Taxon: Corypha umbraculifera **Family:** Arecaceae

Common Name(s): palmier talipot
talipot palm

Synonym(s): Bessia sanguinolenta Raf.
Corypha guineensis L.

Assessor: No Assessor **Status:** Assessor Approved **End Date:** 30 Jul 2014

WRA Score: 6.0 **Designation:** EVALUATE **Rating:** Evaluate

Keywords: Tropical Palm, Ornamental, Spiny Petioles, Bird-dispersed, Monocarpic

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	?
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)	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)	n
401	Produces spines, thorns or burrs	y=1, n=0	y
402	Allelopathic		
403	Parasitic	y=1, n=0	n
404	Unpalatable to grazing animals		
405	Toxic to animals		
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		

Qsn #	Question	Answer Option	Answer
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		
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)	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	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)		
708	Propagules survive passage through the gut	y=1, n=-1	y
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**
	Riffle, R.L.& Craft, P. 2003. An Encyclopedia of Cultivated Palms. Timber Press, Portland, OR.	[Long history of cultivation, but no evidence that domestication has significantly changed this species] "...of unknown origin because of its long history of cultivation and is no longer found in the wild except in association with human habitation; it probably originated in the monsoonal plains and open forests of southern India and Sri Lanka."

102	**Has the species become naturalized where grown?**	
	Source(s)	**Notes**
	WRA Specialist. 2014. Personal Communication	NA

103	**Does the species have weedy races?**	
	Source(s)	**Notes**
	WRA Specialist. 2014. 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**
	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/. [Accessed 30 Jul 2014]	"Native: ASIA-TROPICAL Indian Subcontinent: India [s.]; Sri Lanka"

202	**Quality of climate match data**	**High**
	Source(s)	**Notes**
	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/. [Accessed 30 Jul 2014]	

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

Qsn #	Question	Answer
	Dave's Garden. 2014. PlantFiles: Talipot Palm - Corypha umbraculifera. http://davesgarden.com/guides/pf/go/59751/. [Accessed 30 Jul 2014]	"Hardiness: USDA Zone 10b: to 1.7 °C (35 °F) USDA Zone 11: above 4.5 °C (40 °F)" ... "On Jul 1, 2006, palmbob from Acton, CA (Zone 8b) wrote: This is a truly majestic species of tropical palm... the leaves are unbelievably large and heavy. Standing next to one makes you feel small and insignificant. Not a great palm for most yards, unless you have a monster yard. Slow palm, even in the tropics. And despite what the young palm grower above says about a 'must palm for So California', they cannot grow here (unless you say growing in a greenhouse counts, or surviving 2-3 winters eking along until rotting and dying counts). Hundreds have tried... none have succeeded. But my hopes is someone will succeed someday, so keep on trying!"
	Ellison, D. & Ellison, A. 2001. Cultivated Palms of the World. UNSW Press, Sydney, Australia	"It requires a spacious sunny position in a subtropical to tropical climate and is hardy once established."
	Squire, D. 2007. Palms and Cycads. A Complete Guide to Selecting, Growing and Propagating. Ball Publishing, Batavia, Illinois	"This warmth-loving palm grows slowly when young, but moderately quickly once established." ... "USA Zones 10b and 11"

204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	**Notes**
	Rajapaksha, U. 1998. Traditional Food Plants in Sri Lanka. Hector Kobbekaduwa Agrarian Research and Training Institute, Colombo, Sri Lanka	"Grown in Sri Lanka and some parts of India. Rather common in most regions in Sri Lanka below 800 m altitude (Jayaweera, 1982)."
	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/. [Accessed 30 Jul 2014]	"Native: ASIA-TROPICAL Indian Subcontinent: India [s.]; Sri Lanka"

205	Does the species have a history of repeated introductions outside its natural range?	?
	Source(s)	**Notes**
	Riffle, R.L.& Craft, P. 2003. An Encyclopedia of Cultivated Palms. Timber Press, Portland, OR.	"...of unknown origin because of its long history of cultivation and is no longer found in the wild except in association with human habitation; it probably originated in the monsoonal plains and open forests of southern India and Sri Lanka."
	Dave's Garden. 2014. PlantFiles: Talipot Palm - Corypha umbraculifera. http://davesgarden.com/guides/pf/go/59751/. [Accessed 30 Jul 2014]	"This plant has been said to grow in the following regions: Fort Lauderdale, Florida Naples, Florida Kingshill, Mississippi"
	WRA Specialist. 2014. Personal Communication	Listed on numerous palm-related websites, but unknown how widely it has been planted in settings conducive to its estalbishment

