



Declared Plant Policy

This policy relates to natural resources management under section 9(1)(d) of the Landscape South Australia Act 2019 (the Act), enabling co-ordinated implementation and promotion of sound management programs and practices for the use, development or protection of natural resources of the State. Specifically, this policy provides guidance on the use and management of natural resources relating to the prevention or control of impacts caused by pest species of plants that may have an adverse effect on the environment, primary production or the community, as per object s7(1)(f) of the Act.

giant reed (*Arundo donax*)

Large perennial of stream edges and wetlands, native to Eurasia and naturalised locally in South Australia. Research has shown potential as a biomass or biochar crop.

Management Plan for Giant Reed

Outcomes

- Minimise possible the potential impacts of giant reed on wetlands and streams.

Objectives

- Prevent any further planting of giant reed in sites where it has potential to spread.

Best Practice Implementation

- To minimise further dispersal within South Australia, sale and movement to be prohibited except under permit.
- Regional landscape boards and Green Adelaide to consider any proposals to cultivate giant reed in their regions and use their discretion on making recommendations to the Chief Executive of the Department for Environment and Water to grant the necessary permits for sale and road transport.

Regional Implementation

Refer to regional management plans for further details.

Region	Actions
Alinytjara Wilurara	Prevent sale or movement
Eyre Peninsula	Prevent sale or movement
Green Adelaide	Prevent sale or movement
Hills and Fleurieu	Prevent sale or movement
Kangaroo Island	Prevent sale or movement
Limestone Coast	Prevent sale or movement
Murraylands and Riverland	Prevent sale or movement
Northern and Yorke	Prevent sale or movement
South Australian Arid Lands	Prevent sale or movement

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Declaration

To implement this policy, giant reed is declared under the *Landscape South Australia Act 2019* throughout the whole of the State of South Australia. The movement or transport of the plant on a public road by itself or as a contaminant, or its sale, is prohibited. Land owners must comply with the instructions of an authorised officer with respect to keeping any giant reed within the boundaries of their land.

Giant reed is declared in category 2 under the Act, for the purpose of setting maximum penalties and for other purposes. Any permit to allow its sale or road transport can only be issued by the Chief Executive, DEW or their delegate pursuant to section 197.

Under the *Landscape South Australia (General) Regulations 2020*, Regulation 27 specifies the conditions under which a person is exempt from the operation of section 186 and may transport wool, grain or other produce or goods carrying giant reed on public roads. Note that certain produce or goods may be excluded from this general movement exemption by Gazettal Notice of the Chief Executive, DEW.

The following sections of the Act apply to giant reed throughout each of the regions noted below:

Sections of Act	Region								
	AW	EP	GA	HF	KI	LC	MR	NY	SAAL
186(1) Prohibiting entry to area									
186(2) Prohibiting movement on public roads	X	X	X	X	X	X	X	X	X
188(1) Prohibiting sale of the plant	X	X	X	X	X	X	X	X	X
188(2) Prohibiting sale of contaminated goods									
190 Requiring notification of presence									
191(3) Land owners to comply with instructions	X	X	X	X	X	X	X	X	X
192(1) Land owners to destroy the plant on their properties									
192(2) Land owners to control the plant on their properties									
194 Recovery of control costs on adjoining road reserves									

However, no sections of the Act apply to dead material of giant reed used in cane furniture, musical instruments or other artefacts.

Review

This policy is to be reviewed by 2025, or in the event of a change in one or more regional management plans for giant reed.

Weed Risk

Invasiveness

Giant reed is highly sterile. Most of the pollen and ovules produced are unviable, and it exhibits virtually no seed production. Reproduction by seed has not been reported in Australia, although more than one clone is present here.

Clumps spread slowly by underground rhizomes producing successive stems and forming a dense monoculture. Vegetative propagation occurs when stems or rhizomes are moved

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deliberately, in soil or garden waste. Stems, rhizomes or whole plants can be carried downstream during floods.

Impacts

Giant reed can grow very rapidly under favourable conditions, such as abundant water in the warm months of the year. The stems can reach 7 m tall or more. Clumps spread by underground rhizomes producing successive stems and forming a dense monoculture.

Large infestations can change stream flow due to their bulk and ability to trap sediment and floating debris.

The stems and dry leaves are highly flammable, increasing fire risk and intensity in riparian vegetation. Giant reed regenerates rapidly from the rhizomes after burning.

The stems and leaves contain alkaloids, tryptamines and other toxins that make them inedible to most herbivorous insects and also deter grazing animals.

Potential distribution

Giant reed could grow along streams and in wetlands in the southern parts of South Australia. It tolerates a broad range of climates and conditions, including salinity, in areas that receive over 300 mm rainfall per annum.

