

Family: *Malvaceae*

Taxon: *Lagunaria patersonia*

Synonym: *Hibiscus patersonius* Andrews
Lagunaria patersonia var. *bracteata* Benth.
Lagunaria queenslandica Craven

Common Name: cowitchtree
Norfolk Island-hibiscus
Norfolk-hibiscus
pyramid-tree
sallywood
white-oak
whitewood

Questionnaire :	current 20090513	Assessor:	Patti Clifford	Designation:	H(HPWRA)
Status:	Assessor Approved	Data Entry Person:	Patti Clifford	WRA Score	7
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	y
302	Garden/amenity/disturbance weed			n=0, y = 1*multiplier (see Appendix 2)	
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)	y
305	Congeneric weed			n=0, y = 1*multiplier (see Appendix 2)	n
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	n
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	y
408	Creates a fire hazard in natural ecosystems			y=1, n=0	

409	Is a shade tolerant plant at some stage of its life cycle	y=1, n=0	n
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	
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	
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	y
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	n
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	
802	Evidence that a persistent propagule bank is formed (>1 yr)	y=1, n=-1	y
803	Well controlled by herbicides	y=-1, n=1	
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y=1, n=-1	
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	y=-1, n=1	

Designation: H(HPWRA)

WRA Score 7

Supporting Data:

101	2010. WRA Specialist. Personal Communication.	No evidence of domestication.
201	2010. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: http://www.ars-grin.gov/cgi-bin/npgs/html/genus.pl?1738	Native range: Australia - Lord Howe Island, Queensland [e.]; Norfolk Island
202	2010. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: http://www.ars-grin.gov/cgi-bin/npgs/html/genus.pl?1738	Native range: Australia - Lord Howe Island, Queensland [e.]; Norfolk Island
203	1982. Mitchel, A.S.. Economic aspects of the Malvaceae in Australia. <i>Economic Botany</i> . 36: 313-322.	<i>Lagunaria patersonii</i> is widely cultivated throughout Australia as an outstanding garden specimen, and is able to withstand a wide range of climatic conditions.
203	1998. Mueller-Dombois, D./Fosberg, F. R.. <i>Vegetation of the tropical Pacific islands</i> . Springer-Verlag, New York	"On Lord Howe Island, <i>Lagunaria patersonia</i> forms pure stands restricted to the coast on well-drained soil as well as swampy ground. On Norfolk Island <i>L. patersonia</i> has a broad, islandwide distribution, and there is the second most important canopy tree after <i>Araucaria</i> . <i>Lagunaria</i> on Norfolk Island seems to demonstrate ecological release from interspecific competition, a phenomenon also observed in other isolated islands with disharmonious floras."
204	2003. Hinsley, S.R.. The <i>Lagunaria</i> page. www.malvaceae.info , http://www.malvaceae.info/Genera/Lagunaria/Lagunaria.html	<i>Lagunaria patersonia</i> is in cultivation as an ornamental in many warm temperate and moist subtropical climates, including New South Wales, Victoria and Swanland in Australia, and South Africa, northern New Zealand, Florida, California and Hawaii. It has naturalised in a number of these areas. Subspecies <i>patersonia</i> is the showier plant, and is more frequently represented amongst naturalised populations.
205	2003. Hinsley, S.R.. The <i>Lagunaria</i> page. www.malvaceae.info , http://www.malvaceae.info/Genera/Lagunaria/Lagunaria.html	It is widely cultivated as an ornamental and amenity tree in warm temperate and moist subtropical regions. <i>Lagunaria patersonia</i> is in cultivation as an ornamental in many warm temperate and moist subtropical climates, including New South Wales, Victoria and Swanland in Australia, and South Africa, northern New Zealand, Florida, California and Hawaii. It has naturalised in a number of these areas. Subspecies <i>patersonia</i> is the showier plant, and is more frequently represented amongst naturalised populations.
301	2003. Hinsley, S.R.. The <i>Lagunaria</i> page. www.malvaceae.info , http://www.malvaceae.info/Genera/Lagunaria/Lagunaria.html	<i>Lagunaria patersonia</i> is in cultivation as an ornamental in many warm temperate and moist subtropical climates, including New South Wales, Victoria and Swanland in Australia, and South Africa, northern New Zealand, Florida, California and Hawaii. It has naturalised in a number of these areas. Subspecies <i>patersonia</i> is the showier plant, and is more frequently represented amongst naturalised populations.
302	1998-. Western Australian Herbarium. FloraBase — The Western Australian Flora - <i>Lagunaria patersonia</i> (Andrews) G.Don. Department of Environment and Conservation, http://florabase.dec.wa.gov.au/	History of use/introduction. Garden escape, inappropriate coastal plantings. [Suggested method of management and control. Hand pull seedlings. Fell mature plants or stem inject with 50% glyphosate, or if stems are less than 30 cm diameter apply 250 ml Access® in 15 L of diesel to basal 50 cm of trunk (basal bark).]
303	2007. Randall, R.P.. Global Compendium of Weeds [Online Database]. http://www.hear.org/gcw/	No evidence.
304	2010. Auckland Regional Council. Pest plant Norfolk Island hibiscus. Auckland Regional Council, http://www.arc.govt.nz/environment/biosecurity/search-for-plants/index.cfm?63E0F20E-14C2-3D2D-B905-50098EBBE4B9&plantcode=Lagpat	Considered a surveillance pest plant by the Auckland Regional Council's biosecurity program. Surveillance Pest Plants These plants are prohibited from sale, propagation and distribution to prevent their establishment or spread. The ARC will ensure these species are not offered for sale by undertaking regular checks of retailers and growers. The ARC offers advice on control of these species and funds research into biological control options. Environmental impact: fast growing and once established wind, salt and drought tolerant. Out competes coastal species.
304	2010. Dave's Garden. PlantFiles: Norfolk Island Hibiscus, Cow Itch Tree, Pyramid Tree, Queensland Pyramid Tree <i>Lagunaria patersonii</i> . http://davesgarden.com/guides/pf/go/54275/	"It seeds easily and competes with native vegetation eventually dominating and taking over as the seedlings, if left to grow forms thickets" [comment from one of the growers]

