Native plants as environmental weeds on the Mornington Peninsula

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The Mornington Peninsula features a surprising variety of vegetation types and landforms from coastal saltmarsh, wetlands, coastal scrub and heathlands to foothill forests, riparian forests and rural landscapes. Many sites and species of international, national, state and regional significance are present. The fact that it is close to Melbourne and attracts many visitors to the natural and cultural features, and that it has many linear parks with rural and urban interfaces, creates major challenges in natural resource management. This is particularly the case when managing the many diverse Parks and Reserves on the Mornington Peninsula which include Mornington Peninsula National Park, French Island National Park, Arthurs Seat State Park and Langwarrin Flora and Fauna Reserve. These Parks and Reserves comprise a great diversity of vegetation communities and over 15 ecological vegetation class's (EVC's).

The major threat to the habitat of many threatened, rare or significant flora and fauna species and communities represented in the Parks and Reserve systems is weed invasion. Many thousands of dollars, volunteer, contractor and staff time are targeted to the control, monitoring and research of weeds. Parks Victoria has developed Environmental Management Systems, research partnerships and Environmental Information Systems to record and monitor environmental management programs such as pest plants, pest animals, threatened species, catchment and marine management, fire and native animal management.

A large proportion of the pest plant program, other than targeting legislated state and regionally prohibited weed species, is in controlling environmental weeds threatening our remnant ecosystems and rare and threatened flora and fauna.

Many of these environmental weeds are native plants outside their pre-European natural distribution and spread into other natural vegetation communities primarily due to human habitation and activities. They are opportunistic, filling niches in the ecosystem, many having the potential to monopolize and modify natural systems on the peninsula. These weed species are definitely not in balance, as when present in the vegetation communities of their natural distribution, and many issues associated with human occupation, disturbance, and modified landscapes enhance the spread and dominance of these weeds.

On the Peninsula many parks are linear in nature, are segmented or a small remnant surrounded by varied land uses and often urban development. Many vectors for weed spread exist as well including park visitors, foxes, blackbirds, starlings, garden and roadside escapee's, vehicles (including management vehicles) and many more including native fauna. Other means of invasion include dumped garden refuse, arboretums, planting's – gardens, nurseries (point of sale and infestation: i.e. Boronia, Grevillea and Blue Gums etc.), railway reserves, road reserves.

Some thirty species of native plants and their hybrids including two local native plants (*Acacia sophorae* and *Leptospermum laevigatum*) are invasive in the Peninsula's native bushland (Table 1).

Native weeds on the Mornington Peninsula pose varying levels of risk and threat to vegetation integrity and diversity, relative to, vegetation communities type, their environment, weed ecology and presence of vectors and other factors. The most threatening and invasive weeds have the behaviour to dominate and develop into monoculture or major understorey structural species and reduce diversity, shading out as a canopy, exhibiting allelopathic responses, altering and destroying habit, etc.

Local (indigenous) plants that are considered serious environmental weeds along with their hybrids, are invading the majority of our Parks and Reserves except where occurrence is indigenous. *Acacia sophorae* (Coast Wattle) extends inland invading many vegetation communities particularly as it hybridizes with *A. longifolia* (Sallow Wattle) making identification of the cross very difficult. *A. sophorae* also behaves as a weed in its indigenous vegetation community taking over niches created by disturbance, vegetation senescence and modification.

Acacia longifolia is not indigenous and is a major invader of woodlands and many

Table 1. Native plants as environmental weeds on the Mornington Peninsula.

Family	Genus and species	Common name	Origin
Fabaceae	*Oxylobium lanceolatum*	Native Willow	WA
Pittosporaceae	*Sollya heterophylla*	Bluebell Creeper	WA
	Pittosporum undulatum	Sweet Pittosporum	Vic
Mimosaceae	*Acacia baileyana*	Cootamundra Wattle	NSW
	Acacia decurrens	Early Black Wattle	NSW
	Acacia elata	Cedar Wattle	NSW
	Acacia floribunda	White Sallow Wattle	NSW
	Acacia longifolia	Sallow Wattle	Vic
	Acacia paradoxa	Kangaroo Thorn Wattle	Vic
	Acacia prominens	Gosford Wattle	NSW
	Acacia pycnantha	Golden Wattle	Vic
	Acacia saligna	Golden wreath Wattle	WA
	Acacia longifolia × *oxycedrus*	(hybrid)	Vic
	Acacia retinodes var. *retinodes*	Wirilda	Vic
	Acacia sophorae	Coast Wattle	Vic / NSW
	Acacia sophorae × *longifolia*	(hybrid)	Vic
	Paraserianthes lopantha	Cape Wattle	WA
Myrtaceae	*Leptospernum laevigatum*	Coastal Tea tree	Vic
	Leptospernum laevigatum × *juniperinum*	(hybrid)	Vic
	Kunzea ericoides	Burgan	Vic
	Melaleuca armillaris	Giant Honey Myrtle	NSW
	Eucalyptus botryoides	Southern Mahogany	NSW
	Eucalyptus lehmannii	Bushy Yate	WA
	Eucalyptus globulus	Blue Gum	Vic
	Eucalyptus maculata	Spotted Gum	NSW
Proteaceae	*Hakea suaveolens*	Sweet Hakea	WA
	Grevillea rosemarinifolia	Rosemary Grevillea	Vic
	Grevillea spp.	Grevillea hybrids	Gardens
Other species	*Actinotis helianthi*	Flannel Flower	Nurseries
	Boronia spp.	Boronia	Nurseries

vegetation communities. As indicated above, *A. longifolia* hybridizes with *A. sophorae* and also with *A. oxycedrus* (Spike Wattle), the latter producing infertile seed. Its natural distribution extends through Gippsland and used widely in the past as an Aboriginal food in having a large protein filled seed. *Acacia longifolia* is a prolific obligate seeder with seed persisting in the soil for many years, seed is readily germinated by fire creating a dense monoculture requiring intense management.

