Key Words: Evaluate, Not Naturalized, Subtropical Tree Fern, Wind-dispersed, Ornamental

Family: ***Cyatheaceae***

Taxon: ***Cyathea australis***

Synonym: *Alsophila australis R. Br. (basionym)* ***Common Name:*** rough tree fern

Questionaire : current 20090513 **Assessor:** Chuck Chimera **Designation:** EVALUATE

Status: Assessor Approved **Data Entry Person:** Chuck Chimera **WRA Score** 5

101	**Is the species highly domesticated?**	**y=-3, n=0**	**n**
102	**Has the species become naturalized where grown?**	**y=1, n=-1**	
103	**Does the species have weedy races?**	**y=1, n=-1**	
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**	**y**
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**	**n**
302	**Garden/amenity/disturbance weed**	**n=0, y = 1*multiplier (see Appendix 2)**	**n**
303	**Agricultural/forestry/horticultural weed**	**n=0, y = 2*multiplier (see Appendix 2)**	**n**
304	**Environmental weed**	**n=0, y = 2*multiplier (see Appendix 2)**	**n**
305	**Congeneric weed**	**n=0, y = 1*multiplier (see Appendix 2)**	**y**
401	**Produces spines, thorns or burrs**	**y=1, n=0**	**n**
402	**Allelopathic**	**y=1, n=0**	
403	**Parasitic**	**y=1, n=0**	**n**
404	**Unpalatable to grazing animals**	**y=1, n=-1**	
405	**Toxic to animals**	**y=1, n=0**	**n**
406	**Host for recognized pests and pathogens**	**y=1, n=0**	
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**	**y**
411	**Climbing or smothering growth habit**	**y=1, n=0**	**n**

412	**Forms dense thickets**	**y=1, n=0**	
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**	**y=1, n=-1**	**y**
604	**Self-compatible or apomictic**	**y=1, n=-1**	
605	**Requires specialist pollinators**	**y=-1, n=0**	**n**
606	**Reproduction by vegetative fragmentation**	**y=1, n=-1**	**n**
607	**Minimum generative time (years)**	**1 year = 1, 2 or 3 years = 0, 4+ years = -1**	**>3**
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**	**y=1, n=-1**	**n**
704	**Propagules adapted to wind dispersal**	**y=1, n=-1**	**y**
705	**Propagules water dispersed**	**y=1, n=-1**	**y**
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**	
801	**Prolific seed production (>1000/m2)**	**y=1, n=-1**	**y**
802	**Evidence that a persistent propagule bank is formed (>1 yr)**	**y=1, n=-1**	
803	**Well controlled by herbicides**	**y=-1, n=1**	
804	**Tolerates, or benefits from, mutilation, cultivation, or fire**	**y=1, n=-1**	**y**
805	**Effective natural enemies present locally (e.g. introduced biocontrol agents)**	**y=-1, n=1**	

Designation: EVALUATE **WRA Score** 5

Supporting Data:

