack of native seed supply have been raised both within the Australian and global ecological restoration communities for several decades. Recent natural disasters such as the 2019–20 Black Summer bushfires in Australia have exacerbated that concern.

Many factors can contribute to supply shortages, including failed revegetation projects. Improved guidance on where to source native seed so as to reduce the possibility of maladaptation to the planting site offers one possible solution.

Seed transfer zones (STZs) provide clarification on where seed can be geographically transferred with little disruption of genetic patterns or loss of local adaptation to support better restoration outcomes.

The aim of this report was to identify the use of STZs and the level of prescription of seed movement both within Australia and internationally. A further goal was to report on current research or actions that have contributed to, or may assist with, consensus for the development of STZs.

Issues

There were several issues with this project:

- The project was not able to start until it had been approved by the Steering Committee and ethics approval had been obtained. The application, additionally, could not be made to the Ethics Committee until the final sign off in case any changes were necessary. Together, this meant that the project was delayed from mid-August until mid-October. The project end date was extended but, due to a timing clash with the Christmas/January holidays, it proved difficult to conduct interviews for two months (December and January). In order to compensate for the time lost, both Priority 5 of the project (jurisdictions) and our sampling frame were reduced (i.e. Canada was not included in our international group and fewer NGOs were interviewed).
- COVID-19 issues in some countries also made it very difficult to contact international people and thus fewer interviews were conducted than we had anticipated.
- Language barriers hindered some of the international literature searches we undertook and interviews we had planned, especially in central and southern America, and Europe.
- The interviewing process took much longer than expected.
  - Firstly, many existing contacts, particularly in government, had moved from their previous positions (and/or the position no longer existed) and their replacement was not always easy to locate.
  - Secondly, in Australia, where a sizeable amount of interviewing was conducted, interviewees were very happy to talk and a short chat often turned into a much longer discussion.
  - Thirdly, although at the start of the project we did not intend to send a transcript back to interviewees, it soon became obvious that the interviewee, who allowed us to publish their organisation's name, was more comfortable when they were able to review what was to be reported. Some interviewees changed their transcripts several times.
  - Lastly, it was sometimes difficult to elicit responses to our invitations from people whom we wished to interview. This took extra time and, particularly in the case of Priority 3, we did not achieve the number of researchers to interview that we had hoped.
- To enable further interviewing, the project would have benefitted from a longer time frame or more hours within the existing time frame.



Key outputs

This report is the first comprehensive review of practices and policies on prescribed native seed movements in Australia, as well as reviewing the latest practices used overseas (mainly Europe and the US).

The following list of tables and appendices from the full report *Native seed transfer zones in Australia — How far can seed go?,* indicate key outputs from our review of Australia and overseas practices, policies and research based on interviews and a literature review.

Table 1. Interviews with Australian researchers to identify (1) studies (including their own) that have contributed to or are currently underway, and (2) further actions or information needed to generate consensus on the implementation of seed transfer zones (STZ)

Table 2. Practitioner-led research/trials currently underway that may contribute to the development of seed transfer zones (STZ)

Appendix 1: Native seed movement/seed sourcing — Practice and policies of Australian federal government departments and Landcare organisations

Appendix 2: Native seed movement/seed sourcing — Practice and policies of Australian state and territory government departments and their agencies

Appendix 3: Native seed movement/seed sourcing — Practice and policies of Australian knowledge providers

Appendix 4: Native seed movement/seed sourcing — Practice and policies of Australian non-government organisations (NGOs), large-scale ecological restoration service providers and mining companies

Appendix 5: References (peer-reviewed) for Appendices 1–4

Appendix 6: U.S. Federal Agencies participating in the National Seed Strategy, 2015–2020, as part of the Plant Conservation Alliance (PCA)

Appendix 7: Recently developed empirical seed transfer zones for non-tree species in the US

Appendix 8: Native seed movement/seed sourcing — Practice and policies of US Federal Agencies

Appendix 9: Native seed movement/seed sourcing — Practice and policies of European governments

Appendix 10: References for Table 1

Comment

Not applicable

Outcomes

Identified prescribed seed movement policy and/or practices, including information on the use of local provenance, at the department level for Australian federal, state and territory governments and a sample of their agencies, and selected NGOs.

