

Leaf cactus (*Pereskia aculeata*):

NT Weed Risk Assessment Technical Report



Leaf cactus *Pereskia
aculeata*

This report summarises the results and information used for the weed risk assessment of Leaf cactus (*Pereskia aculeata*) in the Northern Territory. A feasibility of control assessment has also been completed for this species and is available on request.

Online resources are available at <https://denr.nt.gov.au/land-resource-management/rangelands/publications/weed-management-publications> which provide information about the NT Weed Risk Management System including an explanation of the scoring system, fact sheet, user guide, a map of the Northern Territory weed management regions and FAQs.

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Cover photos: Leaf cactus infestation (top), fruit (bottom-left) and spines (bottom-right).

Source: Alien Invader Complaints (South Africa), <<http://www.oocities.org/wessaaliens/species/pereskia.htm>>.

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Leaf cactus *Pereskia aculeata*

Weed Risk = Very high

Section A: Invasiveness	92 %
Section B: Impact	84 %
Section C: Potential distribution	49 %
Total score = A x B x C x 1000 =	381



Taxon: *Pereskia aculeata*

Common name: Leaf cactus

Other names: Barbados gooseberry, pereskia, lemon vine

Family: Cactaceae (cactus family)

Lifeform: Shrub or vine

Environment: Terrestrial

Origin: Tropical and sub-tropical Central and South America.

Description: Spiky, clambering shrub or woody, climbing vine, up to 10 m high. Long, slender spines in groups along the grey-brown trunk. Short recurved, claw-like spikes in pairs on the branches. Leaves variable in size and shape, 4-5 cm long, 1.5-5 cm broad, petioles short. Terminal inflorescences of 70 or more flowers, whitish to light pink, fragrant, 2.5-5 cm in diameter. It bears spherical fleshy fruits, yellow to orange at maturity, 1.5-5 cm in diameter. The fruit contains a single black seed up to 5 mm in diameter

Habitat: Wide temperature tolerance, prefers well-drained high nutrient soils and dislikes waterlogging.

Distribution: Introduced to North America, South Africa and Australia. In Australia, it is mostly confined to coastal sub-tropical Queensland and New South Wales.

Legislation: Not declared in any Australian jurisdiction. Declared in South Africa.

Other: Present on the Australian government's *Alert List for Environmental Weeds* (a list of 28 non-native plants in the early stages of establishment).

Assessed as high risk (score = 13) by the Australian/New Zealand Weed Risk Assessment system as adapted for Hawai'i.

Continues to pose a risk as a traded and cultivated plant in Australia, including via internet sites. It is desired as a novelty as it is an unusual type of cactus (with leaves). The flowers are attractive to people and it sets edible fruit.

In rural Brazil, the stems and leaves are eaten by humans and livestock.

Difficult to control – it resists fire and canopy infestations can be difficult to access. Cutting the main stem does not necessarily kill the plant as aerial branches can persist, fall, root and regrow later.

In the Northern Territory, there is only one location where it is believed to be cultivated. It has not been recorded as naturalised in the Northern Territory.

Leaf cactus *Pereskia
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Leaf cactus *Pereskia aculeata*

Summary of weed risk information by section

Invasiveness: Can invade disturbed sites, native forests, plantations, riparian vegetation. Fruits are spread by birds and water. Can also be spread by stem fragments. People disperse the plant long distances as an ornamental plant and accidentally from garden clippings.

Impact: Forms dense impenetrable clumps and can destroy patches of forest by growing up into the canopy and smothering trees. Dense infestations can restrict movement of animals and people due to the presence of thorns. In South Africa, it is a weed of forestry and conservation reserves.

Potential distribution: Grows vigorously in tropical and sub-tropical environments with a wide range of temperature tolerances. The habitat in the NT most at risk would be tropical riparian areas, however tropical woodland areas and rainforests may also be suitable for its growth.