101	1999. Keith, D.A./Miles, J./Mackenzie, B.D.E.. Vascular Flora of the South East Forests region, Eden, New South Wales. Cunninghamia. 6(1): 219-281.	[Is the species highly domesticated? No evidence]
102	2012. WRA Specialist. Personal Communication.	NA
103	2012. WRA Specialist. Personal Communication.	NA
201	2012. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Species suited to tropical or subtropical climate(s) 2-High] "Native: AUSTRALASIA; Australia: Australia - New South Wales [e.], Queensland [s.e.], Tasmania, Victoria [s.]"
202	2012. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Quality of climate match data 2-High]
203	2003. Australian National Botanic Gardens. Growing Native Plants - Cyathea australis, Cyathea cooperi. http://www.anbg.gov.au/gnp/interns-2003/cyathea-spp.html [Accessed 13 Dec 2012]	[Broad climate suitability (environmental versatility)? Yes] "The horticultural appeal of C. australis is not only due to its beautiful looks but also because it is an extremely hardy species, even capable of tolerating direct sun when the roots are wet. It is also a robust tub plant and is unusual in that it is tolerant of salty winds. C. australis is thus a popular, cold-hardy tree fern, adaptable to a variety of climates and soils."
203	2011. Forest Ferns. Cyathea australis. http://www.forestferns.co.uk/tree-ferns/cyathea/cyathea-australis [Accessed 13 Dec 2012]	[Broad climate suitability (environmental versatility)? Yes] "Cyathea australis grows at elevations as high as 4,200ft in Southeast Australia, and for this reason it is considered to be slightly more cold-hardy than Dicksonia antarctica. If it's location in Australia is anything to go by the plant could be cold hardy down to -12°C (10°F), however it would be advisable to protect this plant the same way as Dicksonia antarctica until the plant is well established."
203	2012. Learn 2 Grow. Cyathea australis. http://www.learn2grow.com/plants/cyathea-australis/ [Accessed 13 Dec 2012]	[Broad climate suitability (environmental versatility)? Yes] "The rough tree fern is well-known and utilized in Australia because of its beauty and better cold hardiness, adaptability to a wider range of soil types, and tolerance of salt spray and drier conditions. This helps differentiate it from the more globally-recognized and used Cooper's tree fern."
204	1992. Medeiros, A.C./Loope, L.L./Flynn, T./Anderson, S.J./Cuddihy, L.W./Wilson, K.A.. Notes on the status of an invasive Australian tree fern (Cyathea cooperi) in Hawaiian rain forests. American Fern Journal. 82: 27-33.	[Native or naturalized in regions with tropical or subtropical climates? Yes] "Cyathea australis is a subtropical to warm temperate species growing in subtropical rain forest and tall Eucalyptus forests (A. Irvine, pers. comm.); it is much slower growing than C. cooperi."
205	1992. Medeiros, A.C./Loope, L.L./Flynn, T./Anderson, S.J./Cuddihy, L.W./Wilson, K.A.. Notes on the status of an invasive Australian tree fern (Cyathea cooperi) in Hawaiian rain forests. American Fern Journal. 82: 27-33.	[Does the species have a history of repeated introductions outside its natural range? Hawaii] "...the similar Cyathea australis is also present in Hawai'i but is limited to botanical gardens and a few private collections (Wilson, 1991)."
205	2002. Schmidt, E./Lötter, M./McCleland, W.. Trees and shrubs of Mpumalanga and Kruger National Park. Jacana Media, Johannesburg, South Africa	[Does the species have a history of repeated introductions outside its natural range? South Africa] "Ornamentally very popular, with the Australian Tree Fern (Cyathea australis) and the Tasmanian Tree Fern (Dicksonia antarctica) widely cultivated in South Africa."
205	2005. Imada, C.T./Staples, G.W./Herbst, D.R.. Annotated Checklist of Cultivated Plants of Hawai'i. The Bishop Museum, http://www2.bishopmuseum.org/HBS/botany/cultivatedplants/	[Does the species have a history of repeated introductions outside its natural range? Hawaiian Islands] "Locations: Foster Botanical Garden; Harold L. Lyon Arboretum; Ho'omaluhia Botanical Garden; Pacific Tropical Botanical Garden (now National Tropical Botanical Garden); Wahiawa Botanical Garden"
205	2012. Dave's Gardern. PlantFiles: Rough Tree Fern - Cyathea australis. http://davesgarden.com/guides/pf/go/58539/ [Accessed 13 Dec 2012]	[Does the species have a history of repeated introductions outside its natural range? Yes] "This plant has been said to grow in the following regions: Hayward, California Miami, Florida Naples, Florida"
301	2008. Foxcroft, L.C./Richardson, D.M./Wilson, J.R.U.. Ornamental Plants as Invasive Aliens: Problems and Solutions in Kruger National Park, South Africa. Environmental Management. 41: 32–51.	[Naturalized beyond native range? No] "Table 2 Ornamental alien plant species recorded per camp in the Kruger National Park, indicating the number of camps in which each species has been recorded, as well as mode of introduction" … [Cyathea australis - Evidence of naturalization? = No]

