

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

Milestone Report

**Regional Landscape Surveillance for
New Weed Threats Project
2016-2017**

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

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June 2017



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Summary

Through the work of the State Herbarium of South Australia's Weeds Botanist, this year, 19 weeds that have naturalised or are questionably established in the State have been added to the Census. This includes 9 taxa collected and databased for the first time and 10 taxa, for which previous herbarium collections were known, but only recent investigation established that they were weedy in South Australia. Detailed descriptions are given for each plant. Furthermore, 37 up-dates were made to existing Census records.

The Weeds Botanist undertook 62 days of fieldwork and 32 Community Engagement Activities during the last year in many of the State's NRM regions.

1. Activities and outcomes for 2016/2017 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 2016/17 financial year.

Funding

Overall funding for the project was received from a number of sources namely the State NRM Program, PIRSA Biosecurity SA, Adelaide and Mt Lofty Ranges NRM (NR AMLR), and South East NRM (NR SE), and their support is gratefully acknowledged.

Funding covered the salary of a Weeds Botanist (Chris Brodie), based at the State Herbarium. It also covered some of the fieldwork and plant sample processing expenses.

Further funding was provided from PIRSA Biosecurity SA for two additional projects. Work continued on investigations relating to proposed introductions of biological control organisms for the Silverleaf Nightshade *Solanum elaeagnifolium*. Much of this work was carried out by State Herbarium Honorary Research Associate Laurie Haegi, who has extensive taxonomic knowledge of the Solanaceae.

The other project, *Capacity Building to manage Pest Plants and Animals*, funded through the Commonwealth Agricultural Competiveness White Paper funding and administered through PIRSA Biosecurity SA, sought the Herbarium's assistance to:

- Provide input into the development of the best practice management guide for opuntoid cacti (e.g. Prickly Pear).
- Contribute to collation of workshop materials for 'Stopping the spread of invasive perennial grasses' workshops.
- Attend up to 14 regional workshop across the eight NRM Regions on 'Stopping the spread of invasive perennial grasses' to provide training on the collection, identification and submission of grass weed specimens.
- Whilst in the regions collect specimens of invasive perennial grasses to update the state distribution maps.

A significant amount of in-kind support was also provided by State Herbarium staff, Honorary Researchers and volunteers for associated activities such as plant identification, specimen processing, data entry and reporting.

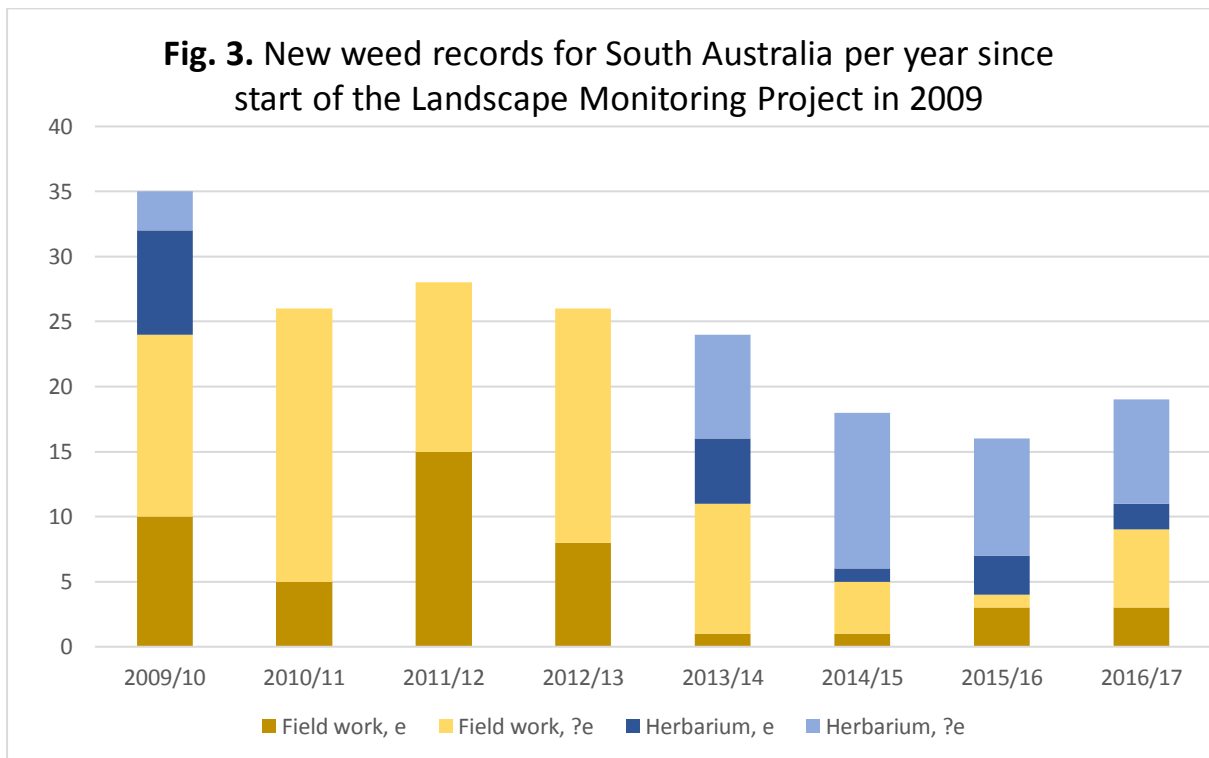
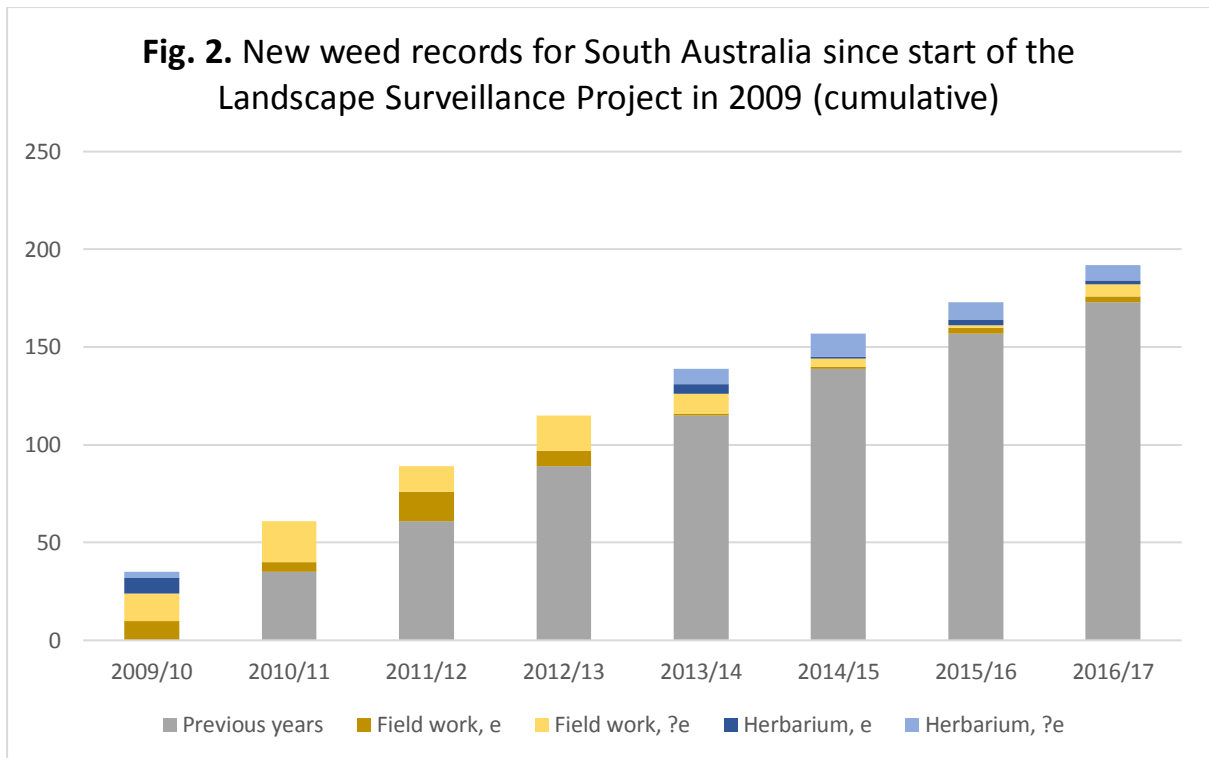


Fig. 1. Weeds Botanist Chris Brodie explaining weedy grasses during a workshop in Quorn.

