

State Herbarium of South Australia
Botanic Gardens and State Herbarium
Economic & Sustainable Development Group
Department for Environment and Water

Milestone Report

**Regional Landscape Surveillance for
New Weed Threats Project
2018-2019**

**Milestone: Annual report on new plant
naturalisations in South Australia**

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June 2019



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Summary

Largely through the work of the State Herbarium of South Australia's Weeds Botanist, this year **13** weeds have been added to the Census that have naturalised or become questionably established in the State. This comprises **six** taxa collected for the first time, and **seven** for which herbarium collections had been made in previous years but have now been more thoroughly investigated and assessed as weedy in South Australia. Detailed descriptions are given for each of these plant species. Furthermore, **31** updates were made to existing Census weed taxa records involving either a change to the scientific name of a taxon, or to its regional occurrence(s) or establishment status.

The Weeds Botanist undertook **27** days of fieldwork and **six** separate community engagement activities during the last year, in three of the State's eight NRM regions.

1. Activities and outcomes for 2017/2018 financial year

This report summarises the work carried out by the State Herbarium of South Australia for the project *Regional Landscape Surveillance for New Weed Threats* for the 2018/19 financial year.

Funding

Overall funding for the project was received from a number of sources, namely: the State Natural Resource Management Program; Biosecurity SA, Department of Primary Industries and Regions, South Australia (PIRSA); Natural Resources Adelaide and Mt Lofty Ranges (NR AMLR); and their support is gratefully acknowledged. Additional funds came from plant identification services; the provision of a workshop at Taillem Bend on weeds of the dairy industry was organised by Natural Resources SA Murray-Darling Basin (NR SAMDB), supported by Dairy Australia, and a workshop on Kangaroo Island on asparagus weeds and new weed threats was organised by Natural Resources Kangaroo Island (NR KI).

This funding covered the salary of a Weeds Botanist (Chris Brodie), based at the State Herbarium, and partially defrayed the cost of undertaking fieldwork and plant sample processing.

Significant in-kind support was also provided by the State Herbarium of South Australia staff, Honorary Research Associates and other volunteers: identification, taxonomic and nomenclatural expertise; analysis and reporting; project management; field assistance; plant sample processing and data generation (on specimens and species, available online via eFloraSA, SA Census, AVH, ALA, GBIF).

Activities

A major focus of the work of the Weeds Botanist was discovery and collection of new ‘weed’ records, with all field work carried out in the Adelaide Mount Lofty Ranges (AMLR) Natural Resources Management (NRM) region, apart from one day in the SA Murray-Darling Basin (SA MDB) NRM region. The Weeds Botanist undertook 27 days fieldwork during the period, in conjunction with State Herbarium and agency staff, Honorary Research Associates and volunteers (see Appendix 1; Table 3). During these field trips, 271 specimens were collected for the State Herbarium of South Australia.

The Weeds Botanist undertook **six** community and staff engagement activities during the year (see Appendix 1; Table 4). Community and staff engagement activities help to increase awareness of the weeds themselves, the value of their early detection and the processes required to contribute scientifically valid specimens and records to the State Herbarium.

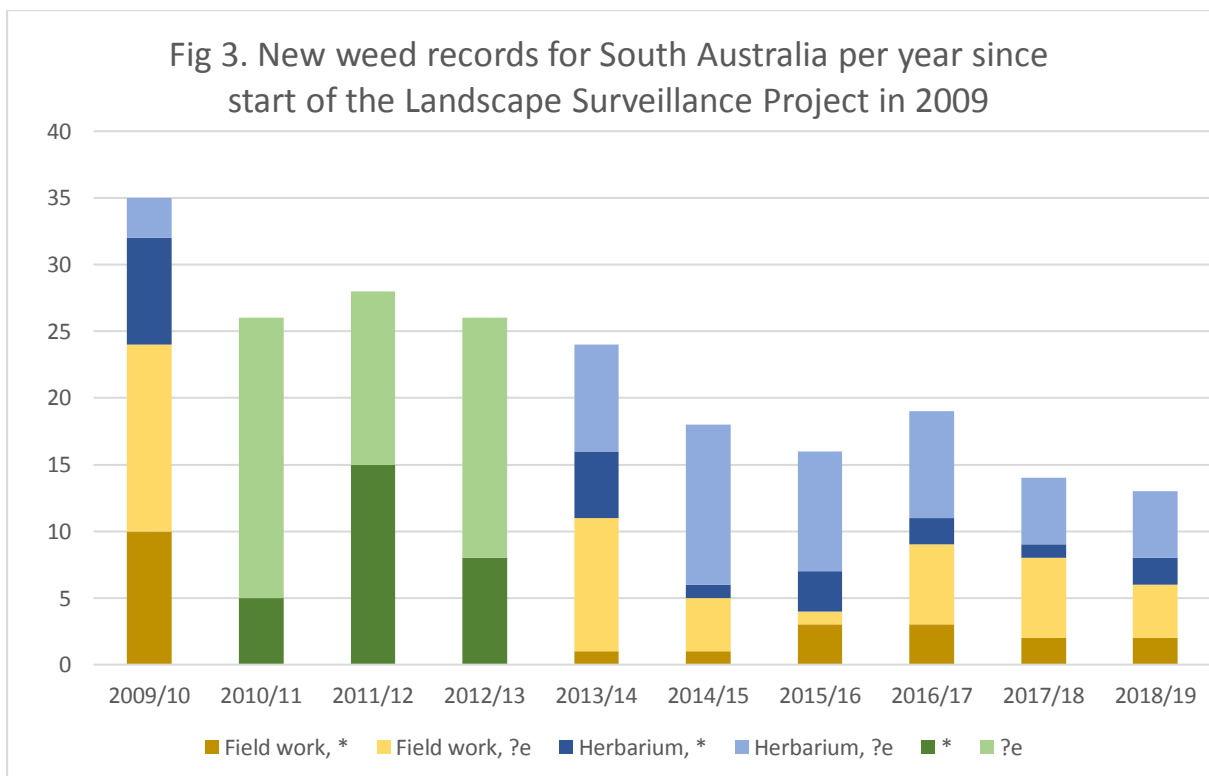
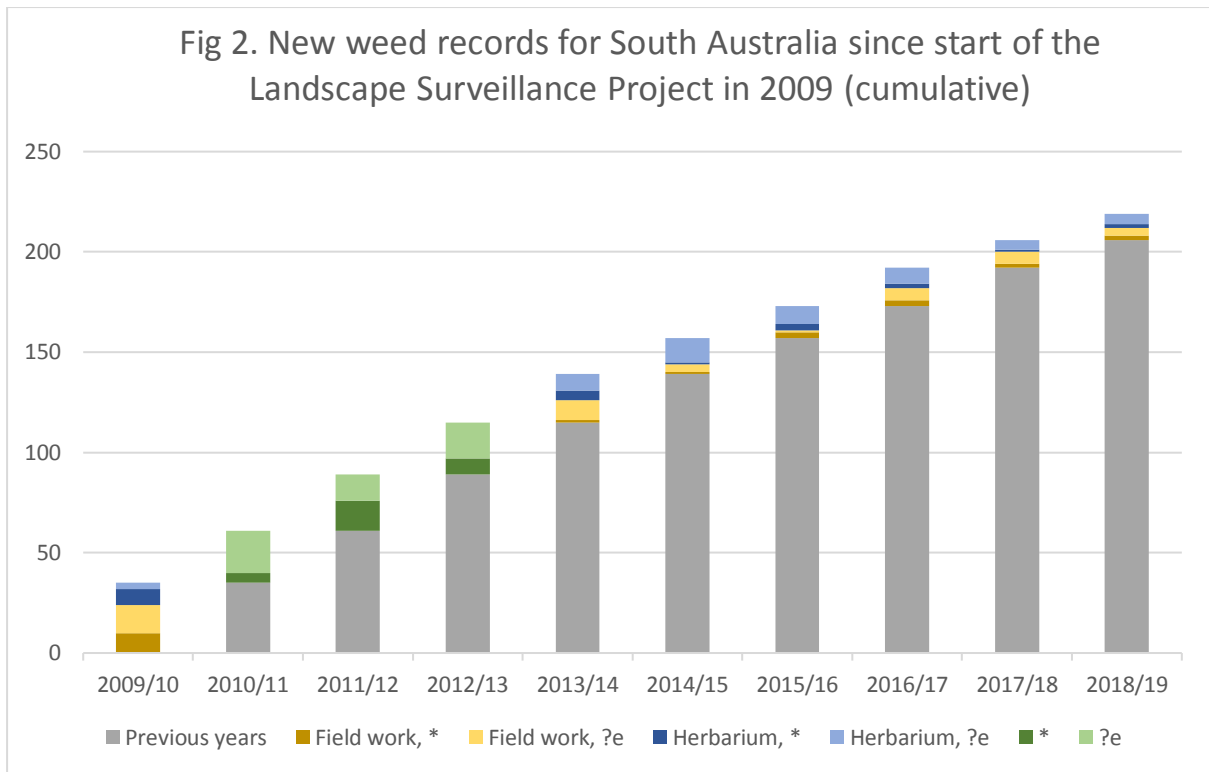
The Weeds Botanist attended the Australasian Weeds Conference in Sept. 2018 and was invited as keynote speaker at the Victorian Weeds Society Conference in May 2019 (Fig. 1).

