

PROJECT PHOENIX



# BUSHFIRE IMPACTS WHERE WILL THE SEED COME FROM?



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

**The native seed sector operates on a seasonal cycle. While collectors often have some stock within seedbanks, it is unlikely to be sufficient to service the demand from such an extensive bushfire event.**

It is critical to understand the regional variation in seed capacity as planned restoration projects are at risk of:

- being unachievable in designated timeframes
- being delivered at a lower quality (species or genetic diversity) and
- being subject to species substitution in the absence of seed from suitable species.

This assessment will help to identify where capacity gaps exist, enabling projects to plan accordingly and investment in the native seed sector to occur.

## Scope

The scope of this project was to:

- undertake spatial and sector engagement analysis of the ability of the current seed sector to respond to restoration priorities and management scenarios and
- clarify seed and plant resources available in fire-affected areas.



## Introduction

**The capacity of the native seed industry to respond to restoration priorities as a result of the 2019–20 bushfires is unknown, due to the seasonal nature of the industry and the variability of seed supply and demand from region to region.**

While collectors often have some stock within seedbanks, it is unlikely to be sufficient to service the demand from such an extensive bushfire event, especially if target vegetation communities are traditionally not the focus for restoration, bear seed with limited storage options (such as flesh fruited rainforest species), are comprised of a high proportion of threatened species that may not be held in restoration seed banks or are in regions where traditional demand for native seed is low.

As a result, planned restoration programs are potentially at risk of being incapable of securing native seed in sufficient quantity or quality to meet requirements. It is critical to understand the regional variation in seed capacity as planned restoration projects are at risk of being unachievable in designated timeframes, being delivered at a lower quality (species or genetic diversity), or being subject to species substitution in the absence of seed from suitable species.

This project aims to identify where capacity gaps exist, enabling projects to plan accordingly and investment in the native seed sector to occur. As a basis for investigation of seed industry capacity, five priority locations were nominated (a subset of the 19 identified in *Bushfire impacts — A national model for assessing local landscape restoration priorities*), which include the following Threatened Ecological Communities (TECs) detailed in **Table 1**.

**Table 1.** Priority locations identified for seed industry capacity assessments, and number of species searched per community

Threatened Ecological Community (TEC)	Code	Community type	State	# spp. searched
Lowland Rainforest of Subtropical Australia	LROSA	Rainforest	QLD/NSW	61
Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion	UBEFS	Wet Sclerophyll	NSW	86
Lowland Grassy Woodland in the South East Corner Bioregion	LGWSEC	Grassy Woodland	NSW	80
Silurian Limestone Pomaderris Shrubland of the South East Corner and Australian Alps Bioregions	SLPS	Shrubland	VIC	20
Eastern Stirling Range Montane Heath and Thicket	ESRMHT	Heathland	WA	68



A list of suppliers for each TEC was obtained through Greening Australia's existing industry contacts and web searches, prioritising suppliers within or closest to the TEC based on physical distance between place of business and TEC location, measured using Google Earth. The list of suppliers was then prioritised for assessment based on availability of web catalogues or online inventory search portals, supplier type, and distance from TEC, generating a list of seven seed suppliers and three seedling suppliers for each region, totalling ten suppliers.

Catalogue or web portal searches were then conducted, recording the presence or absence of 296 priority species (ranging from 20–86 species per community), supplier details including name, location, approximate number of native species in catalogue, supplier type, market focus and subjective/qualitative observations. The collected data was analysed in Excel, and charts and tables generated. The percentage of species available within the supply sector and number of suppliers assessed have been reported in the Outcomes section.



## Issues

Catalogue searches recorded presence or absence of priority species, and supplier details (i.e. name, location and type of supplier). Provenance information and available quantities of seed were rarely reported in commercial supplier catalogues but were often featured in community seedbank websites. Due to this lack of consistency, provenance and quantity available were not recorded. As a result, key information that can be gleaned from searches is whether a species is ordinarily featured in supply chains, and some indication as to the likelihood of obtaining it, inferred by the frequency a species is listed by multiple suppliers.