Activities

A focus of the work of the Weeds Botanist was discovery and collection of new ‘weed’ records, with field work occurring across the State, much in the AMLR, SAAL and SE regions. The Weeds Botanist undertook 62 days of fieldwork during the period, in conjunction with State Herbarium and agency staff, Hon. Research Associates and volunteers (see Appendix 1).

In addition, regional visits were used to provide workshops and field days for regional staff, NGOs and community members. These visits help to increase awareness of weeds, the value of early detection and the processes required to contribute scientifically valid specimens and records to the State Herbarium. Support for the Weeds Botanist position also provided a point of contact for regional staff and communities as well as training and support. The Weeds Botanist undertook 32 Community Engagement activities during the year (see Appendix 1; Fig. 1).



Data in Fig. 2 & 3 from the yearly *Regional Landscape Surveillance* reports, specifying new weeds (established, **e**, 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, e) and questionably established (?e) taxa in this report as weeds or potential weeds. These taxa are non-native species that are self-sustaining in the wild and show some degree of self-propagation.

This year we have recognised 19 new weed species records for the State (see Section 2).

Since the project began in 2009, 192 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 even after the initial rapid detection of new weeds at the initiation of the program there are ongoing increases in new weeds being detected in South Australia. About half of the new records were found among existing herbarium collections, the other half were discovered through fieldwork by the Weeds Botanist, regional staff and collaborators.

The Census provides information on the South Australia's native and weedy plants occurring in the wild, listing their current name and synonyms (previous names), as well as their regional distribution and conservation status. It underpins our knowledge on plant species identity and occurrence, and as such forms the legal basis for any legislative action relating to native and naturalised plants in the 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. This work includes monitoring the work published by botanists anywhere in the world that affects a 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.

In the previous year (30 May 2016 – 2 May 2017) **19** new records of questionably naturalised or naturalised plants were added to the *Census*, based on plants deposited and accessioned in the State Herbarium (see Table 1 and Section 3 of this report).

These fall into three categories:

- **Nine** species were discovered through field work, i.e. collected recently and databased for the first time in the past year, meaning that there is definitive evidence that they are questionably established or established in the wild: *Abies pinsapo*, *Cardiospermum grandiflorum*, *Carex divulsa*, *Clematis aristata*, *Cupressus goveniana*, *Eucalyptus urna*, *Euphorbia prostrata*, *Homalanthus populifolius* and *Ludwigia repens*.
- **Six** taxa were known from State Herbarium collections, but data on their distribution in the State or taxonomic status was insufficient. Recent field observations and collections enabled their addition to the *Census*: *Crowea exalata* subsp. *exalata*, *Eucalyptus campaspe*, *Eucalyptus spathulata* subsp. *spathulata*, *Eucalyptus woodwardii*, *Laburnum anagyroides* and *Nerine sarniensis*.
- **Four** taxa were discovered, when existing State Herbarium collections were re-examined and identified during the past year: *Agapanthus praecox* subsp. *minimus*, *Eucalyptus tricarpa* subsp. *tricarpa*, *Helosciadium nodiflorum* and *Zephyranthes candida*.

Table 1: New State weed records included in the Census, based on recent collections and knowledge newly generated. Taxa are listed in alphabetical order.
e = established/naturalised in the wild; **?e** = questionably established.

New Taxon	Common Name	Family	Naturalised/ established	Regional distribution
<i>Abies pinsapo</i> Boiss.	Spanish Fir	Pinaceae	?e	SL
<i>Agapanthus praecox</i> Willd. subsp. <i>minimus</i> (Lindl.) F.M.Leight	Agapanthus	Liliaceae	?e	SL
<i>Cardiospermum grandiflorum</i> Sw.	Balloon Vine	Sapindaceae	e	SL
<i>Carex divulsa</i> Stokes	Grey Sedge	Cyperaceae	?e	SL
<i>Clematis aristata</i> R.Br. ex Ker Gawl.	Mountain Clematis	Ranunculaceae	?e	SL
<i>Crowea exalata</i> F.Muell. subsp. <i>exalata</i>	Small Crowea	Rutaceae	?e	SL
<i>Cupressus goveniana</i> Gordon	Californian cypress	Cupressaceae	e	SL
<i>Eucalyptus campaspe</i> S.Moore	Silver Gimlet	Myrtaceae	?e	NL
<i>Eucalyptus spathulata</i> Hook. subsp. <i>spathulata</i>	Swamp Mallet	Myrtaceae	?e	NL
<i>Eucalyptus tricarpa</i> (L.A.S.Johnson) L.A.S.Johnson & K.D.Hill subsp. <i>tricarpa</i>	Ironbark	Myrtaceae	?e	SL
<i>Eucalyptus urna</i> D.Nicolle	Merrit	Myrtaceae	?e	NL
<i>Eucalyptus woodwardii</i> Maiden	Lemon-flowered Gum	Myrtaceae	?e	NL
<i>Euphorbia prostrata</i> Aiton	Prostrate Spurge	Euphorbiaceae	e	EP
<i>Helosciadium nodiflorum</i> (L.) W.D.J.Koch	Fool's Water-cress	Umbelliferae	e	NL
<i>Homalanthus populifolius</i> Graham	Bleeding-heart Tree	Euphorbiaceae	?e	KI
<i>Laburnum anagyroides</i> Medik.	Golden-chain	Leguminosae	e	SL
<i>Ludwigia repens</i> J.R.Forst.	Creeping Primrose-willow.	Onagraceae	?e	SL
<i>Nerine sarniensis</i> (L.) Herb.	Guernsey-lily	Amaryllidaceae	?e	SL
<i>Zephyranthes candida</i> (Lindl.) Herb.	Zephyr Lily	Amaryllidaceae	?e	NL

3. Description of newly recognised weeds in South Australia

Taxa are listed in alphabetical order (see also Table 2).

Family: Pinaceae

***Abies pinsapo* Boiss.**

Common name: Spanish Fir.

Description: A conifer, eventually a large tree to 25–40 m tall with a conical to rounded crown. The bark is smooth, eventually breaking into plates on main trunk and large limbs. Evergreen needles on young branches. Cones erect and slender, 10–15 cm long, on younger growth. **Fig. 4**

Native to: Spain and Morocco. *Abies pinsapo* has a very limited natural distribution and is restricted in habitat in small areas (IUCN 2016).

Worldwide: Not widely documented as a weed outside its native range, with only a few casual occurrences recorded from Europe, in Mediterranean type climates similar to SA.

Distribution in Australia: No wild records known from other areas in Australia, and limited in cultivation, normally to large parks and gardens.

Collections in SA: A single collection made from a single plant in Adelaide Hills, just off the Crafers-Stirling Walking Track, accessed from the bottom of road called 'The Crescent'.

Status in SA: This is a questionably naturalised record for the Adelaide Mount Lofty Ranges NRM region (AMLR). Added to the Census for the SL region, based on collection *C.J.Brodie 6990* (17 Feb 2016), and a follow-up visit by Peter Lang (P JL) on 28 May 2016 to assess its naturalised status.

References: Debreczy & Racz, IUCN (2016).



Fig. 4. Branches of *Abies pinsapo* (*C.J.Brodie 6990*).

Family: Liliaceae

***Agapanthus praecox* Willd. subsp. *minimus* (Lindl.) F.M.Leight**

Common name: Dwarf Agapanthus.

Description: A rhizomatous (bulb-like) herb with shiny strap-like leaves, to 50 cm long and 2.5 cm wide. A single stalk is produced in summer, held above the leaves, bearing a rounded umbel of many showy blue flowers to about 2.5 cm long.

Native to: South Africa occurring in the south-eastern Western Cape and Eastern Cape.

Worldwide: Cultivated as a garden ornamental in temperate areas worldwide. This subspecies has only been recorded as growing wild in New Zealand. However, the popular and widely planted subspecies, *Agapanthus praecox* Willd. subsp. *orientalis* (F.M. Leight.) F.M. Leight., (*Agapanthus*) is known to be weedy in temperate climates worldwide and throughout temperate Australia.

Distribution in Australia: Not recorded as wild elsewhere in Australia.

Collections in SA: A single collection from a single patch on the edge of bush at Mt George Reserve.

Status in SA: This is a questionably naturalised record for the Adelaide Mount Lofty NRM Region. Added to the Census for the SL region in Feb. 2017, based on the re-determination of *R.J.Bates 62082* (Jan. 2004, AD157182) by Chris Brodie (CJB) and PJL.

References: King (2011).