Support for the Weeds Botanist position also provided an essential point of contact for regional staff and communities to gain precise plant identifications and associated information including distribution, taxonomic status and establishment status of weeds.

The Weeds Botanist also carried out plant identification work for other researchers leading external projects.



Fig 1. Conference presentation on ‘New and emerging weed threats in South East Australia’ by Weeds Botanist Chris Brodie at the Victorian Weeds Conference in Echuca, Vic.



Data in **Figs 2 & 3** from the yearly *Regional Landscape Surveillance* reports, specifying new weeds (established, *, or questionably established, ?e) recorded through **Field work** or existing **Herbarium** collections. The distinction between Field work and Herbarium was not reported in the years 2010/11 to 2012/13.

Outcomes and progress of weeds monitoring

The State Herbarium includes all naturalised (established,*) and questionably or sparingly naturalised (questionably established,?e) taxa in this report as weeds or potential weeds. These taxa are non-native species that have at some level established naturally in the wild, being either self-sustaining or showing some degree of self-propagation.

This year we have recognised 13 new weed species records for the State (see Section 2).

Since the project began in 2009, a total of 219 new naturalised plant species have been recorded through field collections and research at the Herbarium. These records have subsequently been added to the online *Census of South Australian plants, algae and fungi* (Census¹).

An overview of the numbers of weeds reported through this project (Figs 2 & 3) shows that beyond the initial rapid detection of new weeds at the start of the program, significant numbers of new weeds still continue to be detected each year in South Australia. Nearly half of the new records are discoveries resulting from fieldwork by the Weeds Botanist, regional staff and collaborators. Some of the collections made supplement existing (historical) herbarium collections that lacked adequate data for assessment of their establishment status. The new collections and associated data allowed a number of species to be assessed as questionably naturalised for the first time and subsequently added to the Census. Other new taxa records were found as a result of more detailed taxonomic investigation and analysis of existing herbarium collections.

The Census provides the South Australian community with information on the State's native and naturalised (weedy) plants occurring in the wild, listing their current name and synonyms (previous names), as well as their regional distribution and conservation status. This information underpins our knowledge on plant species identity and occurrence, and as such forms an official reference point for any legislative action relating to native and naturalised plants growing wild.

Data obtained from researchers and botanists within and outside SA, through ongoing taxonomic research in the Herbarium and from field collections, has been assessed and included in the Census. Maintaining the Census involves monitoring and reviewing the work published by botanists world-wide that affects the taxonomy of species occurring in South Australia.

¹ *Census of South Australian Plants, Algae and Fungi*, current edition available online <http://flora.sa.gov.au/census.shtml>

2. New naturalised or questionably naturalised records of plants in South Australia.

Over the previous year (2 May 2018 – 13 May 2019) a total of **13** new species records of naturalised or questionably naturalised plants in the wild were added to the Census, based on collections deposited and accessioned in the State Herbarium (listed in **Table 1** and described in Section 3 of this report).

These fall into three categories:

(1) **Five** field work detected species, i.e. collected recently and added to the Census for the first time in the past year. There is definitive evidence of these being established or questionably established in the wild:

- ?e *Agave attenuata*
- ?e *Aloiampelos ciliaris*
- * *Atriplex amnicola*
- * *Callitris oblonga* subsp. *oblonga*
- ?e *Eucalyptus steedmanii* × *Eucalyptus* species
- ?e *Lilium formosanum*.

(2) **Two** fieldwork detected species had existing State Herbarium collections but data on their distribution in the State or taxonomic status was inadequate for assessment. The recent field observations and collections enabled their addition to the Census:

- ?e *Acacia adunca*
- ?e *Hedychium gardnerianum*.

(3) **Five** new species records were discovered when existing State Herbarium collections were re-examined and identified during the past year:

- * *Acacia cardiophylla*
- ?e *Acacia jibberdingensis*
- * *Acacia vestita*
- ?e *Aptenia cordifolia* × *Aptenia haeckeliana*
- ?e *Hypericum canariense*.

* = established/naturalised in the wild; ?e = questionably established.

Table 1: The 13 new South Australian weed records added to the Census, based on recent collections and knowledge newly generated.

* = established/naturalised in the wild; ?e = questionably established.

New Taxon	Common Name	Family	Naturalised/ established	Regional distribution
<i>Acacia adunca</i> A.Cunn. ex G.Don	Wallangarra wattle	Leguminosae	?e	SL
<i>Acacia cardiophylla</i> A.Cunn. ex Benth.	Wyalong wattle	Leguminosae	*	SL
<i>Acacia jibberdingensis</i> Maiden & Blakely	Jibberding wattle	Leguminosae	?e	SL
<i>Acacia vestita</i> Ker Gawl.	Hairy wattle	Leguminosae	*	SL
<i>Agave attenuata</i> Salm-Dyck	Foxtail agave	Agavaceae	?e	SL
<i>Aloiampelos ciliaris</i> (Haw.) Klopper & Gideon F.Sm. var. <i>ciliaris</i>	Climbing aloe	Liliaceae	?e	SL
<i>Aptenia cordifolia</i> (L.f.) Schwantes × <i>Aptenia haeckeliana</i> (A.Berger) Bittrich ex Gerbaulet	Hybrid heart-leaf iceplant	Aizoaceae	?e	SL
<i>Atriplex amnicola</i> Paul G.Wilson	River saltbush or swamp saltbush	Chenopodiaceae	*	SL
<i>Callitris oblonga</i> Rich. & A.Rich. spp. <i>oblonga</i>	Tasmanian cypress pine	Cupressaceae	*	SL
<i>Eucalyptus steedmanii</i> C.A.Gardner × <i>Eucalyptus</i> sp.	Steedman's mallet hybrid	Myrtaceae	?e	MU
<i>Hedychium gardnerianum</i> Sheppard ex Ker Gawl.	Kahili ginger	Zingiberaceae	?e	SL
<i>Hypericum canariense</i> L.	Canary Islands St. John's wort	Guttiferae	?e	SL
<i>Lilium formosanum</i> A.Wallace	Formosan lily	Liliaceae	?e	SL

3. Descriptions of newly recognised weeds in South Australia

Taxa are listed in alphabetical order (see also Table 1).

Family: **Leguminosae**

Acacia adunca A.Cunn. ex G.Don

Common name: Wallangarra wattle

Description: Bushy shrub or tree normally to 6 m tall, occasionally to 14 m. Branches smooth and slender, dark reddish in colour. Phyllodes (modified leaf stalks functioning as leaves) soft and narrow 1.5–2.5 mm wide, but relatively long to 75–140 mm. Phyllodes have a characteristic small hooked-tip. Inflorescence racemes simple, raceme axes 15–40 mm long, comprising 4–13 globular flower heads, each head of 9–14 bright yellow flowers. Flowering racemes are produced in large numbers near the ends of branches, causing the outer branches to become pendulous. Fruits are smooth, pods slightly curved and bent, 10–13 mm wide, 5–130 mm long containing about (2–) 5–10 seeds. Pods are sometimes slightly constricted between the seeds. Seeds oblong to elliptic, 5.5–6 mm long, somewhat shiny, blackish with short funicle (the strand that connects the seed to the pod). Flowering in mid-winter to mid-autumn. **Fig 4.**

Native to: Qld and NSW and geographically restricted to a small area along the Great Divide.

Worldwide: Introduced into South Africa and India.

Distribution in Australia: Occasionally planted as an ornamental in the eastern States and SA. Not known to have naturalised elsewhere in Australia.

Collections in SA: Two collections, one historical and one recent. The recent one, *C.J.Brodie 8412*, was made in Aug. 2018 from two adjacent self-sown whippy trees in the Aldgate area on a road verge in native vegetation with a blue marker identifying it as a conservation site (no. 75). The earlier historical collection, *R. Bates 47986*, was made in Aug. 1997 from south of Longwood on the west side of Mount Bold Road, but as it lacked details giving evidence of naturalisation, the species had not been added to the Census.

Status in SA: A new questionably naturalised record (?e) for SA and the AMLR NRM region. Added to the Census for SA and the Southern Lofty (SL) herbarium region based on: collection *C.J.Brodie 8412* made on 23 Aug. 2018; and identification from M. O'Leary in 2018.

References: PlantNET (2018); WorldWideWattle (2018).



Fig. 4. *Acacia adunca*, herbarium specimens in fruit and flower. Images by C.J. Brodie.

Acacia cardiophylla A.Cunn. ex Benth.

Common name: Wyalong wattle

Description: Flat-topped many-stemmed shrub or tree 1–3.3 m high. Bark smooth, grey or mottled brown. Young branches rounded or sometimes obscurely angled, with or without stiff spreading cream-coloured hairs. The young foliage-tips are more or less cream-coloured. Leaves are a little leathery, pale green in colour, and fern-like (bi-pinnate, composed of leaf pinnae), the main leaf axis (leaf rachis) is 10–60 mm long with (3–) 8–19 pairs of leaf pinnae, the lower pairs normally shorter than those above. The pinnae are narrowly ovate, orbicular or oblong, 0.8–2 mm long, 0.5–1 (–1.3) mm wide, with short hairs especially below and on margins. The leaf stalks are minute or absent, with the leaf sections (pinnae) arising immediately, or to 2 mm above the small swollen leaf-base. The first pair of leaf pinnae have a small rounded gland at their insertion on the main leaf stalk (rachis), and similar glands occur less consistently between subsequent pairs of leaf pinnae up the leaf rachis. Inflorescences in axillary racemes of flowering heads, with raceme axis zig-zagged. Flowering heads 3–5 mm diameter, 16–32-flowered, golden. Fruiting pods 15–115 mm long, 4–6.5 mm wide, partially leathery to touch, blue-black or dark brown, paler between seeds, with stiff, silver hairs. Flowering in spring. **Fig 5.**

Native to: Interior of NSW north of Macquarie River. Grows in mallee communities on open plains, foothills or ridges, especially in moist situations and stream banks, in red sandy loams or gravelly clays (WorldWideWattle 2018).