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

Qsn #	Question	Answer
	Johnson, D.V. 1998. Non-Wood Forest Products 10: Tropical Palms. FAO, Rome	[Naturalized in Thailand] "On a more positive note, recognition in Thailand of the overexploitation of the naturalized talipot palm (Corphya umbraculi f era) has led to its inclusion in a list of the protected non-wood forest products. Under forest regulations, small amounts of protected NVVFPs can be harvested for subsistence needs, but any commercial exploitation requires a permit (Subansenee, 1995)."

302	Garden/amenity/disturbance weed	n
	Source(s)	**Notes**
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence

303	Agricultural/forestry/horticultural weed	n
	Source(s)	**Notes**
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence

304	Environmental weed	n
	Source(s)	**Notes**
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence

305	Congeneric weed	n
	Source(s)	**Notes**
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence

401	Produces spines, thorns or burrs	y
	Source(s)	**Notes**
	Ashton, M. S., Gunatilleke, S., de Zoysa, N., Dassanayake, M.D., Gunatilleke, N., and Wijesundera, S. 1997. A Field Guide to the Common Trees and Shrubs of Sri Lanka. WHT Publications (Pvt.) Limited, Colombo, Sri Lanka	"Leaves: fan-like, terminal/ very large, deeply divided into pointed lobes/ plicate; petiole very stout, spiny."
	Squire, D. 2007. Palms and Cycads. A Complete Guide to Selecting, Growing and Propagating. Ball Publishing, Batavia, Illinois	"The large, leathery, light- to dark-green leaves, up to 6m (20ft) wide, are claimed to be the largest on any palm. They are borne on stout 3m (10ft) leafstalks and armed with black teeth."

Qsn #	Question	Answer
402	**Allelopathic**	
	Source(s)	**Notes**
	WRA Specialist. 2014. Personal Communication	Unknown

403	**Parasitic**	**n**
	Source(s)	**Notes**
	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/. [Accessed 30 Jul 2014]	Arecaceae

404	**Unpalatable to grazing animals**	
	Source(s)	**Notes**
	Chandran, M. S. 1996. Talipot: A forgotten palm of the Western Ghats. Resonance, 1(11): 69-75	[Palatable fruit. Palatability of foliage unknown] "If the starch is not extracted before flowering the large output of fruits (over 200 kg per palm) offers food to a variety of wild life such as birds, bats, porcupines, squirrels, boars, deers and sambar."
	Johnson, D.V. 1998. Non-Wood Forest Products 10: Tropical Palms. FAO, Rome	[Unknown. Fodder not listed among uses] "Table 8-1 Candidate Palms for Domestication or Management" ... "Corypha umbraculifera - Major Products. sap to make sugar. wine alcohol, vinegar, sap yield 20 liters/tree/day for 3-4 months for C. utan; starch from stem petiole to make hats; leaf midrib used to make furniture" ... "Minor Products - leaves for thatching & weaving various products, edible heart; etc."

405	**Toxic to animals**	
	Source(s)	**Notes**
	Ashton, M. S., Gunatilleke, S., de Zoysa, N., Dassanayake, M.D., Gunatilleke, N., and Wijesundera, S. 1997. A Field Guide to the Common Trees and Shrubs of Sri Lanka. WHT Publications (Pvt.) Limited, Colombo, Sri Lanka	"Uses: fruit-stuns fish;"
	Quattrocchi, U.. 2012. CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	"Young fruits as fish poison."
	Renuka, C., Bhat, K.V. & Chand Basha, S. 1996. Palm Resources of Kerala and Their Utilisation. KFRI Research Report 116. Kerala Forest Research Institute, Peechi, Thrissur, India	[Starch not toxic, but seeds contain chemicals that can stun fish]] "This stored starch is extracted from the trunks after felling them which is to be done prior to the initiation of flowering The starch is similar to sago starch and is used to make bread and other edible preparations The starchy pith is also used for feeding the ducks." ... "The seeds pounded into a paste are said to be used for stupefying fish (Bourdillon. 1908)"

