Victorian Noxious Weeds Review: Phase 2 species

This document contains information relating to the assessment of the ten plants nominated for assessment as part of phase 2 of the Victorian noxious weeds review process. Those species are as follows:

Common name	Scientific name
Arrowhead	*Sagittaria graminea*
Bearskin fescue	*Festuca gautieri*[1]
Blue periwinkle	*Vinca major*
Bridal creeper	*Asparagus asparagoides*
Cane needlegrass	*Nassella hyalina*
Chilean needlegrass	*Nassella neesiana*
Spanish broom	*Spartium junceum*
Sweet pittosporum	*Pittosporum undulatum*
Texas needlegrass	*Nassella leucotricha*
White Spanish broom	*Cytisus multiflorus*

The document is arranged into two sections. Section 1 contains, in order of appearance, the invasiveness assessment, present distribution map for Victoria, potential distribution map for Victoria, and the impact assessment for each of the ten species.

Section 2 is a series of worksheets for each of the 10 Catchment Management Authorities (CMA). These worksheets, in order, are a score and rank summary for each species, the present distribution, the potential distribution by landuse type, and lastly, a comparative list showing the ranking of phase 2 species in relation to phase 1.

While the invasiveness and impact assessments are based on a whole of Victoria scenario, the data presented in the worksheets is relevant only to each respective CMA. This is due to the ratio of present to potential distribution being unique for each CMA and the influence this measure has on the overall score.

The methodology used to assess these plants has been published previously in phase 1, and is available on the CD 'Noxious Weeds Review 2004: Phase 1 Assessment Data' published by the Victorian Department of Primary Industries.

[1]. 20 October 2005.
Due to the declaration of *Festuca gautieri*, bearskin fescue, as a State Prohibited Weed under Section 58A of the *Catchment and Land Protection Act 1994*, this species has been added to the list of weeds to be reviewed under Phase 2 of the Victorian Noxious Weeds Review to expedite its consideration by CMAs.

Invasiveness Assessment Record

Scientific name: *Asparagus asparagoides* (L.) Druce Common Name: bridal creeper

QUESTION	COMMENTS	REFERENCE	RANK
Establishment			
Germination requirements?	"Seedlings usually emerge in autumn". "Seeds germinate in autumn or early winter".	Muyt (2001) P & C (2001)	**MH**
Establishment requirements?	"Tolerates shade or part shade".	Blood (2001)	**MH**
How much disturbance is required?	Occurs in undisturbed vegetation e.g. heath land and Mallee shrubland. "It invades disturbed and undisturbed vegetation across a wide range of habitats".	Carr et al (1992) Raymond (1996)	**H**
Growth/Competitive			
Life form?	Tuberous geophyle. Climber.	Carr et al (1992) Muyt (2001)	**ML**
Allelopathic properties?	No Allelopathic properties described.		**L**
Tolerates herb pressure?	"Bridal creeper is a palatable specimen and is not an agricultural weed due to grazing by stock. (See information on grazing trial)".	Carr (1996) p 67 (Ed Marchant)	**ML**
Normal growth rate?	"Its seed germinate readily at temperatures between 10°C and 20°C, usually much quicker than some of the native species, thus putting them at risk of replacement". "It grows rapidly during winter and as a consequence smother native vegetation". (France 1996).	P & C (2001)	**MH**
Stress tolerance to frost, drought, w/logg, sal. etc?	"Tolerates drought conditions and most soils including saline". "Fire can also stimulate bridal creeper growth if the tubers are not killed".	Blood (2001) Carr (1996) p. 67	**MH**
Reproduction			
Reproductive system	"Reproduces by seed and Rhizome".	Muyt (2001)	**H**
Number of propagules produced?	"Plants produce hundred of fruits annually, each containing up to nine seeds". ~ 300 x 9 = 2,700 seeds.	Muyt (2001)	**H**
Propagule longevity?	"Carry over of viable seeds between years is minimal. Most buried seed germinate and the remainder within 2 years. Dry seeds may remain viable for at least three years".	Blood (2001)	**L**
Reproductive period?	Forms virtual monocultures. (See pic. in P & C 2001 p. 46).	P & C (2001)	**H**
Time to reproductive maturity?	"Seeds germinate in autumn or early winter, these plants then flower the following August or September".	P & C (2001)	**MH**
Dispersal			
Number of mechanisms?	"Seed is dispersed mainly by birds, as well as by water, machinery and in garden refuse. Rhizomes are dispersed by animal diggings, machinery in garden refuse and during removal".	Muyt (2001)	**H**
How far do they disperse?	"The seeds either pass through the digestive tract unharmed or, sticking to the beak, are dropped considerable distances from the source".	P & C (2001)	**H**

Present distribution of *Asparagus asparagoides* in Victoria

Species: *Asparagus asparagoides* (L.) Druce
Common name: Bridal creeper
Status: Not declared in Victoria; Weed of National Significance (WONS)

Habitat: Warm-temperate to tropical regions, preferring fertile, well drained soils of light texture (Parsons and Cuthbertson 1992). It is often grown as an ornamental, and occurs as a weed along roadsides, in town allotments, orchards and citrus groves, waste places and disturbed scrubland close to habitation (Parsons and Cuthbertson 1992). Bridal creeper invades dry coastal vegetation, heathland and heathy woodland, mallee shrubland, lowland grassland and grassy woodland, dry sclerophyll forest and woodland, damp sclerophyll forest, riparian vegetation, rock outcrop vegetation, and warm temperate rainforest (Carr *et al* 1992).

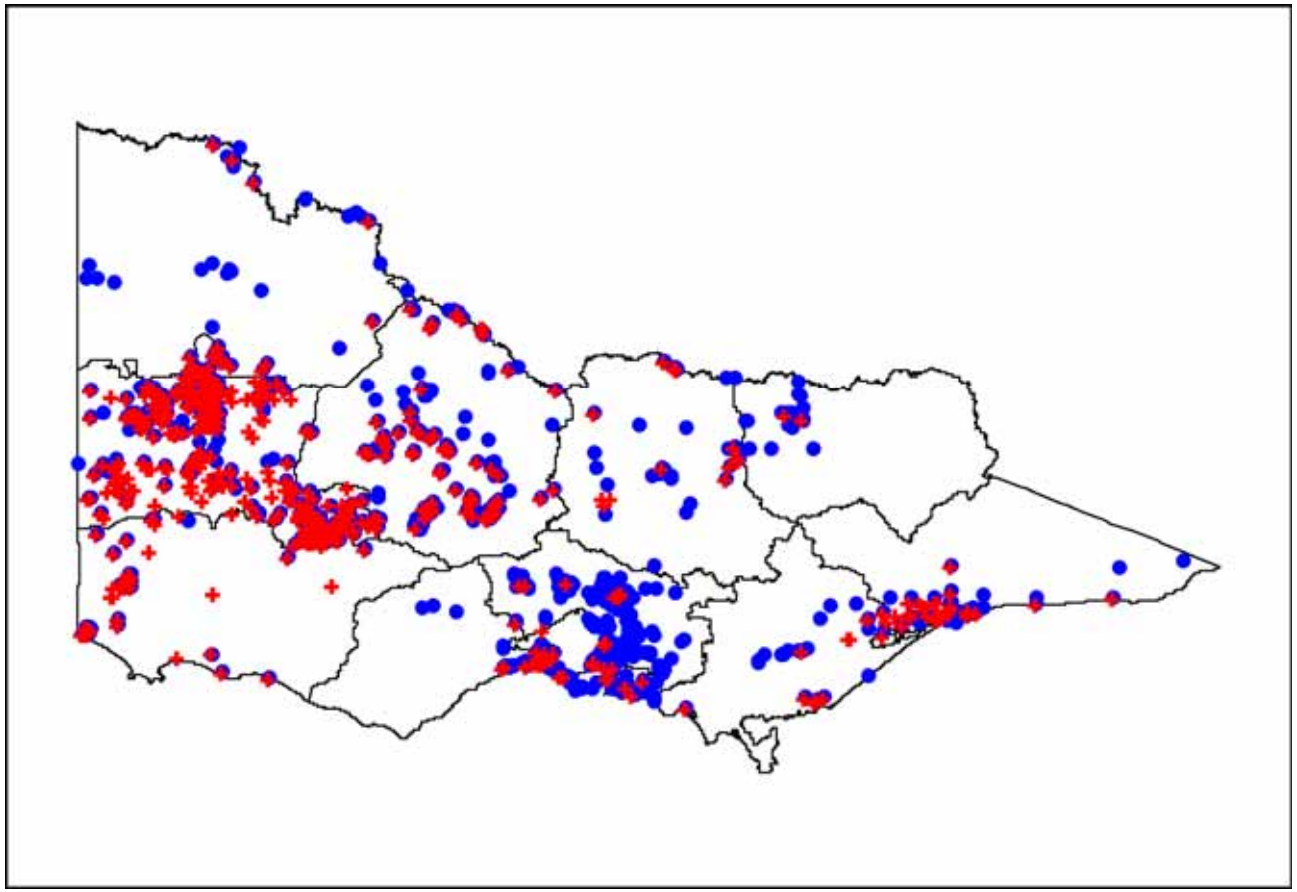
Present distribution in Victoria using Victorian Flora Information System (FIS) and IPMS.

Information from FIS (*blue circles*)

Number of records	1408

Information from PMIS (*red crosses*)

Number of records	670
Total Area of infestation (ha)	11,700



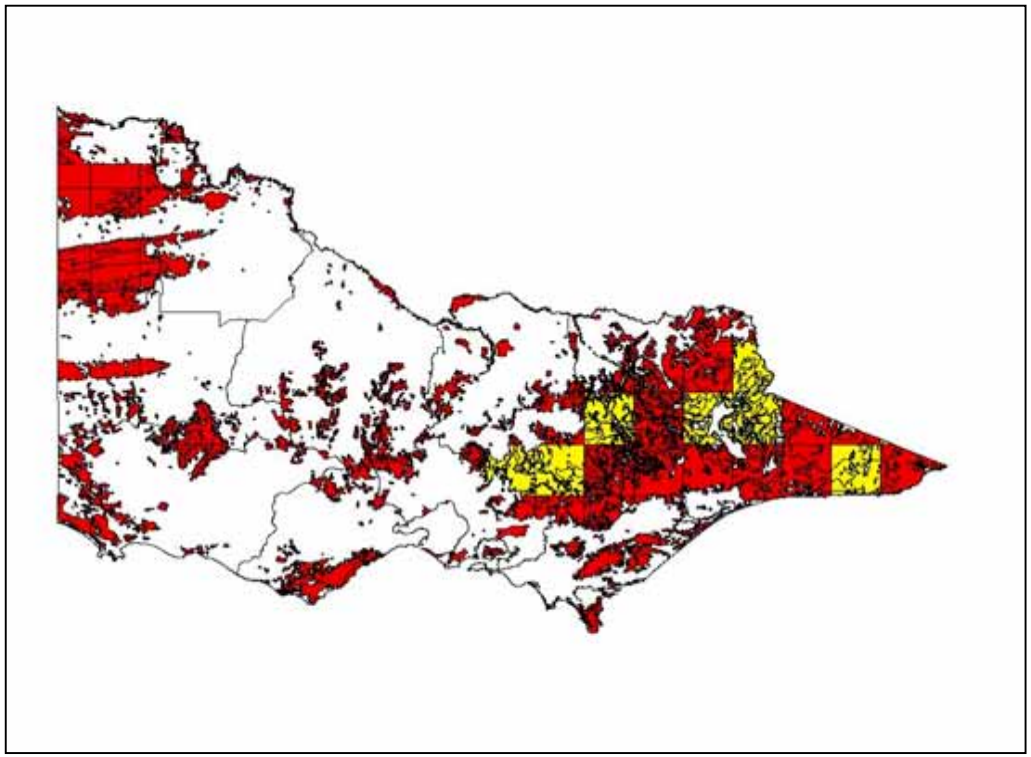
Potential distribution of *Asparagus asparagoides* in Victoria.

Species: *Asparagus asparagoides* (L.) Druce
Common name: Bridal creeper
Status: Not declared noxious in Victoria.
Habitat:
Warm-temperate to tropical regions, preferring fertile, well drained soils of light texture (Parsons and Cuthbertson 1992). It is often grown as an ornamental, and occurs as a weed along roadsides, in town allotments, orchards and citrus groves, waste places and disturbed scrubland close to habitation (Parsons and Cuthbertson 1992). Bridal creeper invades dry coastal vegetation, heathland and heathy woodland, mallee shrubland, lowland grassland and grassy woodland, dry sclerophyll forest and woodland, damp sclerophyll forest, riparian vegetation, rock outcrop vegetation, and warm temperate rainforest (Carr *et al* 1992).

Potential distribution produced from CLIMATE modelling and overlayed on suitable overlays with CMA boundaries.

Overlays used.
Land use:
Forestry private & public
Horticulture
Broad vegetation types:
Coastal scrubs and grassland; dry foothill forest; moist foothill forest; montane dry woodland; montane moist forest; sub-alpine woodland; grassland; plains grassy woodland; valley grassy forest; coastal grassy woodland; herb-rich woodland; montane grassy woodland; riverine grassy woodland; riparian forest; rainshadow woodland; mallee; mallee-heath; boinka-raak; mallee woodland; heathy woodland; wimmera mallee/woodland; lowland forest; heath; box-ironbark forest; inland slopes and sedge-rich woodland.

Colours indicate possibility of *Asparagus asparagoides* infesting these areas.
Red = Very high Yellow = High
Orange = Medium Green = Likely
In the non-coloured areas the plant is unlikely to establish as the climate, soil or landuse is not presently suitable.



Impact Assessment Record

Weed Name: *Asparagus asparagoides* (L.) Druce

Common name: bridal creeper, smilax

QUESTION	COMMENTS	REFERENCE	RANKING
Social			
1. Restrict human access?	Perennial climber that dominates ground flora and can form, "dense curtains smothering shrubs and the lower canopy of trees." While the plant does occur in riparian areas, it is most vigorous on lighter well-drained soils. Its presence would a nuisance to humans impeding individual access.	Muyt (2001)	**ML**
2. Reduce tourism?	The dense, smothering curtains this plant creates would present a major negative impact on aesthetics.	Muyt (2001)	**MH**
3. Injurious to people?	The plant presents no harmful physical or toxic properties to humans.		**L**
4. Damage to cultural sites?	"Its ability to establish in natural bushland and form a canopy over plants 2 to 3 metres high or higher, makes it a threat to native plant communities." Dense infestations would create a negative visual impact, but unlikely to cause damage to cultural sites.	Parsons & Cuthbertson (2001)	**ML**
Abiotic			
5. Impact flow?	Terrestrial species. "It is usually most vigorous on lighter, well-drained soils."	Muyt (2001)	**L**
6. Impact water quality?	Terrestrial species.		**L**
7. Increase soil erosion?	Although stems die-off during summer, the dense cover provided by the twining stems and the thick mat of rhizomes and tuberous roots may reduce soil erosion.	Parsons & Cuthbertson (2001)	**L**
8. Reduce biomass?	"It has the potential to dominate a community, reaching high densities and accumulating a large biomass, especially underground." Biomass would increase.	Raymond (1995)	**L**
9. Change fire regime?	While fire is recommended as an adjunct to controlling this species, there is no data on the flammability of the species. Stems commonly senesce in early summer, and leave little if any material. Thus, increases in fuel load because of infestation may be minimal. Dense infestations may have some minor effect on frequency of fire risk where shrubs or small trees have been smothered and killed.	Parsons & Cuthbertson (2001) Raymond (1995) Holland-Clift (pers.com)	**L**
Community Habitat			
10. Impact on composition (a) high value EVC	EVC=Sedgy Riparian Woodland (V); CMA=Corangamite; Bioreg=Otway Ranges; VH CLIMATE potential. "It is widespread in South Australia, Victoria and NSW in grassy woodlands, heathlands, forests, rocky escarpments and riparian areas." It is, "…capable of eliminating all indigenous ground-flora and smaller shrubs." Capacity to dominate ground-flora and reduce mid-storey diversity.	Muyt (2001)	**MH**
(b) medium value EVC	EVC=Montane Grassy Woodland (D); CMA=North East; Bioreg=Highlands – Northern Fall; VH CLIMATE potential. Impact as in 10(a) above. However, open vegetation structure may limit density of growth. "It tolerates heavy shade and generally is not found in open situations."	Parsons & Cuthbertson (2001)	**M**
(c) low value EVC	EVC=Riparian Forest (LC); CMA=North East; Bioreg=Highlands – Northern Fall; VH CLIMATE potential. Impact as in 10(a) above.	Muyt (2001)	**MH**

Impact Assessment Record

Weed Name: *Asparagus asparagoides* (L.) Druce

Common name: bridal creeper, smilax

QUESTION	COMMENTS	REFERENCE	RANKING
11. Impact on structure?	"It has the potential to dominate a community, reaching high densities." The plant can grow to a height of 3 metres, thus having great potential to affect lower and mid storeys.	Raymond (1995) Parsons & Cuthbertson (2001)	**MH**
12. Effect on threatened flora?	This species is not documented as posing an additional risk to threatened flora.		**MH**
Fauna			
13. Effect on threatened fauna?	This species is not documented as posing an additional risk to threatened fauna		**MH**
14. Effect on non-threatened fauna?	The plant forms, "…dense curtains smothering shrubs and the lower canopy of trees." It is also considered capable of eliminating all indigenous ground-flora. Such serious impact on the plant community would significantly change the habitat for fauna species potentially leading to reduced numbers.	Muyt (2001)	**MH**
15. Benefits fauna?	Some bird species (Silvereye *Zosterops lateralis* and Little Crow *Corvus bennetti*) are known to feed on the fruit.	Stansbury (1996)	**MH**
16. Injurious to fauna?	No documented affects to fauna.		**L**
Pest Animal			
17. Food source to pests?	Bird species, both native and introduced, are known to feed on the fruit. "…and the introduced starling were identified as feeding on bridal creeper fruits in South Australia." Potential to provide food to one or more pest species.	Stansbury (1996)	**ML**
18. Provides harbor?	Not documented as providing harbor for pest animals. The dense growth, which occurs in late winter, may provide some temporary harbor, particularly for birds.		**ML**
Agriculture			
19. Impact yield?	"Introduced as an ornamental to many parts of the world, it is often found as a garden escape but is rarely considered a serious agricultural weed." However, "it also occurs in a number of orchards and citrus groves along the Murray River where it smothers and weakens the trees and interferes with harvesting." "The smothering effect…displacement of [citrus] roots contribute to reduced tree growth, and fruit production and increased susceptibility to disease." Potential to impact yield in some horticultural industries.	Parsons & Cuthbertson (2001) Kwong & Holland-Clift (2004)	**MH**
20. Impact quality?	In citrus orchards, bridal creeper is a serious competitor for nutrients and moisture, and its smothering habit reduces crop yield. With such competition, it is likely that quality is also affected, but there is no specific mention of this problem in the literature. It could be that fruit from infested trees is not used, thus only yield is affected. Anecdotal evidence is that fruit size on weed-affected trees is reduced, thus it flows that quality is also reduced, but not significantly.	Kwong & Holland-Clift (2004)	**ML**
21. Affect land value?	Not known as a serious agricultural weed. The presence of bridal creeper would have little or no affect on land value.	Parsons & Cuthbertson (2001)	**L**

Weed Name: *Asparagus asparagoides* (L.) Druce

Common name: bridal creeper, smilax

QUESTION	COMMENTS	REFERENCE	RANKING
22. Change land use?	For general agriculture, no. For orchardists, the difficulty in controlling bridal creeper and impact on fruit quality and yield may result in some areas within the property being removed from production.		**ML**
23. Increase harvest costs?	See comment in 19 above. Citrus growers in the north west of Victoria comment that labour costs increase as a result of bridal creeper infestations. While some of the cost is due to increased weed control, the cost of harvesting also increases as fruit pickers have to negotiate through a blanket of bridal creeper to gather fruit.	Parsons & Cuthbertson (2001) Kwong (pers comms)	**M**
24. Disease host/vector?	Not known as a host or vector for disease.		**L**

References:

Holland-Clift, S. Project Officer, Biological Control of Bridal Creeper and Gorse. Primary Industries Research Victoria, Frankston. Tel: 9785 0111 (personal communication)

Kwong, R.M. and Holland-Clift, S., 2004, 'Biological control of bridal creeper, *Asparagus asparagoides* (L.) W. Wight, in citrus orchards', in *14th Annual Weeds Conference*, ed B.M. Sindel and S.B. Johnson, Weed Science Society of New South Wales, Sydney.

Raymond, K. 1996. The ecology of bridal creeper in south-eastern Australia. In *Plant Protection Quarterly*, Vol 11(2). R.G. and F.J. Richardson, Frankston, Victoria. p47

Stansbury, C. 1996. Observations of birds feeding on bridal creeper (*Asparagus asparagoides)* fruits within Yanchep National Park, Western Australia. In Plant Protection Quarterly, Vol 11(2). R.G. and F.J. Richardson, Frankston, Victoria. pp 59–60.

Personal communications

Kwong, R.M., Section Leader, Invertebrate Sciences, Primary Industries Research Victoria.

Invasiveness Assessment Record

Scientific name: *Cytisus multiflorus* (L.' Hér.) Sweet Common Name: white Spanish broom

QUESTION	COMMENTS	REFERENCE	RATING
Establishment			
1. Germination requirements?	"The seeds germinate with autumn rains and during spring." Responds to natural season disturbances; autumn rain, and spring rainfall and temperatures.	Weeds CRC (2003)	**MH**
2. Establishment requirements?	"…white Spanish broom is hard seeded and the seeds remain viable for a long time in the soil." As with the related *C. scoparius*, it is likely that germination will occur only after the hard seed coat is damaged by fire, or some abrasive action (e.g. disturbance due to animal digging). In New Zealand, *C. multiflorus* occurs in dry waste places, scrubland, and riverbeds. Possibly requires access to light and direct rainfall.	Weeds CRC (2003)	**ML**
3. How much disturbance is required?	"As a weed, it is known to enter relatively undisturbed bushland. In Australia it has spread from lakeside plantings into roadsides and townships." Potential to establish in areas subject to minor disturbance.	Weeds CRC (2003)	**MH**
Growth/Competitive			
4. Life form?	Perennial shrub ⇒ Legume	Webb *et al* (1988)	**MH**
5. Allelopathic properties?	None described. A nitrogen-fixing plant, it may inhibit the growth of some native species by changing the soil chemistry.	Weeds CRC (2003)	**ML**
6. Tolerates herb pressure?	A study on the consumption of a related broom, *C. scoparius*, by both vertebrate and invertebrate herbivores found that the growth or reproductive capacity is not affected. It appears the same result may be applied to *C. multiflorus*. (It is a common practice in other research or extension material to compare or combine these species.) Not eaten by animals/insects; not under a biological control program in Victoria.	Bossard & Rejmanek (1994)	**H**
7. Normal growth rate?	*C. multiflorus* will grow at the same or similar rate to other native and exotic leguminous species.	Perez-Fernandez & Lamont (2002)	**MH**
8. Stress tolerance to frost, drought, w/logg, sal. etc?	Occurs in dry sclerophyll forest and woodland ⇒ tolerates dry weather: somewhat drought resistant. In cultivation in the U.S., it is noted as having a hardiness rating of 6 to 10 (-23°C to 2°C). Likely to survive mild frosts in Australia. "Many dry-fruited shrubs form highly resilient thickets because of their pyrophilous (fire-loving) nature." Plants able to withstand low-intensity fire.	Carr *et al* (1992) Page & Olds (1998) Malo (2004)	**MH**
Reproduction			
9. Reproductive system	Sexual reproduction. Cross-pollination only.	Rodriguez-Riaño *et al* (2004)	**L**
10. Number of propagules produced?	"*Cytisus multiflorus* is a winter-flowering species in the study population and produces a great number of white flowers per plant (range = 8259–15228), [but]…the final crop of seeds and fruit was sparse." Fruit set ≈ 23%: 2 seeds/fruit ⇒ 7,000 seeds	Rodriguez-Riaño *et al* (2004)	**H**
11. Propagule longevity?	"Like many legumes, white Spanish broom is hard seeded and the seeds remain viable for a long time in the soil, probably as long as the seed of the closely related *C. scoparius*, which is still viable 20 years after being dropped."	Weeds CRC (2003)	**MH**

Invasiveness Assessment Record

Scientific name: *Cytisus multiflorus* (L.' Hér.) Sweet Common Name: white Spanish broom

QUESTION	COMMENTS	REFERENCE	RATING
12. Reproductive period?	No data are available on the life span of this species. As with other broom species, it is possible that *C. multiflorus* would produce propagules for a period of 5 to 10 years or possibly longer. It is noted that the related *C. scoparius* can live for up to 27 years.	Muyt (2001)	**H**
13. Time to reproductive maturity?	Seeds produced from the third year.	Weeds CRC (2003)	**ML**
Dispersal			
14. Number of mechanisms?	The main mechanism for dispersal is the explosive pods that eject the seed. As with other brooms, rainwater and erosion may move some seeds over much greater distance. However, the role of humans in dispersal of this attractive plant should not be discounted.	Malo (2004)	**MH**
15. How far do they disperse?	Seedpods eject the seed, but most fall near to the maternal plant. "Under natural conditions, over 60% of *C. multiflorus* seeds are dispersed less than 1 m from the edge of the plant and less than 15% reach beyond 3 m." The abiotic dispersal of seed from such Mediterranean shrubs appears to allow only for the colonisation of peripheral areas around the scrub patches. "The above-mentioned case of *C. multiflorus* and the published data on *Cistus ladanifer* strengthen the idea of minimal abiotic dispersal of dry-fruited shrubs typical in pioneer Mediterranean scrubland."	Weeds CRC (2003) Malo (2004)	**ML**

References cited:

Bossard, C.C., and Rejmanek, M., 1994, Herbivory, growth, seed production and resprouting of an exotic invasive shrub Cytisus scoparius, *Biological Conservation*, Vol: 67, No: 3, pp 193–200

Carr, G.W., Yugovic, J.V. and Robinson, K.E. 1992, *Environmental weed invasions in Victoria: Conservation and management implications*, Department of Conservation and Natural Resources and Ecological Horticulture, Victoria.

Malo, J., 2004, Potential ballistic dispersal of Cytisus scoparius (Fabaceae) seeds, *Australian Journal of Botany*, Vol: 52, No: 5, pp 653–658

Muyt, A. 2001, Bush invaders of south-east Australia. a guide to the identification and control of environmental weeds found in south-east Australia, R.G. & F.J. Richardson Victoria.

Page, S., and Olds, M. (eds), 1998, *Botanica* 2nd ed, Random House, Milsons Point, NSW, Australia

Perez-Fernandez, M.A., and Lamont, B.B., 2002, Competition between Australian and Spanish legumes growing in seven Australian soils,

Rodriguez-Riaño, T., Ortega-Olivencia, A. and Devesa, J.A., 2004, Reproductive biology in Cytisus multiflorus (Fabaceae), *Annales Botanici Fennici*, Vol: 4, pp 179–188

Weeds CRC, 2003, Alert list for environmental weeds, weed management guide: white Spanish broom (Cytisus multiflorus), CRC for Australian Weed Management

Webb, C.J., Sykes, W.R., Garnock-Jones, P.J., 1988, *Flora of New Zealand*, Vol 4, Botany Division, Department of Scientific & Industrial Research, New Zealand

Revisions

Date	Revised by	Revision
20 Oct 2005	TDH	Criterion 4 revised from L to MH, sp. is leguminous.

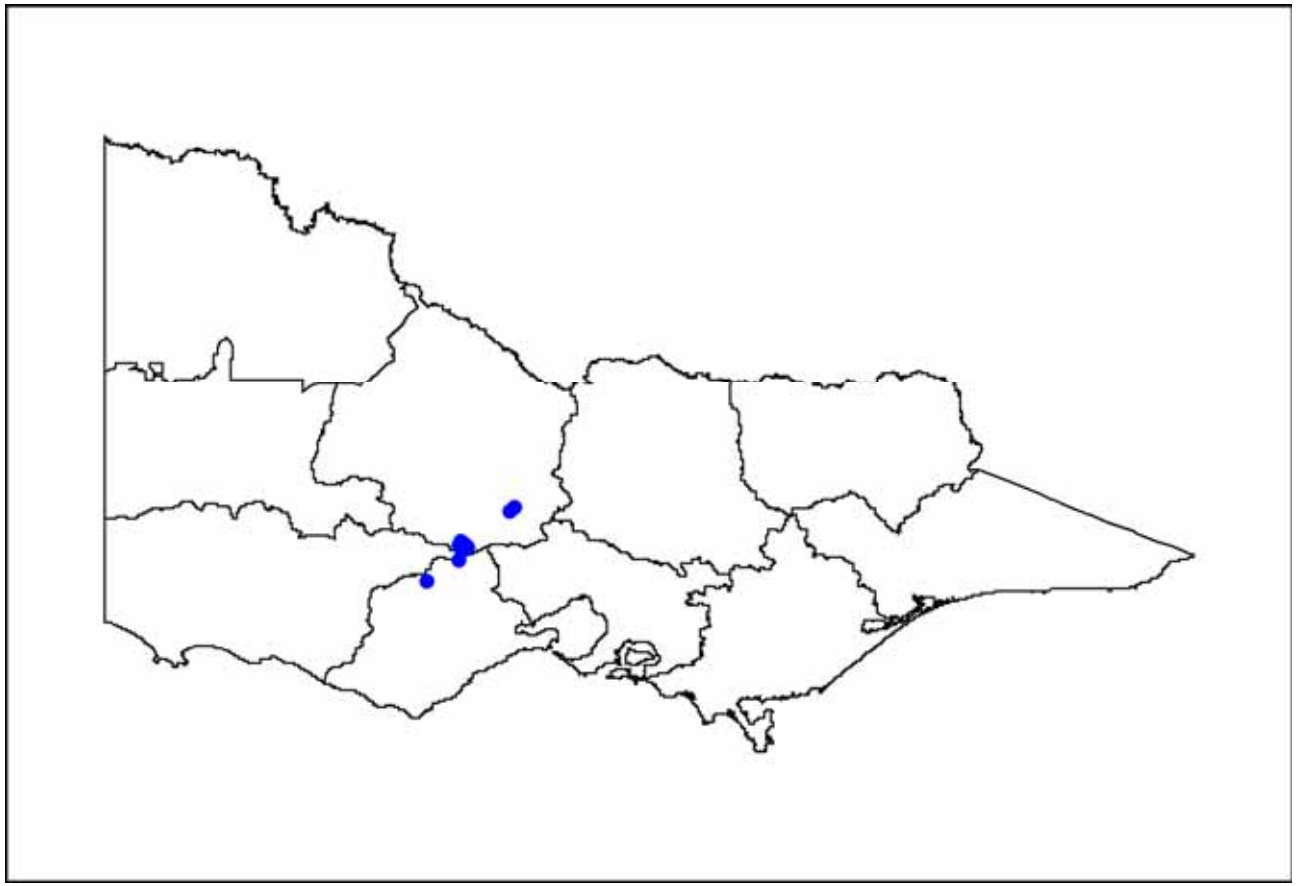
Present distribution of *Cytisus multiflorus* in Victoria

Species: *Cytisus multiflorus* (L'Hér.) Sweet
Common name: white Spanish broom
Status: Not declared in Victoria

Habitat: In Victoria, this plant naturalised following an ornamental planting on a lakeside in central Victoria. It has since spread along roadsides and into townships (Weeds CRC). In New Zealand, it occurs on the South Island in dry waste places, scrubland and riverbeds (Webb *et al* 1988). Within its native range in the Mediterranean region it occurs as one of the representative species in woodlands and scrublands (Rodriguez-Riaño *et al* 2004).

Present distribution in Victoria using Victorian Flora Information System (FIS). The are no records of this species in IPMS.

Information from FIS (*blue circles*)
Number of records 15



Potential distribution of *Cytisus multiflorus* in Victoria

Species: *Cytisus multiflorus* (L'Hér.) Sweet
Common name: white Spanish broom
Status: Not declared

Habitat:
In Victoria, this plant naturalised following an ornamental planting on a lakeside in central Victoria. It has since spread along roadsides and into townships (Weeds CRC). In New Zealand, it occurs on the South Island in dry waste places, scrubland and riverbeds (Webb *et al* 1988). Within its native range in the Mediterranean region it occurs as one of the representative species in woodlands and scrublands (Rodriguez-Riaño *et al* 2004).

Potential distribution produced from CLIMATE modelling, relevant land uses and broad vegetation types and overlayed on CMA boundaries.

OVERLAYS USED.

Land Use:

Pasture dryland

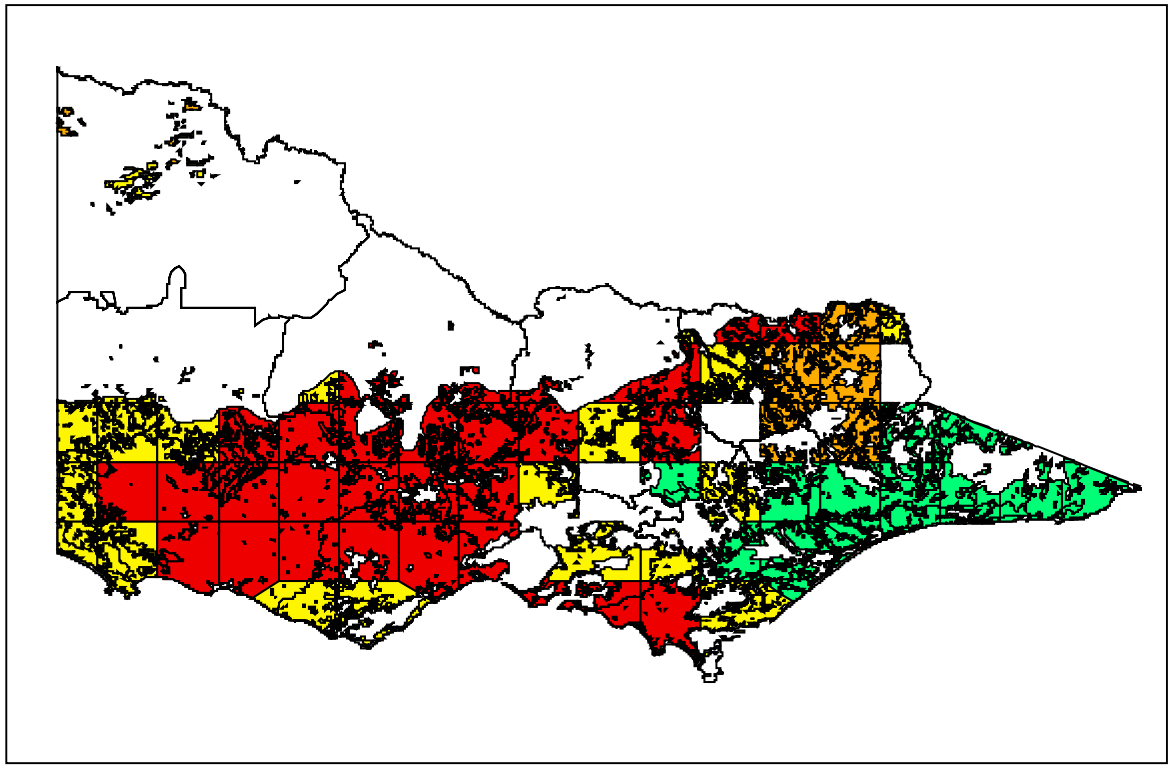
Broad vegetation types

boinka-raak; box-ironbark forest; coastal grassy woodland; dry foothill forest; heathy woodland; herb rich woodland; inland slopes woodland; lowland forest; Mallee woodland; montane dry woodland; montane grassy woodland; plains grassy woodland; rainshadow woodland; valley grassy forest; Wimmera/Mallee woodland

Colours indicate possibility of *Cytisus multiflorus* infesting these areas.

Red	=	Very high	Yellow	=	High
Orange	=	Medium	Green	=	Likely

In the non-coloured areas the plant is unlikely to establish as the climate, soil or land use is not presently suitable.



Impact Assessment Record

Scientific Name: *Cytisus multiflorus* (L.' Hér.) Sweet

Common name: white Spanish broom

QUESTION	COMMENTS	REFERENCE	RATING
Social			
1. Restrict human access?	Large shrub to 3 metres high; infestations can create a dense scrub layer. More commonly occurring in disturbed places such as roadsides. As it likely to establish in undisturbed habitats, such as grasslands and woodlands, dense infestations would inhibit pedestrians. Dense stands are impenetrable.	Weeds CRC (2003) Blood (pers coms)	**MH**
2. Reduce tourism?	The plant produces abundant white, sweet-scented flowers from September to November, which the 'average' visitor may find attractive. It is unlikely to inhibit recreational pursuits except where it may occur as a dense patch beside or near a waterbody. Minor effect; visitors would be aware of the plant, but not greatly bothered by its presence.	Weeds CRC (2003)	**ML**
3. Injurious to people?	Seeds are poisonous. Produces a great number of seeds most of which fall near to the parent plant. Toxic properties at most time of the year.	Rodriguez-Riaño *et al* (2004) Malo (2004) Weeds CRC (2003)	**MH**
4. Damage to cultural sites?	"Dense broom stands shade out native herbaceous groundcover plants and eucalypt seedlings." Changes to vegetation structure may create a moderate negative visual effect.	Weeds CRC (2003)	**ML**
Abiotic			
5. Impact flow?	Terrestrial sp. Occurs in dry sclerophyll forest and woodland.	Carr *et al* (1992)	**L**
6. Impact water quality?	Terrestrial sp.		**L**
7. Increase soil erosion?	"[Brooms] have been widely used as ornamental landscape plants and also for wasteland reclamation (e.g. mine tailings) and sand dune stabilisation." Although the distribution of white Spanish broom in Victoria is limited, within infestations it is known to occur in medium to large populations. Likely to enhance soil stabilisation in neglected or waste areas. Low probability of large-scale soil movement.	Wikipedia Carr *et al* (1992)	**L**
8. Reduce biomass?	"…it could also establish in a wide range of disturbed and undisturbed habitats such as grasslands and open eucalypt woodlands." Dense infestations may lead to a slight increase in biomass.	Weeds CRC (2003)	**L**
9. Change fire regime?	Its contribution to fuel load and flammability are not documented. In Victoria, it occurs in dry sclerophyll forest and woodland; observed growing in conjunction with English broom and gorse. Influence on fire regime in these situations would be minimal.	Carr *et al.* (1992) Blood (pers coms) Hansford (pers coms)	**L**
Community Habitat			
10. Impact on composition (a) high value EVC	EVC=Heathy Woodland (V); CMA=North Central; Bioreg=Goldfields; VH CLIMATE potential. The dense habit of the shrub produces deep shade that would affect ground covers and forbs. It may also affect the regeneration of native overstorey species. Potential for major displacement of some dominant spp. within different layers.	Weeds CRC (2003)	**MH**
(b) medium value EVC	EVC=Box Ironbark Forest (D); CMA=North Central; Bioreg=Goldfields; VH CLIMATE potential. Impact as in 10(a) above.		**MH**
(c) low value EVC	EVC=Heathy Dry Forest (LC); CMA=North Central; Bioreg=Goldfields; VH CLIMATE potential. Impact as in 10(a) above.		**MH**

Impact Assessment Record

Scientific Name: *Cytisus multiflorus* (L.' Hér.) Sweet

Common name: white Spanish broom

QUESTION	COMMENTS	REFERENCE	RATING
11. Impact on structure?	At Creswick in Victoria, it occurs with other invasive shrubs (English broom, gorse), on roadsides and some private land. The dense habit of the shrub produces deep shade that would affect ground covers and forbs. It may also affect the regeneration of native overstorey species. Major effect on < 60% of the lower and mid storeys.	Blood (pers coms) Hansford (pers coms) Weeds CRC (2003)	**MH**
12. Effect on threatened flora?	This species is not documented as posing an additional risk to threatened flora.		**MH**
Fauna			
13. Effect on threatened fauna?	This species is not documented as posing an additional risk to threatened fauna		**MH**
14. Effect on non-threatened fauna?	Reduction in native groundcovers or forbs reducing food source for native spp. Minor effect due to reduction in food.	Weeds CRC (2003)	**ML**
15. Benefits fauna?	No benefits documented.		**H**
16. Injurious to fauna?	The seeds are known to be poisonous, however, consumption by native herbivores is not documented.	Weeds CRC (2003)	**M**
Pest Animal			
17. Food source to pests?	Not known to be a source of food to pest animals.		**M**
18. Provides harbor?	It is considered to provide shelter for feral animals, though the species are not documented. The dense habit of the shrub may provide harbour for pest birds such as blackbirds. Similar to Scotch broom, *C. scoparius*, it may possibly provide harbour for feral pigs.	Weeds CRC (2003) Parsons & Cuthbertson (2001)	**MH**
Agriculture			
19. Impact yield?	"In pastures, white Spanish broom forms thickets that prevent grazing and restrict access to water." However, the more aggressive *C. scoparius* is not known to be a problem in pasture; certainly not in cropping. Likely to have a limited impact on yield (e.g. by reducing carrying capacity).	Weeds CRC (2003) Parsons & Cuthbertson (2001)	**ML**

Impact Assessment Record

Scientific Name: *Cytisus multiflorus* (L.' Hér.) Sweet

Common name: white Spanish broom

QUESTION	COMMENTS	REFERENCE	RATING
20. Impact quality?	Not likely to affect the quality of produce. Not a seed contaminant. (Large seed would be easily removed during processing.)		**L**
21. Affect land value?	As with *C. scoparius*, it is unlikely to be a significant agricultural weed, thus it would have an immeasurable affect on the value of agricultural land.	Parsons & Cuthbertson (2001)	**L**
22. Change land use?	No. Not likely to be a significant weed on managed farms. Potentially, it could be a problem on abandoned pasture.		**L**
23. Increase harvest costs?	No.		**L**
24. Disease host/vector?	None documented. No other brooms are known to be hosts or vectors of disease.		**L**

References cited:

Blood, K., Victorian Department of Primary Industries, Environmental Weeds Education Coordinator

Carr, G.W., Yugovic, J.V. and Robinson, K.E. 1992, *Environmental weed invasions in Victoria: Conservation and management implications*, Department of Conservation and Natural Resources and Ecological Horticulture, Victoria.

Hansford, M., Victorian Department of Primary Industries, New and Emerging Weeds Officer.

Malo, J., 2004, Potential ballistic dispersal of Cytisus scoparius (Fabaceae) seeds, *Australian Journal of Botany*, Vol: 52, No: 5, pp 653–658

Rodriguez-Riaño, T., Ortega-Olivencia, A. and Devesa, J.A., 2004, Reproductive biology in Cytisus multiflorus (Fabaceae), *Annales Botanici Fennici*, Vol: 4, pp 179–188

Weeds CRC, 2003, Alert list for environmental weeds, weed management guide: white Spanish broom (Cytisus multiflorus), CRC for Australian Weed Management

Invasiveness Assessment Record

Scientific name: *Festuca gautieri* (Hack.) K. Richt. Common Name: bearskin fescue

QUESTION	COMMENTS	REFERENCE	RATING
Establishment			
1. Germination requirements?	No published data on germination requirements. Seed can be purchased, ∴viable seed produced. One seed supplier suggesting chilling seed to promote germination. Most likely germination occurs due to normal seasonal rainfall and temperatures.	B & T World Seeds Garden Makers	**MH**
2. Establishment requirements?	Optimal condition is open sunny situation. Established plants can tolerate some shading.	PEN	**ML**
3. How much disturbance is required?	No published data on occurrence as a weed. Within its native range (northeastern Spain: Pyrenees) it occurs in rocky, open montane vegetation subject to annual snowfall and high rainfall. In Australia, it may establish in similar situations subject to natural disturbance.	Camarero & Gutiérrez (2002)	**MH**
Growth/Competitive			
4. Life form?	Grass	Tutin (1980)	**MH**
5. Allelopathic properties?	None described		**M**
6. Tolerates herb pressure?	Noted by Randall as unpalatable. Forms low-growing, dense tussocks with needle-like leaves. May discourage browsing.	Spafford Jacob *et.al.* (2004) Annies annuals	**H**
7. Normal growth rate?	No data		**M**
8. Stress tolerance to frost, drought, w/logg, sal. etc?	Grows in Pyrenees at altitudes of 1500 to 2000 metres. Tolerates snow (to 2 m depth). More commonly found in xeric (dry) rather than mesic (moist) grasslands. In cultivation is recommended as a drought tolerant plant in cooler climates. Salt tolerance, waterlogging not documented.	Sebastiá (2003)	**MH**
Reproduction			
9. Reproductive system	Sexual and vegetative. “Mat-forming vegetative shoots.”	Flora of NW Eur	**MH**
10. Number of propagules produced?	No data		**M**
11. Propagule longevity?	No data		**M**
12. Reproductive period?	No data		**M**
13. Time to reproductive maturity?	Perennial grass: assume maturity within first year.		**H**
Dispersal			

Invasiveness Assessment Record

Scientific name: *Festuca gautieri* (Hack.) K. Richt. Common Name: bearskin fescue

QUESTION	COMMENTS	REFERENCE	RATING
14. Number of mechanisms?	No data. In high rainfall montane areas seed dispersed by water.		**MH**
15. How far do they disperse?	No data. Dispersal by rainfall would be several hundred metres on hillsides.		**ML**

References cited:

Annies Annuals, *Festuca scoparia*: "Bearskin Fescue", online: http://www.anniesannuals.com/signs/list/parent_redirect.htm, accessed 3 Oct. 05

Camarero, J.J., Gutiérrez, E., 2002, 'Plant species distribution across two contrasting treeline ecotones in the Spanish Pyrenees', in *Plant Ecology*, Vol 162, pp 247-257

Garden Makers Perennial and Annual Flower Seeds, online http://www.gardenmakers.com/festuca_scoparia.htm

Interactive Flora of NW Europe, (Flora of NW Eur), no date, Spiky fescue: *Festuca gautieri* (Hack.) K. Richt., Online: http://ip30.eti.uva.nl/bis/flora.php?selected=beschrijving&menuentry=soorten&id+4426 , accessed 28 Sep 05

Spafford Jacob, H, Randall, R, Lloyd, S., 2004, Front door wide open to weeds: an examination of the weed species permitted for import without risk assessment, WWF Australia.