Family: Sapindaceae

***Cardiospermum grandiflorum* Sw.**

Common name: Balloon Vine.

Description: Long-lived scrambling vine with twining habit and tendrils that climbs up and over trees and shrubs to 8 m or more. Plant with rust-coloured hair on stems, especially on younger growth. Green compound soft leaves. Flowers white to cream. Fruit distinctively balloon-shaped, papery, 65 × 45 mm. **Fig. 5.**

Native to: Tropical America (Brazil and eastern Argentina)

Worldwide: *Cardiospermum grandiflorum* has extended its range in within tropical America to southern Mexico and the Caribbean. Also naturalised in East Africa and recorded as invasive in parts of Kenya, Uganda and in Tanzania, being common in urban open spaces, disturbed areas and riparian zones.

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

Collections in SA: Only known from one location in southern Adelaide in the suburb of Darlington, in a creek-line on the corner of Main South Road and Brookside Road, bordering the back yards of houses of Klar Avenue and extending for about 50 m along the creek-line and rambling over trees to 5–8 m tall. Starting to smother all vegetation in the riparian zone.

Status in SA: A naturalised record for the Adelaide Mount Lofty NRM Region. Added to the Census for the SL region, based on *G.Bell s.n.* (13 May 2016) and *C.J.Brodie 7165* (1 June 2016), collected during a follow-up visit.

References: Cullen (2011), Reynolds (1989).



Fig. 5. *Cardiospermum grandiflorum*, growing along a creekline (left), flowers and young fruits (right) (C.J.Brodie 7165).

Family: Cyperaceae

***Carex divulsa* Stokes**

Common name: Grey Sedge.

Description: Evergreen, arching, tufted sedge to 25–45 cm tall, grass-like, with small inconspicuous flowers along stems.

Native to: North Africa and most of Europe, also from the Caucasus and Western Asia.

Worldwide: Naturalised in the US, Canada and New Zealand.

Distribution in Australia: Naturalised in Vic. and NSW, and known as a weed of pastures and riparian environments.

Collections in SA: A single collection of a plant, 25 cm high and 40 cm wide, made from the only known population in SA, at Angus River, Crystal Lake Park, Macclesfield. In damp areas along the river with occasional plants higher up the slopes.

Status in SA: This is a questionably naturalised record for the Adelaide Mount Lofty NRM Region. Added to the Census for the SL region, based on the only known collection A. Welsh s.n. (30 Nov. 2016), which was sent to the State Herbarium for identification.

Family: Ranunculaceae

***Clematis aristata* R.Br. ex Ker Gawl.**

Common name: Mountain Clematis, Old Man's Beard.

Description: A vigorous climber with stems that coil round branches and twigs of other plants, as do the petioles (stalks) of the tri-foliate leaves, to 75 mm long. It has attractive star-shaped flowers, 70mm across, white or cream colour. Flowering plants are covered in bloom in spring and early summer. The fluffy seed-heads are characteristic of many Clematis species.

Native to: Eastern Australia in dry and wet forests of Qld, NSW, Tas. and Vic. Also native in the very south-east corner of SA.

Worldwide: Known to be in cultivation within Australia, but unknown if this species is cultivated outside Australia.

Distribution in Australia: Qld, NSW, Tas. and Vic, and south-eastern SA. Records from WA, but unknown if these are weeds or cultivated plants.

Collections in SA: Collected in the Adelaide Hills in Forest Range, off Deviation Road. Known to have been present in shrubby Stringybark woodland for at least two years. Approximately four plants over 20 × 20 m, creeping and forming dense cover over shrubs of shoulder height.

Status in SA: This is a questionably naturalised record for the Adelaide Mount Lofty NRM Region. Added to the Census for the SL region, based on several collections, the most recent one from 2016. *Clematis aristata* is also recorded as a native plant in the far south-east of the State.

References: PlantNET (2017).

Family: Rutaceae

Crowea exalata* F.Muell. subsp. *exalata

Common name: Small Crowea.

Description: A small native shrub, forming domed mounds to 1 m wide and 50-70 cm tall. Small narrow, green leaves that are normally wider at the apex. The plant produces masses of pink star-shaped waxy flowers, most of the year with flushes in autumn and spring, and fewer to none in mid-winter and the height of summer.

Native to: Australia, occurs in Qld, NSW, ACT and Vic.

Worldwide: Not known as a weed in other countries.

Distribution in Australia: Not known to be naturalised in other States or Territories in Australia.

Collections in SA: Several older collections of this taxa were made from a location in Crafers Bushland, bordering Reynolds drive, *E.L.Robertson s.n.* (15 Oct 1992) and *P.Shearman s.n.* (10 Mar. 1993). A new collection, *C.Austin s.n.* (30 Nov 2016), from a different location, a property on Moores road, Norton Summit, was from a single plant that had dispersed from an unknown location into native vegetation. It was brought to the State Herbarium for identification and has subsequently been removed.

Status in SA: This is a questionably naturalised record for the Adelaide Mount Lofty NRM Region. Added to the Census for the SL region, based on the three collections mentioned above.

References: Gebert & Duretto (2008).

Family: Cupressaceae

***Cupressus goveniana* Gordon**

Also known as *Hesperocyparis goveniana* (Gordon) Bartel, in other institutions around the world, but this name is not accepted here.

Common name: Californian cypress.

Description: A large evergreen coniferous tree, variable in size, 30–50 m tall in ideal conditions. The foliage in dense, dark green sprays with overlapping scale-like leaves. Seed cones are globose 11–22 mm long, with 6 to 10 scales. **Fig. 6.**

Native to: USA, Monterey Peninsula on the central coast of California.

Worldwide: Widely cultivated in temperate areas, weed references known from Europe and India.

Distribution in Australia: Not known as a wild plant elsewhere in Australia.

Collections in SA: Known from a single collection, *C.J. Brodie 7377* (Nov. 2016), made in the Adelaide Hills, just off the Crafers-Stirling pathway, near the freeway exit to Stirling (accessed from Crescent Road, Crafers). Small to medium trees forming a thicket with plants of varying ages.

Status in SA: This is an established record for the Adelaide Mount Lofty NRM Region. Added to the Census for the SL region based the above collection.

References: Spencer (1995).



Fig. 6. *Cupressus goveniana*, near Crafers (*C.J. Brodie 7377*).

***Eucalyptus campaspe* S.Moore**

Common name: Silver Gimlet.

Description: Medium-sized evergreen tree to about 10 m tall, with smooth coppery trunk. Thick leathery glaucous grey-green leaves to 12cm long, 8–25mm wide. White flowers in clusters of 3–7.

Fig. 7.

Native to: Western Australia.

Worldwide: Not known as a weed in other countries.

Distribution in Australia: Not known to be naturalised in other States or Territories in Australia. However, cultivated records are known from NSW.

Collections in SA: Known from four separate Locations. Three these are historical, with two collected in 1993, from the Flinders Ranges and the SA Murray-Darling Basin NRM regions; the third specimen was collected in 1996, also from the SA Murray-Darling Basin NRM region. The most recent collections, *P.J.Lang 2899* & *P.J.Lang 2900*, are from the same population, on the Highway, 17.6 km NNE of Lochiel, in the Northern & York NRM region. The self-sown plants that have spread from roadside plantings, with wild plants consisting of 16 self-sown individuals, including five self-sown trees 3–5m tall, and eleven saplings to 2 m tall, with some in fruit.

Status in SA: This is a questionably naturalised record for SA Arid Lands, SA Murray-Darling Basin and the Northern & York NRM regions. Added to the Census for the FR, MU and NL regions, based on the above collections.

References: Nicolle (2016).



Fig. 7. *Eucalyptus campaspe*, native to WA and questionably established in SA (*P.J.Lang 2899*).

Eucalyptus spathulata* Hook. subsp. *spathulata

Common name: Swamp Mallet.

Description: A medium to taller, long-lived evergreen tree, 5–12 m tall, with a slim to eventually broad round crown and erect habit. The short trunk branches from close to the base, is smooth, and has attractive colourful cooper to salmon-pink, brown-grey bark in patches. The leaves are small, narrow, attractive grey-green. The tree has attractive red flowers. **Fig. 8.**

Native to: Western Australia.

Worldwide: Not known as a weed in other countries.

Distribution in Australia: Known as sparingly naturalised in Vic.

