

<b>Taxon:</b> <i>Etilingera megalocheilos</i> (Griff.) A.D.Poulsen	<b>Family:</b> Zingiberaceae
<b>Common Name(s):</b> tepus	<b>Synonym(s):</b> <i>Achasma megalocheilos</i> Griff. <i>Amomum megalocheilos</i> (Griff.) <i>Amomum rubroluteum</i> Baker <i>Etilingera rubrolutea</i> (Baker) C.K.Lim <i>Hornstedtia megalocheilos</i> (Griff.) Poulsen

<b>Assessor:</b> Chuck Chimera	<b>Status:</b> Assessor Approved	<b>End Date:</b> 28 Jul 2016
<b>WRA Score:</b> 3.0	<b>Designation:</b> L	<b>Rating:</b> Low Risk

**Keywords:** Tropical, Ornamental, Rhizomatous, Deer-dispersed, Pollinator-limited

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	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	n
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n= question 205	n
302	Garden/amenity/disturbance weed	n=0, y = 1*multiplier (see Appendix 2)	n
303	Agricultural/forestry/horticultural weed	n=0, y = 2*multiplier (see Appendix 2)	n
304	Environmental weed	n=0, y = 2*multiplier (see Appendix 2)	n
305	Congeneric weed	n=0, y = 1*multiplier (see Appendix 2)	n
401	Produces spines, thorns or burrs	y=1, n=0	n
402	Allelopathic		
403	Parasitic	y=1, n=0	n
404	Unpalatable to grazing animals		
405	Toxic to animals	y=1, n=0	n
406	Host for recognized pests and pathogens	y=1, n=0	n
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	n

Qsn #	Question	Answer Option	Answer
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		
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)		
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		
604	Self-compatible or apomictic		
605	Requires specialist pollinators	y=-1, n=0	y
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	2
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		
706	Propagules bird dispersed		
707	Propagules dispersed by other animals (externally)		
708	Propagules survive passage through the gut	y=1, n=-1	y
801	Prolific seed production (>1000/m <sup>2</sup> )		
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	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
	Poulsen, A. D. 2007. <i>Etlingera</i> Giseke of Java. Gardens' Bulletin Singapore 59(1&2): 145-172	[No evidence of domestication] "Ecology and habitat: Often dominant in forest gaps or completely open areas to 1300 m."

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. 2016. Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. 2016. 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
	Poulsen, A. D. 2007. <i>Etlingera</i> Giseke of Java. Gardens' Bulletin Singapore 59(1&2): 145-172	"Distribution: Malay Peninsula, Singapore, Sumatra, Java, and Borneo."

202	Quality of climate match data	High
	Source(s)	Notes
	Poulsen, A. D. 2007. <i>Etlingera</i> Giseke of Java. Gardens' Bulletin Singapore 59(1&2): 145-172	

203	Broad climate suitability (environmental versatility)	y
	Source(s)	Notes
	Poulsen, A. D. 2007. <i>Etlingera</i> Giseke of Java. Gardens' Bulletin Singapore 59(1&2): 145-172	[Elevation range exceeds 1000 m in tropical latitudes, demonstrating some environmental versatility] "Ecology and habitat: Often dominant in forest gaps or completely open areas to 1300 m."

204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	Notes
	Poulsen, A. D. 2007. <i>Etlingera</i> Giseke of Java. Gardens' Bulletin Singapore 59(1&2): 145-172	"Distribution: Malay Peninsula, Singapore, Sumatra, Java, and Borneo."

Qsn #	Question	Answer
205	Does the species have a history of repeated introductions outside its natural range?	n
	<b>Source(s)</b>	<b>Notes</b>
	WRA Specialist. 2016. Personal Communication	Limited evidence of cultivation outside native range

301	Naturalized beyond native range	n
	<b>Source(s)</b>	<b>Notes</b>
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence
	Wagner, W.L., Herbst, D.R.& Lorence, D.H. 2016. Flora of the Hawaiian Islands. Smithsonian Institution, Washington, D.C. <a href="http://botany.si.edu/">http://botany.si.edu/</a> . [Accessed 28 Jul 2016]	No evidence to date

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

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

305	Congeneric weed	n
	<b>Source(s)</b>	<b>Notes</b>
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence [Etilingera elatior naturalized in several locations, but no negative impacts have been documented to date]

401	Produces spines, thorns or burrs	n
	<b>Source(s)</b>	<b>Notes</b>

Qsn #	Question	Answer
	Poulsen, A. D. 2007. <i>Etingera</i> Giseke of Java. Gardens' Bulletin Singapore 59(1&2): 145-172	[No evidence] "Rhizome long-creeping, subterranean (1.5–25 cm), stout, >2 cm in diameter, cream to pale brown, scales to 6 cm, brown, pubescent at base. Leafy shoot to 5 m, with up to 28 leaves; base to 8 cm in diameter, dark green. Sheath striate with some cross bars, especially in upper part of the shoot, glabrous, green when fresh. Ligule to 35 mm, entire, green or tinged reddish brown, glabrous or with a few scattered hairs, margin ciliate. Petiole 25–55 mm, glabrous. Lamina to 101 x 16 cm, oblong, broadest above the middle, midto dark green, pale beneath, young leaf tinged reddish, glabrous (rarely pubescent); average length to width ratio 3.5–7; base ± unequal; apex acute."