Sebastia, M-T., 2003, 'Role of topography and soils in grassland structuring at the landscape and community scales', in *Basic and applied ecology*, Vol 5, pp. 331-346

Tutin, T.G., 1980, *Flora Europea*, Vol 5, Cambridge University Press, Cambridge

Revisions

Date Revised by Revision

Potential distribution of *Festuca gautieri* in Victoria

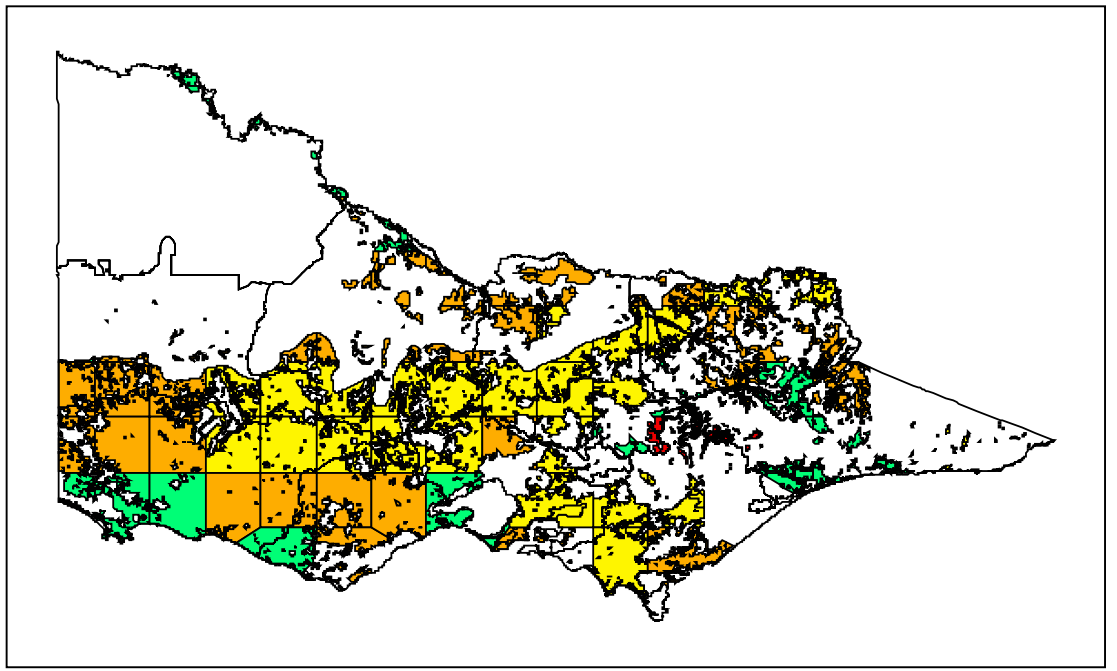
Species: *Festuca gautieri* (Hackel) K. Richter
Common name: Bearskin fescue
Status: Not declared

Habitat:
Native habitat; rocks and scrub sub-alpine regions NE Spain and SW France. Occurs in both moist (mesic) and dry (xeric) environments with preference for dry situations. Requires an open, sunny, cool location. Not known to be naturalised in Australia yet, but promoted as an attractive ornamental grass. Known on limestone quarry in Northwest Yorks (Britain).

Potential distribution produced from CLIMATE modelling overlayed on suitable landuse and broad vegetation type map layers, with CMA boundaries

OVERLAYS USED.
Land Use:
Pasture irrigated Pasture dryland

Broad vegetation types
Sub-alpine woodland, sub-alpine grassy woodland, montane grassy woodland, montane dry woodland, inland slopes woodland, grassland, grassy woodland, coastal grassy woodland, coastal scrubs.



Colours indicate possibility of *Festuca gautieri* infesting these areas.

Red=	Very high	Yellow=	High
Orange=	Medium	Green=	Likely

In the non-coloured areas the plant is unlikely to establish as the climate, soil or landuse is not presently suitable.

Edition date: 14 October 2005

Impact Assessment Record

Scientific Name: *Festuca gautieri* (Hack.) K. Richt. Common name: bearskin fescue

QUESTION	COMMENTS	REFERENCE	RATING
Social			
1. Restrict human access?	Low-growing perennial grass (50 cm). Would not restrict human access	Tutin (1980)	**L**
2. Reduce tourism?	This grass has a dense habit and fine, curved, narrow leaves, and is aptly named as it resembles the tight, dense fur of bears. As such, it would be quite noticeable in contrast to other grasses including native species. Its presence would not affect recreational activities, but would detract from the visual aesthetic of native grasslands or open woodlands.	Spafford Jacob *et.al.* (2004)	**ML**
3. Injurious to people?	No harmful characteristics described. The leaf-blade apex is pungent (terminates in a rigid sharp point), but is not noted to cause injury.	Clayton *et. al.* (2002)	**L**
4. Damage to cultural sites?	Little or no affect in European cultural sites. Due to the strong visual contrast between this species and native grasses there is a potential for moderate visual impact in native or indigenous cultural sites.	Spafford Jacob *et.al.* (2004)	**ML**
Abiotic			
5. Impact flow?	Terrestrial sp.	Tutin (1980)	**L**
6. Impact water quality?	Terrestrial sp.	Tutin (1980)	**L**
7. Increase soil erosion?	A dense, compact groundcover species. *Festuca* spp. generally promoted as suitable for erosion control. Not likely to contribute to soil erosion.		**L**
8. Reduce biomass?	Would displace native grasses. Dense, clump forming species likely to increase biomass.	Tutin (1980) Flora of NW Eur.	**L**
9. Change fire regime?	A dense, clump forming species. There is no data available to indicate flammability of this species, but once fire established the increased biomass might increase the intensity of fire.		**M**
Community Habitat			
10. Impact on composition (a) high value EVC	No data available.		**M**
(b) medium value EVC	No data available		**M**
(c) low value EVC	No data available		**M**
11. Impact on structure?	Occurs in open spaces. Requires access to direct light for optimum growth. Occurs as a dominant spp. in the subalpine calcareous grasslands in the southeastern Pyrenees. Dense habit would displace grasses and low-growing forbs. Unpalatable species, which may lead to it becoming dominant. Major effect on the floral strata in grassland situations.	Sebastia (2003)	**MH**
12. Effect on threatened flora?			**MH**

Impact Assessment Record

Scientific Name: *Festuca gautieri* (Hack.) K. Richt. Common name: bearskin fescue

QUESTION	COMMENTS	REFERENCE	RATING
Fauna			
13. Effect on threatened fauna?			**MH**
14. Effect on non-threatened fauna?	Unpalatable species. Potential displacement of palatable species through preferential grazing. Minor effect through reduction in food source for fauna.	Spafford Jacob *et.al.* (2004)	**ML**
15. Benefits fauna?	No documented benefits.		**H**
16. Injurious to fauna?	No data available.		**M**
Pest Animal			
17. Food source to pests?	Unpalatable species. Unlikely to be a food source for pest animals.	Spafford Jacob *et.al.* (2004)	**L**
18. Provides harbor?	Dense, clump forming ground cover. May provide limited cover for minor pest species (e.g. rodents)		**ML**
Agriculture			
19. Impact yield?	No direct data available. A dense, unpalatable plant. Invasion is aided by preferential grazing, which would lead to reduced carrying capacity.	Spafford Jacob *et.al.* (2004)	**M**
20. Impact quality?	Not harmful. Not documented as contaminant in wool, produce, etc.		**M**
21. Affect land value?	No data.		**M**
22. Change land use?	No data.		**M**
23. Increase harvest costs?	A threat to grazing situations, not cropping. Not likely to affect harvest cost.		**L**
24. Disease host/vector?	None described.		**L**

Impact Assessment Record

Scientific Name: *Festuca gautieri* (Hack.) K. Richt. Common name: bearskin fescue

References cited:

Clayton, W.D., Harman, K.T. and Williamson, H., 2002, World Grass Species: Descriptions, Identification and Information Retrieval, Online: http://www.kew.org/data/grasses-db.htm

Interactive Flora of NW Europe, (Flora of NW Eur), no date, Spiky fescue: *Festuca gautieri* (Hack.) K. Richt., Online: http://ip30.eti.uva.nl/bis/flora.php?selected=beschrijving&menuentry=soorten&id+4426

Spafford Jacob, H, Randall, R, Lloyd, S., 2004, Front door wide open to weeds: an examination of the weed species permitted for import without risk assessment, WWF Australia.

Sebastia, M-T., 2003, 'Role of topography and soils in grassland structuring at the landscape and community scales', in *Basic and applied ecology*, Vol 5, pp. 331-346

Tutin, T.G., 1980, *Flora Europea*, Vol 5, Cambridge University Press, Cambridge

Revisions

Date	Revised by	Revision

Invasiveness Assessment Record

Scientific name: *Nassella hyalina* (Nees) Barkworth Common Name: cane needle grass

QUESTION	COMMENTS	REFERENCE	RATING
Establishment			
1. Germination requirements?	"Most vegetative growth and seed germination occur from autumn to winter, although some germination may occur year round under suitable conditions." Requires normal season disturbance such as autumn rains.	CRC (2003)	**MH**
2. Establishment requirements?	"It occurs predominantly on fertile soils in variable situations and is also found in woodlands." While more commonly occurring in grassland, it can also establish with some degree of cover as it is found in woodlands.	McLaren *et al* (1998)	**MH**
3. How much disturbance is required?	In Victoria, it has been observed in both grasslands and riparian situations. Assume it can establish in areas subjected to some disturbance. "Stipoid grasses (such as the *Nassella* species) generally invade sites that are already highly degraded with a history of disturbance."	McLaren *et al* (1998) CRC (2003)	**ML**
Growth/Competitive			
4. Life form?	perennial grass	Harden (1993)	**MH**
5. Allelopathic properties?	None described. Other species in the *Nassella* taxa are not known to have allelopathic properties.		**L**
6. Tolerates herb pressure?	In pastures of low quality, *N. hyalina* is consumed. The plant produces 'hidden' seeds (i.e. normal awned seeds, not cleistogenes) in the flowering stems. These seeds are released after seed drop and, "…enable the plant to reproduce despite grazing, slashing and fire". Likely to withstand grazing: it is not preferred when other more palatable species are available.	McLaren *et al* (1998) CRC (2003)	**MH**
7. Normal growth rate?	Documented as a minor weed of neglected and urban land. Possibly growth rate less than other weedy *Nassella* spp.	AWC (n.d.)	**ML**
8. Stress tolerance to frost, drought, w/logg, sal. etc?	"It appears to be spreading, especially in wetter areas within open native grasslands." Appears to withstand seasonal inundation. Tolerance to other stresses unknown.	CRC (2003)	**M**
Reproduction			
9. Reproductive system	Sexual (cross and self-pollination)	Gardener & Sindel (1998)	**ML**
10. Number of propagules produced?	Unknown		**M**
11. Propagule longevity?	Unknown		**M**
12. Reproductive period?	Unknown. A perennial grass: likely to produce propagules for at least 2 years.		**M**

Invasiveness Assessment Record

Scientific name: *Nassella hyalina* (Nees) Barkworth Common Name: cane needle grass

QUESTION	COMMENTS	REFERENCE	RATING
13. Time to reproductive maturity?	Winter growing perennial grass. Flowers and produces seed in spring and summer. Reaches maturity in less than one year.	CRC (2003)	**H**
Dispersal			
14. Number of mechanisms?	Seed dispersed by attaching to animals, clothing and machinery.	Gardener & Sindel (1998)	**ML**
15. How far do they disperse?	Most dispersal is likely to occur due to animals: dispersal mostly 20 – 200 metres.	Gardener & Sindel (1998)	**ML**

References cited:

Australian Weeds Committee (AWC), n.d., Weed identification: cane needlegrass, *Nassella hyalina*, viewed 01/10/04, http://www.weeds.org.au/cgi-bin/weedident.cgi?tpl=plant.tpl&ibra=all&card=G19

Cooperative Research Centre (CRC) for Australian Weed Management, 2003, Weed management guide: cane needle grass-*Nassella hyalina*, Commonwealth Department of Environment and Heritage, Australia.

Harden, G., (ed), 1993, *Flora of New South Wales*, N.S.W. University press, Kensington.

Gardener, M.R. and Sindel, B.M., 1998, 'The biology of *Nassella* and *Achnatherum* species naturalized in Australia and the implications for management on conservation lands', *Plant Protection Quarterly*, Vol: 13, No: 2, pp. 76–79.

McLaren, D., Stajsic, V. and Gardener, M.R., 1998, 'The distribution and impact of South/North American stipoid grasses (Poaceae: Stipeae) in Australia', *Plant Protection Quarterly*, Vol: 13, No: 2, pp. 62–68.

Present distribution of *Nassella hyalina* in Victoria

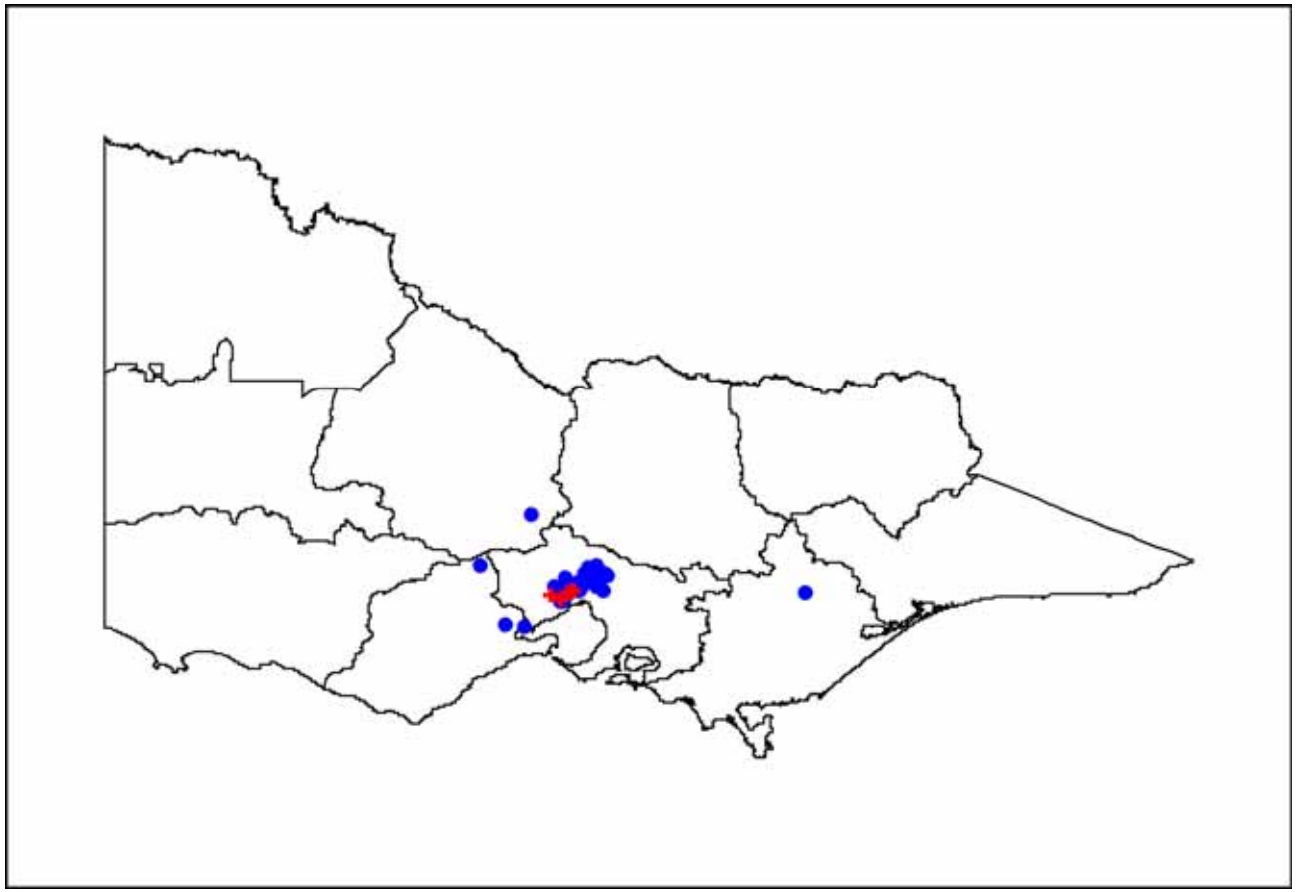
Species: *Nassella hyalina* (Nees.) Barkworth
Common name: cane needlegrass
Status: Not declared in Victoria

Habitat: It is found in variable situations on fertile soils (Walsh 1998). Cane needle grass invades lowland grassland and grassy woodland (Carr *et al* 1992). It has also been observed growing in areas subject to seasonal waterlogging and riparian vegetation (Walsh 1998).

Present distribution in Victoria using Victorian Flora Information System (FIS) and IPMS.

Information from FIS (*blue circles*)
Number of records 89

Information from PMIS (*red crosses*)
Number of records 7
Total Area of infestation (ha) 5

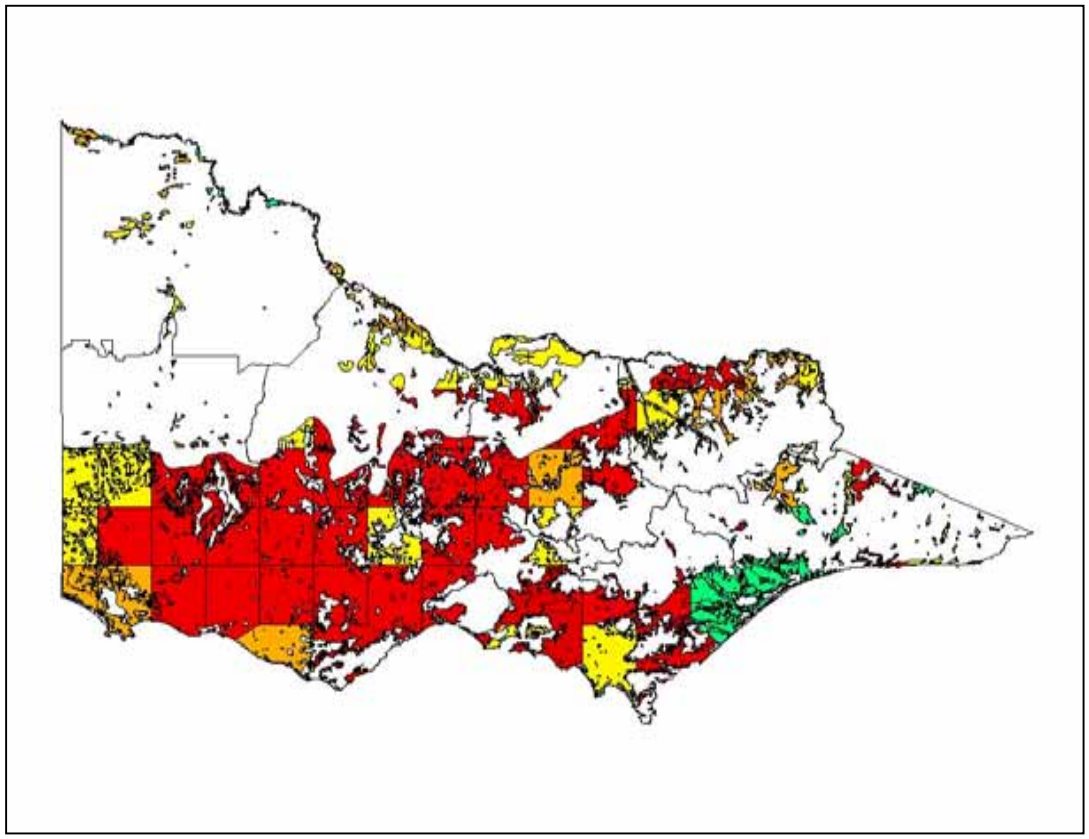


Potential distribution of *Nassella hyalina* in Victoria

Species: *Nassella hyalina* (Nees) Barkworth
Common name: Cane needle grass
Status: Not declared noxious in Victoria.
Habitat:
It is found in variable situations on fertile soils (Walsh 1998). Cane needle grass invades lowland grassland and grassy woodland (Carr *et al* 1992). It has also been observed growing in areas subject to seasonal waterlogging and riparian vegetation (Walsh 1998).
Potential distribution produced from CLIMATE modelling and overlayed on suitable overlays with CMA boundaries.

OVERLAYS USED.
Land use:
Pasture irrigated and dryland
Broad vegetation types:
Grassland; plains grassy woodland; coastal grassy woodland; herb-rich woodland; riverine grassy woodland; riparian forest; rainshadow woodland; mallee woodland; heathy woodland; wimmera mallee/woodland; swamp scrub; inland slopes and sedge-rich woodland.

Colours indicate possibility of *Nassella hyalina* infesting these areas.
Red = Very high Yellow = High
Orange = Medium Green = Likely
In the non-coloured areas the plant is unlikely to establish as the climate, soil or landuse is not presently suitable.



Impact Assessment Record

Scientific Name: *Nassella hyalina* (Nees) Barkworth

Common name: cane needle grass

QUESTION	COMMENTS	REFERENCE	RATING
Social			
1. Restrict human access?	Tufted or clumping perennial grass to 0.8 m high. Would not restrict human access.	Harden (1993)	**L**
2. Reduce tourism?	"Cane needle grass is hard to identify because of its similarity to native spear grasses." Unlikely that the average visitor would notice this grass as being a weed.	CRC (2003)	**L**
3. Injurious to people?	As a generalisation, it is considered that the sharp seeds of *Nassella* sp. penetrate and damage sheep skins and carcases. However, such potential to injure humans very limited. Little to no effect.	CRC (2003)	**L**
4. Damage to cultural sites?	Occurs mostly in grassland, grassy woodland and riparian areas as part of a mixed vegetation community. Unlikely to be noticeable in such situations. No structural impact. "A minor weed of neglected and urban land."	McLaren *et al* (1998) AWC (n.d.)	**L**
Abiotic			
5. Impact flow?	Terrestrial sp. In its native range in the Pampas of Argentina cane needle grass occurs in areas subject to regular flooding. However, it is assumed that the grass does not survive in permanent water.	Coughenour & Ellis (1993)	**L**
6. Impact water quality?	Terrestrial sp. See comment above.		**L**
7. Increase soil erosion?	"A minor weed of neglected and urban land." Generally, *Nassella* spp. are known to invade disturbed and degraded sites. As aerial growth dies off after flowering, areas of exposed soil would be subject to erosion. However, in sites that are already disturbed or degraded, the potential for erosion would not change significantly. Minimal impact.	AWC (n.d.)	**L**
8. Reduce biomass?	"A minor weed of neglected and urban land." *Nassella* spp. are known to invade disturbed and degraded sites, i.e., where little other vegetation exists. In contrast to the related *N. trichotoma, N. neesiana* and *N. charruana,* cane needle grass is not documented to establish, "…dense competitive infestations". Minimal change to biomass	AWC (n.d.) McLaren *et al* (1998)	**ML**
9. Change fire regime?	Unlike serrated tussock, which is known to produce dense tussocks, little information is documented about the fuel load provided by cane needle grass. See also comment in 8 above regarding density of infestations. Little or no change to fire frequency or intensity.	McLaren *et al* (1998)	**L**
Community Habitat			
10. Impact on composition (a) high value EVC	EVC=Grassy Woodland (E); CMA=Corangamite; Bioreg=Victorian Volcanic Plain; VH CLIMATE potential. The literature suggests that cane needle grass is not as competitive as the related Chilean needle grass or serrated tussock. Where it occurs north west of Melbourne it forms part of a mixed vegetation community. However, its presence will displace other more desirable native grass species. "Stipoid grasses generally invade plant communities which are already highly degraded,…and evidence suggests that there is a drop in biodiversity in stipoid grass-dominated grasslands." Minor displacement of some dominant spp.	McLaren *et al* (1998) Gardener & Sindel (1998)	**ML**
(b) medium value EVC	It appears unlikely to occur, or have any significant impact, in medium value EVCs across the southern areas of Victoria. (Refer to potential distribution map.)		**L**
(c) low value EVC	It appears unlikely to occur, or have any significant impact, in low value EVCs across the southern areas of Victoria. (Refer to potential distribution map.)		**L**
11. Impact on structure?	Where it occurs north west of Melbourne it forms part of a mixed vegetation community. However, its presence will displace other more desirable native grass species. Likely to have at least a minor impact on the lower stratum.	McLaren *et al* (1998)	**M**

Impact Assessment Record

Scientific Name: *Nassella hyalina* (Nees) Barkworth

Common name: cane needle grass

QUESTION	COMMENTS	REFERENCE	RATING
12. Effect on threatened flora?	This species is not documented as posing an additional risk to threatened flora.		**MH**
Fauna			
13. Effect on threatened fauna?	This species is not documented as posing an additional risk to threatened fauna		**MH**
14. Effect on non-threatened fauna?	In Argentina, it is only of intermediate feed value. Where it replaces better quality native grasses, it would reduce the quality of fodder overall. Minor negative affect on food source for fauna.	McLaren *et al* (1998)	**ML**
15. Benefits fauna?	No known benefits		**H**
16. Injurious to fauna?	The sharp seeds of *Nassella* are considered to damage the skin and carcases of sheep, but effect on fauna is not known.	CRC (2003)	**M**
Pest Animal			
17. Food source to pests?	Not documented as a food source to pest animals. Along with other vegetation, rabbits or goats may graze the plant. A grass with intermediate feed value; consider little or no effect.		**L**
18. Provides harbor?	Slender, tufted grass. Unlikely to provide harbour to pest animals.	CRC (2003)	**L**
Agriculture			
19. Impact yield?	"… it is not currently seen as a threat to agriculture." More commonly occurs as an environmental weed. In agricultural situations it is somewhat useful as low quality fodder and does not appear to be strongly competitive. Not likely to affect yield in well-managed pastures. However, from information regarding the related sp. *Nassella neesiana*, it is likely to present a problem where grazing land is not actively managed. As *N. hyalina* does not appear to be as aggressive as *N. neesiana*, the impact on yield may not be as serious. Consider unknown effects.	CRC (2003)	**M**
20. Affect quality?	See comments in 19, above. Where sheep graze, cane needle grass as with other *Nassella* species has the potential to damage sheepskins and carcases, and is a possible contaminant of wool. Seed is approximately half the size of *N. neesiana* and may not have as serious an impact on wool or hide quality.	Grech (pers coms) Walsh (1998)	**ML**
21. Affect land value?	Impacts in agricultural activities not fully known. As with other *Nassella* sp. it may be that the value of infested land is decreased.		**M**
22. Change land use?	See comments in 19 and 20. Where the grass occurs in sheep grazing, a change to cattle may be indicated to overcome the problem of wool contamination and subsequent reduction in product quality. Perhaps not as serious as *N. leucotricha* or *N.. neesiana*.	Grech (pers coms)	**ML**
23. Increase harvest costs?	A perennial grass. Not known in cropping situations. Does not affect harvesting of plant crops. (See also comments for this question in *Nassella neesiana* impact assessment regarding handling sheep carcases; unknown consequence of contamination with *N. hyalina*, though potential exists.)		**M**
24. Disease host/vector?	It is not documented as a host or vector of disease.		**L**

Impact Assessment Record

Scientific Name: *Nassella hyalina* (Nees) Barkworth

Common name: cane needle grass

References cited:

Australian Weeds Committee (AWC), n.d., Weed identification: cane needlegrass, *Nassella hyalina*, viewed 01/10/04, http://www.weeds.org.au/cgi-bin/weedident.cgi?tpl=plant.tpl&ibra=all&card=G19

Cooperative Research Centre (CRC) for Australian Weed Management, 2003, Weed management guide: cane needle grass-*Nassella hyalina*, Commonwealth Department of Environment and Heritage, Australia

Coughenour, M.B. and Ellis, J.E., 1993, Landscape and climatic control of woody vegetation in a dry tropical ecosystem: Turkana district, Kenya, *Journal of Biogeography*, Vol: 20, No: 4, pp. 383–98

Harden, G., (ed), 1993, *Flora of New South Wales*, N.S.W. University Press, Kensington, pp.638–39

McLaren, D., Stajsic, V. and Gardener, M.R., 1998, 'The distribution and impact of South/North American stipoid grasses (Poaceae: Stipeae) in Australia', *Plant Protection Quarterly*, Vol: 13, No: 2, pp. 62–68.

Walsh, N.G., 1998, 'Identification of South American tussock weeds', *Plant Protection Quarterly*, Vol: 13, No: 2, pp. 59–62

Personal communications

Revisions

Date	Revised by	Revision
21 Oct 05	TDH	Criterion 19 revised up from L to M. Effects unknown but suspected to be similar to *N. neesiana* and *N. leucotricha*.
21 Oct 05	TDH	Criterion 20 revised up from L to ML. Effects not documented, but similarity with *N. neesiana* suggests impact may be greater than originally stated.
21 Oct. 05	TDH	Criterion 21 revised up from L to M in accordance with other revisions and additional data cited in *N. neesiana* impact assessment.
21 Oct 05	TDH	Criterion 22 revised up from L to ML in accordance with other revisions and additional data cited in *N. neesiana* impact assessment.
21 Oct 05	TDH	Criterion 23 revised up from L to M in accordance with other revisions and additional data cited in *N. neesiana* impact assessment.

Invasiveness Assessment Record

Scientific name: *Nassella leucotricha* (Trin. & Rupr.) Pohl Common Name: Texas needle grass

QUESTION	COMMENTS	REFERENCE	RANK
Establishment			
Germination requirements?	Growth is seasonal, so germination also assumed seasonal.	Leithead (1971)	**MH**
Establishment requirements?	Similar to N. Neesiana which establishes well in moderate shaded habitats.	Gould (1975)	**MH**
How much disturbance is required?	"Thrives under conditions of moderate disturbance and is frequently abundant on roadsides and heavily grazed pastures". Also a serious weed of grassland communities.	Gould (1975) McLaren *et al* (1998).	**MH**
Growth/Competitive			
Life form?	Grass-belonging to the family Poaceae.	TROPICOS (2000)	**MH**
Allelopathic properties?	None described.		**L**
Tolerates herb pressure?	Grazed by all livestock – consumed but recovers quickly/slowly? Produces seeds under moderate herbivory.	Leithead et al (1971).	**MH**
Normal growth rate?	"Makes most rapid growth in early fall before cold weather".	Leithead *et al* (1971)	**M**
Stress tolerance to frost, drought, w/logg, sal. etc?	Tolerant of drought (occurs in dry areas of Oklahoma, Texas and Central Mexico). (Hitchcock 1950).	Hitchcock (1950).	**L**
Reproduction			
Reproductive system	Plants bisexual with bisexual spikelets: with hermaphrodite florets. The spikelets all alike in sexuality.	Watson & Dallwitz (1985)	**ML**
Number of propagules produced?			**M**
Propagule longevity?			**M**
Reproductive period?	Short-lived perennial sp. – because short-lived, probably a short reproductive period.		**M**
Time to reproductive maturity?	Short-lived perennial sp. – because short-lived, probably a short time to reproductive maturity – assumed < two years.		**MH**
Dispersal			
Number of mechanisms?	"Seeds become attached to the hair and wool of grazing animals, which help distribute them".	Leithead (1971)	**MH**
How far do they disperse?	Animals could disperse 200-1000 m from source.		**MH**

Present distribution of *Nassella leucotricha* in Victoria

Species: *Nassella leucotricha* (Trin & Rupr.) R.W. Pohl
Common name: Texas needlegrass
Status: Not declared in Victoria

Habitat:
Grows best on deep loam soils (Leithead *et al* 1971). It is a weed of disturbed areas, especially roadsides, heavily grazed pastures and dry open grasslands (Gould 1975, Hitchcock 1950). Stipoid grasses generally invade plant communities that are already highly degraded and have a history of disturbance, and lands previously used for grazing and farming (Gardener and Sindel 1998). It is not highly shade tolerant and is replaced in woodland areas (Gould 1975).

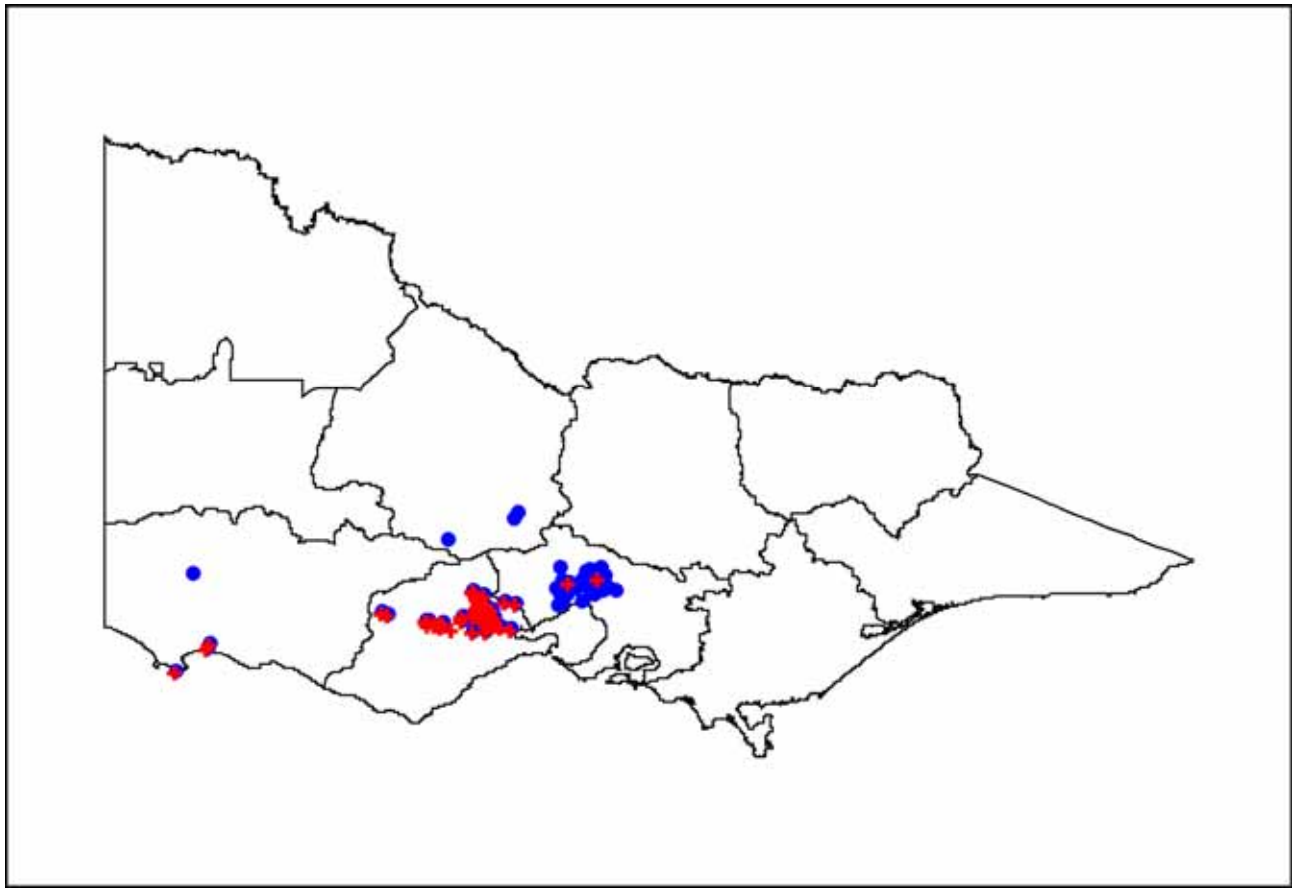
Present distribution in Victoria using Victorian Flora Information System (FIS) and IPMS.

Information from FIS (*blue circles*)

Number of records	212

Information from PMIS (*red crosses*)

Number of records	103
Total Area of infestation (ha)	46

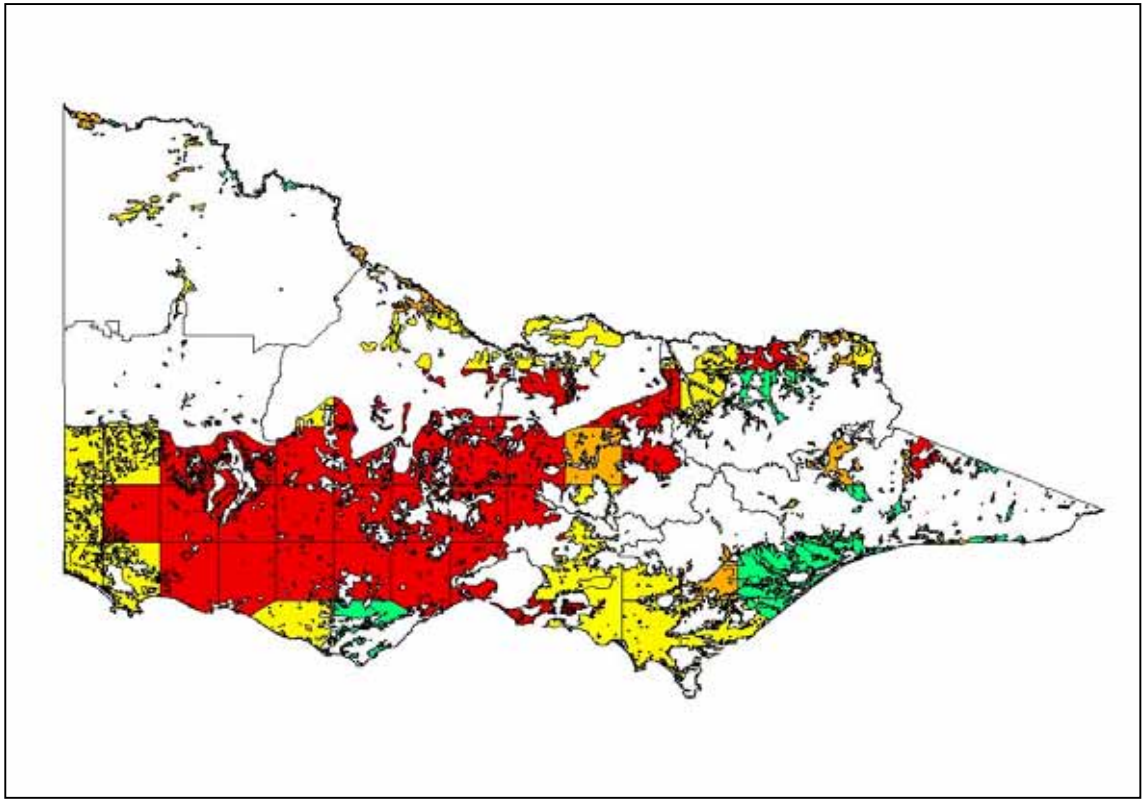


Potential distribution of *Nassella leucotricha* in Victoria

Species: *Nassella leucotricha* (Trin. & Rupr.) R.W. Pohl
Common name: Texas needle grass
Status: Not declared noxious in Victoria.
Habitat:
Grows best on deep loam soils (Leithead *et al* 1971). It is a weed of disturbed areas, especially roadsides, heavily grazed pastures and dry open grasslands (Gould 1975, Hitchcock 1950). Stipoid grasses generally invade plant communities that are already highly degraded and have a history of disturbance, and lands previously used for grazing and farming (Gardener and Sindel 1998). It is not highly shade tolerant and is replaced in woodland areas (Gould 1975).
Potential distribution produced from CLIMATE modelling and overlayed on suitable overlays with CMA boundaries.

OVERLAYS USED.
Land use:
Pasture irrigated and dryland
Broad vegetation types:
Coastal scrubs and grassland; grasslands; plains grassy woodlands; coastal grassy woodland; herb-rich woodlands; riverine grassy woodlands; rainshadow woodlands; mallee woodland; heathy woodland; wimmera mallee/woodland; inland slopes and sedge-rich woodlands.

Colours indicate possibility of *Nassella leucotricha* infesting these areas.
Red = Very high Yellow = High
Orange = Medium Green = Likely
In the non-coloured areas the plant is unlikely to establish as the climate, soil or landuse is not presently suitable.