Collections in SA: Known from three collections, the first a historical record from 1993 from the Callington area (with limited collection information). Two recent collections are from two separate areas: *P.J.Lang* 2898A (14 July 2016) was collected 16.6 km NNE of Port Wakefield and south of Snowtown on the side of the Highway; these wild plants were spreading from a planting and comprised of 8 saplings to 3.5m tall, but none with fruit. *C.J.Brodie* 7176 (14 July 2016) was collected 1 km N of Lochiel, on the side of the Highway; again the wild plants were spreading from a planting and comprised of about 100 seedlings, 0.5–1.9 m tall, with none in fruit.

Status in SA: This is a questionably naturalised record in the SA Murray-Darling Basin and Northern & York NRM regions. Added to the Census for the MU and NL region, based on the above collections.

References: Nicolle (2016), Florabank (2017).



Fig. 8. *Eucalyptus spathulata* subsp. *spathulata* near Port Wakefield (*P.J.Lang* 2898A).

Family: Myrtaceae

Eucalyptus tricarpa* (L.A.S.Johnson) L.A.S.Johnson & K.D.Hill subsp. *tricarpa

Common name: Ironbark.

Description: An evergreen tree to 35 m height, 8–15 m wide. This has attractive grey-green leaves and rough brown/black bark. Red flowers appear in autumn.

Native to: Australia in NSW and Vic.

Worldwide: Not known to be naturalised in other countries.

Distribution in Australia: Not known as a weed in other States or Territories in Australia. An amenity plant throughout many parts of urban temperate Australia.

Collections in SA: A single historical collection, *R.J.Bates* 39555 (29 Oct 1994) from Kuitpo (with vague locations details). The notes say ‘Came up in hundreds after Ash Wednesday fires. In area of Eucalyptus plantation with several planted specimens’.

Status in SA: This is a questionably naturalised record in the Adelaide and Mount Lofty Ranges NRM region. Added to the Census for the SL region, based on the above collection.

References: Florabank (2017).

Family: Myrtaceae

***Eucalyptus urna* D.Nicolle**

Common name: Merrit.

Description: Evergreen tree to 8–16 metres tall, usually with a single trunk with smooth attractive orange-tan bark. Crown funnel-shaped to rounded, with fresh green lance-shaped leaves. Masses of pendulous flower buds are produced with long beaked caps. Flowers are cream. Fruiting capsules are small, to 10–11 mm wide. **Fig. 9.**

Native to: Western Australia.

Worldwide: Not known as a weed in other countries.

Distribution in Australia: Not known to be naturalised in other states or territories in Australia. An amenity plant throughout many parts of urban warm temperate Australia, with records from NSW and Qld.

Collections in SA: A single collection, *P.J.Lang* 2904, 1 km north of Snowtown, on eastern side of Port Wakefield Highway. This was a roadside occurrence of self-sown wild plants spanning 20 m of 48+ self-sown individuals, to 9 m tall, incl. many with fruit and possibly some second generation saplings. These had come from the parent planted roadside trees.

Status in SA: This is a questionably naturalised record in the Northern & York NRM region. Added to the Census for the NL region based on the above collection.

References: Nicolle (2016).



Fig. 9. *Eucalyptus urna*, near Snowtown (P.J.Lang 2904).



Fig. 10. *Eucalyptus woodwardii*, near Snowtown (P.J.Lang 2902).

Family: Myrtaceae

***Eucalyptus woodwardii* Maiden**

Common name: Lemon-flowered Gum.

Description: Medium-sized, evergreen, single-trunked tree 6–10 m tall, with smooth bark, white to orange-tan to olive-yellow or pink, shedding in long strips. Branches drooping, with pendulous lance-shaped leaves. Buds waxy white, flowers bright lemon-yellow. Fruit bell-shaped, red-brown, 11–15 mm wide. **Fig. 10.**

Native to: Western Australia.

Worldwide: Not known as a weed in other countries.

Distribution in Australia: Known to be sparingly naturalised in Vic. An amenity plant throughout many parts of urban warm temperate Australia.

Collections in SA: Known from two collections: *R.J.Bates 49214* was made in 1997 in the Tarlee area in the Northern & York NRM region. *P.J.Lang 2902* (14 July 2016), from the same NRM region, was collected near the south-western edge of Snowtown, on the western side of Port Wakefield Highway, c. 100 m south of turn-off into town. The population consisted of 12 self-sown individuals, incl. 6 self-sown trees 2–8 m tall and all in fruit.

Status in SA: This is a questionably naturalised record in the Northern & York NRM region. Added to the Census for NL region, based on the above collection.

References: Nicolle (2016).

Family: Euphorbaceae

***Euphorbia prostrata* Aiton**

Common name: Prostrate Spurge, Red Caustic Weed.

Description: A small, non-descript prostrate plant, to 0.5 m across, forming dense dark green mats. Plants sparsely hairy.

Native to: North America, in Canada and the US, to South America and the Caribbean.

Worldwide: Widely naturalised around the world, throughout Africa, temperate and tropical Asia, Mediterranean regions of Europe, and the Pacific islands.

Distribution in Australia: Naturalised widely in WA, NT, Qld, NSW. Not yet recorded for Vic. or Tas.

Collections in SA: Known from a single collection, *C.J.Brodie 7626* (8 Feb. 2017), in Penong, EP region, on a roadside behind the Caltex Garage. Scattered, but localised, possibly hundreds of plants on a weedy roadside in compacted gravelly soil.

Status in SA: This is an established naturalised record in the Eyre Peninsula NRM region. Added to the Census for the EP region, based on the above collection.

References: PlantNET (2017).

Family: Apiaceae

***Helosciadium nodiflorum* (L.) W.D.J.Koch**

Common name: Fool's Water-cress.

Description: Perennial soft herb, found growing in riparian areas, to 1.3 m tall, often sprawling to decumbent. Leaves pinnate. Flowers white.

Native to: Widespread in Europe, North Africa and temperate Asia.

Worldwide: Recorded as widely naturalised in North America and found in Argentina and Chile, South America.

Distribution in Australia: Naturalised in NSW and Vic.

Collections in SA: This name is represented in the State Herbarium by a single historical collection, *R.Bates 14178* (24 Apr. 1998), which was re-determined in June 2016 as this previously unrecorded taxon by CJB & Rosemary Taplin. The specimen was collected from the Northern & York NRM region, in a creek west of the township of Sevenhill. Collected from a large population, growing with *Mentha* species and water-cress.

Status in SA: This is an established naturalised record in the Northern & York NRM region. Added to the Census for the NL region, based on the above collection.

References: PlantNET (2017).

Family: Euphorbiaceae

***Homalanthus populifolius* Graham**

Common name: Bleeding heart tree.

Description: A fast-growing, evergreen small to medium-sized tree or shrub, to 6 m tall, with smooth pale grey trunk. Deep green heart-shaped leaves, pale below, turning deep red before falling. Small separate male and female flowers, borne on erect inflorescences, in the warmer months, followed by small fruit. **Fig. 11.**

Native to: Australia in NSW and Qld, Papua New Guinea and the Solomon Islands.

Worldwide: Recorded as possibly naturalised from New Zealand, Southern Africa, and the USA.

Distribution in Australia: Sparely naturalised in Vic. Cultivated around Australia.

Collections in SA: Known from a single collection that was collected from a single plant, *C.J.Brodie 7473*, from Kingscote (KI). A single stemmed plant, c. 2 m tall, growing opposite the driveway of 3 Chapman Terrace, by a walking track in coastal scrubland, with *Fraxinus angustifolia*, *Acacia* spp., *Myoporum insulare*, *Clematis* spp. and weedy grasses.

Status in SA: This is a questionably naturalised record in the Kangaroo Island NRM region. Added to the Census for KI region based on the above collection.

References: PlantNET (2017).



Fig. 11. *Homalanthus populifolius* in Kingscote, KI (C.J.Brodie 7473).

Family: Fabaceae

***Laburnum anagyroides* Medik.**

Common name: Golden-chain.

Description: A small deciduous tree, to c. 7 m tall, with brown bark. Leaves trifoliate. Inflorescences showy pendulous racemes, 10–20 cm long, with lemon-yellow pea-like flowers. Produces pendulous pods with many black seeds. Seeds are highly toxic to humans, horses and goats.

Native to: Central, south-eastern and south-western Europe.

Worldwide: Planted as an ornamental in temperate areas and known as a casual escape in many countries in Europe, North America and South America, also in India and New Zealand.

Distribution in Australia: Sparingly naturalised in Tas.