305	2003. Hinsley, S.R.. The <i>Lagunaria</i> page. www.malvaceae.info , http://www.malvaceae.info/Genera/Lagunaria/Lagunaria.html	Monotypic genus. This species is divided into two subspecies, <i>patersonia</i> from Norfolk Island and Lord Howe Island, and <i>bracteata</i> from Queensland.
401	1998-. Western Australian Herbarium. FloraBase — The Western Australian Flora - <i>Lagunaria patersonia</i> (Andrews) G.Don. Department of Environment and Conservation, http://florabase.dec.wa.gov.au/	No spines, thorns, burrs.
402	2010. WRA Specialist. Personal Communication.	Unknown
403	1998-. Western Australian Herbarium. FloraBase — The Western Australian Flora - <i>Lagunaria patersonia</i> (Andrews) G.Don. Department of Environment and Conservation, http://florabase.dec.wa.gov.au/	Not parasitic.
404	2008. World Wildlife Fund. Norfolk Island subtropical forests. The Encyclopedia of Earth, http://www.eoearth.org/article/Norfolk_Island_subtropical_forests	"Land clearance and introduced species have devastated the flora and fauna of the Norfolk islands. The forests have been logged and cleared for pasture and while some Norfolk Island pines and <i>Lagunaria patersonia</i> trees persist in the pastures, there is no regeneration due to grazing pressure.
405	2010. National Center for Biotechnology Information. PubMed. U.S. National Library of Medicine, Bethesda, Maryland http://www.ncbi.nlm.nih.gov/sites/entrez	No evidence of toxicity to animals. [widespread street tree]
405	2010. Specialized Information Services, U.S. National Library of Medicine. TOXNET Toxicology Data Network [Online Database]. National Institutes of Health, http://toxnet.nlm.nih.gov/	No evidence of toxicity to animals.
406	2003. Hinsley, S.R.. The <i>Lagunaria</i> page. www.malvaceae.info , http://www.malvaceae.info/Genera/Lagunaria/Lagunaria.html	A fungal pathogen of <i>Hoheria</i> and <i>Plagianthus</i> (<i>Nectria hoheriae</i>) has jumped to <i>Lagunaria</i> in New Zealand, specifically in the Nelson and Wellington areas, at the southern fringe of the region of New Zealand in which <i>Lagunaria</i> is hardy. Also in New Zealand, <i>Lagunaria</i> is attacked by olive scale or black scale (<i>Saissetia oleae</i>).
406	2010. WRA Specialist. Personal Communication.	Unknown.
407	1982. Mitchel, A.S.. Economic aspects of the Malvaceae in Australia. <i>Economic Botany</i> . 36: 313-322.	<i>Lagunaria patersonii</i> has been used by the aborigines as a fiber source.
407	2003. Hinsley, S.R.. The <i>Lagunaria</i> page. www.malvaceae.info , http://www.malvaceae.info/Genera/Lagunaria/Lagunaria.html	The hairs within the seed pods cause skin irritation.
407	2010. Dave's Garden. PlantFiles: Norfolk Island Hibiscus, Cow Itch Tree, Pyramid Tree, Queensland Pyramid Tree <i>Lagunaria patersonii</i> . http://davesgarden.com/guides/pf/go/54275/	"Seed is poisonous if ingested. Handling plant may cause skin irritation or allergic reaction."
408	2008. Radford, I.J./Grice, A.C./Abbott, B.N./Nicholas, D.M./Whiteman, L.. Impacts of changed fire regimes on tropical riparian vegetation invaded by an exotic vine. <i>Austral Ecology</i> . 33: 151-167.	Fire resistant species.
408	2010. WRA Specialist. Personal Communication.	Unknown.
409	2010. The Garden Guide. The garden guide Norfolk Island hibiscus - <i>Lagunaria patersonia</i> . The Garden Guide, http://www.gardenguide.com.au/d115/norfolk-island-hibiscus-lagunaria-patersonia	Full sun.
409	2010. WRA Specialist. Personal Communication.	Full sun.