402	Allelopathic	
	Source(s)	Notes
	WRA Specialist. 2016. Personal Communication	Unknown

403	Parasitic	n
	Source(s)	Notes
	Poulsen, A. D. 2007. <i>Etingera</i> Giseke of Java. Gardens' Bulletin Singapore 59(1&2): 145-172	"Rhizome long-creeping, subterranean (1.5–25 cm), stout, >2 cm in diameter" [Zingiberaceae. No evidence]

404	Unpalatable to grazing animals	
	Source(s)	Notes
	Phillipps, Q. & Phillipps, K. (2016). Phillipps' Field Guide to the Mammals of Borneo and Their Ecology. Princeton University Press, Princeton & Oxford	[Fruit presumably edible to animals. Palatability of foliage unknown] " <i>Etingera megalochelios</i> . The seeds of this wild ginger, common at Danum, are dispersed by mousedeer"

405	Toxic to animals	n
	Source(s)	Notes
	Phillipps, Q. & Phillipps, K. (2016). Phillipps' Field Guide to the Mammals of Borneo and Their Ecology. Princeton University Press, Princeton & Oxford	" <i>Etingera megalochelios</i> . The seeds of this wild ginger, common at Danum, are dispersed by mousedeer"
	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
	Wagstaff, D.J. 2008. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	No evidence in genus

406	Host for recognized pests and pathogens	n
	Source(s)	Notes

Qsn #	Question	Answer
	Ibrahim, H.& Setyowati, F.M., 1999. <i>Etlingera Giseke</i> [Internet] Record from Proseabase. de Guzman, C.C. and Siemonsma, J.S. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. <a href="http://www.proseanet.org">http://www.proseanet.org</a> . [Accessed 28 Jul 2016]	"Diseases and pests No serious diseases and pests are known to affect <i>Etlingera</i> . In cultivation trials in Sarawak some leaf-cutting insects were observed, but without significant damage to the crop."

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	Notes
	Quattrocchi, U. 2012. <i>CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology</i> . CRC Press, Boca Raton, FL	No evidence
	Wagstaff, D.J. 2008. <i>International poisonous plants checklist: an evidence-based reference</i> . CRC Press, Boca Raton, FL	No evidence in genus

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	Notes
	Poulsen, A. D. 2007. <i>Etlingera Giseke of Java</i> . <i>Gardens' Bulletin Singapore</i> 59(1&2): 145-172	[No evidence. Fleshy, herbaceous plant of habitat that is not fire prone] "Rhizome long-creeping, subterranean (1.5–25 cm), stout, >2 cm in diameter, cream to pale brown, scales to 6 cm, brown, pubescent at base. Leafy shoot to 5 m, with up to 28 leaves; base to 8 cm in diameter, dark green."

409	Is a shade tolerant plant at some stage of its life cycle	n
	Source(s)	Notes
	Poulsen, A. D. 2007. <i>Etlingera Giseke of Java</i> . <i>Gardens' Bulletin Singapore</i> 59(1&2): 145-172	"Ecology and habitat: Often dominant in forest gaps or completely open areas to 1300 m." [Habitat suggest adaptation to high light environment & possible intolerance to shade]
	Asiatic Green. 2009. <i>Gingers</i> . <a href="http://www.asiaticgreen.com/gingers.htm">www.asiaticgreen.com/gingers.htm</a>	"Often found in open areas such as abandoned plantations, gardens or places near rivers or streams." [Open areas suggest possible intolerance to shade]

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	n
	Source(s)	Notes
	Fayaz, A. 2011. <i>Encyclopedia of Tropical Plants - Identification and Cultivation of over 3,000 Tropical Plants</i> . Firefly Books Ltd., New Zealand	"plants in this genus generally prefer a sunny position and a moist but well-drained, fertile, humus rich soil"
	Ibrahim, H.& Setyowati, F.M., 1999. <i>Etlingera Giseke</i> [Internet] Record from Proseabase. de Guzman, C.C. and Siemonsma, J.S. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. <a href="http://www.proseanet.org">http://www.proseanet.org</a> . [Accessed 28 Jul 2016]	"Soils rich in organic matter are preferred."

411	Climbing or smothering growth habit	n
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Poulsen, A. D. 2007. <i>Etlingera</i> Giseke of Java. Gardens' Bulletin Singapore 59(1&2): 145-172	"Rhizome long-creeping, subterranean (1.5–25 cm), stout, >2 cm in diameter, cream to pale brown, scales to 6 cm, brown, pubescent at base."