406	**Host for recognized pests and pathogens**	

Qsn #	Question	Answer
	Source(s)	**Notes**
	Manjunatha, H., Niranjana, K. S., & Ravikumar, M. 2013. Incidence of red palm weevil, Rhynchophorus ferrugineus Olivier (Coleoptera: Curculionidae) on arecanut from Karnataka, India. Current Biotica 7(1/2): 92-95	"The Red Palm Weevil (RPW) Rhynchophorus ferrugineus Olivier (Coleoptera: Curculionidae) is the most important pest of the Phoenix dactylifera (Date palm), Metroxylon sagu (Sago palm), Phoenix sylvestris (Toddy palm), Borassus flabellifer (Palmyra palm), Elaeis guineensis (Oil palm), Corypha umbraculifera (Talipot palm), Arenga saccharifera (Sugar palm), Livistona chinensis (Serdang palm), Oncosperma tigillaria (Nibong palm), Oreodoxa regia (Royal palm) and some ornamental palms also have been reported to be attacked by the weevil (Esteban-Duran et al.,1998)."
	Sivakumar, T., & Mohan, C. 2013. Occurrence of rhinoceros beetle, Oryctes rhinoceros (L.), on banana cultivars in Kerala. Pest Management In Horticultural Ecosystems, 19(1): 99-101	[Host of coconut rhinoceros beetle] "The coconut rhinoceros beetle, Oryctes rhinoceros (L.) (Coleoptera:Scarabaeidae) is one of the most damaging pests of coconut and African oil palm in south and south-east Asia and the Western Pacific islands." ... "Apart from coconut and African oil palm, other host plants of O. rhinoceros include the date palm, arecanut palm (Nair, 2002) and a variety of palms grown for ornamental purpose, including Roystonea regia, Livistona chinensis, Corypha umbraculifera and Raphia ruffia (Gressitt, 1953; Bedford, 1980) Arenga, Borassus, Corypha, Elaeis, Metroxylon, Nypa, Oncosperma and Phoenix (Lever, 1969)."

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	**Notes**
	Rajapaksha, U. 1998. Traditional Food Plants in Sri Lanka. Hector Kobbekaduwa Agrarian Research and Training Institute, Colombo, Sri Lanka	"The palm trunk is cut before flowering and sun-dried. Thereafter cabbage is ground into flour which is used to prepare paste (thalapa) and sweet meets. It is told that if the palm is cut after flowering, the flower tastes bitter. In drought and lean seasons, the villagers used to cut down the palm and distribute the flower among them. There was a belief that flowering of the palm was a bad sign; it brings disaster to the village and therefore palm is cut down before flowering. Robert Knox states that flowers give bad smell; therefore people used to the cut the tree before flowering. However, the truth is after flowering the stored food in the trunk is reduced; therefore it is necessary to cut down the plant to get a high yield of palm cabbage."
	Squire, D. 2007. Palms and Cycads. A Complete Guide to Selecting, Growing and Propagating. Ball Publishing, Batavia, Illinois	[No evidence] "The growing points were once used as a vegetable, and the large, ivory-like seeds as buttons and ornaments. The large, fan-shaped leaves have been made into olas (immature leaves bleached for use as paper). The leaves are used in the construction of umbrellas and in thatching, trunks are felled for the starchy pith, and the sap is used to make alcoholic drinks."
	Wagstaff, D.J. 2008. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	No evidence

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	**Notes**

Qsn #	Question	Answer
	Kulkarni, A. R., & Mulani, R. M. 2004. Indigenous palms of India. Current Science 86(12): 1598-1603	[No evidence that these palms contribute to fire risk] "C. umbraculifera L., the famous 'tale palm' or 'tad-patri' on the compressed dried leaves of which are found our ancient scriptures, grows in the hills and valleys of the Western Ghats forests from Uttara Kannada district of Karnataka to Kerala and extending further to Sri Lanka. Monocarpic habit, extensive use of their foliage and pith of stems have endangered these palms in their natural habitat. They are often found planted in botanical gardens."