301	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Naturalized beyond native range? No evidence]
302	1992. Garrett, M.. Pteridophytes of Northeastern Tasmania. Tasforests. 4: 57-68.	[Garden/amenity/disturbance weed? Not considered a weed, but disturbance adapted] "It successfully re-establishes in roadside drains and other moist, disturbed sites."
302	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Garden/amenity/disturbance weed? No evidence]
303	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Agricultural/forestry/horticultural weed? No evidence]
304	1992. Medeiros, A.C./Loope, L.L./Flynn, T./Anderson, S.J./Cuddihy, L.W./Wilson, K.A.. Notes on the status of an invasive Australian tree fern (Cyathea cooperi) in Hawaiian rain forests. American Fern Journal. 82: 27-33.	[Environmental weed? Not in the Hawaiian Islands] "Hawai'i's "Australian tree fern" has long been identified in Hawaiian botanical literature and the horticultural trade as Cyathea australis (R.Br.) Copel. (Neal, 1965). Recently, however, the widely planted species in Hawai'i and California was identified as Cyathea cooperi (Hook. ex F.Muell.) Dom.; the similar Cyathea australis is also present in Hawai'i but is limited to botanical gardens and a few private collections (Wilson, 1991)."
304	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Environmental weed? No evidence]
305	1992. Medeiros, A.C./Loope, L.L./Flynn, T./Anderson, S.J./Cuddihy, L.W./Wilson, K.A.. Notes on the status of an invasive Australian tree fern (Cyathea cooperi) in Hawaiian rain forests. American Fern Journal. 82: 27-33.	[Congeneric weed? Yes] "The densest stands of Cyathea in the Kipahulu Valley population were conspicuously lacking in understory species diversity and biomass. This may be due to the thick layer of fibrous roots at the soil surface that surrounds individuals of Cyathea cooperi, extending up to 5 m from a large individual." … "Cyathea cooperi does not support the dense growth of epiphytic native species that typically occupies the trunks of native tree ferns in wet forests. Medeiros et al. (submitted) found more than ten times as many epiphyte individuals growing on trunks of native tree ferns (Cibotium spp.) as on trunks of Cyathea cooperi."
305	2012. Chau, M.M./Walker, L.R./Mehltreter, K.. An invasive tree fern alters soil and plant nutrient dynamics in Hawaii. Biological Inasions. DOI 10.1007/s10530-012-0291-0: .	[Congeneric weed? Yes] "Invasive species that alter ecosystems are often successful competitors due to their effects on nutrient cycling. Sphaeropteris cooperi (Cyatheaceae; Australian tree fern) has been invading intact Hawaiian rainforests for decades and displacing the dominant native tree fern Cibotium glaucum (Cibotiaceae). S. cooperi produces more leaves that grow faster, contain more N and P, and decompose faster than C. glaucum leaves. Our experiment tested the effects of additions of leaf litter from native and non native tree ferns on the growth and nutrient content of four native angiosperm species in forest (N-rich) and landslide (Prich) soils. Both litter treatments inhibited growth initially in all species, but subsequent responses were species-specific. Compared to control treatments, the increase in biomass was highest in the fast growing Carex wahuensis and Hibiscus arnottianus with S. cooperi litter in landslide soil. Leaf N in C. wahuensis was higher with S. cooperi litter and in forest soil, as expected, but other leaf nutrient responses showed some evidence of nutrient immobilization from litter addition. Several growth measures were higher with S. cooperi than C. glaucum litter and in forest than landslide soil, suggesting that N availability is the strongest driver of growth. Our results show that S. cooperi can alter nutrient cycling in Hawaiian plants, sometimes with positive effects on growth. However, under natural conditions, native plants must compete for these additional nutrients with S. cooperi and other invasive species. This study contributes to invasion biology as the first to examine the impact of leaf litter of an invasive fern on native species."
401	1990. Andrews, S.B.. Ferns of Queensland. Queensland Department of Primary Industries, Brisbane	[Produces spines, thorns or burrs? No] "Trunk to 20 m high. Fronds 2-4 m long,. Stipe-bases persistent, rought, with conical spines to 3 mm long and bearing glossy, brown scales 2-5 cm long, 0.5-3.0 mm wide, the latter often with plae fragile edges." ["Spines" are blunt]
402	2012. WRA Specialist. Personal Communication.	[Allelopathic? Unknown]
403	2012. PlantNET. New South Wales flora online - Cyathea australis (R.Br.) Domin. Royal Botanic Gardens & Domain Trust,, Sydney http://plantnet.rbgsyd.nsw.gov.au/cgi-bin/NSWfl.pl?page=nswfl&lvl=sp&name=Cyathea~australis [Accessed 13 Dec 2012]	[Parasitic? No] Cyatheaceae