Leptospermum laevigatum (Coastal tea tree), a coastal indigenous species, invades primarily from disturbance such as road construction, land clearing and development, and has the potential to create a monoculture and severely impact on diversity by shading and perhaps an allelopathic response in its leaves. These monocultures are generally a desert in terms of diversity with the odd orchid, sedge or herb existing where once rich heathland and coastal scrub stood. *L. laevigatum* hybridizes with *L. myrsinodes* and possibly *L. juniperinum*. It is an obligate seeder colonizing tracks and any disturbed site and niche.

Pittosporum undulatum (Sweet Pittosporum) is another serious invader and threat to many of the Peninsula's natural ecosystems with the ability to invade the majority of vegetation types with its spread aided by garden escapes, blackbirds, starlings, foxes, other birds and animals. Again this species infests the lower canopy, shading out and is believed to have an allelopathic response in its leaves, reducing diversity to limited understorey species and significantly affecting habitat values. It is an obligate seeder producing many sticky seeds in an orange fruit attractive to birds and has a natural distribution to almost Western Port.

Various methods and treatments in controlling these native weed species are used with variations in timing in relation to the weeds life-cycle and those of other species impacted on. Control methods depend on the ecology of the plant, extent of infestation, age classes of the vegetation, time of the year (season) rare or threatened species present etc. Care must be taken to ensure the native species is a weed and identified correctly as similar species are readily mistaken such as *Acacia retinodes* var. *uncifolia* (Wirilda) indigenous to the Peninsula and *A. retinodes* var. *retinodes* native to western Victoria.

Other native species can become 'weedy' for example *Kunzea ericoides* (Burgan) and *Pteridium esculentum* (Bracken Fern) that colonize vegetation communities post disturbance and fire. These species protect germinated seedlings and generally become a natural part of the vegetation communities structure and ecology.

Acacia longifolia and *A. longifolia* × *sophorae* are controlled using cut and paint / drill and fill hand removal, chemical application and fire followed up with hand removal, utilizing the Bradley techniques. Fire must be of an intensity to crown into canopy requiring a high intensity fire with good elevation of fuels. This species is sensitive to herbicide and killed a simple cut paint technique. Many thousands of seeds germinate post fire and mature to seeding in four years.

Leptospermum laevigatum is controlled using cut and paint hand removal and fire followed up with hand removal utilizing Bradley technique principles. As monoculture this species is difficult to burn with the lack of understorey and would generally burn only under wildfire conditions creating a fire of high intensity and burning the canopy. The time of year when burning this species is important given it obligates its seed post summer and has immature green seed capsules in Spring whilst the seedbank has been harvested by ants etc. ensuring minimal recruitment post burn. Management techniques need to balance the risk of control methods to the ecosystem and species of rare and threatened flora and fauna.

Pittosporum undulatum is a very aggressive invader and treatment relies on drill and fill / cut and paint, use of fire and chemical control is a possibility with seedlings. Fire must be of a high intensity and it is a good idea to cut larger plants to create fuel to carry fire as infestations generally shade out species that act as fuels. Post fire removal / treatment is essential and there are varying techniques used.

Interestingly *Acacia longifolia* and *Leptospermum laevigatum* have established themselves as weeds in other countries such as South Africa in fact many of our native plants are international weeds as well. Many other species have the potential to hybridize impacting on vegetation integrity.

Acacia paradoxa (Kangaroo-thorn Wattle, Hedge Wattle) indigenous in many natural ecosystems is a weed in industry and agriculture.

These native weeds are a serious threat and a risk of varying degrees, with introduced grasses, creepers like Bridal Creeper, and woody species such as Boneseed remaining, as the greatest weed threat to our remnant and significant ecosystems. However the cultivation of native plants is rapidly increasing commercially and the threat of even more native weed species establishing from such enterprise, urbanization and development will increase.

Future research will uncover more about the ecology of these weeds their dispersal mechanisms, rate of invasion, changes to habitat along with, greater knowledge and development of treatment methods and biological control agents. More resources and funding need to be directed into the eradication of environmental native weeds or any weed species that threaten the integrity of our representative parks and reserve systems and other remnant indigenous habitat. Education and awareness of the general public, staff, volunteers and contractors and the use of 'environmentally aware' contractors is imperative. Of key importance is the development and implementation of a weed strategies, prioritizing control in significant habitat and vegetation communities, risk to indigenous species and targeting of new infestations.

Further reading

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