Collections in SA: Known two historical and one recent collection. Two collections were made in 1996 in the Adelaide Hills, with minimal information, from the Mt Lofty and the Paracombe areas. The most recent collection, *P.J.Lang 3113* (17 Feb 2017) was also collected in the Adelaide Hills. Ten to 15 establishing wild plants were seen on both the sides of the weed-infested road verges at the junction of Sturt Valley Road and Manoah Drive. The specimen was collected from a small tree c. 3 m tall.

Status in SA: This is an established naturalised record in the Adelaide & Mount Lofty Ranges NRM region. Added to the Census for the SL region, based on the most recent collection.

References: Spencer (2002).

***Ludwigia repens* J.R.Forst.**

Common name: Creeping Primrose-willow.

Description: This is an aquatic, floating herb or riparian low-growing, creeping, mat-forming herb, rooting at the nodes in damp conditions. Stems about 30 cm long, with crowded, opposite, elliptic leaves, 1–4 cm long. Small flowers in leaf axils with 4 yellow insignificant petals that fall promptly. Fruit also small and insignificant 3–7 mm long, tapering to the stem. **Fig. 12.**

Native to: The USA and Mexico, the Caribbean, Guatemala and Colombia.

Worldwide: Known as a weed in parts of Europe, the USA, Japan and Madagascar.

Distribution in Australia: Introduced to Australia, recorded as naturalised in WA, Qld and NSW.

Collections in SA: Known from a single collection, *C.J.Brodie 7594*, from 8 Kramm Avenue, Hahndorf. Collected from a patch, 30 cm in diameter, that was not planted by the owners, in a private back garden. The plants were found in a small depression/pond, into which an ephemeral creek flows and then overflows into the paddock next door.

Status in SA: This is a questionably naturalised record in the Adelaide & Mount Lofty Ranges NRM region. Added to the Census for the SL region based on the above collection.

References: Hoch (2011).



Fig. 12. *Ludwigia repens* near Hahndorf (*C.J.Brodie 7594*).

Family: Amaryllidaceae

***Nerine sarniensis* (L.) Herb.**

Common name: Guernsey-lily.

Description: Bulbous perennial herbaceous plants with strap-like leaves. Inflorescences in a globular head, on a single erect stem. **Fig. 13.**

Native to: West Cape Province of South Africa.

Worldwide: Popular garden plant, but recorded as potential weeds in Portugal, the UK and New Zealand.

Distribution in Australia: Not recorded as naturalised in any other part of Australia, although a 1967 collection from NSW, most likely cultivated, has not been assigned a status.

Collections in SA: Known from five collections in the Adelaide Hills. Collections from 1995, 1998 and 2015 only had minimal information (*R.J.Bates* 20880, 49886 and 65047, respectively). The most recent collection, *P.J.Lang* 2984 (12 April 2016), was made in Belair National Park. This is a population of 26 flowering stems within a radius of 25 m, growing near in the NW corner of the National Park, about 50 m east of Sir Edwin Avenue and 0.4 km south-east of Belair Railway Station. *P.J.Lang* 2985, collected on the same day from the same population is an outlier in intact bush, and evidence of the potential to spread.

Status in SA: This is an established naturalised record in the Adelaide & Mount Lofty Ranges NRM region. Added to the Census for the SL region, based on the collections in Belair National Park and the three older collections, mentioned above.

References: Spencer (2005).



Fig. 13. *Nerine sarniensis* in Belair National Park (*P.J.Lang* 2985).

Family: Amaryllidaceae

Name: *Zephyranthes candida* (Lindl.)Herb.

Common name: Zephyr Lily.

Description: A bulb with white to pale pink crocus-like flowers on stems to 15–20 cm tall. The leaves are stiff and rush-like to about 30 cm tall.

Native to: South America to Argentina and Paraguay.

Worldwide: Also widely cultivated around the world in temperate regions.

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

Collections in SA: A single collection, *R.Bates 64733* (Feb. 2005), from the Northern & York NRM Region, at the east end of Buchanan St, Clare, on the edge of foot track, in vacant land by creek. The plant was in full bloom after heavy rains.

Status in SA: *Zephyranthes candida* has been listed as a questionable naturalised taxa for the Northern & York NRM Region and added to the Census for the NL region, based on the single recently identified specimen found in the State Herbarium's vaults.

References: Spencer (2005).

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

Updates to 37 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 numerous changes listed for one or more regions within SA.

A change in **distribution** indicates:

- additional regions added due to new or recently identified collections
- regions removed due to incorrect names applied to specimens.

A **name change** could be:

- A change in genus or species
- A change of, adding or removing a subspecies, variety, form or cultivar.

These changes occur due to application of new or recently accepted taxonomic classifications

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

- naturalised / established in the wild (**e**)
- 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 change has been made is underlined). Plant status: **e** = naturalised, i.e. established in the wild; **?e** = questionably established; **n** = native; **?n** = questionably native.

Taxon	Update type	Update / comment
<i>Acacia pendula</i> A.Cunn. ex G.Don Weeping Myall	Status	<u>NL</u> ^e Changed Status in the NL region from ?e to e , based on new collections, <i>P.J.Lang</i> 2903, <i>P.J.Lang</i> 2905 & <i>C.J.Brodie</i> , on 14 July 2016, where it is establishing.
<i>Acer negundo</i> L. Box Elder	Distribution	SL ^e , SE ^{?e} Added for SE, based on a new collection, <i>C.J.Brodie</i> 6674 from Naracoorte made in Oct. 2015.
<i>Aeonium arboreum</i> (L.) Webb & Berthel. Tree Aeonium	Distribution	NL ^e , MU ^e , YP ^e , SL ^e , KI ^e , SE ^e Added for KI, based on two new collections, <i>C.J.Brodie</i> 7415 & 7470, from separate locations, made in Nov 2016.
<i>Aeonium haworthii</i> Webb & Berthel. Pinwheel Aeonium	Distribution	EP ^e , NL ^e , SL ^e , KI ^e , SE ^e Added for KI, based on a new collections, <i>C.J.Brodie</i> 7414, made in Nov. 2016. Added for SE based on <i>C.J.Brodie</i> 596, made in Oct 2009.
<i>Agapanthus praecox</i> Willd. subsp. <i>orientalis</i> (F.M.Leight.) F.M.Leight. Agapanthus	Distribution Status	<u>SL</u> ^e , KI ^{?e} , SE ^e Added for KI, based on a new collection <i>C.J.Brodie</i> 7586, made in Nov 2016. Added for SE, based on C.J.Brodie 1413, made in 2010, and 2 other collections. Changed Status in Southern Lofty region from questionably established (?e) to naturalised (e), based on 8 collections where it is establishing.
<i>Aloe arborescens</i> Mill. Tree Aloe	Distribution	EP ^{?e} , NL ^{?e} , MU ^{?e} , YP ^{?e} , SL ^{?e} , KI ^e Added for EP, based on collection <i>C.J.Brodie</i> 5625, made in 2014. Added for KI, based on a new collection, <i>C.J.Brodie</i> 7416, made in Nov. 2016.
<i>Celtis australis</i> L. European Nettle Tree	Distribution	NL ^{?e} , SL ^{?e} , SE ^{?e} Added for the SE region, based on two new collections, <i>C.J.Brodie</i> 7719 & <i>D.Burgoyne</i> 20, made in Mar. 2017.
<i>Cenchrus ciliaris</i> L. Buffel Grass	Distribution	NW ^e , LE ^e , NU ^e , GT ^e , FR ^e , EA ^e , EP ^e , NL ^e , MU ^e , YP ^e , SL ^e , SE ^{?e} Added for SE, based on collection, <i>J.Forrest</i> s.n. (29 Jan 2015), a single plant.
<i>Cenchrus pennisetiformis</i> Hochst. & Steud. ex Steud. Buffel Grass	Distribution	LE ^e , GT ^e , FR ^e , EA ^e Added for the GT region, based on collection <i>A.Sleep</i> s.n., made on 12 May 2016.