404	2006. Tasker, E. M./Bradstock, R.A.. Influence of cattle grazing practices on forest understorey structure in north-eastern New South Wales. Austral Ecology. 31: 490-502.	[Unpalatable to grazing animals? Possibly palatable] "Fig. 4. Dominant understorey plant species in grazed and ungrazed sites." [Cyathea australis - More common in ungrazed sites; possibly due to palatability of fern, or to trampling and disturbance]
404	2011. Forsyth, D.M./Davis, N.E.. Diets of Non-Native Deer in Australia Estimated by Macroscopic Versus Microhistological Rumen Analysis. Journal of Wildlife Management. 75(6): 1488-1497.	[Unpalatable to grazing animals? Possibly palatable to deer] "Table 1. Percentage contribution and percent frequency occurrence of plant species in the rumen contents of 102 sambar deer harvested in Victoria, Australia, 2007–2009, estimated by macroscopic and microhistological techniques." [Cyathea australis present in small amounts]
405	2008. Wagstaff, D.J.. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	[Toxic to animals? No evidence]
406	1987. Jones, D. L.. Encyclopedia of Ferns. Timber Press, Portland, OR.	[Host for recognized pests and pathogens?] "Armillariella mellea is an unusual fungus which becomes established in dead stumps or other large pieces of rotting wood." … "Armillaria attacks a very wide range of plants but is particularly severe on trees, and shrubs. In some areas it can also attack large ferns such as Cyathea australis…"
406	2003. Australian National Botanic Gardens. Growing Native Plants - Cyathea australis, Cyathea cooperi. http://www.anbg.gov.au/gnp/interns-2003/cyathea-spp.html [Accessed 13 Dec 2012]	[Host for recognized pests and pathogens?] "Though a wide range of pests attack ferns they rarely cause significant damage. If outbreaks do occur tree-ferns can be treated with the standard array of organic and non organic pesticides. It has been found that the use of fertilizers can reduce a tree-ferns susceptibility to attack. Thus by providing adequate food, water and shelter you will be able to grow beautiful and healthy tree-ferns in your own garden!"
407	2005. Sculthorpe, A.. People and Plants on our land. Government of Tasmania, http://www.dpiw.tas.gov.au/internnsf/Attachments/LJEM-6TE4EN/$FILE/PeopleandPlants.pdf	[Causes allergies or is otherwise toxic to humans? No evidence] "The rough treefern (Cyathea australis) can be harvested and roasted – its thick inner pith was valued as an important food in many areas of Tasmania. The rough tree fern was considered superior eating over the soft treefern variety (Dicksonia antarctica)."
407	2008. Wagstaff, D.J.. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	[Causes allergies or is otherwise toxic to humans? No evidence]
408	2004. Ough, K./Murphy, A.. Decline in tree-fern abundance after clearfell harvesting. Forest Ecology and Management. 199: 153–163.	[Creates a fire hazard in natural ecosystems? No evidence] "In Wet Forests (sensu Woodgate et al., 1994) of the Victorian Central Highlands, south eastern Australia, the tree-fern species Dicksonia antarctica (Soft treefern) and Cyathea australis (Rough tree-fern) are common and widespread. These fire-tolerant species are characteristic of Wet Forest understoreys, often forming a dominant component…"
408	2010. Fairley, A./Moore, P.. Native Plants of the Sydney Region: From Newcastle to Nowra and West to the Dividing Range. Allen & Unwin, Crows Nest, NSW	[Creates a fire hazard in natural ecosystems? No evidence] "Habitat: Forested gullies, moist hillsides."
409	2001. Kirsten, K.. Gardening with Keith Kirsten. Struik Publishers, Cape Town, South Africa	[Is a shade tolerant plant at some stage of its life cycle? Yes] "It grows best in dappled shade, but can tolerate a fair amount of sun or shade."
409	2010. Volkova, L./Bennett, L.T./Merchant, A./Tausz, M.. Shade does not ameliorate drought effects on the tree fern species Dicksonia antarctica and Cyathea australis. Trees. 24: 351–362.	[Is a shade tolerant plant at some stage of its life cycle? Yes] "Observational evidence indicates that both D. antarctica and C. australis can tolerate short periods of drought if some shade is available. Despite infrequent but severe drought events, tree fern abundance increased by 80% in the lower strata of wet sclerophyll forests over 48 years (Ashton 2000)."
409	2012. Learn 2 Grow. Cyathea australis. http://www.learn2grow.com/plants/cyathea-australis/ [Accessed 13 Dec 2012]	[Is a shade tolerant plant at some stage of its life cycle? Yes] "Sun Exposure - Full Sun, Partial Sun, Partial Shade, Full Shade"
410	1987. Jones, D. L.. Encyclopedia of Ferns. Timber Press, Portland, OR.	[Tolerates a wide range of soil conditions? Yes] "A popular, cold-hardy tree fern that has proved to be adaptable to a variety of soils and climates."
410	2012. Learn 2 Grow. Cyathea australis. http://www.learn2grow.com/plants/cyathea-australis/ [Accessed 13 Dec 2012]	[Tolerates a wide range of soil conditions? Yes] "The rough tree fern is well-known and utilized in Australia because of its beauty and better cold hardiness, adaptability to a wider range of soil types, and tolerance of salt spray and drier conditions. " … "Soil pH - Acidic, Neutral, Alkaline; Soil Drainage - Average; Soil type - Clay, Loam, Sand; Tolerances - Wet Site, Salt"
411	2010. Fairley, A./Moore, P.. Native Plants of the Sydney Region: From Newcastle to Nowra and West to the Dividing Range. Allen & Unwin, Crows Nest, NSW	[Climbing or smothering growth habit? No] "Common tree fern with erect trunk 2-6 m tall and 40 cm diam."

