

**Taxon:** *Platycerium superbum* de Jonch. & Hennipman      **Family:** Polypodiaceae

**Common Name(s):** staghorn fern      **Synonym(s):**

**Assessor:** Chuck Chimera

**Status:** Assessor Approved

**End Date:** 11 Dec 2019

**WRA Score:** 4.0

**Designation:** EVALUATE

**Rating:** Evaluate

**Keywords:** Epiphytic Fern, Naturalized, Ornamental, Shade-Tolerant, Wind-Dispersed

Qsn #	Question	Answer Option	Answer
101	Is the species highly domesticated?	y=-3, n=0	n
102	Has the species become naturalized where grown?		
103	Does the species have weedy races?		
201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
202	Quality of climate match data	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
203	Broad climate suitability (environmental versatility)	y=1, n=0	n
204	Native or naturalized in regions with tropical or subtropical climates	y=1, n=0	y
205	Does the species have a history of repeated introductions outside its natural range?	y=-2, ?=-1, n=0	y
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n= question 205	y
302	Garden/amenity/disturbance weed	n=0, y = 1*multiplier (see Appendix 2)	y
303	Agricultural/forestry/horticultural weed	n=0, y = 2*multiplier (see Appendix 2)	n
304	Environmental weed		
305	Congeneric weed		
401	Produces spines, thorns or burrs	y=1, n=0	n
402	Allelopathic		
403	Parasitic	y=1, n=0	n
404	Unpalatable to grazing animals		
405	Toxic to animals	y=1, n=0	n
406	Host for recognized pests and pathogens		
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	n
408	Creates a fire hazard in natural ecosystems	y=1, n=0	n
409	Is a shade tolerant plant at some stage of its life cycle	y=1, n=0	y
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	n

Qsn #	Question	Answer Option	Answer
411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets	y=1, n=0	n
501	Aquatic	y=5, n=0	n
502	Grass	y=1, n=0	n
503	Nitrogen fixing woody plant	y=1, n=0	n
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	y=1, n=0	n
601	Evidence of substantial reproductive failure in native habitat	y=1, n=0	n
602	Produces viable seed	y=1, n=-1	y
603	Hybridizes naturally		
604	Self-compatible or apomictic		
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation	y=1, n=-1	n
607	Minimum generative time (years)		
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y=1, n=-1	n
702	Propagules dispersed intentionally by people	y=1, n=-1	y
703	Propagules likely to disperse as a produce contaminant		
704	Propagules adapted to wind dispersal	y=1, n=-1	y
705	Propagules water dispersed	y=1, n=-1	n
706	Propagules bird dispersed	y=1, n=-1	n
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
708	Propagules survive passage through the gut	y=1, n=-1	n
801	Prolific seed production (>1000/m2)	y=1, n=-1	y
802	Evidence that a persistent propagule bank is formed (>1 yr)		
803	Well controlled by herbicides		
804	Tolerates, or benefits from, mutilation, cultivation, or fire		
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)		

**Supporting Data:**

Qsn #	Question	Answer
101	Is the species highly domesticated?	n
	Source(s)	Notes
	Australian Biological Resources Study. (1998). Flora of Australia Volume 48, Ferns, Gymnosperms and Allied Groups. CSIRO Publishing, Melbourne	[No evidence of domestication] "Endemic to eastern Qld and north-eastern N.S.W. (from ?Cooktown south to about Newcastle); epiphytic or occasionally lithophytic in rainforest or wet sclerophyll forest."

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. (2019). Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. (2019). Personal Communication	NA

201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	High
	Source(s)	Notes
	Palmer, D.D. 2003. Hawaii's Ferns and Fern Allies. University of Hawaii Press, Honolulu, HI	"Native of tropical and subtropical eastern Australia, <i>Platyserium superbum</i> does not produce offshoots and must be grown from spores."
	USDA, Agricultural Research Service, National Plant Germplasm System. (2019). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="https://npgsweb.ars-grin.gov/">https://npgsweb.ars-grin.gov/</a> . [Accessed 8 Dec 2019]	"Native Australasia AUSTRALIA: Australia [Queensland]"

202	Quality of climate match data	High
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2019). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="https://npgsweb.ars-grin.gov/">https://npgsweb.ars-grin.gov/</a> . [Accessed 8 Dec 2019]	

Qsn #	Question	Answer
203	<b>Broad climate suitability (environmental versatility)</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Dave's Garden. (2019). Staghorn Fern - <i>Platycerium superbum</i> . <a href="https://davesgarden.com/guides/pf/go/57622/">https://davesgarden.com/guides/pf/go/57622/</a> . [Accessed 9 Dec 2019]	"Hardiness: USDA Zone 9b: to -3.8 °C (25 °F) USDA Zone 10a: to -1.1 °C (30 °F) USDA Zone 10b: to 1.7 °C (35 °F) USDA Zone 11: above 4.5 °C (40 °F)"