Taxon	Update type	Update / comment
<i>Clematis aristata</i> R.Br. ex Ker Gawl. Mountain Clematis	Distribution	SL^{?e}, SEⁿ Added for SL, based on <i>C.Austin 6</i> , made in Dec 2016.
<i>Conyza bonariensis</i> (L.) Cronquist Flax-leaf Fleabane	Distribution	NW^e, LE^e, NU^e, GT^e, FR^e, EA^e, EP^e, NL^e, MU^e, YP^e, SL^e, KI^{?e}, SE^e Added for the LE & NU regions, based on the collections <i>C.J.Brodie 1685 & 4612</i> , respectively.
<i>Cotoneaster pannosus</i> Franch. Cotoneaster	Distribution	EP^e, NL^e, SL^e, KI^{?e}, SE^e Added for KI, based on the collection <i>C.J.Brodie 7471</i> , made in Nov 2016.
<i>Crowea exalata</i> F.Muell. subsp. <i>exalata</i>	Name	Name change to subsp. <i>exalata</i> .
<i>Diplotaxis muralis</i> (L.) DC.	Name	Removed variety name: var. <i>muralis</i> .
<i>Eucalyptus conferruminata</i> D.J.Carr & S.G.M.Carr subsp. <i>recherche</i> D.Nicolle & M.E.French Bald Island Marlock	Name Change	SL^e Changed from <i>Eucalyptus conferruminata</i> subsp. <i>conferruminata</i> to subsp. <i>recherche</i> on 7 Dec 2016, as it was originally mis-identified (see <i>Nuytsia</i> 18: 202–205, 2008).
<i>Eucalyptus cornuta</i> Labill. Yate	Distribution	NL^{?e}, SE^{?e} SE region removed, as the sole collection, <i>C.J.Brodie 901</i> , is presumed cultivated. Collection notes provides no evidence of natural establishment.
<i>Eucalyptus viminalis</i> Labill. subsp. <i>cygnetensis</i> Boomsma Rough-Bark Manna Gum	Distribution	EPⁿ, NL^{?n}, MUⁿ, SLⁿ, KIⁿ, SEⁿ A native species that has been added as questionably native for the NL region, based on a single collection, <i>R.Bates 81111</i> , made in 2009 of large old trees that seem unlikely to have been planted. However this needs field evaluation.
<i>Fraxinus angustifolia</i> Vahl subsp. <i>angustifolia</i> Desert Ash	Distribution	FR^e, EP^{?e}, NL^e, MU^{?e}, YP^{?e}, SL^e, KI^{?e}, SE^e Added for the KI region, based on <i>C.J.Brodie 7474</i> , made in Nov 2016.
<i>Hydrocotyle bonariensis</i> Lam. Hydrocotyle	Status	SL^{?e} Changed from established (e) to questionably established (?e), as the three State Herbarium collections have limited data and were collected over 50 years ago in: Dec. 1954, Nov. 1964 and Jan. 1965.
<i>Malcolmia flexuosa</i> (Sibth. & Sm.) Sibth. & Sm. Malcolmia	Distribution Status	EP^{?e}, MU^{?e} Added for the EP region based on <i>R.Bates 53945</i> (“isolated plants”). Changed status in MU region from naturalised (e) to questionably established (?e), based on <i>R.Bates 35587</i> (“Single plant, roadside”) and <i>R.Bates 40823</i> (“In garden after floods”).

Taxon	Update type	Update / comment
<i>Muscari armeniacum</i> Baker Grape Hyacinth	Status	FR ^e , NL ^e , <u>MU</u> ^e , <u>YP</u> ^e , SL ^e Changed status in MU and YP regions from questionably established (?e) to established (e), based on <i>R.J.Bates 44220</i> & <i>R.Bates 38469</i> , respectively.
<i>Oncosiphon suffruticosum</i> (L.) Kallersjo Calomba Daisy	Distribution	LE ^e , GT ^e , EP ^e , NL ^e , MU ^e , SL ^e Added for the GT region, based on <i>C.J.Brodie 7347</i> , a small population of 100+ plants, on both sides of road.
<i>Opuntia polyacantha</i> Haw. var. <i>hystricina</i> (Engelm. & Bigelow) B.D.Parfitt	Distribution	FR ^e , GT ^e Removed from the FR region and added to the GT region, because the three existing collections were originally incorrectly assigned to the FR region. All three specimens and another recently collected one (<i>BS1097-818</i> , Sep. 2016) are from a hill behind or near Andamooka Homestead.
<i>Passiflora caerulea</i> L. Blue Passionflower	Distribution	LE ^{?e} , FR ^{?e} , MU ^{?e} , SL ^{?e} , KI ^{?e} Added for the KI region, based on <i>C.J.Brodie 7469</i> , a single plant in a 3 × 2 m area, climbing over coastal scrub in Kingscote.
<i>Periballia minuta</i> (L.) Asch. & Graebn. Small Hair-grass	Distribution	FR ^e , NL ^e , MU ^e , YP ^e , SL ^e , SE ^e . Added for YP, based on <i>P.J.Lang BS63-1697</i> (Sep. 1994).
<i>Physalis hederifolia</i> A.Gray Cape Gooseberry	Name	The name was spelled incorrectly (as <i>Physalis hederæfolia</i> A.Gray).
<i>Rorippa sylvestris</i> (L.) Besser Creeping Yellowcress	Name	No subspecies are recognised anymore, i.e. removed the sub-species name (subsp. <i>sylvestris</i>).
<i>Sagina apetala</i> Ard. Annual Pearlwort	Distribution	NU ^e , GT ^e , FR ^e , EA ^e , EP ^e , NL ^e , MU ^e , YP ^e , SL ^e , KI ^e , SE ^e Added for the NU region, based on the specimen AD275408, removed from the cellophane bag of <i>Neoscadium glochidiatum</i> (<i>J.B.Cleland s.n.</i> , 11 Nov 1955, AD275407).
<i>Scilla hyacinthoides</i> L. Hyacinth Bluebell	Distribution	NL ^e , SL ^{?e} , KI ^{?e} , SE ^{?e} Added for NL, based on <i>R.J.Bates 51346</i> and two others, both in cemetery reserves.
<i>Solanum lycopersicum</i> L. Tomato	Name	Changed name from <i>Lycopersicon esculentum</i> Mill.
<i>Sporobolus africanus</i> (Poir.) Robyns & Tournay Rat-tail Grass	Distribution	EP ^e , MU ^e , SL ^e , KI ^e , SE ^e Added for the EP region, based on collection <i>A.Sleep s.n.</i> (30 Jan 2017).

Taxon	Update type	Update / comment
<i>Sternbergia lutea</i> (L.) Ker Gawl. ex Spreng. Autumn Crocus	Name	Removed sub-species name (subsp. <i>lutea</i>), as subspecies are no longer recognised.
<i>Urochloa gilesii</i> (Benth.) Hughes var. <i>notochthona</i> (Domin) B.K.Simon	Distribution Status	<u>NWⁿ</u> , <u>LE^{?n}</u> , <u>EA^{?n}</u> , <u>EP^{?e}</u> , <u>MU^{?e}</u> , <u>SL^{?e}</u> Added NW region as questionably native (?n), based on a determination of a historical specimen. Changed status in LE and EA from questionably established (?e) to questionably native (?n). Removed from the SL, MU and NL regions, following redetermination of historical collections to <i>Urochloa panicoides</i> P.Beauv. var. <i>panicoides</i> .
<i>Urochloa panicoides</i> P.Beauv. var. <i>panicoides</i> Annual urochloa grass	Distribution	<u>LE^e</u> , <u>EP^e</u> , <u>NL^e</u> , <u>MU^e</u> , <u>SL^e</u> Added LE, based on a re-determination of <i>C.J.Brodie 1678</i> by PJJ.
<i>Veronica hederifolia</i> L. Ivy-leaved speedwell.	Distribution	<u>NL^e</u> , <u>MU^e</u> , <u>YP^e</u> , <u>SL^e</u> , <u>SE^e</u> Removed YP and added NL to the distribution, because the cited collection was originally incorrectly assigned to the YP region.
<i>Veronica plebeia</i> R.Br.	Distribution	<u>FR^e</u> , <u>EP^e</u> , <u>NL^e</u> , <u>YP^e</u> , <u>SL^{?e}</u> Added EP region, based on, <i>Anon 68</i> (5 May 1987), from Devils Peak near Quorn.
<i>Vitis vinifera</i> L. Grape vine	Status	<u>FR^{?e}</u> , <u>EP^{?e}</u> , <u>NL^{?e}</u> , <u>MU^{?e}</u> , <u>SL^{?e}</u> Changed status in all regions in SA from naturalised (e) to questionably established (?e), based on new assessment of existing material and recent collections.