Worldwide: Not known elsewhere around the world.

Distribution in Australia: A widely cultivated shrub with attractive foliage, adaptable to a variety of situations and soils (WorldWideWattle 2018). It is now sparingly naturalised in Vic. (VicFlora 2018) and is naturalised on the Central Coast and Southern Tablelands in NSW (PlantNET 2018).

Collections in SA: A total of 6 historical collections, all made between May 1993 and Sept. 2005 in the Mount Bold area south of Adelaide by the same collector.

Status in SA: A new naturalised record (*) for SA and the AMLR NRM region. Added to the Census for SA and the SL herbarium region based on: *R.J.Bates 63311* made in Aug. 2004; five other separate collections; and recent identifications and advice from M. O’Leary in 2018.

References: PlantNET (2018); VicFlora (2018); WorldWideWattle (2018).



Fig. 5. *Acacia cardiophylla*. Wagga Wagga NSW. From an image by Bidgee (CC BY-SA 2.5 AU).

Acacia jibberdingensis Maiden & Blakely

Common name: Jibberding wattle

Description: Usually a shrub or small tree to 2–4 m high, with angled branchlets with appressed-long hairs at least at the nodes. The phyllodes (modified leaf stalks functioning as a leaves) are long and narrow, straight to slightly curved, and can be flat or rounded. Phyllodes are 150–320 mm long, and 1–1.5 mm wide for rounded phyllodes or to 4 mm wide for flat phyllodes, all slightly rough. Rounded phyllodes prominently 8-nerved, flat phyllodes 3-nerved per face, without hairs except for a few forward pointing hairs on the margins, with pointed tip. Inflorescences simple tubular golden flower spikes, 20–35 mm long, 6 mm diameter on a 6–11 mm long stalk. Flowers are 4-merous with sepals half to fully united. Fruiting pods to 210 mm long, 5–7 mm wide, without hairs, margins moderately to prominently constricted between the seeds, surfaces slightly to prominently swollen over the seeds. Seeds broadly elliptic, 4.5–5.5 mm long, glossy, black; areole pitted; aril formed of two loops of fleshy funicle. Flowering from June to Oct. **Fig 6.**

Native to: South-western WA scattered from Mullewa and Jingemarra Stations to Peak Charles National Park. Grows mostly in granitic loamy sand near granite outcrops, usually in scrub and shrubland.

Worldwide: Very rarely seen as a garden plant outside Australia and not known as a weed overseas.

Distribution in Australia: Native to WA and only occasionally grown as an ornamental garden plant. Not known to have naturalised elsewhere in Australia.

Collections in SA: A single historical collection made in June 2009 from Watiparinga National Trust Reserve, Belair, near Adelaide.

Status in SA: A new questionably naturalised record (?e) for SA and the AMLR NRM region. Added to the Census for SA and the SL herbarium region based on: collection *E.L. Robertson 658* made on 27 June 2009; and recent identification and advice from M. O’Leary in 2018.

References: WorldWideWattle (2018).



Fig. 6. *Acacia jibberdingensis* herbarium specimens showing flower spikes and phyllode tips. Images by C.J. Brodie.

Acacia vestita Ker Gawl.

Common name: Hairy wattle

Description: Bushy shrub to 4 m high with gracefully pendulous branches. Small branches with many straight erect hairs. The phyllodes (modified leaf stalks functioning as leaves) have uneven margins with the side farthest from the stem gently curving to near-straight, and the other side closest to the stem much rounded. Phyllodes are 10–20 mm long, 4–10 mm wide, with a thin 1–2 mm long tip, straight to shallowly incurved, grey-green to glaucous, one-nerved per side and lateral nerves indistinct, with hairs as on small branches but normally shorter and slightly forward-pointing. Inflorescences racemes with a finely hairy stem 15–60 mm long, bearing 6–12 flowering globular clusters. Globular clusters of 12–18 bright light golden flowers on individual stalks 1.5–4 mm long. Flowers 5-merous sepals united. Fruiting pods narrowly oblong, to c.110 mm long, 10–14 mm wide, rounded over seeds, thinly leathery, dark brown but with powdery covering at least when young, with no hairs. Seeds longitudinal, oblong to elliptic, 5.5–7 mm long, slightly shiny, black; aril club shaped. Flowering in spring. **Fig 7.**

Native to: NSW, occurring on the western part of the Great Divide. Usually grows on rocky hillsides in Eucalyptus woodland or open forest.

Worldwide: Grown as a garden and landscape plant in temperate to Mediterranean climates and is popular in California in the US.

Distribution in Australia: Native and introduced in NSW, doubtfully naturalised in the ACT.

Collections in SA: Five historical collections made between May 1993 and May 2005 all from the Scott Creek and Mount Bold Reservoir area south of Adelaide by the same collector.

Status in SA: A new naturalised record (*) for SA and the AMLR NRM region. Added to the Census for SA and the SL herbarium region based on: collection *R.Bates 48004* made on 30 Aug. 1997; four other separate collections; and recent identifications and advice from M. O’Leary in 2018.

References: WorldWideWattle (2018).



Fig. 7. *Acacia vestita* at Hong Kong Botanical Gardens. Image by 阿橋 HQ (CC BY-SA 2.0).

Agave attenuata Salm-Dyck

Common name: Foxtail agave, spineless century plant.

Description: A large perennial succulent to 1–2 m diameter, forming evergreen rosettes of silvery, pale green smooth-edged leaves, absent of teeth or terminal spines. Leaves taper to soft points that fray with age. The rosettes can be up to 1.5–2 m in diameter, and rosettes freely sucker producing new plants in the immediate area of the parent. The funnel-shaped pale green-yellow flowers are borne on a large erect stems that arch almost 180 degrees back towards the ground, bending just past half length of inflorescence stem. The stem emerges from the centre of the rosette in summer, reaching to about 1.5m in height. Flowering in spring. **Fig 8.**

Native to: Central and West Mexico.

Worldwide: A common garden plant in warm temperate, semi-tropical and even tropical areas of the world. It is a tender plant, so in cooler climates it is only grown outdoors in summer, or in sheltered covered sites against sunny walls. Naturalised in the Canary Islands, Madeira (region of Portugal), Sicily (region of Italy) and Libya in North Africa.

Distribution in Australia: Naturalised in WA, NT and Qld.

Collections in SA: Two recent collections by Weeds Botanist Chris Brodie were made in Aug. and Oct. 2018. The first was from about 30 wild suckering plants in the Adelaide suburb of Skye in a reserve bordering a home garden. The second was from a single mature rosette with two small suckering rosettes from coastal sand dunes near Port Parham.

Status in SA: A new questionably naturalised record (?e) for SA and the AMLR NRM region. Added to the Census for SA and the Southern Lofty (SL) herbarium region based on collection *C.J.Brodie 8410B* made on 23 Aug. 2018. Added for the Northern Lofty (NL) herbarium region, based on collection *C.J.Brodie 8424* made on 8 Oct. 2018.

References: Spencer (2005).



Fig. 8. *Agave attenuata* naturalised in the Canary Islands. Image by H. Zell (CC BY-SA 3.0).

Aloiampelos ciliaris (Haw.) Klopper & Gideon F.Sm. **var. ciliaris**

Synonym: *Aloe ciliaris* Haw.

Common name: Climbing aloe

Description: A clumping, fast-growing, untidy, succulent shrub reaching 6–8 m when growing through and supported by surrounding vegetation. Without nearby trees or shrubs for support, it just forms a straggly shrub to 2 m tall supported by its own weak woody stems. Leaves clustered at the end of stems in rosettes of up to 15–20, being normally shed on lower stem. Leaf blades recurved, fleshy, to 140 mm long, with widely spaced small teeth on the margins, and the teeth becoming more closely spaced, narrower, white and almost hair-like towards the sheathing base where the leaves wrap around the stem. Flowers spreading to pendulous in erect spikes 200–400 mm long, with about 25–50 flowers per spike. The flowers are 25–40 mm long, cylindrical, bright orange-red with a pale to yellow apex and united for most of their length. Flowering is in winter and spring. **Fig 9.**

Native to: Cape Provinces in South Africa

Worldwide: Introduced and naturalised in Algeria, Morocco, France, Canary Islands.

Distribution in Australia: Used as a garden plant in Australia. It is sparingly naturalised in Vic. and Norfolk Island.

Collections in SA: A single recent collection was made by Weeds Botanist Chris Brodie and John Conran (University of Adelaide) on 20 Sept. 2018 from a single 3 × 1 m patch growing on the road verge of Upper Penneys Hill Road, Onkaparinga Hills, north of Onkaparinga National Park in the McLaren Vale area.

Status in SA: A new questionably naturalised record (?e) for SA and the AMLR NRM region. Added to the Census for SA and the Southern Lofty (SL) herbarium region based on collection, *C.J.Brodie 8423* made on 20 Sept. 2018.