409	Is a shade tolerant plant at some stage of its life cycle	
	Source(s)	**Notes**
	Tropilab Inc. 2014. Corypha umbraculifera - Talipot. http://www.tropilab.com/tekeningen/talipot.html. [Accessed 30 Jul 2014]	"Culture: full sun / partial shade; wet soil, has a low salt tolerance."
	Dave's Garden. 2014. PlantFiles: Talipot Palm - Corypha umbraculifera. http://davesgarden.com/guides/pf/go/59751/. [Accessed 30 Jul 2014]	"Sun Exposure: Full Sun" ... "On Oct 21, 2003, Monocromatico from Rio de Janeiro Brazil (Zone 11) wrote:" ... "It likes moist organic soil, and may tolerate some shade when young."

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	**Notes**
	Riffle, R.L.& Craft, P. 2003. An Encyclopedia of Cultivated Palms. Timber Press, Portland, OR.	"The palm is adaptable to most soils with good drainage but only looks its best with adequately fertile soil."
	Chandran, M. S. 1996. Talipot: A forgotten palm of the Western Ghats. Resonance, 1(11): 69-75	"The tali palm in Uttara Kannada generally favours the semievergreen forests along the spurs and slopes of the Western Ghats, from near the sea level to 600 meters. It occurs both on good soil as well as on the eroded and stony slopes with granite, schists and quartz rather than on exposed laterite."

411	Climbing or smothering growth habit	n
	Source(s)	**Notes**
	Rajapaksha, U. 1998. Traditional Food Plants in Sri Lanka. Hector Kobbekaduwa Agrarian Research and Training Institute, Colombo, Sri Lanka	"An unbranched annulate palm with a huge, erect cylindric, straight trunk 10-25 m high, 60-90 cm diameter and trunk up to 1 m thickness after about 12 years and is covered with persistent leaf bases and dying after flowering and fruiting when about 40 years old."

412	Forms dense thickets	
	Source(s)	**Notes**
	Janzen, D. H. 1976. Why bamboos wait so long to flower. Annual Review of Ecology and Systematics, 7: 347-391	"The semelparous talipot palm (Corypha umbraculifera) may have had an intermast period of 37-44 years in southern India, if the behavior of garden trees (130, 188, 247) represents that of wild plants in the natural dense stands in which they used to occur."

Qsn #	Question	Answer
	Kulkarni, A. R., & Mulani, R. M. 2004. Indigenous palms of India. Current Science 86(12): 1598-1603	[No evidence] "C. umbraculifera L., the famous 'tale palm' or 'tad-patri' on the compressed dried leaves of which are found our ancient scriptures, grows in the hills and valleys of the Western Ghats forests from Uttara Kannada district of Karnataka to Kerala and extending further to Sri Lanka. Monocarpic habit, extensive use of their foliage and pith of stems have endangered these palms in their natural habitat. They are often found planted in botanical gardens."

501	Aquatic	n
	Source(s)	**Notes**
	Kulkarni, A. R., & Mulani, R. M. 2004. Indigenous palms of India. Current Science 86(12): 1598-1603	[Terrestrial] "...grows in the hills and valleys of the Western Ghats forests from Uttara Kannada district of Karnataka to Kerala and extending further to Sri Lanka."

502	Grass	n
	Source(s)	**Notes**
	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/. [Accessed 30 Jul 2014]	Arecaceae

503	Nitrogen fixing woody plant	n
	Source(s)	**Notes**
	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/. [Accessed 30 Jul 2014]	Arecaceae

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	**Notes**
	Riffle, R.L.& Craft, P. 2003. An Encyclopedia of Cultivated Palms. Timber Press, Portland, OR.	"Mature trees grow to 90 feet high with a trunk diameter to 3 feet."

601	Evidence of substantial reproductive failure in native habitat	
	Source(s)	**Notes**
	Chandran, M. S. 1996. Talipot: A forgotten palm of the Western Ghats. Resonance, 1(11): 69-75	"Due to greater availability of food grains, for the last many years, the Uttara Kannada people have hardly cut down any tali palm to extract starch. Whereas the palm is having a new lease of life in its natural habitats of Kumta and Honavar, in other places where it used to be planted, it is almost forgotten. Moreover the strengthening cult of exotic trees has pushed the tali palm into obscurity."