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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
14 July 2016	N&Y	CJB & Peter Lang (PJL) (SHSA)	CJB: 8 PJL: 9	Road side between Pt Wakefield and Pt Pirie	Assessment and confirmation of the presence of the questionably naturalised of <i>Eucalyptus stricklandii</i> and <i>E. spathulata</i> subsp. <i>spathulata</i> , and naturalisation of <i>Acacia pendula</i> .
21 Aug. 2016	AMLR	Michelle Waycott, CJB, Juergen Kellermann, PJL, Martin O'Leary, Helen Vonow (HV) (SHSA), Adelaide University Staff and students	CJB: 2 Many student collections	Aldinga Scrub Conservation Park Onkaparinga River National Park	Plant Identification II course (The University of Adelaide 2 nd year undergraduate class). Rarely collected bulb called <i>Ipheion uniflorum</i> and emerging weedy <i>Sedum</i> species.
28 Aug.– 9 Sep. 2016	SAAL	CJB, PJL, Chelsea Novice, JK, HV (SHSA), and c. 25 other scientists and volunteers	C 850 joint collections	West of Lake Torrens - (Andamooka, Arcoona, Bosworth, Pernatty, Purple Downs, Roxby Downs Stations and Lake Torrens NP	Lake Torrens Bush Blitz survey. Collection of all species of native and naturalised (weeds) plant species seen, including algae, fungi, lichens and bryophytes. Two potential new native species collected.
5 Oct. 2016	AMLR	CJB, Peter Hanson (graduate ranger), Dana Miles & Lisa Blake (NR AMLR)	11	Blewett Springs area	General weed collection with a focus on weedy South African bulbs.
9–18 Oct. 2016	AW, EP, SAAL	CJB & PJL	CJB: 174 PJL: 168	APY Lands, Sturt Highway and Northern EP	Collection of naturalised (weeds) and native plants in remote areas. Several native taxa that are suspected to be new to science were collected for further research to be carried out by PJL.
10 Nov. 2016	AMLR	CJB	17	Adelaide Hills	General weed collection with a focus on questionably naturalised and under collected taxa.

Date(s)	NRM Region	Participants	No.	General Location	Significant weed collections
18 Nov. 2016	AMLR	CJB	22	Morialta Conservation Park	General collection of weeds not collected in the park before, or only collected one or few times over 10–20 years ago. Re-collected fruiting specimen of weedy <i>Pandorea pandorana</i> , last collected 20 years ago from a population that is covering large areas of the hillside above 4 th Creek, by 1 st Falls track. This species is native to the north-west of South Australia, NT, WA and is common in all the eastern states from southern Vic. to Cape York in Qld.
23-27 Nov. 2016	KI	CJB with Rory Wiadrowski & Jason Walter (NR KI)	181	Around Kangaroo Island (KI)	General weed collection. A new weeds record for South Australia, <i>Homalanthus populneus</i> (Bleeding Heart Tree), was collected near Kingscote.
14 Dec. 2016	AMLR	CJB, Anne Prescott (Consultant)	3	Hahndorf, private garden	Parrot feather, <i>Myriophyllum aquaticum</i> , (before eradication) and two self-sown aquatic weeds.
27 Jan. 2017	AMLR	CJB, David Blewett (WMSSA)	15	Mitcham to McLaren Vale (Onkaparinga NP)	General weed collections.
8 Feb. 2017	EP	CJB, Andrew Sleep (NR EP), Leah Feuerherdt, Troy Bowman (Rural Solutions SA)	18	Penong township and surrounding area	General weed collections with emphasis on grasses, incl. a new weed record for S.A., <i>Euphorbia prostrata</i> , commonly known as Prostrate Spurge or Prostrate Sandmat, that is also naturalised in WA, NT, Qld and NSW.
16 Feb. 2017	AMLR	CJB, Stephen Kingdom (Botanic Garden Staff)	1	Adelaide Botanic Garden	Weedy grass collection.
21 Feb. 2017	AMLR	CJB, David Blewett (WMSSA)	20	Mitcham to Adelaide Hills (Stirling Area)	General weed collection (not yet determined).
28 Feb.– 4 Mar. 2017	SAMDB & SE	CJB, Aidan Laslett, Dean Burgoyne (NR SE), Robert Mock (landowner)	100	SW of Murray Bridge and Upper South-East (Coonalpyn, Coorong, Keith, Bordertown, Kingston SE and Robe)	General weed collection, emphasis on grasses, <i>Celtis australis</i> (a new weed record for SE).
8 Mar. 2017	AMLR	CJB	8	Adelaide Plains, Brompton (near Port Road)	<i>Cenchrus ciliaris</i> (Buffel Grass infestation) and general weed collection.

Date(s)	NRM Region	Participants	No.	General Location	Significant weed collections
14–16 Mar. 2017	N&Y	CJB, Anne Brown (Greening Australia), Kevin Smith, Kurtis Madigan (NR N&Y)	18	Crystal Brook area, Orroroo to Quom	General weed collections, emphasis on grasses.
28 Mar. 2017	AMLR	CJB	4	Adelaide Botanic Gardens	General weed collection along creek line
19 Apr. 2017	AMLR	CJB, Lisa Duffy, Flavio Perez, Diter Strike (Botanic Garden Staff)	13	Mount Lofty Botanic Gardens	Garden plants that are self-propagating in both irrigated and non-irrigated areas of the garden
24–28 Apr. 2017	N&Y	CJB, Troy Bowman (Rural Solutions SA), Anne Brown (Greening Australia), Kevin Smith, Kurtis Madigan (NR N&Y)	50	Crystal Brook, Gladstone, Jamestown, Peterborough, Wirrabara, Wilmington, Quom, Hawker	Collection and mapping of <i>Cenchrus ciliaris</i> (Buffel Grass) and general weed collection.
15–19 May 2017	SE	CJB, Aidan Laslett	40	Coorong, Robe, Millicent, Mount Gambier,	General weed collection in and around Mt Gambier and Robe.
22–26 May 2017	SAAL	CJB, Sarah Voumard & Lelia Kamphorst (both NR SAAL), Neville Bonney (consultant)	26	Olympic Dam, Andamooka, Roxby Downs, Oodnadatta, Coober Pedy.	General weed collection; visited and examined expanding populations of <i>Cenchrus ciliaris</i> (Buffel Grass).
13-16 June 2017	KI	CJB, Jason Walter (NR KI)	93	Central and eastern Kangaroo Island	General weed collection.
22 June	N&Y	CJB	30	York Peninsula	General weed collections, emphasis on grasses.

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)	DEWNR Staff	Location	Presentation title / subject	Audience / Society / Conference	# Attendees
11–15 Sep. 2016	Chris Brodie (CJB)	Perth, Pan Pacific Hotel.	Talk & Poster presentation: 'Determining hybrids between invasive and native <i>Carpobrotus</i> N.E.Br. species in South Australia: field, morphological and molecular insights'.	20 th Australasian Weeds Society Conference.	100
27 Sep. 2016	CJB, James Donnelly, Dana Miles (NR AMLR)	Andrew Hardy Vineyard in Blewett Springs.	Talk and demonstration: 'Invasive grasses workshop', part of the 'Pests cost us all' federally funded program (collaboration with PIRSA).	Local land owners and managers (farmers and viticulturists).	c. 10
5 Oct. 2016	CJB, James Donnelly, Dana Miles, Henry Rutherford (NR AMLR)	Andrew Hardy Vineyard in Blewett Springs.	Talk and demonstration: 'Invasive grasses workshop'.	Local contractors and council workers that manage natural resources on public land.	c. 30
8 Oct. 2016	CJB	Sturt Upper Soldiers Memorial Hall, 173 Upper Sturt Road.	Talk and demonstration: 'The Flora of South Australia and the State Herbarium – an introduction...' 'How to collect and identify unknown plants'.	Sturt Upper Reaches Landcare Group.	c. 50
13 Oct. 2016	CJB, Peter Lang (PJL)	APY lands, in the bush by shady tree 23 km ENE of Pukatja (Ernabella).	Talk and demonstration: 'Invasive grasses workshop'.	Anangu Pitjantjatjara Yankunytjatjara (APY) Land Management staff, NR AW staff, and traditional owners.	c. 35
17 Oct. 2016	CJB, Iggy Honan (NR EP)	Waddikee Town Hall.	Talk and demonstration: 'Invasive grasses workshop'.	NR staff and community members from EP.	c. 15
25 October 2016	CJB	Waite Campus, in Lecture theatre.	Talk: 'Buffel Grass: identification 'lookalikes' and specimen collection'.	Buffel Grass Forum at Waite Campus with attendees from across SA and interstate from Qld, NT and Vic.	c. 80