The initial field identification by John Conran was confirmed by the Weeds Botanist at the State Herbarium and taken to variety level by P.J. Lang using the table and figures provided by Ellis (2014, pp. 19-20). The specimen was assigned to var. *ciliaris*, based on the presence of some longer leaf base cilia and on flower and leaf size, although it approaches var. *redacta* on some stems with shorter and sparser sheath margin cilia.

Reference: Ellis (2014).



Fig. 9. The roadside population of *Aloiaampelos ciliaris* var. *ciliaris*, Upper Penneys Hill Road (C.J.Brodie 8423). Images by C.J. Brodie.

Aptenia cordifolia (L.f.) Schwantes × *Aptenia haeckeliana* (A.Berger) Bittrich ex Gerbault

Synonym: *Aptenia cordifolia* auct. non (L.f.) Schwantes: SA Census online (30 Apr. 2019), partly.

Common name: Hybrid heart-leaf iceplant.

Description: A short-lived fast-growing perennial, prostrate or scrambling ground cover, with semi-succulent stems and leaves; younger stems angular and mildly textured (slightly papillose). Leaves opposite, mid-green, slightly papillose, broad-lanceolate to ovate, 10–30 mm long; leaf-base wedge shaped to abruptly tapered, leaf-stalk (petiole) to 5–10 mm long. Flowers red to deep reddish-pink in colour, about 15–20 mm across, solitary in leaf axils, on a short flower stalk (pedicel), with four sepals, two large and two small opposite each other. Stamens numerous; styles 4; ovary inferior. Fruit a 4-locular capsule, opening when wet via apical slits; seeds numerous and very hard. Flowers all year **Fig. 10.**

Hybrid plants are freely available in the nursery trade for growing in gardens but are frequently confused with *Aptenia cordifolia*. The hybrid's origin involves *A. cordifolia* and *A. haeckeliana* and there are several selections available, with *Aptenia* 'Baby Sun Rose' being the most common. In general, hybrids are more vigorous and have the ability to root from small pieces of stem. Their leaves are broad-lanceolate or ovate, with the bases tapered to wedge-shaped, and surfaces that are smoother (with less obvious papillae) than in *A. cordifolia*. Hybrids have larger flowers, 5–20 mm across, that are darker in colour, ranging from reddish to deep reddish-pink.

Aptenia cordifolia can be readily distinguished from the hybrid by its cordate (rounded) leaf bases, duller leaf surfaces with more prominent papillae, smaller flowers, 5–8 mm across, and lighter flower colour, from magenta to light pink or light purple. **Fig 11.**

State Herbarium Honorary Research Associate R.J. Chinnock reported that self-sown plants in his garden derived from the hybrid included a range of forms, some close to *A. cordifolia* with pink flowers and some resembling *A. haeckeliana* with yellow flowers.

Native to: Both *Aptenia cordifolia* and *A. haeckeliana* are native to South Africa, but the hybrid is of garden origin.

Worldwide: The hybrids are widely available and cultivated around the world. *Aptenia cordifolia* is recorded as naturalised in Australia & New Zealand, USA, northern Africa, Mediterranean Europe, extending to the UK, East Africa, and Central and South America. However, some of these occurrences, at least in part, are likely to be the hybrids.

Distribution in Australia: *Aptenia cordifolia* is recorded as naturalised in SA, Qld, NSW, Vic. and Tas., but further assessment is required to determine the full extent of hybrids. In Vic. the hybrids are not known to be naturalised (VicFlora 2019).

Collections in SA: A review of *Aptenia cordifolia* collections at the State Herbarium showed most SA material to be the hybrid. However, *A. cordifolia*, or at least forms close to that parent species, were identified for the NW and NL Regions (and occurrences reassessed as questionably naturalised). There are numerous collections of the hybrid *Aptenia* from SL region, with many best treated as cultivated occurrences. However sparingly naturalised occurrences are clearly indicated by at least two collections: *D.E.Murfet* 5224 made in Feb. 2006 from a Port Elliot reserve; and *C.J.Brodie* 8, made in Feb. 2009, from a single clump between the cliff and Esplanade road, Sellicks Beach.

Status in SA: A new questionably naturalised record (?e) for SA and the AMLR NRM region. Added to the Census for SA and the SL herbarium region based on: collection *C.J.Brodie* 8 made on 5 Feb. 2009; and identifications (30 Apr. 2019) and advice from P.J. Lang, confirmed by R.J. Chinnock.

References: VicFlora (2019).



Fig. 10. Hybrid *Aptenia cordifolia* × *A. haeckeliana*. Images by J.G. Conran.



Fig. 11. *Aptenia cordifolia*. Top image: naturalised plant at Werribee Gorge State Park, Vic.; photo by Arthur Chapman (CC BY-NC-SA 2.0). Bottom image by Alfredo Eloisa (CC BY-NC-SA 2.0).

Atriplex amnicola Paul G. Wilson

Common name: River saltbush, swamp saltbush

Description: A multi-branched straggly shrub, pale blue-green to pale grey-green, ranging from prostrate to semi-erect. Mature plants to 4 m wide and 2.5 m tall. Branches spreading to partially erect, but normally erect at their tips; those along the ground sometimes layering (taking root). Leaves variable in size and shape, normally spear-shaped, pale blue-green to pale grey-green, 10–20 mm long (reportedly to 30 mm, but not in SA material), young leaves scaly but soon becoming smooth. Male and female flowers are normally borne on separate plants. Male flowers in clusters at the ends of branches, purplish-green in colour. Female flowers usually cluster in the axils (base of leaves). The fruit is a similar colour to leaves, diamond-shaped, 5–8 mm long, × 5–8 mm wide, hard all over, or just in the in centre and partially spongy, with short papery valves to about 5 mm long. Each fruit contains a single seed. Flowers in late winter but is variable depending on seasonal conditions. **Figs 12 & 13**

Native to: Western Australia.

Worldwide: Not widely cultivated outside Australia, but recorded as a weed in California.

Distribution in Australia: Both native and naturalised in WA. Apart from two SA collections, no records are known outside WA. However, *Atriplex amnicola* seeds are widely available online, as the species is used as a forage for sheep in southern Australia and for revegetation, especially in the rehabilitation of saline areas as it is highly salt tolerant. *Atriplex amnicola* is sometimes sold using the common name, River saltbush, and the same common name is also used for the very closely related SA native *Atriplex rhagodioides*.

Collections in SA: A single recent ‘wild’ collection was made on 28 Mar. 2019 from coastal Adelaide, at Kingston Park Cliff Face Reserve, in Kingston Park. The population of over 100 plants was spreading rapidly over a steep slope and becoming dominant amongst native vegetation. A historical ‘cultivated’ collection at the State Herbarium from Eyre Peninsula (EP) has label information stating that it was planted as part of a coastal revegetation project. This collection warrants further investigation to see if *Atriplex amnicola* has naturalised in that area. In both SA locations, this WA species may have been planted mistakenly for the SA native River saltbush, *Atriplex rhagodioides*.

Status in SA: A new questionably naturalised record (?e) for SA and the AMLR NRM region. Added to the Census for SA and the SL herbarium region based on collection *K. Bartley s.n.* made on 28 Mar. 2019, with identification by P.J. Lang on 15 Apr. 2019.

References: Western Australian Herbarium (1998–); Wilson (1984).



Fig. 12. *Atriplex amnicola* at Kingston Park Cliff Face Reserve, Adelaide. Images by Kerri Bartley.



Fig. 13. *Atriplex amnicola* at Kingston Park Cliff Face Reserve, Adelaide. Images by Kerri Bartley.

Callitris oblonga* Rich. & A.Rich. subsp. *oblonga

Common name: Tasmanian cypress pine

Description: A large shrub to small tree, narrow columnar to rounded in shape, to 5–7 m tall (but may reach 10 m) and to about 2 m wide, with a narrow form when young and normally becoming rounder when mature, with dense erect branches. Leaves evergreen, scale-like, in whorls of three, 4–5 mm long, blue-green, arranged in rows along the twigs with their keeled dorsal surface giving the branches an angular appearance. Male cones are solitary or occur in clusters of 2 to 5 near the tips of the foliage. Female cones occasionally solitary or produced in dense clusters on short fruiting branchlets, ovoid, smooth and shiny, distinctly longer than broad (14–22 mm long and 18–24 mm wide); cone scales thick, tapering at apex, with three large scales alternating with three smaller ones. Cones persistent, retained after maturity, with branches on older trees growing over their bases and partially engulfing them. Seeds numerous, dark brown, with a small wing; seed and wing about 2–3 mm long and 3–4.5 mm wide. **Figs 14 & 15.**

Native to: Tas., where it occurs along creeks and rivers in the north-east. Other subspecies of *Callitris oblonga* occur in NSW.

Worldwide: Cultivated in temperate areas around the world. Not reported as a weed outside Australia.

Distribution in Australia: Available in Australia through the nursery and garden trade with several cultivars available. This Tasmanian native was previously only known to have naturalised in Vic.

Collections in SA: Two recent collections were made in July 2018 after this species was discovered growing wild in native vegetation at a ‘Bush for Life’ site in Heathfield Stone Reserve, close to Heathfield Primary School in the Adelaide Hills. The collection *C.J.Brodie 8399* is from the main population which forms a dense patch of about 20 × 25 m and comprises several hundred plants, ranging from seedlings to 1 m tall to mature plants 6–7 m tall. A second collection, *C.J.Brodie 3400*, samples one of its numerous outliers, in this case a single large mature freshly fallen tree about 80 m from the main population.

