Seed sourcing to establish a healthy translocated population

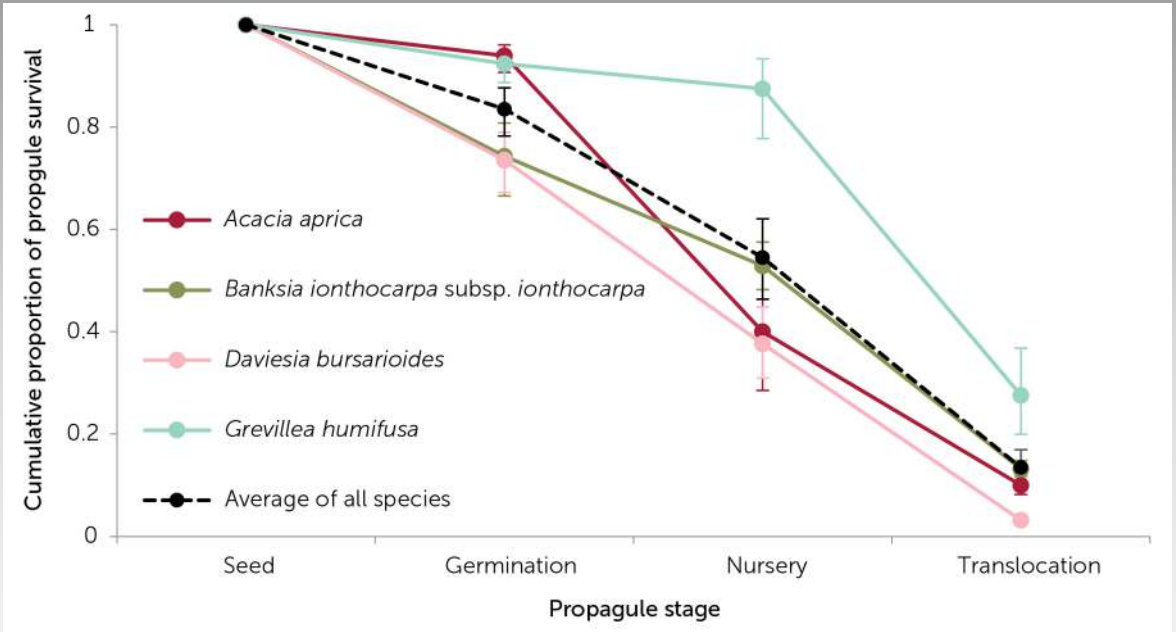
Andrew Crawford

Start early!

How much seed do we need?

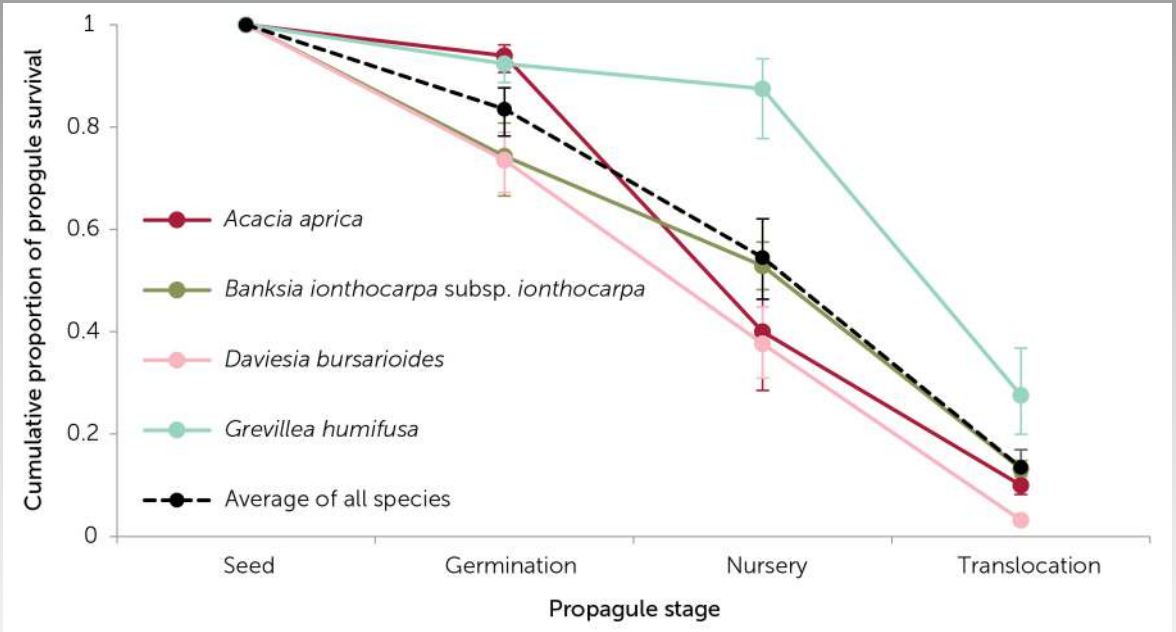
- 3000 to 20000 seed recommended for an ‘ideal’ conservation collection.
- Allows for seed testing, monitoring, duplication & use.