Giant reed can grow in infertile and saline soils and responds strongly to fertiliser. It can grow in a variety of soil types, from coarse river sands to heavy clays, but generally prefers well-drained soils above the mean water level in freshwater streams. It suffers damage from frosts and will not survive in areas with prolonged or regular periods of freezing temperatures.

Feasibility of Containment

Control costs

Control targets the rhizomes to prevent regeneration, for example by repeated use of herbicide on regrowth after burning or cutting. Removing the rhizomes mechanically is more expensive and only feasible if a site is to be completely revegetated.

Herbicides applied after flowering as a cut stump treatment or a foliar spray have been found to control giant reed.

Once giant reed is established over large areas, as has happened on some rivers in North America, its control becomes generally ineffective and expensive.

Persistence

Giant reed will persist indefinitely at a site even if it does not spread, as seen in the high rainfall parts of South Australia.

Current distribution

Giant reed has been in South Australia since 1841. Over this time, it has not developed extensive infestations, most are localised. Given ideal conditions, rapid spread by rhizomes and fragmentation of plant stems might occur.

It is known to be present as plantings and escapes in the Green Adelaide, Hills and Fleurieu, Murraylands and Riverland, Northern and Yorke, and South Australian Arid Lands landscape regions. It is recorded from all mainland States of Australia.

State Level Risk Assessment

Assessment using the Biosecurity SA Weed Risk Management System gave the following comparative weed risk and feasibility of containment scores by land use:

Land use	Weed Risk	Feasibility of control	Response at State Level
Aquatic (riparian)	low 23	very high 3	monitor

Considerations

Giant reed is native to the Middle East, India and southern Europe, where it has been grown for millennia as a building material and for making cane artefacts. It is very uniform genetically. It was first introduced to South Australia in colonial times as amenity plant for hedges.

Research into the use of giant reed as a biomass energy crop has shown considerable potential as a highly productive crop that can utilise waste and saline water unsuitable for food production. Potential uses of shoot biomass include as feedstock for commercial pyrolysis for energy and biochar production, bioethanol and pulp/paper production.

Considering all of Australia, giant reed has been assessed to pose a very high weed risk in riparian areas but a negligible risk to terrestrial areas due to its limited capacity for dispersal in the absence of floodwater. Within South Australia, the weed risk is low due to the small area of suitable habitat and the lower risk of movement by water.

The risks of giant reed escaping from cultivation are manageable by protocols that authorities can enforce using section 189(3), including:

- preventing plantings in sites having a flood frequency higher than 1 in 50 years, unless contained by levees.
- buffer zones maintained at least 10 m wide around plantings.
- annual surveys of the buffer zone to detect and remove any escapes, including all rhizome material, by hand.
- hygiene protocols for harvest, transport and processing. For example, harvesting equipment to be cleaned of any fragments before leaving a plantation; harvested material to be moved in fully tarped enclosed loads or sealed containers; processing of material for biomass to ensure that it loses its capacity for vegetative regeneration.

Giant reed is used in making cane furniture, fishing rods and walking sticks. It also provides the reeds used in many musical instruments, but this is a highly skilled industry based in France and is not established locally.

Synonymy

Arundo donax L., Sp. Pl. 81 (1753).

Taxonomic synonyms:

Arundo bambusifolia Hook.f., Fl. Brit. India 7: 303 (1896).

Arundo bengalensis Retz., Observ. Bot. 5: 20 (1789).

Arundo coleotricha (Hack.) Honda, Bot. Mag. (Tokyo) 41: 14 (1927).

Arundo sativa Lam., Fl. Franç. 3: 616 (1779).

Arundo versicolor Mill., Gard. Dict. ed.8: 3 (1768).

Donax arundinaceus P.Beauv., Ess. Agrostogr. t. 16, f. 4 (1812).

Other common names include bamboo, Danubian reed, false bamboo, giant cane, giant Danube reed, Spanish reed, elephant grass.

References

Virtue, J.G., Reynolds, T., Malone, J., Preston, C., Williams, C. & Coles, R. (2010). Weed risk management guidelines for *A. donax* plantations in Australia. In 'Commercial potential of giant reed (*Arundo donax*) for pulp/paper and biofuel production. A final report for the Rural Industries Research and Development Corporation', eds C.M.J. Williams and T.K. Biswas, pp. 41-68. (RIRDC: Canberra).

Virtue, J.G., Reynolds, T., Malone, J., Preston, C. & Williams, C. (2014) Managing the weed risk of cultivated *Arundo donax* L. *Proc. 17th Australasian Weeds Conf.* pp. 176-179.

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