Taxon: Cordyline australis (G. Forst.) Endl. **Family:** Asparagaceae

Common Name(s): cabbage palm
cabbagetree
fountain dracaena
giant dracaena
grass palm
New Zealand cabbagetree
palm lily

Synonym(s): Dracaena australis G. Forst.

Assessor: Chuck Chimera **Status:** Assessor Approved **End Date:** 5 Apr 2017

WRA Score: 5.0 **Designation:** EVALUATE **Rating:** Evaluate

Keywords: Temperate Tree, Naturalized, Edible, Bird-Dispersed, Suckers

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)	Low
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	n
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		
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	y=1, n=-1	n
405	Toxic to animals	y=1, n=0	n

Qsn #	Question	Answer Option	Answer
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		
409	Is a shade tolerant plant at some stage of its life cycle		
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		
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	n
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation	y=1, n=-1	y
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	y
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
708	Propagules survive passage through the gut	y=1, n=-1	y
801	Prolific seed production (>1000/m2)	y=1, n=-1	n
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	y
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)		

Supporting Data:

Qsn #	Question	Answer
101	**Is the species highly domesticated?**	**n**
	Source(s)	**Notes**
	Dawson, M. 2014. On distant shores: New Zealand's natives as weeds abroad. New Zealand Garden Journal 17 (1): 10-24	[Assessment of wild type. Cultivars may possess traits that reduce weediness] "They are hardy and tolerant of a wide range of conditions, and can be grown in containers or out in the open to provide a palm-like tropical effect in temperate regions of the world. More than 30 cultivars have been named, including those with purple or red coloured leaves and green, cream, or yellow striped variegation."

102	**Has the species become naturalized where grown?**	
	Source(s)	**Notes**
	WRA Specialist. 2017. Personal Communication	NA

103	**Does the species have weedy races?**	
	Source(s)	**Notes**
	WRA Specialist. 2017. 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"**	**Low**
	Source(s)	**Notes**
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 5 Apr 2017]	Native: Australasia New Zealand: New Zealand

202	**Quality of climate match data**	**High**
	Source(s)	**Notes**
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 5 Apr 2017]	

203	**Broad climate suitability (environmental versatility)**	**y**
	Source(s)	**Notes**

Qsn #	Question	Answer
	Beever, R. E., Houliston, G. J., & Armstrong, T. T. J. (2013). Geographic patterns of genetic variation in Cordyline australis; does fingerprinting recover phenotypic and phenological patterns?. New Zealand Journal of Botany, 51(1), 3-12	"Cordyline australis (G.Forst.) Endl. (tı kouka; Asparagaceae) is a widespread monocot tree endemic to New Zealand." ... "It is found in a wide range of habitats in New Zealand, including forest margins, swampland, coastal cliffs and even tussock grasslands (Moore & Edgar 1970; Esler 1974)." ... "Cordyline australis covers a wide altitudinal and latitudinal range, and due to this it has been the subject of earlier studies looking at adaptation to different temperature regimes (Harris et al. 1998, 2001; Harris & Beever 2000)."
	Dawson, M. 2014. On distant shores: New Zealand's natives as weeds abroad. New Zealand Garden Journal 17 (1): 10-24	"They are hardy and tolerant of a wide range of conditions, and can be grown in containers or out in the open to provide a palm-like tropical effect in temperate regions of the world. More than 30 cultivars have been named, including those with purple or red coloured leaves and green, cream, or yellow striped variegation."

204	Native or naturalized in regions with tropical or subtropical climates	n
	Source(s)	**Notes**
	Useful Temperate Plants. 2017. Cordyline australis. http://temperate.theferns.info/plant/Cordyline+australis. [Accessed 5 Apr 2017]	"A very wind hardy plant, tolerating maritime exposure[49 , 166]. A very ornamental plant[1], it is not very cold-hardy, tolerating short-lived lows down to about -10°c[260]. It only succeeds outdoors in the milder areas of Britain[1, 11, 59]. It grows very well in Cornwall where it often self-sows[1, 11, 59]. A form with purplish leaves is hardier than the type and succeeds outdoors in Gloucestershire [11].The flowers have a delicious sweet scent that pervades the air tc a considerable distance[245]."
	Korner, C. 1999. Alpine Plant Life. Functional Plant Ecology of High Mountain Ecosystems. Springer-Verlag, Berlin Heidelberg	"Giant rosette are not restricted to tropical alpine floras, but also occur in warm temperate and subtropical semi-deserts (species of Yucca, Xanthorrea, Aloe, Dracena, Aeonium), in the lowland and montane humid tropics (Arecaceae and Pandanaceae) and in temperate climates ,(Cordyline australis and tree ferns)."
	Dawson, M. 2014. On distant shores: New Zealand's natives as weeds abroad. New Zealand Garden Journal 17 (1): 10-24	"The iconic cabbage tree is one of the most widely cultivated New Zealand plants in Europe, Britain and the USA. They are hardy and tolerant of a wide range of conditions, and can be grown in containers or out in the open to provide a palm-like tropical effect in temperate regions of the world."