Suppliers were prioritised for each TEC based on physical distance between place of business and TEC location, on the assumption that the likelihood of stocking target species would increase with increased proximity to the TEC. There were more challenges identifying suppliers within close range of TECs that had limited geographical distribution and were located at greater distances from major population centres.

Using catalogue-only searches, no more than seven suppliers could be identified in any region. To supplement this, native plant nurseries were also assessed, based on the premise that native plant nurseries have or source seed or propagules for the native plant species they stock. In addition, native plant nurseries may be considered as storage of seed in seedling form, which is a viable option if a species has seed with limited storage options (such as fleshy rainforest fruits), or if seed production is limited and germ culture is considered a reasonable alternative.

## Comment

Efforts were made to identify suppliers <100km from each TEC. While no single community had a total of ten suppliers operating within this range, each community had at least one seed or seedling supplier.

As the purpose of this report is to investigate seed supply capacity, limited numbers of native plant nurseries were assessed, limiting the reliability of comparisons between these two industries.

This report is not advocating the superiority of any one supplier over another, and indications that a supplier may provide a species does not mean the species is currently stocked.

Preference was given to suppliers self-described as seed merchants, restoration market suppliers, etc, based on the assumption that these suppliers would have or intend to develop capacity to deliver seed from a reasonable species diversity and at reasonable quantities. Community seedbanks were also assessed based on the assumption that they may have reasonable diversity of local species, if not the capacity to supply great quantities. Seed suppliers selling packet seeds only were avoided.





## Key outputs

The key output of this activity is a report investigating the capacity of suppliers to provide seed or seedlings of species associated with TECs.

The report provides context surrounding the many factors involved, including:

- variations in market focus of suppliers
- constraints surrounding market stability and reliability
- environmental factors affecting seed availability
- challenges in locating, harvesting, processing, storing and propagating and
- best practice surrounding seed quality and environmental sustainability.



## Outcomes

Planned outcomes include identifying the percentage availability of seed requirements per priority vegetation group (which was calculated as the percentage of target species listed in supply catalogues), and the number of seed suppliers contacted.

### Number of suppliers identified and assessed

The number of suppliers initially identified through Greening Australia's industry contacts and web searches, located within broad geographic range of the target TECs, included 77 seed suppliers and 25 nurseries. Please note, this does not represent the actual total number of suppliers operating in each state, only in focus regions. Of these 102 suppliers identified, the websites of 25 seed suppliers and 14 seedling suppliers were assessed (39 total), as may be seen in **Table 2**.

Table 2. Total number of suppliers identified through industry contacts and web searches, compared to number of suppliers assessed.

State		QLD	NSW	Vic	SA	WA	Total
Seed suppliers	Identified	7	31	14	2	23	77
	Assessed	4	7	7	1	6	25
Nurseries	Identified	1	8	5	0	11	25
	Assessed	1	7	3	0	3	14



## Percentage of species available

From the 315 species searches (296 species, with 18 species searched more than once) across 39 seed/ seedling suppliers, an average of 37% of species were listed in catalogues or web search portals. Between the communities, the highest percentage of species listed was for Grassy Woodland (LGWSEC) at 50%, and the lowest was for Heathland (ESRMHT) at 22%. Seed suppliers offered a higher percentage of species listed for Wet Sclerophyll (UBEFS) and Heathland (ESRMHT) communities, while seedling suppliers offered a higher percentage of listings for the remaining three communities.

Refer to **Table 3** for details regarding total number of species assessed per TEC, percentage of species listed per seed or seedling suppliers, and the total percentage of species listed across all suppliers assessed.

Table 3. Comparison of species availability between seed and seedling suppliers and TECs

TEC species list	# species assessed / TC	% seed available from 7 suppliers	% seedling available from 3 suppliers	% combined species available from 10 suppliers
LROSA	61	26%	33%	41%
UBEFS	86	34%	23%	41%
LGWSEC	80	25%	38%	50%
SLPS	20	15%	25%	30%
ESRMHT	68	15%	10%	22%
<b>Total</b>	296*	25%	26%	37%

