

Eyre Peninsula Landscape Board

PEST SPECIES REGIONAL MANAGEMENT PLAN

Asparagus asparagoides

Bridal creeper

This plan has a five year life period and will be reviewed in 2027.



INTRODUCTION

Synonyms

Asparagus asparagoides (L.) W.Wight, *Asparagus medeoloides* (L.f.) Thunb. *Dracaena medeoloides* L.f. *Elachanthera sewelliae* F.Muell. *Luzuriaga sewelliae* (F.Muell.) K.Kraus, *Medeola asparagoides* L. *Myrsiphyllum asparagoides* (L.) Willd.

Smilax asparagus, smilax, American smilax, bridal-veil creeper, gnarboola (South Africa), florist's smilax', narbas (South Africa), krulkransie (South Africa), African asparagus Fern (USA)

Biology

Two distinct forms of the herbaceous bridal creeper *Asparagus asparagoides* (L.) Druce (Asparagaceae) exist in South Australia [1]. The most common form, WF, corresponds to the 'widespread form' in South Africa. A second form, WCF, has a restricted distribution in South Australia and corresponds to the southwestern Cape form of South Africa. The WCF can be differentiated from the WF by larger-flatter cladodes (leaf-like stems) that are generally more waxy and elongated, the presence of two or three flowers per cladode axil, its larger more elongate tubers (40 to 75 mm) that grow closer to the soil surface and lie parallel to the ground, arranged in a rosette around a vertical rhizome (horizontal in WF), and conspicuously three-lobed fruits (compared to obscurely six lobed fruits in WF) [2-4]. Eyre Peninsula has only the WF.

Bridal creeper is a long-lived, summer-dormant geophyte (plant propagated by underground buds). The extensive, perennial, below-ground storage organs (branching rhizomes, with spindle-shaped fleshy tubers) make up approximately 90% of total plant biomass. The above-ground climbing cladodes (leaf-like stems) are up to 2-6 m long and die back annually or in unfavourable conditions [3, 5]. Bisexual flowers generally form in late winter/early spring and are able to self-pollinate, with up to 40% of flowers setting fruit [3]. Seed viability has been recorded at over 50% after 18 months for seeds not buried, with some seeds viable for up to three years [6]. Seeds on the surface germinate only after covering by litter, with germination over a broad temperature range (10 – 30 °C) [6]. Tubers enable vegetative reproduction. Layering of tuber mats occurs down to a depth of up to 300mm (A. Simpson *Pers. Comm.* 10/05/2015).

The WF prefers shaded or part-shaded habitat, but in South Australia will also grow in hind dunes on exposed beaches, on coastal cliffs, among shrubs in sheltered bays [3] and on islands. Mature plants can tolerate fires.

Origin

Bridal creeper is native to South Africa, Namibia and possibly further north in Africa, and was introduced to Australia as a garden ornamental, possibly via Europe, as early as 1857 [3].

Distribution

The WF of bridal creeper has naturalised in New Zealand, United States of America, Portugal, Sicily and Australia [3]. Within Australia it has naturalised in all states [3], being distributed across southern Australia (Figure 1). Within South Australia the WF occurs extensively across the southern half of the state (Figure 2).

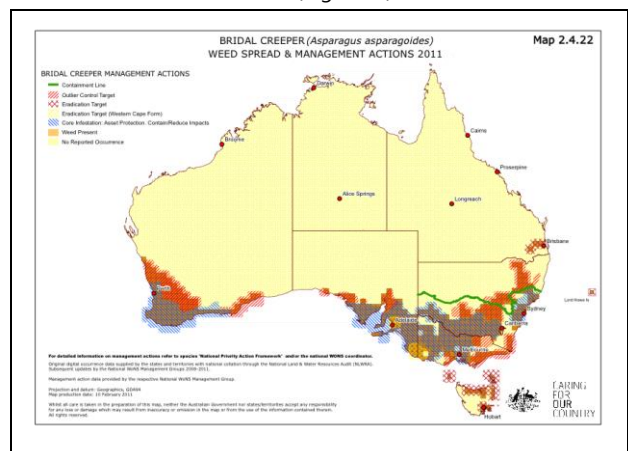


Figure 1: Current distribution (2011) and management actions for the widespread form of *Asparagus asparagoides*.