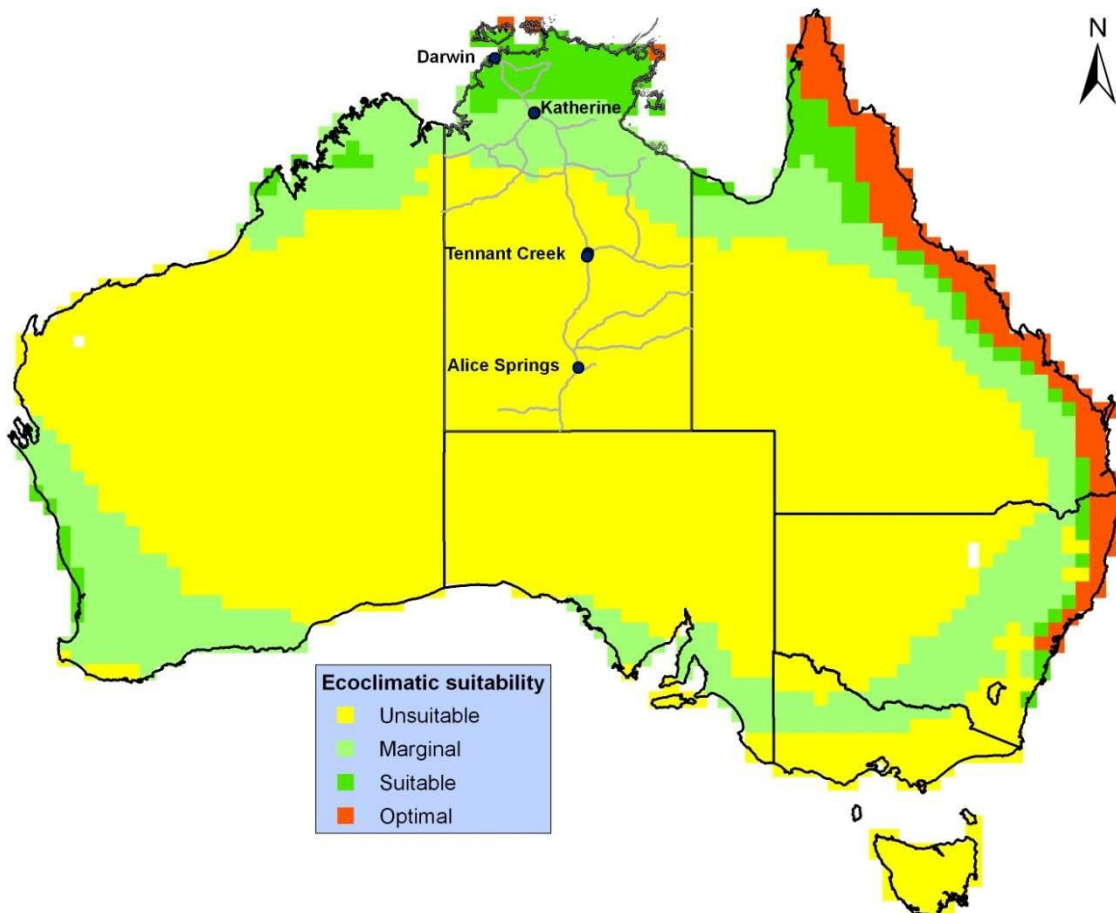


Figure 1. Potential distribution of leaf cactus (*Pereskia aculeata*) in Australia using the CLIMEX model. This calculates an Ecoclimatic Index from growth and stress factors to give an overall measure of how favourable the climate is for the species (V. Chejara, NT Weed Management Branch 2009).

Weed Risk Assessment - Determinations

Invasiveness

1. What is the ability of the plant to establish amongst intact native environments?
2. What is the reproductive ability of the plant?
 - a) Time to seeding
 - b) Annual production of viable seed per square metre or plant
 - c) Vegetative reproduction

Determination

Very high

Don't know
High
Frequent

3. Do propagules of the plant have properties that allow them to be dispersed long-distance by natural means?
 - a) Flying animals (birds, bats)
 - b) Other wild animals
 - c) Water
 - d) Wind

Yes
Yes
Yes
No

4. How likely is long-distance dispersal by human means?
 - a) Deliberate spread by people
 - b) Accidentally by people and vehicles
 - c) Contaminated produce
 - d) Domestic/farm animals

Occasional
Occasional
Unlikely
Occasional

Impacts

1. What is the plants competitive potential?
2. What is the plant's potential to modify the existing fire behaviour and alter the fire regime?
3. What is the plant's potential to restrict the physical movement of people, animals, vehicles, machinery and/or water?
4. What is the plant's potential to negatively affect the health of animals and/or people?

High

Significant potential

High

Medium

5. Does the plant potentially have negative effects on natural and cultural values?
 - a) reducing habitat quality for native animals
 - b) threatened species or communities
 - c) sites of natural significance

High
More than 1
More than 1

6. Is the plant presumed to have negative effects on environmental health?
 - a) soil chemistry/stability
 - b) water quality
 - c) hydrology

Don't know
No
Don't know

Potential distribution

1. What is the climate suitability score (which indicates out of 10 the proportion of the NT environment that is suitable for the plant)?
2. How many broad habitat types in the NT will the plant potentially naturalise in (up to 5) ?
3. What is the potential of the plant to occur throughout its favoured habitat in the NT (from those identified in question 2)?

2.4

Three

Most

Weed Risk Assessment - Evidence Used

A INVASIVENESS

A1 What is the ability of the plant to establish amongst intact native environments?