Qsn #	Question	Answer
	Peter, K.V. (ed.). 2008. Underutilized and Underexploited Horticultural Crops:, Volume 3. New India Publishing, New Delhi	"Monocarpic habit, extensive use of their foliage and pith of stems have endangered these palms in their natural habitat."
	Johnson, D. 1998. Corypha umbraculifera. The IUCN Red List of Threatened Species. Version 2014.2. www.iucnredlist.org	"Red List Category & Criteria: Data Deficient" ... "Restricted to Karnataka and the Malabar coast of Kerala. It is difficult to distinguish between wild and semi-wild subpopulations."

602	Produces viable seed	y
	Source(s)	**Notes**
	Ellison, D. & Ellison, A. 2001. Cultivated Palms of the World. UNSW Press, Sydney, Australia	"Fresh seed should germinate in 4 months."
	Squire, D. 2007. Palms and Cycads. A Complete Guide to Selecting, Growing and Propagating. Ball Publishing, Batavia, Illinois	"Sow fresh seed, which usually germinates within 20 weeks, sometimes more."

603	Hybridizes naturally	
	Source(s)	**Notes**
	Renuka, C. 2008. KFRI Palmetum (Final report of the project KFRI 444/04-Strengthening and enriching the Palmetum). Kerala Forest Research Institute, Kerala, India	[Unknown, but long time to reproductive maturity & moncarpic flowering would minimize chance for natural hybridization] "Flowering & Fruiting: The palm flowers once in its life time when 30 -40 years old."

604	Self-compatible or apomictic	
	Source(s)	**Notes**
	Chandran, M. S. 1996. Talipot: A forgotten palm of the Western Ghats. Resonance, 1(11): 69-75	"It is bisexual with six free stamens and a gynoecium of three fused carpels. The three chambered ovary has an ovule in each chamber. The ovary narrows into a style which ends in the stigma. The flowering begins with the hot season, although an occasional palm might flower at any time of the year."
	Henderson, A. 1986. A review of pollination studies in the Palmae. The Botanical Review, 52(3): 221-259	[Other Corypha species are self-compatible] "Tomlinson and Soderholm (1975) reported that C. elata Roxb. in cultivation in Florida was self-compatible"

605	Requires specialist pollinators	n
	Source(s)	**Notes**
	Learn 2 Grow. 2014. Corypha. http://www.learn2grow.com/plants/corypha/. [Accessed 30 Jul 2014]	[Insect-pollinated] "After insect pollination, millions of green to brown, one-seeded fruits mature. "

Qsn #	Question	Answer
	Chandran, M. S. 1996. Talipot: A forgotten palm of the Western Ghats. Resonance, 1(11): 69-75	[No indication from morphology] "The inflorescence, a pyramidal spadix 3 to 6 m high, springs from the centre of the leafy crown. The several branches of the spadix are covered with millions of minute flowers. The flower has a three toothed calyx and 3 petals, each about 2 mm long. It is bisexual with six free stamens and a gynoecium of three fused carpels. The three chambered ovary has an ovule in each chamber. The ovary narrows into a style which ends in the stigma. The flowering begins with the hot season, although an occasional palm might flower at any time of the year."
	Henderson, A. 1986. A review of pollination studies in the Palmae. The Botanical Review, 52(3): 221-259	[No mention of specialized pollinator requirements] "Douglas and Bimantoro (1956) gave a list of insect visitors to Corypha flowering in cultivation in Indonesia"

606	Reproduction by vegetative fragmentation	n
	Source(s)	**Notes**
	Renuka, C. 2008. KFRI Palmetum (Final report of the project KFRI 444/04-Strengthening and enriching the Palmetum). Kerala Forest Research Institute, Kerala, India	[Reproduces by seed] "This is a huge, solitary, monocarpic palm with dark grey stem with distinct leaf scars. Stem 10-15 m long and to 90 cm in diameter, leaf base persistent from middle to upper part of the stem." ... "The palm flowers once in its life time when 30-40 years old."