Status in SA: A new naturalised record (*) for SA and the AMLR NRM region. Added to the Census for SA and the SL herbarium region based on collections *C.J.Brodie 8399 & 8400* made on 25 July 2018, with identifications by the collector.

References: (Hill 1998).



Fig. 14. *Callitris oblonga* subsp. *oblonga*, stems of trees of varying ages at Heathfield Stone Reserve in the Adelaide Hills (*C.J.Brodie 8399*). Image by C.J. Brodie.



Fig. 15. *Callitris oblonga* subsp. *oblonga*, main population, young cones and old retained cones, at Heathfield Stone Reserve in the Adelaide Hills (*C.J.Brodie 8399*). Images by C.J. Brodie.

***Eucalyptus steedmanii* C.A.Gardner × *Eucalyptus* sp.**

Common name: Steedman's mallet hybrid

Description: This description is based on some putative hybrid trees growing around their suspected parent, *Eucalyptus steedmanii*. Hybrids recorded are whippy trees, no more than 4–5 m tall, with a trunk (stem) diameter of around 35 mm. The bark is smooth coppery orange-yellow, exfoliating in grey layers, or mostly grey with small coppery orange-yellow patches. Leaves are similar to *Eucalyptus steedmanii*, narrow lance-shaped to elliptic, to about 70 mm long and 12–14 mm wide. The buds and fruits are in clusters of three, flowers are reddish; the fruit has 4 ridges as in *E. steedmanii*. Summer flowering. **Figs 16 & 17.**

Native to: The native distribution of *Eucalyptus steedmanii* is confined in a small area of south-west WA.

Worldwide: Self-established *Eucalyptus steedmanii* hybrids are not reported from elsewhere.

Distribution in Australia: Not known elsewhere in SA.

Collections in SA: Two hybrid specimens were collected by C.J. Brodie & P.J. Lang on 26 Apr. 2018 within the Monarto plantings, on the east side of block RVB, west of Brown Road. Fifty or so hybrids were observed growing around their parent trees in a single area of the plantation.

Status in SA: A questionably naturalised record (?e) for SA and the SAMDB NRM region. Added to the Census for SA and the Murray (MU) herbarium region, supported by two collections made on 26 Apr. 2018 (with tentative identifications by P.J. Lang on 6 Aug. 2018). These are: *C.J.Brodie 8279B*, a *Eucalyptus steedmanii* hybrid with the second parent possibly *E. erythronema* (**Fig 16**); and *C.J.Brodie 8279C*, a *E. steedmanii* hybrid with the second parent possibly *E. cernua* (**Fig 17**).

Reference: Slee *et al.* (2015).



Fig. 16. *Eucalyptus steedmanii* × *Eucalyptus* sp. (possibly *E. erythronema*) at the Monarto plantings (*C.J.Brodie 8279B*). Images by P.J. Lang.



Fig. 17. *Eucalyptus steedmanii* × *Eucalyptus* sp. (possibly *E. cernua*) at the Monarto plantings (C.J.Brodie 8279C). Images by P.J. Lang.

Hedychium gardnerianum Sheppard ex Ker Gawl.

Common name: Kahili ginger

Description: A large perennial herb to 2.5 m high, tropical in appearance. It has pseudo-stems (composed of leaf stalks) that arise from the rapidly growing perennial rhizome. Leaves are hairless and smooth (like banana leaves), glossy green on the upper surface and powdery-white below, lance-shaped to narrowly oval, to 400 mm long by 150 mm wide, and have margins without teeth and an apex tapering to a point. The many-flowered inflorescences are spike-like and 250–350 mm long by 150–200 mm wide. Bright to pale yellow pleasantly scented flowers emerge from a cylindrical cone of tightly rolled bracts. Petals are broader at the apex tapering to narrowly wedge-shaped base, with the central one being larger with a broader rounded apex. Flowers have sterile stamens which are inversely lance-shaped and often pendulous or occasionally bent. The single prominent central fertile stamen is 55–70 mm long, twice the length of the larger central petal, and has a straight red-orange filament (stalk). Fruiting capsules are about 15 mm long, thin-walled, with an orange inner surface and bright red seeds with a red aril. Flowering occurs mostly during summer and autumn. **Fig 18.**

Native to: North East India, Myanmar, Nepal, Thailand and Vietnam.

Worldwide: *Hedychium gardnerianum* is a popular landscape ornamental throughout the world, especially in tropical, subtropical and warmer temperate areas. It is introduced and naturalised on the Ascension Islands of the South Atlantic Ocean, the Azores in the Mid Atlantic Ocean, on Cook Island and New Zealand in the South Pacific Ocean, on Hawaii in the North Pacific Ocean, on Mauritius and Reunion Island in the Indian Ocean, in the Caribbean and Honduras in Central America.

Distribution in Australia: Naturalised in Qld and NSW, and sparingly naturalised in Vic.

Collections in SA: Two collections, one historical and the other a recently collected specimen. The most recent, *C.J.Brodie 8282*, was made in May 2018 in the Adelaide region near Waterfall Gully Road. It was found where a creek-line had been recently cleared of woody weeds exposing this plant on the margins in very damp soil. On investigation, an earlier but hitherto un-database collection, also from the Adelaide region, was uncovered in the State Herbarium holdings. This collection, *K.Preiss 341*, was made on 2 Mar. 1974 from the south-west portion of Ferguson Conservation Park at Stonyfell, where it is likely to have originated from dumped garden refuse. It would have been removed by the local Friends of Park group and could not be found when the area was visited by Weeds Botanist, Chris Brodie in Mid-2018.

Status in SA: A new questionably naturalised record (?e) for SA and the AMLR NRM region. Added to the Census for SA and the SL herbarium region based on collection *C.J.Brodie 8282* made on 4 May 2018.

References: Spencer (2005).



Fig. 18. *Hedychium gardnerianum*. LHS & middle image by Raffi Kojian (CC BY-SA 3.0), at Royal Botanic Gardens, Melbourne. RHS image by J.J. Harrison (CC BY-SA 3.0) in Hobart, Tas.

Hypericum canariense L.

Common name: Canary Islands St. John's wort

Description: Medium to large soft shrub 1–4 m high. Stems obscurely 2 or 4-ridged, becoming rounded with age. Leaves with lower leaf surface paler than the upper side, narrowly elliptic to oblong-elliptic, about 20–65 mm long and 4–15 mm wide, with the base narrowing gradually, or wedge-shaped with straight sides, and the tip usually pointed. Bright yellow flowers in sparse to dense terminal corymbs up the stem with as many as 12–15 flowers per corymb. The sepals are unequal and 3–4.5 mm long. Petals 12–17 mm long, widest nearer to tip, persistent after flowering. Stamens many, in three indistinct bundles, slightly shorter than petals. The three conspicuous, uniform styles only just exceed the stamens and are 2.5–5 times longer than the ovary. Fruit ovoid to ellipsoid, considerably longer than sepals; seeds flattened-cylindrical, 0.5–1.5 mm long, minutely ridged longitudinally. Flowers in spring and summer. **Figs 19 & 20.**

Native to: Canary Islands (Spain).

Worldwide: An occasional garden plant in temperate areas of the world, and known to have naturalised in California and Hawaii in the US and New Zealand.

Distribution in Australia: Naturalised in Vic. and WA.

Collections in SA: A single historical collection *R. Bates 56073* was made in Apr. 2001 from Longwood road, halfway between Stock Road and Leslie Creek Road, in the Adelaide Hills. The label states that the plant had come up after a fire 10 years ago and was “semi naturalised”.

Status in SA: A new questionably naturalised record (?e) for SA and the AMLR NRM region. Added to the Census for SA and the SL herbarium region based on collection *R. Bates 56073* made on 17 Apr. 2001, with the identification confirmed by P.J. Lang.



Fig. 19. *Hypericum canariense*. LHS image by Krzysztof Ziarnek, Kenraiz (CC BY-SA 4.0), in Jardín Botánico Canario Viera y Clavijo, Spain. RHS, image by Forest Starr and Kim Starr (CC BY 2.0), showing *H. canariense*, smothering an old car at Kula, Maui, Hawaii.



Fig. 20. *Hypericum canariense*. Top image: Flowers at Kula, Maui, Hawaii. Bottom image: Habit in pasture along fence at Kula, Maui, Hawaii. Images by Forest Starr and Kim Starr (CC BY 2.0).

Lilium formosanum A. Wallace**Common name:** Formosan lily

Description: An attractive single-stemmed perennial herb with showy trumpet-shaped flowers. This Asian lily has a perennial bulb composed of thickened scales. The annual stem dies back in late spring and re-sprouts in summer producing a tall stem 0.5–2 m tall with long thin lance-shaped leaves to 150 mm long and mostly 5–10 mm wide, reducing in length up stem. The fragrant white flowers are produced at the top of the plant in clusters of 2–8, or occasionally individually, each held on a flower stalk 1–15 mm long, more or less horizontally to slightly ascending. The petals (actually tepals) are pale cream to white, with a pale mauve central line on their outer part, and are wider nearer the tip than the base. Six long stamens to about 100 mm long bear yellow to purplish cylindrical anthers, 8–10 mm long. Female styles are 70–80 mm long with a 3-fid stigma. The fruit is a cylindrical papery capsule to 80 mm long by 10–20 mm in diameter, with 3 locules (chambers containing seeds). Seeds have a papery margin (wing). Flowers in late summer to early autumn. **Fig. 21.**

Native to: Taiwan.

