

Eyre Peninsula Landscape Board

PEST SPECIES REGIONAL MANAGEMENT PLAN

Ulex europaeus

Gorse

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



INTRODUCTION

Synonyms

Ulex europaeus L., *Ulex armoricanus* Mabilie, *Ulex compositus* Moench, *Ulex floridus* Salisb., *Ulex strictus* J.Mackay, *Ulex hibernicus* G.Don, *Ulex major* Thore, *Ulex vernalis* Thore.

Furze, furse and whin.

Biology

Gorse is a spiny perennial, evergreen shrub of the pea family Fabaceae and produces abundant yellow flowers. Plants are commonly up to two metres high but can achieve heights of four metres [1]. All stems and leaves are prickly and end in a sharp spine.

Gorse plants live for up to 30 years [2], with flowering beginning from 18 months of age on (Figure 1). In NSW and Victoria, flowering peaks twice in the year (March to May, and July to October), but in South Australia gorse flowers only once, in spring [2]. Pollination of the flower occurs primarily by bees [3, 4] but also by selfing [5]. Seed is set in warm weather, when pods split open and eject seed up to five metres from the plant. Seed falls onto the ground at a rate from 600 to 2,120 seeds /m² /year. There may be up to 40,000 gorse seeds / m² or 400 million seeds / ha in the soil under a mature gorse bush at any one time [2, 6].

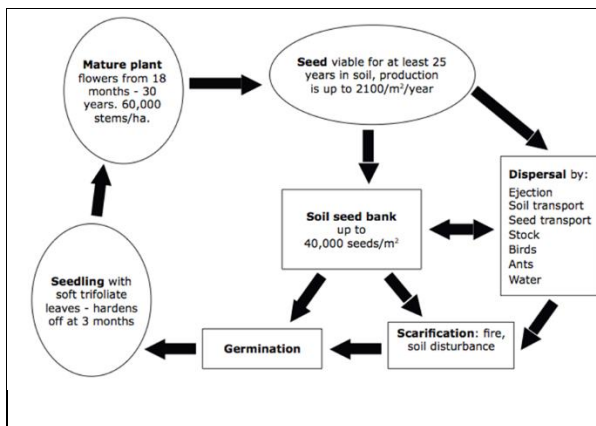


Figure 1: Flow diagram of gorse life-cycle. Source: [2]

Seedlings pass through two structural forms as they mature. In the first, the plant grows rapidly in a compact habit, with typically thin, expanded, trifoliate leaflets. As gorse grows the leaves become narrower, smaller, more pointed and eventually, in the second stage, awl like. In this stage spines develop in the axils of the leaves (from three months of age) and the leaf cuticle thickens, and thick wax is produced on the leaf surface.

Gorse does not have a well-developed taproot [1]. Roots are mostly shallow, but each plant also has a few deep roots [1].

Mature gorse survives ambient temperatures down to -20°C, but seedlings are frost-sensitive. Rainfall

at gorse sites in Australia ranges from 450 to 2,400 mm / annum [2].

Origin

Gorse or furze *Ulex europaeus* is native to central and western Europe (Portugal, Spain, France and Britain), where it has long been cultivated for hedgerows [2]. In its natural range, gorse grows as scrub and heath, in which frequent fire promotes its growth and prevents the development of forest or other vegetation [2]. Gorse was introduced to Australia during the early 1800s as a hedge and ornamental plant [2], and deliberately dispersed through most of its present range for this purpose. It had naturalised in Australia by 1889 [7]. In South Australia, it probably originated from hedges planted in the 1860's [2].

Distribution

Gorse occurs over 23 million hectares of Australia, actually covering and making unusable up to 1 million hectares of land [8].

In South Australia, gorse is restricted to higher rainfall areas [9] being mainly found on Kangaroo Island, and Eyre, Fleurieu and Yorke Peninsulas, Mt Lofty Ranges, Barossa and Clare Valleys, the south-east, Burra, Jamestown and Port Wakefield (Figure 2). The total area of infestation is a few thousand hectares [2].

