



Declared Plant Policy under the Natural Resources Management Act 2004

Wilding olives (*Olea europaea*)

Olives are evergreen trees that originate from the Mediterranean region. They were first introduced to South Australia in 1836 and have since become naturalised especially in woodland habitats. A distinction is made between olive trees that were deliberately planted and are used and maintained and wilding olives, defined as 1) feral olives that have grown from self-sown seed; and 2) olive trees that are no longer used and/or maintained such that they pose a high risk of giving rise to feral olives.

Management Plan for wilding olives

Outcomes

- To protect native vegetation from invasion by feral olives

Objectives

- Contain the spread of feral olives.
- Remove wilding olives from sites of high conservation value with appropriate buffers.
- Control high priority infestations according to regional management plans.

Implementation

- Biosecurity SA and NRM authorities to increase awareness of the environmental damage caused by wilding olives.
- High priority infestations that threaten native vegetation assets to be controlled as detailed in regional management plans.

Regional Implementation

Refer to regional management plans for further details.

NRM Region	Actions
Adelaide and Mount Lofty Ranges	Manage weed (native vegetation)
Alinytjara Wilurara	Limited action
Eyre Peninsula	Protect sites
Kangaroo Island	Protect sites
Northern and Yorke	Manage sites
South Australian Arid Lands	Limited action
South Australian Murray Darling Basin	Manage weed (native vegetation)
South East	Protect sites

Declaration

To implement this policy, wilding olives are declared under the *Natural Resources Management Act, 2004* throughout the State of South Australia.

NRM authorities may require land owners to control olives (other than planted trees that are used and maintained for domestic, public amenity or commercial purposes) on their land. NRM authorities are required to control wilding olives on road reserves, and may recover costs from the owners of adjoining land.

For the purposes of this policy, the uses of planted olive trees for domestic, public amenity or commercial purposes include fruit production for olive oil or table olives, as well as ornament or hedging. Maintenance of planted olive trees is activity that reduces the risk of giving rise to feral olives: regular pruning or harvesting of fruit. Wilding olive trees on public roadsides are not outside the requirement for control even if their fruit is frequently harvested.

Wilding olives are declared in category 2 under the Act for the purpose of setting maximum penalties and for other purposes.

The following sections of the Act apply to wilding olives throughout each of the NRM regions noted below:

Sections of Act	Region							
	AMLR	AW	EP	KI	NY	SAAL	SAMDB	SE
175(1) Prohibiting entry to area								
175(2) Prohibiting movement on public roads								
177(1) Prohibiting sale of the plant								
177(2) Prohibiting sale of contaminated goods								
180 Requiring notification of infestations								
182(1) Landowners to destroy the plant on their properties								
182(2) Landowners to control the plant on their properties	X	X	X	X	X	X	X	X
185 Recovery of control costs on adjoining road reserves	X	X	X	X	X	X	X	X

Review

This policy is to be reviewed by 2020, or in the event of a change in one or more regional management plans for wilding olives.

Weed Risk

Invasiveness

Olives are predominantly outbreeding, and those naturalised in SA appear to be generally self-compatible. Feral olive infestations have been shown genetically to be the offspring of nearby cultivated olive trees.

Seeds are spread from feral and planted trees by native and pest animals (such as foxes), which swallow the whole fruit and defaecate the seed hours later. Birds that regurgitate the pit instead of swallowing it will generally disperse it no more than 100 metres, but starlings may regurgitate or defaecate some seeds at their roosts up to 40 km away. Wilding olive

fruits are generally smaller than those produced by trees in cultivated orchards, and may consequently be eaten by a wider range of birds.

Impacts

Invasion by olives takes place on a slower time scale than most other weeds. Their seeds are long-lived in the soil and slow to germinate, due to both the resistant endocarp and an endogenous dormancy of the embryo even when the endocarp is removed. This endogenous dormancy varies widely between cultivars. Self-sown seedlings establish on roadsides, in bush and abandoned pasture and may be slow-growing at first, with a juvenile period of 5-10 years before they begin to bear fruit. But established olive trees form a dense and permanent canopy that prevents other vegetation from re-establishing. Individual trees live for many centuries and retain the ability to regenerate from stumps after felling or burning, as well as forming a large seedbank in the soil.

Olive infestations reduce the abundance and diversity of native plant species, altering the canopy structure of woodlands and preventing native regeneration. Native canopy cover may be reduced by 80% and native species diversity by 50%.

Olives are highly flammable due to their oil content and therefore increase fire risk compared to grazing or other horticulture.

Potential distribution

Olives can survive with an annual rainfall as low as 300 mm. However, they are vulnerable to root rot, and will not persist in waterlogged sites.