205	Does the species have a history of repeated introductions outside its natural range?	y
	Source(s)	**Notes**
	Dawson, M. 2014. On distant shores: New Zealand's natives as weeds abroad. New Zealand Garden Journal 17 (1): 10-24	"The iconic cabbage tree is one of the most widely cultivated New Zealand plants in Europe, Britain and the USA."

301	Naturalized beyond native range	y
	Source(s)	**Notes**

Qsn #	Question	Answer
	Dawson, M. 2014. On distant shores: New Zealand's natives as weeds abroad. New Zealand Garden Journal 17 (1): 10-24	"Despite being so widely grown, there are relatively few places in the world where cabbage trees have become weedy. In Australia, C. australis has naturalised in southern Victoria, south-eastern South Australia, and has sparingly naturalised in New South Wales. It has also naturalised at Salt Point State Park in Northern California where the California Exotic Pest Plant Council listed it as a "wildland weed of secondary importance.""
	Queensland Government. (2017). Weeds of Australia. Cordyline australis. http://keyserver.lucidcentral.org. [Accessed 5 Apr 2017]	"Naturalised in some parts of south-eastern Australia (i.e. naturalised in southern Victoria and south-eastern South Australia and sparingly naturalised in New South Wales)."
	Harris, G. (2002). Our native plant invaders. New Zealand Garden Journal, 5, 6-8	"Ti kouka or New Zealand cabbage tree (Cordyline australis) has infested Salt Point State Park in Northern California where its growth is encouraged by the cool foggy coastal conditions. It is listed by the California Exotic Pest Plant Council as a -"wildland weed of secondary importance." The council is keeping the plants under close observation because of the potential for the seeds to be distributed more widely by birds."

302	Garden/amenity/disturbance weed	y
	Source(s)	**Notes**
	Queensland Government. (2017). Weeds of Australia. Cordyline australis. http://keyserver.lucidcentral.org. [Accessed 5 Apr 2017]	[A potential environmental weed] "This species is regarded as an emerging environmental weed in Victoria. It has become naturalised in conservation areas, including in rainforest near Mallacoota in south-eastern Victoria."
	California Invasive Pest Council. 2017. Cordyline australis (giant dracaena, New Zealand cabbage tree). http://www.cal-ipc.org/ip/management/plant_profiles/Cordyline_australis.php. [Accessed]	[A weed of minor significance] "Cordyline australis (New Zealand cabbage tree) is a small tree-like plant (family Liliaceae) whose known distribution in California is limited to two infestations in coniferous forests of Salt Point State Park in Sonoma County and Redwood National Park in Humboldt County. New Zealand cabbage tree grows in moist, cool climates in the forest understory. It was originally brought to California for use as a landscape ornamental, but is has escaped to invade both disturbed areas and undisturbed wildlands. The tree's seeds are contained in blue or bluish white berries that are distributed by birds. The two known infestations are spreading, but the species does not appear to be aggressively invasive. "

303	Agricultural/forestry/horticultural weed	
	Source(s)	**Notes**
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Cordyline australis ... Weed of: Pastures" [Possibly]

304	Environmental weed	
	Source(s)	**Notes**

Qsn #	Question	Answer
	California Invasive Pest Council. 2017. Cordyline australis (giant dracaena, New Zealand cabbage tree). http://www.cal-ipc.org/ip/management/plant_profiles/Cordyline_australis.php. [Accessed 5 Apr 2017]	"Cordyline australis (New Zealand cabbage tree) is a small tree-like plant (family Liliaceae) whose known distribution in California is limited to two infestations in coniferous forests of Salt Point State Park in Sonoma County and Redwood National Park in Humboldt County. New Zealand cabbage tree grows in moist, cool climates in the forest understory. It was originally brought to California for use as a landscape ornamental, but is has escaped to invade both disturbed areas and undisturbed wildlands. The tree's seeds are contained in blue or bluish white berries that are distributed by birds. The two known infestations are spreading, but the species does not appear to be aggressively invasive. "
	Queensland Government. (2017). Weeds of Australia. Cordyline australis. http://keyserver.lucidcentral.org. [Accessed 5 Apr 2017]	[Impacts unspecified] "This species is regarded as an emerging environmental weed in Victoria. It has become naturalised in conservation areas, including in rainforest near Mallacoota in south-eastern Victoria."