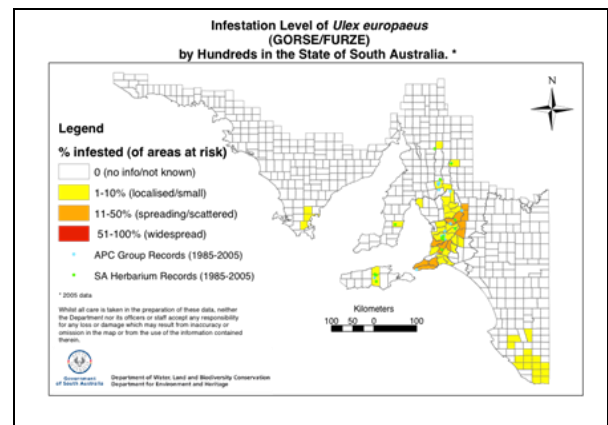


Figure 2: Distribution by hundreds and percentage infestation of area at risk in South Australia, 2005 data. Source: PIRSA

Based on climatic factors, the potential range for gorse (Figure 3) is 87 million hectares of mainland Australia and Tasmania [8]. Gorse has not yet reached its distributional limits in South Australia. Its extent is contracting due to active control programs in the Barossa Valley, Mt Lofty Ranges and Fleurieu Peninsula [2]. Currently, gorse on the Eyre Peninsula is restricted to a small, isolated area in lower Eyre Peninsula (Figure 4).

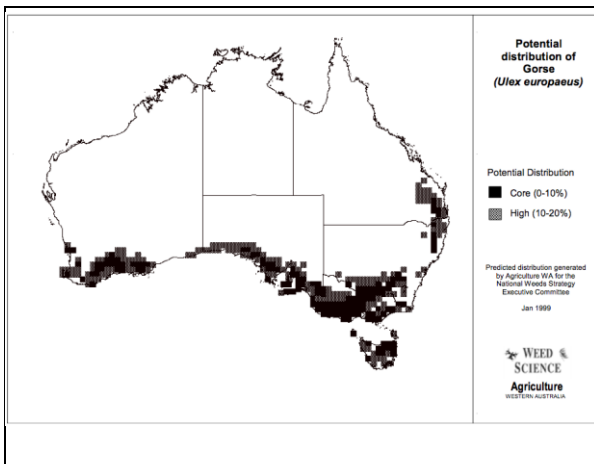


Figure 3: Potential distribution of gorse in Australia.
Source: [8].

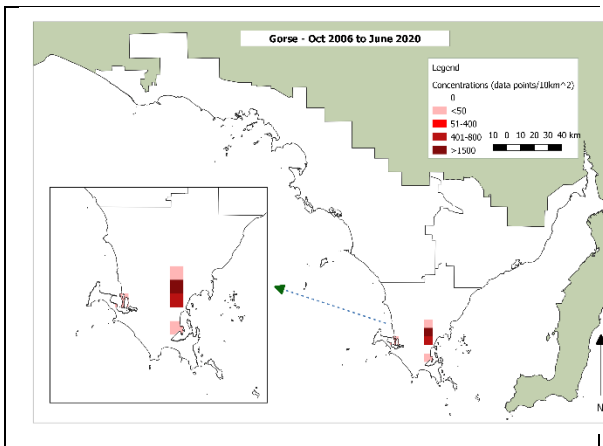


Figure 4: Distribution of Gorse on Eyre Peninsula using BDBSA data and EPLB control data collected from Oct 2006 to June 2020.

RISK ASSESSMENT

Pest risk

Gorse forms dense extensive spiny thickets, which degrade pasture and native vegetation. Gorse is as a Weed of National Significance (WoNS).

Gorse reduces agricultural production by encroaching on pasture and excluding stock. Thickets also harbor feral animals including rabbits, feral cats, house mice and foxes. Gorse-infested areas have reduced land value [2, 10, 11]. In forestry, gorse interferes with access, seedling establishment and growth, pruning and harvesting, imposes costs for its control and is a major fire hazard [2, 10]. The impact of gorse on these sectors alone was valued at \$7 million across Australia in 2000 (\$3.6 million agriculture, \$3.4 million forestry). A 2006 report estimates the cost of gorse control at \$500-\$2000/ha in dense infestations in Tasmania [19]. In native vegetation, gorse forms dense monocultural stands. It poses a fire hazard and detracts from landscape values across all land types. Gorse invades native

vegetation, where it reduces floral diversity and alters fire behaviour. It threatens riparian zone integrity, and impacts on biodiversity in native vegetation and on threatened species [2].