410	2010. Gardening EU. Cow itch tree <i>Lagunaria patersonii</i> Malvaceae. Gardening EU, http://www.gardening.eu/plants/Masts/Lagunaria-patersonii/3444/stamp_a.asp	These trees need a dissolved soil with optimum drainage.
410	2010. Plant this. <i>Lagunaria patersonia</i> Norfolk Island hibiscus, sallywood Malvaceae-Malvoideae. Plant This, http://www.plantthis.com/plant-information.asp?gardener=17229&tabview=features&plantSpot=5	Soil: ordinary soil, sand, acidic to alkaline
410	2010. WRA Specialist. Personal Communication.	Unknown.
411	1998-. Western Australian Herbarium. FloraBase — The Western Australian Flora - <i>Lagunaria patersonia</i> (Andrews) G.Don. Department of Environment and Conservation, http://florabase.dec.wa.gov.au/	Trees up to 20 m high.
412	2010. Dave's Garden. PlantFiles: Norfolk Island Hibiscus, Cow Itch Tree, Pyramid Tree, Queensland Pyramid Tree <i>Lagunaria patersonii</i> . http://davesgarden.com/guides/pf/go/54275/	Forms dense thickets. [comment from a gardener]
412	2010. WRA Specialist. Personal Communication.	Unknown.
501	1998-. Western Australian Herbarium. FloraBase — The Western Australian Flora - <i>Lagunaria patersonia</i> (Andrews) G.Don. Department of Environment and Conservation, http://florabase.dec.wa.gov.au/	Terrestrial
502	1998-. Western Australian Herbarium. FloraBase — The Western Australian Flora - <i>Lagunaria patersonia</i> (Andrews) G.Don. Department of Environment and Conservation, http://florabase.dec.wa.gov.au/	Malvaceae
503	2010. www.nationmaster.com. Encyclopedia Nitrogen fixation. Nationmaster.com, http://www.nationmaster.com/encyclopedia/Nitrogen-fixation	Not a nitrogen-fixer.
504	1998-. Western Australian Herbarium. FloraBase — The Western Australian Flora - <i>Lagunaria patersonia</i> (Andrews) G.Don. Department of Environment and Conservation, http://florabase.dec.wa.gov.au/	Tree
601	2010. WRA Specialist. Personal Communication.	No evidence.
602	2003. Hinsley, S.R.. The <i>Lagunaria</i> page. www.malvaceae.info , http://www.malvaceae.info/Genera/Lagunaria/Lagunaria.html	<i>Lagunaria patersonia</i> can be grown from seed. It is also said that it may be propagated by means of semiripe cuttings in summer.
603	2010. WRA Specialist. Personal Communication.	Unknown.
604	2010. WRA Specialist. Personal Communication.	Unknown.
605	1992. Watson, L./Dallwitz, M.J.. The families of flowering plants: descriptions, illustrations, identification, and information retrieval. Version 20th May 2010. http://delta-intkey.com/angio/www/malvacea.htm	Pollination entomophilous [family level description]