The plant invades not only disturbed sites but will also readily colonise native and commercially planted forests.	Moran & Zimmermann (1991)
<i>Pereskia aculeata</i> seeds generally germinate in the wetter winter and spring periods, providing there is not too much rain.	CRC for Australian Weed Management (2003)
<i>Pereskia aculeata</i> is a very thorny, climbs over native and commercially planted forests, and can eventually kill the supporting plants.	Moran & Zimmermann (1991)
In South Africa, infestations occur mainly in the temperate coastal regions of Natal and the Eastern Cape.	Campbell (1988)
The reproductive strategies of <i>Pereskia aculeata</i> make it an efficient invader of a new region.	Campbell (1988)
In Australia the weed has been reported growing amongst riparian vegetation along the banks of rivers in Queensland and New South Wales.	CRC for Australian Weed Management (2003)
<i>Pereskia aculeata</i> may become an invasive weed in coastal, sub-tropical areas of southern Queensland and north-eastern New South Wales. The plant has a tendency to form large, impenetrable clumps. Its extreme thorniness could make control of large infestations difficult.	Csurhes & Edwards (1998)
Germination can occur in both light and dark, across a range of temperatures.	Campbell (1988)
Seedlings can establish or grow readily in open areas or under plant canopies.	de Beer (1988)

A2a Reproductive ability: Time to seeding?

No specific information available.	No reference
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A2b Reproductive ability: Annual production of viable seed per square meter or per plant?

Abundant seed production is also apparent in dense infestations of <i>Pereskia</i> .	Campbell (1988)
Seed production is likely to be high based on the plant's characteristics large tree-like habit and numerous flowers.	NT Weed Risk Management Committee (2009)

A2c Reproductive ability: Vegetative reproduction?

The sexual and asexual reproductive strategies play an important role in its spread.	Campbell (1988)
It can reproduce vegetatively from the broken stem fragments.	Csurhes & Edwards (1998)

A3a Propagule dispersal: Flying animals (birds, bats)

Its main cause of spread is by birds eating the fruit (often from garden plants) and dropping them under the trees in which they perch.	CRC for Australian Weed and Management (2003)
Seeds mainly dispersed by birds.	de Beer (1988)

A3b Propagule dispersal: Other wild animals

Weed Risk Assessment - Evidence Used

	Monkeys are the main dispersers of seed in Brazil (at the Santa Genebra Reserve).	Pedroni & Sanchez (1997)
	Edible fruits and seeds spread by birds and animals.	Alien Invader Plants (2009)
A3c	Propagule dispersal: Water	
	Where leaf cactus is near creeks and other water bodies, pieces of the plant may be washed downstream a considerable distance to establish new populations.	CRC for Australian Weed Management (2003)
A3d	Propagule dispersal: Wind	
	Unlikely to disperse by wind due to large size of fruit and seed.	No reference
A4a	Human dispersal: Deliberate spread by people	
	The fruits of leaf cactus were used for making jams in KwaZulu-Natal (South Africa), as early as 1881, and the plant has also been used for hedges.	Moran & Zimmermann (1991)
	<i>Pereskia</i> is a primitive cactus climber originally cultivated as an ornamental shrub or hedge.	Campbell (1988)
	Leaves of <i>P. aculeata</i> are eaten cooked and marginally cultivated in many places in Brazil as vegetables.	Pereira et al. (2007)
	The spread of leaf cactus throughout the world has been assisted by its ornamental value and its nutritional properties.	CRC for Australian Weed Management (2003)
A4b	Human dispersal: Accidentally by people and vehicles	
	Inappropriate disposal of garden clippings have been led to <i>Pereskia aculeata</i> escaping into bushland. Stems and detached fragments of plant stay alive and can form roots months after removal from the parent plant.	Alien Invader Plants (2009)
A4c	Human dispersal: Contaminated produce	
	Unlikely – no evidence that the species grows near seed crops.	No reference
A4d	Human dispersal: Domestic/farm animals	
	Seeds are likely to be able to pass through the intestines of stock that may eat the fruit, as is the case for prickly pear (<i>Opuntia ficus-indica</i>).	A. Cameron, NT DPIFM, pers. comm. (2009)
	No evidence that the propagules have any means of attachment.	No reference
B	IMPACTS	
B1	What is the plant's competitive potential?	
	Spines probably protect most of the plant from grazing animals.	Pacific Island Ecosystems at Risk (2009)
	It overshadows all other vegetation and even big trees can collapse under the mass of the tangled branches.	de Beer (1988)
	It grows quite vigorously in tropical and subtropical environments, and is drought tolerant.	CRC for Australian Weed Management (2003)

Weed Risk Assessment - Evidence Used

<i>Pereskia aculeata</i> exhibits a very rapid growth rate under the right conditions (warm temperatures combined with high rainfall).	Victorian Department of Primary Industries (2008)
Leaf cactus adapts to a wide variety of soil types, but seems to prefer well drained, high nutrient soils.	CRC for Australian Weed Management (2003) Faucon (2005)
It can survive in to a wide range of temperatures from frost (- 3 °C) to heat (40 °C) and also can survive in a short period of drought.	Alien Invader Plants (2009)
Completely destroys patches of forest by growing up into the canopy and smothering the trees.	
Seed viability for mature and freshly released pereskia is high with approximately 30% successful germination.	de Beer (1988)
B2 What is the plant's potential to modify the existing fire behaviour and alter the fire regime?	