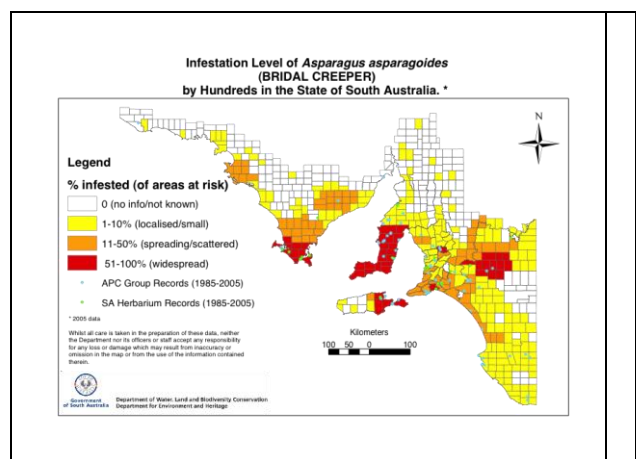


Figure 2: Distribution by hundreds in South Australia 2005 data. *Asparagus asparagoides* widespread form.

The model for the WF (Figure 3) matches most of the observed current Australian distribution (Figure 1).

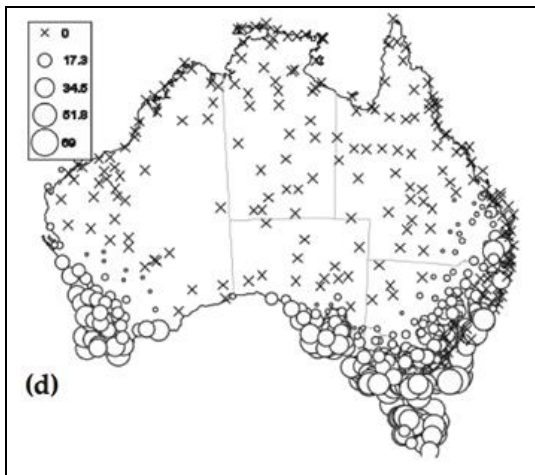


Figure 3: Potential distributions: *Asparagus asparagoides* widespread form CLIMEX prediction of Ecoclimatic Index (EI) showing circles for suitable locations and crosses where species is predicted to not survive in Australia [7].

Projected climate suitability for bridal creeper in South Australia to 2080, based on the A1B SRES emissions scenario, suggests the risk profile is likely to change under future climates [8]. Under climate change scenarios, suitability of climate for WF decreases across most of SA (Figure 4).

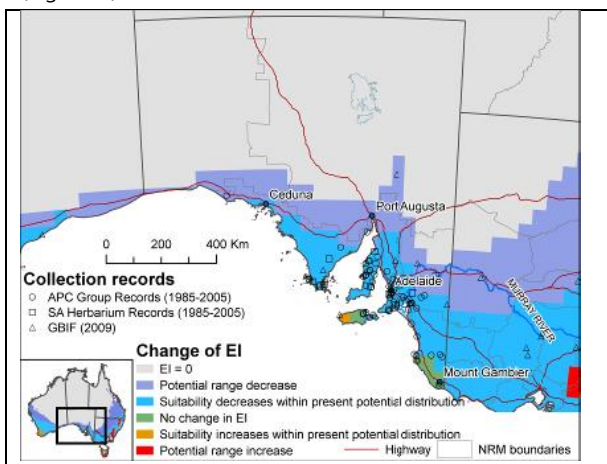


Figure 4: Change in climate suitability for *A. Asparagus asparagoides* “widespread form” in South Australia as indicated by the CLIMEX Ecoclimatic Index (EI) using CSIRO Mk3 projections for 2080 based on the A1B SRES emissions scenario. Source: [9].