204	<b>Native or naturalized in regions with tropical or subtropical climates</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	Australian Biological Resources Study. (1998). Flora of Australia Volume 48, Ferns, Gymnosperms and Allied Groups. CSIRO Publishing, Melbourne	"Endemic to eastern Qld and north-eastern N.S.W. (from ?Cooktown south to about Newcastle); epiphytic or occasionally lithophytic in rainforest or wet sclerophyll forest."
	Palmer, D.D. 2003. Hawaii's Ferns and Fern Allies. University of Hawaii Press, Honolulu, HI	"Native of tropical and subtropical eastern Australia, <i>Platycerium superbum</i> does not produce offshoots and must be grown from spores. The very similar <i>P. grande</i> (Fee) C. Presl from the Philippines has 2 sporangial patches in the secondary forks of the fertile fronds. Localized on tree branches near cultivated plants in upper Nu'uuanu Valley, O'ahu. Apparently in the early stages of becoming established in the wild."

205	<b>Does the species have a history of repeated introductions outside its natural range?</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	"Large elkhorn fern is native to eastern tropical and subtropical Australia, where it is a common rainforest epiphyte. In Nu'uuanu Valley, O'ahu, young plants of this fern volunteer on tree branches near cultivated specimens."
	Dave's Garden. (2019). Staghorn Fern - <i>Platycerium superbum</i> . <a href="https://davesgarden.com/guides/pf/go/57622/">https://davesgarden.com/guides/pf/go/57622/</a> . [Accessed 9 Dec 2019]	"This plant has been said to grow in the following regions: Encinitas, California Encino, California Hayward, California Livermore, California Long Beach, California Mission Viejo, California San Clemente, California San Diego, California San Jose, California San Leandro, California Santa Barbara, California Thousand Oaks, California Babson Park, Florida Brandon, Florida Dade City, Florida Dover, Florida Fernandina Beach, Florida Fort Lauderdale, Florida Frostproof, Florida Grant, Florida Hollywood, Florida Jacksonville, Florida Lakeland, Florida Melbourne Beach, Florida Miami, Florida Palm Harbor, Florida Panama City, Florida(2 reports) Port Richey, Florida Port Saint Lucie, Florida Punta Gorda, Florida Tampa, Florida Valrico, Florida Honomu, Hawaii Gonzales, Louisiana Medina, New York Grove City, Pennsylvania Gallatin, Tennessee Bishop, Texas Dallas, Texas Mc Kinney, Texas"

Qsn #	Question	Answer
	Johnson, S. B. (2014). The emerging weed challenge of managing native plant species: what are we doing in New South Wales. Pp. 227-230 In M. Baker (ed.). Proceedings of the 19th Australasian Weeds Conference. Tasmanian Weed Society, Hobart	[Introduced, and controlled, on Lord Howe Island] "Two groups of native species are managed as noxious weeds. With one exception, the first group includes a range of 14 tree, shrub, vine and epiphytic species found in northern and eastern rainforests and high rainfall areas. These species are generally of concern outside their endemic range, for example sweet pittosporum ( <i>Pittosporum undulatum</i> Vent.), some lilly-pilly species (both <i>Acmena</i> and <i>Syzygium</i> species), bower vine ( <i>Pandorea jasminoides</i> (Lindl.) Schum.) and staghorn fern ( <i>Platycerium superbum</i> de Jonch. & Hennipman)." ... "Declaration of such invasive plants has occurred with 14 tree, shrub, vine and epiphytic species that are not endemic to, but are beginning to invade Lord Howe Island."

301	Naturalized beyond native range	y
	Source(s)	Notes
	Palmer, D.D. 2003. Hawaii's Ferns and Fern Allies. University of Hawaii Press, Honolulu, HI	"Localized on tree branches near cultivated plants in upper Nu'uuanu Valley, O'ahu. Apparently in the early stages of becoming established in the wild."
	Wilson, K.A. 1996. Alien Ferns in Hawaii. <i>Pacific Science</i> 50 (2): 127-141	" <i>Platycerium superbum</i> DeJoncheere & Hennipman has not been included in this list of naturalized species, but in 1992 Barbara Joe Hoshizaki (pers. comm.) found that young plants of this fern were volunteering on tree branches near cultivated plants growing in Nu'uuanu Valley, O'ahu. It will no doubt find this valley a very favorable area for continued spread."