Date(S)	DEWNR Staff	Location	Presentation title / subject	Audience / Society / Conference	# Attendees
30 Oct. 2016	CJB, Peter Michelmore (NR SAMDB)	Callington Show, Callington Recreation Grounds, Callington Road, Callington.	Talk and demonstration: 'Invasive grasses workshop'.	NR staff and community members.	c. 30
7 Dec. 2016	CJB	Adelaide Botanic Garden, Goodman Building lecture theatre.	Talk: 'The State Herbarium of South Australia and the Naturalised Flora'.	Botanic Garden and State Herbarium staff.	c. 60
8 Dec. 2016	CJB	Mount Lofty Botanic Garden, Staff Meeting room.	Talk: 'The State Herbarium of South Australia and the Naturalised Flora'.	Mount Lofty & Wittunga Botanic Garden staff.	c. 40
8 Feb. 2017	CJB	Penong, Community Hall	Talk and demonstration: 'Invasive grasses workshop'.	AW NR and general public	N/A
2 Mar. 2017	CJB	Kingston SE, Community Hall	Talk and demonstration: 'Invasive grasses workshop'.	SE NR and farming community	c. 15
3 Mar. 2017	CJB	Kingston SE, NRM Building lecture theatre	Talk and demonstration: 'Invasive grasses workshop'.	SE NR and farming community	16
4 Mar. 2017	CJB	Mundulla Show	Providing weed identification at public event	General public	Many (c. 20 identifications)
14 Mar. 2017	CJB	Napperby Tennis Club rooms	Talk and demonstration: 'Invasive grasses workshop'.	N&Y NR and government staff, council workers and general public	c. 25
15 Mar. 2017	CJB	Orroroo, Blacksmiths Chatter	Talk and demonstration: 'Invasive grasses workshop'.	N&Y NR and government staff and general public	c. 20
16 Mar. 2017	CJB	Quorn, Bowls Club rooms	Talk and demonstration: 'Invasive grasses workshop'.	N&Y NR and government staff, NGOs, council workers and general public	c. 25
28 Apr. 2017	CJB, Henry Rutherford (NR AMLR)	Private residence Mitcham	Site visit to inspect suspected declared garden plants offered for sale via <i>gumtree.com.au</i> . Declared plants seized under NRM Act by NR ALMR)	Hobbyist seller	3
16 May 2017	CJB, Aidan Laslett (NR SE)	Mount Gambier, City Hall	Talk and demonstration: 'Invasive grasses workshop'.	SE NR and farming community	c. 20

Date(S)	DEWNR Staff	Location	Presentation title / subject	Audience / Society / Conference	# Attendees
17 May 2017	CJB, Aidan Laslett (NR SE)	Robe, Council Chambers	Talk and demonstration: 'Invasive grasses workshop'.	SE NR and farming community	c. 10
22 May 2017	CJB, Paul Hodges (PH) (NR SAAL), Neville Bonney (Consultant)	Olympic Dam Training room	Talk and demonstration: 'Invasive grasses workshop'.	Community	c. 35
23 May 2017 AM	CJB, PH, NB	Andamooka Community Hall	Talk and demonstration: 'Invasive grasses workshop'.	Community	c. 15
24 May 2017 PM	CJB, PH, NB	Roxby Area School	Talk and demonstration: 'Invasive grasses workshop'.	2 school groups	c. 60 schools children
24 May 2017	CJB, PH, NB	Cooper Pedy	Talk and demonstration: 'Invasive grasses workshop'.	Community	c. 15
25 May 2017	CJB, PH, NB	Oodnadatta	Talk and demonstration: 'Invasive grasses workshop'.	Community	c. 5
31 May 2017	CJB	Adelaide Botanic Gardens	'A pictorial introduction to The State Herbarium of South Australia and the Naturalised Flora'	Horticultural students	c. 35
3 June 2017	CJB	Belair National Park	'The State Herbarium and Weeds'	Friends of Parks group	50+
6 June 2017	CJB, Nikko Menzel (Botanic Gardens staff)	Adelaide Botanic Gardens	'Feral Invaders' for World Environment Day Trail in ABG	Various school groups with children aged 5-11 years old	300+
15 June 2017	CJB, Jason Walter (JH) (NR KI)	Kingscote Council Depot	Talk: 'Invasive grasses workshop'.	Kangaroo Island Council employees	5
15 June 2017	CJB, JW	Mawarra farm, Kangaroo Island	Talk: 'Invasive grasses workshop'.	Community	c. 8
21 June 2017	CJB	Paskeville Football Club	Talk: 'Invasive grasses workshop'.	Community	4
21 June 2017	CJB	Minlaton council offices	Talk: 'Invasive grasses workshop'.	Council and DEWNR staff	c. 10

Appendix 2: Herbarium regions

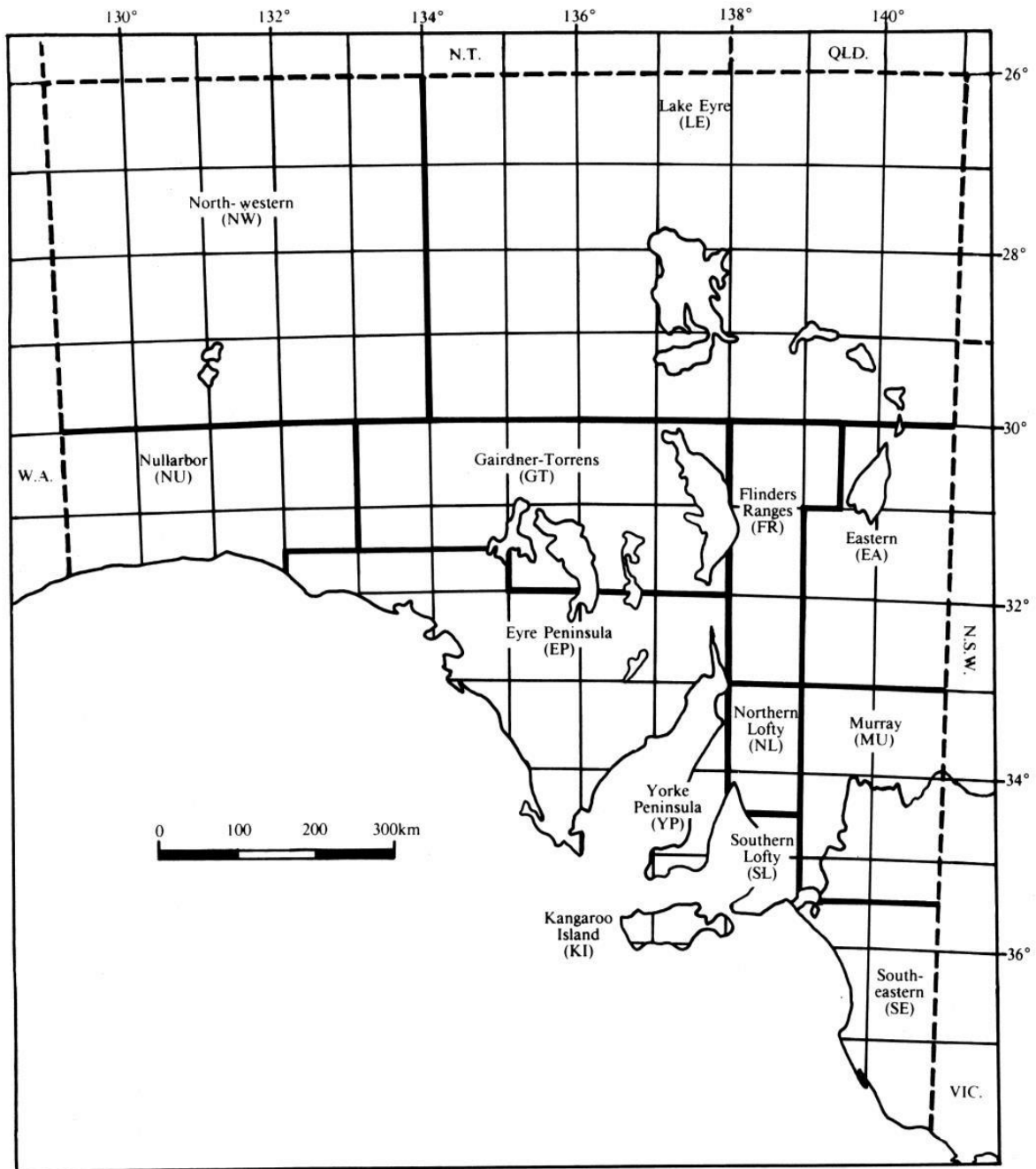


Fig. 14. State Herbarium regions for South Australia. Map from J.P. Jessop & H.R. Toelken, *Flora of South Australia*, 4 vols (1986).