305	Congeneric weed	
	Source(s)	**Notes**
	CABI, 2017. Invasive Species Compendium. Wallingford , UK: CAB International. www.cabi.org/isc	"C. fruticosa is an evergreen flowering plant that has become essentially pantropical. It is widespread in the Pacific Islands, Australia and tropical Asia (Little and Skolmen, 2003). Usually it is closely associated with settlements and occurs in gardens and hedges, but sometimes it has become naturalized in wild areas, spreading by seed and cuttings of stems or rhizomes. It is a common houseplant and this leads to dispersal in warm temperate areas when discarded. There are no reports that it damages native vegetation."
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	Cordyline fruticosa, Cordyline rubra, Cordyline stricta, & Cordyline terminalis listed as naturalized and/or weeds, but impacts are minimal or unspecified

401	Produces spines, thorns or burrs	n
	Source(s)	**Notes**
	Moore, L. B., & Edgar, E. (1970). Flora of New Zealand. Volume 2. Indigenous Tracheophyta. Monocotyledones except Gramineae. A. R. Shearer, Government Printer, Wellington, New Zealand	"Plant to 12–(20) m. tall; stem in young unbranched state 5–10 cm. diam., massive trunk of large old trees to 1.5 m. diam. and many-branched above; bark thick, rough and fissured. Lvs 30–100 × 3–6 cm., little inclined to droop at tip but bending from base when old, only slightly narrowed above base and thick and flat in narrowest part; lamina light green and very similar on both surfaces; midrib indistinct; nerves fine, equal and ± parallel. "

402	Allelopathic	
	Source(s)	**Notes**
	WRA Specialist. 2017. Personal Communication	Unknown. No evidence found

403	Parasitic	n

Qsn #	Question	Answer
	Source(s)	**Notes**
	Moore, L. B., & Edgar, E. (1970). Flora of New Zealand. Volume 2. Indigenous Tracheophyta. Monocotyledones except Gramineae. A. R. Shearer, Government Printer, Wellington, New Zealand	"Plant to 12–(20) m. tall; stem in young unbranched state 5–10 cm. diam., massive trunk of large old trees to 1.5 m. diam. and many-branched above; bark thick, rough and fissured." [No evidence]

404	Unpalatable to grazing animals	n
	Source(s)	**Notes**
	Forsyth, D. M., Coomes, D. A., Nugent, G., & Hall, G. M. J. (2002). Diet and diet preferences of introduced ungulates (Order: Artiodactyla) in New Zealand. New Zealand Journal of Zoology, 29 (4): 323-343	"Table 2 A three-way classification of the preferences of ungulates for common forest species in New Zealand. Graminoids are excluded." [Preferred - Cordyline australis]

405	Toxic to animals	n
	Source(s)	**Notes**
	Forsyth, D. M., Coomes, D. A., Nugent, G., & Hall, G. M. J. (2002). Diet and diet preferences of introduced ungulates (Order: Artiodactyla) in New Zealand. New Zealand Journal of Zoology, 29 (4): 323-343	[No evidence] "Table 2 A three-way classification of the preferences of ungulates for common forest species in New Zealand. Graminoids are excluded." [Preferred - Cordyline australis]
	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**
	Missouri Botanical Garden. 2017. Cordyline australis. http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?kempercode=a498. [Accessed 5 Apr 2017]	"No serious insect or disease problems. Watch for mealybugs, scale and spider mites, particularly on indoor plants."

Qsn #	Question	Answer
	Beever, R. E., Forster, R. L. S., Rees-George, J., Robertson, G. I., Wood, G. A., & Winks, C. J. (1996). Sudden decline of cabbage tree (Cordyline australis): search for the cause. New Zealand Journal of Ecology, 20(1): 53-68	"Summary: Many cabbage trees (Cordyline australis) are dying throughout much of the North Island and the northern South Island of New Zealand. The symptomatology of those dying in urban environments is described, and is concluded to be consistent with the hypothesis that death is caused by a biotic agent entering through a leafy tuft of the branch system. This disease, which has been named Sudden Decline, usually leads to almost total defoliation of affected trees within 2-12 months. Disease incidence has increased linearly at about 11% per annum since 1987/88. Cultivated trees of C. kaspar, C. obtecta, and various Cordyline hybrids have also been observed dying with Sudden Decline symptoms. Investigations aimed at identifying the causal agent are described, and the hypothesis is advanced that a phytoplasma (mycoplasma-like organism or MLO) is the cause. Sudden Decline is contrasted with the widespread ill-health apparent in many pastoral populations of cabbage tree throughout the country. This Rural Decline is characterised by a general loss of branch and leaf vigour and occasional tree death. It is suggested that Rural Decline is a complex disease (decline disease) caused by various biotic and abiotic agents interacting with an ageing population growing in situations where regeneration is prevented. In many pastoral situations Sudden Decline is superimposed on Rural Decline. The ecological implications of Sudden Decline are discussed."