302	Garden/amenity/disturbance weed	y
	Source(s)	Notes
	Johnson, S. B. (2014). The emerging weed challenge of managing native plant species: what are we doing in New South Wales. Pp. 227-230 In M. Baker (ed.). Proceedings of the 19th Australasian Weeds Conference. Tasmanian Weed Society, Hobart	[Classified as a weed outside its native range within Australia] "Two groups of native species are managed as noxious weeds. With one exception, the first group includes a range of 14 tree, shrub, vine and epiphytic species found in northern and eastern rainforests and high rainfall areas. These species are generally of concern outside their endemic range, for example sweet pittosporum ( <i>Pittosporum undulatum</i> Vent.), some lilly-pilly species (both <i>Acmena</i> and <i>Syzygium</i> species), bower vine ( <i>Pandorea jasminoides</i> (Lindl.) Schum.) and staghorn fern ( <i>Platycerium superbum</i> de Jonch. & Hennipman)." ... "Declaration of such invasive plants has occurred with 14 tree, shrub, vine and epiphytic species that are not endemic to, but are beginning to invade Lord Howe Island."
	Lord Howe Island Board. (2016). Lord Howe Island Weed Management Strategy 2016 – 2025. Lord Howe Island Board, Lord Howe Island, NSW	[ <i>Platycerium superbum</i> classified as a noxious weed of Lord Howe island, and apparently eradicated, or controlled, for its potential negative environmental impacts. Because such impacts have not been manifested prior to eradication, this assessment classifies it conservatively as a general weed] "Category 1: Eradicate (immediate or suppression leading to eradication)" ... "Control class - 3 = Plants that pose a potentially serious threat to primary production or the environment of a region to which the order applies, are not widely distributed in the area and are likely to spread in the area or to another area; # Removed 200 –15 = 9; Last seen - 2016]"

Qsn #	Question	Answer
303	Agricultural/forestry/horticultural weed	n
	Source(s)	Notes
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

304	Environmental weed	
	Source(s)	Notes
	Lord Howe Island Board. (2016). Lord Howe Island Weed Management Strategy 2016 – 2025. Lord Howe Island Board, Lord Howe Island, NSW	[ <i>Platycerium superbum</i> classified as a noxious weed of Lord Howe island, and apparently eradicated, or controlled, for its potential negative environmental impacts. Because such impacts have not been manifested prior to eradication, this assessment classifies it conservatively as a general weed. See 3.02] "Category 1: Eradicate (immediate or suppression leading to eradication)" ... "Control class - 3 = Plants that pose a potentially serious threat to primary production or the environment of a region to which the order applies, are not widely distributed in the area and are likely to spread in the area or to another area; # Removed 2004–15 = 9; Last seen - 2016]

305	Congeneric weed	
	Source(s)	Notes
	Pemberton, R. (2003). The Common Staghorn Fern, <i>Platycerium bifurcatum</i> , Naturalizes in Southern Florida. American Fern Journal, 93(4), 203-206	[Speculation that <i>Platycerium bifurcatum</i> could be a potential environmental weed] "If <i>P. bifurcatum</i> plants become very dense on trees, they could displace native epiphytes. In the oak forests presently colonized, most of the branches, including those with <i>P. bifurcatum</i> are covered with resurrection fern ( <i>Pleopeltis polypodioides</i> Humb. & Bonpl. ex Willd.), and five species of bromeliads ( <i>Tillandsia balbisiana</i> Schult. & Schult.f., <i>T. fasciculata</i> Sw., <i>T. recurvata</i> (L.) L., <i>T. setaceae</i> Sw., <i>T. usneoides</i> (L.) L., <i>T. utriculata</i> L.) are common. Two of these bromeliads, <i>T. fasciculata</i> and <i>T. utriculata</i> , are classified as endangered by the State of Florida because of the attack of an exotic weevil which specifically feeds on bromeliads (Coile, N.C. 2000. Notes on Florida's endangered and threatened plants. Florida Division of Plant Industry, Bureau of Entomology, Nematology and Plant Pathology-Botany Section Contribution No. 38, 3rd edition. p. 122.). If <i>P. bifurcatum</i> becomes abundant in other preserves, which are rich in rare endangered epiphytic orchids and bromeliads, it could become more serious threat. Its presence in Tree Tops and Flamingo represents another exotic species in natural areas already plagued with abundant introduced species. It is a more obviously nonnative component of the forests, than are the exotic figs ( <i>Ficus</i> spp.) and shoebutton ardisia ( <i>Ardisia elliptica</i> Thunb.), which have native counterparts. Given the incipient naturalization, despite an apparent long history of cultivation, and its modest abundance, it seems unlikely that <i>P. bifurcatum</i> will approach the severity of other invasive ferns in Florida."