How much seed to establish a translocation?



Cochrane A, Crawford AD, Errington G, Cuneo P, Viler M, Wood JA, Perrins L (2021) Seed and vegetative material collection. In 'Plant Germplasm Conservation in Australia: Strategies and guidelines for developing, managing and utilising ex situ collections. (Eds AJM Yenson, CA Offord, PF Meagher et al) pp. 85-117. (Australian Network for Plant Conservation: Canberra).

How much seed to establish a translocation?



To establish 250 plants:

Grevillea humifusa
~ 900 seed

Daviesia bursarioides
~ 7900 seed

No guarantee of success

Keep some seed in reserve

Collections in the WA Seed Centre

Collection size for Threatened plant species

Seed collection size	Proportion of collections (%)
≤ 100	32
> 100 and ≤ 1000	42
>1000 and ≤ 10000	22
>10000	5

Multiple collections made for most species

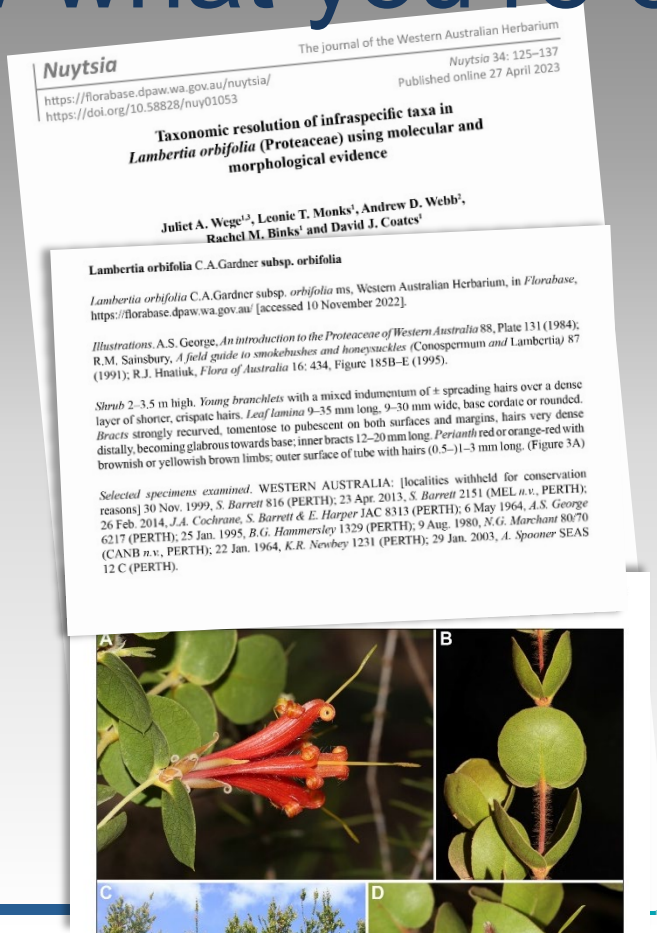
$\bar{x}$ = 7.8 (range: 1 to 72) collections / species