412	1992. Garrett, M.. Pteridophytes of Northeastern Tasmania. Tasforests. 4: 57-68.	[Forms dense thickets? No evidence] "Common in sheltered gullies and soaks within dry sclerophyll forest, in wet sclerophyll forest, and margins of callidendrous rainforest. C. australis is not as abundant as Dicksonia, and prefers drier sites with greater exposure to light."
412	2009. Lorimer, G.S.. Vegetation Assessment and Mapping of Hoddles Creek Education Area. Biosphere Pty Ltd, Bayswater North, Vic. http://www.provender.com.au/fohc/hcea2009.pdf	[Forms dense thickets? Possibly] "Cool Temperate Rainforest … Tree Ferns: Dense, with Cyathea australis outnumbering Dicksonia antarctica." … "Riparian Wet Forest … Tree Ferns: Dense, with Cyathea australis outnumbering Dicksonia antarctica" … [Dense, but no evidence that C. australis forms monocultures]
501	2010. Fairley, A./Moore, P.. Native Plants of the Sydney Region: From Newcastle to Nowra and West to the Dividing Range. Allen & Unwin, Crows Nest, NSW	[Aquatic? No] "Forested gullies, moist hillsides."
502	1990. Andrews, S.B.. Ferns of Queensland. Queensland Department of Primary Industries, Brisbane	[Grass? No] Cyatheaceae
503	1990. Andrews, S.B.. Ferns of Queensland. Queensland Department of Primary Industries, Brisbane	[Nitrogen fixing woody plant? No] Cyatheaceae
504	2012. PlantNET. New South Wales flora online - Cyathea australis (R.Br.) Domin. Royal Botanic Gardens & Domain Trust,, Sydney http://plantnet.rbgsyd.nsw.gov.au/cgi-bin/NSWfl.pl?page=nswfl&lvl=sp&name=Cyathea~australis [Accessed 13 Dec 2012]	[Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)? No] "Description: Trunk 2.5–20 m high, 16–40 cm diam., covered, at least in upper part, by the persistent bases of the stipes; scales of trunk and stipe base shiny, red-brown, stiff and often twisted, 2–5 cm long, with inconspicuous pale fragile edges. Fronds 2–3 m long; stipe to 60 cm long, bearing conical spines on the dark brown base; lamina mostly 3-pinnate or sometimes 2 pinnate with secondary pinnae pinnatifid, dark green above, paler green below, ultimate segments shallowly crenate to toothed. "
601	1951. Tindale, M.D.. Notes on Three Australasian Ferns. American Fern Journal. 41(4): 97-106.	[Evidence of substantial reproductive failure in native habitat? No] "Cyathea australis is a fairly common species in eastern Australia; it occurs in southern Queensland, New South Wales, Victoria, and Tasmania. In herbaria it is frequently misidentified as C. Cooperi (Hook. ex F. Muell.) Domin, but the latter is easily distinguished by the dendriform scales on the costae."