Seed dispersal is primarily by ejection from the pod. The seed usually lands less than two metres, but up to five metres, from the parent plant [12]. Seeds are also dispersed by mud, which contains gorse seed, clinging to livestock or human feet. The seed of gorse growing along streams is spread by water. Birds and ants also spread the seeds [9-11]. Based on these data an effective dispersal distance of up to 200 m from an infestation can be anticipated for gorse over dryland habitat. Where gorse occurs in association with streams, effective dispersal distance may be anywhere along the stream verge downstream of the infestation. Dispersal corridors associated with human movement must be monitored.

Gorse produce seed with a hard, water impermeable coat that accumulate in large, long-lived seed banks [2, 10]. Up to 90% of the seed under living plants may be dormant [2] and seeds are typically viable for 40, and up to 70, years [13].

Seed germination is mostly in autumn and spring [1], but may take place under suitable conditions at any time of the year. Few seeds germinate in the shade of established gorse, but when dense gorse cover is removed, germination is plentiful either with increased light availability or associated changes in temperature conditions.

Gorse forms infestations on a wide range of soil types. Gorse fixes nitrogen and is very competitive on nutrient-poor alkaline soils. It gains a competitive advantage in repeatedly burnt vegetation where soil nitrogen is depleted [10, 13].

Although young shoots or seedlings are palatable, the mature spiny foliage is not browsed [10]. Seedlings germinating under the cover of older bushes are protected from grazing and can slowly encroach on pasture.

Gorse produces nitrogen-rich litter [14], which tends to acidify and lower the cation exchange capacity of moderately fertile soils [10].

The dense spiny thickets of gorse exclude regeneration, create a fire hazard and provide cover for rabbits. It does not establish in undisturbed native vegetation, but invades area opened up by bushfires or partial clearing. Long-range dispersal is a rare event, but once established the thickets are long-lived and continue to expand in size.

Feasibility of control

Successful gorse control involves combining a variety of methods to prevent its spread, reduce its above-ground mass and kill regrowth. A control

time frame of at least five years and up to 25 years is required [2].

Combining a range of physical control methods with the strategic use of herbicides is a reliable approach [2]. The aim of mechanical clearing is to reduce the above-ground mass of gorse before follow-up methods are applied, including spraying with herbicides, restoring pasture, grazing or cultivation [2].

Physical control methods include combinations of large earthmoving equipment, grubbing, root raking, mulching, crushing, and slashing. Follow-up cultivation, spraying with herbicide, cutting and painting of stumps with herbicide, hand-pulling, judicious use of burning, grazing by sheep and goats and other livestock, pasture management and revegetation to kill regrowth and address seedling germination are important [2].

Biological control agents can be released in gorse infestations where access is difficult and the opportunity for other control methods is limited [2]. Integrated biological control using the seed feeding gorse seed weevil *Exapion ulicis*, the three foliage feeding control agents: gorse spider mite *Tetranychus lintearius*; gorse thrips *Sericothrips staphylinus*; and gorse soft shoot moth *Agonopterix "umbellana"* can control the growth and/or spread of gorse [2, 15]. Recently, the native hemiparasitic plant, *Cassytha pubescens*, has been suggested as a potential biological control agent as it voluntarily utilizes high impact woody weeds as hosts. Voluntary stands are currently being monitored by photographs in the South East of South Australia. The plant is also indigenous to the Eyre Peninsula [20].

Status

Within the EP Landscape Board region, a risk management assessment [16] shows gorse merits (Table 1):

- a protect sites management action in southern perennial pasture areas;

Table 1: Regional Assessment

Land Use	Pest Risk	Feasibility of Control	Management Action
Southern Perennial Pasture	Low	Very High	Protect Sites

REGIONAL RESPONSE

Special considerations/Board position

In 2007 the National Gorse Task Force (NGTF) negotiated a Memorandum of Understanding

(MOU) with the Eyre Peninsula Landscape Board for the eradication of all gorse infestations known on Eyre Peninsula.