Total seed for Threatened plant species

Species total collection size	Proportion of collections (%)
≤ 100	6
> 100 and ≤ 1000	26
>1000 and ≤ 10000	37
>10000	31

Seed production areas

Know what you're collecting



Nuytsia — The journal of the Western Australian Herbarium

https://florabase.dpaw.wa.gov.au/nuytsia/
https://doi.org/10.58828/nuy01053

Nuytsia 34: 125–137
Published online 27 April 2023

Taxonomic resolution of infraspecific taxa in *Lambertia orbifolia* (Proteaceae) using molecular and morphological evidence

Juliet A. Wege[1,3], Leonie T. Monks[1], Andrew D. Webb[2], Rachel M. Binks[1] and David J. Coates[1]

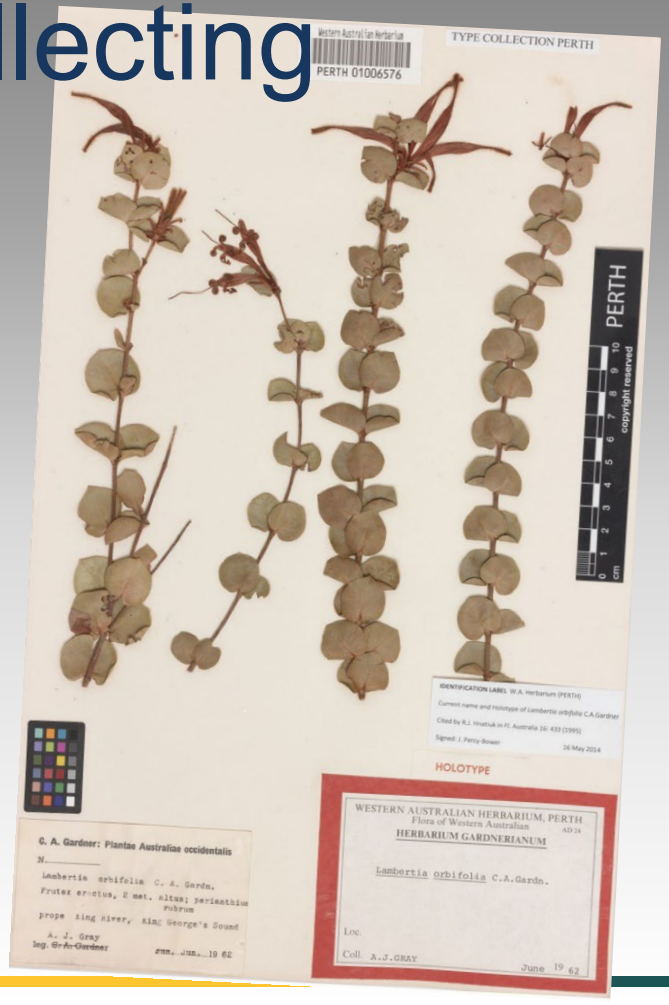
Lambertia orbifolia C.A.Gardner **subsp. orbifolia**

Lambertia orbifolia C.A.Gardner subsp. *orbifolia* ms, Western Australian Herbarium, in *Florabase*, https://florabase.dpaw.wa.gov.au/ [accessed 10 November 2022].