601	2004. Ough, K./Murphy, A.. Decline in tree-fern abundance after clearfell harvesting. Forest Ecology and Management. 199: 153–163.	[Evidence of substantial reproductive failure in native habitat? No. Common and widespread] "In Wet Forests (sensu Woodgate et al., 1994) of the Victorian Central Highlands, south-eastern Australia, the tree-fern species Dicksonia antarctica (Soft treefern) and Cyathea australis (Rough tree-fern) are common and widespread."
601	2012. Australian Native Plant Society. Cyathea australis. http://anpsa.org.au/c-aus.html [Accessed 13 Dec 2012]	[Evidence of substantial reproductive failure in native habitat? No] "Not considered to be at risk in the wild." … "Cyathea australis is probably the most common tree fern encountered, as it occurs widely from coastal areas to the mountains."
602	2012. PlantNET. New South Wales flora online - Cyathea australis (R.Br.) Domin. Royal Botanic Gardens & Domain Trust,, Sydney http://plantnet.rbgsyd.nsw.gov.au/cgi-bin/NSWfl.pl?page=nswfl&lvl=sp&name=Cyathea~australis [Accessed 13 Dec 2012]	[Produces viable seed? Yes. Spores] "Propagation is carried out from spores (see "Australian Plants online" March 1999 issue for simple propagation methods)."
603	1992. Garrett, M.. Pteridophytes of Northeastern Tasmania. Tasforests. 4: 57-68.	[Hybridizes naturally? Yes] "Cyathea marcescens Only recently recorded for Tasmania, this giant tree-fern is infertile, and almost certainly a hybrid between C. australis and C. cunninghamii."
603	1999. Keith, D.A./Miles, J./Mackenzie, B.D.E.. Vascular Flora of the South East Forests region, Eden, New South Wales. Cunninghamia. 6(1): 219-281.	[Hybridizes naturally? Possibly Yes] "Table 2: Pairs of taxa for which intermediate forms have been recorded in the South East Forests region." … "Cyathea australis × C. leichhardtiana (C. × marcescens)"
603	2005. Roberts, N.R./Dalton, P.J./Jordan, G.J.. Epiphytic ferns and bryophytes of Tasmanian tree-ferns: A comparison of diversity and composition between two host species. Austral Ecology. 30: 146–154.	[Hybridizes naturally? Possibly] "Two other species of tree-fern occur in Tasmania, C. australis and Todea barbara, as well as a putative hybrid between C. australis and C. cunninghamii (C. X marcescens) (McCarthy & Orchard 1998)."
603	2011. Forest Practices Authority. Flora Technical Note No. 5: Identification and management of treeferns. http://www.fpa.tas.gov.au/__data/assets/pdf_file/0020/58052/Flora_Tech_Note_05_Treefern_identification_and_management.pdf	[Hybridizes naturally? Yes] "Cyathea x marcescens is a natural hybrid between C. cunninghamii and C. australis."