Worldwide: Widely cultivated in temperate to warm temperate areas of the world. Naturalised in Brazil, South Africa, Zimbabwe, Kenya, Tanzania, Zaire, New Zealand, Japan and southern US, including Louisiana and Florida.

Distribution in Australia: Traditionally widely cultivated as a garden ornamental, particularly in the temperate regions of Australia. Now naturalised in Qld, NSW and Vic. and on Lord Howe Island and Norfolk Island.

Collections in SA: Recent collections were made in Aug. 2018 and Mar. 2019, both from the same population of about 5 plants spread over a 30 × 10 m area in the Adelaide Hills, adjoining Gores Road, Piccadilly. The population occurs in native Stringybark vegetation that is flagged by a blue marker. The first collection, *C.J.Brodie 8414*, was made in late winter and had mature fruit and seed but no flowers. The second collection, *C.J.Brodie 8571*, made in early spring, had flowers which enabled the species identification to be confirmed. Flower colour is a helpful identifying character.

Status in SA: A new questionably naturalised record (?e) for SA and the AMLR NRM region. Added to the Census for SA and the SL herbarium region based on two collections from the same population: *C.J.Brodie 8414*, made on 23 Aug. 2018, and *C.J.Brodie 8571*, made on 13 Mar. 2019, with both identified by Weeds Botanist, Chris Brodie.

References: Spencer (2005).

Fig. 21. *Lilium formosanum*. LHS image from Wikimedia commons (location & author unknown, CC BY-SA 3.0). RHS image by C.J. Brodie, dried fruit from herbarium specimen (*C.J.Brodie 8414*).

4. Updates to weed distributions in South Australia, weed status and name changes

Updates to 31 taxa were made in the Census during the last year. These are changes to **distribution, names or status (Table 2)** of plant names already listed in the Census. Some taxa have multiple changes listed for one or more regions within SA.

A change in **distribution** indicates:

- additional regions added due to new collections, corrected or updated identifications, or reassignment of recorded locations to their correct regions
- regions removed due to corrected or updated identifications, or reassignment of recorded locations to their correct regions.

A **name change** could be:

- a change in genus, species or infraspecific name (subspecies, variety, form or cultivar)
- adding or removing an infraspecific name.

These changes may result from the application of new or recently accepted taxonomic classifications in South Australia, or merely through application of the rules of botanical nomenclature to existing taxonomy.

A change of **weed status** in one or more regions; this can be change from one of the following to another:

- naturalised / established in the wild (*)
- questionably established (?e)
- native (n)
- questionably native (?n).

Table 2: Updates to weed distribution, weed status and name changes

Update type: **Name** = name change; **Distribution** = change in distribution, extension of range or new regional record (new region indicated in **bold**, deleted region with ~~strike through~~); **Status** = change of weed status (region changed is underlined).

Weed status: * = naturalised, i.e. established in the wild; ?e = questionably naturalised / established; n = native; ?n = questionably native.

Taxon	Update type	Update / comment
<i>Aizoon pubescens</i> Eckl. & Zeyh. Coastal galenia	Name	Changed from <i>Galenia pubescens</i> (Eckl. & Zeyh.) Druce var. <i>pubescens</i> .
<i>Aizoon secundum</i> L.f. One-sided galenia	Name	Changed from <i>Galenia secunda</i> (L.f.).
<i>Aloe brevifolia</i> Mill. Short-leaved aloe	Distribution	EP*, NL ?e Added NL as questionably naturalised based on <i>C.J.Brodie 8440</i> , collected on 8 Oct. 2018.
<i>Aptenia cordifolia</i> (L.f.) Schwantes Heart-leaf iceplant	Distribution Status	<u>NW</u> ?e, EP *, <u>NL</u> ?e, SL * Removed EP after assessing it to be cultivated rather than naturalised; removed SL after re-identification to hybrid taxon (see p. 16). Changed status for <u>NW</u> and <u>NL</u> from naturalised (*) to questionably established (?e).
<i>Bidens subalternans</i> DC. var. <i>simulans</i> Sherff Cobbler's pegs	Distribution	LE*, MU?e, SL ?e Added SL as questionably naturalised based on <i>C.J.Brodie 8271</i> , collected on 20 Apr. 2018.
<i>Brachychiton populneus</i> (Schott & Endl.) R.Br. subsp. <i>populneus</i> Kurrajong	Distribution	NL ?e, MU*, SL*, SE* Added NL as questionably naturalised based on re-determination of <i>Brachychiton gregorii</i> , collected on 9 Dec. 2009, <i>C.J.Brodie 1032</i> , and supported by recent collection <i>C.J.Brodie 8242</i> , collected on 22 Feb. 2018.
<i>Chenopodium glaucum</i> L. Glaucous goosefoot	Status	<u>FR</u> ?n?e, <u>EA</u> ?n?e, <u>EP</u> ?n?e, <u>MU</u> ?n?e, <u>YP</u> ?n?e, <u>SL</u> ?n?e, <u>KI</u> ?n?e, <u>SE</u> ?n?e Changed status for all regions from native (n) to questionably native (?n) and questionably established (?e).
<i>Citrullus amarus</i> Schrud. Bitter melon	Name Distribution	Changed from <i>Citrullus lanatus</i> (Thunb.) Matsum. & Nakai. LE*, GT*, FR*, EA*, EP*, NL*, MU*, YP*, SL*, KI *, SE* Added KI as naturalised based on <i>J. Haska s.n.</i> , collected on 8 Apr. 2019.
<i>Clematis flammula</i> L. Fragrant virgin's bower	Distribution	EP ?e, NL ?e, MU?e, YP?e, SL?e, Added EP as questionably naturalised based on re-determination of <i>Clematis vitalba</i> sheet, collected on 7 Feb. 2001, <i>Abbott SEP-290</i> .

Taxon	Update type	Update / comment
<i>Clematis vitalba</i> L. Traveller's joy.	Distribution	EP ^{?e} , NL^{?e} , SL* Removed NL as questionably naturalised based on re-determination of two specimens as <i>Clematis flammula</i> : <i>D.E.Murfet</i> 6839, collected on 22 Apr. 2010, and <i>C.J.Brodie</i> 2375, on 21 Jan. 2011.
<i>Commelina benghalensis</i> L. Benghal dayflower	Distribution	LE ^{?e} , SL ^{?e} Added LE as questionably naturalised based on <i>T.Webb</i> 56, collected on 4 Apr. 2019.
<i>Cylindropuntia pallida</i> (Rose) F.M.Knuth	Distribution	Added SL as questionably naturalised based on <i>H. Rutherford</i> 110 & <i>H. Rutherford</i> 111, collected on 18 May 2016 and 21 June 2016, respectively.
<i>Cymbalaria muralis</i> P.Gaertn., B.Mey. & Scherb.	Name	Changed from <i>Cymbalaria muralis</i> P.Gaertn., B.Mey. & Scherb. subsp. <i>muralis</i> .
<i>Datura ferox</i> L. Long-spine thornapple	Distribution	GT*, FR*, EA*, EP*, NL*, MU*, YP*, SL*, KI^{?e} , SE* Added KI as questionably naturalised based on <i>B.M.Overton</i> 2882, collected on 17 Mar. 2004 (and now presumed extinct in the region due to eradication efforts).
<i>Datura inoxia</i> Mill. Downy thornapple	Distribution	LE*, FR*, EA* EP* NL* MU* YP* Added LE as naturalised based on <i>Anon. s.n.</i> , no collection date recorded. Removed EA as naturalised, as the single sheet in EA folder is from Ketchowla which is in MU Region.
<i>Dracunculus vulgaris</i> Schott Dragon lily	Distribution	SL ^{?e} , SE ^{?e} Added SE as questionably naturalised based on <i>A.Shepherd</i> 6, collected on 11 Sep 2018.
<i>Eryngium campestre</i> L. White devil	Distribution	MU*, NL* , SL* Removed NL and SL as naturalised, as these were based on records from the Angaston - Keyneton area and all fall in the MU herbarium region.
<i>Euphorbia heterophylla</i> L. Desert spurge	Distribution	NL ^{?e} , MU ^{?e} Added MU as questionably naturalised based on <i>S.Lance s.n.</i> , collected on 31 Jan. 2018.
<i>Euphorbia serpens</i> Kunth Matted Sandmat	Distribution	EP*, NL*, YP*, SL* Added NL as questionably naturalised based on <i>J.A.Scott</i> 5, collected on 10 May 2012.
<i>Gonocarpus confertifolius</i> (F.Muell.) Orchard var. <i>helmsii</i> Orchard Helm's Raspwort	Status	<u>NU</u> ^{?n} Changed status for <u>NU</u> from native (n) to questionably native (?n)

