Chapter 1

Invasive vines and scramblers – an overview

At a glance

- **Vines and scramblers are a diverse group of climbing plants that use other plants or structures as supports.**
- **Plants use different features to climb, such as spines, tendrils and aerial roots.**
- **Invasive vines and scramblers can change the structure and function of natural areas, with impacts for native plant and animal communities.**
- **The performance of agricultural crops and forestry plantations can also be negatively impacted by invasive vines and scramblers.**
- **The presence of invasive vines and scramblers can restrict human access and reduce aesthetic values of natural areas.**
- **Some invasive vines and scramblers are poisonous to humans.**
- **The impacts of invasive vines and scramblers are acknowledged as key threatening processes under Australian and New South Wales (NSW) legislation.**
- **It is important to correctly identify which species of vines and scramblers are present at sites so that you can manage them appropriately.**

What are they?

The term 'invasive vines and scramblers' is used to describe those species that have been introduced to Australia and are known, or have the potential, to establish and cause negative impacts (Bernich et al., 2024).

Invasive vines and scramblers are a diverse group of climbing plants. They:

- are typically fast growing
- produce copious amounts of seed and/or other propagules such as tubers
- use other plants and structures—such as buildings or fences—as supports, allowing them to invest more resources into growth and reproduction than self-supporting species can
- can cause extensive damage to both native plant communities and planted vegetation (including gardens or commercial plantations).

Native vines and scramblers may also exhibit invasive tendencies in some situations. See Chapter 6 for examples of other common vines and scramblers, both introduced and native.

Origin

Most invasive vines and scramblers were introduced to Australia for ornamental purposes and have subsequently escaped from gardens.

A 2007 study found 179 non-native vine and scrambler species present in Australia, from all continents except Antarctica (Harris et al., 2007).

What makes a plant a vine or a scrambler?

Vines and scramblers are species of plants that either grow up, or out across the ground (APS NSW, 2020). They do not form their own supports, and instead use other plants or structures (e.g. fences) to grow. They climb in various ways:

Twiners

Twist their way up, wrapping their whole stem around the support; e.g. common silkpod (*Parsonsia straminea*), shown here.

Adam Bernich

Tendril climbers

Use modified appendages to 'grab' onto small branches and other supports; e.g. kangaroo vine (*Cissus antarctica*), shown here.

Adam Bernich

Aerial roots

Sprout from the stem, or leaves of climbing plants, which can stick onto supports. Also called adventitious roots; e.g. cat's claw creeper (*Dolichandra unguis-cati*), shown here.

Adam Bernich

Scramblers

Grow over the top of lower-lying vegetation; e.g. trad (*Tradescantia fluminensis*), shown here.

Matt Sheehan

Spines

Hook onto supports as they climb; e.g. cockspur thorn (*Maclura cochinchinensis*), shown here.

© M. Fagg 2019

Preferred habitats

Invasive vines and scramblers affect a range of ecosystems across Australia, particularly rainforests or wet sclerophyll forests. In South East Queensland (Qld) and NSW alone, vines and scramblers account for approximately 70% of introduced species in subtropical rainforests (Grice and Setter, 2003).

They can also dominate a wide range of habitats such as coastal dune scrub, savannahs, floodplain forests and open woodlands, and can be prolific in riparian areas and disturbed areas such as roadsides and urban parklands.

Impacts

Environmental

The smothering and rambling nature of invasive vines and scramblers can cause functional and structural changes to the vegetation communities that they invade. They do this by:

- smothering vegetation at the ground, shrub layer and canopy, and suppressing growth and recruitment of native species (Harris et al., 2007)
- increasing the risk of tree and shrub damage through extra weight on limbs and branches, increasing susceptibility to damage during storm events (Estrada-Villegas and Schnitzer, 2018; Phillips et al., 2002)
- having extensive root systems, making them strong competitors for underground resources such as water and nutrients (Schnitzer et al., 2005)
- killing trees through the combined effect of the above impacts (Estrada- Villegas and Schnitzer, 2018; Phillips et al., 2002)
- altering soil chemistry and nutrient cycling, which can further suppress the growth and recruitment of native species (French et al., 2017; Schnitzer et al., 2005).

These impacts have flow-on effects for animal communities, reducing the abundance and diversity of plant-dwelling invertebrates (Harden et al., 2004), restricting movement and water access for some native fauna and favouring pest animals by providing protective shelter (NSW Scientific Committee, 2006).

'Structural parasites' transforming entire ecosystems

Matt Sheehan

Pictured here is a highly disturbed wet sclerophyll forest in northern Sydney, NSW, where multiple invasive vines and scramblers—including balloon vine, lantana, Madeira vine and trad—have established.

This is an excellent example of why invasive vines and scramblers are often referred to as 'structural parasites': the species are dominating the canopy and causing physical damage or death to host plants and surrounding vegetation (Harris et al., 2007).

Many invasive vines and scramblers have also been categorised as transformer species because of the severe and often irreversible damage they cause to the invaded ecosystem (Ernst and Cappuccino, 2005; Richardson et al., 2000; Swarbrick, 1991).

Climbing to boost reproduction

Kate Blood

The ability of vines to climb to treetops puts them in a prime position for long-distance seed dispersal. Windblown seeds can be carried many kilometres. In this photo, the ivy (*Hedera* spp.) that covers this tree is putting its fruit in prime bird-dispersal position. Birds and arboreal animals eat fruits and deposit seeds long distances away, and seeds can fall into water courses and be carried away.