Impact Assessment Record

Scientific Name: *Nassella leucotricha* (Trin. & Rupr.) Pohl

Common name: Texas needle grass

QUESTION	COMMENTS	REFERENCE	RATING
Social			
1. Restrict human access?	Tufted perennial grass to 1 m high. Would not restrict human access. See also images on page 3.	Walsh & Entwistle (1994)	**L**
2. Reduce tourism?	As with the other *Nassella* spp. Texas needle grass looks very similar to native *Austrostipa* spp. It is thus unlikely that the average visitor would notice this grass as being a weed. Tussock may not be as dense as *N. neesiana*, but the sharp seeds may cause some discomfort (see Liebert (1996) in *N. neesiana* impact assessment).	Walsh (1998)	**ML**
3. Injurious to people?	As a generalisation, it is considered that the sharp seeds of *Nassella* spp. penetrate and damage sheepskins and carcases. ("To prevent seed from injuring sheep…remove sheep for 2 to 3 weeks until seed ripen and fall to the ground.") However, such potential to injure humans very limited. See comment in 2, above.	Leithead *et al* (1971)	**ML**
4. Damage to cultural sites?	"In Victoria, *N. leucotricha*, invades mostly in native pasture and native grasslands." When present with other grasses it is probably not readily noticeable. No visual or structural impact.	McLaren *et al* (1998)	**L**
Abiotic			
5. Impact flow?	Terrestrial sp.		**L**
6. Impact water quality?	Terrestrial sp.		**L**
7. Increase soil erosion?	In its native range, Texas needle grass is a short-lived perennial. "Because its foliage disintegrates rapidly at end of growing season, it is a poor grass for soil protection." Bare patches of soil may be left exposed to wind erosion. Moderate probability of large-scale soil movement.	Leithead *et al* (1971)	**ML**
8. Reduce biomass?	Having a short growing season, where it replaces native grasses Texas needle grass may create a slight reduction in biomass.	Leithead *et al* (1971)	**MH**
9. Change fire regime?	Foliage disintegrates rapidly at the end of the growing season. Little addition to fuel load; no change to fire regime.	Leithead *et al* (1971)	**L**
Community Habitat			
10. Impact on composition (a) high value EVC	EVC=Grassy Woodland (E); CMA=Corangamite; Bioreg=Victorian Volcanic Plain; VH CLIMATE potential. "Stipoid grasses generally invade plant communities which are already highly degraded, …and evidence suggests that there is a drop in biodiversity in stipoid grass-dominated grasslands." Minor displacement of some dominant spp.	Gardener & Sindel (1998)	**ML**
(b) medium value EVC	It appears unlikely to occur or have any significant impact in medium value EVCs across the southern areas of Victoria. (Refer to potential distribution map.)		**L**
(c) low value EVC	It appears unlikely to occur or have any significant impact in low value EVCs across the southern areas of Victoria. (Refer to potential distribution map.)		**L**
11. Impact on structure?	Where it occurs in Victoria, it forms part of a mixed vegetation community. However, its presence will displace other more desirable native grass species. Likely to have at least a minor impact on the lower stratum.	McLaren *et al* (1998)	**M**
12. Effect on threatened flora?	This species is not documented as posing an additional risk to threatened flora.		**MH**

Scientific Name: *Nassella leucotricha* (Trin. & Rupr.) Pohl

Common name: Texas needle grass

QUESTION	COMMENTS	REFERENCE	RATING
Fauna			
13. Effect on threatened fauna?	This species is not documented as posing an additional risk to threatened fauna		**MH**
14. Effect on non-threatened fauna?	In Texas, it provides good forage as it is one of the few green grasses during winter. While it may displace some native grasses, it might also provide suitable alternative fodder to native herbivores.	Leithead *et al* (1971)	**L**
15. Benefits fauna?	No known benefits. It may provide additional food source during winter. See comment in 14 above. May provide some assistance.	Leithead *et al* (1971)	**MH**
16. Injurious to fauna?	The sharp seeds of *Nassella* spp. are considered to damage the skin and carcases of sheep, however, it is not known if fauna is subjected to similar threat.		**M**
Pest Animal			
17. Food source to pests?	Not documented as a food source to pest animals. A grass with that is, "…green and succulent," during winter, it may provide an alternate food source during that time.	Leithead *et al* (1971)	**L**
18. Provides harbor?	Short-lived perennial bunch grass. Foliage dies back rapidly after growing period. Unlikely to provide harbour to pest animals.	Leithead *et al* (1971)	**L**
Agriculture			
19. Impact yield?	Not known to occur in managed pasture; "In Victoria, *N. leucotricha*, invades mostly in native pasture and native grasslands." More commonly occurs as an environmental weed. In pasture situations it may be useful as fodder during winter. Not likely to affect yield in managed pastures. However, from information regarding the related sp. *Nassella neesiana*, it is likely to present a problem where grazing land is not actively managed. As *N. leucotricha* does not appear to be as aggressive as *N. neesiana*, the impact on yield may not be as serious. Consider unknown effects.	McLaren *et al* (1998) Grech (pers coms)	**M**
20. Impact quality?	See comments in 19, above. Where sheep graze, Texas needle grass has the potential to damage sheepskins and carcases, and is a likely contaminant of wool. Seed is similar in size to *N. neesiana* and likely to cause similar problems as wool contaminant and damage to hides, though perhaps not as extensively.	Grech (pers coms) Walsh (1998)	**MH**
21. Affect land value?	Impacts in agricultural activities not fully known. As with other *Nassella* sp. it may be that the value of infested land is decreased.		**M**
22. Change land use?	See comments in 19 and 20. Where the grass occurs in sheep grazing, a change to cattle may be indicated to overcome the problem of wool contamination.	Grech (pers coms)	**M**
23. Increase harvest costs?	Not known in cropping situations. A perennial grass. Does not affect harvesting of plant crops. (See also comments for this question for *Nassella neesiana*.)		**M**
24. Disease host/vector?	Along with other *Nassella* spp., Texas needle grass is not documented as a host or vector of disease.		**L**

Scientific Name: *Nassella leucotricha* (Trin. & Rupr.) Pohl Common name: Texas needle grass

References cited:

Leithead, H.L., Yarlett, L.L., Shiflet, T.N., 1971, Agriculture Handbook No. 389: 100 native forage grasses in 11 southern states, Soil Conservation Service, U.S. Department of Agriculture, Washington D.C.

McLaren, D., Stajsic, V. and Gardener, M.R., 1998, 'The distribution and impact of South/North American stipoid grasses (Poaceae: Stipeae) in Australia', *Plant Protection Quarterly*, Vol: 13, No: 2, pp. 62–68

Walsh, N.G. and Entwistle, T.G., 1994, *Flora of Victoria*, Vol 2, Inkata Press, Melbourne and Sydney

Walsh, N.G., 1998, 'Identification of South American tussock weeds', *Plant Protection Quarterly*, Vol: 13, No: 2, pp. 59–62

Personal communications

Grech, C., Project Officer, Victorian Department of Primary Industries.

Revisions

Date	Revised by	Revision
20 Oct 05	TDH	Criterion 20 revised up from L to MH. Effects not documented, but similarity with *N. neesiana* suggests impact may be greater than originally stated.
20 Oct. 05	TDH	Criterion 21 revised up from L to M in accordance with other revisions and additional data cited in *N. neesiana* impact assessment.
20 Oct 05	TDH	Criterion 22 revised up from L to M in accordance with other revisions and additional data cited in *N. neesiana* impact assessment.
20 Oct 05	TDH	Criterion 23 revised up from L to M in accordance with other revisions and additional data cited in *N. neesiana* impact assessment.

Impact Assessment Record

Scientific Name: *Nassella leucotricha* (Trin. & Rupr.) Pohl

Common name: Texas needle grass

Image source: University of Texas, Austin, http://www.esb.utexas.edu/mbierner/bio406d/images/pics/poa/nassella_leucotricha.htm

Invasiveness Assessment Record

Scientific name: *Nassella neesiana* (Trin. & Rupr.) Barkworth Common Name: Chilean needle grass

QUESTION	COMMENTS	REFERENCE	RATING
Establishment			
Germination requirements?	Seedlings emerged predominantly in autumn & spring, but emergence was also observed at other times of the year when sufficient moisture was available. However, lemma must be broken for germination.	Gardener *et al* (1999)	**MH**
Establishment requirements?	Require 'gaps', thus access to light. However, it is known to occur in grassy woodland (*Eucalyptus microcarpa* woodland)	Gardener *et al* (1999) McLaren (pers coms)	**MH**
How much disturbance is required?	Establishes in bushland / conservation areas, e.g. grassland and flora reserves	DNRE (1996) Gardener *et al* (1999)	**MH**
Growth/Competitive			
Life form?	Grass - belongs to the speargrass group of grasses	DNRE (1996)	**MH**
Allelopathic properties?	None described		**L**
Tolerates herb pressure?	Tolerates heavy grazing by livestock	DNRE (1996) Gardener *et al* (1996)	**MH**
Normal growth rate?	Highly invasive sp. with rapid population growth. Lack of effective competition from agricultural or native vegetation.	Liebert (1996) Champion (1995)	**H**
Stress tolerance to frost, drought, w/logg, sal. etc?	Tolerates drought, climatic & soil variation & fire. Presumably also waterlogging, as occurs in damp depressions (e.g. drainage lines).	DNRE (1996) Liebert (1996)	**MH**
Reproduction			
Reproductive system	Sexual (seeds) & asexual (asexual seeds are produced underground at the base of tillers).	DNRE (1996) Liebert (1996)	**H**
Number of propagules produced?	Up to 15,000 seeds per square meter can be found in the seed bank beneath infestations. Exponential decay curve suggests 12.4 years to reach 10 seeds/m2 from 7123seeds/m^2	DNRE (1996) Gardener *et al*. (2003)	**H**
Propagule longevity?	Seedbank long-lived; [a seedbank of 7100 seeds m^{-2} can] take 12.4 years to reach 10 seeds $m^{-2.}$	Gardener *et al* (1999)	**ML**
Reproductive period?	Perennial sp.; forms dense stands (self-sustaining monocultures) in pasture, bushland and parkland.	Liebert (1996)	**H**
Time to reproductive maturity?	Fast growing grass, whose seeds emerge between spring & autumn & other times of year in favourable conditions.	Liebert (1996)	**H**
Dispersal			
Number of mechanisms?	Propagules spread animals (usually stock), machinery, hay, soil, gravel, floodwater, even rubber tyres.	Liebert (1996)	**MH**
How far do they disperse?	Car / machinery could disperse seeds many km in short time. Seed (which has a long viability) can remain in sheep wool for > 6 months, & in that time disperse > 1 km, but more will disperse between 200 - 1000 metres.	Liebert (1996)	**MH**

Invasiveness Assessment Record

Scientific name: *Nassella neesiana* (Trin. & Rupr.) Barkworth Common Name: Chilean needle grass

References cited:

Champion, P., 1995, Assessment of plant pests proposed for inclusion in Auckland Regional Council's pest management strategies, National Institute of Water and Atmospheric Research (NIWA), Auckland, New Zealand.

Department of Natural Resources and Environment, 1996, Chilean needle grass, Landcare notes: pest plant identification, Keith Turnbull Research Institute, State of Victoria.

Gardener, M.R., Whalley, R.D.B. and Sindel, B.M., 1996, *The failure of management technology for reproductively efficient grassy weeds: the Chilean needle grass example: proceedings of the 11th Australian Weeds Conference*, Council of Australian Weed Science Societies, pp 243–246.

Gardener, M.R., Sindel, B.M. and Whalley, R.D.B., 1999, *Chilean needle grass(*Nassella neesiana*) - what we know and where to next?: proceedings of the 12th Australian Weeds Conference,* Tasmanian Weed Society Inc., pp 8–12.

Gardener, M. R., Whalley, R. D. B, & Sindel, B., 2003a, "Ecology of Nassella neesiana, Chilean needle grass, in pastures on the Northern tablelands of New South Wales. I. Seed production and dispersal." *Australian journal of Agricultural Research*, Vol 54, No 6, pp613-619.

Liebert, A., 1996, Chilean needle grass (*Stipa neesiana*): assessment report to the North Central CALP region, Department of Conservation and Natural Resources, State of Victoria.

Present distribution of *Nassella neesiana* in Victoria

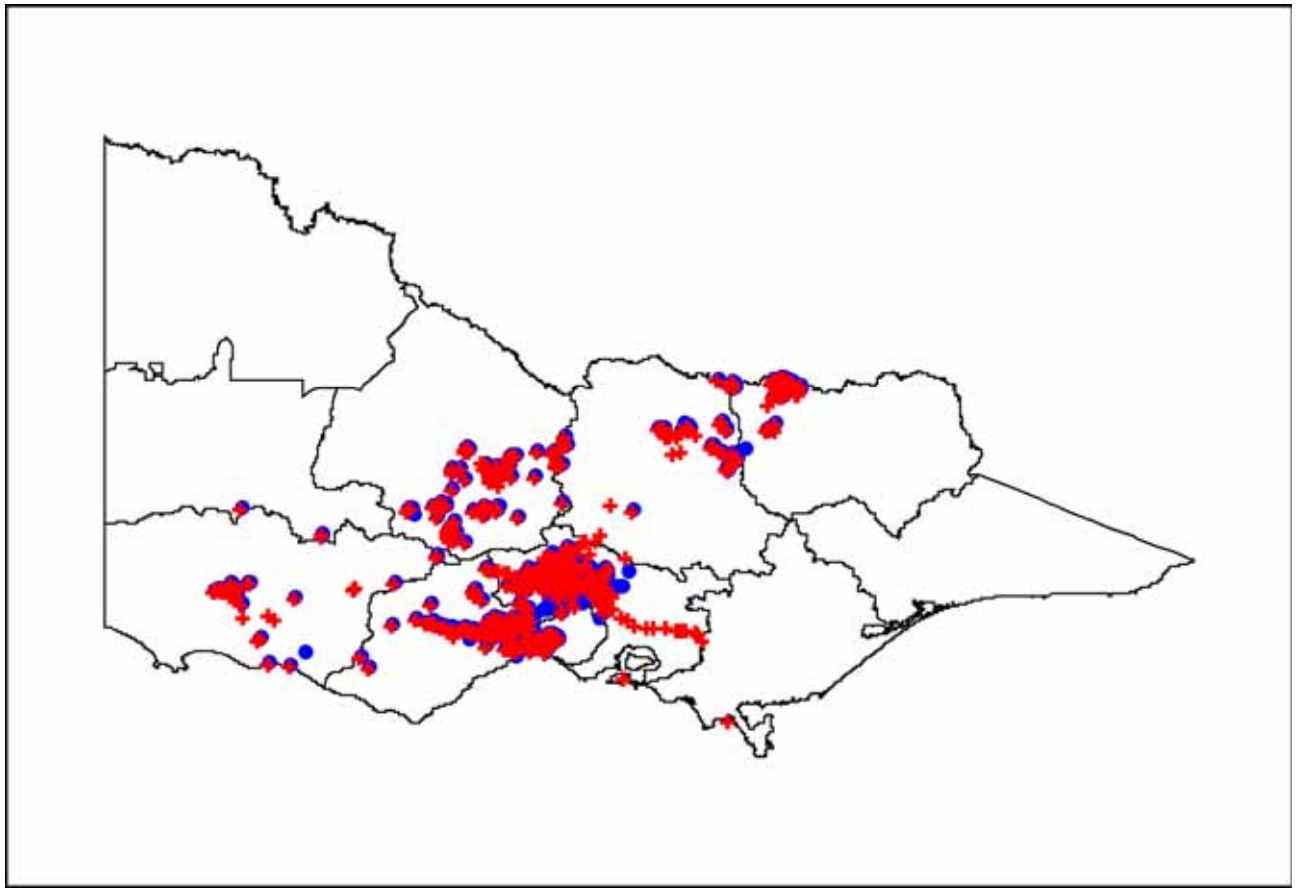
Species: *Nassella neesiana* Trin & Rupr.
Common name: Chilean needlegrass
Status: Not declared in Victoria; Weed of National Significance (WONS)

Habitat:
Seasonally dry environments, as well as a wide range of other climatic conditions (Champion 1995, Gardener *et al* 1996). Tends to be found on basalt soils, but has been reported on other soil types at several locations in Victoria (Gardener *et al* nd). Very invasive and forms dense stands in pastures, parkland, roadsides and near watercourses (Gardener 1996, Walsh and Entwisle 1994). Chilean needle grass can vigorously invade native grasslands and open woodlands (Liebert 1996).

Present distribution in Victoria using Victorian Flora Information System (FIS) and IPMS.

Information from FIS (*blue circles*)
Number of records 1676

Information from PMIS (*red crosses*)
Number of records 1133
Total Area of infestation (ha) 2000

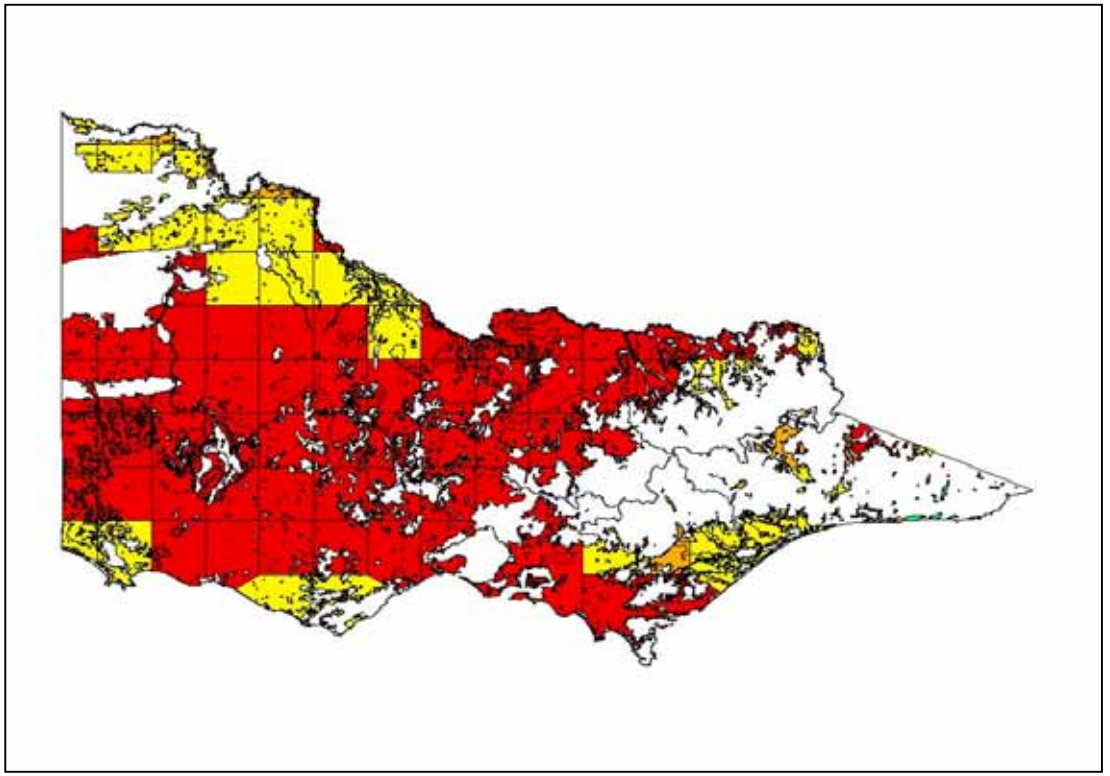


Potential distribution of *Nassella neesiana* in Victoria

Species: *Nassella neesiana* Trin. et Rupr.
Common name: Chilean needle grass
Status: Not declared noxious in Victoria.
Habitat:
Seasonally dry environments, as well as a wide range of other climatic conditions (Champion 1995, Gardener *et al* 1996). Tends to be found on basalt soils, but has been reported on other soil types at several locations in Victoria (Gardener *et al* nd). Very invasive and forms dense stands in pastures, parkland, roadsides and near watercourses (Gardener 1996, Walsh and Entwisle 1994). Chilean needle grass can vigorously invade native grasslands and open woodlands (Liebert 1996).
Potential distribution produced from CLIMATE modelling and overlayed on suitable overlays with CMA boundaries.

OVERLAYS USED.
Land use:
Pasture irrigated and dryland\
Broadacre cropping
Broad vegetation types:
Grasslands; plains grassy woodlands; coastal grassy woodland; herb-rich woodlands; riverine grassy woodlands; rainshadow woodlands; mallee woodland; heathy woodland; wimmera mallee/woodland; inland slopes and sedge-rich woodlands.

Colours indicate possibility of *Nassella neesiana* infesting these areas.
Red = Very high Yellow = High
Orange = Medium Green = Likely
In the non-coloured areas the plant is unlikely to establish as the climate, soil or landuse is not presently suitable.



Impact Assessment Record

Weed Name: *Nassella neesiana* (Trin. & Rupr.) Barkworth

Common name: Chilean needle grass

QUESTION	COMMENTS	REFERENCE	RANKING
Social			
1. Restrict human access?	"Chilean needle grass is a perennial tussock-forming grass. It usually forms dense clumps, and in the absence of grazing can grow to 1 m in height." Dense clumps may impede individual access.	ARMCANZ	**ML**
2. Reduce tourism?	"Chilean needle grass is a vigorous competitor spreading in extremely dense swards. The seeds cause discomfort for dogs and humans." Tussocks in dense swards may affect some recreational uses, particularly during flowering.	Liebert (1996)	**MH**
3. Injurious to people?	"The seeds cause discomfort for dogs and humans which presents a problem in recreational reserves."	Liebert (1996)	**ML**
4. Damage to cultural sites?	"An infestation of Chilean needle grass changes the natural appearance of native environment, downgrading it's (sic) aesthetic value." Dense clumps would create a negative visual effect.	Liebert (1996)	**ML**
Abiotic			
5. Impact flow?	Terrestrial species.		**L**
6. Impact water quality?	Terrestrial species.		**L**
7. Increase soil erosion?	"Chilean needle grass is a perennial tussock-forming grass. It usually forms dense clumps." "Landowners at Hawke's Bay have noted that it…provides good cover for erosion control." Not likely to increase soil erosion.	ARMCANZ Slay (2002)	**L**
8. Reduce biomass?	"It can almost completely displace perennial native grasses." It produces a denser sward than native grasses and is greater in height. Biomass likely to increase.	Liebert (1996)	**L**
9. Change fire regime?	"As a fire hazard, Chilean needle grass poses a greater threat than native grasses due to the greater height and density of the sward." Greatly changes the frequency of fire risk.	Liebert (1996)	**H**
Community Habitat			
10. Impact on composition (a) high value EVC	EVC=Plains grassy woodland (E); CMA=Glenelg Hopkins; Bioreg=Victorian Volcanic Plain; VH CLIMATE potential. "…Chilean Needle Grass can vigorously invade…native grasslands and open woodlands where it finds little competition." "…forms dense stands in…bushland and parkland." Serious impact on ground flora.	Gardener, *et al.* (1996) Liebert (1996)	**MH**
(b) medium value EVC	EVC=Grassy dry forest (D); CMA=North Central; Bioreg=Goldfields; VH CLIMATE potential. Impact similar to 10(a) above, however, it is most commonly found in open habitats. Plant growth and population density may be restricted.	Gardener, *et al.* (1996) Liebert (1996)	**MH**
(c) low value EVC	EVC=Heathy dry forest (D); CMA=North Central; Bioreg=Goldfields; VH CLIMATE potential. Impact similar to 10(b) above, however, population density may be restricted by competition from native plants.	Gardener, *et al.* (1996) Liebert (1996)	**ML**
11. Impact on structure?	"…Chilean Needle Grass can vigorously invade…native grasslands and open woodlands where it finds little competition." Major impact on ground flora.	Liebert (1996)	**MH**
12. Effect on threatened flora?	This species is not documented as posing an additional risk to threatened flora.		**MH**

Impact Assessment Record

Weed Name: *Nassella neesiana* (Trin. & Rupr.) Barkworth

Common name: Chilean needle grass

QUESTION	COMMENTS	REFERENCE	RANKING
Fauna			
13. Effect on threatened fauna?	This species is not documented as posing an additional risk to threatened fauna		**MH**
14. Effect on non-threatened fauna?	"It can almost completely displace perennial native grasses. Stock will only eat Chilean needle grass when it is young, not tall and stemmy." Potential to reduce available food source for native species.	Liebert (1996)	**ML**
15. Benefits fauna?	No known benefits.		**H**
16. Injurious to fauna?	"…the sharp seed are troublesome, penetrating the hides of sheep. Cattle hides are too thick for the seed to penetrate." "…irritation and potential blindness of stock from the seeds, causing loss of thrift." Potentially harmful to fauna species. Page: 2 Some producers have observed massive infections in cattle briskets (front of chest) and eye infections due to Chilean needlegrass, while others report mouth injury to horses. In one case, it is reported that grass seed caused blindness in cattle.	Gardener, *et al.* (1996) Liebert (1996)	**H**
Pest Animal			
17. Food source to pests?	Not known as a food source to pests.		**L**
18. Provides harbor?	Not known to provide harbor for pest animals.		**L**
Agriculture			
19. Impact yield?	"It is unpalatable to stock [when flowering]. Chilean needle grass is highly invasive and competes with desirable pasture species." "…this species produces large amounts of unpalatable flower stalks and very little leaf material resulting in a severe reduction of summer stock carry in capacity." "Productivity has been decreased by as much as 50% due to heavy infestations of Chilean needle grass." Serious impacts on quantity. See also comments in Notes below.	Liebert (1996) Gardener (nd) ARMCANZ	**H**
20. Impact quality?	"Chilean needle grass seeds contaminate wool and hay. [The seed also contributes to] vegetable fault in wool, abscesses in meat and holes in hides." Serious impact on quality. Some NSW abattoirs had rejected stock from some needle grass infested properties Potential for rejected product.	Liebert (1996) Woods (2003)	**H**
21. Affect land value?	"The competitive ability of and efficient reproductive mechanisms of *S. neesiana* have led this grass to dominate large areas of highly productive pastures in NSW and Victoria. Traditional control methods…have been tried…with little success." Infestations on sheep grazing properties reduce productive pasture during summer that can result in, "…a severe reduction in stock carrying capacity." Invasive nature, difficulty of control and impact on agricultural productivity suggest that land values would possibly decrease.	Gardener (nd)	**M**
22. Change land use?	"Attempts at controlling *N. neesiana* have failed. In light of this knowledge perhaps it is better that we consider *N. neesiana* as an intermediate quality pasture species and manage it as such." Page: 2 Some producers have observed massive infections in cattle briskets (front of chest) and eye infections due to Chilean needlegrass. In one case, it is reported that grass seed cause blindness in cattle. Changing from sheep to cattle to overcome the problems associated with sheep hide and meat quality may be questionable.	Gardener, *et al.* (1996) Nair (1993)	**H**

Impact Assessment Record

Weed Name: *Nassella neesiana* (Trin. & Rupr.) Barkworth Common name: Chilean needle grass

QUESTION	COMMENTS	REFERENCE	RANKING
	Landholders on NSW tablelands have found Chilean needle grass virtually impossible to control and so are now adjusting their farm management to be able to live with it and utilise it to the best of their ability. "The weed got to the stage where it was impossible to manage effectively with sheep…sheep and machinery pick up Chilean needle grass and spread it throughout the property." The invasivness of Chilean needle grass has forced Brett Kissell, Victoria , to move out of sheep and into bull beef production. Virtually impossible to prevent the input of seeds, especially cleistogenes that survive after slash/heavy graze "…once a seedbank has become established, this seedbank will remain despite any actions taken to control adult plants and or reduce seedbank." Eradication appears highly unlikely, thus land management will change to minimise the impacts of this grass, possibly leading to a major change in use if such management is not sustainable.	Lowien (2002) Hancock, *et al*. (2005) Gardener *et al*. (2003)	
23. Increase harvest costs?	Not known to affect harvesting, however, costs to hay producers (contaminated product) is high and real as hay is a major operation in the 'green wedges' where CNG exists and people do not have the grazing knowledge or management skills to utilise the spring pasture flush. It is reported that meat workers have cut their hands on the seed as they pushed the hides of carcasses. This would lead to an increase of indirect cost associated with harvesting product.	Grech (pers coms) Woods (2003)	**M**
24. Disease host/vector?	None evident.		**L**

References cited:

Agriculture & Resource Management Council of Australia & New Zealand, Australian & New Zealand Environment & Conservation Council and Forestry Minister, (2001) *Weed of National Significance Chilean Needle Grass (Nassella neesiana) Strategic Plan.* National Weeds Strategy Executive Committee, Launceston.

Gardener, M. nd. Stipa neesiana. (Information paper) University of New England.

Gardener, M., Whalley, R., Sindel, B. 1996. *The usefulness and ecology of Chilean needle grass (*Nassella neesiana) *as a pasture species in Argentina.* University of New England. NSW.

Gardener, M. R.,. Whalley, R. D. B, & Sindel, B., 2003, "Ecology of Nassella neesiana, Chilean needle grass, in pastures on the northern tablelands of New south Wales. II. Seedbank dynamics, seed germination, and seedling recruitment." *Australian journal of Agricultural Research*, Vol 54, No 6, pp621-626.

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Liebert, A. 1996. *Chilean Needle Grass:* Stipa neesiana. *Assessment Report to the North Central CaLP Region.* Department of Conservation and Natural Resources.

Lowien, J. (2002). Weed of National Significance - can it be controlled? A Good Weed, Weed Society of New South Wales. January.

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Notes:

2/08/05. Query on intensity rating for agricultural impacts.

There is some question regarding the severity of agricultural impacts in this assessment and that they are overstated.

The two main sources of information for this assessment are Gardener *et al* (1996) and Gardener (nd), and Liebert (1996), which document the range of impacts across both agricultural and natural ecosystems, respectively. It is clear from Liebert's report that, at the time, Chilean needle grass was more of a problem in natural than agricultural ecosystems in Victoria, reflected by the fact that most of the sites visited were in areas such as public reserves, a flora reserve, roadsides, beside railway line and farm paddock, etc. Gardener's papers are based on experience and research in NSW.

Acknowledging that NSW and Victoria have a different climate, which would influence the degree of affect of Chilean needle grass, it doesn't seem unreasonable to assume that the potential agricultural impacts that were experienced in NSW could also occur in Victoria. Such a conclusion is supported by the experience with Chilean needle grass in the Hawke's Bay region, New Zealand, (Slay 2002), which has a similar latitude and rainfall to areas at risk in Victoria. In that region, it was found that, "contaminated pasture allowed to seed will affect the welfare of stock and result in lost grazing and trading opportunities. Economic losses can be expected from damaged sheep pelts, contaminated wool, pasture seed and hay and general disruption of normal farming practices." Such is the potential risk in non-managed or poorly managed pasture, and this impact assessment assumes that a plant will have maximum potential.

On the positive side, CNG provides useful fodder during winter and spring, and it is reported that farmers in Victoria are able to, and do manage Chilean needle grass in grazing situations without serious impacts to yield or quality. (Lovick pers coms). In contrast, however, it is evident there are farmers who do not actively graze or manage infested paddocks, allowing it to flower and seed with the attendant loss of yield and / or quality (Smithyman pers coms).

Additional references:

Lovick, T., Project Manager Pest Plants, Victorian Department of Primary Industries, Benalla (personal communications)
Smithyman, D., Project Officer, Victorian Department of Primary Industries, Geelong (personal communications)
Grech, C, Research Officer, Victorian Department of Primary Industries, Attwood (personal communications)

Revisions

Date	Revised by	Revision
28/08/05	TDH	Criterion 21 'Affect land value' revised down to M rating. The likelihood of land value decreasing would possibly be more driven by the plant having a legal status (noxious weed), which demands some form of management or control, than the potential impact on agricultural productivity. It is considered that the value of land infested with CNG could be affected by <10%
18/10/05	TDH	Criterion 22 'Change in land use' revised up to H rating in light of additional information provided by Grech (pers comms.).
20/10/05	TDH	Criterion 23 revised up from L to M; additional information provided.

Invasiveness Assessment Record

Scientific name: *Pittosporum undulatum* Vent. Common Name: sweet pittosporum

QUESTION	COMMENTS	REFERENCE	RATING
Establishment			
Germination requirements?	"*P. undulatum* seedlings emerge after periods of wet weather." "Seeds may germinate after seed fall in spring, but most germinate in autumn." "Most seedlings at Langwarrin emerged in late autumn with the early rains, however, some also emerged in spring when the temperatures started to rise after winter."	Binggeli & Goodland (1997) Blood (2001) Gleadow (1982)	**MH**
Establishment requirements?	"Full sun or light shade."	PFF (2001)	**MH**
How much disturbance is required?	Invades undisturbed / minor disturbed natural ecosystems, e.g. heathland, sclerophyll forest & woodland, & riparian vegetation. "Much of the understorey in the relatively undisturbed forest of the Silvan water-catchment area consists, beside Pittosporum, of exotics such as holly (*Ilex europaeus*), cotoneaster and *Prunus* species."	Carr *et al* (1992) Gleadow (1983)	**H**
Growth/Competitive			
Life form?	Tree; other	Carr *et al* (1992)	**L**
Allelopathic properties?	"The successful invasion of *Pittosporum undulatum* displacement of native understorey plant species has been partially attributed to allelopathic effects."	Turnbridge *et al* (2000)	**ML**
Tolerates herb pressure?	"Following cutting of *Pittosporum*, it has a high capacity to resprout." "The ability of the seedling to recover suggests that if shoots were damaged the seedlings would be able to survive."	Goodland & Healey (1996) Gleadow (1982)	**MH**
Normal growth rate?	"*P. undulatum* becomes dominant in secondary forests & natural forest subjected to hurricane damage. In areas invaded by *P. undulatum* a sharp decrease in native species richness has been recorded."	Binggeli & Goodland (1997)	**MH**
Stress tolerance to frost, drought, w/logg, sal. etc?	"Drought & frost resistant." "Shoots are able to resprout after low-temperature fires." "Succeeds in dry soils, Tolerates maritime exposure."	Bodkin (1990) PFF (2001) Gleadow (1982)	**MH**
Reproduction			
Reproductive system	Reproduces by seed, self and cross-pollination. "Seed and suckers."	Maiden Blood (2001)	**H**
Number of propagules produced?	"The capsules usually contain 20 – 40 sticky orange seeds." "It is easily multiplied by seed, which is abundantly produced." Mature tree would easily produce >2000 seeds. "Large plants produce thousands of seeds annually."	Binggeli & Goodland (1997) Maiden Muyt (2001)	**H**
Propagule longevity?	"Fresh seed usually has a viability greater than 90%, but it declines significantly within two years."	Muyt (2001)	**L**
Reproductive period?	As a tree - not stated to be short-lived, etc. assumed to produce viable propagules for > 10 years.		**H**

Invasiveness Assessment Record

Scientific name: *Pittosporum undulatum* Vent. Common Name: sweet pittosporum

QUESTION	COMMENTS	REFERENCE	RATING
Time to reproductive maturity?	"Flowering starts at around 5 years of age."	Binggeli & Goodland (1997)	**ML**
Dispersal			
Number of mechanisms?	"Reproduces from seed with the help of birds who eat the fruit then excrete the seed, giving the plant excellent dispersal reliant upon the bird's range."	DPIWE (2001)	**H**
How far do they disperse?	Blackbirds main vector in Victoria - could disperse seed > 1km	Gleadow (1982)	**H**

References cited:

Bodkin, F., 1990, Encyclopaedia Botanica, Angus & Robertson, Australia.

Binggeli, P. and Goodland, T., 1997, Pittosporum undulatum Vent. (Pittosporaceae), viewed: 28/09/04, http://members.lycos.co.uk/woodyplantecology/docs/web-sp15.htm

Blood, K. 2001. *Environmental Weeds. A Field Guide for SE Australia*, CH Jerram, Science Publishers.

Carr, G.W., Yugovic, J.V. and Robinson, K.E. 1992, *Environmental Weed Invasions in Victoria: Conservation and Management Implications*, Department of Conservation and Natural Resources and Ecological Horticulture, Victoria.

DPIWE, 2001. ????

Gleadow, R.M., 1982, Invasion by *Pittosporum undulatum* of the forests of central Victoria, 2, Dispersal, germination and establishment, *Australian Journal of Botany*, Vol 30, No. 2, pp. 185–198.

Gleadow, R.M., 1983, 'Sweet pittosporum: friend or foe?', *Parkwatch*, no. 135, pp 26-29.

Goodland, T. and Healey, J.R., 1996, The control of the Australian tree *Pittosporum undulatum* in the Blue Mountains of Jamaica, University of Wales, Bangor.

Muyt, A. 2001, *Bush Invaders of South-East Australia. A guide to the identification and control of environmental weeds found in South-East Australia*, R.G. & F.J. Richardson Victoria.

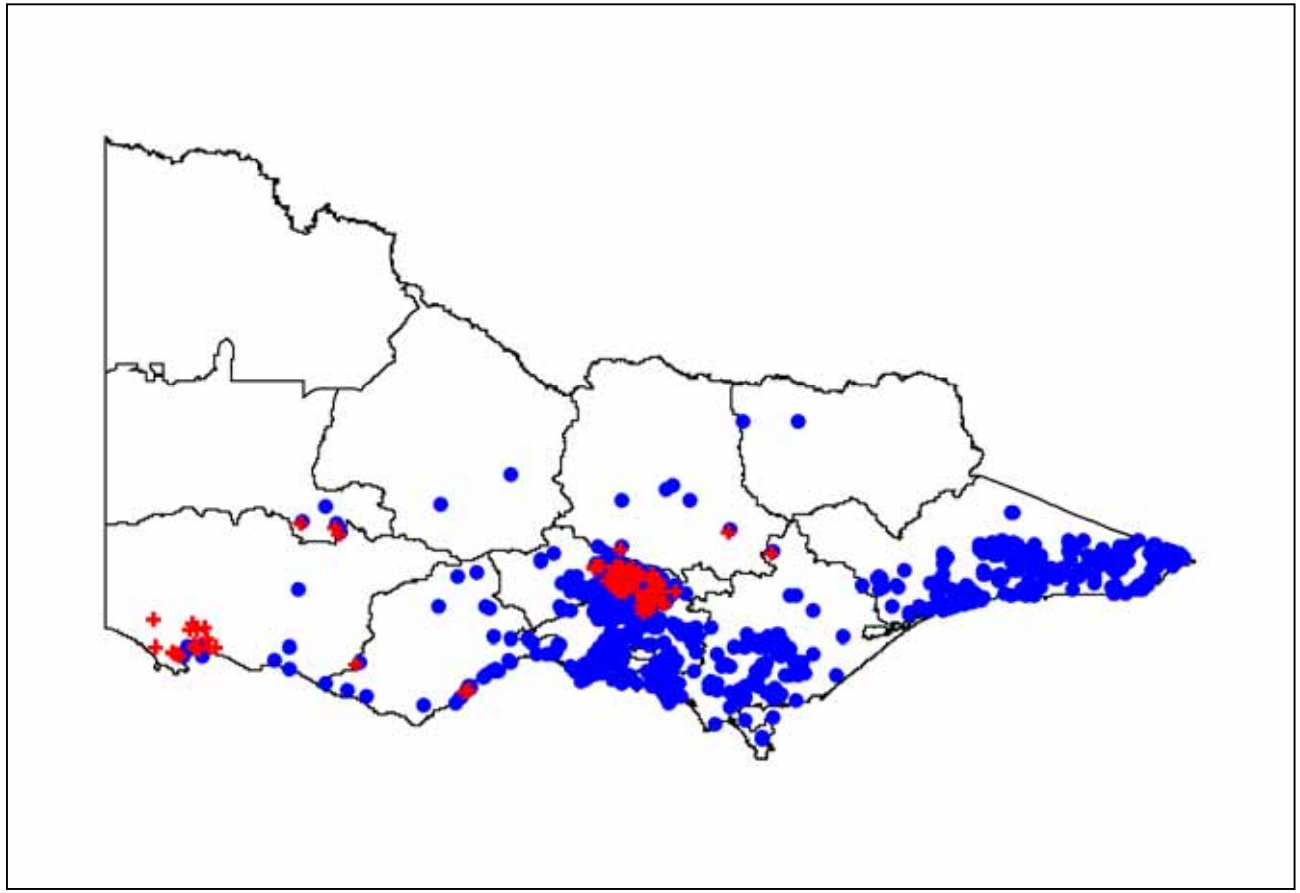
PFF (Plants For a Future), Pittosporum undulatum, viewed: 28/09/04, http://www.comp.leeds.ac.uk/cgi-bin/pfaf/arr_html?Pittosporum+undulatum

Turnbridge, A., Simmons, D., Adams, R., 2000, '*P. undulatum* Vent. on the germination of selected native plant species 1987 – 1997', *The Victorian Naturalist*, Vol 117, No. 2, pp 44 – 50.

Present distribution of *Pittosporum undulatum* in Victoria

Species: *Pittosporum undulatum* Vent.
Common name: sweet pittosporum
Status: Not declared in Victoria

Habitat:
Common in a variety of climates and habitat types, from moist sub-tropical to dry temperate, including wet and dry forest environments, riparian and coastal communities, rocky gullies and on bluffs and cliffs within range of severe salt spray (Binggeli and Goodland 1997, Gleadow 1983, Mullett and Simons 1995). Sweet pittosporum invades dry coastal vegetation, heathland and heathy woodland, lowland grassland and grassy woodland, dry sclerophyll forest and woodland, damp sclerophyll forest, wet sclerophyll forest, and riparian vegetation (Carr *et al* 1992).



Present distribution in Victoria using Victorian Flora Information System (FIS) and IPMS.

Information from FIS (*blue circles*)
Number of records 2412

Information from PMIS (*red crosses*)
Number of records 157
Total Area of infestation (ha) 310

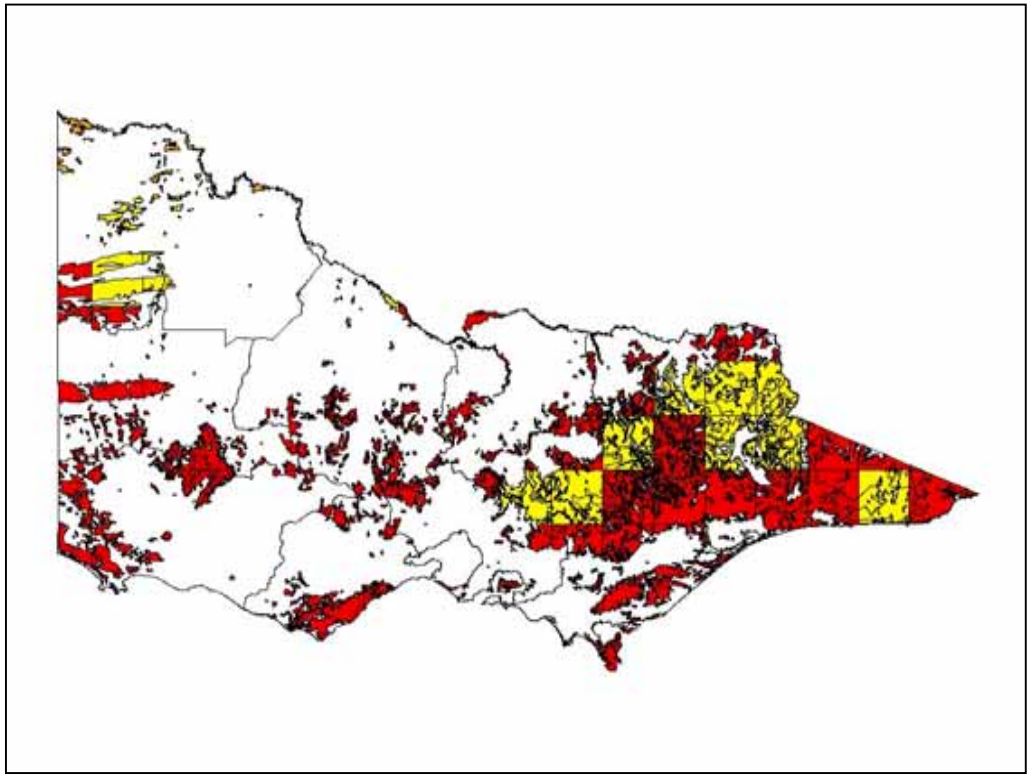
Potential distribution of *Pittosporum undulatum* in Victoria

Species: *Pittosporum undulatum* Vent
Common name: Sweet pittosporum
Status: Not declared noxious under the *Catchment and Land Protection Act* 1994.
Habitat:
Common in a variety of climates and habitat types, from moist sub-tropical to dry temperate, including wet and dry forest environments, riparian and coastal communities, rocky gullies and on bluffs and cliffs within range of severe salt spray (Binggeli and Goodland 1997, Gleadow 1983, Mullett and Simons 1995). Sweet pittosporum invades dry coastal vegetation, heathland and heathy woodland, lowland grassland and grassy woodland, dry sclerophyll forest and woodland, damp sclerophyll forest, wet sclerophyll forest, and riparian vegetation (Carr *et al* 1992).

Potential distribution produced from CLIMATE modelling and overlayed on suitable overlays with CMA boundaries.

OVERLAYS USED.
Land use:
Forestry private and public
Broad vegetation types:
Coastal scrubs and grassland; dry foothill forest; moist foothill forest; montane dry woodland; montane moist woodland; sub-alpine woodland; grassland; plains grassy woodland; coastal grassy woodland; herb-rich woodland; montane grassy woodland; riverine grassy woodland; riparian forest; rainshadow woodland; mallee-heath; boinka-raak; mallee woodland; heathy woodland; wimmera mallee/woodland; lowland forest; heath; swamp scrub; box-ironbark forest; inland slopes and sedge-rich woodland.

Colours indicate possibility of *Pittosporum undulatum* infesting these areas.
Red = Very high Yellow = High
Orange = Medium Green = Likely
In the non-coloured areas the plant is unlikely to establish as the climate, soil or landuse is not presently suitable.