Taxon	Update type	Update / comment
<i>Homalanthus populifolius</i> Graham Bleeding-heart tree	Distribution	SL ^{?e} , KI ^{?e} Added SL as questionably naturalised based on <i>R.Taylor</i> 2568, collected on 7 Nov. 2017.
<i>Hypericum perforatum</i> L. subsp. <i>veronense</i> (Schrank) H.Lindb. St John's wort	Name	Changed from <i>Hypericum perforatum</i> L.
<i>Isolepis levynsiana</i> Muasya & D.A.Simpson Tiny flat-sedge	Name	Changed from <i>Cyperus tenellus</i> L.f.
<i>Medicago minima</i> (L.) Bartal. Small burr-medic	Name	Changed from <i>Medicago minima</i> (L.) Bartal. var. <i>minima</i>
<i>Medicago polymorpha</i> L. Burr-medic	Name	Changed from <i>Medicago polymorpha</i> L. var. <i>polymorpha</i>
<i>Opuntia microdasys</i> (Lehm.) Pfeiff. Bunny-ears	Distribution	FR *, EP *, NL ^{?e} , MU * Added NL as questionably naturalised based on <i>C.J.Brodie</i> 8474, collected on 30 Oct. 2018.
<i>Parietaria judaica</i> L. Wall pellitory	Distribution	EP *, MU *, SL *, KI *, SE * Removed EP as based on re-determination of <i>D.J.E.Whibley</i> 1843, collected on 24 Aug. 1967 as <i>Parietaria debilis</i> . Added SE as naturalised based on <i>C.J.Brodie</i> 1238, collected on 28 Jan. 2010, and two other collections by C.J. Brodie.
<i>Petroselinum crispum</i> (Mill.) Fuss Parsley	Distribution	EP *, YP *, SL *, KI *, SE * Added SE as naturalised based on <i>C.J.Brodie</i> 8336, collected on 18 May 2018.
<i>Platycapnos spicatus</i> (L.) Bernh. subsp. <i>spicatus</i> Platycapnos	Status	NL ^{?e} Changed status for NL from naturalised (*) to questionably established (?e).
<i>Salvinia molesta</i> D.S.Mitch. Salvinia	Distribution	EP ^{?e} , SL ^{?e} Added SL as questionably naturalised based on <i>C.Austin</i> s.n, collected on 14 May 2018; confined to a dam and part of adjacent watercourse, and being eradicated.
<i>Solanum chenopodioides</i> Lam. Whitetip nightshade	Distribution	EP *, SL * Added SL as questionably naturalised based on <i>C.J.Brodie</i> 2669, collected on 10 Feb. 2011; a questionable identification that is a possible intergrade with <i>S. nigrum</i> .

Taxon	Update type	Update / comment
<i>Tagetes erecta</i> L. Mexican Marigold	Distribution	NW ^{?e} , GT ^{?e} , EP ^{?e} , NL ^{?e} , SL ^{?e} Added SL as questionably naturalised based on <i>C.M.Ricci s.n.</i> , collected on 22 Aug. 2017.

References

- Ellis, K. (2014). Revision of *Aloiampelos* Klopper & Gideon F.Sm. (Xanthorrhoeaceae subfam. Asphodeloideae). M.Sc. thesis. (Nelson Mandela Metropolitan University: Port Elizabeth, South Africa).
- Hill, K.D. (1998). Cupressaceae. *Flora of Australia* **48**: 569–588. (Australian Biological Resources Study: Canberra & CSIRO Publishing: Collingwood).
- Nicolle, D. (2016). *Smaller Eucalypts for planting in Australia: Their selection, cultivation and management*. (Published by the author: Adelaide).
- PlantNET (2018). *The NSW Plant Information Network System*. Published on the Internet. (Royal Botanic Gardens and Domain Trust: Sydney). <http://plantnet.rbgsyd.nsw.gov.au/> [accessed: 10 Apr. 2019].
- POWO (2019). *Plants of the World Online*. Published on the Internet. (Royal Botanic Gardens, Kew). <http://www.plantsoftheworldonline.org/> [accessed: 28 May 2019].
- Slee, A.V., Brooker, M.I.H., Duffy, S.M., & West, J.G. (2015). *EUCLID Eucalypts of Australia*. Fourth Edition. (Centre for Australian National Biodiversity Research: Canberra). <http://keyserver.lucidcentral.org:8080/euclid/data/02050e02-0108-490e-8900-0e0601070d00/media/Html/index.htm> [accessed 27 May 2019].
- Spencer, R. (2005). *Horticultural flora of south-eastern Australia* 5. (University of New South Wales Press: Sydney).
- VicFlora (2018). *Flora of Victoria*. Published on the Internet. (Royal Botanic Gardens Victoria: South Yarra). <https://vicflora.rbg.vic.gov.au/> [accessed: 10 Apr. 2019].
- Western Australian Herbarium (1998–). *Atriplex amnicola*. In: *FloraBase—the Western Australian Flora*. Published on the Internet. (Department of Biodiversity, Conservation and Attractions: Perth). <https://florabase.dpaw.wa.gov.au/> [accessed: 10 Apr. 2019].
- Wilson, P.G. (1984). Chenopodiaceae. *Flora of Australia* **4**: 81–317. (Australian Government Publishing Service: Canberra).
- WorldWideWattle (2018) *World Wide Wattle*, version 2. Published on the Internet. (Western Australian Herbarium: Perth). <http://www.worldwidewattle.com/> [accessed: 29 May 2019].

Appendix 1: Activities of the Weeds Botanist

Surveillance based on field observations and collections

Table 3: Summary of field surveys and collections

Activities of the Weeds Botanist, Chris Brodie (CJB), State Herbarium of South Australia (SHSA), with other participants listed individually. **No.** = Number of collections.

Date(s)	NRM Region	Participants	No.	General Location	Significant weed collections
26 Jun. 2018	AMLR	CJB & Tayla Westley (Volunteer)	13	Regency Park, Adelaide and One-Tree Hill.	Collected a mature <i>Cyperus involucratus</i> and a flowering <i>Canna × generalis</i> to help with identification of these species. Also a <i>Cardiospermum grandiflorum</i> record to document a new geographical location within Adelaide and Mount Lofty Ranges (AMLR) NRM region.
10 July 2018	AMLR	CJB & David Blewett (Volunteer)	15	Ferguson Conservation Park in Adelaide's eastern suburbs and the Adelaide Hills.	Possible new State record collected - <i>Thuja</i> species. Also seasonal bulb species, <i>Cyperus</i> species and garden escapees.
25 July 2018	AMLR	CJB, Peter Watton, Priya Spencer & Alan Dandie (Trees for Life)	6	Adelaide Hills (Heathfield and Stirling).	New State record collected – <i>Callitris oblonga</i> subsp. <i>oblonga</i>. Also seasonal bulbs.
1 Aug. 2018	AMLR	CJB	4	Adelaide - Botanic Park, by First Creek.	Collected <i>Cyperus involucratus</i> to help with identification of species. Also a <i>Solanum mauritianum</i> record to document a new geographical location within Adelaide and Mount Lofty Ranges (AMLR) NRM region.
23 Aug. 2018	AMLR	CJB & Tonia Brown (Adelaide Hills Council)	18	Adelaide Hills - Skye, Aldgate & Piccadilly areas.	New State records collected – <i>Acacia adunca</i>; <i>Agave attenuata</i>; <i>Lilium formosanum</i>. Also <i>Hedera</i> species, seasonal bulbs and other weed species.
20 Sept. 2018	AMLR	University of Adelaide Plant Identification course field-trip. CJB, John Conran (University of Adelaide)	2	Onkaparinga River National Park & Aldinga Scrub Conservation Park.	New State record collected – <i>Aloiampelos ciliaris</i>. <i>Polygala myrtifolia</i> record to document a new geographical location within AMLR NRM region.

Date(s)	NRM Region	Participants	No.	General Location	Significant weed collections
8 Oct. 2018	AMLR	CJB & Warwick Barnes (AMLR NRM officer)	21	Northern Beaches – Port Parham.	New State records collected – <i>Agave attenuata</i> ; and possible new cacti genus, <i>Pachycereus</i> species. New regional record collected – <i>Opuntia microdasys</i> . Also other cacti, succulents and weed species documenting new geographical locations within AMLR NRM region.
10 Oct. 2018	AMLR	CJB & Corey Jackson (NR AMLR)	14	Southern Fleurieu coastline from Normanville to Middleton.	Collected succulents including <i>Aloe</i> species, <i>Yucca gloriosa</i> , <i>Aeonium</i> species, and a variety of Aizoaceae genera & species, with some records documenting new geographical locations for taxa within the AMLR NRM region.
29 Oct. 2018	AMLR	CJB, Caroline Ricci (SHSA) & Stephanie Madigan (SHSA volunteer)	2	Adelaide - Botanic Park, by First Creek.	<i>Ageratina adenophora</i> (Crofton weed) to document a new geographical location within AMLR NRM region.
30 Oct. 2018	AMLR	CJB	17	Dublin, Two Wells and Middle Beach areas.	General weed collection including, cacti, succulents, <i>Oncosiphon suffruticosum</i> locations and a <i>Beta vulgaris</i> (leaf-beet) to document a large wild population.
7 Nov. 2018	AMLR	CJB, Monica Seiler & Tracey Hardwicke (NR AMLR) & Brad Mann (Tea-Tree Gully Council)	18	Lower North-East Road, One Tree Hill area.	Identification and collection of young <i>Buddleja dysophylla</i> plant, with flowers. Large plants had been removed from the roadside and chipped 18 months ago. Brad Mann (Tea-Tree Gully Council) reported that the smell from freshly chipped <i>Buddleja dysophylla</i> material induced vomiting in all council workers in attendance, hence the required identification by Tea Tree Gully Council. Populations of stipoid grass weed <i>Nassella neesiana</i> (Chilean Needle Grass) in the One Tree Hill area, to document new geographical locations within AMLR NRM region, and other weed species under-represented in the State Herbarium.
14 Nov. 2018	AMLR	CJB	14	Adelaide Hills (Skye), McLaren Vale area to Myponga Beach.	General weed collections, including bulb species, and other taxa under-represented in the State Herbarium.
20 Nov. 2018	AMLR	CJB	4	Horsnell Gully Conservation Park.	<i>Ornithogalum thyrsoides</i> (Chinckerinchee) collected and photographed. Also <i>Ixia polystachya</i> and <i>Chasmanthe floribunda</i> to document these species for Horsnell Gully Conservation Park.