Impacts to threatened species

The Richmond birdwing butterfly (*Ornithoptera richmondia*) is a highly threatened species of subtropical rainforest in Qld/NSW, vulnerable to the clearing of rainforest habitat. At low elevations, its larvae depend entirely on the native birdwing butterfly vine (*Pararistolochia praevenosa*) for food.

Unfortunately, this vine species (also near threatened) is often outcompeted by exotic vines and scramblers, reducing the number of host plants available to the butterfly.

To make matters worse, the butterflies are also attracted to the closely related exotic vine, Dutchman's pipe (*Aristolochia elegans*; top right photo) and often lay eggs on it (bottom photo). The leaves of Dutchman's pipe are poisonous and fatal to larvae that try to feed on them (Queensland Government, 2020).

The butterfly's survival is dependent on containment of Dutchman's pipe and prevention of it dominating the few remaining rainforests that provide habitat to the butterflies.

Adam Bernich

Don Sands

Agriculture and production systems

While the impacts of vines and scramblers on intensive agriculture systems is believed to be low, there are some documented cases in specific industries where they can be problematic. Vines and scramblers can reduce the performance and yield of crops. For example, common morning glory (*Ipomoea purpurea*) can reduce soy bean yields by up to 80% when at high densities (Pagnoncelli et al., 2017). Some species of invasive vine, such as moth vine (*Araujia sericifera*), are poisonous to livestock.

Forestry is the most impacted industry, with invasive vines and scramblers reducing tree growth and damaging branches (Estrada-Villegas and Schnitzer, 2018). When a tree with attached vines is felled, neighbouring trees may be damaged or even pulled down (Estrada-Villegas and Schnitzer, 2018). This may have both economic and safety implications.

Social

Invasive vines and scramblers can also have significant social costs, reducing the enjoyment of and ability to utilise, impacted natural areas. They can quickly grow over tracks and form thickets that can restrict movement and access, as well as reduce the aesthetic values and social amenity of parks and reserves. This is particularly problematic for species with spiky stems or thorns, such as climbing asparagus (*Asparagus plumosus*) and Mysore thorn (*Caesalpinia decapetala*).

In urban areas, vines and scramblers can occur as weeds on neglected land, parks, gardens and reserves where garden waste is commonly disposed. They can move from these areas into native bushland.

Some species, such as moth vine, glory lily (*Gloriosa superba*) and English ivy (*Hedera helix*) are poisonous to humans and often grow in residential environments. Leaves of old man's beard (*Clematis vitalba*) are poisonous and can cause skin irritations.

Invasive vines and scramblers – a key threatening process

Invasive vines and scramblers are the subject of key threatening process listings, meaning they threaten or may threaten, the survival, abundance or evolutionary development of a native species or ecological community. The listings include:

- 'Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants'. Listing under the *Environmental Protection and Biodiversity Conservation Act 1999* (Cth) (Threatened Species Scientific Committee, 2010).
- 'Invasion and establishment of exotic vines and scramblers'. NSW Key Threatening Process listing (NSW Scientific Committee, 2006).

These key threatening process listings identify species and communities at risk and the actions required to reduce impacts. Aligning with or complementing the threat reduction recommendations for these listings should be considered when planning vine and scrambler control activities.

Refer to Chapter 6 for further information on the legal status and management requirements of cat's claw creeper and Madeira vine.

Bluebell creeper (*Billardiera heterophylla*), a native vine that has established outside its natural range, contains toxins that can cause skin irritation and nausea, while the spines of leaf cactus (*Pereskia aculeata*) can injure people and pets.

Invasive vines and scramblers can also affect the welfare of weed managers, conservationists and nature enthusiasts. The noticeable degradation of natural areas following vine and scrambler invasion can be distressing and overwhelming for those who work in and care for these environments. Additionally, the requirement for long-term management of vines and scramblers is often taxing—physically, financially and emotionally—for land managers.

Economic

There is currently limited ability to quantify the economic cost of vines and scramblers across the range of situations and values that they impact – in particular, the environment. Similarly, current control costs vary considerably depending on the species, management approach employed and density and remoteness of the infestation.

Identifying invasive vines and scramblers

Knowing which vine or scrambler species are present at a site is important so that you can choose the most appropriate control method while protecting native species from off-target damage.

Identifying invasive vines and scramblers can be difficult because distinguishing features, such as leaves, are often in the tree canopy and there may be more than one species present, including native species.

Many vine and scrambler species have features that can make identification possible if leaves, flowers or fruit cannot be accessed. For example, cat's claw creeper is characterised by its 'claws' on young stems and dense and prominent aerial roots on larger stems, while Madeira vine may be identified by its aerial tubers on larger stems.

However, to confidently identify vine and scrambler species, samples of leaves, flowers and fruit must be taken. The following resources may assist in identifying common species (native and exotic):

- weeds.org.au/categories/vine/
- sydneyweeds.org.au/vines-and-scramblers/
- moretonbay.qld.gov.au/files/assets/public/services/environment/vines.pdf
- resources.austplants.com.au/plant-database/climbers/

You can also seek assistance by lodging a plant specimen with your state/territory herbarium. See Chapter 6 for more information, including contact details for herbaria.

While cat's claw creeper and Madeira vine are two of the most harmful invasive vines and scramblers, many other species also pose a threat to biodiversity in Australia. Refer to Chapter 6 for more information on the identification of other invasive vines and scramblers, some of which may co-occur with cat's claw creeper and Madeira vine.

Adam Bernich

Stems can assist with identification. Left to right: stems of moth vine, cat's claw creeper, coastal morning glory and balloon vine.