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	**Notes**
	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] "New Zealand. Tree, rounded crown, large grass-like leaves, bunch of white blossoms, leaves eaten" ... "Leaves rubbed for cuts, sores, diarrhea and dysentery"

408	Creates a fire hazard in natural ecosystems	
	Source(s)	**Notes**
	Fogarty, L.G. 2001. A flammability guide for some common New Zealand native tree and shrub species. Forest Research Bulletin No. 197, Forest and Rural Fire Scientific and Technical Series, Report No. 6. New Zealand Fire Service Commission and National Rural Fire Authority, Wellington.	[Potentially] "Cordyline australis ... Flammability class: Low/Moderate" ... "Comments: Flammability increases with age due to elevated dead material. Old trees have High flammability. Near houses or in "green breaks", flammable material must be removed."

Qsn #	Question	Answer
409	**Is a shade tolerant plant at some stage of its life cycle**	
	Source(s)	**Notes**
	Czernin, A., & Phillips, C. (2005). Below-ground morphology of Cordyline australis (New Zealand cabbage tree) and its suitability for river bank stabilisation. New Zealand Journal of Botany, 43(4), 851-864	"C. australis is a light-demanding pioneer species that requires open space in order to establish."
	Missouri Botanical Garden. 2017. Cordyline australis. http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?kempercode=a498. [Accessed 5 Apr 2017]	"Sun: Full sun to part shade"

410	**Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)**	**y**
	Source(s)	**Notes**
	Missouri Botanical Garden. 2017. Cordyline australis. http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?kempercode=a498. [Accessed 5 Apr 2017]	"In its native habitat, it tolerates a wide range of soils from boggy conditions to dry ones. In cultivation, it is best grown in moist, fertile, organically rich, well-drained soils in full sun to part shade."
	New Zealand Plant Conservation Network. (2017). Flora Details - Cordyline australis. http://www.nzpcn.org.nz/flora_details.aspx?ID=1744. [Accessed 5 Apr 2017]	"Very hardy and will tolerate most soils and moisture regimes but dislikes long periods of drought."

411	**Climbing or smothering growth habit**	**n**
	Source(s)	**Notes**
	Moore, L. B., & Edgar, E. (1970). Flora of New Zealand. Volume 2. Indigenous Tracheophyta. Monocotyledones except Gramineae. A. R. Shearer, Government Printer, Wellington, New Zealand	"Plant to 12–(20) m. tall; stem in young unbranched state 5–10 cm. diam., massive trunk of large old trees to 1.5 m. diam. and many-branched above; bark thick, rough and fissured."

Qsn #	Question	Answer
412	**Forms dense thickets**	
	Source(s)	**Notes**
	Moore, L. B., & Edgar, E. (1970). Flora of New Zealand. Volume 2. Indigenous Tracheophyta. Monocotyledones except Gramineae. A. R. Shearer, Government Printer, Wellington, New Zealand	"Forest margins, open places, abundant near swamps." [No evidence]
	Simpson, P. (1997). Are Cabbage Trees Worth Anything? Relating Ecological and Human Values in the Cabbage Tree, ti kouka. The Journal of New Zealand Studies, 7(1): 14-21	[Cordyline species not specified. Forms dense stands, but no evidence that they exclude other vegetation] "Trees grow together and form forest (called 'woods' by early European explorers, like Bishop Selwyn). Cabbage trees do this by colonizing freshly exposed ground (usually wetland formed after a flood, or burnt ground) in dense stands that last for hundreds of years."
	Smale, M. C., Hall, G. M. J., & Gardner, R. O. (1995). Dynamics of kanuka (Kunzea ericoides) forest on South Kaipara spit, New Zealand, and the impact of fallow deer (Dama dama). New Zealand Journal of Ecology, 19(2): 131-141	[No evidence] "Table 3: Changes in density (stems ha-1) and basal area (m2 ha-1) of saplings and trees (>2.5 cm dbh) in kanuka forest in Lookout Bush," [Cabbage tree documented to occur at densities of 75 trees/ha]