Qsn #	Question	Answer
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	Platycterium bifurcatum is listed as "E - Environmental Weed Species that invade and impact on native ecosystems." and "U - Casual Alien These species appear with no direct (apparent) human assistance, survive, possibly set seed, but do not persist. They then may appear again some seasons later, but do not develop persistent populations. Such species are often considered as ruderal species but for this publications purpose the association with human disturbance is not a requirement" Platycterium stemaria is listed as "I - Invasive Species may have escaped from gardens, cultivation or both; source not specific but includes some crop and pasture species." [Unable to verify impacts]

401	Produces spines, thorns or burrs	n
	Source(s)	Notes
	Australian Biological Resources Study. (1998). Flora of Australia Volume 48, Ferns, Gymnosperms and Allied Groups. CSIRO Publishing, Melbourne	[No evidence] "Roots not proliferous. Base fronds rounded-reniform in lower part, 60 cm or more diam., appressed to substrate and densely clothed with fawn stellate hairs; upper part flabellate, irregularly divided into elongate dichotomous spreading lobes. Foliage fronds usually paired, pendulous, up to 5 times forked, 30–200 cm long; base broadly cuneate. Sporangia in a single patch c. 10–50 cm wide, bulging into the sinus of first fork of foliage frond on its lower surface. Spores 70–85 µm long, 42.5–57.5 µm wide."

402	Allelopathic	n
	Source(s)	Notes
	WRA Specialist. (2019). Personal Communication	Unknown. No evidence found

403	Parasitic	n
	Source(s)	Notes
	Australian Biological Resources Study. (1998). Flora of Australia Volume 48, Ferns, Gymnosperms and Allied Groups. CSIRO Publishing, Melbourne	"epiphytic or occasionally lithophytic in rainforest or wet sclerophyll forest." [Polypodiaceae. No evidence]

404	Unpalatable to grazing animals	n
	Source(s)	Notes
	Martin, R. (2005). Tree-kangaroos of Australia and New Guinea. CSIRO Publishing, Collingwood, Australia	[Palatable to tree kangaroos] "Table 4.1 Food plants and the parts of the plant eaten by Lumholtz's Tree-kangaroos at Curtain Fig (based on Proctor-Grey 1985) and at Massey Creek (based on Jones 2001)" [Platycterium superbum - Parts eaten = Fronds]

405	Toxic to animals	n
	Source(s)	Notes

Qsn #	Question	Answer
	Dave's Garden. (2019). Staghorn Fern - <i>Platycerium superbum</i> . <a href="https://davesgarden.com/guides/pf/go/57622/">https://davesgarden.com/guides/pf/go/57622/</a> . [Accessed 10 Dec 2019]	"Danger: N/A"
	Martin, R. (2005). Tree-kangaroos of Australia and New Guinea. CSIRO Publishing, Collingwood, Australia	[No evidence. Palatable to tree kangaroos] "Table 4.1 Food plants and the parts of the plant eaten by Lumholtz's Tree-kangaroos at Curtain Fig (based on Proctor-Grey 1985) and at Massey Creek (based on Jones 2001)" [ <i>Platycerium superbum</i> - Parts eaten = Fronds]
	Quattrocchi, U. 2012. CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	No evidence

406	Host for recognized pests and pathogens	
	Source(s)	Notes
	PlantFileonline. (2019). <i>Platycerium superbum</i> . <a href="http://plantfileonline.net/plants/plant_details/92">http://plantfileonline.net/plants/plant_details/92</a> . [Accessed 10 Dec 2019]	"This plant is susceptible to Grey Mold, Leaf Nematodes and Fungal Leaf Spots."

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	Notes
	Dave's Garden. (2019). Staghorn Fern - <i>Platycerium superbum</i> . <a href="https://davesgarden.com/guides/pf/go/57622/">https://davesgarden.com/guides/pf/go/57622/</a> . [Accessed 10 Dec 2019]	"Danger: N/A"
	Quattrocchi, U. 2012. CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	No evidence

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	Notes
	Australian Biological Resources Study. (1998). Flora of Australia Volume 48, Ferns, Gymnosperms and Allied Groups. CSIRO Publishing, Melbourne	[No evidence. Occurs in rainforest and wet forest. May burn if host tree is on fire, but unlikely to increase fire hazard in areas in which it grows] "epiphytic or occasionally lithophytic in rainforest or wet sclerophyll forest."