Impact Assessment Record
Scientific ame: *Pittosporum undulatum* Common name: sweet pittosporum

QUESTION	COMMENTS	REFERENCE	RATING
Social			
1. Restrict human access?	An evergreen shrub or small tree with dense foliage, 4 – 14 metres tall. Capable of invading a broad range of habitats. Is used widely for hedges, ornament or windbreaks. Dense stands do occur in clumps and may be a nuisance to humans on foot.	Blood (2001) Mullett & Simmons (1995)	**ML**
2. Reduce tourism?	Where dense clumps occur in open forest they may be a minor nuisance to bushwalkers.	Mullett & Simmons (1995)	**ML**
3. Injurious to people?	No documented toxic or harmful physical properties.		**L**
4. Damage to cultural sites?	Over time, clump enlargement can occur in some sites leading to almost monospecific stands. The consequent reduction in species diversity may create a negative visual effect.	Mullett & Simmons (1995)	**ML**
Abiotic			
5. Impact flow?	Terrestrial species		**L**
6. Impact water quality?	Terrestrial species		**L**
7. Increase soil erosion?	The root system is variable and adapts to the type of soil. In sandy soils a taproot develops, while in clay soils the root system is diffuse and branched. With such a variable root system and the dense evergreen canopy the presence of *P. undulatum* is unlikely to contribute to soil erosion.	Gleadow (1982) Gleadow & Ashton (1981)	**L**
8. Reduce biomass?	In one study an infested site in a eucalypt woodland showed a decrease in cover and abundance of indigenous species from 100% to 10% when comparing a minimally infested area to one dominated by *P. undulatum*. Most of the species affected where understorey shrubs, herbs and grasses. Although clumped infestations may produce a dense evergreen canopy, it is possible that biomass may decrease slightly due to the reduction in the overall number of species.	Mullett & Simmons (1995)	**MH**
9. Change fire regime?	"*Pittosporum undulatum* is fire sensitive." Within its native range wildfire, amongst other natural controls, keeps pittosporum populations in check. "…natural and prescribed burns [in the forests of the greater Melbourne region] are controlled to the extent that fires rarely reach temperatures high enough to be fatal to *P. undulatum.*" This suggests that *P. undulatum* of itself is not a highly flammable plant, and would thus have little impact on the intensity of fire. It is known to displace understorey species including grasses, and this may have an effect of reducing the frequency of fire. Negligible effect on fire risk.	Mullett & Simmons (1995)	**L**
Community Habitat			
10. Impact on composition (a) high value EVC	EVC=grassy woodland (V); CMA=Corangamite; Bioreg=Otway ranges; VH CLIMATE potential Can lead to significant reduction on species diversity, particularly in lower and mid strata. Major displacement of dominant spp. within different layers. See comments at question 11.	Mullett & Simmons (1995)	**MH**
(b) medium value EVC	EVC=herb-rich foothill forest (D); CMA=Corangamite; Bioreg=Otway ranges; VH CLIMATE potential See comment above.		**MH**
(c) low value EVC	EVC=riparian forest (LC); CMA=Corangamite; Bioreg=Otway ranges; VH CLIMATE potential See comment in 10(a) above.		**MH**

Impact Assessment Record
Scientific ame: *Pittosporum undulatum* Common name: sweet pittosporum

QUESTION	COMMENTS	REFERENCE	RATING
11. Impact on structure?	"The total cover and abundance of indigenous species was reduced from over 100% in quadrats where *P. undulatum* was minimal, to less than 10% in the central quadrats where *P. undulatum* cover was highest. Species diversity fell from a maximum of 25 species per quadrat to an almost complete floristic impoverishment." Mostly understorey spp. were affected. Major effect on lower and mid strata.	Mullett & Simmons (1995)	**MH**
12. Effect on threatened flora?	The spread of *Pittosporum undulatum* outside is native range is considered a potentially threatening process and has been declared as such under the *Flora and Fauna Guarantee Act* 1988. In particular it threatens the rare Forest Red Gum Grassy Woodland community in the lowland Gippsland plains.	DSE (1994)	**H**
Fauna			
13. Effect on threatened fauna?	This species is not documented as posing an additional risk to threatened fauna		**MH**
14. Effect on non-threatened fauna?	Over time and in the absence of management controls, the population density of *P. undulatum* increases, which has a known impact on reducing species diversity. In spite of the research undertaken to date on the impacts of the spread of *P. undulatum* no data is available to indicate how fauna is affected, if at all. Mullet (1999) suggests that, "…impacts of the floristic and structural simplification associated with *P. undulatum* invasion on faunal assemblages are unknown, but presumably substantial". Significant reduction in habitat for fauna possibly leading to reduce numbers.	Mullet (1999)	**MH**
15. Benefits fauna?	Native frugivorous birds are known to feed on the fleshy fruit, e.g. Pied Currawongs (*Strepera graculina*), Satin Bowerbirds (*Ptilonorhynchus violaceus*) and Silvereyes (*Zosterops lateralis*).	Mullett (1999)	**MH**
16. Injurious to fauna?	No effect		**L**
Pest Animal			
17. Food source to pests?	"*P. undulatum* seeds from a large part of the diet of the introduced European blackbird (*Turdus merula*) during winter." Food source to minor pest species	Gleadow (1982)	**ML**
18. Provides harbor?	The dense, evergreen canopy and bushy habit of the plant would likely provide for the pest birds that feed on the fruit.		**ML**
Agriculture			
19. Impact yield?	Not known as a weed of agriculture.		**L**
20. Impact quality?	Not known as a weed of agriculture.		**L**
21. Affect land value?	Not known as a weed of agriculture.		**L**
22. Change land use?	Not known as a weed of agriculture.		**L**
23. Increase harvest costs?	Not known as a weed of agriculture.		**L**

QUESTION	COMMENTS	REFERENCE	RATING
24. Disease host/vector?	None evident in spite of extensive research undertaken for this species.		**L**

References cited:

Blood, K. 2001, *Environmental weeds. a field guide for SE Australia,* CH Jerram, Science Publishers.

Department of Sustainability and Environment (DSE), 1994, 'The spread of Pittosporum undulatum in areas outside its natural range: declared threatening process', Flora and Fauna Guarantee act 1988, File no. 92/4216 & 93/0384.

Gleadow, R.M., 1982, 'Invasion by *Pittosporum undulatum* of the forests of central Victoria, II. Dispersal, germination and establishment', *Australian Journal of Botany*, Vol: 30, pp: 185–98.

Gleadow, R.M. & Ashton, D.H, 1981, 'Invasion by *Pittosporum undulatum* of the forests of central Victoria, I. Invasion patterns and plant morphology', *Australian Journal of Botany*, Vol: 29, pp. 705–20.

Mullet, T. and Simmons, D., 1995, 'Ecological impacts of the environmental weed sweet pittosporum (*Pittosporum undulatum* Vent.) in dry sclerophyll forest communities, Victoria', *Plant Protection Quarterly* Vol: 10, No. 4, pp 131–38.

Mullett, T.L., 1999, *Some characteristics of a native environmental weed:* Pittosporum undulatum: *Twelfth Australian Weeds Conference,* Tasmanian Weed Society, pp. 592–95.

Invasiveness Assessment Record

Scientific name: *Sagittaria graminea* Michx. Common Name: Arrowhead

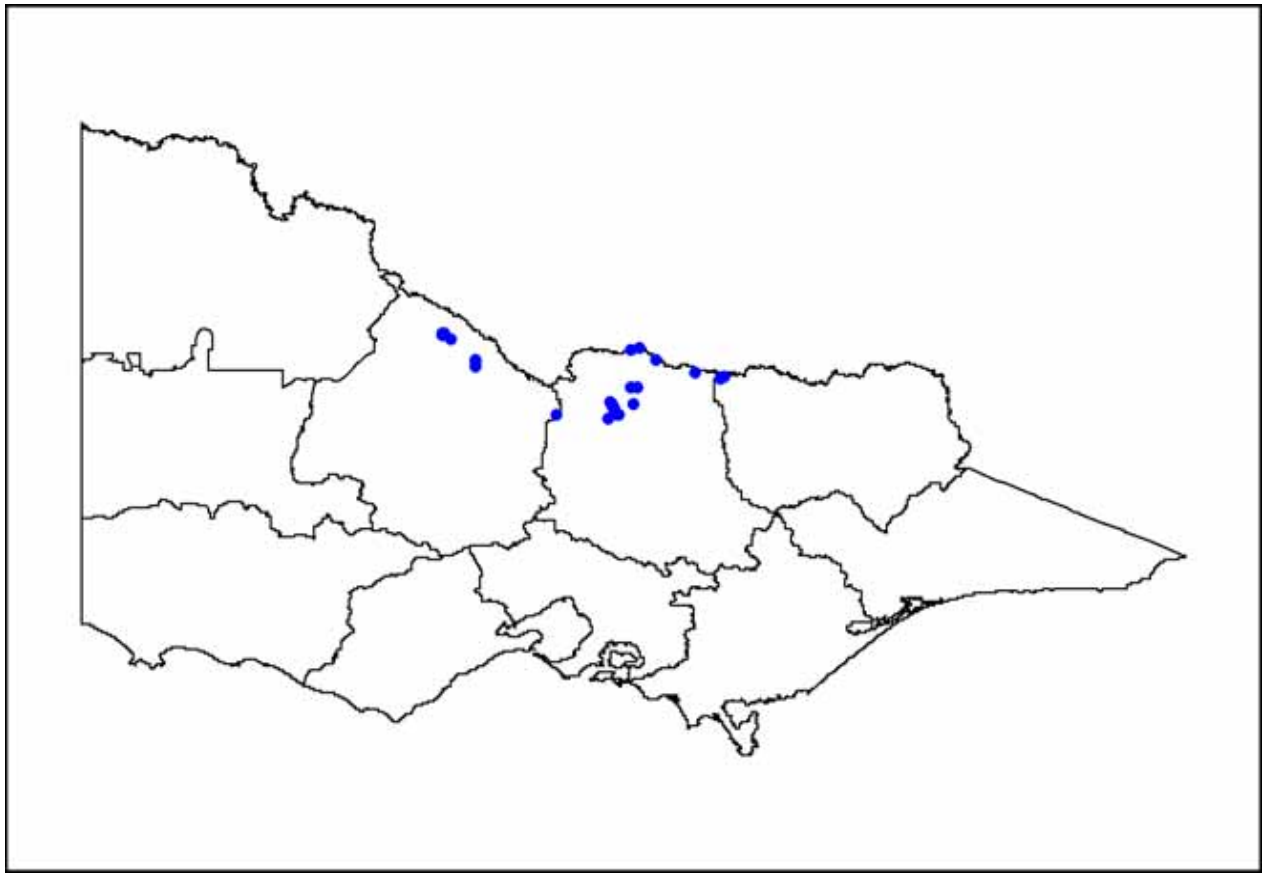
QUESTION	COMMENTS	REFERENCE	RANK
Establishment			
Germination requirements?	Seeds germinate as temperatures rise in spring. Rhizomes begin to form on seedlings about a month after germination.	P & C (1992)	**MH**
Establishment requirements?	Establishes in 'open' habitats. (See 'habitats' notes).	P & C (1992)	**ML**
How much disturbance is required?	Establishes in highly disturbed natural ecosystems. E.g. irrigation channels and drainage systems associated with permanent swamps.	P & C (1992)	**ML**
Growth/Competitive			
Life form?	Emergent aquatic perennial herb.	P & C (1992)	**H**
Allelopathic properties?	None described.		**L**
Tolerates herb pressure?	Spoonbills and carp have been observed feeding on the plant. Either or both of these animals may have been the cause of the plants disappearance on river flats along the River Murray. Small patches, however, reappeared. (Black 1987).	Black (1987)	**ML**
Normal growth rate?	*Sagittaria* competes strongly with h*ydrilla.*	P & C (1992)	**MH**
Stress tolerance to frost, drought, w/logg, sal. etc?	Tolerates water logging and fire as occurs in aquatic habitats.	P & C (1992)	**MH**
Reproduction			
Reproductive system	Reproducing by seed, rhizomes and tubers.	P & C (1992)	**H**
Number of propagules produced?	? "Hundreds of viable seeds produced from each flower".	Champion (1995)	**M**
Propagule longevity?	?		**M**
Reproductive period?	Forms dense monocultures. (See picture in P & C 1992 p. 35).	P & C (1992)	**H**
Time to reproductive maturity?	Seeds germinate in spring and flowering stems appear in summer.	P & C (1992)	**H**
Dispersal			
Number of mechanisms?	Some seeds are eaten by ducks and believed to be viable when excreted, while others may float some distance before sinking.	P & C (1992)	**H**
How far do they disperse?	Most seeds drop within the parent colony (< 20 m). However, some bird dispersed seeds may disperse > 1 km.	P & C (1992)	**H**

Present distribution of *Sagittaria graminea* in Victoria.

Species: *Sagittaria graminea* Michx. (*Sagittaria platyphylla* (Englem.). J.G. Sm., N. Amer. Sagittaria 55, t.26 (1894))[1]
Common name: Arrowhead
Status: Not declared noxious in Victoria.
Habitat:
Warm-temperate and subtropical shallowly flooded to about 45 cm or marshy areas associated with rivers and streams (Parsons and Cuthbertson 1992). It is a weed of drainage ditches and permanent swamps associated with irrigation and drainage systems in south-eastern Australia (Parsons and Cuthbertson 1992). Arrowhead invades permanent freshwater wetlands (Carr *et al* 1992).

Present distribution in Victoria using Victorian Flora Information System (FIS). No records exist in IPMS.

Information from FIS (*blue circles*)
Number of records 59
Note: These locations refer to the species *Sagittaria platyphylla*.



1. In Victoria the accepted name of this species is *Sagittaria platyphylla*. In this map, the previous name of *S. graminea* is used for conformity with the original nomination for assessment as a noxious weed.
(Ref: Ross,J.H., and Walsh, N.G., 2003, *A census of the vascular plants of Victoria*, 7th ed, Royal Botanic Gardens, Melbourne.)

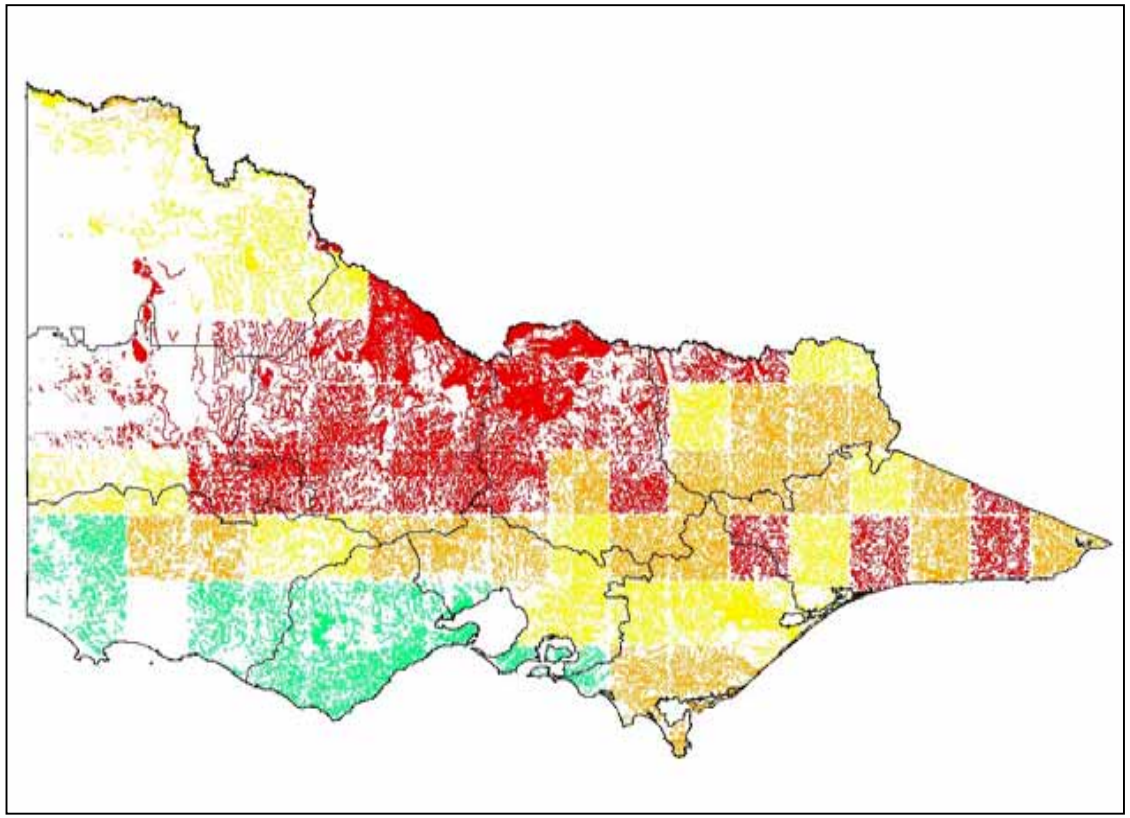
Potential distribution of *Sagittaria graminea* in Victoria.

Species: *Sagittaria graminea* Michx.
Common name: Arrowhead
Status: Not declared noxious in Victoria.
Habitat:
Warm-temperate and subtropical shallowly flooded to about 45 cm or marshy areas associated with rivers and streams (Parsons and Cuthbertson 1992). It is a weed of drainage ditches and permanent swamps associated with irrigation and drainage systems in south-eastern Australia (Parsons and Cuthbertson 1992). Arrowhead invades permanent freshwater wetlands (Carr *et al* 1992).

Potential distribution produced from CLIMATE® modeling with CMA boundaries.

No overlays used; as an aquatic species land use or broad vegetation types do not limit its distribution.

Colours indicate possibility of *Sagittaria graminea* infesting these areas.
Red = Very high Yellow = High
Orange = Medium Green = Likely
In the non-coloured areas the plant is unlikely to establish as the climate, soil or landuse is not presently suitable.



Impact Assessment Record
Scientific Name: *Sagittaria graminea* Common name: arrowhead

QUESTION	COMMENTS	REFERENCE	RATING
Social			
1. Restrict human access?	An emergent aquatic perennial herb. Inhabits shallowly flooded (to 45cm) or marshy areas associated with rivers and streams. In south eastern Australia it is commonly found in drainage ditches and permanent swamps associated with irrigation and drainage systems. Would not affect land-based activities.	Parson & Cuthberston (2001)	**L**
2. Reduce tourism?	Although most commonly found in drainage ditches and irrigation canals, it has also been found in a number of creeks in Victoria including Nine Mile Creek, Wunghnu and Bullock Creek near the junction of the Oven and Murray Rivers. In drain and irrigation channels it can form dense infestations. Likewise, in similar slow-flowing creeks its presence may affect water-based activities such as fishing or swimming.	Parson & Cuthberston (2001)	**MH**
3. Injurious to people?	No known toxic or physical properties. Other tuber forming species such as *S. sagittifolia* are eaten by ducks and sometimes humans. Not harmful.	Parson & Cuthberston (2001)	**L**
4. Damage to cultural sites?	An aquatic species. Not likely to occur in any site of cultural significance.		**L**
Abiotic			
5. Impact flow?	"Sagittaria grows in static or slow-moving freshwater such as drains, streams and pond margins, up to a depth of 45cm. [It] forms extensive infestations in shallow waterways, seriously restricting water flow and increasing sedimentation, thus aggravating flooding." An emergent aquatic, firmly rooted. Would have serious impact on surface and sub-surface flows in slow-moving water bodies.	Bay of Plenty Parson & Cuthberston (2001)	**H**
6. Impact water quality?	In flowing water it occurs on stream margins and can obstruct flow. Its presence in Victoria, though well known, has not produced any reports of serious impact on water quality. Dense infestations may have a minor impact on dissolved O_2 or light levels.	Sainty & Jacobs (1981)	**ML**
7. Increase soil erosion?	In New Zealand it, "forms extensive infestations in shallow waterways, seriously restricting water flow and increasing sedimentation, thus aggravating flooding." Increased chance of flooding would create the potential for large-scale soil movement with minor off-site implications.	Bay of Plenty	**MH**
8. Reduce biomass?	Where it occurs in drainage channels and irrigation canals little other vegetation would normally exist. Infestations of arrowhead would increase biomass.	Parson & Cuthberston (2001)	**ML**
9. Change fire regime?	Aquatic species. No effect on fire regime.		**L**
Community Habitat			
10. Impact on composition (a) high value EVC	Aquatic species	Parson & Cuthberston (2001)	**L**
(b) medium value EVC	Aquatic species	Parson & Cuthberston (2001)	**L**
(c) low value EVC	Aquatic species	Parson & Cuthberston (2001)	**L**
11. Impact on structure?	It has the potential to, "…replace natural communities on stream margins." Potential to dominate native aquatic species.	Champion (1995)	**MH?**

Impact Assessment Record
Scientific Name: *Sagittaria graminea* Common name: arrowhead

QUESTION	COMMENTS	REFERENCE	RATING
12. Effect on threatened flora?	This species is not documented as posing an additional risk to threatened flora.		**MH**
Fauna			
13. Effect on threatened fauna?	This species is not documented as posing an additional risk to threatened fauna		**MH**
14. Effect on non-threatened fauna?	No known negative impacts on native fauna. See also comment in 15 below.		**L**
15. Benefits fauna?	In South Australia, spoonbills have been observed digging up plants to get at the corms. The plant may provide an alternate source of food. (Note: It is believed that such predation led to the disappearance of an infestation along the Murray River in South Australia.)	Black (1987)	**MH**
16. Injurious to fauna?	Spoonbills and carp have been observed feeding on the plant. Not harmful	Parson & Cuthberston (2001)	**L**
Pest Animal			
17. Food source to pests?	Carp have been observed feeding on the plant. (Consider a serious aquatic pest)	Parson & Cuthberston (2001)	**MH**
18. Provides harbor?	Unlikely to provide any additional harbour not already available by native species.		**L**
Agriculture			
19. Impact yield?	Aquatic species. Would not affect yield		**L**
20. Impact quality?	Aquatic species. Would not affect quality of produce		**L**
21. Affect land value?	Aquatic species. It may affect the value of irrigated land due to increased costs relating to keeping channels clear. Very minor.		**L**
22. Change land use?	Aquatic species. Infestations are unlikely to affect land use.		**L**
23. Increase harvest costs?	Aquatic species. The cost of keeping irrigation channels open may increase production costs, but not affect harvesting.		**L**
24. Disease host/vector?	None documented.		**L**

References cited:
Bay of Plenty Regional Council, Sagittaria graminea, http://www.envbop.govt.nz/weeds/weed6.asp viewed 15/11/04
Sainty, G.R. & Jacobs, S.W.L., 1981, *Waterplants of New South Wales*, Water Resources Commission, NSW.

Invasiveness Assessment Record

Scientific name: *Spartium junceum* L. Common Name: Spanish broom

QUESTION	COMMENTS	REFERENCE	RATING
Establishment			
1. Germination requirements?	"Seeds germinate readily without any pretreatment, but scarification gives greater germination results." "Spanish broom rapidly colonizes disturbed habitats." Requires natural seasonal disturbance, though human disturbance may stimulate germination.	Hoshovsky (1986) Cal-IPC	**MH**
2. Establishment requirements?	As a weed in California, it occurs commonly in disturbed places such as eroded slopes, riverbanks, roadsides and abandoned or disturbed land. Likely to require open sites with access to light and water. "…brooms do not establish well in highly shaded areas."	Cal-IPC LeBlanc (2001)	**ML**
3. How much disturbance is required?	Establishes in highly (human) disturbed natural ecosystems.	Cal-IPC	**ML**
Growth/Competitive			
4. Life form?	Perennial leguminous sp.	Hoshovsky (1986)	**MH**
5. Allelopathic properties?	None described. A nitrogen-fixing plant, it may inhibit the growth of some native species by changing the soil chemistry.	Hoshovsky (1986)	**ML**
6. Tolerates herb pressure?	Broom plants were grown for a number of domestic uses including cattle fodder. However, as the plant contains alkaloids and is known to "…cause to vomit with great violence", it likely to be avoided by animals. As with other broom species, it is	LeBlanc (2001) Grieve (1981)	**H**
7. Normal growth rate?	With brooms generally, "stem growth can be rapid during the first year." Growth rate is probably at least equal to similar species.	LeBlanc (2001)	**MH**
8. Stress tolerance to frost, drought, w/logg, sal. etc?	In California, *S. junceum* tolerates dry conditions, but it is restricted to lower elevations due to cold winter temperatures. In Washington state, it is known to flower from July (summer) to the first frosts. These frosts are not known to kill the below-ground parts of the plant. "Spanish broom is the most drought resistant of the broom species." The plant can withstand cool fires (i.e. soil temps < 149°C), but a hot fire that, "…kills all above-ground stems and burns hot and close to the ground will completely kill standing individuals." Tolerant of drought, frost and cool fires.	LeBlanc (2001) Coggan (2003) Cal-IPC	**MH**
Reproduction			
9. Reproductive system	Sexual reproduction, both self- and cross-pollinated	Bossard (2003)	**ML**
10. Number of propagules produced?	"One plant can easily produce 7,000 to 10,000 seed in one season."	Cal-IPC	**H**
11. Propagule longevity?	"Seed viability is at least five years."	Cal-IPC	**ML**

Invasiveness Assessment Record

Scientific name: *Spartium junceum* L. Common Name: Spanish broom

QUESTION	COMMENTS	REFERENCE	RATING
12. Reproductive period?	"Initial rapid growth in the first 4 or 5 years is followed by 6 to 8 years of relatively slow growth. This is followed by a period of senescence in which there is more dead, woody tissue than green tissue." Reproduces from second or third year of growth. Thus the reproductive period is likely to exceed 10 years.	LeBlanc (2001) Cal-IPC	**H**
13. Time to reproductive maturity?	"Spanish broom reproduces …after two or three years of growth." 2–5 years.	Cal-IPC	**ML**
Dispersal			
14. Number of mechanisms?	Seedpods burst open and eject seed, however, most seed falls near to the plant. Seed can be moved by erosion, rain-wash and possibly ants. "Despite local dispersal produced by the ballistic mechanism, broom seeds are most likely to land beneath or at a short distance from the maternal plant."	Cal-IPC Malo (2004)	**L**
15. How far do they disperse?	Much of the fallen seed will remain near the maternal plant. Those propagules spread due to erosion or rain-wash may disperse greater than 200 metres.	Cal-IPC	**L**

References cited:

Bossard, C., 2003, Spartium junceum; Plant assessment form, California Exotic Pest Plant Council and South West Vegetation Management Association, http://ucce.ucdavis.edu/files/filelibrary/5319/14908.doc, viewed 04/01/2005

California Invasive Plant Council (Cal-IPC), Spartium junceum, University of California, Division of Agriculture and Natural Resources, http://ucce.ucdavis.edu/datastore/detailreport.cfm?usernumber=79&surveynumber=182, viewed 29/12/2004.

Coggan, D., 2003, Spanish broom, Spartium junceum, Written findings of the State Noxious Weed Control Board, Washington State, http://www.nwcb.wa.gov/weed_info/spanishbroom.html, viewed 29/12/2004.

Grieve, M, 1981, *A modern herbal*, Botanical.com, http://botanical.com/botanical/mgmh/b/brospa73.html, viewed 04/01/2005

Hoshovsky, M., 1986, Spartium junceum, *Spanish Broom, Weaver's Broom*, Element Stewardship Extract, The Nature Conservancy, Virginia, USA.

LeBlanc, J.W., 2001, Getting a handle on broom, Scotch, French, Spanish and Portuguese brooms in California, (publication 8049), University of California, Division of Agriculture and Natural Resources, Oakland, California.

Malo, J.E., 2004, Potential ballistic dispersal of *Cytisus scoparius* (Fabaceae) seeds, *Australian Journal of Botany*, Vol: 52, No: 5, pp: 653–658.

Revisions

Date	Revised by	Revision
20 Oct 2005	TDH	Criterion 4 revised from L to MH, sp. is leguminous.

Present distribution of *Spartium junceum* in Victoria

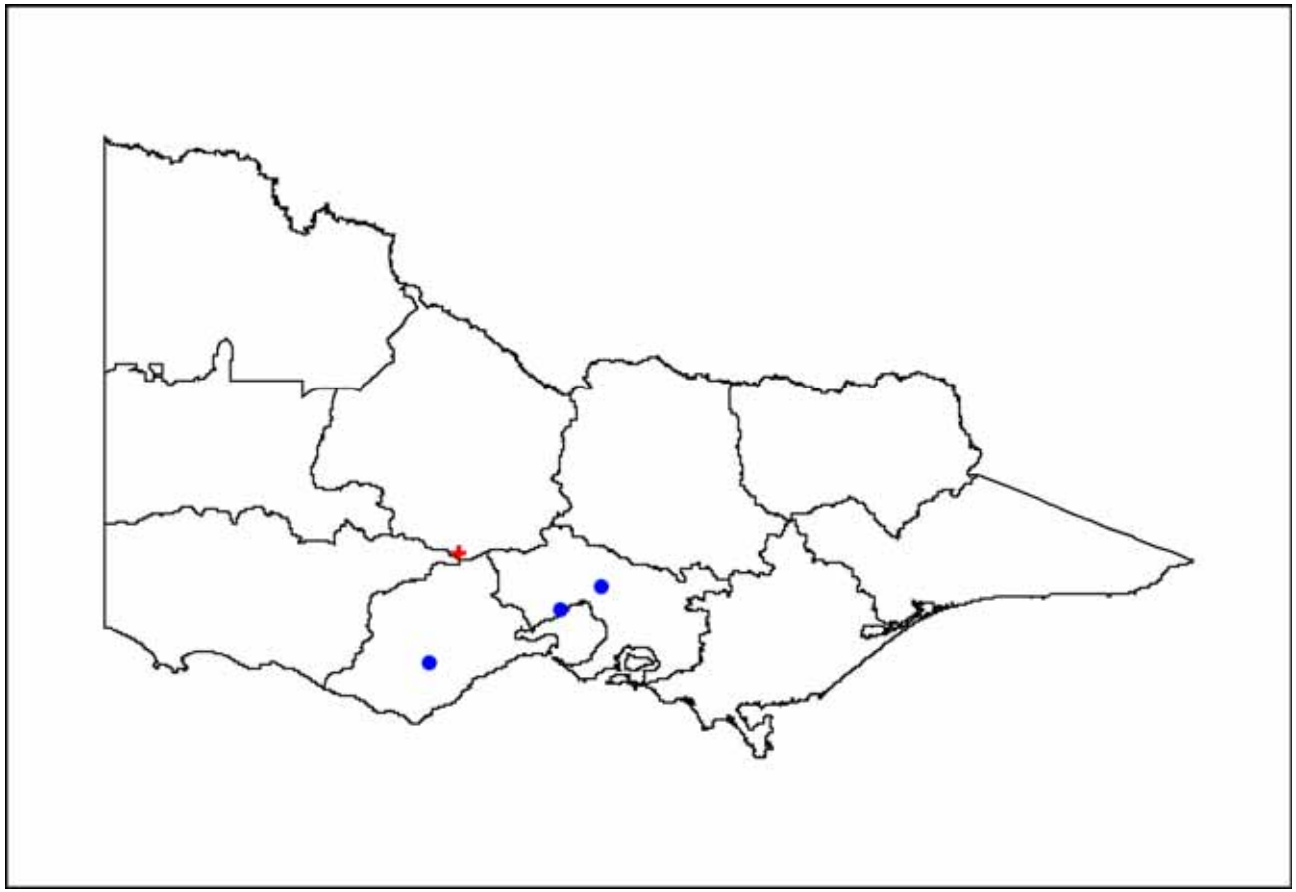
Species: *Spartium junceum* L.
Common name: Spanish broom
Status: Not declared in Victoria

Habitat:
It is common in disturbed places particularly along riverbanks, roadsides and trails, and abandoned or disturbed land. Within its native range in the Mediterranean area, it occurs as part of a mixed community of stunted, tangled bushes and shrubs in seasonally arid regions, (known as *maquis*).

Present distribution in Victoria using Victorian Flora Information System (FIS) and IPMS.

Information from FIS (*blue circles*)
Number of records 3

Information from PMIS (*red crosses*)
Number of records 1
Total Area of infestation (ha) 6



Potential distribution of *Spartium junceum* in Victoria

Species: *Spartium junceum* L.
Common name: Spanish broom
Status: Not declared

Habitat:
It is common in disturbed places particularly along riverbanks, roadsides and trails, and abandoned or disturbed land. Within its native range in the Mediterranean area, it occurs as part of a mixed community of stunted, tangled bushes and shrubs in seasonally arid regions, (known as *maquis*).

Potential distribution produced from CLIMATE modelling, relevant landuses and broad vegetation types and overlayed on CMA boundaries.

OVERLAYS USED.

Land Use:

Pasture dryland

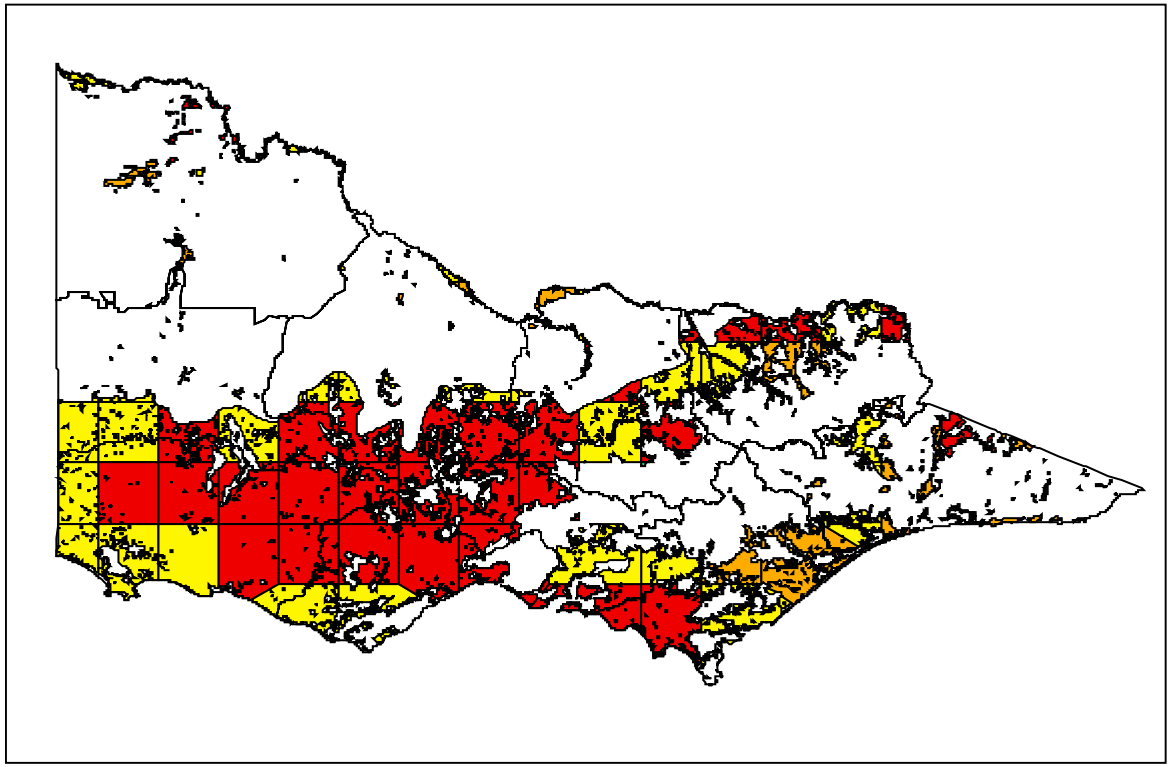
Broad vegetation types

coastal grassy woodland; grassland; heathy woodland; herb rich woodland; inland slopes woodland; Mallee woodland; plains grassy woodland; rainshadow woodland; riverine grassy woodland; sedge-rich woodland.; Wimmera/Mallee woodland

Colours indicate possibility of *Spartium junceum* infesting these areas.

Red = Very high Yellow = High
Orange = Medium Green = Likely

In the non-coloured areas the plant is unlikely to establish as the climate, soil or landuse is not presently suitable.



Impact Assessment Record

Scientific Name: *Spartium junceum* L. Common name: Spanish broom

QUESTION	COMMENTS	REFERENCE	RATING
Social			
1. Restrict human access?	Perennial shrub to 3m high. "Brooms grow rapidly and form dense stand that are inaccessible to… wildlife." Humans would also have difficulty pushing through dense stands.	LeBlanc (2001)	**MH**
2. Reduce tourism?	"An occasional weed in woodlands and rocky areas of Victoria. This species can form large infestations, especially after fire which assists seedling germination." In situations where the plant is dominant it would have a negative visual impact. However, it is unlikely to greatly affect recreational activities. Minor effects.	Conservation Council	**ML**
3. Injurious to people?	"The Spanish broom in its medicinal properties closely resembles the common broom, but is from five to six times more active." "…the seeds [of *Cytisus scoparius*] are poisonous if eaten in quantity." "All parts of the plant are poisonous if eaten." It is likely then that seeds from *S. junceum* present a similar threat to humans. Toxic properties all year.	Grieve (1931) Blood (2001) Coggon (2003)	**H**
4. Damage to cultural sites?	Dense stands could produce a negative visual effect.		**ML**
Abiotic			
5. Impact flow?	Terrestrial sp. "All brooms grow best in dry, sand soils in full sunlight."	LeBlanc (2001)	**L**
6. Impact water quality?	Terrestrial sp.		**L**
7. Increase soil erosion?	"A common feature of the invasive brooms is and aggressive root system…taproot to 0.6m…extensive, many branched, shallow, lateral root system." Dense patches may enhance soil stabilisation particularly in waste places or neglected areas.	LeBlanc (2001)	**L**
8. Reduce biomass?	"This species can form large infestations, especially after fire which assists seedling germination. This leads to considerable fuel buildup." Occurs in grassy woodland and lowland grassland. Dense patches may increase biomass.	Conservation Council	**L**
9. Change fire regime?	"This species can form large infestations, especially after fire which assists seedling germination. This leads to considerable fuel buildup." "As plants grow, the inner stems die back, providing a highly flammable fuel." In a comparative study of 45 plants *Spartium junceum* was found to be slow burning. Such woody material may lead to seasonal changes to the frequency of fire.	Conservation Council Neyisci (1987) LeBlanc (2001)	**ML**
Community Habitat			
10. Impact on composition (a) high value EVC	EVC=Plains grassy woodland (E); CMA=North Central; Bioreg=Goldfields; VH CLIMATE potential. "Dense stems make regeneration of most other species difficult or impossible." "This species is capable of crowding out desirable native plants." A study in the Orcia Valley, Tuscany, Italy, found that species diversity was reduced in scrub dominated by *Spartium junceum*. Likely to displace a dominant species within the lower storey and have some effect on mid-storey species.	LeBlanc (2001) Coggan (2003) Maccherini *et al* (2000)	**MH**
(b) medium value EVC	EVC=Heathy, herb-rich woodland (D); CMA=Glenelg Hopkins; Bioreg=Dundas Tablelands; VH CLIMATE potential. See comments in 10(a) above.		**MH**

QUESTION	COMMENTS	REFERENCE	RATING
(c) low value EVC	EVC=Heathy woodlands (LC); CMA=Glenelg Hopkins; Bioreg=Dundas Tablelands; VH CLIMATE potential. See comments in 10(a) above.		**MH**
11. Impact on structure?	"The dense stems make regeneration of most other species difficult or impossible." "This species is capable of crowding out desirable native plants." A study in the Orcia Valley, Tuscany, Italy, found that species diversity was reduced in scrub dominated by *Spartium junceum*. In Victoria, it occurs in lowland grassland and grassy woodland. Likely to affect species in the lower storey, but may also restrict the regeneration of other shrubs. Major effect on <60% of species in the lower storey.	LeBlanc (2001) Coggan (2003) Maccherini *et al* (2000)	**MH**
12. Effect on threatened flora?			
Fauna			
13. Effect on threatened fauna?			
14. Effect on non-threatened fauna?	Changes to vegetation structure may reduce habitat or food for native fauna. Minor negative effects.	LeBlanc (2001)	**ML**
15. Benefits fauna?	No documented benefits.		**H**
16. Injurious to fauna?	The whole plant contains alkaloids, which are thought to act as a primary defence mechanism against predation, particularly by vertebrate herbivores. However, brooms are also promoted as useful animal (sheep and cattle) fodder. Potential for injury to fauna under some conditions.	LeBlanc (2001) Barboni *et al* (1994) Bonciarelli & Santilocchi (1980)	**ML**
Pest Animal			
17. Food source to pests?	Not known as a food source to pest animals. Young plants have the highest alkaloid content (primary twigs, flowers and seed) possibly deterring consumption by rabbits, for example.	Barboni *et al* (1994)	**L**
18. Provides harbor?	Dense patches may provide harbour for rabbits, but not individual plants. (Refer to photos in Spartium junceum images.)	The Nature Conservancy	**MH**
Agriculture			
19. Impact yield?	Not known as a pest plant in pasture situations. Plants are used for fodder in Italy. Not likely to occur in cropping situations. Little or negligible effect on yield.	Bonciarelli & Santilocchi (1980)	**L**

Impact Assessment Record

Scientific Name: *Spartium junceum* L. Common name: Spanish broom

QUESTION	COMMENTS	REFERENCE	RATING
20. Impact quality?	Not likely to affect the quality of produce. Not a seed contaminant. (Large seed would be easily removed during processing.)		**L**
21. Affect land value?	As with *C. scoparius*, it is unlikely to be a significant agricultural weed, thus it would have an immeasurable affect on the value of agricultural land.	Parsons & Cuthbertson (2001)	**L**
22. Change land use?	No. Not likely to be a significant weed on managed farms. Potentially, it could be a problem on abandoned pasture.		**L**
23. Increase harvest costs?	No.		**L**
24. Disease host/vector?	None documented. No other brooms are known to be hosts or vectors of disease.		**L**

References cited:

Barboni, L., Manzi, A., Bellormaria, B. and Quinto, A.M., 1994, 'Alkaloid content in four Spartium junceum populations as a defensive strategy against predators,' *Phytochemistry*, Vol: 37, No: 4, pp: 1197–1200. (CAB abstract)

Blood, K. 2001, *Environmental weeds. a field guide for SE Australia*, CH Jerram, Science Publishers.

Bonciarelli, F. and Santilocchi, R., 1980, 'First results of trials with forage shrubs for pasture,' *Rivista di Agronomia*, Vol: 14, No: 1, pp: 21-29. (CAB abstract)

Coggan, D., 2003, Spanish broom, Spartium junceum, Written findings of the State Noxious Weed Control Board, Washington State, http://www.nwcb.wa.gov/weed_info/spanishbroom.html, viewed 29/12/2004.

LeBlanc, J.W., 2001, Getting a handle on broom, Scotch, French, Spanish and Portuguese brooms in California, (publication 8049), University of California, Division of Agriculture and Natural Resources, Oakland, California.

Maccherini, S., Chiarucci, A., de Dominicis, V., 2000, Structure and species diversity of Bromus erectus grassland of biancana badlands, *Belgian Journal of Botany*, Vol: 133, No: 1-2, pp: 3–14. (CAB abstract)

Neyisci, T., 1987, 'A study on the slow burning plant species suitable for controlling forest fires.' *Doga, Turk Tarim ve Ormancilik Dergisi*, Vol: 11, No: 3, pp 595–604. (CAB abstract)

Parsons, W.T. and Cuthbertson, E.G. (2001). Noxious Weeds of Australia, 2nd edn. Inkata Press Melbourne & Sydney.