604	2012. WRA Specialist. Personal Communication.	[Self-compatible or apomictic? Unknown]
605	2012. WRA Specialist. Personal Communication.	[Requires specialist pollinators? No] A pteridophyte - no flowers present
606	2003. Australian National Botanic Gardens. Growing Native Plants - Cyathea australis, Cyathea cooperi. http://www.anbg.gov.au/gnp/interns-2003/cyathea-spp.html [Accessed 13 Dec 2012]	[Reproduction by vegetative fragmentation? No] "These two species cannot be propagated vegetatively (unlike some other tree-ferns) as they do not produce offsets from the trunk or roots. Propagation from spores must therefore be employed…"
607	2004. Ough, K./Murphy, A.. Decline in tree-fern abundance after clearfell harvesting. Forest Ecology and Management. 199: 153–163.	[Minimum generative time (years)?] "Life spans of several centuries appear to be common for these slow growing plants (Cremer and Mount, 1965; Mueck et al., 1996; Ashton and Bassett, 1997), and a variety of epiphytes often inhabit the trunks of the taller tree-ferns (Ough and Ross, 1992; Chesterfield, 1996; Ough and Murphy, 1996; Ashton and Chinner, 1999; Ashton, 2000)."
607	2011. Anonymous. Koonwarra Gravel Pit Reserve, Koonwarra Fire management plan. obliqua pty ltd, Mallacoota, VIC, Australia	[Minimum generative time (years)? 20+] "Appendix 2: Main Flora Key Fire Response Species - Koonwarra Gravel Pit Reserve" [Cyathea australis - Time to reproduction = 20 years]
701	2010. Fairley, A./Moore, P.. Native Plants of the Sydney Region: From Newcastle to Nowra and West to the Dividing Range. Allen & Unwin, Crows Nest, NSW	[Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)? No evidence] "Forested gullies, moist hillsides." [Unlikely, as fern prefers moist habitats]
702	2003. Kirsten, K.. Down to Earth: Garden Plants & Flowers. Struik Publishers, Cape Town, South Afrca	[Propagules dispersed intentionally by people? Yes] "It makes a dramatic form plant and is also ideal for large shady areas."
703	2012. WRA Specialist. Personal Communication.	[Propagules likely to disperse as a produce contaminant? No evidence, but possibly if ferns are cultivated in nurseries or other settings which could promote the production of sporophytes in other potted plants receiving water]
704	2010. Gordon, D.R./Mitterdorfer, B./Pheloung, P.C. et al.. Guidance for addressing the Australian Weed Risk Assessment questions. Plant Protection Quarterly. 25(2): 56-74.	[Propagules adapted to wind dispersal? Yes] "This group includes tumbling plants and fern spores."
705	2009. Lorimer, G.S.. Vegetation Assessment and Mapping of Hoddles Creek Education Area. Biosphere Pty Ltd, Bayswater North, Vic. http://www.provender.com.au/fohc/hcea2009.pdf	[Propagules water dispersed? Probably Yes] "Riparian Wet Forest … Tree Ferns: Dense, with Cyathea australis outnumbering Dicksonia antarctica" [Common in wet & riparian areas]
706	2012. WRA Specialist. Personal Communication.	[Propagules bird dispersed? Possible, but unlikely] Although spores may potentially adhere to bird feet or feathers, the primary vector of dispersal is wind (& probably water)
707	2012. WRA Specialist. Personal Communication.	[Propagules dispersed by other animals (externally)? Possibly, but unlikely] Although spores may potentially adhere to animal fur or feet, the primary vector of dispersal is wind (& probably water)
708	2012. WRA Specialist. Personal Communication.	[Propagules survive passage through the gut? Unknown]
801	2010. Gordon, D.R./Mitterdorfer, B./Pheloung, P.C. et al.. Guidance for addressing the Australian Weed Risk Assessment questions. Plant Protection Quarterly. 25(2): 56-74.	[Prolific seed production (>1000/m2)? Yes] "Assume 'yes' for fern taxa unless contradictory evidence exists."
801	2012. PlantNET. New South Wales flora online - Cyathea australis (R.Br.) Domin. Royal Botanic Gardens & Domain Trust,, Sydney http://plantnet.rbgsyd.nsw.gov.au/cgi-bin/NSWfl.pl?page=nswfl&lvl=sp&name=Cyathea~australis [Accessed 13 Dec 2012]	[Prolific seed production (>1000/m2)? Yes. Spores] "Sori lacking a true indusium but base of sorus often bears a semicircular series of small scales."
802	1987. Jones, D. L.. Encyclopedia of Ferns. Timber Press, Portland, OR.	[Evidence that a persistent propagule bank is formed (>1 yr)? Unknown in natural conditions] "The author knows of many instances of tree ferns such as Cyathea australis and Dicksonia antarctica retaining viability for 10-15 years…"
802	2008. Penman, T.D./Binns, D./Allen, R./Shiels, R./Plummer, S.. Germination responses of a dry sclerophyll forest soil-stored seedbank to fire related cues. Cunninghamia. 10(4): 547-555.	[Evidence that a persistent propagule bank is formed (>1 yr)? Unknown. Not present in soil seedbank] "Appendix 1: All understorey species recorded within the Eden Burning Study Area, highlighting those that have been recorded in the soil seedbank study." [Cyathea australis - Seed bank = No]
803	2012. WRA Specialist. Personal Communication.	[Well controlled by herbicides? Unknown] No information on herbicide efficacy or chemical control of this species.