RISK ASSESSMENT

Pest risk

Bridal creeper produces slightly woody, thin, wiry, twisting shoots up to six metres long, which entwine with each other and surrounding vegetation, allowing them to climb understorey shrubs and small trees to achieve canopy dominance [3]. The species is highly competitive and capable of rapid growth. Reduced substrate light levels prevent other plants from persisting. Extensive below

ground biomass allows the plant to occupy most of the available substrate [3]. Bridal creeper is thought to have originally established in bush land areas through dumping of garden waste or movement of seed from gardens.

Frugivorous birds are important vectors in seed dispersal, with dispersal generally up to 300-500 m, but maximum potential dispersal has been estimated at 12 km [10]. New infestations often occur under bird perching sites such as trees and fence lines. Based on these data an effective dispersal distance of up to 500 m from an infestation can be anticipated for the widespread form of bridal creeper.

These factors make this species a major problem for conservation. The species can change the structure, floristic composition and ecology of natural ecosystems in both disturbed and undisturbed habitat [3]. Bridal creeper significantly reduces native species richness and the frequency of native ground-cover plants in invaded areas and modifies habitat structure [11]. Areas invaded by bridal creeper have been shown to contain 52% fewer native plant species when compared with nearby reference areas [12]. In South Australia it poses a direct threat to a range of native plant species including a variety of rare orchids [13-19], and it has been shown to eliminate or restrict growth of a wide variety of native plants [19]. The germination and recruitment of native plants following bridal creeper removal may be slow, possibly due to low propagule numbers and the persistence of bridal creeper below-ground tissues [3]. Simply reducing the presence of bridal creeper does not guarantee successful restoration of invaded areas and additional restoration efforts are needed to restore native biodiversity [12].

Bridal creeper is not a weed of pastures, as it cannot withstand heavy grazing [20], nor does it invade broad acre cropping [3]. It is a significant weed of citrus orchards causing a decline in tree health and fruit quality [21].

Feasibility of control

Following a highly successful biological control introduction and redistribution program the rust fungus agent (*Puccinia myrsiphylli* (Thuem.) Wint.) is now established across the range of bridal creeper, with long-term monitoring data demonstrating a reduction in bridal creeper growth and reproduction capabilities [22]. Infected plants produce fewer shoots, lower above ground biomass, fewer fruits and seeds, fewer tubers, shorter rhizomes and a reduced relative growth rate compared to uninfected plants [23]. But, additional management may be required post-control to overcome increased soil nutrient levels, secondary weed growth and physical barriers to native species regeneration [24].

Two additional biological agents have been released: leaf hopper *Zygina* sp. (released 1999); and leaf beetle *Crioceris* sp. (released 2002). Generally establishment and growth of leaf beetle populations were disappointing, possibly due to predation and limited availability of young shoots at time of release [25]. Heavy attacks of leafhopper were evident at some sites but high population levels were not

necessarily sustained across years [25]. At Big Swamp on Eyre Peninsula trials of all three agents were established, but extremely low presence is evident in the medium term (A. Simpson *Pers. Comm.* 10/05/2015).

To achieve best results with chemical control of bridal creeper, a spray program of at least three years is recommended, with repeat applications essential to kill plants that are missed in the first year, any new re-growth and seedlings, and to have a significant impact on below-ground biomass [3]. Herbicides such as glyphosate, metsulfuron methyl and some related sulfonylureas as the most effective non-selective systemic herbicides against bridal creeper [3]. Most effective is glyphosate (180 g / 100 L) and Pulse® (0.5% v/v) with a single application shown to reduce the living root system by 78% compared to untreated plots [26]. Between 90–99% of the root biomass was killed following a repeat application one or two years after the initial application. But, the main challenge in using herbicides to control bridal creeper in natural ecosystems is to avoid damage to non-target species.