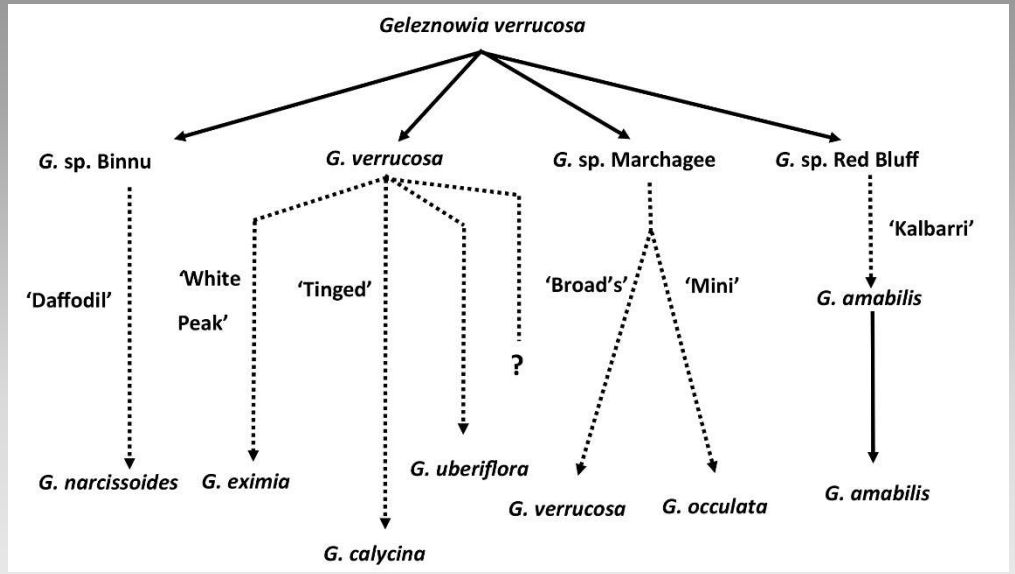
Illustrations. A.S. George, *An introduction to the Proteaceae of Western Australia* 88, Plate 131 (1984); R.M. Sainsbury, *A field guide to smokebushes and honeysuckles* (Conospermum *and* Lambertia*)* 87 (1991); R.J. Hnatiuk, *Flora of Australia* 16: 434, Figure 185B–E (1995).

Shrub 2–3.5 m high. *Young branchlets* with a mixed indumentum of ± spreading hairs over a dense layer of shorter, crispate hairs. *Leaf lamina* 9–35 mm long, 9–30 mm wide, base cordate or rounded. *Bracts* strongly recurved, tomentose to pubescent on both surfaces and margins, hairs very dense distally, becoming glabrous towards base; inner bracts 12–20 mm long. *Perianth* red or orange-red with brownish or yellowish brown limbs; outer surface of tube with hairs (0.5–)1–3 mm long. (Figure 3A)

Selected specimens examined. WESTERN AUSTRALIA: [localities withheld for conservation reasons] 30 Nov. 1999, *S. Barrett* 816 (PERTH); 23 Apr. 2013, *S. Barrett* 2151 (MEL *n.v.*, PERTH); 26 Feb. 2014, *J.A. Cochrane, S. Barrett & E. Harper* JAC 8313 (PERTH); 6 May 1964, *A.S. George* 6217 (PERTH); 25 Jan. 1995, *B.G. Hammersley* 1329 (PERTH); 9 Aug. 1980, *N.G. Marchant* 80/70 (CANB *n.v.*, PERTH); 22 Jan. 1964, *K.R. Newbey* 1231 (PERTH); 29 Jan. 2003, *A. Spooner* SEAS 12 C (PERTH).