804	2001. Ough, K.. Regeneration of Wet Forest flora a decade after clear-felling or wildfire—is there a difference?. Australian Journal of Botany. 49(5): 645–664.	[Tolerates, or benefits from, mutilation, cultivation, or fire? Yes. Resprouts after fires] "Several taxa that normally rely on resprouting to regenerate after wildfire were significantly less abundant at clear felled sites, including the tree ferns Cyathea australis (rough tree fern) and Dicksonia antarctica (soft tree fern),…"
804	2004. Ough, K./Murphy, A.. Decline in tree-fern abundance after clearfell harvesting. Forest Ecology and Management. 199: 153–163.	[Tolerates, or benefits from, mutilation, cultivation, or fire? Yes. Fire-tolerant] "These fire-tolerant species are characteristic of Wet Forest understoreys, often forming a dominant component (Ough and Ross, 1992; Ashton and Attiwill, 1994;Walsh and Entwisle, 1994; Ough and Murphy, 1996)."
804	2012. Australian Native Plant Society. Cyathea australis. http://anpsa.org.au/c-aus.html [Accessed 13 Dec 2012]	[Tolerates, or benefits from, mutilation, cultivation, or fire? Not cutting] "Note: Large tree ferns are often sold by nurseries as trunks sawn off at the base. These are Dicksonia antarctica and they quickly form roots from the base when planted. Cyathea australis cannot be treated in the same way and will not grow from sawn off sections."
805	2012. WRA Specialist. Personal Communication.	[Effective natural enemies present locally (e.g. introduced biocontrol agents) Unknown]

Summary of Risk Traits

High Risk / Undesirable Traits

- Thrives in subtropical climates
- Extremely hardy and environmentally versatile
- Other Cyathea species (e.g. C. cooperi) have become invasive
- Shade tolerant
- Tolerates many soil conditions (and potentially able to exploit many different habitat types)
- Hybridizes with other Cyathea species
- Numerous spores dispersed by wind and water and ferns intentionally planted by people
- Tolerates fires

Low Risk / Desirable Traits

- No reports of naturalization or invasiveness to date
- Non-toxic
- Landscaping and ornamental value
- Long time to reproductive maturity (up to 20 years)