409	Is a shade tolerant plant at some stage of its life cycle	y
	Source(s)	Notes



Qsn #	Question	Answer
	Hughes, R. H. (1982). <i>Platycerium superbum</i> in the Wild and in Cultivation. <i>Fiddlehead Forum</i> 9(6): 42-44	"Adult plants prefer more light than younger ones. The requirement is for high light, 600 or more foot-candles for adults and 300 to 400 for young sporelings two to six inches in diameter. In a greenhouse, fiberglass structure, or polyethylene shelter, 50 to 75 percent shade is normal. With high humidity outdoors as little as 25 percent shade is satisfactory. In or near tropical rainforests, <i>P. superbum</i> is found on occasion in full sun, high in the crown of emergent trees, on trunks of depauperate trees, in open park-like forests, and mostly exposed boulders. Full sun is also compatible along overcast coastal areas of California. While adaptation in the open is feasible, subnormal growth accompanies full exposure during the high light season in southern Florida. Plants benefit from more light than is generally provided nursery stock, hence they are receptive to improved habitat through increased lighting. In the upper end of the intensity range, shield fronds become leathery, shorter, thicker, more clasping and tolerant of habitat changes. Larger sporelings and adults suffering from too much light (and heat) are smaller, less luxuriant, yellowish green, and may develop brown margins. Sporelings in smaller sizes may be grown under artificial lights."
	Dave's Garden. (2019). <i>Staghorn Fern - Platycerium superbum</i> . <a href="https://davesgarden.com/guides/pf/go/57622/">https://davesgarden.com/guides/pf/go/57622/</a> . [Accessed 10 Dec 2019]	"Sun Exposure: Light Shade Partial to Full Shade Full Shade"
	Australian Native Plant Society. (2019). <i>Platycerium superbum</i> . <a href="http://anpsa.org.au/p-sup.html">http://anpsa.org.au/p-sup.html</a> . [Accessed 10 Dec 2019]	[Does not do well in dense shade, in contrast with Dave's Garden website] "In nature, these ferns often grow high up in trees, where they receive much light filtering through the canopy. Similarly, plenty of light is important for good growth in cultivation and dense shade is resented. Filtered sunlight with some humidity is best."

<b>410</b>	<b>Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Australian Biological Resources Study. (1998). <i>Flora of Australia Volume 48, Ferns, Gymnosperms and Allied Groups</i> . CSIRO Publishing, Melbourne	"epiphytic or occasionally lithophytic in rainforest or wet sclerophyll forest."

<b>411</b>	<b>Climbing or smothering growth habit</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Palmer, D.D. 2003. <i>Hawaii's Ferns and Fern Allies</i> . University of Hawaii Press, Honolulu, HI	[An epiphyte, but no evidence that this fern climbs up, or smothers trees on which it is found] "Plants medium-sized, epiphytic." ... "Localized on tree branches near cultivated plants in upper Nu'uuanu Valley"
	Australian Biological Resources Study. (1998). <i>Flora of Australia Volume 48, Ferns, Gymnosperms and Allied Groups</i> . CSIRO Publishing, Melbourne	[An epiphyte, but no evidence that this fern climbs up, or smothers trees on which it is found] "Roots not proliferous. Base fronds rounded-reniform in lower part, 60 cm or more diam., ... epiphytic or occasionally lithophytic in rainforest or wet sclerophyll forest."

<b>412</b>	<b>Forms dense thickets</b>	<b>n</b>
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Australian Biological Resources Study. (1998). Flora of Australia Volume 48, Ferns, Gymnosperms and Allied Groups. CSIRO Publishing, Melbourne	"epiphytic or occasionally lithophytic in rainforest or wet sclerophyll forest." [As an epiphyte, does not form thickets or impede movement]

<b>501</b>	<b>Aquatic</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Australian Biological Resources Study. (1998). Flora of Australia Volume 48, Ferns, Gymnosperms and Allied Groups. CSIRO Publishing, Melbourne	"epiphytic or occasionally lithophytic in rainforest or wet sclerophyll forest."

<b>502</b>	<b>Grass</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	USDA, Agricultural Research Service, National Plant Germplasm System. (2019). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="https://npgsweb.ars-grin.gov/">https://npgsweb.ars-grin.gov/</a> . [Accessed 9 Dec 2019]	Polypodiaceae

<b>503</b>	<b>Nitrogen fixing woody plant</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	USDA, Agricultural Research Service, National Plant Germplasm System. (2019). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="https://npgsweb.ars-grin.gov/">https://npgsweb.ars-grin.gov/</a> . [Accessed 9 Dec 2019]	Polypodiaceae

<b>504</b>	<b>Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Australian Biological Resources Study. (1998). Flora of Australia Volume 48, Ferns, Gymnosperms and Allied Groups. CSIRO Publishing, Melbourne	"Roots not proliferous." ... "epiphytic or occasionally lithophytic in rainforest or wet sclerophyll forest."