Date(s)	NRM Region	Participants	No.	General Location	Significant weed collections
21 Nov. 2018	AMLR	CJB	14	Northern Adelaide Hills, Lower North East Road and North East Road area.	Collected taxa under-represented in the State Herbarium within the AMLR NRM region including, <i>Melia azedarach</i> , <i>Robinia pseudoacacia</i> and <i>Allium ampeloprasum</i> .
26 Nov. 2018	AMLR	CJB	8	Morialta Conservation Park.	Iridaceae species and other weeds within Morialta Conservation Park.
30 Nov. 2018	AMLR	CJB, John Sandham & Andrew Carrick (Botanic Gardens)	4	Glenthorne Farm.	Cultivated trees of interest.
4 Dec. 2018	AMLR	CJB	6	Onkaparinga River National Park and surrounds.	Collected stipoid grass weed <i>Nassella leucotricha</i> from Onkaparinga River National Park to document the species in this location, present here for more than 10 years. Also collected other weeds while in Onkaparinga River National Park and a Cactus and an <i>Aloe</i> species on roadside near the Park.
12 Dec. 2018	AMLR	CJB & Brett Coghlan (DEW Graduate Ranger)	3	Aldinga Eco-Village.	Collected a PIRSA ALERT stipoid weed being grown as a garden ornamental – <i>Nassella tenuissima</i> , commonly known as Mexican feather grass.
23 Jan. 2019	AMLR	CJB, Tom Kloeden & Shannon Robertson (PIRSA Bio-security)	2	Adelaide, Western suburbs domestic gardens.	Inspected suspected PIRSA ALERT weed taxa <i>Equisetum</i> , being grown as garden ornamentals. <i>Equisetum</i> taxa confiscated by PIRSA Bio-security and plants collected to confirm identification. Remaining plant material disposed in accordance with Bio-security protocol.
31 Jan. 2019	SAMDB	CJB, Bec Gould (NR SAMDB)	3	Tallem Bend area.	Several weeds of concern.
5 Feb. 2019	AMLR	CJB, Kerri Bartley (NR AMLR)	10	Aldinga Washpool and coastal areas.	Collection and determination of a southern range expansion of the weed <i>Suaeda baccifera</i> at Aldinga washpool. Also collected native <i>Suaeda australis</i> and other Chenopod shrubs to determine if these were weeds or native species.
13 Mar. 2019	AMLR	CJB, Daniel Luscombe (Forestry Commission UK)	10	Central Adelaide Hills.	Collection of introduced conifer species with UK conifer expert. New State record collected – <i>Lilium formosanum</i> , in flower for confirmation of identification. Previous collection in fruit made on 23 Aug. 2018. Other under-collected weeds.

Date(s)	NRM Region	Participants	No.	General Location	Significant weed collections
3 Apr. 2019	AMLR	CJB, Bob Baldock (SHSA)	7	Adelaide suburb of Rostrevor, First Creek in Adelaide Botanic Gardens.	Common under-collected weeds.
19- 22 Jun 2019	KI	CJB & Jason Walter (NR KI)		Eastern Kangaroo Island	New regional record collected – <i>Asparagus plumosus</i> & <i>Asparagus officinalis</i> . General weed collections documenting <i>Asparagus</i> weeds, and other taxa under-represented in the State Herbarium.

Community Engagement

Table 4: Summary of community engagement activities.

Weeds Botanist, Chris Brodie (CJB), State Herbarium of South Australia (SHSA), with other participants as listed.

Date(S)	DEW Staff	Location	Presentation title / subject	Audience / Society / Conference	# Attendees
12 Sept.2018	CJB	Manly, Sydney, NSW	A conversation starter - standardising terminology and definitions for weed status in Australia – what do you think?	Australasian Weeds Conference participants	c.100
19 Sept. 2018	CJB	University of Adelaide	The Flora of South Australia - introduced alien taxa – weeds from casual, invasive, & transformer plants	University of Adelaide plant identification course students	c.50
26 Nov. 2018	CJB	Black Hill Natural Resource Centre	New and emerging alien taxa – weeds in the Adelaide and Mount Lofty Ranges (AMLR) Central Hills Natural Resources Management (NRM) region	Government staff-AMLR NRM and National Parks and Wildlife staff	12
31 Jan. 2019	CJB	Tailem Bend	Do you know your weeds?	'Dairy Australia' regional weed event	10
7-8 May 2019	CJB	Echuca, Vic.	Early detection, identification and introduction pathways of new and emerging weed threats in South East Australia. What can the States learn from each other?	Victorian weeds Society	70
22 June 2019	CJB	MacGillivray Cricket Club, KI	Asparagus weeds Kangaroo Island	Kangaroo Island Community members	20

Appendix 2: Herbarium regions

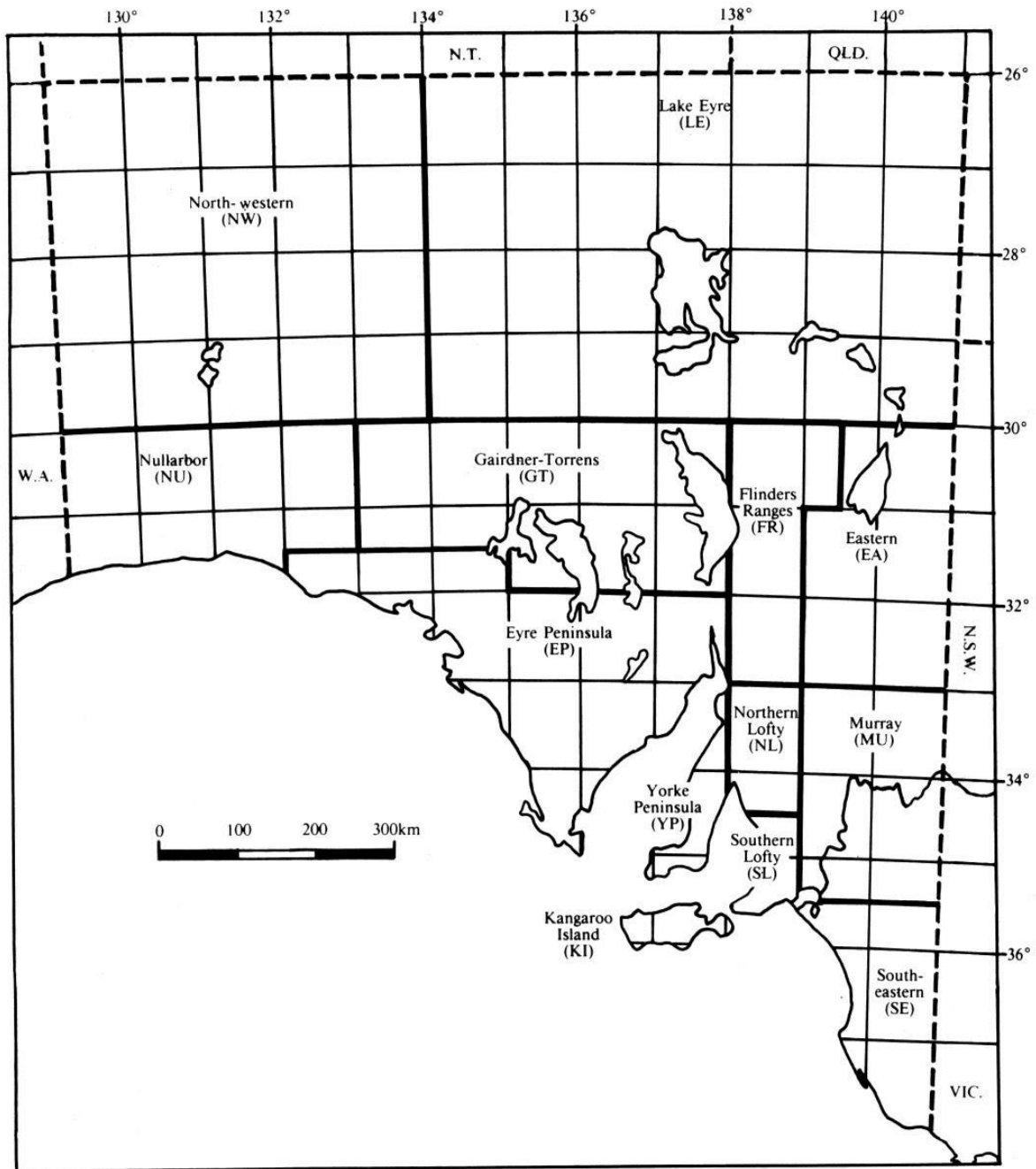


Fig. 22. State Herbarium regions for South Australia. Map from J.P. Jessop & H.R. Toelken, *Flora of South Australia*, vol. 4 (1986).