The Nature Conservancy, Spartium junceum, http://tncweeds.ucdavis.edu/photosp-z.html Accessed 21/02/2005

Invasiveness Assessment Record

Scientific name: *Vinca major* L. Common Name: blue periwinkle

QUESTION	COMMENTS	REFERENCE	RANK
Establishment			
Germination requirements?	"May be propagated by division, any single shoot with roots being dibbled in from autumn to early spring. The over wintering shoots of *Vinca major* can be cut away in late winter before new growth begins:	Huxley *et al* (1992)	**MH**
Establishment requirements?	"Very shade tolerant".	PFF (2001)	**MH**
How much disturbance is required?	Establishes in undisturbed/minor disturbed natural ecosystems; e.g. heathland; sclerophyll forest and woodland; riparian vegetation' warm temperate rainforest.	Carr et al (1992)	**H**
Growth/Competitive			
Life form?	Creeper.	Page & Olds (eds) (1998)	**ML**
Allelopathic properties?	No Allelopathic properties described.		**L**
Tolerates herb pressure?	"Rarely if ever troubled by browsing deer or rabbits".	PFF (2001)	**MH**
Normal growth rate?	"It spreads rapidly by long trailing stems taking root at their tips and leaf nodes, it can be invasive. Once established it will swamp out smaller plants".	PFF (2001)	**H**
Stress tolerance to frost, drought, w/logg, sal. etc?	"Drought and moderately frost resistant". Possibly also displays some salt resistance (occurs in 'coastal areas'), and water logging (weed of riparian areas).	Page & Olds (eds) (1998) Carr et al (1992) Bay of Plenty (n.d.)	**MH**
Reproduction			
Reproductive system	Vegetative. Seed.	Carr et al 91992) PFF (2001)	**H**
Number of propagules produced?	"This species rarely if ever sets seed in Britain". "It is not known if this species sets viable seed in Australia".	PFF (2001) Northcote CC (n.d.)	**M**
Propagule longevity?	?		**M**
Reproductive period?	Can "form a thick smothering blanket…may spread over many square metres of forest floor". Therefore form monocultures.	Bay of Plenty (n.d.)	**H**
Time to reproductive maturity?	Assumed no more than 1-2 years after germination. → "Spread rapidly, the shoots rooting as they progress".	Huxley *et al* (1992)	**H**
Dispersal			
Number of mechanisms?	Wind and, in riparian zones, water.	Carr et al (1992) Bay of Plenty (n.d.)	**MH**
How far do they disperse?	"Probably dispersed from dumping of garden waste and may be moved over land by road machinery > 200 m and soil disturbance along rivers".	Bay of Plenty (n.d.)	**MH**

Invasiveness Assessment Record

Scientific name: *Vinca major* L. Common Name: blue periwinkle

References cited:

Bay of Plenty Regional Council, n.d., Vinca major, periwinkle, http://www.boprc.govt.nz/weeds/weed94.asp viewed 19/07/01
Huxley, A., and Griffiths, M., (eds.), 1992, *The New RHS Dictionary of Gardening*, Macmillan, London
Northcote City Council, n.d., Weed profile 26: Vinca major, blue periwinkle, Northcote City Council Parks and Gardens, Melbourne
Page, S. and Olds, M., 1998, *Botanica*, 2nd ed, Random House, Australia
Plants for a Future (PFF), Vinca major cultivation notes, http://www.gardenbed.com/v/6797.cfm, viewed 19/07/01

Present distribution of *Vinca major* in Victoria

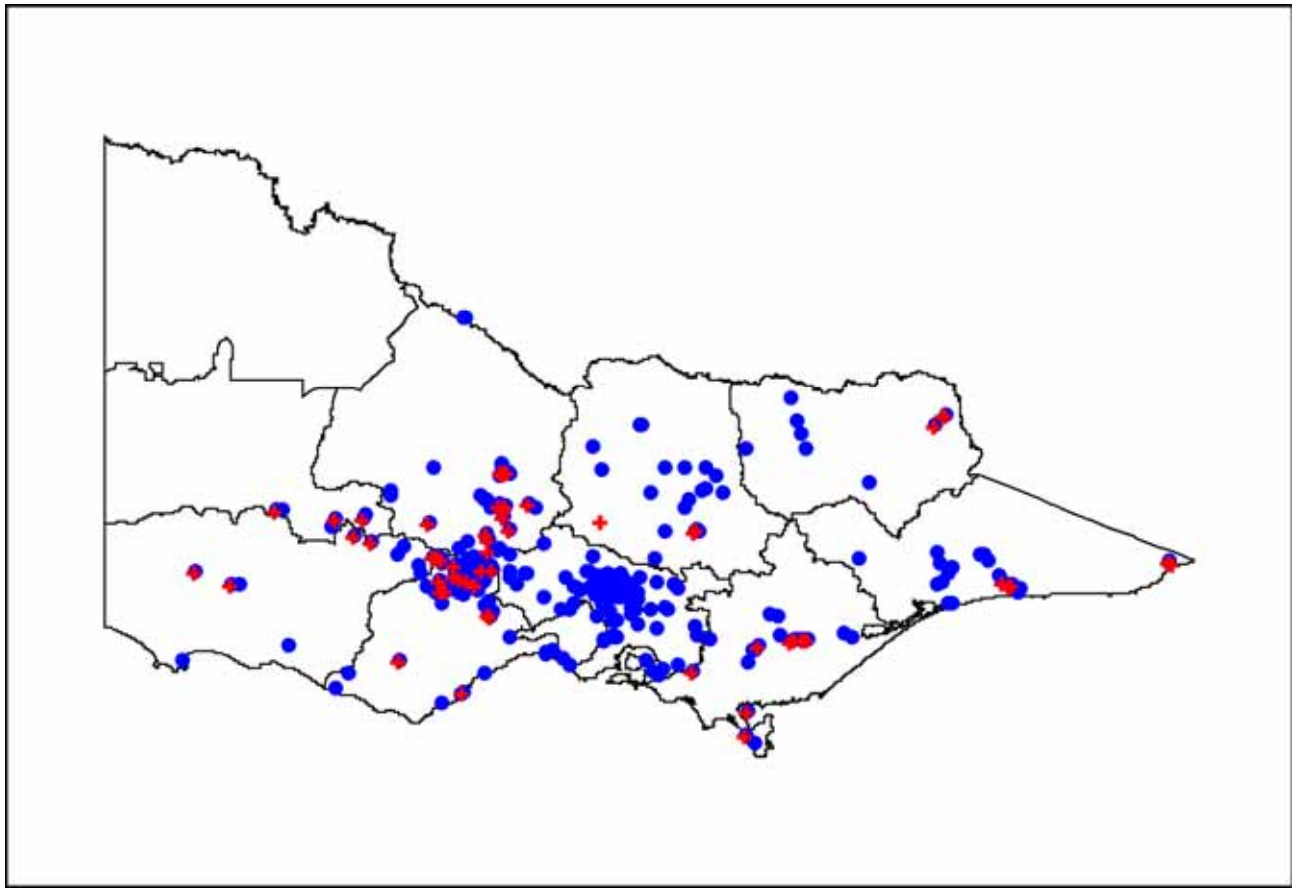
Species: *Vinca major* L.
Common name: blue periwinkle
Status: Not declared in Victoria

Habitat:
Widely cultivated and has become a problem in various ecosystems, found primarily in damp and seasonally moist sites in forest, woodlands and heathlands, as well as along waterways and drainage lines (Muyt 2001). It favours fertile soils and, while particularly vigorous in shade, will readily establish in open, sunny locations provided conditions are moist for much of the year (Muyt 2001). Blue periwinkle invades dry coastal vegetation, heathland and heathy woodland, lowland grassland and grassy woodland, dry sclerophyll forest and woodland, damp sclerophyll forest, riparian vegetation, and warm temperate rainforest (Carr *et al* 1992).

Present distribution in Victoria using Victorian Flora Information System (FIS) and IPMS.

Information from FIS (*blue circles*)
Number of records 353

Information from PMIS (*red crosses*)
Number of records 65
Total Area of infestation (ha) 109



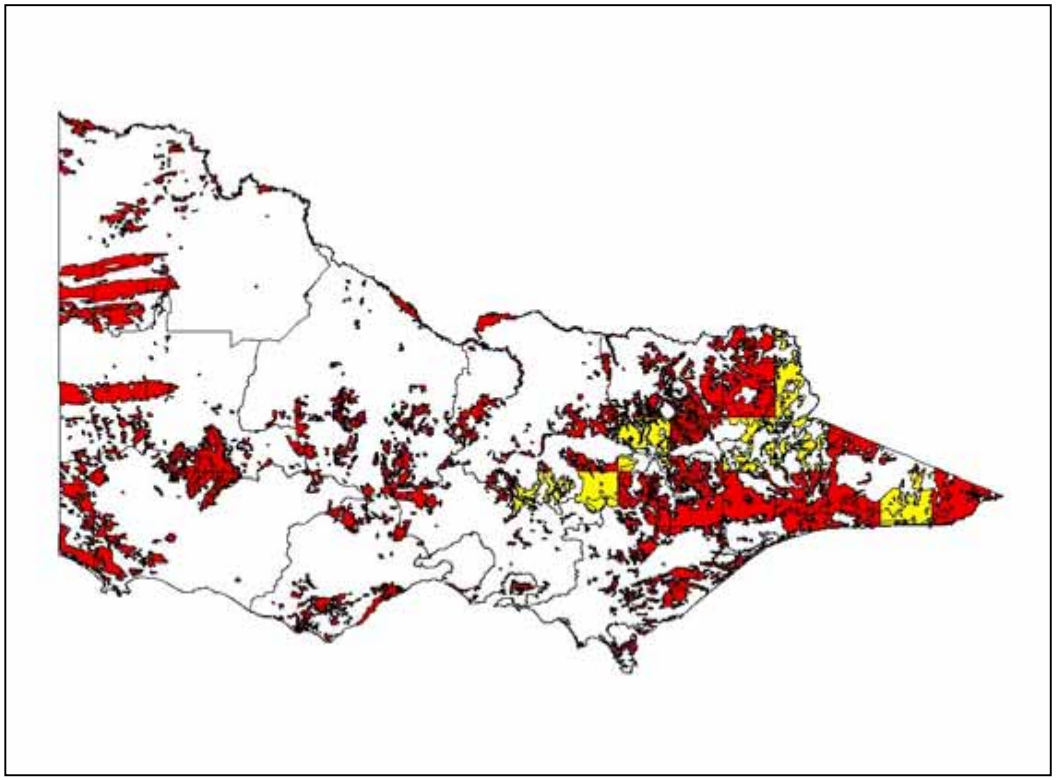
Potential distribution of *Vinca major* in Victoria

Species: *Vinca major* L.
Common name: Blue periwinkle
Status: Not declared noxious under the *Catchment and Land Protection Act* 1994.
Habitat:
Widely cultivated and has become a problem in various ecosystems, found primarily in damp and seasonally moist sites in forest, woodlands and heathlands, as well as along waterways and drainage lines (Muyt 2001). It favours fertile soils and, while particularly vigorous in shade, will readily establish in open, sunny locations provided conditions are moist for much of the year (Muyt 2001). Blue periwinkle invades dry coastal vegetation, heathland and heathy woodland, lowland grassland and grassy woodland, dry sclerophyll forest and woodland, damp sclerophyll forest, riparian vegetation, and warm temperate rainforest (Carr *et al* 1992).

Potential distribution produced from CLIMATE modelling and overlayed on suitable overlays with CMA boundaries.

OVERLAYS USED.
Land use:
Forestry private and public
Broad vegetation types:
Coastal scrubs and grassland; dry foothill forest; montane dry woodland; grassland; plains grassy woodland; coastal grassy woodland; herb-rich woodland; sub-alpine grassy woodland; montane grassy woodland; riverine grassy woodland; riparian forest; rainshadow woodland; mallee-heath; boinka-raak; mallee woodland; heathy woodland; wimmera mallee/woodland; lowland forest; heath; box-ironbark forest; inland slopes and sedge-rich woodland.

Colours indicate possibility of *Vinca major* infesting these areas.
Red = Very high Yellow = High
Orange = Medium Green = Likely
In the non-coloured areas the plant is unlikely to establish as the climate, soil or landuse is not presently suitable.



Impact Assessment Record
Scientific Name: *Vinca major* L. Common name: blue periwinkle

QUESTION	COMMENTS	REFERENCE	RATING
Social			
1. Restrict human access?	Perennial creeper capable of forming dense intertwined mats. Mats known to grow to height of 50 cm. Unlikely, however, to restrict human access.	Muyt (2001) Blood (2001)	**L**
2. Reduce tourism?	In dense infestations mats of periwinkle dominate the vegetation in the lower storey. While the presence of this plant is quite noticeable, it would not inhibit recreational activities. Major effect to aesthetics	Muyt (2001)	**ML**
3. Injurious to people?	"Blue periwinkle is poisonous to sheep, cattle and horses if eaten." "These plants are poisonous; about 90 alkaloids have been isolated from them," [i.e. *Vinca* genus]. Ingestion of plants by humans is highly unlikely; no known problems relating to allergic reaction.	Huxley (1992)	**L**
4. Damage to cultural sites?	"It is found primarily in damp or seasonally moist sites in forests, woodlands and heathlands as well as along waterways and drainage lines." Dense mats would produce at least a moderate negative visual impact.	Muyt (2001)	**ML**
Abiotic			
5. Impact flow?	Terrestrial sp.		**L**
6. Impact water quality?	Terrestrial sp.		**L**
7. Increase soil erosion?	Extensive root system; dense mats would improve soil stability. Low probability of large-scale soil movement.	Muyt (2001)	**L**
8. Reduce biomass?	"Blue periwinkle forms dense, intertwined low mats that completely smother then exclude all indigenous ground-flora." Biomass is likely to increase due to the dense mats that periwinkle creates in the understorey.	Muyt (2001)	**L**
9. Change fire regime?	In the U.S., periwinkle is considered to have low flammability. Small or negligible effect on fire regime.	VFLTF (1998)	**L**
Community Habitat			
10. Impact on composition (a) high value EVC	EVC=Montane Grassy Woodland (E); CMA=East Gipplsand; Bioreg=East Gippsland Uplands; VH CLIMATE potential. "…dense intertwined low mats completely smother then exclude all indigenous ground-flora." Major displacement of dominant species in the herbaceous layer.	Muyt (2001)	**MH**
(b) medium value EVC	EVC=Riparian Forest (R); CMA=East Gippsland; Bioreg=East Gippsland Uplands; VH CLIMATE potential. "…dense intertwined low mats completely smother then exclude all indigenous ground-flora." It is, "…particularly vigorous in shade." Major displacement of dominant species in the herbaceous layer.	Muyt (2001)	**MH**
(c) low value EVC	EVC=Riparian Forest (LC); CMA=North East; Bioreg=Highlands - Northern Fall; VH CLIMATE potential. "…dense intertwined low mats completely smother then exclude all indigenous ground-flora." It is, "…particularly vigorous in shade." Major displacement of dominant species in the herbaceous layer.	Muyt (2001)	**MH**
11. Impact on structure?	"Blue periwinkle forms dense, intertwined low mats that completely smother then exclude all indigenous ground-flora and prevent any shrub or tree regeneration." Major impact on lower storey with possible implications for mid and upper stories.	Muyt (2001)	**MH**

QUESTION	COMMENTS	REFERENCE	RATING
12. Effect on threatened flora?			
Fauna			
13. Effect on threatened fauna?			
14. Effect on non-threatened fauna?	"It can form large dense mats often covering many square metres." The plant is known to be poisonous to sheep, cattle and horses; similar effect on fauna. Infestations lead to reduced habitat or food supply.	Blood (2001)	**ML**
15. Benefits fauna?	No documented benefits. The plant is poisonous.	Blood (2001)	**H**
16. Injurious to fauna?	Although it is known that periwinkle is poisonous to some stock, it is not known if fauna consume this species.		**M**
Pest Animal			
17. Food source to pests?	The plant is poisonous; unlikely to be a food source to pest animals.		**L**
18. Provides harbor?	Herbaceous perennial ground cover. Not known to provide harbour to pest animals.		**M**
Agriculture			
19. Impact yield?	Not known as a weed of agriculture. An environmental weed.	Randall (2002)	**L**
20. Impact quality?	Not known as a weed of agriculture. An environmental weed.	Randall (2002)	**L**
21. Affect land value?	Not known as a weed of agriculture. An environmental weed.	Randall (2002)	**L**
22. Change land use?	Not known as a weed of agriculture. An environmental weed.	Randall (2002)	**L**
23. Increase harvest costs?	Not known as a weed of agriculture. An environmental weed.	Randall (2002)	**L**
24. Disease host/vector?	None documented		**L**

References cited:
Huxley, A. (ed.), 1992, *The New RHS Dictionary of Gardening*, Macmillan, London
Randall, R., 2002, *A global compendium of weeds*, R.G. and F.J. Richardson, Meredith, Victoria.
Virginia Firewise Landscaping Task Force, 1998, Virginia Firescapes Firewise Landscaping for Woodland Homes, http://www.ext.vt.edu/pubs/turf/430-300/lists.html , viewed 01/11/04.

Noxious Weeds Review Phase 2 species
Summary of score and rank

Corangamite CMA

Scientific name	Common name	Inv. Score	Regional dist.	Impact Score	Regional score	Regional rank	Rank Relative to Phase 1*
Sagittaria graminea	Arrowhead	0.5866	0.85	0.2985	0.5095	4	62
Vinca major	blue periwinkle	0.7030	0.57	0.2892	0.4287	10	99
Asparagus asparagoides	bridal creeper	0.7828	0.57	0.3619	0.4790	7	82
Nassella hyalina	cane needle grass	0.5036	0.85	0.2678	0.4824	6	80
Nassella neesiana	Chilean needle grass	0.6866	0.57	0.5438	0.5693	1	26
Spartium junceum	Spanish broom	0.3418	0.85	0.3359	0.5011	5	67
Pittosporum undulatum	sweet pittosporum	0.7937	0.57	0.3151	0.4541	8	90
Nassella leucotricha	Texas needle grass	0.6279	0.57	0.3261	0.4404	9	96
Cytisus multiflorus	white Spanish broom	0.5170	0.85	0.3308	0.5193	3	58
Festuca gautieri	bearskin fescue	0.4914	0.85	0.3878	0.5481	2	42

* Total list now comprises 111 species; 101 phase 1, 10 phase 2.

East Gippsland CMA

Scientific name	Common name	Inv. Score	Regional dist.	Impact Score	Regional score	Regional rank	Rank Relative to Phase 1*
Sagittaria graminea	Arrowhead	0.5866	0.85	0.2985	0.5095	6	70
Vinca major	blue periwinkle	0.7030	0.42	0.2892	0.3807	10	108
Asparagus asparagoides	bridal creeper	0.7828	0.42	0.3619	0.4310	9	102
Nassella hyalina	cane needle grass	0.5036	0.85	0.2678	0.4824	8	85
Nassella neesiana	Chilean needle grass	0.6866	0.42	0.5438	0.5213	4	60
Spartium junceum	Spanish broom	0.3418	0.85	0.3359	0.5011	7	73
Pittosporum undulatum	sweet pittosporum	0.7937	0.85	0.3151	0.5437	2	45
Nassella leucotricha	Texas needle grass	0.6279	0.85	0.3261	0.5300	3	56
Cytisus multiflorus	white Spanish broom	0.5170	0.85	0.3308	0.5193	5	62
Festuca gautieri	bearskin fescue	0.4914	0.85	0.3878	0.5481	1	43

* Total list now comprises 111 species; 101 phase 1, 10 phase 2.

Glenelg Hopkins CMA

Scientific name	Common name	Inv. Score	Regional dist.	Impact Score	Regional score	Regional rank	Rank Relative to Phase 1*
Sagittaria graminea	Arrowhead	0.5866	0.85	0.2985	0.5095	5	63
Vinca major	blue periwinkle	0.7030	0.42	0.2892	0.3807	10	111
Asparagus asparagoides	bridal creeper	0.7828	0.42	0.3619	0.4310	9	100
Nassella hyalina	cane needle grass	0.5036	0.85	0.2678	0.4824	7	77
Nassella neesiana	Chilean needle grass	0.6866	0.57	0.5438	0.5693	1	26
Spartium junceum	Spanish broom	0.3418	0.85	0.3359	0.5011	6	67
Pittosporum undulatum	sweet pittosporum	0.7937	0.57	0.3151	0.4541	8	92
Nassella leucotricha	Texas needle grass	0.6279	0.85	0.3261	0.5300	3	53
Cytisus multiflorus	white Spanish broom	0.5170	0.85	0.3308	0.5193	4	57
Festuca gautieri	bearskin fescue	0.4914	0.85	0.3878	0.5481	2	40

* Total list now comprises 111 species; 101 phase 1, 10 phase 2.

Goulburn Broken CMA

Scientific name	Common name	Inv. Score	Regional dist.	Impact Score	Regional score	Regional rank	Rank Relative to Phase 1*
Sagittaria graminea	Arrowhead	0.5866	0.42	0.2985	0.3719	10	102
Vinca major	blue periwinkle	0.7030	0.42	0.2892	0.3807	9	100
Asparagus asparagoides	bridal creeper	0.7828	0.71	0.3619	0.5238	3	46
Nassella hyalina	cane needle grass	0.5036	0.85	0.2678	0.4824	8	63
Nassella neesiana	Chilean needle grass	0.6866	0.42	0.5438	0.5213	4	47
Spartium junceum	Spanish broom	0.3418	0.85	0.3359	0.5011	6	56
Pittosporum undulatum	sweet pittosporum	0.7937	0.71	0.3151	0.4989	7	57
Nassella leucotricha	Texas needle grass	0.6279	0.85	0.3261	0.5300	2	45
Cytisus multiflorus	white Spanish broom	0.5170	0.85	0.3308	0.5193	5	48
Festuca gautieri	bearskin fescue	0.4914	0.85	0.3878	0.5481	1	33

* Total list now comprises 111 species; 101 phase 1, 10 phase 2.

Mallee CMA

Scientific name	Common name	Inv. Score	Regional dist.	Impact Score	Regional score	Regional rank	Rank Relative to Phase 1*
Sagittaria graminea	Arrowhead	0.5866	0.85	0.2985	0.5095	6	57
Vinca major	blue periwinkle	0.7030	0.71	0.2892	0.4735	9	70
Asparagus asparagoides	bridal creeper	0.7828	0.42	0.3619	0.4310	10	88
Nassella hyalina	cane needle grass	0.5036	0.85	0.2678	0.4824	8	68
Nassella neesiana	Chilean needle grass	0.6866	0.85	0.5438	0.6589	1	13
Spartium junceum	Spanish broom	0.3418	0.85	0.3359	0.5011	7	59
Pittosporum undulatum	sweet pittosporum	0.7937	0.85	0.3151	0.5437	3	41
Nassella leucotricha	Texas needle grass	0.6279	0.85	0.3261	0.5300	4	50
Cytisus multiflorus	white Spanish broom	0.5170	0.85	0.3308	0.5193	5	53
Festuca gautieri	bearskin fescue	0.4914	0.85	0.3878	0.5481	2	40

* Total list now comprises 111 species; 101 phase 1, 10 phase 2.

Noxious Weeds Review Phase 2 species
Summary of score and rank

North Central CMA

Scientific name	Common name	Inv. Score	Regional dist.	Impact Score	Regional score	Regional rank	Rank Relative to Phase 1*
Sagittaria graminea	Arrowhead	0.5866	0.85	0.2985	0.5095	5	51
Vinca major	blue periwinkle	0.7030	0.71	0.2892	0.4735	9	67
Asparagus asparagoides	bridal creeper	0.7828	0.42	0.3619	0.4310	10	82
Nassella hyalina	cane needle grass	0.5036	0.85	0.2678	0.4824	8	62
Nassella neesiana	Chilean needle grass	0.6866	0.42	0.5438	0.5213	3	47
Spartium junceum	Spanish broom	0.3418	0.85	0.3359	0.5011	6	55
Pittosporum undulatum	sweet pittosporum	0.7937	0.85	0.3151	0.5437	2	40
Nassella leucotricha	Texas needle grass	0.6279	0.71	0.3261	0.4852	7	61
Cytisus multiflorus	white Spanish broom	0.5170	0.85	0.3308	0.5193	4	48
Festuca gautieri	bearskin fescue	0.4914	0.85	0.3878	0.5481	1	38

* Total list now comprises 111 species; 101 phase 1, 10 phase 2.

North East CMA

Scientific name	Common name	Inv. Score	Regional dist.	Impact Score	Regional score	Regional rank	Rank Relative to Phase 1*
Sagittaria graminea	Arrowhead	0.5866	0.71	0.2985	0.4647	7	81
Vinca major	blue periwinkle	0.7030	0.42	0.2892	0.3807	10	109
Asparagus asparagoides	bridal creeper	0.7828	0.42	0.3619	0.4310	8	91
Nassella hyalina	cane needle grass	0.5036	0.85	0.2678	0.4824	6	69
Nassella neesiana	Chilean needle grass	0.6866	0.42	0.5438	0.5213	3	45
Spartium junceum	Spanish broom	0.3418	0.85	0.3359	0.5011	5	60
Pittosporum undulatum	sweet pittosporum	0.7937	0.42	0.3151	0.4061	9	97
Nassella leucotricha	Texas needle grass	0.6279	0.85	0.3261	0.5300	2	43
Cytisus multiflorus	white Spanish broom	0.5170	0.85	0.3308	0.5193	4	47
Festuca gautieri	bearskin fescue	0.4914	0.85	0.3878	0.5481	1	35

* Total list now comprises 111 species; 101 phase 1, 10 phase 2.

Port Phillip and Westernport CMA

Scientific name	Common name	Inv. Score	Regional dist.	Impact Score	Regional score	Regional rank	Rank Relative to Phase 1*
Sagittaria graminea	Arrowhead	0.5866	0.85	0.2985	0.5095	4	46
Vinca major	blue periwinkle	0.7030	0.42	0.2892	0.3807	9	102
Asparagus asparagoides	bridal creeper	0.7828	0.42	0.3619	0.4310	6	90
Nassella hyalina	cane needle grass	0.5036	0.42	0.2678	0.3448	10	109
Nassella neesiana	Chilean needle grass	0.6866	0.42	0.5438	0.5213	2	36
Spartium junceum	Spanish broom	0.3418	0.85	0.3359	0.5011	5	51
Pittosporum undulatum	sweet pittosporum	0.7937	0.42	0.3151	0.4061	7	95
Nassella leucotricha	Texas needle grass	0.6279	0.42	0.3261	0.3924	8	100
Cytisus multiflorus	white Spanish broom	0.5170	0.85	0.3308	0.5193	3	38
Festuca gautieri	bearskin fescue	0.4914	0.85	0.3878	0.5481	1	31

* Total list now comprises 111 species; 101 phase 1, 10 phase 2.

West Gippsland CMA

Scientific name	Common name	Inv. Score	Regional dist.	Impact Score	Regional score	Regional rank	Rank Relative to Phase 1*
Sagittaria graminea	Arrowhead	0.5866	0.85	0.2985	0.5095	5	69
Vinca major	blue periwinkle	0.7030	0.42	0.2892	0.3807	10	110
Asparagus asparagoides	bridal creeper	0.7828	0.85	0.3619	0.5686	1	31
Nassella hyalina	cane needle grass	0.5036	0.85	0.2678	0.4824	7	84
Nassella neesiana	Chilean needle grass	0.6866	0.42	0.5438	0.5213	4	60
Spartium junceum	Spanish broom	0.3418	0.85	0.3359	0.5011	6	73
Pittosporum undulatum	sweet pittosporum	0.7937	0.42	0.3151	0.4061	9	107
Nassella leucotricha	Texas needle grass	0.6279	0.85	0.3261	0.5300	3	57
Cytisus multiflorus	white Spanish broom	0.5170	0.71	0.3308	0.4745	8	89
Festuca gautieri	bearskin fescue	0.4914	0.85	0.3878	0.5481	2	46

* Total list now comprises 111 species; 101 phase 1, 10 phase 2.

Wimmera CMA

Scientific name	Common name	Inv. Score	Regional dist.	Impact Score	Regional score	Regional rank	Rank Relative to Phase 1*
Sagittaria graminea	Arrowhead	0.5866	0.85	0.2985	0.5095	6	44
Vinca major	blue periwinkle	0.7030	0.71	0.2892	0.4735	9	66
Asparagus asparagoides	bridal creeper	0.7828	0.42	0.3619	0.4310	10	86
Nassella hyalina	cane needle grass	0.5036	0.85	0.2678	0.4824	8	60
Nassella neesiana	Chilean needle grass	0.6866	0.85	0.5438	0.6589	1	13
Spartium junceum	Spanish broom	0.3418	0.85	0.3359	0.5011	7	51
Pittosporum undulatum	sweet pittosporum	0.7937	0.85	0.3151	0.5437	3	31
Nassella leucotricha	Texas needle grass	0.6279	0.85	0.3261	0.5300	4	37
Cytisus multiflorus	white Spanish broom	0.5170	0.85	0.3308	0.5193	5	39
Festuca gautieri	bearskin fescue	0.4914	0.85	0.3878	0.5481	2	30

* Total list now comprises 111 species; 101 phase 1, 10 phase 2.

Noxious Weeds Review; Phase 2 species
Corangamite CMA
Final score and rank

WONS	Scientific name	Common name	Inv. Score	Regional dist.	Impact Score	Regional score	Regional rank	Rank Relative to Phase 1*
	Sagittaria graminea	Arrowhead	0.5866	0.85	0.2985	0.5095	4	62
	Vinca major	blue periwinkle	0.7030	0.57	0.2892	0.4287	10	99
Yes	*Asparagus asparagoides*	bridal creeper	0.7828	0.57	0.3619	0.4790	7	82
	Nassella hyalina	cane needle grass	0.5036	0.85	0.2678	0.4824	6	80
Yes	*Nassella neesiana*	Chilean needle grass	0.6866	0.57	0.5438	0.5693	1	26
	Spartium junceum	Spanish broom	0.3418	0.85	0.3359	0.5011	5	67
	Pittosporum undulatum	sweet pittosporum	0.7937	0.57	0.3151	0.4541	8	90
	Nassella leucotricha	Texas needle grass	0.6279	0.57	0.3261	0.4404	9	96
	Cytisus multiflorus	white Spanish broom	0.5170	0.85	0.3308	0.5193	3	58
	Festuca gautieri	bearskin fescue	0.4914	0.85	0.3878	0.5481	2	42

* Total list now comprises 111 species; 101 phase 1, 10 phase 2.

Noxious Weeds Review; Phase 2 species
Corangamite CMA
Present distribution

		IPMS		FIS	Regional Estimate				
Common name	**Scientific name**	# infestations	area of infestation (ha)	# infestations	# infestations	area of infestation	Weight	Estimate based on: regional description, present potential ratio or gut feeling	
arrowhead	*Sagittaria graminea*			0	0	0	0.85	regional description	
blue periwinkle	*Vinca major*		7.4	94		1,500	0.57	"	Roadsides, waterways, public land
bridal creeper	*Asparagus asparagoides*		827.3	51		1,500	0.57	"	Coastal dune, public land
cane needle grass	*Nassella hyalina*			3	5	20	0.85	"	Roadsides, grazing paddocks
Chilean needle grass	*Nassella neesiana*		419.3	371		1,000	0.57	"	Roadsides, grazing paddocks, public land
Spanish broom	*Spartium junceum*			1		0.1	0.85	"	
sweet pittosporum	*Pittosporum undulatum*		9.0	52		200	0.57	"	Public lands (parks)
Texas needle grass	*Nassella luecotricha*		37.8	83		1,000	0.57	"	Roadsides, grazing paddocks, public land
white Spanish broom	*Cytisus multiflorus*			2		0.1	0.85	"	

* area unit of measure is hectare

Noxious Weeds Review; Phase 2 species
Corangamite CMA
Potential distribution by landuse type

		Potential area* infested by landuse type						
Common name	**Scientific name**	**Horticulture**	**Broadacre cropping**	**Forestry**	**Pasture dryland**	**Pasture irrigated**	**Public land**	**Potential total area**
arrowhead	*Sagittaria graminea*							0
blue periwinkle	*Vinca major*			27,300			162,800	190,100
bridal creeper	*Asparagus asparagoides*	21,500					269,300	290,800
cane needle grass	*Nassella hyalina*				950,770	220	35,300	986,290
Chilean needle grass	*Nassella neesiana*				950,770	220	35,300	986,290
Spanish broom	*Spartium junceum*				950,770		35,300	986,070
sweet pittosporum	*Pittosporum undulatum*			27,300			269,300	296,600
Texas needle grass	*Nassella luecotricha*				950,770	220	35,300	986,290
white Spanish broom	*Cytisus multiflorus*				950,770		156,900	1,107,670
bearskin fescue	*Festuca gautieri*	21,600			962,800	500	5,000	989,900

* area unit of measure is hectare

Noxious Weeds Review
Corangamite CMA
Phase 2 Species: Ranking relative to Phase 1 Review (highlighted in red)

Scientific name	common name	Invasiveness Score	Regional Dist	Impact Scores	Final Score	RANK
Eichhornia crassipes	Water Hyacinth	0.879335	1	0.527622	0.720989	1
Orobanche ramosa	Branched Broomrape	0.769900	1	0.519638	0.703385	2
Pennisetum macrourum	African Feather Grass	0.612026	0.85	0.627185	0.696667	3
Acacia erioloba	Giraffe thorn	0.700000	1	0.519638	0.694997	4
Hieracium spp.	Hawkweeds	0.700000	1	0.519638	0.694997	4
Nassella tenuissima	Mexican feather grass	0.700000	1	0.519638	0.694997	4
Acacia karroo	Karoo thorn	0.670000	1	0.519638	0.691397	7
Nassella charruana	Lobed needle grass	0.650000	1	0.519638	0.688997	8
Salvinia molesta	Salvinia	0.587464	1	0.529090	0.686786	9
Fallopia japonica, Fallopia sach	Japanese and Giant knotweed	0.506400	1	0.519638	0.671765	10
Parthenium hysterophorus	Parthenium Weed	0.825166	1	0.420087	0.654269	11
Nassella trichotoma	Serrated Tussock	0.761536	0.57	0.675277	0.651939	12
Equisetum spp.	Horsetails	0.726000	0.85	0.519638	0.650117	13
Alternanthera philoxeroides	Alligator Weed	0.527352	0.57	0.719621	0.648670	14
Prosopis spp.	Mesquite	0.658431	0.85	0.521093	0.642824	15
Iva axillaris	Poverty Weed	0.538501	1	0.453036	0.638320	16
Rubus fruticosus agg.	Blackberry	0.767146	0.42	0.726464	0.633277	17
Xanthium spinosum	Noogoora Burr/ Californian Bur	0.619536	0.85	0.500315	0.626521	18
Convolvulus arvensis	Bindweed	0.779101	0.85	0.430366	0.606497	19
Echium vulgare	Viper's Bugloss	0.655865	0.85	0.446556	0.600775	20
Lagarosiphon major	Lagarosiphon	0.649037	1	0.342517	0.589694	21
Homeria flaccida	Cape Tulip (two-leaf)	0.684162	0.85	0.417379	0.587832	22
Centaurea solstitialis	St. Barnaby's Thistle	0.655091	0.85	0.423400	0.587715	23
Ulex europaeus	Furze/Gorse	0.828248	0.57	0.545087	0.587038	24
Acroptilon repens	Hardheads/Russian Knapweed	0.514006	0.85	0.434553	0.577030	25
Nassella neesiana	**Chilean needle grass**	**0.686622**	**0.57**	**0.543816**	**0.569332**	26
Cirsium arvense	Californian/Perennial Thistle	0.702729	0.71	0.458673	0.568385	27
Homeria miniata	Cape Tulip (one-leaf)	0.747658	0.71	0.440860	0.563800	28
Rosa rubiginosa	Sweet Briar	0.793721	0.57	0.508953	0.562660	29
Cytisus scoparius	English Broom	0.734874	0.57	0.520938	0.562310	30
Onopordum illyricum	Illyrian Thistle	0.533147	0.85	0.401999	0.561097	31
Datura ferox	Thorn Apple (common)	0.703633	0.71	0.444751	0.560697	32
Datura stramonium	Thorn Apple (longspine)	0.703600	0.71	0.444751	0.560693	33
Datura inoxia	Thorn Apple (recurved)	0.703600	0.71	0.444751	0.560693	33
Alhagi maurorum	Camelthorn	0.569959	0.85	0.386286	0.556715	35
Cuscuta spp.	Dodder	0.734033	0.71	0.429397	0.555746	36
Hypericum triquetrifolium	Tangled Hypericum	0.602251	0.85	0.377231	0.555520	37
Cannabis sativa	Marijuana	0.565385	1	0.297461	0.554424	38
Onopordum acanthium	Scotch/Heraldic Thistle	0.571238	0.85	0.381627	0.554260	39
Allium triquetrum	Angled Onion	0.614461	0.71	0.448094	0.551868	40
Tribulus terrestris	Caltrop	0.606654	0.85	0.368584	0.551205	41
Festuca gautieri	**bearskin fescue**	**0.491440**	**0.85**	**0.387816**	**0.548150**	42
Amsinckia spp.	Amsinckia	0.745464	0.85	0.333240	0.548070	43
Salpichroa origanifolia	Pampas Lily-of-the-Valley	0.762638	0.85	0.320066	0.542753	44
Opuntia robusta	Wheel Cactus	0.645158	0.85	0.345016	0.542628	45
Senecio pterophorus	African Daisy	0.676556	0.85	0.337358	0.542107	46
Chondrilla juncea	Skeleton Weed	0.742382	0.85	0.315662	0.537856	47
Ailanthus altissima	Tree of Heaven	0.895314	0.57	0.441183	0.536900	48
Cardaria draba	Hoary Cress	0.563497	0.71	0.429138	0.535137	49
Ambrosia psilostachya	Perennial Ragweed	0.489293	0.85	0.364356	0.534755	50
Eragrostis curvula	African Lovegrass	0.715330	0.85	0.314456	0.533935	51
Opuntia stricta	Prickly Pear (drooping)	0.552003	0.85	0.345016	0.531449	52
Lavandula stoechas	Topped Lavender	0.682210	0.85	0.316423	0.531062	53
Marrubium vulgare	Horehound	0.771737	0.57	0.451853	0.528046	54
Lycium ferocissimum	Boxthorn	0.674957	0.57	0.470710	0.526993	55
Centaurea nigra	Black Knapweed	0.641607	0.85	0.317275	0.526667	56
Alternanthera pungens	Khaki Weed	0.653479	0.85	0.303604	0.520436	57
Cytisus multiflorus	**white Spanish broom**	**0.517034**	**0.85**	**0.330775**	**0.519278**	58
Cestrum parqui	Chilean Cestrum	0.727801	0.71	0.358471	0.515280	59

Noxious Weeds Review
Corangamite CMA
Phase 2 Species: Ranking relative to Phase 1 Review (highlighted in red)

Scientific name	common name	Invasiveness Score	Regional Dist	Impact Scores	Final Score	RANK
Conium maculatum	Hemlock	0.665290	0.57	0.446703	0.512388	60
Opuntia vulgaris	Prickly Pear (erect)	0.759228	0.71	0.345016	0.511516	61
Sagittaria graminea	**Arrowhead**	**0.586551**	**0.85**	**0.298489**	**0.509540**	62
Sida leprosa	Ivy-leafed Sida	0.485639	1	0.234041	0.509339	63
Solanum elaeagnifolium	Silverleaf Nightshade	0.667968	0.71	0.357925	0.507794	64
Calicotome spinosa	Spiny Broom	0.447135	0.85	0.317558	0.503489	65
Crataegus monogyna	Hawthorn	0.704590	0.42	0.506902	0.502816	66
Spartium junceum	**Spanish broom**	**0.341815**	**0.85**	**0.33587**	**0.501105**	67
Scolymus hispanicus	Golden Thistle	0.497723	0.71	0.377717	0.498448	68
Hypericum tetrapterum	St. Peter's Wort	0.552896	0.85	0.284303	0.497557	69
Cenchrus longispinus	Spiny Burr Grass/ Gentle Annie	0.402417	0.85	0.313125	0.495640	70
Onopordum acaulon	Stemless Thistle	0.528267	0.85	0.285015	0.495001	71
Cynara cardunculus	Artichoke Thistle	0.662745	0.57	0.413264	0.493358	72
Echium plantagineum	Paterson's Curse	0.665066	0.57	0.412722	0.493332	73
Silybum marianum	Variegated Thistle	0.765111	0.57	0.387726	0.491340	74
Centaurea calcitrapa	Star Thistle	0.408196	0.85	0.303943	0.491192	75
Juncus acutus	Spiny Rush	0.516930	0.57	0.438554	0.490022	76
Carduus nutans	Nodding Thistle	0.390918	0.85	0.302426	0.488269	77
Physalis viscosa	Prairie Ground Cherry	0.727781	0.71	0.309365	0.487778	78
Genista linifolia	Flax Leaved Broom	0.703726	0.57	0.392163	0.486458	79
Nassella hyalina	**cane needle grass**	**0.503576**	**0.85**	**0.267807**	**0.482401**	80
Ibicella lutea	Devil's Claw (yellowflower)	0.616016	0.85	0.241384	0.481097	81
Asparagus asparagoides	**bridal creeper**	**0.782848**	**0.57**	**0.361907**	**0.479010**	82
Emex australis	Spiny Emex	0.535113	0.85	0.247396	0.474755	83
Cirsium acarna	Soldier Thistle	0.523968	0.85	0.249563	0.474632	84
Proboscidea louisianica	Devil's Claw (purpleflower)	0.542172	0.85	0.241384	0.472236	85
Hypericum androsaemum	Tutsan	0.746650	0.71	0.276452	0.471611	86
Solanum rostratum	Buffalo Burr	0.468698	0.85	0.254399	0.470707	87
Carthamus lanatus	Saffron Thistle	0.499430	0.57	0.405518	0.469422	88
Carduus tenuiflorus / C. pycno	Slender/Shore Thistle	0.608219	0.57	0.359060	0.456460	89
Pittosporum undulatum	**sweet pittosporum**	**0.793704**	**0.57**	**0.315117**	**0.454110**	90
Genista monspessulana	Cape Broom /Montpellier Broor	0.698418	0.42	0.419839	0.453320	91
Xanthium strumarium	Bathurst Burr	0.585163	0.57	0.356250	0.452120	92
Hypericum perforatum	St. John's Wort	0.660601	0.57	0.334271	0.448864	93
Leucanthemum vulgare	Ox-eye Daisy	0.610238	0.57	0.333108	0.442169	94
Chrysanthemoides monilifera	Boneseed/Bitou Bush	0.799614	0.42	0.375091	0.440405	95
Nassella leucotricha	**Texas needle grass**	**0.627929**	**0.57**	**0.326146**	**0.440393**	96
Dittrichia graveolens	Stinkwort	0.607585	0.57	0.319717	0.434352	97
Senecio jacobaea	Ragwort	0.776347	0.42	0.363784	0.431281	98
Vinca major	**blue periwinkle**	**0.703021**	**0.57**	**0.289181**	**0.428704**	99
Dipsacus fullonum	Wild Teasel	0.551563	0.57	0.309552	0.421937	100
Allium vineale	Wild Garlic	0.658241	0.57	0.285822	0.421449	101
Melianthus comosus	Tufted Honeyflower	0.492463	0.42	0.394016	0.414144	102
Solanum linnaeanum	Apple of Sodom	0.356227	0.57	0.325025	0.407161	103
Verbascum thapsus	Great Mullein	0.474171	0.57	0.296038	0.405082	104
Watsonia meriana 'Bulbillifera	Wild Watsonia	0.402004	0.57	0.307647	0.402923	105
Foeniculum vulgare	Fennel	0.574220	0.42	0.326980	0.386415	106
Oxalis pes-caprae	Soursob	0.743995	0.28	0.365451	0.383532	107
Asphodelus fistulosus	Onion Weed	0.539790	0.42	0.328848	0.383330	108
Diplotaxis tenuifolia	Sand Rocket/Sand Mustard	0.565974	0.42	0.317803	0.380286	109
Cirsium vulgare	Spear Thistle	0.693549	0.28	0.353660	0.370875	110
Reseda luteola	Wild Mignonette	0.537021	0.57	0.167145	0.340444	111

Noxious Weeds Review; Phase 2 species
East Gippsland CMA
Final score and rank

WONS	Scientific name	Common name	Inv. Score	Regional dist.	Impact Score	Regional score	Regional rank	Rank Relative to Phase 1*
	Sagittaria graminea	Arrowhead	0.5866	0.85	0.2985	0.5095	6	70
	Vinca major	blue periwinkle	0.7030	0.42	0.2892	0.3807	10	108
Yes	*Asparagus asparagoides*	bridal creeper	0.7828	0.42	0.3619	0.4310	9	102
	Nassella hyalina	cane needle grass	0.5036	0.85	0.2678	0.4824	8	85
Yes	*Nassella neesiana*	Chilean needle grass	0.6866	0.42	0.5438	0.5213	4	60
	Spartium junceum	Spanish broom	0.3418	0.85	0.3359	0.5011	7	73
	Pittosporum undulatum	sweet pittosporum	0.7937	0.85	0.3151	0.5437	2	45
	Nassella leucotricha	Texas needle grass	0.6279	0.85	0.3261	0.5300	3	56
	Cytisus multiflorus	white Spanish broom	0.5170	0.85	0.3308	0.5193	5	62
	Festuca gautieri	bearskin fescue	0.4914	0.85	0.3878	0.5481	1	43

* Total list now comprises 111 species; 101 phase 1, 10 phase 2.