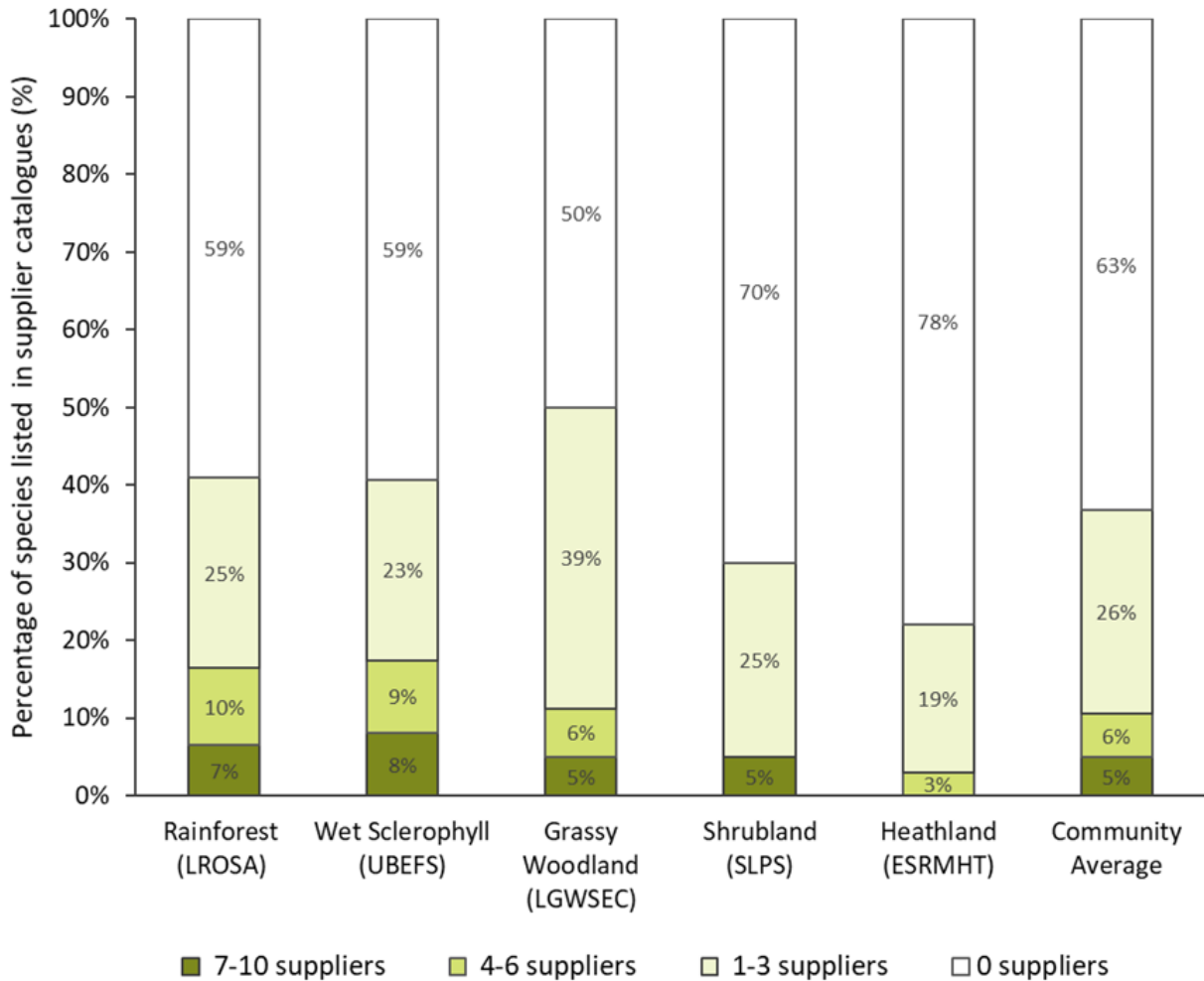
\*17 Species were included in two searches, and one species in three searches. 315 searches in total.



### Number of suppliers (out of 10) with a species listed

The highest percentage of species listed by  $\geq 4$  suppliers were found in assessments of suppliers for Rainforest (LROSA, 16%) and Wet Sclerophyll (UBEFS, 17%). For all communities, most species listed in supplier catalogues were offered by  $\leq 3$  suppliers, which was largely confined to species listed by one supplier only. Refer to **Figure 1** below for comparison of the percentage of species listed for each community, compared to the number of suppliers with each species listed.