501	Aquatic	n
	Source(s)	**Notes**
	Moore, L. B., & Edgar, E. (1970). Flora of New Zealand. Volume 2. Indigenous Tracheophyta. Monocotyledones except Gramineae. A. R. Shearer, Government Printer, Wellington, New Zealand	[Terrestrial tree] "Plant to 12–(20) m. tall; stem in young unbranched state 5–10 cm. diam., massive trunk of large old trees to 1.5 m. diam. and many-branched above; bark thick, rough and fissured." ... "Forest margins, open places, abundant near swamps."

502	Grass	n
	Source(s)	**Notes**
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 5 Apr 2017]	Family: Asparagaceae Subfamily: Lomandroideae

503	Nitrogen fixing woody plant	n
	Source(s)	**Notes**
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 5 Apr 2017]	Family: Asparagaceae Subfamily: Lomandroideae

Qsn #	Question	Answer
504	**Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)**	**n**
	Source(s)	**Notes**
	Moore, L. B., & Edgar, E. (1970). Flora of New Zealand. Volume 2. Indigenous Tracheophyta. Monocotyledones except Gramineae. A. R. Shearer, Government Printer, Wellington, New Zealand	"Plant to 12–(20) m. tall; stem in young unbranched state 5–10 cm. diam., massive trunk of large old trees to 1.5 m. diam. and many-branched above; bark thick, rough and fissured."

601	**Evidence of substantial reproductive failure in native habitat**	**n**
	Source(s)	**Notes**
	New Zealand Plant Conservation Network. (2017). Flora Details - Cordyline australis. http://www.nzpcn.org.nz/flora_details.aspx?ID=1744. [Accessed 5 Apr 2017]	"Populations have been decimated from some parts of the country due to a mysterious illness linked to a Myoplast Like Organisim (MLO) which is believed to cause the syndrome known as Sudden Decline. Plants stricken with this illness suddenly, and rapidly, wilt, with the leaves failing off still green. If the bark is peeled off the base of the tree near the soil line blackened or rotten spots are typically present. Once stricken with Sudden Decline there is no cure and the trees can die within days. Recently there has been some evidence to suggest the severity of Sudden Decline is lessening."

602	**Produces viable seed**	**y**
	Source(s)	**Notes**
	New Zealand Plant Conservation Network. (2017). Flora Details - Cordyline australis. http://www.nzpcn.org.nz/flora_details.aspx?ID=1744. [Accessed 5 Apr 2017]	"Easily grown from fresh seed (seedlings often spontaneously appear in gardens from bird dispersed seed), emergent shoot, stem and even trunk cuttings."

603	**Hybridizes naturally**	**y**
	Source(s)	**Notes**
	Beever, R. E., & Parkes, S. L. (1996). Self-incompatibility in Cordyline australis (Asteliaceae). New Zealand Journal of Botany, 34(1), 135-137	"Natural hybridisation of C. australis has been reported with C. banksii (Kirk 1874; Esler 1961) and with C. pumilio (Carse 1926), and artificial hybridisation has been demonstrated both with C. kaspar and with a putative F1 hybrid between C. australis and C. kaspar (Beever 1981)."

604	**Self-compatible or apomictic**	**n**
	Source(s)	**Notes**
	Beever, R. E., & Parkes, S. L. (1996). Self-incompatibility in Cordyline australis (Asteliaceae). New Zealand Journal of Botany, 34(1), 135-137	"Abstract Controlled pollination among four individuals of Cordyline australis (cabbage tree, ti kouka) demonstrate that this species is self-incompatible, setting little or no seed when self pollinated. Seed production per fruit in wild trees was less than half that observed following artificial pollination. Parthenocarpic fruit production is recorded in some wild populations."

605	**Requires specialist pollinators**	**n**

Qsn #	Question	Answer
	Source(s)	**Notes**
	Heine, E. M. (1937). Observations on the pollination of New Zealand flowering plants. Transactions and Proceedings of the Royal Society of New Zealand 67(2): 133-148	"Cordyline ausfralis: Numerous Diptera not identified."
	Harris, W., Beever, R. E., Parkes, S., Smallfield, B., Anderson, R. A., & Scheele, S. (2006). Genotypic variation of the flowering phenology of Cordyline australis (Laxmanniaceae) grown at three locations in New Zealand. New Zealand Journal of Botany, 44(1), 23-39	[Insect pollinated] "As pollination of C. australis is entomophilous it is possible that pollinator influences may have selected flowering time, and this may be extended to competition with other plant species for the availability of seed dispersers of which the native pigeon, kereru, is an obvious example (Simpson 2000), i.e., to regulate the availability of ripe fruit at a time different from times when fruit of other species are available."