607	Minimum generative time (years)	>3
	Source(s)	**Notes**
	Renuka, C. 2008. KFRI Palmetum (Final report of the project KFRI 444/04-Strengthening and enriching the Palmetum). Kerala Forest Research Institute, Kerala, India	"Flowering & Fruiting: The palm flowers once in its life time when 30 -40 years old."
	Seifriz, W. 1924. The gregarious flowering of the talipot palm, Corypha umbraculifera, at Peradeniya, Ceylon. Bulletin of the Torrey Botanical Club, 51(8): 341-350	"In June, 1922, eight more of the remaining thirteen talipot palms in the avenue at Peradeniya commenced to flower. (PLATE 8). The palms were at this time 4I years of age. The seven palms which flowered in I9I8 (FIG. i) were 37 years old. The second lot of eight Coryphas were in full flower in December, 1922."
	Kulkarni, A. R., & Mulani, R. M. 2004. Indigenous palms of India. Current Science 86(12): 1598-1603	"Regular annual flowering and fruiting is a rule. However, Corypha, of which three species occur in our country, flowers and fruits only once in its lifespan after attaining a full vegetative growth of about 40 years and dies away leaving enormous seed population to continue the progeny. Such palms are called hepazanthic or monocarpic."

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	n
	Source(s)	**Notes**
	Renuka, C. 2008. KFRI Palmetum (Final report of the project KFRI 444/04-Strengthening and enriching the Palmetum). Kerala Forest Research Institute, Kerala, India	[Unlikely. Fruits relatively large and lack means of external attachment, and trees take a long time to reach reproductive maturity. Essentially sterile for most of their lives] "Fruits take about 12 months to mature. Ripe fruits are pale green, globose, 3 cm in diameter." ... "The palm flowers once in its life time when 30-40 years old."

Qsn #	Question	Answer
702	**Propagules dispersed intentionally by people**	**y**
	Source(s)	**Notes**
	Wong, M. 2006. Palms for Hawaii Landscapes. Landscape L-19. College of Tropical Agriculture and Human Resources, Honolulu, HI	"The following palm species can be used to portray a strong “tropical” theme:" [Includes Corypha umbraculifera]
	Henderson, A. 2009. Palms of Southern Asia. Princeton University Press, Princeton, NJ	"Widely cultivated as an ornamental."

703	**Propagules likely to disperse as a produce contaminant**	**n**
	Source(s)	**Notes**
	Renuka, C. 2008. KFRI Palmetum (Final report of the project KFRI 444/04-Strengthening and enriching the Palmetum). Kerala Forest Research Institute, Kerala, India	[Unlikely. Fruits relatively large and lack means of external attachment, and trees take a long time to reach reproductive maturity. Essentially sterile for most of their lives] "Fruits take about 12 months to mature. Ripe fruits are pale green, globose, 3 cm in diameter." ... "The palm flowers once in its life time when 30-40 years old."

704	**Propagules adapted to wind dispersal**	**n**
	Source(s)	**Notes**
	Rajapaksha, U. 1998. Traditional Food Plants in Sri Lanka. Hector Kobbekaduwa Agrarian Research and Training Institute, Colombo, Sri Lanka	[Fleshy-fruited. No adaptations for wind dispersal] "FRUITS:- A shortly stipitate, globose drupe 3.7 cm diameter. With two small arrested carpels at its base, grayish olive-coloured. Flowers between November and January when it has reached full maturity (Jayaweera, 1982)."

705	**Propagules water dispersed**	**y**
	Source(s)	**Notes**
	Chandran, M. S. 1996. Talipot: A forgotten palm of the Western Ghats. Resonance, 1(11): 69-75	"The rain water rushing down the steep hill slopes also disperses the seeds."

706	**Propagules bird dispersed**	**y**
	Source(s)	**Notes**
	Chandran, M. S. 1996. Talipot: A forgotten palm of the Western Ghats. Resonance, 1(11): 69-75	"The seed is dispersed by birds, bats, squirrels, porcupines, and many other herbivores, which feed on the fleshy fruit."

707	**Propagules dispersed by other animals (externally)**	
	Source(s)	**Notes**
	Chandran, M. S. 1996. Talipot: A forgotten palm of the Western Ghats. Resonance, 1(11): 69-75	[Possibly carried externally before pulp is consumed] "Only one of the three carpels matures into the fruit, a drupe 4 cm in diameter. It has a single hard, white, smooth and polished seed with the texture of ivory. The seed is dispersed by birds, bats, squirrels, porcupines, and many other herbivores, which feed on the fleshy fruit."