In South Africa, burning is used as a control option for this species. However, this appears to have been by dropping plant pieces into oil drums. This indicates that it is not very flammable.	CRC for Australian Weed Management (2003)
<i>Pereskia aculeata</i> is likely to significantly affect fire regimes as a fire preventative.	NT Weed Risk Management Committee (2009)
B3 What is the plant's potential to restrict the physical movement of people, animals, vehicles, machinery and/or water?	

The plant has a tendency to form large and impenetrable clumps and its extreme thorniness makes control of large infestations difficult. It can restrict the physical movement of people, animals and vehicles.	Csurhes & Edwards (1998)
Its runners also spread along the ground making the whole area	de Beer (1988) inaccessible.
B4 What is the plant's potential to negatively affect the health of animals and/or people?	

<i>Pereskia aculeata</i> is not poisonous to humans. The fruits are generally stewed or preserved with sugar, or made into jam. Young shoots and leaves are cooked and eaten as greens. In rural Brazil, they are important as food for humans and livestock.	Morton (1987)
In Brazil, the leaves are valued for their emollient nature and are applied on inflammations and tumors.	Morton (1987)
B5a Natural & cultural values: Reducing habitat quality for native animals	

Dense and large infestations that smother native trees could reduce habitat availability of food for native animals.	CRC for Australian Weed and Management (2003)
B5b Natural & cultural values: Threatened species of communities	

<i>Pternandra coerulescens</i> Jack (Threatened riparian tree).	D. Liddle, NT Biodiversity Conservation, pers. comm. (2009) Kerrigan & Cowie (2006a)
<i>Zeuxine oblonga</i> R.S. Rogers & C.T. White (Threatened orchid found in riparian areas).	D. Liddle, NT Biodiversity Conservation, pers. comm. (2009) Kerrigan & Cowie (2006b)
B5c Natural & cultural values: Sites of natural and cultural significance	

Weed Risk Assessment - Evidence Used

As a large, thorny climbing shrub that clambers over trees this plant has capacity to detract visually from cultural sites.	Department of Primary Industries VIC (2009)
Both the Adelaide and Mary River systems would be negatively impacted by this species. These are listed as the Adelaide Rivers coastal floodplains and the Mary River coastal floodplains in Harrison et al. (2009).	Harrison et al. (2009) NT Weed Risk Management Committee (2009)
The plant has a tendency to form large and impenetrable clumps and its extreme thorniness that are difficult to control and situated along riverbanks are likely to have a major impact on recreation in and around those rivers.	Csurhes & Edwards (1998)

B6a Environmental health: Soil chemistry/stability

This plant can smother vegetation that might otherwise bind soil.	de Beer (1988)
In cool or drought conditions this plant loses its leaves (Leuenberger, 1986) and where it has killed the vegetation it has smothered, it will leave the soil bare and prone to erosion.	Victorian Department of Primary Industries (2009)

B6b Environmental health: Water quality

Unlikely - terrestrial species.	NT Weed Risk Management Committee (2009)
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B6c Environmental health: Hydrology

No information available.	No reference
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C POTENTIAL DISTRIBUTION

C1 What is the CLIMATE suitability score (which indicates the proportion of the NT environment that is suitable for the plant)?

The CLIMATCH model used by the NT Weed Management Branch predicts that 24% of the Northern Territory is climatically suitable for <i>Pereskia aculeata</i> (see Figure 1).	NT Weed Management Branch (2009)
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C2 How many broad vegetation types in the NT will the plant potentially naturalise in (up to 5) ?

The broad vegetation types in the Northern Territory that <i>Pereskia aculeata</i> will potentially naturalise in are: <ul style="list-style-type: none"> • Tropical riparian areas • Tropical open forests/savanna woodlands • Rainforests 	NT Weed Risk Management Committee (2009) Rossiter-Rachor et al. (2012)
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Of these, the favoured vegetation type is tropical riparian areas.

C3 What is the potential of the plant to occur throughout its favoured habitat in the NT (identified in question 2)?

<i>Pereskia aculeata</i> has the potential to occur through most of its favoured habitat.	NT Weed Risk Management Committee (2009)
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