606	**Reproduction by vegetative fragmentation**	**y**
	Source(s)	**Notes**
	Hosking, J. R., Conn, B. J., Lepschi, B. J., & Barker, C. H. 2011. Plant species first recognised as naturalised or naturalising for New South Wales in 2004 and 2005. Cunningham, 12(1): 85-114	"Spread by seed or as a result of dumping of garden waste." [Vegetative fragments may establish new plants]
	New Zealand Plant Conservation Network. (2017). Flora Details - Cordyline australis. http://www.nzpcn.org.nz/flora_details.aspx?ID=1744. [Accessed 5 Apr 2017]	[Suckers] "Easily grown from fresh seed (seedlings often spontaneously appear in gardens from bird dispersed seed), emergent shoot, stem and even trunk cuttings. "

607	**Minimum generative time (years)**	**>3**
	Source(s)	**Notes**
	Harris, W., Beever, R. E., Parkes, S., Smallfield, B., Anderson, R. A., & Scheele, S. (2006). Genotypic variation of the flowering phenology of Cordyline australis (Laxmanniaceae) grown at three locations in New Zealand. New Zealand Journal of Botany, 44(1), 23-39	[6 to 10 years] "The YFF of several populations at different evaluation sites are of particular interest. At Auckland, Population 1 (Spirits Bay) took the fewest number of years to flower, all 18 of its surviving trees having flowered by 2003 (Year 9). At Invermay none of 19 surviving trees of this population had flowered by 2004. Population 27 (Dipton) at Lincoln stands out as taking the fewest number of years to flower; 15 of its 20 surviving plants at this site flowered in 1998 (Year 4) and all had flowered by 2000 (Year 6). In relation to their latitudes of origin, the Lake Papaitonga (14) and Wainuiomata (15) populations consistently show as populations taking a long time to reach flowering at all sites. After the 2004 flowering season at Auckland, 7 of the 19 surviving trees of Population 14 and 5 of the 20 surviving trees of Population 15 had not flowered in the 10 years since they were sown. At Lincoln, the respective numbers of trees for these populations that had not flowered were 4 of 20 and 3 of 19, and at Invermay, 16 of 19 and 12 of 20."

701	**Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)**	**y**
	Source(s)	**Notes**

Qsn #	Question	Answer
	Hosking, J. R., Conn, B. J., Lepschi, B. J., & Barker, C. H. 2011. Plant species first recognised as naturalised or naturalising for New South Wales in 2004 and 2005. Cunningham, 12(1): 85-114	[Spread accidentally as dumped garden waste] "Cordyline australis" ... "Spread by seed or as a result of dumping of garden waste. Five stems were present in the collection area. The species occurs sporadically in the upper Blue Mountains. Cordyline australis is also naturalised in Victoria and Tasmania (Walsh & Stajsic 2007, Buchanan 2009) and listed as doubtfully established in South Australia (eFlora SA 1999+). In Victoria it is naturalised in wet areas (Carr et al. 1992)."

702	Propagules dispersed intentionally by people	y
	Source(s)	**Notes**
	Dawson, M. 2014. On distant shores: New Zealand's natives as weeds abroad. New Zealand Garden Journal 17 (1): 10-24	"The iconic cabbage tree is one of the most widely cultivated New Zealand plants in Europe, Britain and the USA."

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	**Notes**
	New Zealand Plant Conservation Network. (2017). Flora Details - Cordyline australis. http://www.nzpcn.org.nz/flora_details.aspx?ID=1744. [Accessed 5 Apr 2017]	"Fleshy berries are dispersed by frugivory"
	Hosking, J. R., Conn, B. J., Lepschi, B. J., & Barker, C. H. 2011. Plant species first recognised as naturalised or naturalising for New South Wales in 2004 and 2005. Cunningham, 12(1): 85-114	"Spread by seed or as a result of dumping of garden waste."