<b>601</b>	<b>Evidence of substantial reproductive failure in native habitat</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Australian Native Plant Society. (2019). <i>Platyserium superbum</i> . <a href="http://anpsa.org.au/p-sup.html">http://anpsa.org.au/p-sup.html</a> . [Accessed 8 Dec 2019]	"Conservation Status: Not considered to be at risk in the wild"

<b>602</b>	<b>Produces viable seed</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>

Qsn #	Question	Answer
	Australian Native Plant Society. (2019). <i>Platycerium superbum</i> . <a href="http://anpsa.org.au/p-sup.html">http://anpsa.org.au/p-sup.html</a> . [Accessed 9 Dec 2019]	"Propagation is by germination of spores"
	Hughes, R. H. (1982). <i>Platycerium superbum</i> in the Wild and in Cultivation. <i>Fiddlehead Forum</i> 9(6): 42-44	"The giant staghorn does not offset plantlets (pups) nor lend itself to present methods of meristem culture, hence propagation by spore is routine. Success in spore culture depends on care needed to combat growth of algae and molds. An essential practice, aseptic spore culture, is described by Gmoser (1979)." ... "Viable spores are produced abundantly in cultivation. They may be obtained from a fern society spore store when donated or directly from the grower."
	Staples, G.W. & Herbst, D.R. 2005. <i>A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places</i> . Bishop Museum Press, Honolulu, HI	[Viable spores produced] "Large elkhorn fern does not develop pups and is therefore propagated by spores. Tissue culture methods are now also being used to propagate this fern."

603	Hybridizes naturally	
	Source(s)	Notes
	Hoshizaki, B. (1975). A Staghorn Fern ( <i>Platycerium</i> ) Hybrid. <i>American Fern Journal</i> , 65(4), 99-101	[Artificial hybrid possible] "A hybrid of <i>Platycerium</i> has been developed by Mr. Tom Mentelos of Fantastic Gardens, Miami, Florida. The parents of this hybrid are <i>P. stemaria</i> (Pal. Beauv.) Desv. and <i>P. superbum</i> Jonch. & Hennipm. (formerly known as <i>P. grande</i> (Cunn.) J. Smith). Mr. Mentelos obtained the hybrid by planting prothalli of the parents in alternate rows. I examined only one hybrid plant of the three reportedly obtained from the sowing. Spores produced by this hybrid are greatly distorted, although a few of normal shape may be found; these probably account for the reports of viability of this hybrid. Plants grown from these spores are said to vary in appearance, but when small they are silvery and like <i>P. superbum</i> ."

604	Self-compatible or apomictic	
	Source(s)	Notes
	Pemberton, R. (2003). The Common Staghorn Fern, <i>Platycerium bifurcatum</i> , Naturalizes in Southern Florida. <i>American Fern Journal</i> , 93(4), 203-206	[Unknown for related species] "It is not known whether <i>Platycerium</i> gametophytes are able to self fertilize (B. J. Hoshizaki, pers.com.). The ability to self fertilize would make naturalization easier because only one spore would be needed to establish a plant and population. Self fertilization seems desirable in epiphytic ferns growing on tall trees in dense forests. Ferns that are long distance dispersers are more likely to self fertilize (Peck, J., C. Peck and D. Farrar. 1990. <i>Amer J. Bot</i> 80:126-126.)."
	Fernández, H., Kumar, A., & Revilla, A. (Eds.). (2011). <i>Working with ferns: issues and applications</i> . Springer Science & Business Media, New York	[Unknown] "Although current evidence suggests that the majority of homosporous ferns will undergo intragametophytic selfing, there seem to be gametophytic adaptations which increase or decrease the probability of this phenomenon."

Qsn #	Question	Answer
605	Requires specialist pollinators	n
	Source(s)	Notes
	Mehltreter, K., Walker, L.R. & Sharpe, J.M. 2010. Fern Ecology. Cambridge University Press, Cambridge, UK	[Requires water, but otherwise nothing specialized] "For fertilization, the sperm cell must swim through water to an egg cell"

606	Reproduction by vegetative fragmentation	n
	Source(s)	Notes
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	"Large elkhorn fern does not develop pups and is therefore propagated by spores."
	Australian Native Plant Society. (2019). <i>Platycerium superbum</i> . <a href="http://anpsa.org.au/p-sup.html">http://anpsa.org.au/p-sup.html</a> . [Accessed 9 Dec 2019]	"Propagation is by germination of spores"