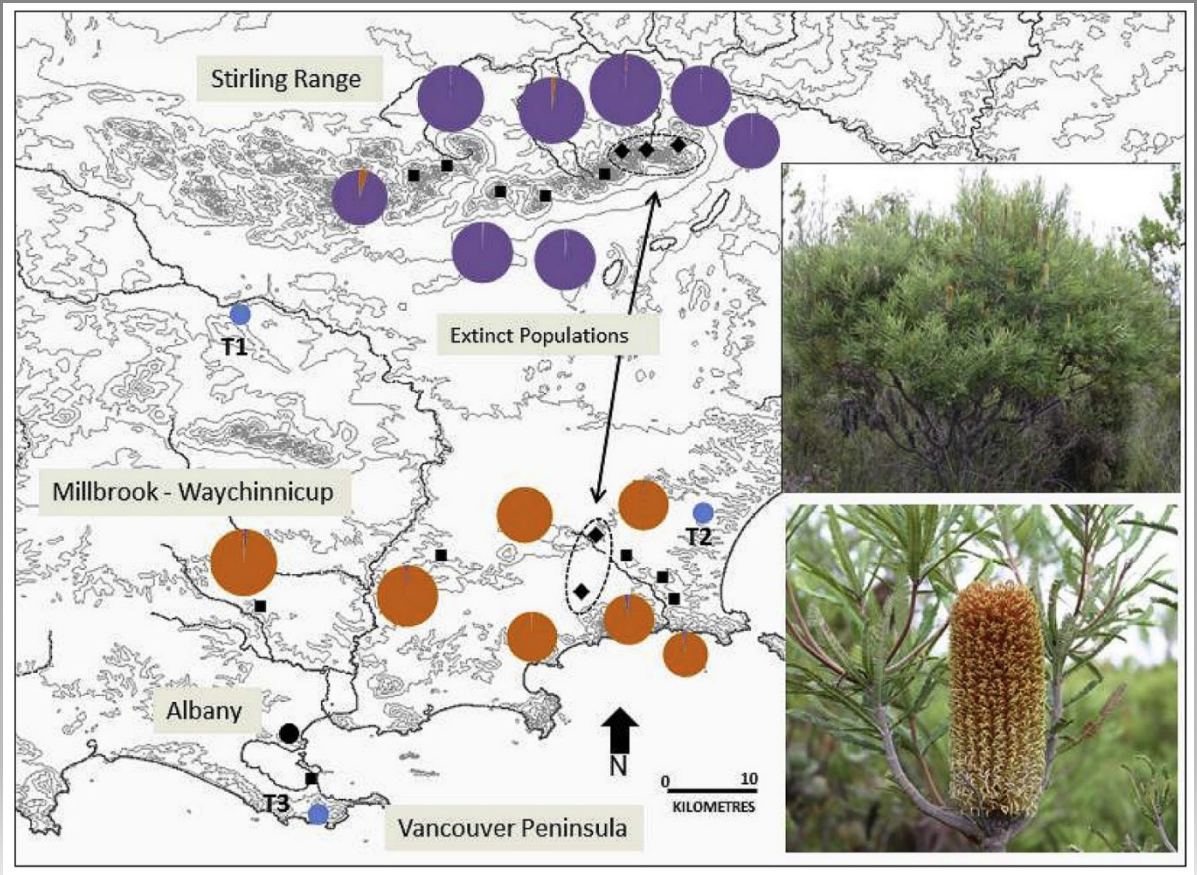

PERTH 08152012
Holotype of
Geleznowia amabilis K.A.Sheph. & R.J.Crawford
DETERMINAVIT K.A. Shepherd 28/9/2010
Western Australian Herbarium (PERTH)
cm 0 1 2 3 4 5 6 7 8 9 10
copyright reserved
PERTH
Geleznowia sp. Red Bluff (A. Crawford ADC 587)
DETERMINAVIT: Kelly A. Shepherd 4/2/2010
Western Australian Herbarium (PERTH)
WESTERN AUSTRALIAN HERBARIUM, PERTH
Flora of Western Australia
Geleznowia verrucosa Turcz.
Rutaceae
Erect single stemmed shrub 1.2 m high, 0.8 m wide. Leaves grey–green. Flowers bright yellow.
Gentle slope, brown sand. Mallee woodland, Anthocerus.
Frequency: occasional.
Loc: E of Kalbarri WA
Lat. 27° Long. 114° GDA94
Coll. K.A. Shepherd & J. Wege KS 1305 Date: 23/09/2009
Dups. to: DNA MO NSW
PERTH 08152012


Geleznowia verrucosa
G. sp. Binnu
G. verrucosa
G. sp. Marchagee
G. sp. Red Bluff
'Kalbarri'
'Daffodil'
'White Peak'
'Tinged'
?
'Broad's'
'Mini'
G. amabilis
G. narcissoides
G. eximia
G. uberiflora
G. verrucosa
G. occulata
G. amabilis
G. calycina

Aim to sample the diversity of a species – within and between populations

- Aim to conserve at least 95% of the genetic variability within a population
- Sample plants randomly across the population
- Ideally keep individuals separate
- Collect from across the species range

Population extinctions and diversity loss



Banksia brownii

Coates DJ, McArthur SL, Byrne M (2015) Significant genetic diversity loss following pathogen driven population extinction in the rare endemic Banksia brownii (Proteaceae). *Biological Conservation* **192**, 353-360.