Identified prescribed seed movement policy and/or practices for Federal US Government Agencies and the relevant entities in Europe and Central America.

Identified existing and 'work in progress' research and actions that may contribute to the development of STZs in Australia.

Identified what further actions or information is required to generate consensus on the implementation of STZs.

Findings

This review found that in Australia and the US, it is uncommon for policy on seed sourcing to be mandatory, instead, guidance is often provided. However, in many European countries, governments provide clear seed sourcing guidelines (in some cases legislated).

Prescribed or enforced policy on seed movement and/or the use of STZs in Australia and the US is rarely generated from the top levels of governments or their agencies.

The strength of encouragement by individual state departments to use locally collected seed (local provenance) are greatest in Tasmania, South Australia and the Northern Territory, where the use of local seed is an expectation, rather than a rule.

The definition of 'local provenance' ranges widely among the organisations; from 'on the site' to 'the region'.

By state, the following STZs were found:

- Western Australia has hundreds
- New South Wales has approximately 20
- Tasmania has general seed zones for Eucalyptus commercial forest species and
- South Australia has zones for 17 grass species spanning 13 botanical regions.

Within the native seed/ecological restoration community in Australia, there is support for the development of STZs. However, not all academics or practitioners think that STZs are necessary in Australia. For consensus to be reached, it will require multiple agreements and negotiations, with wide consultation among stakeholders on the many characteristics of potential STZs. There are many research projects currently underway, existing STZs, and theory (in both Australia and internationally) that can contribute to the development of STZs and present an opportunity to build on these. A coordinating central body such as the federal government will need to be appointed.

Evidence

Refer to the report *Native seed transfer zones in Australia — How far can seed go?* for a full list of references and appendices, including the below:

- Interviews — Tables 1 & 2: Appendices 1–4, 8, 9
- Peer-reviewed literature and web-based searches — Appendices 5 and 10

RECOMMENDATIONS

RECOMMENDATIONS	
1	**Further consultation needs to be undertaken on how (and if) seed transfer zones (STZs) could be developed and implemented in Australia. We suggest doing this over a longer period than this report (e.g., 2–5 years). Further discussion should be undertaken as part of the consultation process for the ten-year Strategy.[1]**
2	**Consideration should be given to include representation from overseas experts from the US, Canada and/or Europe to provide advice from people that have already implemented STZs. These representatives will bring a more neutral perspective to the discussions and avoid parochial views. Their inclusion may require payment as external consultants.**
3	**An adequately resourced coordinating body is needed to organise stakeholder engagement in further discussions on STZs. Initially, this could be instigated at the federal level, with a cost/benefit analysis on the efficacy of non-prescriptive seed movement throughout the multiple layers of government (federal, state/territory/agencies, local government) to demonstrate its economic viability. This process may identify those entities most willing to be involved in the process of STZ development.**
4	**Consideration should be given to releasing an information package about STZs — what they are, and the advantages and disadvantages of their use. This information must be made widely available and written for non-academic readers.**

[1] This project contributes to the evidence base for a ten-year strategy to guide the native seed and landscape sector. The document, which is untitled until endorsement in September 2021, is referred to as the Strategy in all Project Phoenix publications.

WANT TO KNOW MORE?

For further information read the full report *Native seed transfer zones in Australia — How far can seed go?*

Related projects

- *Join the National Seed Network!*
- *Psst... Everything you wanted to know about native seed licensing*
- *Do we need a National Seed Code of Practice?*
- *Making tracks — Where does seed come from and where does it go?*

This project contributes to the evidence base for a ten-year strategy to guide the native seed and landscape sector. The document, which is untitled until endorsement in September 2021, is referred to as the Strategy in all Project Phoenix publications.


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