Outcome

To eradicate gorse.

Objectives

To:

1. destroy all known gorse infestations;
2. maintain gorse free areas where gorse has previously been controlled by surveying annually;
3. prevent the spread of gorse by searching for outlier infestations near known infestations; and
4. destroy any new infestations identified.

Area/s to be protected

All areas.

Actions

Land managers to:

1. survey and control known infestations annually (including sites where all plants have been controlled but a seedbank may still persist) and supply survey and control information on request to Landscape Board staff;
2. prevent the spread of gorse by searching annually for outlier infestations near known infestations;

Landscape Board staff to:

3. facilitate, encourage or compel (develop action plans) control on private land before plants can seed (particularly relevant for landholders who have signed a MOU about gorse control);
4. facilitate, encourage, compel or undertake control on public land, including roadsides, before plants can seed (costs may be recovered from land managers);
5. where possible hasten gorse control by using prescribed burning to kill or germinate the seedbank;
6. carry out opportunistic monitoring for sale of gorse plants at markets and community events;
7. develop localised annual action plans to achieve the objectives and actions of this management plan
8. encourage landholders with new infestations to enter into a MOU to eradicate gorse;
9. assess opportunity for gorse control post fire or other disturbance;
10. undertake systematic data collection (control and survey numbers, location and date

information) and storage in a central spatial database;

11. raise community awareness to promote control across the region

Evaluation

Evaluation of success will be based on:

- annual analysis in November of monitoring data to evaluate the success of pest plan actions (including the update of spatial layers);
- provide this data annually to Biosecurity SA as per MOU requirements.
- identify any gaps in delivery and action as soon as possible; and
- review of this pest management plan every five years.

Declarations

Historically gorse was proclaimed for parts of South Australia under the *Weeds Act 1956*, and placed on schedule three under the *Pest Plants Act 1975*. More recently in South Australia gorse or furze *Ulex europaeus* is a declared weed under Schedule 2 (CLASS 19 – Provisions: 186 (2), 188 (1)(2), 192 (2) and 194 for the whole state) of the *Landscape South Australia Act 2019* (Table 2). This means 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. Notification of infestations in the Limestone Coast Landscape region is necessary to ensure these are controlled. Landscape authorities in the Hills and Fleurieu, Eyre Peninsula, Kangaroo Island, Northern and Yorke, Murraylands and Riverland and Limestone Coast Landscape regions may require land owners to control gorse plants growing on their land. Landscape authorities in these regions are required to control plants on road reserves, and may recover costs from the adjoining landowners.

Gorse is declared in category 2 under the Act for the purpose of setting maximum penalties and for other purposes. Any permit to allow its movement or sale can only be issued by the Chief Executive of DEW pursuant to section 197. Under the *Landscape South Australia (General) Regulations 2020*, the transport or movement of grain for milling or wool for cleaning or any other product or goods is exempt from the operation of sections 186 and the sale of wool or grain is exempt from section 188 (2) if at the time of the sale the person believes on reasonable grounds that the purchaser will remove the plant from the wool or grain before any re-sale.

As part of the goal of eradication of isolated and scattered gorse infestations, the EP Landscape Board signed a Memorandum of Understanding with the National Gorse Task Force committing to a long-term program of annual inspections and infestation control [17]. A revised National Gorse Strategy and Workplan for each objective was developed in January 2011 [18].

Table 2: Relevant sections of the *Landscape South Australia Act 2019*. Provisions for the whole of state for gorse or furze *Ulex europaeus*.

Section	How the section applies
Provision for whole of State	
186 (2)	Cannot transport the plant or any substance carrying the plant in it
188 (1) (2)	Cannot sell the plant. Cannot sell any produce / goods carrying the plant
192 (2)	Land owner must keep controlled plants on their land.
194	Landscape authority may recover costs for control of plants on roadsides from adjoining land owners

More information

Contact your local Eyre Peninsula Landscape Board office

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