Noxious Weeds Review; Phase 2 species
East Gippsland CMA
Present distribution

		IPMS		FIS	Regional Estimate			
Common name	**Scientific name**	# infestations	area of infestation (ha)	# infestations	# infestations	area of infestation	Weight	Estimate based on: regional description, present potential ratio or gut feeling
arrowhead	*Sagittaria graminea*			0			0.85	
blue periwinkle	*Vinca major*		49.2	23			0.42	
bridal creeper	*Asparagus asparagoides*		157.4	75			0.42	
cane needle grass	*Nassella hyalina*			0			0.85	
Chilean needle grass	*Nassella neesiana*			0			0.42	
Spanish broom	*Spartium junceum*			0			0.85	
sweet pittosporum	*Pittosporum undulatum*			616			0.85	In the area where it shouldn't be, not including the area where it is indigenous
Texas needle grass	*Nassella luecotricha*			0			0.85	
white Spanish broom	*Cytisus multiflorus*			0			0.85	

* area unit of measure is hectare

Noxious Weeds Review; Phase 2 species
East Gippsland CMA
Potential distribution by landuse type

		Potential area* infested by landuse type						
Common name	**Scientific name**	**Horticulture**	**Broadacre cropping**	**Forestry**	**Pasture dryland**	**Pasture irrigated**	**Public land**	**Potential total area**
arrowhead	*Sagittaria graminea*							0
blue periwinkle	*Vinca major*			640			1,272,000	1,272,640
bridal creeper	*Asparagus asparagoides*	9,300					1,850,000	1,859,300
cane needle grass	*Nassella hyalina*				313,200	7,600	65,000	385,800
Chilean needle grass	*Nassella neesiana*				313,200	7,600	65,000	385,800
Spanish broom	*Spartium junceum*				313,200		65,000	378,200
sweet pittosporum	*Pittosporum undulatum*			640			1,850,000	1,850,640
Texas needle grass	*Nassella luecotricha*				313,200	7,600	74,700	395,500
white Spanish broom	*Cytisus multiflorus*				313,200		1,250,800	1,564,000
bearskin fescue	*Festuca gautieri*	9,300			313,200	7,600	182,700	512,800

* area unit of measure is hectare

Noxious Weeds Review
East Gippsland CMA
Phase 2 Species: Ranking relative to Phase 1 Review (highlighted in red)

Scientific name	common name	Invasiveness Score	Regional Dist	Impact Scores	Final Score	RANK
Nassella trichotoma	Serrated Tussock	0.761536	0.85	0.675277	0.741539	1
Alternanthera philoxeroides	Alligator Weed	0.527352	0.85	0.719621	0.738270	2
Orobanche ramosa	Branched Broomrape	0.769900	1	0.519638	0.703385	3
Pennisetum macrourum	African Feather Grass	0.612026	0.85	0.627185	0.696667	4
Acacia erioloba	Giraffe thorn	0.700000	1	0.519638	0.694997	5
Nassella tenuissima	Mexican feather grass	0.700000	1	0.519638	0.694997	5
Acacia karroo	Karoo thorn	0.670000	1	0.519638	0.691397	7
Nassella charruana	Lobed needle grass	0.650000	1	0.519638	0.688997	8
Salvinia molesta	Salvinia	0.587464	1	0.529090	0.686786	9
Eichhornia crassipes	Water Hyacinth	0.879335	0.85	0.527622	0.672989	10
Fallopia japonica, Fallopia sacha	Japanese and Giant knotweed	0.506400	1	0.519638	0.671765	11
Parthenium hysterophorus	Parthenium Weed	0.825166	1	0.420087	0.654269	12
Equisetum spp.	Horsetails	0.726000	0.85	0.519638	0.650117	13
Hieracium spp.	Hawkweeds	0.700000	0.85	0.519638	0.646997	14
Prosopis spp.	Mesquite	0.658431	0.85	0.521093	0.642824	15
Centaurea solstitialis	St. Barnaby's Thistle	0.655091	1	0.423400	0.635715	16
Rubus fruticosus agg.	Blackberry	0.767146	0.42	0.726464	0.633277	17
Ulex europaeus	Furze/Gorse	0.828248	0.71	0.545087	0.631838	18
Xanthium spinosum	Noogoora Burr/ Californian Burr	0.619536	0.85	0.500315	0.626521	19
Ailanthus altissima	Tree of Heaven	0.895314	0.85	0.441183	0.626500	20
Cirsium arvense	Californian/Perennial Thistle	0.702729	0.85	0.458673	0.613185	21
Convolvulus arvensis	Bindweed	0.779101	0.85	0.430366	0.606497	22
Echium vulgare	Viper's Bugloss	0.655865	0.85	0.446556	0.600775	23
Allium triquetrum	Angled Onion	0.614461	0.85	0.448094	0.596668	24
Crataegus monogyna	Hawthorn	0.704590	0.71	0.506902	0.595616	25
Genista monspessulana	Cape Broom /Montpellier Broom	0.698418	0.85	0.419839	0.590920	26
Lagarosiphon major	Lagarosiphon	0.649037	1	0.342517	0.589694	27
Homeria flaccida	Cape Tulip (two-leaf)	0.684162	0.85	0.417379	0.587832	28
Cynara cardunculus	Artichoke Thistle	0.662745	0.85	0.413264	0.582958	29
Acroptilon repens	Hardheads/Russian Knapweed	0.514006	0.85	0.434553	0.577030	30
Genista linifolia	Flax Leaved Broom	0.703726	0.85	0.392163	0.576058	31
Oxalis pes-caprae	Soursob	0.743995	0.85	0.365451	0.565932	32
Rosa rubiginosa	Sweet Briar	0.793721	0.57	0.508953	0.562660	33
Cytisus scoparius	English Broom	0.734874	0.57	0.520938	0.562310	34
Onopordum illyricum	Illyrian Thistle	0.533147	0.85	0.401999	0.561097	35
Datura stramonium	Thorn Apple (longspine)	0.703600	0.71	0.444751	0.560693	36
Datura inoxia	Thorn Apple (recurved)	0.703600	0.71	0.444751	0.560693	36
Cestrum parqui	Chilean Cestrum	0.727801	0.85	0.358471	0.560080	38
Cuscuta spp.	Dodder	0.734033	0.71	0.429397	0.555746	39
Cannabis sativa	Marijuana	0.565385	1	0.297461	0.554424	40
Solanum elaeagnifolium	Silverleaf Nightshade	0.667968	0.85	0.357925	0.552594	41
Tribulus terrestris	Caltrop	0.606654	0.85	0.368584	0.551205	42
Festuca gautieri	**bearskin fescue**	**0.491440**	**0.85**	**0.387816**	**0.548150**	43
Amsinckia spp.	Amsinckia	0.745464	0.85	0.333240	0.548070	44
Pittosporum undulatum	**sweet pittosporum**	**0.793704**	**0.85**	**0.315117**	**0.543710**	45
Scolymus hispanicus	Golden Thistle	0.497723	0.85	0.377717	0.543248	46
Salpichroa origanifolia	Pampas Lily-of-the-Valley	0.762638	0.85	0.320066	0.542753	47
Opuntia robusta	Wheel Cactus	0.645158	0.85	0.345016	0.542628	48
Senecio pterophorus	African Daisy	0.676556	0.85	0.337358	0.542107	49
Cardaria draba	Hoary Cress	0.563497	0.71	0.429138	0.535137	50
Juncus acutus	Spiny Rush	0.516930	0.71	0.438554	0.534822	51
Ambrosia psilostachya	Perennial Ragweed	0.489293	0.85	0.364356	0.534755	52
Chrysanthemoides monilifera	Boneseed/Bitou Bush	0.799614	0.71	0.375091	0.533205	53
Physalis viscosa	Prairie Ground Cherry	0.727781	0.85	0.309365	0.532578	54
Lavandula stoechas	Topped Lavender	0.682210	0.85	0.316423	0.531062	55
Nassella leucotricha	**Texas needle grass**	**0.627929**	**0.85**	**0.326146**	**0.529993**	56
Marrubium vulgare	Horehound	0.771737	0.57	0.451853	0.528046	57
Lycium ferocissimum	Boxthorn	0.674957	0.57	0.470710	0.526993	58

Noxious Weeds Review
East Gippsland CMA
Phase 2 Species: Ranking relative to Phase 1 Review (highlighted in red)

Scientific name	common name	Invasiveness Score	Regional Dist	Impact Scores	Final Score	RANK
Centaurea nigra	Black Knapweed	0.641607	0.85	0.317275	0.526667	59
Nassella neesiana	**Chilean needle grass**	**0.686622**	**0.42**	**0.543816**	**0.521332**	60
Asphodelus fistulosus	Onion Weed	0.539790	0.85	0.328848	0.520930	61
Cytisus multiflorus	**white Spanish broom**	**0.517034**	**0.85**	**0.330775**	**0.519278**	62
Homeria miniata	Cape Tulip (one-leaf)	0.747658	0.57	0.440860	0.519000	63
Diplotaxis tenuifolia	Sand Rocket/Sand Mustard	0.565974	0.85	0.317803	0.517886	64
Hypericum androsaemum	Tutsan	0.746650	0.85	0.276452	0.516411	65
Datura ferox	Thorn Apple (common)	0.703633	0.57	0.444751	0.515897	66
Conium maculatum	Hemlock	0.665290	0.57	0.446703	0.512388	67
Opuntia vulgaris	Prickly Pear (erect)	0.759228	0.71	0.345016	0.511516	68
Allium vineale	Wild Garlic	0.658241	0.85	0.285822	0.511049	69
Sagittaria graminea	**Arrowhead**	**0.586551**	**0.85**	**0.298489**	**0.509540**	70
Melianthus comosus	Tufted Honeyflower	0.492463	0.71	0.394016	0.506944	71
Calicotome spinosa	Spiny Broom	0.447135	0.85	0.317558	0.503489	72
Spartium junceum	**Spanish broom**	**0.341815**	**0.85**	**0.335870**	**0.501105**	73
Hypericum tetrapterum	St. Peter's Wort	0.552896	0.85	0.284303	0.497557	74
Xanthium strumarium	Bathurst Burr	0.585163	0.71	0.356250	0.496920	75
Cenchrus longispinus	Spiny Burr Grass/ Gentle Annie	0.402417	0.85	0.313125	0.495640	76
Onopordum acaulon	Stemless Thistle	0.528267	0.85	0.285015	0.495001	77
Echium plantagineum	Paterson's Curse	0.665066	0.57	0.412722	0.493332	78
Chondrilla juncea	Skeleton Weed	0.742382	0.71	0.315662	0.493056	79
Silybum marianum	Variegated Thistle	0.765111	0.57	0.387726	0.491340	80
Centaurea calcitrapa	Star Thistle	0.408196	0.85	0.303943	0.491192	81
Carduus nutans	Nodding Thistle	0.390918	0.85	0.302426	0.488269	82
Leucanthemum vulgare	Ox-eye Daisy	0.610238	0.71	0.333108	0.486969	83
Opuntia stricta	Prickly Pear (drooping)	0.552003	0.71	0.345016	0.486649	84
Nassella hyalina	**cane needle grass**	**0.503576**	**0.85**	**0.267807**	**0.482401**	85
Ibicella lutea	Devil's Claw (yellowflower)	0.616016	0.85	0.241384	0.481097	86
Senecio jacobaea	Ragwort	0.776347	0.57	0.363784	0.479281	87
Dittrichia graveolens	Stinkwort	0.607585	0.71	0.319717	0.479152	88
Alternanthera pungens	Khaki Weed	0.653479	0.71	0.303604	0.475636	89
Emex australis	Spiny Emex	0.535113	0.85	0.247396	0.474755	90
Proboscidea louisianica	Devil's Claw (purpleflower)	0.542172	0.85	0.241384	0.472236	91
Solanum rostratum	Buffalo Burr	0.468698	0.85	0.254399	0.470707	92
Carthamus lanatus	Saffron Thistle	0.499430	0.57	0.405518	0.469422	93
Dipsacus fullonum	Wild Teasel	0.551563	0.71	0.309552	0.466737	94
Onopordum acanthium	Scotch/Heraldic Thistle	0.571238	0.57	0.381627	0.464660	95
Cirsium vulgare	Spear Thistle	0.693549	0.57	0.353660	0.463675	96
Carduus tenuiflorus / C. pycnoc	Slender/Shore Thistle	0.608219	0.57	0.359060	0.456460	97
Solanum linnaeanum	Apple of Sodom	0.356227	0.71	0.325025	0.451961	98
Watsonia meriana 'Bulbillifera'	Wild Watsonia	0.402004	0.71	0.307647	0.447723	99
Eragrostis curvula	African Lovegrass	0.715330	0.57	0.314456	0.444335	100
Foeniculum vulgare	Fennel	0.574220	0.57	0.326980	0.434415	101
Asparagus asparagoides	**bridal creeper**	**0.782848**	**0.42**	**0.361907**	**0.431010**	102
Reseda luteola	Wild Mignonette	0.537021	0.85	0.167145	0.430044	103
Iva axillaris	Poverty Weed	0.538501	0.28	0.453036	0.407920	104
Verbascum thapsus	Great Mullein	0.474171	0.57	0.296038	0.405082	105
Hypericum perforatum	St. John's Wort	0.660601	0.42	0.334271	0.400864	106
Cirsium acarna	Soldier Thistle	0.523968	0.57	0.249563	0.385032	107
Vinca major	**blue periwinkle**	**0.703021**	**0.42**	**0.289181**	**0.380704**	108
Alhagi maurorum	Camelthorn	0.569959	0.28	0.386286	0.374315	109
Hypericum triquetrifolium	Tangled Hypericum	0.602251	0.28	0.377231	0.373120	110
Sida leprosa	Ivy-leafed Sida	0.485639	0.28	0.234041	0.278939	111

Noxious Weeds Review; Phase 2 species
Glenelg Hopkins CMA
Final score and rank

WONS	Scientific name	Common name	Inv. Score	Regional dist.	Impact Score	Regional score	Regional rank	Rank Relative to Phase 1*
	Sagittaria graminea	Arrowhead	0.5866	0.85	0.2985	0.5095	5	63
	Vinca major	blue periwinkle	0.7030	0.42	0.2892	0.3807	10	111
Yes	*Asparagus asparagoides*	bridal creeper	0.7828	0.42	0.3619	0.4310	9	100
	Nassella hyalina	cane needle grass	0.5036	0.85	0.2678	0.4824	7	77
Yes	*Nassella neesiana*	Chilean needle grass	0.6866	0.57	0.5438	0.5693	1	26
	Spartium junceum	Spanish broom	0.3418	0.85	0.3359	0.5011	6	67
	Pittosporum undulatum	sweet pittosporum	0.7937	0.57	0.3151	0.4541	8	92
	Nassella leucotricha	Texas needle grass	0.6279	0.85	0.3261	0.5300	3	53
	Cytisus multiflorus	white Spanish broom	0.5170	0.85	0.3308	0.5193	4	57
	Festuca gautieri	bearskin fescue	0.4914	0.85	0.3878	0.5481	2	40

* Total list now comprises 111 species; 101 phase 1, 10 phase 2.

Noxious Weeds Review; Phase 2 species
Glenelg Hopkins CMA
Present distribution

		IPMS		FIS	Regional Estimate			
Common name	**Scientific name**	# infestations	area of infestation (ha)	# infestations	# infestations	area of infestation	Weight	Estimate based on: regional description, present potential ratio or gut feeling
arrowhead	*Sagittaria graminea*			0			0.85	No known infestations, but most likely does occurr
blue periwinkle	*Vinca major*		3.8	15	250	35	0.42	Very common usualy in old townships
bridal creeper	*Asparagus asparagoides*		291.1	80	300	400	0.42	Prevelant Roadsides, forest industry, lower Glenelg NP, river riparian areas
cane needle grass	*Nassella hyalina*			0	0	0	0.85	Not known
Chilean needle grass	*Nassella neesiana*		23.9	50	55	240	0.57	Roadsides and public reserves
Spanish broom	*Spartium junceum*			0	10	20	0.85	roadsides at Hamilton
sweet pittosporum	*Pittosporum undulatum*		3.5	15	80	500	0.57	Widespread
Texas needle grass	*Nassella luecotricha*		0.8	4			0.85	No comments
white Spanish broom	*Cytisus multiflorus*			0	0	0	0.85	Not known

* area unit of measure is hectare

Noxious Weeds Review; Phase 2 species
Glenelg Hopkins CMA
Potential distribution by landuse type

		Potential area* infested by landuse type						
Common name	**Scientific name**	**Horticulture**	**Broadacre cropping**	**Forestry**	**Pasture dryland**	**Pasture irrigated**	**Public land**	**Potential total area**
arrowhead	*Sagittaria graminea*							0
blue periwinkle	*Vinca major*			49,600			486,600	536,200
bridal creeper	*Asparagus asparagoides*	10,900					494,600	505,500
cane needle grass	*Nassella hyalina*				2,171,000	250	346,300	2,517,550
Chilean needle grass	*Nassella neesiana*				2,171,000	250	346,300	2,517,550
Spanish broom	*Spartium junceum*				2,171,000		346,300	2,517,300
sweet pittosporum	*Pittosporum undulatum*			49,600			495,000	544,600
Texas needle grass	*Nassella luecotricha*				2,171,000	250	350,200	2,521,450
white Spanish broom	*Cytisus multiflorus*				2,171,000		482,300	2,653,300
bearskin fescue	*Festuca gautieri*	10,900			2,171,000	300	113,200	2,295,400

* area unit of measure is hectare

Noxious Weeds Review
Glenelg Hopkins CMA
Phase 2 Species: Ranking relative to Phase 1 Review (highlighted in red)

Scientific name	common name	Invasiveness Score	Regional Dist	Impact Scores	Final Score	RANK
Alternanthera philoxeroides	Alligator Weed	0.527352	1	0.719621	0.786270	1
Eichhornia crassipes	Water Hyacinth	0.879335	1	0.527622	0.720989	2
Orobanche ramosa	Branched Broomrape	0.769900	1	0.519638	0.703385	3
Nassella trichotoma	Serrated Tussock	0.761536	0.71	0.675277	0.696739	4
Acacia erioloba	Giraffe thorn	0.700000	1	0.519638	0.694997	5
Hieracium spp.	Hawkweeds	0.700000	1	0.519638	0.694997	5
Nassella tenuissima	Mexican feather grass	0.700000	1	0.519638	0.694997	5
Acacia karroo	Karoo thorn	0.670000	1	0.519638	0.691397	8
Prosopis spp.	Mesquite	0.658431	1	0.521093	0.690824	9
Nassella charruana	Lobed needle grass	0.650000	1	0.519638	0.688997	10
Salvinia molesta	Salvinia	0.587464	1	0.529090	0.686786	11
Fallopia japonica, Fallopia sachalinen	Japanese and Giant knotweed	0.506400	1	0.519638	0.671765	12
Parthenium hysterophorus	Parthenium Weed	0.825166	1	0.420087	0.654269	13
Equisetum spp.	Horsetails	0.726000	0.85	0.519638	0.650117	14
Iva axillaris	Poverty Weed	0.538501	1	0.453036	0.638320	15
Rubus fruticosus agg.	Blackberry	0.767146	0.42	0.726464	0.633277	16
Xanthium spinosum	Noogoora Burr/ Californian Burr	0.619536	0.85	0.500315	0.626521	17
Ailanthus altissima	Tree of Heaven	0.895314	0.85	0.441183	0.626500	18
Acroptilon repens	Hardheads/Russian Knapweed	0.514006	1	0.434553	0.625030	19
Cirsium arvense	Californian/Perennial Thistle	0.702729	0.85	0.458673	0.613185	20
Pennisetum macrourum	African Feather Grass	0.612026	0.57	0.627185	0.607067	21
Hypericum triquetrifolium	Tangled Hypericum	0.602251	1	0.377231	0.603520	22
Allium triquetrum	Angled Onion	0.614461	0.85	0.448094	0.596668	23
Lagarosiphon major	Lagarosiphon	0.649037	1	0.342517	0.589694	24
Centaurea solstitialis	St. Barnaby's Thistle	0.655091	0.85	0.423400	0.587715	25
Nassella neesiana	**Chilean needle grass**	**0.686622**	**0.57**	**0.543816**	**0.569332**	26
Cytisus scoparius	English Broom	0.734874	0.57	0.520938	0.562310	27
Convolvulus arvensis	Bindweed	0.779101	0.71	0.430366	0.561697	28
Onopordum illyricum	Illyrian Thistle	0.533147	0.85	0.401999	0.561097	29
Cestrum parqui	Chilean Cestrum	0.727801	0.85	0.358471	0.560080	30
Conium maculatum	Hemlock	0.665290	0.71	0.446703	0.557188	31
Alhagi maurorum	Camelthorn	0.569959	0.85	0.386286	0.556715	32
Echium vulgare	Viper's Bugloss	0.655865	0.71	0.446556	0.555975	33
Cuscuta spp.	Dodder	0.734033	0.71	0.429397	0.555746	34
Cannabis sativa	Marijuana	0.565385	1	0.297461	0.554424	35
Solanum elaeagnifolium	Silverleaf Nightshade	0.667968	0.85	0.357925	0.552594	36
Melianthus comosus	Tufted Honeyflower	0.492463	0.85	0.394016	0.551744	37
Tribulus terrestris	Caltrop	0.606654	0.85	0.368584	0.551205	38
Crataegus monogyna	Hawthorn	0.704590	0.57	0.506902	0.550816	39
Festuca gautieri	**bearskin fescue**	**0.491440**	**0.85**	**0.387816**	**0.548150**	40
Amsinckia spp.	Amsinckia	0.745464	0.85	0.333240	0.548070	41
Scolymus hispanicus	Golden Thistle	0.497723	0.85	0.377717	0.543248	42
Opuntia robusta	Wheel Cactus	0.645158	0.85	0.345016	0.542628	43
Ulex europaeus	Furze/Gorse	0.828248	0.42	0.545087	0.539038	44
Cynara cardunculus	Artichoke Thistle	0.662745	0.71	0.413264	0.538158	45
Chondrilla juncea	Skeleton Weed	0.742382	0.85	0.315662	0.537856	46
Cardaria draba	Hoary Cress	0.563497	0.71	0.429138	0.535137	47
Ambrosia psilostachya	Perennial Ragweed	0.489293	0.85	0.364356	0.534755	48
Eragrostis curvula	African Lovegrass	0.715330	0.85	0.314456	0.533935	49
Opuntia stricta	Prickly Pear (drooping)	0.552003	0.85	0.345016	0.531449	50
Genista linifolia	Flax Leaved Broom	0.703726	0.71	0.392163	0.531258	51
Lavandula stoechas	Topped Lavender	0.682210	0.85	0.316423	0.531062	52
Nassella leucotricha	**Texas needle grass**	**0.627929**	**0.85**	**0.326146**	**0.529993**	53
Marrubium vulgare	Horehound	0.771737	0.57	0.451853	0.528046	54
Centaurea nigra	Black Knapweed	0.641607	0.85	0.317275	0.526667	55
Alternanthera pungens	Khaki Weed	0.653479	0.85	0.303604	0.520436	56
Cytisus multiflorus	**white Spanish broom**	**0.517034**	**0.85**	**0.330775**	**0.519278**	57
Hypericum androsaemum	Tutsan	0.746650	0.85	0.276452	0.516411	58
Datura stramonium	Thorn Apple (longspine)	0.703600	0.57	0.444751	0.515893	59
Datura inoxia	Thorn Apple (recurved)	0.703600	0.57	0.444751	0.515893	59
Rosa rubiginosa	Sweet Briar	0.793721	0.42	0.508953	0.514660	61
Opuntia vulgaris	Prickly Pear (erect)	0.759228	0.71	0.345016	0.511516	62
Sagittaria graminea	**Arrowhead**	**0.586551**	**0.85**	**0.298489**	**0.509540**	63
Sida leprosa	Ivy-leafed Sida	0.485639	1	0.234041	0.509339	64
Calicotome spinosa	Spiny Broom	0.447135	0.85	0.317558	0.503489	65

Noxious Weeds Review
Glenelg Hopkins CMA
Phase 2 Species: Ranking relative to Phase 1 Review (highlighted in red)

Scientific name	common name	Invasiveness Score	Regional Dist	Impact Scores	Final Score	RANK
Genista monspessulana	Cape Broom /Montpellier Broom	0.698418	0.57	0.419839	0.501320	66
Spartium junceum	**Spanish broom**	**0.341815**	**0.85**	**0.335870**	**0.501105**	67
Homeria flaccida	Cape Tulip (two-leaf)	0.684162	0.57	0.417379	0.498232	68
Cenchrus longispinus	Spiny Burr Grass/ Gentle Annie	0.402417	0.85	0.313125	0.495640	69
Onopordum acaulon	Stemless Thistle	0.528267	0.85	0.285015	0.495001	70
Centaurea calcitrapa	Star Thistle	0.408196	0.85	0.303943	0.491192	71
Juncus acutus	Spiny Rush	0.516930	0.57	0.438554	0.490022	72
Chrysanthemoides monilifera	Boneseed/Bitou Bush	0.799614	0.57	0.375091	0.488405	73
Carduus nutans	Nodding Thistle	0.390918	0.85	0.302426	0.488269	74
Physalis viscosa	Prairie Ground Cherry	0.727781	0.71	0.309365	0.487778	75
Leucanthemum vulgare	Ox-eye Daisy	0.610238	0.71	0.333108	0.486969	76
Nassella hyalina	**cane needle grass**	**0.503576**	**0.85**	**0.267807**	**0.482401**	77
Ibicella lutea	Devil's Claw (yellowflower)	0.616016	0.85	0.241384	0.481097	78
Senecio jacobaea	Ragwort	0.776347	0.57	0.363784	0.479281	79
Foeniculum vulgare	Fennel	0.574220	0.71	0.326980	0.479215	80
Lycium ferocissimum	Boxthorn	0.674957	0.42	0.470710	0.478993	81
Oxalis pes-caprae	Soursob	0.743995	0.57	0.365451	0.476332	82
Asphodelus fistulosus	Onion Weed	0.539790	0.71	0.328848	0.476130	83
Emex australis	Spiny Emex	0.535113	0.85	0.247396	0.474755	84
Cirsium acarna	Soldier Thistle	0.523968	0.85	0.249563	0.474632	85
Diplotaxis tenuifolia	Sand Rocket/Sand Mustard	0.565974	0.71	0.317803	0.473086	86
Proboscidea louisianica	Devil's Claw (purpleflower)	0.542172	0.85	0.241384	0.472236	87
Homeria miniata	Cape Tulip (one-leaf)	0.747658	0.42	0.440860	0.471000	88
Solanum rostratum	Buffalo Burr	0.468698	0.85	0.254399	0.470707	89
Datura ferox	Thorn Apple (common)	0.703633	0.42	0.444751	0.467897	90
Onopordum acanthium	Scotch/Heraldic Thistle	0.571238	0.57	0.381627	0.464660	91
Pittosporum undulatum	**sweet pittosporum**	**0.793704**	**0.57**	**0.315117**	**0.454110**	92
Salpichroa origanifolia	Pampas Lily-of-the-Valley	0.762638	0.57	0.320066	0.453153	93
Senecio pterophorus	African Daisy	0.676556	0.57	0.337358	0.452507	94
Xanthium strumarium	Bathurst Burr	0.585163	0.57	0.356250	0.452120	95
Hypericum perforatum	St. John's Wort	0.660601	0.57	0.334271	0.448864	96
Echium plantagineum	Paterson's Curse	0.665066	0.42	0.412722	0.445332	97
Silybum marianum	Variegated Thistle	0.765111	0.42	0.387726	0.443340	98
Dittrichia graveolens	Stinkwort	0.607585	0.57	0.319717	0.434352	99
Asparagus asparagoides	**bridal creeper**	**0.782848**	**0.42**	**0.361907**	**0.431010**	100
Reseda luteola	Wild Mignonette	0.537021	0.85	0.167145	0.430044	101
Dipsacus fullonum	Wild Teasel	0.551563	0.57	0.309552	0.421937	102
Allium vineale	Wild Garlic	0.658241	0.57	0.285822	0.421449	103
Carthamus lanatus	Saffron Thistle	0.499430	0.42	0.405518	0.421422	104
Cirsium vulgare	Spear Thistle	0.693549	0.42	0.353660	0.415675	105
Carduus tenuiflorus / C. pycnocephal	Slender/Shore Thistle	0.608219	0.42	0.359060	0.408460	106
Hypericum tetrapterum	St. Peter's Wort	0.552896	0.57	0.284303	0.407957	107
Solanum linnaeanum	Apple of Sodom	0.356227	0.57	0.325025	0.407161	108
Verbascum thapsus	Great Mullein	0.474171	0.57	0.296038	0.405082	109
Watsonia meriana 'Bulbillifera'	Wild Watsonia	0.402004	0.57	0.307647	0.402923	110
Vinca major	**blue periwinkle**	**0.703021**	**0.42**	**0.289181**	**0.380704**	111

Noxious Weeds Review; Phase 2 species
Goulburn Broken CMA
Final score and rank

WONS	Scientific name	Common name	Inv. Score	Regional dist.	Impact Score	Regional score	Regional rank	Rank Relative to Phase 1*
	Sagittaria graminea	Arrowhead	0.5866	0.42	0.2985	0.3719	10	102
	Vinca major	blue periwinkle	0.7030	0.42	0.2892	0.3807	9	100
Yes	*Asparagus asparagoides*	bridal creeper	0.7828	0.71	0.3619	0.5238	3	46
	Nassella hyalina	cane needle grass	0.5036	0.85	0.2678	0.4824	8	63
Yes	*Nassella neesiana*	Chilean needle grass	0.6866	0.42	0.5438	0.5213	4	47
	Spartium junceum	Spanish broom	0.3418	0.85	0.3359	0.5011	6	56
	Pittosporum undulatum	sweet pittosporum	0.7937	0.71	0.3151	0.4989	7	57
	Nassella leucotricha	Texas needle grass	0.6279	0.85	0.3261	0.5300	2	45
	Cytisus multiflorus	white Spanish broom	0.5170	0.85	0.3308	0.5193	5	48
	Festuca gautieri	bearskin fescue	0.4914	0.85	0.3878	0.5481	1	33

* Total list now comprises 111 species; 101 phase 1, 10 phase 2.

Noxious Weeds Review; Phase 2 species
Goulburn Broken CMA
Present distribution

		IPMS		FIS	Regional Estimate			
Common name	**Scientific name**	# infestations	area of infestation (ha)	# infestations	# infestations	area of infestation	Weight	Estimate based on: regional description, present potential ratio or gut feeling
arrowhead	*Sagittaria graminea*			0	50,000	6,000	0.42	Guesstimate from GMW 85% of the 14,000km of channels, drains, creeks, etc contain many small infestations
blue periwinkle	*Vinca major*		1.8	22	50	15	0.42	Gut feel but feeling is more in urban gardens
bridal creeper	*Asparagus asparagoides*		94.8	28	31	95	0.71	Gut feel
cane needle grass	*Nassella hyalina*			0	0		1.00	Not known
Chilean needle grass	*Nassella neesiana*		98.8	147	150	1,000	0.42	IPMS will be roadsides and waterways. Gut feel for greater ammountin adjacent paddocks where CNG is identifiable in good season & stock can afford to be more selective
Spanish broom	*Spartium junceum*			0	0		1.00	Not known
sweet pittosporum	*Pittosporum undulatum*		1.8	6	100	10	0.71	Gut feel but feeling is most in urban gardens
Texas needle grass	*Nassella luecotricha*			0	0		1.00	Not known
white Spanish broom	*Cytisus multiflorus*			0	0		1.00	Not known

* area unit of measure is hectare

Noxious Weeds Review; Phase 2 species
Goulburn Broken CMA
Potential distribution by landuse type

		Potential area* infested by landuse type						
Common name	**Scientific name**	**Horticulture**	**Broadacre cropping**	**Forestry**	**Pasture dryland**	**Pasture irrigated**	**Public land**	**Potential total area**
arrowhead	*Sagittaria graminea*							0
blue periwinkle	*Vinca major*			28,400			535,100	563,500
bridal creeper	*Asparagus asparagoides*	39,200					695,600	734,800
cane needle grass	*Nassella hyalina*				723,900	224,500	65,800	1,014,200
Chilean needle grass	*Nassella neesiana*				723,900	224,500	65,800	1,014,200
Spanish broom	*Spartium junceum*				723,900		65,800	789,700
sweet pittosporum	*Pittosporum undulatum*			28,400			695,600	724,000
Texas needle grass	*Nassella luecotricha*				723,900	224,500	65,800	1,014,200
white Spanish broom	*Cytisus multiflorus*				723,900		483,900	1,207,800
bearskin fescue	*Festuca gautieri*	39,200			723,900	224,500	95,000	1,082,600

* area unit of measure is hectare

Noxious Weeds Review
Goulburn Broken CMA
Phase 2 Species: Ranking relative to Phase 1 Review (highlighted in red)

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Equisetum spp.	Horsetails	0.726000	1	0.519638	0.698117	4
Nassella trichotoma	Serrated Tussock	0.761536	0.71	0.675277	0.696739	5
Pennisetum macrourum	African Feather Grass	0.612026	0.85	0.627185	0.696667	6
Nassella tenuissima	Mexican feather grass	0.700000	1	0.519638	0.694997	7
Hieracium spp.	Hawkweeds	0.700000	1	0.519638	0.694997	7
Acacia erioloba	Giraffe thorn	0.700000	1	0.519638	0.694997	7
Acacia karroo	Karoo thorn	0.670000	1	0.519638	0.691397	10
Prosopis spp.	Mesquite	0.658431	1	0.521093	0.690824	11
Nassella charruana	Lobed needle grass	0.650000	1	0.519638	0.688997	12
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Homeria miniata	Cape Tulip (one-leaf)	0.747658	0.85	0.440860	0.608600	17
Datura inoxia	Thorn Apple (recurved)	0.703600	0.85	0.444751	0.605493	18
Hypericum triquetrifolium	Tangled Hypericum	0.602251	1	0.377231	0.603520	19
Echium vulgare	Viper's Bugloss	0.655865	0.85	0.446556	0.600775	20
Lagarosiphon major	Lagarosiphon	0.649037	1	0.342517	0.589694	21
Rubus fruticosus agg.	Blackberry	0.767146	0.28	0.726464	0.588477	22
Homeria flaccida	Cape Tulip (two-leaf)	0.684162	0.85	0.417379	0.587832	23
Chrysanthemoides monilifera	Boneseed/Bitou Bush	0.799614	0.85	0.375091	0.578005	24
Centaurea nigra	Black Knapweed	0.641607	1	0.317275	0.574667	25
Lycium ferocissimum	Boxthorn	0.674957	0.71	0.470710	0.571793	26
Senecio jacobaea	Ragwort	0.776347	0.85	0.363784	0.568881	27
Onopordum illyricum	Illyrian Thistle	0.533147	0.85	0.401999	0.561097	28
Cestrum parqui	Chilean Cestrum	0.727801	0.85	0.358471	0.560080	29
Alhagi maurorum	Camelthorn	0.569959	0.85	0.386286	0.556715	30
Cannabis sativa	Marijuana	0.565385	1	0.297461	0.554424	31
Allium triquetrum	Angled Onion	0.614461	0.71	0.448094	0.551868	32
Festuca gautieri	**bearskin fescue**	**0.491440**	**0.85**	**0.387816**	**0.548150**	33
Scolymus hispanicus	Golden Thistle	0.497723	0.85	0.377717	0.543248	34
Salpichroa origanifolia	Pampas Lily-of-the-Valley	0.762638	0.85	0.320066	0.542753	35
Senecio pterophorus	African Daisy	0.676556	0.85	0.337358	0.542107	36
Ulex europaeus	Furze/Gorse	0.828248	0.42	0.545087	0.539038	37
Cynara cardunculus	Artichoke Thistle	0.662745	0.71	0.413264	0.538158	38
Xanthium spinosum	Noogoora Burr/ Californian Burr	0.619536	0.57	0.500315	0.536921	39
Carduus nutans	Nodding Thistle	0.390918	1	0.302426	0.536269	40
Ambrosia psilostachya	Perennial Ragweed	0.489293	0.85	0.364356	0.534755	41
Opuntia stricta	Prickly Pear (drooping)	0.552003	0.85	0.345016	0.531449	42
Genista linifolia	Flax Leaved Broom	0.703726	0.71	0.392163	0.531258	43
Lavandula stoechas	Topped Lavender	0.682210	0.85	0.316423	0.531062	44
Nassella leucotricha	**Texas needle grass**	**0.627929**	**0.85**	**0.326146**	**0.529993**	45
Asparagus asparagoides	**bridal creeper**	**0.782848**	**0.71**	**0.361907**	**0.523810**	46
Nassella neesiana	**Chilean needle grass**	**0.686622**	**0.42**	**0.543816**	**0.521332**	47
Cytisus multiflorus	**white Spanish broom**	**0.517034**	**0.85**	**0.330775**	**0.519278**	48
Rosa rubiginosa	Sweet Briar	0.793721	0.42	0.508953	0.514660	49
Cytisus scoparius	English Broom	0.734874	0.42	0.520938	0.514310	50
Dipsacus fullonum	Wild Teasel	0.551563	0.85	0.309552	0.511537	51
Melianthus comosus	Tufted Honeyflower	0.492463	0.71	0.394016	0.506944	52
Calicotome spinosa	Spiny Broom	0.447135	0.85	0.317558	0.503489	53
Amsinckia spp.	Amsinckia	0.745464	0.71	0.333240	0.503270	54
Crataegus monogyna	Hawthorn	0.704590	0.42	0.506902	0.502816	55
Spartium junceum	**Spanish broom**	**0.341815**	**0.85**	**0.335870**	**0.501105**	56
Pittosporum undulatum	**sweet pittosporum**	**0.793704**	**0.71**	**0.315117**	**0.498910**	57
Hypericum tetrapterum	St. Peter's Wort	0.552896	0.85	0.284303	0.497557	58

Noxious Weeds Review
Goulburn Broken CMA
Phase 2 Species: Ranking relative to Phase 1 Review (highlighted in red)

Scientific name	common name	Invasiveness Score	Regional Dist	Impact Scores	Final Score	RANK
Solanum linnaeanum	Apple of Sodom	0.356227	0.85	0.325025	0.496761	59
Watsonia meriana 'Bulbillifera'	Wild Watsonia	0.402004	0.85	0.307647	0.492523	60
Ailanthus altissima	Tree of Heaven	0.895314	0.42	0.441183	0.488900	61
Acroptilon repens	Hardheads/Russian Knapweed	0.514006	0.57	0.434553	0.487430	62
Nassella hyalina	**cane needle grass**	**0.503576**	**0.85**	**0.267807**	**0.482401**	63
Ibicella lutea	Devil's Claw (yellowflower)	0.616016	0.85	0.241384	0.481097	64
Marrubium vulgare	Horehound	0.771737	0.42	0.451853	0.480046	65
Cirsium acarna	Soldier Thistle	0.523968	0.85	0.249563	0.474632	66
Proboscidea louisianica	Devil's Claw (purpleflower)	0.542172	0.85	0.241384	0.472236	67
Solanum rostratum	Buffalo Burr	0.468698	0.85	0.254399	0.470707	68
Convolvulus arvensis	Bindweed	0.779101	0.42	0.430366	0.468897	69
Datura ferox	Thorn Apple (common)	0.703633	0.42	0.444751	0.467897	70
Datura stramonium	Thorn Apple (longspine)	0.703600	0.42	0.444751	0.467893	71
Allium vineale	Wild Garlic	0.658241	0.71	0.285822	0.466249	72
Onopordum acanthium	Scotch/Heraldic Thistle	0.571238	0.57	0.381627	0.464660	73
Conium maculatum	Hemlock	0.665290	0.42	0.446703	0.464388	74
Solanum elaeagnifolium	Silverleaf Nightshade	0.667968	0.57	0.357925	0.462994	75
Cuscuta spp.	Dodder	0.734033	0.42	0.429397	0.462946	76
Genista monspessulana	Cape Broom /Montpellier Broom	0.698418	0.42	0.419839	0.453320	77
Centaurea solstitialis	St. Barnaby's Thistle	0.655091	0.42	0.423400	0.450115	78
Cardaria draba	Hoary Cress	0.563497	0.42	0.429138	0.442337	79
Juncus acutus	Spiny Rush	0.516930	0.42	0.438554	0.442022	80
Asphodelus fistulosus	Onion Weed	0.539790	0.57	0.328848	0.431330	81
Alternanthera pungens	Khaki Weed	0.653479	0.57	0.303604	0.430836	82
Reseda luteola	Wild Mignonette	0.537021	0.85	0.167145	0.430044	83
Emex australis	Spiny Emex	0.535113	0.71	0.247396	0.429955	84
Hypericum androsaemum	Tutsan	0.746650	0.57	0.276452	0.426811	85
Carthamus lanatus	Saffron Thistle	0.499430	0.42	0.405518	0.421422	86
Opuntia vulgaris	Prickly Pear (erect)	0.759228	0.42	0.345016	0.418716	87
Sida leprosa	Ivy-leafed Sida	0.485639	0.71	0.234041	0.416539	88
Tribulus terrestris	Caltrop	0.606654	0.42	0.368584	0.413605	89
Iva axillaris	Poverty Weed	0.538501	0.28	0.453036	0.407920	90
Onopordum acaulon	Stemless Thistle	0.528267	0.57	0.285015	0.405401	91
Opuntia robusta	Wheel Cactus	0.645158	0.42	0.345016	0.405028	92
Centaurea calcitrapa	Star Thistle	0.408196	0.57	0.303943	0.401592	93
Echium plantagineum	Paterson's Curse	0.665066	0.28	0.412722	0.400532	94
Silybum marianum	Variegated Thistle	0.765111	0.28	0.387726	0.398540	95
Eragrostis curvula	African Lovegrass	0.715330	0.42	0.314456	0.396335	96
Physalis viscosa	Prairie Ground Cherry	0.727781	0.42	0.309365	0.394978	97
Leucanthemum vulgare	Ox-eye Daisy	0.610238	0.42	0.333108	0.394169	98
Oxalis pes-caprae	Soursob	0.743995	0.28	0.365451	0.383532	99
Vinca major	**blue periwinkle**	**0.703021**	**0.42**	**0.289181**	**0.380704**	100
Diplotaxis tenuifolia	Sand Rocket/Sand Mustard	0.565974	0.42	0.317803	0.380286	101
Sagittaria graminea	**Arrowhead**	**0.586551**	**0.42**	**0.298489**	**0.371940**	102
Carduus tenuiflorus / C. pycnoc	Slender/Shore Thistle	0.608219	0.28	0.359060	0.363660	103
Xanthium strumarium	Bathurst Burr	0.585163	0.28	0.356250	0.359320	104
Cenchrus longispinus	Spiny Burr Grass/ Gentle Annie	0.402417	0.42	0.313125	0.358040	105
Verbascum thapsus	Great Mullein	0.474171	0.42	0.296038	0.357082	106
Hypericum perforatum	St. John's Wort	0.660601	0.28	0.334271	0.356064	107
Foeniculum vulgare	Fennel	0.574220	0.28	0.326980	0.341615	108
Dittrichia graveolens	Stinkwort	0.607585	0.28	0.319717	0.341552	109
Cirsium vulgare	Spear Thistle	0.693549	0.14	0.353660	0.326075	110
Chondrilla juncea	Skeleton Weed	0.742382	0.14	0.315662	0.310656	111

Noxious Weeds Review; Phase 2 species
Mallee CMA
Final score and rank

WONS	Scientific name	Common name	Inv. Score	Regional dist.	Impact Score	Regional score	Regional rank	Rank Relative to Phase 1*
	Sagittaria graminea	Arrowhead	0.5866	0.85	0.2985	0.5095	6	57
	Vinca major	blue periwinkle	0.7030	0.71	0.2892	0.4735	9	70
Yes	*Asparagus asparagoides*	bridal creeper	0.7828	0.42	0.3619	0.4310	10	88
	Nassella hyalina	cane needle grass	0.5036	0.85	0.2678	0.4824	8	68
Yes	*Nassella neesiana*	Chilean needle grass	0.6866	0.85	0.5438	0.6589	1	13
	Spartium junceum	Spanish broom	0.3418	0.85	0.3359	0.5011	7	59
	Pittosporum undulatum	sweet pittosporum	0.7937	0.85	0.3151	0.5437	3	41
	Nassella leucotricha	Texas needle grass	0.6279	0.85	0.3261	0.5300	4	50
	Cytisus multiflorus	white Spanish broom	0.5170	0.85	0.3308	0.5193	5	53
	Festuca gautieri	bearskin fescue	0.4914	0.85	0.3878	0.5481	2	40

* Total list now comprises 111 species; 101 phase 1, 10 phase 2.