Qsn #	Question	Answer
708	**Propagules survive passage through the gut**	**y**
	Source(s)	**Notes**
	Chandran, M. S. 1996. Talipot: A forgotten palm of the Western Ghats. Resonance, 1(11): 69-75	[Presumably Yes] "The seed is dispersed by birds, bats, squirrels, porcupines, and many other herbivores, which feed on the fleshy fruit."

801	Prolific seed production (>1000/m2)	y
	Source(s)	**Notes**
	Chandran, M. S. 1996. Talipot: A forgotten palm of the Western Ghats. Resonance, 1(11): 69-75	"The tali palm is monocarpic since it dies after flowering and fruiting. The inflorescence, a pyramidal spadix 3 to 6 m high, springs from the centre of the leafy crown. The several branches of the spadix are covered with millions of minute flowers. The flower has a three toothed calyx and 3 petals, each about 2 mm long."
	Riffle, R.L.& Craft, P. 2003. An Encyclopedia of Cultivated Palms. Timber Press, Portland, OR.	[Presumably yes, but only after long time to reproduction maturity. Not annually] "The terminal panicle is 30 feet tall with great branches that make it 40 feet wide. This is the largest inflorescence among flowering plants. The flowers are creamy white to almost yellow and number in the millions, creating a Christmas-treelike affair with enormous white plumose branches. The round 2-inch-wide green to brown fruits create a show almost as spectacular as the flowers since they form on the hardening branches of the inflorescence."

802	Evidence that a persistent propagule bank is formed (>1 yr)	
	Source(s)	**Notes**
	Palmpedia. 2014. Corypha umbraculifera. http://www.palmpedia.net/wiki/Corypha_umbraculifera. [Accessed 30 Jul 2014]	"It takes about a year for the fruit to mature, producing thousands of round, dark green fruit 3-4 cm. diameter, each containing a single seed, it take about a year for the fruit to ripen."
	Chandran, M. S. 1996. Talipot: A forgotten palm of the Western Ghats. Resonance, 1(11): 69-75	"Since the fruits which take nearly a year to ripen are consumed at all stages by a variety of animals the tali palm has also the potential to be developed into a keystone resource in the tropical forest belt of India."
	Royal Botanic Gardens Kew. 2008. Seed Information Database (SID). Version 7.1. http://data.kew.org/sid/. [Accessed 30 Jul 2014]	"Storage Behaviour: No data available for species. Of 1 known taxa of genus Corypha, 100.00% Uncertain"

803	Well controlled by herbicides	
	Source(s)	**Notes**
	WRA Specialist. 2014. 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. 2014. Personal Communication	Unknown

805	**Effective natural enemies present locally (e.g. introduced biocontrol agents)**	
	Source(s)	**Notes**
	WRA Specialist. 2014. Personal Communication	Unknown

Summary of Risk Traits:

High Risk / Undesirable Traits
• Thrives in tropical climates
• Naturalized in Thailand, and possibly other locations, but area of origin not well defined
• Petioles very stout and spiny
• Young fruits used as a fish poison (possible toxic effects to other animals?)
• Potential host of coconut rhinoceros beetle and other palm pests
• Tolerates many soil types
• May have formed natural dense stands
• Seeds dispersed by birds, other frugivorous animals, flowing water & intentionally by people
• Produces millions of flowers & potentially large numbers of seeds
• Tree dies after reaching maturity (drawback in landscaping)
• Limited ecological information makes accurate risk prediction difficult

Low Risk Traits
• No reports of invasiveness or detrimental impacts, but no evidence of widespread introduction outside native range
• Multiple uses, including ornamental and food
• Reaches maturity after 30-40 years
• Not reported to spread vegetatively

Second Screening Results for Tree/tree-like shrubs

(A) Shade tolerant or known to form dense stands?> Possibly some shade tolerance. May have produce extensive wild stands, but these no longer occur in the wild
(B) Bird-dispersed?> Dispersed by birds & other frugivorous animals
(C) Life cycle <4 years? No
Outcome = Evaluate