606	1998-. Western Australian Herbarium. FloraBase — The Western Australian Flora - Lagunaria patersonia (Andrews) G.Don. Department of Environment and Conservation, http://florabase.dec.wa.gov.au/	Vegetative regeneration strategy. Does not resprout or produce root suckers.
607	1998-. Western Australian Herbarium. FloraBase — The Western Australian Flora - Lagunaria patersonia (Andrews) G.Don. Department of Environment and Conservation, http://florabase.dec.wa.gov.au/	Time to first flowering. 4 years.
701	1998-. Western Australian Herbarium. FloraBase — The Western Australian Flora - Lagunaria patersonia (Andrews) G.Don. Department of Environment and Conservation, http://florabase.dec.wa.gov.au/	Dispersed through garden waste.
701	2003. Hinsley, S.R.. The Lagunaria page. www.malvaceae.info , http://www.malvaceae.info/Genera/Lagunaria/Lagunaria.html	In Australia it is cultivated in Queensland, New South Wales, Victoria, Tasmania, South Australia and Swanland. It is in disfavor in several regions as an amenity tree, both because of the nuisance value of the seed pod hairs, and because of it naturalising and competing with native vegetation. Elsewhere it is cultivated as a street or park tree in California, Florida and Hawaii in the United States, in South Africa, in northern New Zealand, and in southern Europe.
702	1982. Mitchel, A.S.. Economic aspects of the Malvaceae in Australia. Economic Botany. 36: 313-322.	Lagunaria patersonii is widely cultivated throughout Australia as an outstanding garden specimen, and is able to withstand a wide range of climatic conditions.
703	2010. WRA Specialist. Personal Communication.	No evidence of produce contamination.
704	1998-. Western Australian Herbarium. FloraBase — The Western Australian Flora - Lagunaria patersonia (Andrews) G.Don. Department of Environment and Conservation, http://florabase.dec.wa.gov.au/	Dehiscent, a capsule, non-fleshy, 30–40 mm long, about 25 mm wide (pentagonal).
705	1998-. Western Australian Herbarium. FloraBase — The Western Australian Flora - Lagunaria patersonia (Andrews) G.Don. Department of Environment and Conservation, http://florabase.dec.wa.gov.au/	Water dispersal; capsule, dehiscent.
706	1998-. Western Australian Herbarium. FloraBase — The Western Australian Flora - Lagunaria patersonia (Andrews) G.Don. Department of Environment and Conservation, http://florabase.dec.wa.gov.au/	Dehiscent, a capsule, non-fleshy, 30–40 mm long, about 25 mm wide (pentagonal).
707	1998-. Western Australian Herbarium. FloraBase — The Western Australian Flora - Lagunaria patersonia (Andrews) G.Don. Department of Environment and Conservation, http://florabase.dec.wa.gov.au/	Dehiscent, a capsule, non-fleshy, 30–40 mm long, about 25 mm wide (pentagonal). [no means of attachment]
708	2010. WRA Specialist. Personal Communication.	Unknown.
801	2010. The Garden Guide. The garden guide Norfolk Island hibiscus - Lagunaria patersonia. The Garden Guide, http://www.gardenguide.com.au/d115/norfolk-island-hibiscus-lagunaria-patersonia	"The seed pods can create a mess under the tree when they drop, as there are masses of them."
801	2010. WRA Specialist. Personal Communication.	Unknown.
802	1998-. Western Australian Herbarium. FloraBase — The Western Australian Flora - Lagunaria patersonia (Andrews) G.Don. Department of Environment and Conservation, http://florabase.dec.wa.gov.au/	Seedbank persistence. Medium, 1-5 years.

803	1998-. Western Australian Herbarium. FloraBase — The Western Australian Flora - <i>Lagunaria patersonia</i> (Andrews) G.Don. Department of Environment and Conservation, http://florabase.dec.wa.gov.au/	"Suggested method of management and control. Hand pull seedlings. Fell mature plants or stem inject with 50% glyphosate, or if stems are less than 30 cm diameter apply 250 ml Access® in 15 L of diesel to basal 50 cm of trunk (basal bark). Read the manufacturers' labels and material safety data sheets before using herbicides. For further information consult the Australian Pesticides and Veterinary Medicines Authority to determine the status of permits for your situation or state."
803	2010. WRA Specialist. Personal Communication.	Unknown.
804	1998-. Western Australian Herbarium. FloraBase — The Western Australian Flora - <i>Lagunaria patersonia</i> (Andrews) G.Don. Department of Environment and Conservation, http://florabase.dec.wa.gov.au/	Vegetative regeneration strategy. Does not resprout or produce root suckers.
804	2008. Radford, I.J./Grice, A.C./Abbott, B.N./Nicholas, D.M./Whiteman, L.. Impacts of changed fire regimes on tropical riparian vegetation invaded by an exotic vine. <i>Austral Ecology</i> . 33: 151-167.	Fire resistant species.
805	2010. WRA Specialist. Personal Communication.	Unknown.