607	Minimum generative time (years)	
	Source(s)	Notes
	Hughes, R. H. (1982). <i>Platycerium superbum</i> in the Wild and in Cultivation. Fiddlehead Forum 9(6): 42-44	"The period of adolescence for sporelings is several months to a few years. Growth is unpredictable, irregular and sporadic, particularly in sizes two to six inches in diameter." [Time to maturity unclear]
	Pemberton, R. (2003). The Common Staghorn Fern, <i>Platycerium bifurcatum</i> , Naturalizes in Southern Florida. American Fern Journal, 93(4), 203-206	"Under optimal conditions, it can take <i>P. bifurcatum</i> up to a year to grow from a spore to a young sporophyte to initiate foliage fronds, and another 3-4 years to produce fertile fronds (B.J. Hoshizaki, pers. com.)" [Related species takes 1 year to grow foliage fronds + 3-4 years to produce fertile fronds = 4-5 years to reproductive maturity. Based of slow growth rate of <i>P. superbum</i> , it likely takes 3+ years to reach maturity]
	Jones, D. L. 1987. Encyclopedia of Ferns. Timber Press, Portland, OR	[Slow growing. First leaves don't develop until 12-18 months. Time to maturity assumed to be longer] "On the other hand, slow growing species such as <i>Asplenium nidus</i> , <i>Blechnum patersonii</i> and <i>Platycerium superbum</i> may take 12-18 months before developing the first true leaf and a similar period to become established small plants. Spores sown in greenhouses or held on bottom heat units can be expected to develop more rapidly than those in less privileged conditions."

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	n
	Source(s)	Notes
	Australian Biological Resources Study. (1998). Flora of Australia Volume 48, Ferns, Gymnosperms and Allied Groups. CSIRO Publishing, Melbourne	"epiphytic or occasionally lithophytic in rainforest or wet sclerophyll forest." [Spores are small, & could attach to shoes or equipment, but would not likely be dispersed to an epiphytic substrate]

702	Propagules dispersed intentionally by people	y
	Source(s)	Notes

Qsn #	Question	Answer
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	"Large elkhorn fern is native to eastern tropical and subtropical Australia, where it is a common rainforest epiphyte. In Nu'uuanu Valley, O'ahu, young plants of this fern volunteer on tree branches near cultivated specimens."
	Jones, D. L. 1987. Encyclopedia of Ferns. Timber Press, Portland, OR	"One of the most beautiful and easily grown members of the genus." ... "Readily grown on trees in tropical and subtropical gardens. In cool climates plants need to be kept dry over winter."

703	Propagules likely to disperse as a produce contaminant	
	Source(s)	Notes
	Hughes, R. H. (1982). <i>Platycterium superbum</i> in the Wild and in Cultivation. Fiddlehead Forum 9(6): 42-44	"Since <i>P. superbum</i> does not produce offsets and is difficult to propagate from spore and to handle as young transplants, medium-sized commercially grown sporelings are to be recommended for growing in the home garden. Four or five-inch pot sizes or equivalent sizes on plaques are good." [Wind-dispersed spores could be dispersed into soil of other potted plants, but difficulty of propagation from spores may make this dispersal vector unlikely]

704	Propagules adapted to wind dispersal	y
	Source(s)	Notes
	Australian Biological Resources Study. (1998). Flora of Australia Volume 48, Ferns, Gymnosperms and Allied Groups. CSIRO Publishing, Melbourne	[Presumably wind-dispersed due to epiphytic habit and small size of spores] "Sporangia in a single patch c. 10–50 cm wide, bulging into the sinus of first fork of foliage frond on its lower surface. Spores 70–85 µm long, 42.5–57.5 µm wide."

705	Propagules water dispersed	n
	Source(s)	Notes
	Australian Biological Resources Study. (1998). Flora of Australia Volume 48, Ferns, Gymnosperms and Allied Groups. CSIRO Publishing, Melbourne	"epiphytic or occasionally lithophytic in rainforest or wet sclerophyll forest." [Wind-dispersed spores could be moved by water, but would be unlikely to be dispersed to a suitable epiphytic substrate]

706	Propagules bird dispersed	n
	Source(s)	Notes
	Australian Biological Resources Study. (1998). Flora of Australia Volume 48, Ferns, Gymnosperms and Allied Groups. CSIRO Publishing, Melbourne	"epiphytic or occasionally lithophytic in rainforest or wet sclerophyll forest." [Spores could possibly be dispersed to adhering to birds, but primary mode of dispersal is presumably wind]

707	Propagules dispersed by other animals (externally)	n
	Source(s)	Notes
	Australian Biological Resources Study. (1998). Flora of Australia Volume 48, Ferns, Gymnosperms and Allied Groups. CSIRO Publishing, Melbourne	"epiphytic or occasionally lithophytic in rainforest or wet sclerophyll forest." [Small, wind-dispersed spores could potentially adhere to animal feet or fur, but are unlikely to be dispersed to an appropriate epiphytic site]