704	Propagules adapted to wind dispersal	n
	Source(s)	**Notes**
	Moore, L. B., & Edgar, E. (1970). Flora of New Zealand. Volume 2. Indigenous Tracheophyta. Monocotyledones except Gramineae. A. R. Shearer, Government Printer, Wellington, New Zealand	"Fr. c. 4 mm. diam., globose, whitish. Seeds c. 2.5 mm. long, glossy, ± comma-shaped, deeply notched on one side." [Fleshy-fruited. Bird-dispersed]

Qsn #	Question	Answer
705	**Propagules water dispersed**	**y**
	Source(s)	**Notes**
	Hosking, J. R., Conn, B. J., Lepschi, B. J., & Barker, C. H. 2011. Plant species first recognised as naturalised or naturalising for New South Wales in 2004 and 2005. Cunningham, 12(1): 85-114	"Growing on clay loam in dry sclerophyll forest below a storm water drain." ... "In Victoria it is naturalised in wet areas" [Possible that seeds or vegetative fragments may be secondarily moved by water]
	Czernin, A., & Phillips, C. (2005). Below-ground morphology of Cordyline australis (New Zealand cabbage tree) and its suitability for river bank stabilisation. New Zealand Journal of Botany, 43(4), 851-864	[Water likely plays a role in dispersal of this species] "Phenomena like flood events that create bare river banks, windthrow that induces gaps in vegetation, drought, fire, and frost are required for this species to propagate and persist. Riparian environments have always been favoured habitats. Bare river banks and open, fluvial deposits of sand, silt, and gravel offer perfect sites for seedling establishment."

706	**Propagules bird dispersed**	**y**
	Source(s)	**Notes**
	Burrows, C. J. (1994). Fruit types and seed dispersal modes of woody plants in Ahuriri Summit Bush, Port Hills, western Banks Peninsula, Canterbury, New Zealand. New Zealand Journal of Botany, 32(2), 169-181	"Table 1 Woody plants of Ahuriri Summit Bush, their fruit properties and seed dispersal modes." [Cordyline australis - Main seed dispersal mode = b, birds (by swallowing fruit and either regurgitating or defecating seeds; sometimes by discarding seeds after soft tissues are stripped off)] ... "Table 6 Bird species observed feeding on fruit of woody plants of Ahuriri Summit Bush" [Cordyline australis fed on by Silvereyes, Blackbirds & Starlings]
	McEwen, W.M. 1978. The food of the New Zealand pigeon. New Zealand Journal of Ecology, 1: 99-108	"TABLE 4. Food items recorded by observing feeding pigeons. Exotic species are indicated by *, Fruit F, leaves I, buds b, flowers f." [Cordyline australis fruit consumed]

707	**Propagules dispersed by other animals (externally)**	**n**
	Source(s)	**Notes**
	New Zealand Plant Conservation Network. (2017). Flora Details - Cordyline australis. http://www.nzpcn.org.nz/flora_details.aspx?ID=1744. [Accessed 5 Apr 2017]	"Fleshy berries are dispersed by frugivory" [No means of external attachment]

708	**Propagules survive passage through the gut**	**y**
	Source(s)	**Notes**
	Burrows, C. J. (1994). Fruit types and seed dispersal modes of woody plants in Ahuriri Summit Bush, Port Hills, western Banks Peninsula, Canterbury, New Zealand. New Zealand Journal of Botany, 32(2), 169-181	[Presumably Yes] "Table 1 Woody plants of Ahuriri Summit Bush, their fruit properties and seed dispersal modes." [Cordyline australis - Main seed dispersal mode = b, birds (by swallowing fruit and either regurgitating or defecating seeds; sometimes by discarding seeds after soft tissues are stripped off)] ... "Table 6 Bird species observed feeding on fruit of woody plants of Ahuriri Summit Bush" [Cordyline australis fed on by Silvereyes, Blackbirds & Starlings]

801	**Prolific seed production (>1000/m2)**	**n**

Qsn #	Question	Answer
	Source(s)	**Notes**
	Beever, R. E., & Parkes, S. L. (1996). Self-incompatibility in Cordyline australis (Asteliaceae). New Zealand Journal of Botany, 34(1), 135-137	"Seed production per fruit in wild trees was less than half that observed following artificial pollination."
	Moles, A. T., & Drake, D. R. (1999). Potential contributions of the seed rain and seed bank to regeneration of native forest under plantation pine in New Zealand. New Zealand Journal of Botany, 37 (1), 83-93	"Table 1 Density of all species in each species pool as no. m 2, and frequency (number of samples out of 100 in which each species occurred) for seed pools." [Cordyline australis - Seed bank (no. m-2) = 10.2]