WUBIN

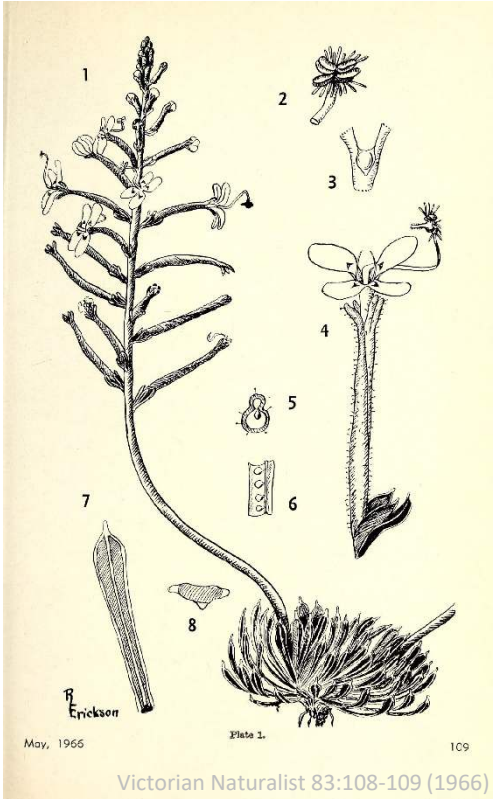
WONGAN HILLS

Stylidium coroniforme

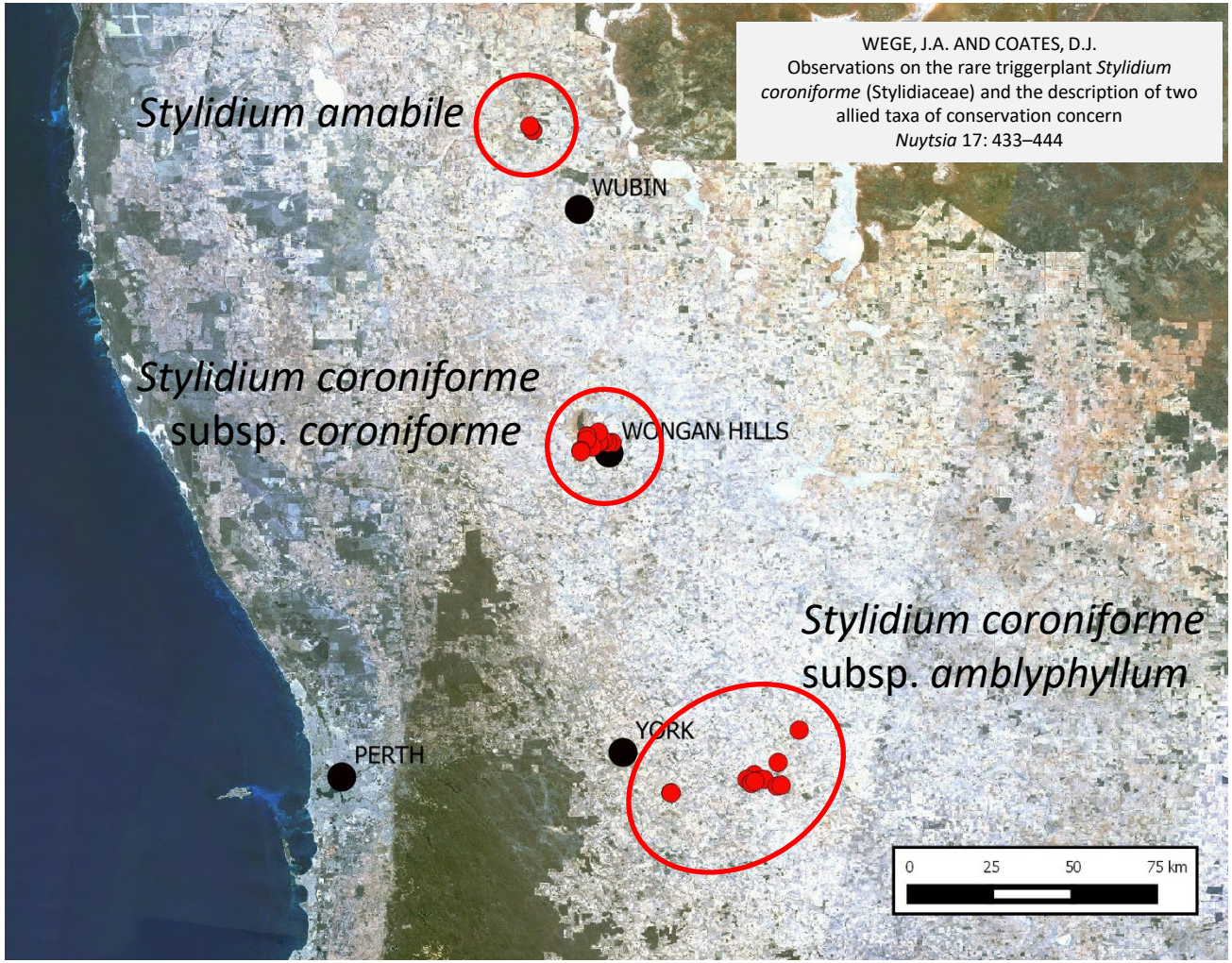
YORK

PERTH

0 25 50 75 km



Victorian Naturalist 83:108-109 (1966)



Stylidium amabile
Photo: J. Wege

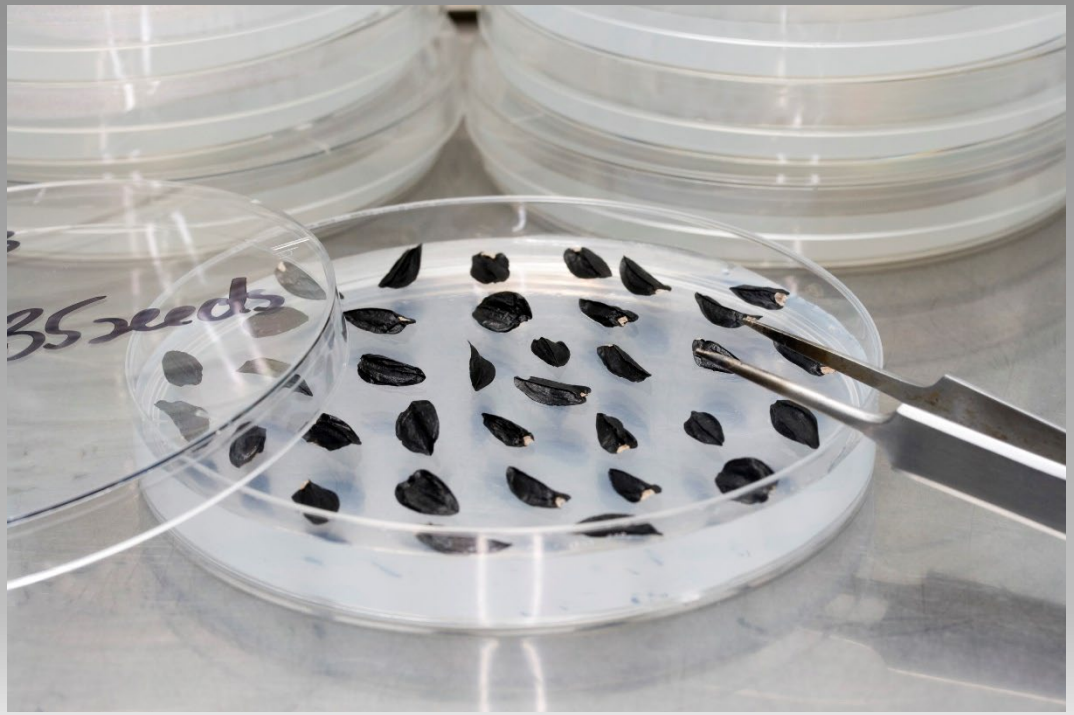
Stylidium coroniforme
subsp. *coroniforme*
Photo: J. Wege

Stylidium coroniforme
subsp. *amblyphyllum*
Photo: J. Wege

Store seed to prolong longevity

- Store below -18°C
- Seed moisture content ca. 3-7%

Assess viability



Good record keeping/tracking

Thank you