Noxious Weeds Review; Phase 2 species
Mallee CMA
Present distribution

		IPMS		FIS	Regional Estimate			
Common name	**Scientific name**	# infestations	area of infestation (ha)	# infestations	# infestations	area of infestation	Weight	Estimate based on: regional description, present potential ratio or gut feeling
arrowhead	*Sagittaria graminea*			0	0		0.85	Not known
blue periwinkle	*Vinca major*			0	1	1	0.71	Local knowledge
bridal creeper	*Asparagus asparagoides*		9.8	36	5,000	1,000	0.42	Local knowledge
cane needle grass	*Nassella hyalina*			0	0		0.85	not known
Chilean needle grass	*Nassella neesiana*			0	1	1	0.85	Wemen
Spanish broom	*Spartium junceum*			0	0		0.85	not known
sweet pittosporum	*Pittosporum undulatum*			0	0		0.85	not known
Texas needle grass	*Nassella luecotricha*			0	0		0.85	not known
white Spanish broom	*Cytisus multiflorus*			0	0		0.85	not known

* area unit of measure is hectare

Noxious Weeds Review; Phase 2 species
Mallee CMA
Potential distribution by landuse type

		Potential area* infested by landuse type						
Common name	**Scientific name**	**Horticulture**	**Broadacre cropping**	**Forestry**	**Pasture dryland**	**Pasture irrigated**	**Public land**	**Potential total area**
arrowhead	*Sagittaria graminea*							0
blue periwinkle	*Vinca major*						52,000	52,000
bridal creeper	*Asparagus asparagoides*	39,700					1,480,000	1,519,700
cane needle grass	*Nassella hyalina*					1,300	135,800	137,100
Chilean needle grass	*Nassella neesiana*					1,300	135,800	137,100
Spanish broom	*Spartium junceum*						135,800	135,800
sweet pittosporum	*Pittosporum undulatum*						520,000	520,000
Texas needle grass	*Nassella luecotricha*					1,300	135,800	137,100
white Spanish broom	*Cytisus multiflorus*						92,600	92,600
bearskin fescue	*Festuca gautieri*	39,700			0	1,300	0	41,000

* area unit of measure is hectare

Noxious Weeds Review
Mallee CMA
Phase 2 Species: Ranking relative to Phase 1 Review (highlighted in red)

Scientific name	common name	Invasiveness Score	Regional Dist	Impact Scores	Final Score	RANK
Alternanthera philoxeroides	Alligator Weed	0.527352	1	0.719621	0.786270	1
Eichhornia crassipes	Water Hyacinth	0.879335	1	0.527622	0.720989	2
Orobanche ramosa	Branched Broomrape	0.769900	1	0.519638	0.703385	3
Equisetum spp.	Horsetails	0.726000	1	0.519638	0.698117	4
Acacia erioloba	Giraffe thorn	0.700000	1	0.519638	0.694997	5
Hieracium spp.	Hawkweeds	0.700000	1	0.519638	0.694997	5
Nassella tenuissima	Mexican feather grass	0.700000	1	0.519638	0.694997	5
Acacia karroo	Karoo thorn	0.670000	1	0.519638	0.691397	8
Nassella charruana	Lobed needle grass	0.650000	1	0.519638	0.688997	9
Salvinia molesta	Salvinia	0.587464	1	0.529090	0.686786	10
Fallopia japonica, Fallopia sacha	Japanese and Giant knotweed	0.506400	1	0.519638	0.671765	11
Cirsium arvense	Californian/Perennial Thistle	0.702729	1	0.458673	0.661185	12
Nassella neesiana	**Chilean needle grass**	**0.686622**	**0.85**	**0.543816**	**0.658932**	13
Parthenium hysterophorus	Parthenium Weed	0.825166	1	0.420087	0.654269	14
Pennisetum macrourum	African Feather Grass	0.612026	0.71	0.627185	0.651867	15
Prosopis spp.	Mesquite	0.658431	0.85	0.521093	0.642824	16
Datura stramonium	Thorn Apple (longspine)	0.703600	0.85	0.444751	0.605493	17
Datura inoxia	Thorn Apple (recurved)	0.703600	0.85	0.444751	0.605493	17
Alhagi maurorum	Camelthorn	0.569959	1	0.386286	0.604715	19
Nassella trichotoma	Serrated Tussock	0.761536	0.42	0.675277	0.603939	20
Echium vulgare	Viper's Bugloss	0.655865	0.85	0.446556	0.600775	21
Allium triquetrum	Angled Onion	0.614461	0.85	0.448094	0.596668	22
Crataegus monogyna	Hawthorn	0.704590	0.71	0.506902	0.595616	23
Genista monspessulana	Cape Broom /Montpellier Broom	0.698418	0.85	0.419839	0.590920	24
Iva axillaris	Poverty Weed	0.538501	0.85	0.453036	0.590320	25
Rubus fruticosus agg.	Blackberry	0.767146	0.28	0.726464	0.588477	26
Centaurea solstitialis	St. Barnaby's Thistle	0.655091	0.85	0.423400	0.587715	27
Cynara cardunculus	Artichoke Thistle	0.662745	0.85	0.413264	0.582958	28
Ambrosia psilostachya	Perennial Ragweed	0.489293	1	0.364356	0.582755	29
Ailanthus altissima	Tree of Heaven	0.895314	0.71	0.441183	0.581700	30
Genista linifolia	Flax Leaved Broom	0.703726	0.85	0.392163	0.576058	31
Centaurea nigra	Black Knapweed	0.641607	1	0.317275	0.574667	32
Homeria miniata	Cape Tulip (one-leaf)	0.747658	0.71	0.440860	0.563800	33
Convolvulus arvensis	Bindweed	0.779101	0.71	0.430366	0.561697	34
Onopordum illyricum	Illyrian Thistle	0.533147	0.85	0.401999	0.561097	35
Datura ferox	Thorn Apple (common)	0.703633	0.57	0.444751	0.560697	36
Opuntia vulgaris	Prickly Pear (erect)	0.759228	0.71	0.345016	0.556316	37
Hypericum triquetrifolium	Tangled Hypericum	0.602251	0.85	0.377231	0.555520	38
Cannabis sativa	Marijuana	0.565385	1	0.297461	0.554424	39
Festuca gautieri	**bearskin fescue**	**0.491440**	**0.85**	**0.387816**	**0.548150**	40
Pittosporum undulatum	**sweet pittosporum**	**0.793704**	**0.85**	**0.315117**	**0.543710**	41
Homeria flaccida	Cape Tulip (two-leaf)	0.684162	0.71	0.417379	0.543032	42
Salpichroa origanifolia	Pampas Lily-of-the-Valley	0.762638	0.85	0.320066	0.542753	43
Senecio pterophorus	African Daisy	0.676556	0.85	0.337358	0.542107	44
Hypericum perforatum	St. John's Wort	0.660601	0.85	0.334271	0.538464	45
Xanthium spinosum	Noogoora Burr/ Californian Burr	0.619536	0.57	0.500315	0.536921	46
Physalis viscosa	Prairie Ground Cherry	0.727781	0.85	0.309365	0.532578	47
Opuntia stricta	Prickly Pear (drooping)	0.552003	0.85	0.345016	0.531449	48
Lavandula stoechas	Topped Lavender	0.682210	0.85	0.316423	0.531062	49
Nassella leucotricha	**Texas needle grass**	**0.627929**	**0.85**	**0.326146**	**0.529993**	50
Lycium ferocissimum	Boxthorn	0.674957	0.57	0.470710	0.526993	51
Senecio jacobaea	Ragwort	0.776347	0.71	0.363784	0.524081	52
Cytisus multiflorus	**white Spanish broom**	**0.517034**	**0.85**	**0.330775**	**0.519278**	53
Cestrum parqui	Chilean Cestrum	0.727801	0.71	0.358471	0.515280	54
Rosa rubiginosa	Sweet Briar	0.793721	0.42	0.508953	0.514660	55
Conium maculatum	Hemlock	0.665290	0.57	0.446703	0.512388	56
Sagittaria graminea	**Arrowhead**	**0.586551**	**0.85**	**0.298489**	**0.509540**	57
Melianthus comosus	Tufted Honeyflower	0.492463	0.71	0.394016	0.506944	58

Noxious Weeds Review
Mallee CMA
Phase 2 Species: Ranking relative to Phase 1 Review (highlighted in red)

Scientific name	common name	Invasiveness Score	Regional Dist	Impact Scores	Final Score	RANK
Spartium junceum	**Spanish broom**	**0.341815**	**0.85**	**0.335870**	**0.501105**	59
Scolymus hispanicus	Golden Thistle	0.497723	0.71	0.377717	0.498448	60
Opuntia robusta	Wheel Cactus	0.645158	0.71	0.345016	0.497828	61
Ulex europaeus	Furze/Gorse	0.828248	0.28	0.545087	0.494238	62
Cardaria draba	Hoary Cress	0.563497	0.57	0.429138	0.490337	63
Chrysanthemoides monilifera	Boneseed/Bitou Bush	0.799614	0.57	0.375091	0.488405	64
Carduus nutans	Nodding Thistle	0.390918	0.85	0.302426	0.488269	65
Acroptilon repens	Hardheads/Russian Knapweed	0.514006	0.57	0.434553	0.487430	66
Leucanthemum vulgare	Ox-eye Daisy	0.610238	0.71	0.333108	0.486969	67
Nassella hyalina	**cane needle grass**	**0.503576**	**0.85**	**0.267807**	**0.482401**	68
Ibicella lutea	Devil's Claw (yellowflower)	0.616016	0.85	0.241384	0.481097	69
Vinca major	**blue periwinkle**	**0.703021**	**0.71**	**0.289181**	**0.473504**	70
Proboscidea louisianica	Devil's Claw (purpleflower)	0.542172	0.85	0.241384	0.472236	71
Hypericum androsaemum	Tutsan	0.746650	0.71	0.276452	0.471611	72
Solanum rostratum	Buffalo Burr	0.468698	0.85	0.254399	0.470707	73
Cytisus scoparius	English Broom	0.734874	0.28	0.520938	0.469510	74
Dipsacus fullonum	Wild Teasel	0.551563	0.71	0.309552	0.466737	75
Onopordum acanthium	Scotch/Heraldic Thistle	0.571238	0.57	0.381627	0.464660	76
Solanum elaeagnifolium	Silverleaf Nightshade	0.667968	0.57	0.357925	0.462994	77
Cuscuta spp.	Dodder	0.734033	0.42	0.429397	0.462946	78
Sida leprosa	Ivy-leafed Sida	0.485639	0.85	0.234041	0.461339	79
Calicotome spinosa	Spiny Broom	0.447135	0.71	0.317558	0.458689	80
Carduus tenuiflorus / C. pycnoc	Slender/Shore Thistle	0.608219	0.57	0.359060	0.456460	81
Hypericum tetrapterum	St. Peter's Wort	0.552896	0.71	0.284303	0.452757	82
Watsonia meriana 'Bulbillifera'	Wild Watsonia	0.402004	0.71	0.307647	0.447723	83
Echium plantagineum	Paterson's Curse	0.665066	0.42	0.412722	0.445332	84
Silybum marianum	Variegated Thistle	0.765111	0.42	0.387726	0.443340	85
Juncus acutus	Spiny Rush	0.516930	0.42	0.438554	0.442022	86
Dittrichia graveolens	Stinkwort	0.607585	0.57	0.319717	0.434352	87
Asparagus asparagoides	**bridal creeper**	**0.782848**	**0.42**	**0.361907**	**0.431010**	88
Alternanthera pungens	Khaki Weed	0.653479	0.57	0.303604	0.430836	89
Reseda luteola	Wild Mignonette	0.537021	0.85	0.167145	0.430044	90
Cirsium acarna	Soldier Thistle	0.523968	0.71	0.249563	0.429832	91
Diplotaxis tenuifolia	Sand Rocket/Sand Mustard	0.565974	0.57	0.317803	0.428286	92
Amsinckia spp.	Amsinckia	0.745464	0.42	0.333240	0.410470	93
Xanthium strumarium	Bathurst Burr	0.585163	0.42	0.356250	0.404120	94
Marrubium vulgare	Horehound	0.771737	0.14	0.451853	0.390446	95
Foeniculum vulgare	Fennel	0.574220	0.42	0.326980	0.386415	96
Cirsium vulgare	Spear Thistle	0.693549	0.28	0.353660	0.370875	97
Lagarosiphon major	Lagarosiphon	0.649037	0.28	0.342517	0.359294	98
Chondrilla juncea	Skeleton Weed	0.742382	0.28	0.315662	0.355456	99
Centaurea calcitrapa	Star Thistle	0.408196	0.42	0.303943	0.353592	100
Eragrostis curvula	African Lovegrass	0.715330	0.28	0.314456	0.351535	101
Oxalis pes-caprae	Soursob	0.743995	0.14	0.365451	0.338732	102
Asphodelus fistulosus	Onion Weed	0.539790	0.28	0.328848	0.338530	103
Emex australis	Spiny Emex	0.535113	0.42	0.247396	0.337155	104
Carthamus lanatus	Saffron Thistle	0.499430	0.14	0.405518	0.331822	105
Allium vineale	Wild Garlic	0.658241	0.28	0.285822	0.328649	106
Tribulus terrestris	Caltrop	0.606654	0.14	0.368584	0.324005	107
Solanum linnaeanum	Apple of Sodom	0.356227	0.28	0.325025	0.314361	108
Onopordum acaulon	Stemless Thistle	0.528267	0.28	0.285015	0.312601	109
Verbascum thapsus	Great Mullein	0.474171	0.28	0.296038	0.312282	110
Cenchrus longispinus	Spiny Burr Grass/ Gentle Annie	0.402417	0.14	0.313125	0.268440	111

Noxious Weeds Review; Phase 2 species
North Central CMA
Final score and rank

WONS	Scientific name	Common name	Inv. Score	Regional dist.	Impact Score	Regional score	Regional rank	Rank Relative to Phase 1*
	Sagittaria graminea	Arrowhead	0.5866	0.85	0.2985	0.5095	5	51
	Vinca major	blue periwinkle	0.7030	0.71	0.2892	0.4735	9	67
Yes	*Asparagus asparagoides*	bridal creeper	0.7828	0.42	0.3619	0.4310	10	82
	Nassella hyalina	cane needle grass	0.5036	0.85	0.2678	0.4824	8	62
Yes	*Nassella neesiana*	Chilean needle grass	0.6866	0.42	0.5438	0.5213	3	47
	Spartium junceum	Spanish broom	0.3418	0.85	0.3359	0.5011	6	55
	Pittosporum undulatum	sweet pittosporum	0.7937	0.85	0.3151	0.5437	2	40
	Nassella leucotricha	Texas needle grass	0.6279	0.71	0.3261	0.4852	7	61
	Cytisus multiflorus	white Spanish broom	0.5170	0.85	0.3308	0.5193	4	48
	Festuca gautieri	bearskin fescue	0.4914	0.85	0.3878	0.5481	1	38

* Total list now comprises 111 species; 101 phase 1, 10 phase 2.

Noxious Weeds Review; Phase 2 species
North Central CMA
Present distribution

		IPMS		FIS	Regional Estimate			
Common name	**Scientific name**	# infestations	area of infestation (ha)	# infestations	# infestations	area of infestation	Weight	Estimate based on: regional description, present potential ratio or gut feeling
arrowhead	*Sagittaria graminea*		1.4	0	43	1	0.85	Reliable and accurate
blue periwinkle	*Vinca major*		39.3	43	10,000	500	0.71	local knowledge
bridal creeper	*Asparagus asparagoides*		363.6	168	20,000	1,000	0.42	local knowledge
cane needle grass	*Nassella hyalina*			1	0	0	0.85	not known
Chilean needle grass	*Nassella neesiana*		341.1	351	500	2,000	0.42	local knowledge
Spanish broom	*Spartium junceum*			0	0	0	0.85	not known
sweet pittosporum	*Pittosporum undulatum*			2	0	0	0.85	not known
Texas needle grass	*Nassella luecotricha*			3	20	100	0.71	local knowledge##
white Spanish broom	*Cytisus multiflorus*		6.0	13	0	0	0.85	not known

* area unit of measure is hectare
Talk to Dave McLaren from KTRI as he may have further information on this species.

Noxious Weeds Review; Phase 2 species
North Central CMA
Potential distribution by landuse type

		Potential area* infested by landuse type						
Common name	**Scientific name**	**Horticulture**	**Broadacre cropping**	**Forestry**	**Pasture dryland**	**Pasture irrigated**	**Public land**	**Potential total area**
arrowhead	*Sagittaria graminea*							0
blue periwinkle	*Vinca major*			6,100			301,500	307,600
bridal creeper	*Asparagus asparagoides*	7,300					330,600	337,900
cane needle grass	*Nassella hyalina*				659,200	220,300	55,900	935,400
Chilean needle grass	*Nassella neesiana*				659,200	220,300	55,900	935,400
Spanish broom	*Spartium junceum*				659,200		55,900	715,100
sweet pittosporum	*Pittosporum undulatum*			6,100			305,000	311,100
Texas needle grass	*Nassella luecotricha*				659,200	220,300	55,900	935,400
white Spanish broom	*Cytisus multiflorus*				659,200		272,100	931,300
bearskin fescue	*Festuca gautieri*	7,300			659,200	220,300	22,300	909,100

* area unit of measure is hectare

Noxious Weeds Review
North Central CMA
Phase 2 Species: Ranking relative to Phase 1 Review (highlighted in red)

Scientific name	common name	Invasiveness Score	Regional Dist	Impact Scores	Final Score	RANK
Alternanthera philoxeroides	Alligator Weed	0.527352	0.85	0.719621	0.738270	1
Eichhornia crassipes	Water Hyacinth	0.879335	1	0.527622	0.720989	2
Orobanche ramosa	Branched Broomrape	0.769900	1	0.519638	0.703385	3
Equisetum spp.	Horsetails	0.726000	1	0.519638	0.698117	4
Nassella trichotoma	Serrated Tussock	0.761536	0.71	0.675277	0.696739	5
Pennisetum macrourum	African Feather Grass	0.612026	0.85	0.627185	0.696667	6
Acacia erioloba	Giraffe thorn	0.700000	1	0.519638	0.694997	7
Hieracium spp.	Hawkweeds	0.700000	1	0.519638	0.694997	7
Nassella tenuissima	Mexican feather grass	0.700000	1	0.519638	0.694997	7
Acacia karroo	Karoo thorn	0.670000	1	0.519638	0.691397	10
Nassella charruana	Lobed needle grass	0.650000	1	0.519638	0.688997	11
Salvinia molesta	Salvinia	0.587464	1	0.529090	0.686786	12
Fallopia japonica, Fallopia sacha	Japanese and Giant knotweed	0.506400	1	0.519638	0.671765	13
Parthenium hysterophorus	Parthenium Weed	0.825166	1	0.420087	0.654269	14
Prosopis spp.	Mesquite	0.658431	0.85	0.521093	0.642824	15
Rubus fruticosus agg.	Blackberry	0.767146	0.42	0.726464	0.633277	16
Cirsium arvense	Californian/Perennial Thistle	0.702729	0.85	0.458673	0.613185	17
Homeria miniata	Cape Tulip (one-leaf)	0.747658	0.85	0.440860	0.608600	18
Hypericum triquetrifolium	Tangled Hypericum	0.602251	1	0.377231	0.603520	19
Echium vulgare	Viper's Bugloss	0.655865	0.85	0.446556	0.600775	20
Iva axillaris	Poverty Weed	0.538501	0.85	0.453036	0.590320	21
Lagarosiphon major	Lagarosiphon	0.649037	1	0.342517	0.589694	22
Ambrosia psilostachya	Perennial Ragweed	0.489293	1	0.364356	0.582755	23
Leucanthemum vulgare	Ox-eye Daisy	0.610238	1	0.333108	0.579769	24
Chrysanthemoides monilifera	Boneseed/Bitou Bush	0.799614	0.85	0.375091	0.578005	25
Genista linifolia	Flax Leaved Broom	0.703726	0.85	0.392163	0.576058	26
Centaurea nigra	Black Knapweed	0.641607	1	0.317275	0.574667	27
Rosa rubiginosa	Sweet Briar	0.793721	0.57	0.508953	0.562660	28
Cytisus scoparius	English Broom	0.734874	0.57	0.520938	0.562310	29
Datura ferox	Thorn Apple (common)	0.703633	0.71	0.444751	0.560697	30
Datura stramonium	Thorn Apple (longspine)	0.703600	0.71	0.444751	0.560693	31
Datura inoxia	Thorn Apple (recurved)	0.703600	0.71	0.444751	0.560693	31
Cestrum parqui	Chilean Cestrum	0.727801	0.85	0.358471	0.560080	33
Conium maculatum	Hemlock	0.665290	0.71	0.446703	0.557188	34
Cuscuta spp.	Dodder	0.734033	0.71	0.429397	0.555746	35
Cannabis sativa	Marijuana	0.565385	1	0.297461	0.554424	36
Onopordum acanthium	Scotch/Heraldic Thistle	0.571238	0.85	0.381627	0.554260	37
Festuca gautieri	**bearskin fescue**	**0.491440334**	**0.85**	**0.387816**	**0.54815**	38
Hypericum tetrapterum	St. Peter's Wort	0.552896	1	0.284303	0.545557	39
Pittosporum undulatum	**sweet pittosporum**	**0.793703813**	**0.85**	**0.315117**	**0.54371**	40
Salpichroa origanifolia	Pampas Lily-of-the-Valley	0.762638	0.85	0.320066	0.542753	41
Senecio pterophorus	African Daisy	0.676556	0.85	0.337358	0.542107	42
Xanthium spinosum	Noogoora Burr/ Californian Burr	0.619536	0.57	0.500315	0.536921	43
Ailanthus altissima	Tree of Heaven	0.895314	0.57	0.441183	0.536900	44
Carduus nutans	Nodding Thistle	0.390918	1	0.302426	0.536269	45
Cirsium acarna	Soldier Thistle	0.523968	1	0.249563	0.522632	46
Nassella neesiana	**Chilean needle grass**	**0.686621695**	**0.42**	**0.543816**	**0.521332**	47
Cytisus multiflorus	**white Spanish broom**	**0.517034361**	**0.85**	**0.330775**	**0.519278**	48
Alhagi maurorum	Camelthorn	0.569959	0.71	0.386286	0.511915	49
Opuntia vulgaris	Prickly Pear (erect)	0.759228	0.71	0.345016	0.511516	50
Sagittaria graminea	**Arrowhead**	**0.586550595**	**0.85**	**0.298489**	**0.50954**	51
Allium triquetrum	Angled Onion	0.614461	0.57	0.448094	0.507068	52
Melianthus comosus	Tufted Honeyflower	0.492463	0.71	0.394016	0.506944	53
Crataegus monogyna	Hawthorn	0.704590	0.42	0.506902	0.502816	54
Spartium junceum	**Spanish broom**	**0.341814806**	**0.85**	**0.33587**	**0.501105**	55
Centaurea solstitialis	St. Barnaby's Thistle	0.655091	0.57	0.423400	0.498115	56
Solanum linnaeanum	Apple of Sodom	0.356227	0.85	0.325025	0.496761	57
Ulex europaeus	Furze/Gorse	0.828248	0.28	0.545087	0.494238	58
Acroptilon repens	Hardheads/Russian Knapweed	0.514006	0.57	0.434553	0.487430	59
Opuntia stricta	Prickly Pear (drooping)	0.552003	0.71	0.345016	0.486649	60
Nassella leucotricha	**Texas needle grass**	**0.627928565**	**0.71**	**0.326146**	**0.485193**	61
Nassella hyalina	**cane needle grass**	**0.503576129**	**0.85**	**0.267807**	**0.482401**	62

Noxious Weeds Review
North Central CMA
Phase 2 Species: Ranking relative to Phase 1 Review (highlighted in red)

Scientific name	common name	Invasiveness Score	Regional Dist	Impact Scores	Final Score	RANK
Ibicella lutea	Devil's Claw (yellowflower)	0.616016	0.85	0.241384	0.481097	63
Marrubium vulgare	Horehound	0.771737	0.42	0.451853	0.480046	64
Senecio jacobaea	Ragwort	0.776347	0.57	0.363784	0.479281	65
Lycium ferocissimum	Boxthorn	0.674957	0.42	0.470710	0.478993	66
Vinca major	**blue periwinkle**	**0.703021303**	**0.71**	**0.289181**	**0.473504**	67
Proboscidea louisianica	Devil's Claw (purpleflower)	0.542172	0.85	0.241384	0.472236	68
Hypericum androsaemum	Tutsan	0.746650	0.71	0.276452	0.471611	69
Onopordum illyricum	Illyrian Thistle	0.533147	0.57	0.401999	0.471497	70
Solanum rostratum	Buffalo Burr	0.468698	0.85	0.254399	0.470707	71
Convolvulus arvensis	Bindweed	0.779101	0.42	0.430366	0.468897	72
Calicotome spinosa	Spiny Broom	0.447135	0.71	0.317558	0.458689	73
Genista monspessulana	Cape Broom /Montpellier Broom	0.698418	0.42	0.419839	0.453320	74
Homeria flaccida	Cape Tulip (two-leaf)	0.684162	0.42	0.417379	0.450232	75
Verbascum thapsus	Great Mullein	0.474171	0.71	0.296038	0.449882	76
Cynara cardunculus	Artichoke Thistle	0.662745	0.42	0.413264	0.445358	77
Echium plantagineum	Paterson's Curse	0.665066	0.42	0.412722	0.445332	78
Silybum marianum	Variegated Thistle	0.765111	0.42	0.387726	0.443340	79
Cardaria draba	Hoary Cress	0.563497	0.42	0.429138	0.442337	80
Juncus acutus	Spiny Rush	0.516930	0.42	0.438554	0.442022	81
Asparagus asparagoides	**bridal creeper**	**0.782848383**	**0.42**	**0.361907**	**0.43101**	82
Emex australis	Spiny Emex	0.535113	0.71	0.247396	0.429955	83
Oxalis pes-caprae	Soursob	0.743995	0.42	0.365451	0.428332	84
Diplotaxis tenuifolia	Sand Rocket/Sand Mustard	0.565974	0.57	0.317803	0.428286	85
Dipsacus fullonum	Wild Teasel	0.551563	0.57	0.309552	0.421937	86
Carthamus lanatus	Saffron Thistle	0.499430	0.42	0.405518	0.421422	87
Solanum elaeagnifolium	Silverleaf Nightshade	0.667968	0.42	0.357925	0.414994	88
Amsinckia spp.	Amsinckia	0.745464	0.42	0.333240	0.410470	89
Cenchrus longispinus	Spiny Burr Grass/ Gentle Annie	0.402417	0.57	0.313125	0.406040	90
Scolymus hispanicus	Golden Thistle	0.497723	0.42	0.377717	0.405648	91
Opuntia robusta	Wheel Cactus	0.645158	0.42	0.345016	0.405028	92
Watsonia meriana 'Bulbillifera'	Wild Watsonia	0.402004	0.57	0.307647	0.402923	93
Centaurea calcitrapa	Star Thistle	0.408196	0.57	0.303943	0.401592	94
Hypericum perforatum	St. John's Wort	0.660601	0.42	0.334271	0.400864	95
Chondrilla juncea	Skeleton Weed	0.742382	0.42	0.315662	0.400256	96
Eragrostis curvula	African Lovegrass	0.715330	0.42	0.314456	0.396335	97
Physalis viscosa	Prairie Ground Cherry	0.727781	0.42	0.309365	0.394978	98
Lavandula stoechas	Topped Lavender	0.682210	0.42	0.316423	0.393462	99
Foeniculum vulgare	Fennel	0.574220	0.42	0.326980	0.386415	100
Dittrichia graveolens	Stinkwort	0.607585	0.42	0.319717	0.386352	101
Asphodelus fistulosus	Onion Weed	0.539790	0.42	0.328848	0.383330	102
Alternanthera pungens	Khaki Weed	0.653479	0.42	0.303604	0.382836	103
Allium vineale	Wild Garlic	0.658241	0.42	0.285822	0.373449	104
Sida leprosa	Ivy-leafed Sida	0.485639	0.57	0.234041	0.371739	105
Cirsium vulgare	Spear Thistle	0.693549	0.28	0.353660	0.370875	106
Tribulus terrestris	Caltrop	0.606654	0.28	0.368584	0.368805	107
Carduus tenuiflorus / C. pycnoc	Slender/Shore Thistle	0.608219	0.28	0.359060	0.363660	108
Xanthium strumarium	Bathurst Burr	0.585163	0.28	0.356250	0.359320	109
Onopordum acaulon	Stemless Thistle	0.528267	0.42	0.285015	0.357401	110
Reseda luteola	Wild Mignonette	0.537021	0.57	0.167145	0.340444	111

Noxious Weeds Review; Phase 2 species
North East CMA
Final score and rank

WONS	Scientific name	Common name	Inv. Score	Regional dist.	Impact Score	Regional score	Regional rank	Rank Relative to Phase 1*
	Sagittaria graminea	Arrowhead	0.5866	0.71	0.2985	0.4647	7	81
	Vinca major	blue periwinkle	0.7030	0.42	0.2892	0.3807	10	109
Yes	*Asparagus asparagoides*	bridal creeper	0.7828	0.42	0.3619	0.4310	8	91
	Nassella hyalina	cane needle grass	0.5036	0.85	0.2678	0.4824	6	69
Yes	*Nassella neesiana*	Chilean needle grass	0.6866	0.42	0.5438	0.5213	3	45
	Spartium junceum	Spanish broom	0.3418	0.85	0.3359	0.5011	5	60
	Pittosporum undulatum	sweet pittosporum	0.7937	0.42	0.3151	0.4061	9	97
	Nassella leucotricha	Texas needle grass	0.6279	0.85	0.3261	0.5300	2	43
	Cytisus multiflorus	white Spanish broom	0.5170	0.85	0.3308	0.5193	4	47
	Festuca gautieri	bearskin fescue	0.4914	0.85	0.3878	0.5481	1	35

* Total list now comprises 111 species; 101 phase 1, 10 phase 2.

Noxious Weeds Review; Phase 2 species
North East CMA
Present distribution

		IPMS		FIS	Regional Estimate			
Common name	**Scientific name**	# infestations	area of infestation (ha)	# infestations	# infestations	area of infestation	Weight	Estimate based on: regional description, present potential ratio or gut feeling
arrowhead	*Sagittaria graminea*			0	5	10	0.71	Indicated no.s known. Not widespread in the wild but numerous infests in backyards not included here) as plant is still sold in nurseries & influencing weighting.
blue periwinkle	*Vinca major*		0.9	9	25	10	0.42	Gut feel + advice from Parks Vic.. Numerous urban area infestations could be added to this
bridal creeper	*Asparagus asparagoides*		0.01	23	120	4,000	0.42	Gut feel + advice from Parks Vic. Numerous urban area infestations from nursery sales
cane needle grass	*Nassella hyalina*			0			0.85	not known
Chilean needle grass	*Nassella neesiana*		167.6	58	100	3,000	0.42	Guesstimate. Note similarity in numbers for IPMS & FIS. May be worth noting that many roadside infestations in IPMS are linked because the reporter identified a new site after travelling 3km along continuous infestations. Overall region estmate is roads +stab in dark for adjioning paddock infest which are usually only identified in a good year where stock can afford to be more selective
Spanish broom	*Spartium junceum*			0			0.85	not known
sweet pittosporum	*Pittosporum undulatum*			2			0.42	Only guessing, Unknown no. of infests in older urban areas.
Texas needle grass	*Nassella luecotricha*			0			0.85	not known
white Spanish broom	*Cytisus multiflorus*			0			0.85	not known

* area unit of measure is hectare

Noxious Weeds Review; Phase 2 species
North East CMA
Potential distribution by landuse type

		Potential area* infested by landuse type						
Common name	**Scientific name**	**Horticulture**	**Broadacre cropping**	**Forestry**	**Pasture dryland**	**Pasture irrigated**	**Public land**	**Potential total area**
arrowhead	*Sagittaria graminea*							0
blue periwinkle	*Vinca major*			50,800			930,700	981,500
bridal creeper	*Asparagus asparagoide*	7,400					1,204,900	1,212,300
cane needle grass	*Nassella hyalina*				495,400	1,400	45,000	541,800
Chilean needle grass	*Nassella neesiana*				468,400	1,400	45,000	514,800
Spanish broom	*Spartium junceum*				495,400		45,000	540,400
sweet pittosporum	*Pittosporum undulatum*			50,800			1,204,900	1,255,700
Texas needle grass	*Nassella luecotricha*				495,400	1,400	45,000	541,800
white Spanish broom	*Cytisus multiflorus*				495,400		922,000	1,417,400
bearskin fescue	*Festuca gautieri*	7,400			495,400	1,300	264,400	768,500

* area unit of measure is hectare

Noxious Weeds Review
North East CMA
Phase 2 Species: Ranking relative to Phase 1 Review (highlighted in red)

Scientific name	common name	Invasiveness Score	Regional Dist	Impact Scores	Final Score	RANK
Alternanthera philoxeroides	Alligator Weed	0.5273517	0.85	0.719621	0.738270	1
Orobanche ramosa	Branched Broomrape	0.7699000	1	0.519638	0.703385	2
Nassella trichotoma	Serrated Tussock	0.7615357	0.71	0.675277	0.696739	3
Pennisetum macrourum	African Feather Grass	0.6120262	0.85	0.627185	0.696667	4
Acacia erioloba	Giraffe thorn	0.7000000	1	0.519638	0.694997	5
Nassella tenuissima	Mexican feather grass	0.7000000	1	0.519638	0.694997	5
Acacia karroo	Karoo thorn	0.6700000	1	0.519638	0.691397	7
Nassella charruana	Lobed needle grass	0.6500000	1	0.519638	0.688997	8
Eichhornia crassipes	Water Hyacinth	0.8793353	0.85	0.527622	0.672989	9
Equisetum spp.	Horsetails	0.7260000	0.85	0.519638	0.650117	10
Hieracium spp.	Hawkweeds	0.7000000	0.85	0.519638	0.646997	11
Prosopis spp.	Mesquite	0.6584313	0.85	0.521093	0.642824	12
Salvinia molesta	Salvinia	0.5874643	0.85	0.529090	0.638786	13
Rubus fruticosus agg.	Blackberry	0.7671459	0.42	0.726464	0.633277	14
Ulex europaeus	Furze/Gorse	0.8282479	0.71	0.545087	0.631838	15
Chrysanthemoides monilifera	Boneseed/Bitou Bush	0.7996145	1	0.375091	0.626005	16
Fallopia japonica, Fallopia sacha	Japanese and Giant knotweed	0.5064000	0.85	0.519638	0.623765	17
Cirsium arvense	Californian/Perennial Thistle	0.7027293	0.85	0.458673	0.613185	18
Homeria miniata	Cape Tulip (one-leaf)	0.7476578	0.85	0.440860	0.608600	19
Convolvulus arvensis	Bindweed	0.7791006	0.85	0.430366	0.606497	20
Parthenium hysterophorus	Parthenium Weed	0.8251664	0.85	0.420087	0.606269	21
Datura stramonium	Thorn Apple (longspine)	0.7036000	0.85	0.444751	0.605493	22
Datura inoxia	Thorn Apple (recurved)	0.7036000	0.85	0.444751	0.605493	22
Hypericum triquetrifolium	Tangled Hypericum	0.6022514	1	0.377231	0.603520	24
Iva axillaris	Poverty Weed	0.5385006	0.85	0.453036	0.590320	25
Lagarosiphon major	Lagarosiphon	0.6490373	1	0.342517	0.589694	26
Homeria flaccida	Cape Tulip (two-leaf)	0.6841624	0.85	0.417379	0.587832	27
Cynara cardunculus	Artichoke Thistle	0.6627453	0.85	0.413264	0.582958	28
Cardaria draba	Hoary Cress	0.5634974	0.85	0.429138	0.579937	29
Acroptilon repens	Hardheads/Russian Knapweed	0.5140063	0.85	0.434553	0.577030	30
Genista linifolia	Flax Leaved Broom	0.7037258	0.85	0.392163	0.576058	31
Onopordum illyricum	Illyrian Thistle	0.5331470	0.85	0.401999	0.561097	32
Alhagi maurorum	Camelthorn	0.5699589	0.85	0.386286	0.556715	33
Allium triquetrum	Angled Onion	0.6144605	0.71	0.448094	0.551868	34
Festuca gautieri	**bearskin fescue**	**0.4914403**	**0.85**	**0.387816**	**0.548150**	35
Solanum linnaeanum	Apple of Sodom	0.3562271	1	0.325025	0.544761	36
Scolymus hispanicus	Golden Thistle	0.4977234	0.85	0.377717	0.543248	37
Centaurea solstitialis	St. Barnaby's Thistle	0.6550906	0.71	0.423400	0.542915	38
Salpichroa origanifolia	Pampas Lily-of-the-Valley	0.7626377	0.85	0.320066	0.542753	39
Opuntia robusta	Wheel Cactus	0.6451575	0.85	0.345016	0.542628	40
Senecio pterophorus	African Daisy	0.6765556	0.85	0.337358	0.542107	41
Ambrosia psilostachya	Perennial Ragweed	0.4892934	0.85	0.364356	0.534755	42
Nassella leucotricha	**Texas needle grass**	**0.6279286**	**0.85**	**0.326146**	**0.529993**	43
Senecio jacobaea	Ragwort	0.7763471	0.71	0.363784	0.524081	44
Nassella neesiana	**Chilean needle grass**	**0.6866217**	**0.42**	**0.543816**	**0.521332**	45
Asphodelus fistulosus	Onion Weed	0.5397901	0.85	0.328848	0.520930	46
Cytisus multiflorus	**white Spanish broom**	**0.5170344**	**0.85**	**0.330775**	**0.519278**	47
Cestrum parqui	Chilean Cestrum	0.7278009	0.71	0.358471	0.515280	48
Rosa rubiginosa	Sweet Briar	0.7937208	0.42	0.508953	0.514660	49
Cytisus scoparius	English Broom	0.7348744	0.42	0.520938	0.514310	50
Opuntia vulgaris	Prickly Pear (erect)	0.7592275	0.71	0.345016	0.511516	51
Echium vulgare	Viper's Bugloss	0.6558653	0.57	0.446556	0.511175	52
Allium vineale	Wild Garlic	0.6582410	0.85	0.285822	0.511049	53
Solanum elaeagnifolium	Silverleaf Nightshade	0.6679680	0.71	0.357925	0.507794	54
Melianthus comosus	Tufted Honeyflower	0.4924631	0.71	0.394016	0.506944	55
Calicotome spinosa	Spiny Broom	0.4471351	0.85	0.317558	0.503489	56
Amsinckia spp.	Amsinckia	0.7454645	0.71	0.333240	0.503270	57
Crataegus monogyna	Hawthorn	0.7045900	0.42	0.506902	0.502816	58
Genista monspessulana	Cape Broom /Montpellier Broom	0.6984179	0.57	0.419839	0.501320	59
Spartium junceum	**Spanish broom**	**0.3418148**	**0.85**	**0.335870**	**0.501105**	60
Onopordum acaulon	Stemless Thistle	0.5282671	0.85	0.285015	0.495001	61
Centaurea calcitrapa	Star Thistle	0.4081961	0.85	0.303943	0.491192	62

Noxious Weeds Review
North East CMA
Phase 2 Species: Ranking relative to Phase 1 Review (highlighted in red)

Scientific name	common name	Invasiveness Score	Regional Dist	Impact Scores	Final Score	RANK
Juncus acutus	Spiny Rush	0.5169304	0.57	0.438554	0.490022	63
Xanthium spinosum	Noogoora Burr/ Californian Burr	0.6195355	0.42	0.500315	0.488921	64
Ailanthus altissima	Tree of Heaven	0.8953138	0.42	0.441183	0.488900	65
Carduus nutans	Nodding Thistle	0.3909181	0.85	0.302426	0.488269	66
Physalis viscosa	Prairie Ground Cherry	0.7277810	0.71	0.309365	0.487778	67
Opuntia stricta	Prickly Pear (drooping)	0.5520029	0.71	0.345016	0.486649	68
Nassella hyalina	**cane needle grass**	**0.5035761**	**0.85**	**0.267807**	**0.482401**	69
Centaurea nigra	Black Knapweed	0.6416074	0.71	0.317275	0.481867	70
Marrubium vulgare	Horehound	0.7717374	0.42	0.451853	0.480046	71
Foeniculum vulgare	Fennel	0.5742197	0.71	0.326980	0.479215	72
Lycium ferocissimum	Boxthorn	0.6749574	0.42	0.470710	0.478993	73
Alternanthera pungens	Khaki Weed	0.6534790	0.71	0.303604	0.475636	74
Emex australis	Spiny Emex	0.5351129	0.85	0.247396	0.474755	75
Cirsium acarna	Soldier Thistle	0.5239676	0.85	0.249563	0.474632	76
Diplotaxis tenuifolia	Sand Rocket/Sand Mustard	0.5659738	0.71	0.317803	0.473086	77
Solanum rostratum	Buffalo Burr	0.4686981	0.85	0.254399	0.470707	78
Datura ferox	Thorn Apple (common)	0.7036329	0.42	0.444751	0.467897	79
Dipsacus fullonum	Wild Teasel	0.5515633	0.71	0.309552	0.466737	80
Sagittaria graminea	**Arrowhead**	**0.5865506**	**0.71**	**0.298489**	**0.464740**	81
Onopordum acanthium	Scotch/Heraldic Thistle	0.5712381	0.57	0.381627	0.464660	82
Conium maculatum	Hemlock	0.6652898	0.42	0.446703	0.464388	83
Cuscuta spp.	Dodder	0.7340330	0.42	0.429397	0.462946	84
Cannabis sativa	Marijuana	0.5653850	0.71	0.297461	0.461624	85
Sida leprosa	Ivy-leafed Sida	0.4856391	0.85	0.234041	0.461339	86
Hypericum tetrapterum	St. Peter's Wort	0.5528955	0.71	0.284303	0.452757	87
Watsonia meriana 'Bulbillifera'	Wild Watsonia	0.4020043	0.71	0.307647	0.447723	88
Silybum marianum	Variegated Thistle	0.7651111	0.42	0.387726	0.443340	89
Leucanthemum vulgare	Ox-eye Daisy	0.6102382	0.57	0.333108	0.442169	90
Asparagus asparagoides	**bridal creeper**	**0.7828484**	**0.42**	**0.361907**	**0.431010**	91
Oxalis pes-caprae	Soursob	0.7439945	0.42	0.365451	0.428332	92
Hypericum androsaemum	Tutsan	0.7466499	0.57	0.276452	0.426811	93
Carthamus lanatus	Saffron Thistle	0.4994298	0.42	0.405518	0.421422	94
Tribulus terrestris	Caltrop	0.6066545	0.42	0.368584	0.413605	95
Carduus tenuiflorus / C. pycnoc	Slender/Shore Thistle	0.6082194	0.42	0.359060	0.408460	96
Pittosporum undulatum	**sweet pittosporum**	**0.7937038**	**0.42**	**0.315117**	**0.406110**	97
Cenchrus longispinus	Spiny Burr Grass/ Gentle Annie	0.4024169	0.57	0.313125	0.406040	98
Verbascum thapsus	Great Mullein	0.4741715	0.57	0.296038	0.405082	99
Xanthium strumarium	Bathurst Burr	0.5851626	0.42	0.356250	0.404120	100
Echium plantagineum	Paterson's Curse	0.6650661	0.28	0.412722	0.400532	101
Chondrilla juncea	Skeleton Weed	0.7423819	0.42	0.315662	0.400256	102
Eragrostis curvula	African Lovegrass	0.7153296	0.42	0.314456	0.396335	103
Lavandula stoechas	Topped Lavender	0.6822096	0.42	0.316423	0.393462	104
Ibicella lutea	Devil's Claw (yellowflower)	0.6160159	0.57	0.241384	0.391497	105
Dittrichia graveolens	Stinkwort	0.6075851	0.42	0.319717	0.386352	106
Reseda luteola	Wild Mignonette	0.5370212	0.71	0.167145	0.385244	107
Proboscidea louisianica	Devil's Claw (purpleflower)	0.5421715	0.57	0.241384	0.382636	108
Vinca major	**blue periwinkle**	**0.7030213**	**0.42**	**0.289181**	**0.380704**	109
Cirsium vulgare	Spear Thistle	0.6935490	0.28	0.353660	0.370875	110
Hypericum perforatum	St. John's Wort	0.6606011	0.28	0.334271	0.356064	111

Noxious Weeds Review; Phase 2 species
Port Phillip and Westernport CMA
Final score and rank

WONS	Scientific name	Common name	Inv. Score	Regional dist.	Impact Score	Regional score	Regional rank	Rank Relative to Phase 1*
	Sagittaria graminea	Arrowhead	0.5866	0.85	0.2985	0.5095	4	46
	Vinca major	blue periwinkle	0.7030	0.42	0.2892	0.3807	9	102
Yes	*Asparagus asparagoides*	bridal creeper	0.7828	0.42	0.3619	0.4310	6	90
	Nassella hyalina	cane needle grass	0.5036	0.42	0.2678	0.3448	10	109
Yes	*Nassella neesiana*	Chilean needle grass	0.6866	0.42	0.5438	0.5213	2	36
	Spartium junceum	Spanish broom	0.3418	0.85	0.3359	0.5011	5	51
	Pittosporum undulatum	sweet pittosporum	0.7937	0.42	0.3151	0.4061	7	95
	Nassella leucotricha	Texas needle grass	0.6279	0.42	0.3261	0.3924	8	100
	Cytisus multiflorus	white Spanish broom	0.5170	0.85	0.3308	0.5193	3	38
	Festuca gautieri	bearskin fescue	0.4914	0.85	0.3878	0.5481	1	31

* Total list now comprises 111 species; 101 phase 1, 10 phase 2.