Qsn #	Question	Answer
708	Propagules survive passage through the gut	n
	<b>Source(s)</b>	<b>Notes</b>
	Australian Biological Resources Study. (1998). Flora of Australia Volume 48, Ferns, Gymnosperms and Allied Groups. CSIRO Publishing, Melbourne	"epiphytic or occasionally lithophytic in rainforest or wet sclerophyll forest." [Wind-dispersed. Unlikely to be consumed or deposited on a suitable epiphytic substrate]
	Martin, R. (2005). Tree-kangaroos of Australia and New Guinea. CSIRO Publishing, Collingwood, Australia	[Palatable to tree kangaroos. Could possibly disperse spores to epiphytic substrates if they were present in the Hawaiian Islands or elsewhere] "Table 4.1 Food plants and the parts of the plant eaten by Lumholtz's Tree-kangaroos at Curtain Fig (based on Proctor-Grey 1985) and at Massey Creek (based on Jones 2001)" [ <i>Platycterium superbum</i> - Parts eaten = Fronds]

801	Prolific seed production (>1000/m <sup>2</sup> )	y
	<b>Source(s)</b>	<b>Notes</b>
	Gordon, D. R., Mitterdorfer, B., Pheloung, P. C., Ansari, S., Buddenhagen, C., Chimera, C., ... & Williams, P. A. 2010). Guidance for addressing the Australian Weed Risk Assessment questions. Plant Protection Quarterly, 25(2): 56-74	"Assume 'yes' for fern taxa unless contradictory evidence exists."
	Hughes, R. H. (1982). <i>Platycterium superbum</i> in the Wild and in Cultivation. Fiddlehead Forum 9(6): 42-44	"Growth habit in nature tends to be gregarious. Several generations may be seen growing on trees or boulders near the parent plant, or single specimens emerge through natural selection. Mature plants may weigh 100 to 200 pounds and display pendulous fertile fronds three to six feet in length, thus the common name 'giant staghorn.'" ... "Viable spores are produced abundantly in cultivation."

802	Evidence that a persistent propagule bank is formed (>1 yr)	
	<b>Source(s)</b>	<b>Notes</b>
	Camloh, M. (1999). Spore Age and Sterilization Affects Germination and Early Gametophyte Development of <i>Platycterium bifurcatum</i> . American Fern Journal, 89(2), 124-132	[Unknown. Germination of other <i>Platycterium</i> decreases with age] "Spore age and sterilization affect spore germination and early gametophyte development in <i>P. bifurcatum</i> ." ... "When <i>Platycterium</i> spores were stored for over three months, a substantial decrease in germination occurred. Similarly, in the fern <i>Polypodium vulgare</i> , the rate of germination declines with increasing spore age, but only by 9% after one year of storage (Smith and Robinson, 1975)."

803	Well controlled by herbicides	
	<b>Source(s)</b>	<b>Notes</b>
	WRA Specialist. (2019). Personal Communication	Unknown. No information on herbicide efficacy or chemical control of this species

Qsn #	Question	Answer
804	Tolerates, or benefits from, mutilation, cultivation, or fire	
	Source(s)	Notes
	WRA Specialist. (2019). Personal Communication	Unknown

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes
	Palmer, D.D. 2003. Hawaii's Ferns and Fern Allies. University of Hawaii Press, Honolulu, HI	[Unknown] "Localized on tree branches near cultivated plants in upper Nu'uuanu Valley, O'ahu. Apparently in the early stages of becoming established in the wild."

**Summary of Risk Traits:**

High Risk / Undesirable Traits

- Thrives in tropical climates. Climate in the Hawaiian Islands is conducive to its establishment and spread.
- Naturalized on Oahu, (Hawaiian Islands)
- Controlled as a potential weed of native forest on Lord Howe Island, Australia
- Shade-tolerant
- An epiphyte (could compete with native epiphytic species)
- Reproduces by prolific, wind-dispersed spores
- Intentionally cultivated by people

Low Risk Traits

- Despite naturalization, and control in Australia, no negative impacts have been detailed to date
- Unarmed (no spines, thorns, or burrs)
- Non-toxic
- Ornamental value

Second Screening Results for Vines, Lianas & Epiphytes

- (A) Reported as a weed of cultivated lands?> No
  - (B) Shade tolerant or known to form dense stands?> Tolerates shade
  - (C) Bird- Or clearly wind- dispersed?> Wind-dispersed
  - (D) Life-cycle <4 years? Unknown. May reach maturity in 4+ years, but potentially sooner
- Outcome = Evaluate