802	**Evidence that a persistent propagule bank is formed (>1 yr)**	**y**
	Source(s)	**Notes**
	Burrows, C. J. (1997). Reproductive ecology of New Zealand forests: 2. Germination behaviour of seeds in varied conditions. New Zealand Natural Sciences, 23, 53-69	"Other species which were shown to be capable of being stored for a time (constrained by the experiment to be no longer than a year), in Sem & Enright's study, were Carpodetus serratus, Cordyline australis, Melicytus ramiflorus and Rhopalostylis sapida." ... "Contrasting with their behaviour in the present study (sprouting to reach the soil surface after having been buried to 5 cm depth), seeds of Cordyline australis and Myrsine australis apparently remained in stasis in soil for two years in the situation described by Enright & Cameron (1988)."
	Royal Botanic Gardens Kew. (2017) Seed Information Database (SID). Version 7.1. Available from: http://data.kew.org/sid/. [Accessed 5 Apr 2017]	"Storage Behaviour: Orthodox Storage Conditions: Seeds can also be stored moist at 2°-4°C for 1 year (Bergin & Dorsser, 1988); long-term storage under IPGRI preferred conditions at RBG Kew, WP. Oldest collection 7 years"
	Enright, N. J., & Cameron, E. K. 1988. The soil seed bank of a kauri (Agathis australis) forest remnant near Auckland, New Zealand. New Zealand Journal of Botany, 26(2): 223-236	"These species range from having short-lived seeds (e.g., M. macrophyllus) to abundant seeds in the seed bank (e.g., C. australis and G. rupestre)."

803	**Well controlled by herbicides**	**y**
	Source(s)	**Notes**
	Robison, R. and Heintzelman, C. 2014. Cabbage Tree (Cordyline australis) Distribution and Management in California State Parks [Poster]. California Invasive Plant Council Symposium. October 8-11, Chico, CA	"Cabbage tree removal began in 2013 and three chemical treatments have been tried with varying degrees of success. Foliar application has been used on small plants (< 2 feet tall) while cut stump and the EZ-Ject lance with cartridges of glyphosate has been used on mature plants. Foliar spraying gave modest success as the leaves shed moisture very effectively. Cut stump treatments induced sprouting from the base of the plant. One 8 foot long stalk re sprouted into 6 individuals. Treatment with the EZ-Ject lance glyphosate cartridges appears to be the most effective. They deliver a precise dose of herbicide into the trunk of the plant, and no re-sprouting has occurred. Treatment with EZ-Ject lance glyphosate cartridges began in December 2013 and will continue into the fall to help determine the most effective treatment timing."

804	**Tolerates, or benefits from, mutilation, cultivation, or fire**	**y**

Qsn #	Question	Answer
	Source(s)	**Notes**
	New Zealand Plant Conservation Network. (2017). Flora Details - Cordyline australis. http://www.nzpcn.org.nz/flora_details.aspx?ID=1744. [Accessed 5 Apr 2017]	"Easily grown from fresh seed (seedlings often spontaneously appear in gardens from bird dispersed seed), emergent shoot, stem and even trunk cuttings."
	Enright, N. J., & Cameron, E. K. 1988. The soil seed bank of a kauri (Agathis australis) forest remnant near Auckland, New Zealand. New Zealand Journal of Botany, 26(2): 223-236	"Many of the component species of kauri forest are able to resprout after being damaged by events such as tree falls and storms. Species at Huapai showing the ability to resprout include Cordyline australis ... "

805	**Effective natural enemies present locally (e.g. introduced biocontrol agents)**	
	Source(s)	**Notes**
	WRA Specialist. 2017. Personal Communication	Unknown

Summary of Risk Traits:

High Risk / Undesirable Traits
• Broad climate suitability
• Naturalized in Australia & California
• Regarded as a potential environmental weed in Australia
• Potential fire hazard (flammability increases with age)
• Tolerates many soil types
• May form dense stands in native range
• Hybridizes with other Cordyline species
• Reproduces by seeds and suckering
• Spread by dumped garden waste in Australia
• Seeds dispersed by birds & intentionally by people
• May form a persistent seed bank
• Able to resprout after cutting

Low Risk Traits
• Native to temperate climates (may only be a threat at higher elevations)
• Unarmed (no spines, thorns, or burrs)
• Palatable to animals and humans
• Ornamental
• Self-incompatible
• Herbicides may provide effective control

Second Screening Results for Tree/tree-like shrubs

(A) Shade tolerant or known to form dense stands?> Possibly shade tolerant and may form dense stands.
(B) Bird-dispersed?> Dispersed by birds
(C) Life cycle <4 years? No. Reaches maturity in 4-6 years
Outcome = Evaluate