Noxious Weeds Review; Phase 2 species
Port Phillip and Westernport CMA
Present distribution

		IPMS		FIS	Regional Estimate			
Common name	**Scientific name**	# infestations	area of infestation (ha)	# infestations	# infestations	area of infestation	Weight	Estimate based on: regional description, present potential ratio or gut feeling
arrowhead	*Sagittaria graminea*			0	10	1	0.85	
blue periwinkle	*Vinca major*		0.1	114			0.42	Widespread; unable to estimate area of infestation. Certainly beyond eradication. Pers comms Natasha Baldyga
bridal creeper	*Asparagus asparagoides*		1,821.2	551			0.42	
cane needle grass	*Nassella hyalina*		5.3	83	4,000	3,500	0.42	
Chilean needle grass	*Nassella neesiana*		950.2	688	25,000	29,000	0.42	
Spanish broom	*Spartium junceum*			2			0.85	
sweet pittosporum	*Pittosporum undulatum*		261.8	1,510			0.42	
Texas needle grass	*Nassella luecotricha*		0.2	122	15,000	17,000	0.42	
white Spanish broom	*Cytisus multiflorus*			0			0.85	

* area unit of measure is hectare

Noxious Weeds Review; Phase 2 species
Port Phillip and Westernport CMA
Potential distribution by landuse type

		Potential area* infested by landuse type						
Common name	**Scientific name**	**Horticulture**	**Broadacre cropping**	**Forestry**	**Pasture dryland**	**Pasture irrigated**	**Public land**	**Potential total area**
arrowhead	*Sagittaria graminea*							0
blue periwinkle	*Vinca major*			660			130,800	131,460
bridal creeper	*Asparagus asparagoides*	47,700					317,500	365,200
cane needle grass	*Nassella hyalina*				725,800	1,800	20,700	748,300
Chilean needle grass	*Nassella neesiana*				725,800	1,800	20,700	748,300
Spanish broom	*Spartium junceum*				725,800		20,700	746,500
sweet pittosporum	*Pittosporum undulatum*			660			317,500	318,160
Texas needle grass	*Nassella luecotricha*				725,800	1,800	25,300	752,900
white Spanish broom	*Cytisus multiflorus*				725,800		122,000	847,800
bearskin fescue	*Festuca gautieri*	47,700			671,300	1,800	8,200	729,000

* area unit of measure is hectare

Noxious Weeds Review
Port Phillip CMA
Phase 2 Species: Ranking relative to Phase 1 Review (highlighted in red)

Scientific name	common name	Invasiveness Score	Regional Dist	Impact Scores	Final Score	RANK
Orobanche ramosa	Branched Broomrape	0.769900	1	0.519638	0.703385	1
Equisetum spp.	Horsetails	0.726000	1	0.519638	0.698117	2
Acacia erioloba	Giraffe thorn	0.700000	1	0.519638	0.694997	3
Hieracium spp.	Hawkweeds	0.700000	1	0.519638	0.694997	3
Nassella tenuissima	Mexican feather grass	0.700000	1	0.519638	0.694997	3
Salvinia molesta	Salvinia	0.587464	1	0.529090	0.686786	6
Cirsium arvense	Californian/Perennial Thistle	0.702729	1	0.458673	0.661185	7
Pennisetum macrourum	African Feather Grass	0.612026	0.71	0.627185	0.651867	8
Alternanthera philoxeroides	Alligator Weed	0.527352	0.57	0.719621	0.648670	9
Acacia karroo	Karoo thorn	0.670000	0.85	0.519638	0.643397	10
Prosopis spp.	Mesquite	0.658431	0.85	0.521093	0.642824	11
Nassella charruana	Lobed needle grass	0.650000	0.85	0.519638	0.640997	12
Eichhornia crassipes	Water Hyacinth	0.879335	0.71	0.527622	0.628189	13
Xanthium spinosum	Noogoora Burr/ Californian Burr	0.619536	0.85	0.500315	0.626521	14
Fallopia japonica, Fallopia sacha	Japanese and Giant knotweed	0.506400	0.85	0.519638	0.623765	15
Parthenium hysterophorus	Parthenium Weed	0.825166	0.85	0.420087	0.606269	16
Datura inoxia	Thorn Apple (recurved)	0.703600	0.85	0.444751	0.605493	17
Alhagi maurorum	Camelthorn	0.569959	1	0.386286	0.604715	18
Hypericum triquetrifolium	Tangled Hypericum	0.602251	1	0.377231	0.603520	19
Iva axillaris	Poverty Weed	0.538501	0.85	0.453036	0.590320	20
Lagarosiphon major	Lagarosiphon	0.649037	1	0.342517	0.589694	21
Centaurea solstitialis	St. Barnaby's Thistle	0.655091	0.85	0.423400	0.587715	22
Ambrosia psilostachya	Perennial Ragweed	0.489293	1	0.364356	0.582755	23
Acroptilon repens	Hardheads/Russian Knapweed	0.514006	0.85	0.434553	0.577030	24
Onopordum illyricum	Illyrian Thistle	0.533147	0.85	0.401999	0.561097	25
Nassella trichotoma	Serrated Tussock	0.761536	0.28	0.675277	0.559139	26
Cuscuta spp.	Dodder	0.734033	0.71	0.429397	0.555746	27
Cannabis sativa	Marijuana	0.565385	1	0.297461	0.554424	28
Solanum elaeagnifolium	Silverleaf Nightshade	0.667968	0.85	0.357925	0.552594	29
Tribulus terrestris	Caltrop	0.606654	0.85	0.368584	0.551205	30
Festuca gautieri	**bearskin fescue**	**0.491440**	**0.85**	**0.387816**	**0.548150**	31
Amsinckia spp.	Amsinckia	0.745464	0.85	0.333240	0.548070	32
Rubus fruticosus agg.	Blackberry	0.767146	0.14	0.726464	0.543677	33
Opuntia robusta	Wheel Cactus	0.645158	0.85	0.345016	0.542628	34
Centaurea nigra	Black Knapweed	0.641607	0.85	0.317275	0.526667	35
Nassella neesiana	**Chilean needle grass**	**0.686622**	**0.42**	**0.543816**	**0.521332**	36
Alternanthera pungens	Khaki Weed	0.653479	0.85	0.303604	0.520436	37
Cytisus multiflorus	**white Spanish broom**	**0.517034**	**0.85**	**0.330775**	**0.519278**	38
Homeria miniata	Cape Tulip (one-leaf)	0.747658	0.57	0.440860	0.519000	39
Convolvulus arvensis	Bindweed	0.779101	0.57	0.430366	0.516897	40
Datura ferox	Thorn Apple (common)	0.703633	0.57	0.444751	0.515897	41
Datura stramonium	Thorn Apple (longspine)	0.703600	0.57	0.444751	0.515893	42
Cestrum parqui	Chilean Cestrum	0.727801	0.71	0.358471	0.515280	43
Cytisus scoparius	English Broom	0.734874	0.42	0.520938	0.514310	44
Echium vulgare	Viper's Bugloss	0.655865	0.57	0.446556	0.511175	45
Sagittaria graminea	**Arrowhead**	**0.586551**	**0.85**	**0.298489**	**0.509540**	46
Onopordum acanthium	Scotch/Heraldic Thistle	0.571238	0.71	0.381627	0.509460	47
Melianthus comosus	Tufted Honeyflower	0.492463	0.71	0.394016	0.506944	48
Calicotome spinosa	Spiny Broom	0.447135	0.85	0.317558	0.503489	49
Crataegus monogyna	Hawthorn	0.704590	0.42	0.506902	0.502816	50
Spartium junceum	**Spanish broom**	**0.341815**	**0.85**	**0.335870**	**0.501105**	51
Homeria flaccida	Cape Tulip (two-leaf)	0.684162	0.57	0.417379	0.498232	52
Salpichroa origanifolia	Pampas Lily-of-the-Valley	0.762638	0.71	0.320066	0.497953	53
Senecio pterophorus	African Daisy	0.676556	0.71	0.337358	0.497307	54
Cenchrus longispinus	Spiny Burr Grass/ Gentle Annie	0.402417	0.85	0.313125	0.495640	55
Onopordum acaulon	Stemless Thistle	0.528267	0.85	0.285015	0.495001	56
Ulex europaeus	Furze/Gorse	0.828248	0.28	0.545087	0.494238	57
Chondrilla juncea	Skeleton Weed	0.742382	0.71	0.315662	0.493056	58
Centaurea calcitrapa	Star Thistle	0.408196	0.85	0.303943	0.491192	59
Cardaria draba	Hoary Cress	0.563497	0.57	0.429138	0.490337	60
Eragrostis curvula	African Lovegrass	0.715330	0.71	0.314456	0.489135	61
Ailanthus altissima	Tree of Heaven	0.895314	0.42	0.441183	0.488900	62

Noxious Weeds Review
Port Phillip CMA
Phase 2 Species: Ranking relative to Phase 1 Review (highlighted in red)

Scientific name	common name	Invasiveness Score	Regional Dist	Impact Scores	Final Score	RANK
Chrysanthemoides monilifera	Boneseed/Bitou Bush	0.799614	0.57	0.375091	0.488405	63
Carduus nutans	Nodding Thistle	0.390918	0.85	0.302426	0.488269	64
Genista linifolia	Flax Leaved Broom	0.703726	0.57	0.392163	0.486458	65
Lavandula stoechas	Topped Lavender	0.682210	0.71	0.316423	0.486262	66
Ibicella lutea	Devil's Claw (yellowflower)	0.616016	0.85	0.241384	0.481097	67
Asphodelus fistulosus	Onion Weed	0.539790	0.71	0.328848	0.476130	68
Emex australis	Spiny Emex	0.535113	0.85	0.247396	0.474755	69
Cirsium acarna	Soldier Thistle	0.523968	0.85	0.249563	0.474632	70
Proboscidea louisianica	Devil's Claw (purpleflower)	0.542172	0.85	0.241384	0.472236	71
Solanum rostratum	Buffalo Burr	0.468698	0.85	0.254399	0.470707	72
Rosa rubiginosa	Sweet Briar	0.793721	0.28	0.508953	0.469860	73
Carthamus lanatus	Saffron Thistle	0.499430	0.57	0.405518	0.469422	74
Opuntia vulgaris	Prickly Pear (erect)	0.759228	0.57	0.345016	0.466716	75
Conium maculatum	Hemlock	0.665290	0.42	0.446703	0.464388	76
Sida leprosa	Ivy-leafed Sida	0.485639	0.85	0.234041	0.461339	77
Allium triquetrum	Angled Onion	0.614461	0.42	0.448094	0.459068	78
Scolymus hispanicus	Golden Thistle	0.497723	0.57	0.377717	0.453648	79
Genista monspessulana	Cape Broom /Montpellier Broom	0.698418	0.42	0.419839	0.453320	80
Hypericum perforatum	St. John's Wort	0.660601	0.57	0.334271	0.448864	81
Leucanthemum vulgare	Ox-eye Daisy	0.610238	0.57	0.333108	0.442169	82
Juncus acutus	Spiny Rush	0.516930	0.42	0.438554	0.442022	83
Opuntia stricta	Prickly Pear (drooping)	0.552003	0.57	0.345016	0.441849	84
Marrubium vulgare	Horehound	0.771737	0.28	0.451853	0.435246	85
Foeniculum vulgare	Fennel	0.574220	0.57	0.326980	0.434415	86
Dittrichia graveolens	Stinkwort	0.607585	0.57	0.319717	0.434352	87
Lycium ferocissimum	Boxthorn	0.674957	0.28	0.470710	0.434193	88
Senecio jacobaea	Ragwort	0.776347	0.42	0.363784	0.431281	89
Asparagus asparagoides	**bridal creeper**	**0.782848**	**0.42**	**0.361907**	**0.431010**	90
Hypericum androsaemum	Tutsan	0.746650	0.57	0.276452	0.426811	91
Dipsacus fullonum	Wild Teasel	0.551563	0.57	0.309552	0.421937	92
Allium vineale	Wild Garlic	0.658241	0.57	0.285822	0.421449	93
Hypericum tetrapterum	St. Peter's Wort	0.552896	0.57	0.284303	0.407957	94
Pittosporum undulatum	**sweet pittosporum**	**0.793704**	**0.42**	**0.315117**	**0.406110**	95
Xanthium strumarium	Bathurst Burr	0.585163	0.42	0.356250	0.404120	96
Cynara cardunculus	Artichoke Thistle	0.662745	0.28	0.413264	0.400558	97
Echium plantagineum	Paterson's Curse	0.665066	0.28	0.412722	0.400532	98
Silybum marianum	Variegated Thistle	0.765111	0.28	0.387726	0.398540	99
Nassella leucotricha	**Texas needle grass**	**0.627929**	**0.42**	**0.326146**	**0.392393**	100
Oxalis pes-caprae	Soursob	0.743995	0.28	0.365451	0.383532	101
Vinca major	**blue periwinkle**	**0.703021**	**0.42**	**0.289181**	**0.380704**	102
Cirsium vulgare	Spear Thistle	0.693549	0.28	0.353660	0.370875	103
Carduus tenuiflorus / C. pycnoc	Slender/Shore Thistle	0.608219	0.28	0.359060	0.363660	104
Solanum linnaeanum	Apple of Sodom	0.356227	0.42	0.325025	0.359161	105
Verbascum thapsus	Great Mullein	0.474171	0.42	0.296038	0.357082	106
Watsonia meriana 'Bulbillifera'	Wild Watsonia	0.402004	0.42	0.307647	0.354923	107
Physalis viscosa	Prairie Ground Cherry	0.727781	0.28	0.309365	0.350178	108
Nassella hyalina	**cane needle grass**	**0.503576**	**0.42**	**0.267807**	**0.344801**	109
Diplotaxis tenuifolia	Sand Rocket/Sand Mustard	0.565974	0.28	0.317803	0.335486	110
Reseda luteola	Wild Mignonette	0.537021	0.42	0.167145	0.292444	111

Noxious Weeds Review; Phase 2 species
West Gippsland CMA
Final score and rank

WONS	Scientific name	Common name	Inv. Score	Regional dist.	Impact Score	Regional score	Regional rank	Rank Relative to Phase 1*
	Sagittaria graminea	Arrowhead	0.5866	0.85	0.2985	0.5095	5	69
	Vinca major	blue periwinkle	0.7030	0.42	0.2892	0.3807	10	110
Yes	*Asparagus asparagoides*	bridal creeper	0.7828	0.85	0.3619	0.5686	1	31
	Nassella hyalina	cane needle grass	0.5036	0.85	0.2678	0.4824	7	84
Yes	*Nassella neesiana*	Chilean needle grass	0.6866	0.42	0.5438	0.5213	4	60
	Spartium junceum	Spanish broom	0.3418	0.85	0.3359	0.5011	6	73
	Pittosporum undulatum	sweet pittosporum	0.7937	0.42	0.3151	0.4061	9	107
	Nassella leucotricha	Texas needle grass	0.6279	0.85	0.3261	0.5300	3	57
	Cytisus multiflorus	white Spanish broom	0.5170	0.71	0.3308	0.4745	8	89
	Festuca gautieri	bearskin fescue	0.4914	0.85	0.3878	0.5481	2	46

* Total list now comprises 111 species; 101 phase 1, 10 phase 2.

Noxious Weeds Review; Phase 2 species
West Gippsland CMA
Present distribution

		IPMS		FIS	Regional Estimate			
Common name	**Scientific name**	# infestations	area of infestation (ha)	# infestations	# infestations	area of infestation	Weight	Estimate based on: regional description, present potential ratio or gut feeling
arrowhead	*Sagittaria graminea*			0			0.85	
blue periwinkle	*Vinca major*		2.0	19			0.42	
bridal creeper	*Asparagus asparagoides*		71.1	31			0.85	
cane needle grass	*Nassella hyalina*			2			0.85	
Chilean needle grass	*Nassella neesiana*		1.0	0			0.42	
Spanish broom	*Spartium junceum*			0			0.85	
sweet pittosporum	*Pittosporum undulatum*			178			0.42	
Texas needle grass	*Nassella luecotricha*			0			0.85	
white Spanish broom	*Cytisus multiflorus*			0			0.71	a couple of known but not confirmed locations so I would guess there is more out there

* area unit of measure is hectare

Noxious Weeds Review; Phase 2 species
West Gippsland CMA
Potential distribution by landuse type

		Potential area* infested by landuse type						
Common name	**Scientific name**	**Horticulture**	**Broadacre cropping**	**Forestry**	**Pasture dryland**	**Pasture irrigated**	**Public land**	**Potential total area**
arrowhead	*Sagittaria graminea*							0
blue periwinkle	*Vinca major*			68,700			451,400	520,100
bridal creeper	*Asparagus asparagoides*	18,100					859,400	877,500
cane needle grass	*Nassella hyalina*				710,400	70,200	111,600	892,200
Chilean needle grass	*Nassella neesiana*				710,400	70,200	111,600	892,200
Spanish broom	*Spartium junceum*				710,400		111,600	822,000
sweet pittosporum	*Pittosporum undulatum*			68,700			859,400	928,100
Texas needle grass	*Nassella luecotricha*				710,400	70,200	114,600	895,200
white Spanish broom	*Cytisus multiflorus*				710,400		419,600	1,130,000
bearskin fescue	*Festuca gautieri*	18,100			651,800	70,200	64,100	804,200

* area unit of measure is hectare

Noxious Weeds Review
West Gippsland CMA
Phase 2 Species: Ranking relative to Phase 1 Review (highlighted in red)

Scientific name	common name	Invasiveness Score	Regional Dist	Impact Scores	Final Score	RANK
Alternanthera philoxeroides	Alligator Weed	0.527352	0.85	0.719621	0.738270	1
Orobanche ramosa	Branched Broomrape	0.769900	1	0.519638	0.703385	2
Nassella trichotoma	Serrated Tussock	0.761536	0.71	0.675277	0.696739	3
Pennisetum macrourum	African Feather Grass	0.612026	0.85	0.627185	0.696667	4
Acacia erioloba	Giraffe thorn	0.700000	1	0.519638	0.694997	5
Nassella tenuissima	Mexican feather grass	0.700000	1	0.519638	0.694997	5
Acacia karroo	Karoo thorn	0.670000	1	0.519638	0.691397	7
Nassella charruana	Lobed needle grass	0.650000	1	0.519638	0.688997	8
Salvinia molesta	Salvinia	0.587464	1	0.529090	0.686786	9
Eichhornia crassipes	Water Hyacinth	0.879335	0.85	0.527622	0.672989	10
Parthenium hysterophorus	Parthenium Weed	0.825166	1	0.420087	0.654269	11
Equisetum spp.	Horsetails	0.726000	0.85	0.519638	0.650117	12
Hieracium spp.	Hawkweeds	0.700000	0.85	0.519638	0.646997	13
Iva axillaris	Poverty Weed	0.538501	1	0.453036	0.638320	14
Rubus fruticosus agg.	Blackberry	0.767146	0.42	0.726464	0.633277	15
Xanthium spinosum	Noogoora Burr/ Californian Burr	0.619536	0.85	0.500315	0.626521	16
Fallopia japonica, Fallopia sacha	Japanese and Giant knotweed	0.506400	0.85	0.519638	0.623765	17
Convolvulus arvensis	Bindweed	0.779101	0.85	0.430366	0.606497	18
Datura stramonium	Thorn Apple (longspine)	0.703600	0.85	0.444751	0.605493	19
Datura inoxia	Thorn Apple (recurved)	0.703600	0.85	0.444751	0.605493	19
Echium vulgare	Viper's Bugloss	0.655865	0.85	0.446556	0.600775	21
Lagarosiphon major	Lagarosiphon	0.649037	1	0.342517	0.589694	22
Homeria flaccida	Cape Tulip (two-leaf)	0.684162	0.85	0.417379	0.587832	23
Centaurea solstitialis	St. Barnaby's Thistle	0.655091	0.85	0.423400	0.587715	24
Ulex europaeus	Furze/Gorse	0.828248	0.57	0.545087	0.587038	25
Cynara cardunculus	Artichoke Thistle	0.662745	0.85	0.413264	0.582958	26
Ailanthus altissima	Tree of Heaven	0.895314	0.71	0.441183	0.581700	27
Cardaria draba	Hoary Cress	0.563497	0.85	0.429138	0.579937	28
Acroptilon repens	Hardheads/Russian Knapweed	0.514006	0.85	0.434553	0.577030	29
Marrubium vulgare	Horehound	0.771737	0.71	0.451853	0.572846	30
Asparagus asparagoides	**bridal creeper**	**0.782848**	**0.85**	**0.361907**	**0.568610**	31
Cirsium arvense	Californian/Perennial Thistle	0.702729	0.71	0.458673	0.568385	32
Rosa rubiginosa	Sweet Briar	0.793721	0.57	0.508953	0.562660	33
Cytisus scoparius	English Broom	0.734874	0.57	0.520938	0.562310	34
Onopordum illyricum	Illyrian Thistle	0.533147	0.85	0.401999	0.561097	35
Cestrum parqui	Chilean Cestrum	0.727801	0.85	0.358471	0.560080	36
Alhagi maurorum	Camelthorn	0.569959	0.85	0.386286	0.556715	37
Opuntia vulgaris	Prickly Pear (erect)	0.759228	0.85	0.345016	0.556316	38
Cuscuta spp.	Dodder	0.734033	0.71	0.429397	0.555746	39
Hypericum triquetrifolium	Tangled Hypericum	0.602251	0.85	0.377231	0.555520	40
Cannabis sativa	Marijuana	0.565385	1	0.297461	0.554424	41
Solanum elaeagnifolium	Silverleaf Nightshade	0.667968	0.85	0.357925	0.552594	42
Melianthus comosus	Tufted Honeyflower	0.492463	0.85	0.394016	0.551744	43
Tribulus terrestris	Caltrop	0.606654	0.85	0.368584	0.551205	44
Crataegus monogyna	Hawthorn	0.704590	0.57	0.506902	0.550816	45
Festuca gautieri	**bearskin fescue**	**0.491440**	**0.85**	**0.387816**	**0.548150**	46
Amsinckia spp.	Amsinckia	0.745464	0.85	0.333240	0.548070	47
Scolymus hispanicus	Golden Thistle	0.497723	0.85	0.377717	0.543248	48
Salpichroa origanifolia	Pampas Lily-of-the-Valley	0.762638	0.85	0.320066	0.542753	49
Opuntia robusta	Wheel Cactus	0.645158	0.85	0.345016	0.542628	50
Senecio pterophorus	African Daisy	0.676556	0.85	0.337358	0.542107	51
Juncus acutus	Spiny Rush	0.516930	0.71	0.438554	0.534822	52
Ambrosia psilostachya	Perennial Ragweed	0.489293	0.85	0.364356	0.534755	53
Chrysanthemoides monilifera	Boneseed/Bitou Bush	0.799614	0.71	0.375091	0.533205	54
Physalis viscosa	Prairie Ground Cherry	0.727781	0.85	0.309365	0.532578	55
Opuntia stricta	Prickly Pear (drooping)	0.552003	0.85	0.345016	0.531449	56
Nassella leucotricha	**Texas needle grass**	**0.627929**	**0.85**	**0.326146**	**0.529993**	57
Lycium ferocissimum	Boxthorn	0.674957	0.57	0.470710	0.526993	58
Centaurea nigra	Black Knapweed	0.641607	0.85	0.317275	0.526667	59
Nassella neesiana	**Chilean needle grass**	**0.686622**	**0.42**	**0.543816**	**0.521332**	60
Asphodelus fistulosus	Onion Weed	0.539790	0.85	0.328848	0.520930	61
Alternanthera pungens	Khaki Weed	0.653479	0.85	0.303604	0.520436	62

Noxious Weeds Review
West Gippsland CMA
Phase 2 Species: Ranking relative to Phase 1 Review (highlighted in red)

Scientific name	common name	Invasiveness Score	Regional Dist	Impact Scores	Final Score	RANK
Homeria miniata	Cape Tulip (one-leaf)	0.747658	0.57	0.440860	0.519000	63
Datura ferox	Thorn Apple (common)	0.703633	0.57	0.444751	0.515897	64
Carthamus lanatus	Saffron Thistle	0.499430	0.71	0.405518	0.514222	65
Conium maculatum	Hemlock	0.665290	0.57	0.446703	0.512388	66
Dipsacus fullonum	Wild Teasel	0.551563	0.85	0.309552	0.511537	67
Allium vineale	Wild Garlic	0.658241	0.85	0.285822	0.511049	68
Sagittaria graminea	**Arrowhead**	**0.586551**	**0.85**	**0.298489**	**0.509540**	69
Allium triquetrum	Angled Onion	0.614461	0.57	0.448094	0.507068	70
Calicotome spinosa	Spiny Broom	0.447135	0.85	0.317558	0.503489	71
Genista monspessulana	Cape Broom /Montpellier Broom	0.698418	0.57	0.419839	0.501320	72
Spartium junceum	**Spanish broom**	**0.341815**	**0.85**	**0.335870**	**0.501105**	73
Xanthium strumarium	Bathurst Burr	0.585163	0.71	0.356250	0.496920	74
Solanum linnaeanum	Apple of Sodom	0.356227	0.85	0.325025	0.496761	75
Cenchrus longispinus	Spiny Burr Grass/ Gentle Annie	0.402417	0.85	0.313125	0.495640	76
Onopordum acaulon	Stemless Thistle	0.528267	0.85	0.285015	0.495001	77
Echium plantagineum	Paterson's Curse	0.665066	0.57	0.412722	0.493332	78
Chondrilla juncea	Skeleton Weed	0.742382	0.71	0.315662	0.493056	79
Silybum marianum	Variegated Thistle	0.765111	0.57	0.387726	0.491340	80
Centaurea calcitrapa	Star Thistle	0.408196	0.85	0.303943	0.491192	81
Genista linifolia	Flax Leaved Broom	0.703726	0.57	0.392163	0.486458	82
Lavandula stoechas	Topped Lavender	0.682210	0.71	0.316423	0.486262	83
Nassella hyalina	**cane needle grass**	**0.503576**	**0.85**	**0.267807**	**0.482401**	84
Ibicella lutea	Devil's Claw (yellowflower)	0.616016	0.85	0.241384	0.481097	85
Dittrichia graveolens	Stinkwort	0.607585	0.71	0.319717	0.479152	86
Oxalis pes-caprae	Soursob	0.743995	0.57	0.365451	0.476332	87
Cirsium acarna	Soldier Thistle	0.523968	0.85	0.249563	0.474632	88
Cytisus multiflorus	**white Spanish broom**	**0.517034**	**0.71**	**0.330775**	**0.474478**	89
Proboscidea louisianica	Devil's Claw (purpleflower)	0.542172	0.85	0.241384	0.472236	90
Solanum rostratum	Buffalo Burr	0.468698	0.85	0.254399	0.470707	91
Onopordum acanthium	Scotch/Heraldic Thistle	0.571238	0.57	0.381627	0.464660	92
Prosopis spp.	Mesquite	0.658431	0.28	0.521093	0.460424	93
Carduus tenuiflorus / C. pycnoc	Slender/Shore Thistle	0.608219	0.57	0.359060	0.456460	94
Hypericum tetrapterum	St. Peter's Wort	0.552896	0.71	0.284303	0.452757	95
Hypericum perforatum	St. John's Wort	0.660601	0.57	0.334271	0.448864	96
Eragrostis curvula	African Lovegrass	0.715330	0.57	0.314456	0.444335	97
Carduus nutans	Nodding Thistle	0.390918	0.71	0.302426	0.443469	98
Leucanthemum vulgare	Ox-eye Daisy	0.610238	0.57	0.333108	0.442169	99
Foeniculum vulgare	Fennel	0.574220	0.57	0.326980	0.434415	100
Senecio jacobaea	Ragwort	0.776347	0.42	0.363784	0.431281	101
Reseda luteola	Wild Mignonette	0.537021	0.85	0.167145	0.430044	102
Emex australis	Spiny Emex	0.535113	0.71	0.247396	0.429955	103
Diplotaxis tenuifolia	Sand Rocket/Sand Mustard	0.565974	0.57	0.317803	0.428286	104
Hypericum androsaemum	Tutsan	0.746650	0.57	0.276452	0.426811	105
Cirsium vulgare	Spear Thistle	0.693549	0.42	0.353660	0.415675	106
Pittosporum undulatum	**sweet pittosporum**	**0.793704**	**0.42**	**0.315117**	**0.406110**	107
Verbascum thapsus	Great Mullein	0.474171	0.57	0.296038	0.405082	108
Watsonia meriana 'Bulbillifera'	Wild Watsonia	0.402004	0.57	0.307647	0.402923	109
Vinca major	**blue periwinkle**	**0.703021**	**0.42**	**0.289181**	**0.380704**	110
Sida leprosa	Ivy-leafed Sida	0.485639	0.28	0.234041	0.278939	111

Noxious Weeds Review; Phase 2 species
Wimmera CMA
Final score and rank

WONS	Scientific name	Common name	Inv. Score	Regional dist.	Impact Score	Regional score	Regional rank	Rank Relative to Phase 1*
	Sagittaria graminea	Arrowhead	0.5866	0.85	0.2985	0.5095	6	44
	Vinca major	blue periwinkle	0.7030	0.71	0.2892	0.4735	9	66
Yes	*Asparagus asparagoides*	bridal creeper	0.7828	0.42	0.3619	0.4310	10	86
	Nassella hyalina	cane needle grass	0.5036	0.85	0.2678	0.4824	8	60
Yes	*Nassella neesiana*	Chilean needle grass	0.6866	0.85	0.5438	0.6589	1	13
	Spartium junceum	Spanish broom	0.3418	0.85	0.3359	0.5011	7	51
	Pittosporum undulatum	sweet pittosporum	0.7937	0.85	0.3151	0.5437	3	31
	Nassella leucotricha	Texas needle grass	0.6279	0.85	0.3261	0.5300	4	37
	Cytisus multiflorus	white Spanish broom	0.5170	0.85	0.3308	0.5193	5	39
	Festuca gautieri	bearskin fescue	0.4914	0.85	0.3878	0.5481	2	30

* Total list now comprises 111 species; 101 phase 1, 10 phase 2.

Noxious Weeds Review; Phase 2 species
Wimmera CMA
Present distribution

		IPMS		FIS	Regional Estimate			
Common name	**Scientific name**	# infestations	area of infestation (ha)	# infestations	# infestations	area of infestation	Weight	Estimate based on: regional description, present potential ratio or gut feeling
arrowhead	*Sagittaria graminea*			0	0	0	1.00	Assume not present
blue periwinkle	*Vinca major*		0.5	7	20	2	0.71	Estimation
bridal creeper	*Asparagus asparagoides*		7,724.8	334	400	8,000	0.42	Estimation
cane needle grass	*Nassella hyalina*			0	0	0	1.00	Assume not present
Chilean needle grass	*Nassella neesiana*		1.4	7	7	2	0.85	Estimation
Spanish broom	*Spartium junceum*			0	0	0	1.00	Assume not present
sweet pittosporum	*Pittosporum undulatum*		14.5	5	55	15	0.85	Garden/non-garden estimation##
Texas needle grass	*Nassella luecotricha*			0	0	0	1.00	Assume not present
white Spanish broom	*Cytisus multiflorus*			0	0	0	1.00	Assume not present

* area unit of measure is hectare

Regional estimate breaks down garden infestation / non-garden infestation

50	5	0.57	Gardens, estimation
5	10	0.85	Non Garden, estimation

To consolditate at regional level, number and area of infestations summed, and non-garden weight (the higher value) assigned to both situations.

Noxious Weeds Review; Phase 2 species
Wimmera CMA
Potential distribution by landuse type

		Potential area* infested by landuse type						
Common name	**Scientific name**	**Horticulture**	**Broadacre cropping**	**Forestry**	**Pasture dryland**	**Pasture irrigated**	**Public land**	**Potential total area**
arrowhead	*Sagittaria graminea*							0
blue periwinkle	*Vinca major*			3,400			356,400	359,800
bridal creeper	*Asparagus asparagoides*						377,200	377,200
cane needle grass	*Nassella hyalina*				566,800	5,500	131,400	703,700
Chilean needle grass	*Nassella neesiana*				566,800	5,500	131,400	703,700
Spanish broom	*Spartium junceum*				566,800		131,400	698,200
sweet pittosporum	*Pittosporum undulatum*			3,400			364,700	368,100
Texas needle grass	*Nassella luecotricha*				566,800	5,500	131,400	703,700
white Spanish broom	*Cytisus multiflorus*				566,800		196,400	763,200
bearskin fescue	*Festuca gautieri*				566,700	5,500	51,200	623,400

* area unit of measure is hectare

Noxious Weeds Review
Wimmera CMA
Phase 2 Species: Ranking relative to Phase 1 Review

Scientific name	common name	Invasiveness Score	Regional Dist	Impact Scores	Final Score	RANK
Alternanthera philoxeroides	Alligator Weed	0.527352	1	0.719621	0.786270	1
Nassella trichotoma	Serrated Tussock	0.761536	0.85	0.675277	0.741539	2
Eichhornia crassipes	Water Hyacinth	0.879335	1	0.527622	0.720989	3
Orobanche ramosa	Branched Broomrape	0.769900	1	0.519638	0.703385	4
Equisetum spp.	Horsetails	0.726000	1	0.519638	0.698117	5
Acacia erioloba	Giraffe thorn	0.700000	1	0.519638	0.694997	6
Hieracium spp.	Hawkweeds	0.700000	1	0.519638	0.694997	6
Nassella tenuissima	Mexican feather grass	0.700000	1	0.519638	0.694997	6
Acacia karroo	Karoo thorn	0.670000	1	0.519638	0.691397	9
Nassella charruana	Lobed needle grass	0.650000	1	0.519638	0.688997	10
Salvinia molesta	Salvinia	0.587464	1	0.529090	0.686786	11
Fallopia japonica, Fallopia sacha	Japanese and Giant knotweed	0.506400	1	0.519638	0.671765	12
Nassella neesiana	**Chilean needle grass**	**0.686622**	**0.85**	**0.543816**	**0.658932**	13
Parthenium hysterophorus	Parthenium Weed	0.825166	1	0.420087	0.654269	14
Prosopis spp.	Mesquite	0.658431	0.85	0.521093	0.642824	15
Iva axillaris	Poverty Weed	0.538501	1	0.453036	0.638320	16
Xanthium spinosum	Noogoora Burr/ Californian Burr	0.619536	0.85	0.500315	0.626521	17
Pennisetum macrourum	African Feather Grass	0.612026	0.57	0.627185	0.607067	18
Alhagi maurorum	Camelthorn	0.569959	1	0.386286	0.604715	19
Hypericum triquetrifolium	Tangled Hypericum	0.602251	1	0.377231	0.603520	20
Cuscuta spp.	Dodder	0.734033	0.85	0.429397	0.600546	21
Lagarosiphon major	Lagarosiphon	0.649037	1	0.342517	0.589694	22
Rubus fruticosus agg.	Blackberry	0.767146	0.28	0.726464	0.588477	23
Homeria flaccida	Cape Tulip (two-leaf)	0.684162	0.85	0.417379	0.587832	24
Ambrosia psilostachya	Perennial Ragweed	0.489293	1	0.364356	0.582755	25
Centaurea nigra	Black Knapweed	0.641607	1	0.317275	0.574667	26
Cytisus scoparius	English Broom	0.734874	0.57	0.520938	0.562310	27
Opuntia vulgaris	Prickly Pear (erect)	0.759228	0.85	0.345016	0.556316	28
Cannabis sativa	Marijuana	0.565385	1	0.297461	0.554424	29
Festuca gautieri	**bearskin fescue**	**0.491440**	**0.85**	**0.387816**	**0.548150**	30
Pittosporum undulatum	**sweet pittosporum**	**0.793704**	**0.85**	**0.315117**	**0.543710**	31
Senecio pterophorus	African Daisy	0.676556	0.85	0.337358	0.542107	32
Carduus nutans	Nodding Thistle	0.390918	1	0.302426	0.536269	33
Physalis viscosa	Prairie Ground Cherry	0.727781	0.85	0.309365	0.532578	34
Acroptilon repens	Hardheads/Russian Knapweed	0.514006	0.71	0.434553	0.532230	35
Opuntia stricta	Prickly Pear (drooping)	0.552003	0.85	0.345016	0.531449	36
Nassella leucotricha	**Texas needle grass**	**0.627929**	**0.85**	**0.326146**	**0.529993**	37
Alternanthera pungens	Khaki Weed	0.653479	0.85	0.303604	0.520436	38
Cytisus multiflorus	**white Spanish broom**	**0.517034**	**0.85**	**0.330775**	**0.519278**	39
Solanum rostratum	Buffalo Burr	0.468698	1	0.254399	0.518707	40
Convolvulus arvensis	Bindweed	0.779101	0.57	0.430366	0.516897	41
Cestrum parqui	Chilean Cestrum	0.727801	0.71	0.358471	0.515280	42
Rosa rubiginosa	Sweet Briar	0.793721	0.42	0.508953	0.514660	43
Sagittaria graminea	**Arrowhead**	**0.586551**	**0.85**	**0.298489**	**0.509540**	44
Sida leprosa	Ivy-leafed Sida	0.485639	1	0.234041	0.509339	45
Solanum elaeagnifolium	Silverleaf Nightshade	0.667968	0.71	0.357925	0.507794	46
Allium triquetrum	Angled Onion	0.614461	0.57	0.448094	0.507068	47
Calicotome spinosa	Spiny Broom	0.447135	0.85	0.317558	0.503489	48
Crataegus monogyna	Hawthorn	0.704590	0.42	0.506902	0.502816	49
Genista monspessulana	Cape Broom /Montpellier Broom	0.698418	0.57	0.419839	0.501320	50
Spartium junceum	**Spanish broom**	**0.341815**	**0.85**	**0.335870**	**0.501105**	51
Centaurea solstitialis	St. Barnaby's Thistle	0.655091	0.57	0.423400	0.498115	52
Opuntia robusta	Wheel Cactus	0.645158	0.71	0.345016	0.497828	53
Ulex europaeus	Furze/Gorse	0.828248	0.28	0.545087	0.494238	54
Echium plantagineum	Paterson's Curse	0.665066	0.57	0.412722	0.493332	55
Ailanthus altissima	Tree of Heaven	0.895314	0.42	0.441183	0.488900	56
Chrysanthemoides monilifera	Boneseed/Bitou Bush	0.799614	0.57	0.375091	0.488405	57
Genista linifolia	Flax Leaved Broom	0.703726	0.57	0.392163	0.486458	58
Lavandula stoechas	Topped Lavender	0.682210	0.71	0.316423	0.486262	59
Nassella hyalina	**cane needle grass**	**0.503576**	**0.85**	**0.267807**	**0.482401**	60
Marrubium vulgare	Horehound	0.771737	0.42	0.451853	0.480046	61
Foeniculum vulgare	Fennel	0.574220	0.71	0.326980	0.479215	62

Noxious Weeds Review
Wimmera CMA
Phase 2 Species: Ranking relative to Phase 1 Review

Scientific name	common name	Invasiveness Score	Regional Dist	Impact Scores	Final Score	RANK
Lycium ferocissimum	Boxthorn	0.674957	0.42	0.470710	0.478993	63
Cirsium arvense	Californian/Perennial Thistle	0.702729	0.42	0.458673	0.475585	64
Emex australis	Spiny Emex	0.535113	0.85	0.247396	0.474755	65
Vinca major	**blue periwinkle**	**0.703021**	**0.71**	**0.289181**	**0.473504**	66
Proboscidea louisianica	Devil's Claw (purpleflower)	0.542172	0.85	0.241384	0.472236	67
Homeria miniata	Cape Tulip (one-leaf)	0.747658	0.42	0.440860	0.471000	68
Datura ferox	Thorn Apple (common)	0.703633	0.42	0.444751	0.467897	69
Datura stramonium	Thorn Apple (longspine)	0.703600	0.42	0.444751	0.467893	70
Datura inoxia	Thorn Apple (recurved)	0.703600	0.42	0.444751	0.467893	70
Conium maculatum	Hemlock	0.665290	0.42	0.446703	0.464388	72
Echium vulgare	Viper's Bugloss	0.655865	0.42	0.446556	0.463175	73
Carduus tenuiflorus / C. pycnoc	Slender/Shore Thistle	0.608219	0.57	0.359060	0.456460	74
Salpichroa origanifolia	Pampas Lily-of-the-Valley	0.762638	0.57	0.320066	0.453153	75
Hypericum perforatum	St. John's Wort	0.660601	0.57	0.334271	0.448864	76
Watsonia meriana 'Bulbillifera'	Wild Watsonia	0.402004	0.71	0.307647	0.447723	77
Cynara cardunculus	Artichoke Thistle	0.662745	0.42	0.413264	0.445358	78
Eragrostis curvula	African Lovegrass	0.715330	0.57	0.314456	0.444335	79
Silybum marianum	Variegated Thistle	0.765111	0.42	0.387726	0.443340	80
Cardaria draba	Hoary Cress	0.563497	0.42	0.429138	0.442337	81
Juncus acutus	Spiny Rush	0.516930	0.42	0.438554	0.442022	82
Ibicella lutea	Devil's Claw (yellowflower)	0.616016	0.71	0.241384	0.436297	83
Dittrichia graveolens	Stinkwort	0.607585	0.57	0.319717	0.434352	84
Asphodelus fistulosus	Onion Weed	0.539790	0.57	0.328848	0.431330	85
Asparagus asparagoides	**bridal creeper**	**0.782848**	**0.42**	**0.361907**	**0.431010**	86
Oxalis pes-caprae	Soursob	0.743995	0.42	0.365451	0.428332	87
Diplotaxis tenuifolia	Sand Rocket/Sand Mustard	0.565974	0.57	0.317803	0.428286	88
Onopordum illyricum	Illyrian Thistle	0.533147	0.42	0.401999	0.423497	89
Allium vineale	Wild Garlic	0.658241	0.57	0.285822	0.421449	90
Carthamus lanatus	Saffron Thistle	0.499430	0.42	0.405518	0.421422	91
Onopordum acanthium	Scotch/Heraldic Thistle	0.571238	0.42	0.381627	0.416660	92
Melianthus comosus	Tufted Honeyflower	0.492463	0.42	0.394016	0.414144	93
Tribulus terrestris	Caltrop	0.606654	0.42	0.368584	0.413605	94
Amsinckia spp.	Amsinckia	0.745464	0.42	0.333240	0.410470	95
Hypericum tetrapterum	St. Peter's Wort	0.552896	0.57	0.284303	0.407957	96
Cenchrus longispinus	Spiny Burr Grass/ Gentle Annie	0.402417	0.57	0.313125	0.406040	97
Scolymus hispanicus	Golden Thistle	0.497723	0.42	0.377717	0.405648	98
Verbascum thapsus	Great Mullein	0.474171	0.57	0.296038	0.405082	99
Xanthium strumarium	Bathurst Burr	0.585163	0.42	0.356250	0.404120	100
Centaurea calcitrapa	Star Thistle	0.408196	0.57	0.303943	0.401592	101
Chondrilla juncea	Skeleton Weed	0.742382	0.42	0.315662	0.400256	102
Leucanthemum vulgare	Ox-eye Daisy	0.610238	0.42	0.333108	0.394169	103
Senecio jacobaea	Ragwort	0.776347	0.28	0.363784	0.386481	104
Hypericum androsaemum	Tutsan	0.746650	0.42	0.276452	0.378811	105
Dipsacus fullonum	Wild Teasel	0.551563	0.42	0.309552	0.373937	106
Solanum linnaeanum	Apple of Sodom	0.356227	0.42	0.325025	0.359161	107
Reseda luteola	Wild Mignonette	0.537021	0.57	0.167145	0.340444	108
Cirsium acarna	Soldier Thistle	0.523968	0.42	0.249563	0.337032	109
Cirsium vulgare	Spear Thistle	0.693549	0.14	0.353660	0.326075	110
Onopordum acaulon	Stemless Thistle	0.528267	0.28	0.285015	0.312601	111