Figure 1. Stacked column chart showing the percentage of species available for each TEC search, and number of suppliers (out of 10) with each target species listed in their catalogues



## Findings

Results of catalogue searches for 296 species associated with five nominated TECs suggest on average:

- only 11% of species needed for targeted revegetation works might be reliably sourced
- an additional 26% of species are infrequently featured in the supply chain, showing capacity to harvest does exist and will need to be boosted and
- the remaining 63% of species assessed were unavailable, indicating research will be needed to learn where, when, and how to harvest, process, store and grow them.

Whether these species should be obtained from wild harvests, Seed Production Areas (SPA), or both needs to be determined early on, as successive harvests over multiple years is likely needed for wild harvests, and SPAs require multiple years to establish and become productive.

**Any targeted revegetation program should have at minimum five years after-care/ maintenance, so adequate seed or seedlings are established by year five of the ten-year Strategy.<sup>1</sup>**

To ensure the native seed sector can deliver what's needed for Black Summer restoration priorities and ensure long-term stability and capacity, support and investment will be needed to boost equipment and infrastructure, research and innovation, market access/visibility of small suppliers, and to support/promote the establishment of SPAs.

In addition, other factors important for a maturing and stable industry include standardised guidelines for seed quality, accredited best practice training and improving provenance information sharing.

## Evidence

Refer to the full report *Bushfire impacts — Where will the seed come from?* for all tables, figures and references.

<sup>1</sup> 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.



# RECOMMENDATIONS

## RECOMMENDATIONS

1

### Research and timing

Prompt actions are needed to generate seed, propagule, or seedling supply within the first five years of the ten-year program, including:

- Further studies into priority species readily available in the market, investigating available provenances and quantities.
- Species already featured in supply chains but not available from existing stocks will need targeted collections. Early arrangements will allow for sustainable harvest over multiple seasons, subject to seasonal variation and seed storability or staged usage.
- Assessments must be made for priority species unavailable in the supply chains as to whether they may be sustainably harvested from wild populations (who, when, where, how, and over what period), or are suitable candidates for Seed Production Areas (or both).
- Research is required into species not ordinarily featured in the seed/seedling supply chain to develop skill and knowledge as to where these species may be sustainably sourced, how and when to harvest, how to process and preserve, germinate and/or propagate.
- Early establishment/development of Seed Production Areas for suitable species will maximise harvest potential. This must include identifying, supporting and/or expanding SPAs already producing priority species, and the development or expansion of SPAs to produce priority species not yet in cultivation.
- SPA research, investigating horticultural methods to maximise seed production of a diverse range of species (including pollinator research), and developing best practice for genetic quality is required.
- Support innovation to develop cheap/cost-effective harvesting or collecting plant/equipment.



## RECOMMENDATIONS

2

**Industry capacity building measures**

All recommendations are subject to regional and community suitability or need, and are to the benefit of the local sector, not just a single supplier.

- Develop and implement models for economically viable and resilient community seedbanks or cooperatives (or increase capability of existing ones), subject to regional and community suitability or need.
- Improve access to equipment and facilities through the creation of regional storage and processing locations through seedbanks, cooperatives or established stable suppliers.
- Create or support access to mobile processing equipment, and/or implement innovations from the sharing-economy such as 'tool libraries'.
- Support networking initiatives between seedbanks or cooperatives which enable improved provenance searching capacity (such as Seeding Victoria's 'map search' function [13]).

3

**Environmental sustainability and quality**

- Develop and implement training and accreditation programs, delivered through FloraBank, instructing best practice native seed harvesting, processing, record keeping and storage methods.
- Development of an environmental risk assessment process for permits/licensed collection of threatened species, or species within Threatened Ecological Communities.



# WANT TO KNOW MORE?

For further information read the full report, *Bushfire impacts — Where will the seed come from?*

## Related projects

- *Bushfire impacts — ArcGIS resources*
- *Bushfire impacts — A national model for assessing local landscape restoration priorities*
- *Bushfire impacts — How much seed will I need?*
- *Join the National Seed Network!*

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