It has been shown that fire can be an important restoration tool to stimulate the regeneration of some native Australian plants and speed up the recovery of bridal creeper and other weeds are kept at a low post-fire density, naturally or through targeted control [27]. After the 2005 Wangary Fires there were many sites where tuber crowns were carbonised on the surface, yet shoots appeared from well below the ground (A. Simpson *Pers. Comm.* 10/05/2015).

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides a national framework for environmental management (including the recognition of nationally threatened species and ecological communities), thereby directing resources towards the delivery of improved environmental protection. The EPBC Act applies where bridal creeper threatens any listed species or ecological community or where its control may have adverse effects on matters of national environmental significance on Commonwealth land. *A. asparagoides* was declared as a Weed of National Significance (WoNS) in 1999. This declaration currently includes the WCF.

Status

Within the Eyre Peninsula Landscape Board region a risk management assessment [28] (Table 1) shows that *A. asparagoides* merits a manage weed management action in native vegetation.

Table 1: Regional Assessment Table

Land Use	Weed Risk	Feasibility of Control	Management Action
Native vegetation	Very High	Negligible	Manageweeds

REGIONAL RESPONSE

Outcome

To reduce the impact of bridal creeper on key environmental sites/assets and prevent spread into unaffected areas.

Objectives

1. Identify and reduce impact on key assets under threat from bridal creeper.
2. Encourage investment in trials and research for alternative control options, including biological.

Area/s to be protected

Key sites/assets to be protected are:

- EPBC listed vegetation communities
- Areas containing EPBC listed plant and animal species

Actions

Land managers to:

1. survey and control infestations near key sites/assets annually and supply survey and control information on request to Landscape Board staff;
2. prevent the spread of bridal creeper by searching annually for outlier infestations near known infestations; and
3. monitor areas of previous control works and undertake follow-up control works as required.

Landscape Board staff to:

4. facilitate, encourage, compel (develop action plans) control on private land to protect key sites/assets;
5. facilitate, encourage, compel or undertake control on public land, including roadsides, to protect key sites/assets (costs may be recovered from land managers);
6. carry out opportunistic monitoring for sale of bridal creeper plants at markets and community events;
7. Develop localised annual action plans to achieve the objectives and actions of this management plan
8. undertake systematic data collection (control and survey numbers, location and date information) and storage in a central spatial database;
9. provide education on control methods and encourage wider control.

Evaluation

Evaluation of success will be based on:

- annual analysis in November of monitoring and control data to evaluate the success of pest plan actions (including the update of spatial layers);
- identify any gaps in delivery and action as soon as possible; and
- review of this pest management plan every five years
- visit 10 reference sites every 10 years to monitor impact of biological control

Declarations

In South Australia bridal creeper *Asparagus asparagoides* is a declared weed under the *Landscape South Australia Act Provisions: 186(2), 188(1)(2), 192(2), 194* for the whole state) 2019 (Table 2). Meaning that the movement or transport of the plant on a public road, by itself or as a contaminant, or the sale by itself or as a contaminant is prohibited. Landscape authorities may require land owners to control bridal creeper plants growing on their land. Landscape authorities are required to control plants on road reserves, and may recover costs from the adjoining land owners.

Table 2: Bridal creeper – Relevant sections of the Landscape South Australia Act 2019 Declared Weed Status.

Section	Description of how the section applies
186 (2)	Prohibited to bring the plant into South Australia
188 (1)	Prohibiting sale of plants
(2)	Prohibiting sale of contaminated goods
192 (2)	Land owner must keep plants controlled on their land
194	Landscape Board may recover costs from land owners for control of plants on adjoining road reserves

More information

Contact your local Eyre Peninsula Landscape Board office

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