The majority of olive infestations occur in former areas of woodland vegetation. These areas were the first to be cleared and settled, and also provide an optimum environment for olives with 400-600 mm annual rainfall on generally well-drained soils. They are commonest on fertile and slightly acidic soils but will also tolerate alkaline and mildly saline soils. However, olives are not completely absent from uncleared forest or uncleared woodland. Areas with an annual rainfall over 700 mm are less susceptible to invasion, partly because they typically have higher watertables and may suffer transient waterlogging within the root zone.

Feasibility of Containment

Control costs

Mature plants can be controlled by the drill and fill, cut stump or basal barking methods using a non-selective herbicide. Seedlings are best hand pulled. Olive control for dense infestations costs at least \$15,000 per hectare, with an annual cost of \$500 per hectare each year for maintenance.

Persistence

Olives are very long lived and accumulate a large seedbank. It is estimated that individual olive trees in the Mediterranean region are more than 1500 years old.

Invasive olives form a stable climax vegetation on some sites and will continue to dominate these sites unless land managers intervene, either by planting and maintaining native vegetation or by adopting some other sustainable land use.

Current distribution

Wilding olives have been recorded in the Adelaide Hills, Fleurieu Peninsula, Yorke Peninsula, the Riverland, on Kangaroo Island, in the upper and lower South East, the mid and upper North and in the Kellidie Conservation Park and Mount Dutton on the Eyre Peninsula and West Coast. In the Adelaide Hills western slopes of the Mount Lofty Ranges have extensive infestations.

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
Native vegetation	medium 98	negligible 101	manage sites

Considerations

Risk assessment indicates a management action at State level of manage sites in native vegetation. However, the local weed risk of wilding olives in the Adelaide and Mount Lofty Ranges is high in native vegetation, therefore that region has a management action of 'manage weed' and recognises that control of unmaintained olives may be necessary at some sites where they pose threats to biodiversity assets, as part of a landscape scale management program. In the South East, on Eyre Peninsula and on Kangaroo Island the weed risk is also high in native vegetation but because the distribution of wilding olives is more localised in these regions a management action of 'protect sites' has been adopted. These actions are aimed at managing the weed risk of wilding olives under the NRM Act, rather than any diseases of olives that may be harboured by wilding infestations.

The domestic olive is a group of cultivars and semi-wild forms of *Olea europaea* subsp. *europaea*, a long-lived evergreen tree. Olive cultivation began around 6,000 years ago. Compared to other tree crops, olives have been little modified by selective breeding. Up to 2600 named cultivars are recorded but these are either heterozygous clones selected from spontaneous, uncontrolled crosses or at most a few generations removed from 'wild' land races. Scientific breeding programs only began in the late 20th century.

Olives were first introduced to South Australia in 1836. Five selected cultivars from Marseilles were imported by the South Australian Company in 1844, and accessions later arrived from Portugal, Spain, Provence and northern Italy. Wilding olive trees generally produce smaller fruits than trees in cultivated orchards, both because the trees are unpruned and because they are no longer under selection for maximum fruit size. The pits of the smaller fruit are more easily dispersed by birds, facilitating their further spread.

The African olive, *Olea europaea* subsp. *cuspidata*, is an environmental weed in New South Wales but is not naturalised in South Australia. This declaration of the whole species covers both subspecies.

Synonymy

Olea europaea L., Sp. Pl. 8 (1753).

Taxonomic synonyms:

Olea africana Mill., Gard. Dict. ed. 8 n. 4 (1768).

Olea chrysophylla Lam., Tabl. Encycl. 1: 29 (1791).

Olea cuspidata Wall. & G.Don, Gen. Hist. 4: 49 (1837).

There are many named cultivars of olive, including 'Barnea', 'Kalamata' and 'Manzanilla'.

References

Besnard, G. H., Henry, P., Wille, L., Cooke, D., Chapuis, E. (2007) On the origin of the invasive olives (*Olea europaea* L., Oleaceae). *Heredity* 99: 608-619.

Crossman, N.D. (2002) The impact of the European olive (*Olea europaea* L. subsp. *europaea*) on grey box (*Eucalyptus microcarpa* Maiden) woodland in South Australia. *Plant Protection Quarterly* 17: 140-146.

Mekuria, G.T., Collins, G.G., Sedgley, M. (2002) Genetic diversity within an isolated olive (*Olea europaea* L.) population in relation to feral spread. *Scientia Horticulturae* 94: 91-105.

Hon Ian Hunter MLC Minister for Sustainability, Environment and Conservation
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Date: 18 July 2017