412	Forms dense thickets	
	<b>Source(s)</b>	<b>Notes</b>
	Poulsen, A. D. 2007. <i>Etlingera</i> Giseke of Java. Gardens' Bulletin Singapore 59(1&2): 145-172	[Dominant. Unknown if dense stands are formed] "Often dominant in forest gaps or completely open areas to 1300 m."

501	Aquatic	n
	<b>Source(s)</b>	<b>Notes</b>
	Poulsen, A. D. 2007. <i>Etlingera</i> Giseke of Java. Gardens' Bulletin Singapore 59(1&2): 145-172	[Terrestrial herb] "Ecology and habitat: Often dominant in forest gaps or completely open areas to 1300 m."

502	Grass	n
	<b>Source(s)</b>	<b>Notes</b>
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. <a href="http://www.ars-grin.gov/npgs/index.html">http://www.ars-grin.gov/npgs/index.html</a> . [Accessed 28 Jul 2016]	"Family: Zingiberaceae Subfamily: Alpinioideae Tribe: Alpinieae"

503	Nitrogen fixing woody plant	n
	<b>Source(s)</b>	<b>Notes</b>
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. <a href="http://www.ars-grin.gov/npgs/index.html">http://www.ars-grin.gov/npgs/index.html</a> . [Accessed 28 Jul 2016]	"Family: Zingiberaceae Subfamily: Alpinioideae Tribe: Alpinieae"

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	<b>Source(s)</b>	<b>Notes</b>
	Poulsen, A. D. 2007. <i>Etlingera</i> Giseke of Java. Gardens' Bulletin Singapore 59(1&2): 145-172	"Rhizome long-creeping, subterranean (1.5–25 cm), stout, >2 cm in diameter, cream to pale brown, scales to 6 cm, brown, pubescent at base."
	Gordon, D. R., Mitterdorfer, B., Pheloung, P. C., Ansari, S., Buddenhagen, C., Chimera, C., ... & Williams, P. A. 2010). Guidance for addressing the Australian Weed Risk Assessment questions. <i>Plant Protection Quarterly</i> , 25(2): 56-74	"This question is specifically to deal with plants that have specialized organs and should not include plants merely with rhizomes" [E. megalochelios is rhizomatous, and can likely can spread vegetatively]

601	Evidence of substantial reproductive failure in native habitat	n
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Poulsen, A. D. 2007. <i>Etlingera</i> Giseke of Java. Gardens' Bulletin Singapore 59(1&2): 145-172	"Conservation status: Least concern (LC). Bakhuizen f. (1968) thought it scarce everywhere, but I have observed it in several very open habitats and consider it rather resilient to disturbance. It may actually have expanded in recent years."

602	Produces viable seed	Y
	<b>Source(s)</b>	<b>Notes</b>
	Phillipps, Q. & Phillipps, K. (2016). Phillipps' Field Guide to the Mammals of Borneo and Their Ecology. Princeton University Press, Princeton & Oxford	" <i>Etlingera megalochelios</i> . The seeds of this wild ginger, common at Danum, are dispersed by mousedeer"
	Poulsen, A. D. 2007. <i>Etlingera</i> Giseke of Java. Gardens' Bulletin Singapore 59(1&2): 145-172	"Infructescence embedded in the soil, head ca 5 x 7–8 cm, bracts not persistent; fruit 2.5–3.5 cm across, rounded, not ridged, sometimes slightly warty at apex, pale brown or pink, densely pubescent. Seeds up to 4 mm across, angular."

603	Hybridizes naturally	
	<b>Source(s)</b>	<b>Notes</b>
	Luc-Cayol, F., & Fereol, L. 1997. X <i>Alpingera martinica</i> (Zingiberaceae): an intergeneric hybrid between <i>Alpinia purpurata</i> and <i>Etlingera elatior</i> . HortScience, 32(5): 914-915	"Artificial intergeneric crosses between <i>Alpinia purpurata</i> and <i>Etlingera elatior</i> (Zingiberaceae) have produced hybrids." [Artificial hybridization possible in genus, but unknown if natural hybridization occurs in any <i>Etlingera</i> species]

604	Self-compatible or apomictic	
	<b>Source(s)</b>	<b>Notes</b>
	Sabu, A.K.M. & Smisha, K. P. 2013. Reproductive biology of <i>Etlingera elatior</i> (Jack) R. M. Sm. Ornamental Torch Ginger. International Journal of Plant, Animal and Environmental Sciences (4): 75-80	[Unknown. Related species <i>E. elatior</i> is self-compatible, but with low fruit set] "There was no apomixis, as none of the emasculated and bagged flowers set fruit. To determine if the species is self-incompatible both self and cross pollinations were carried out. Bagged flowers without manual pollination did not set fruits, confirmed the absence of autogamy in the species. Bagged flowers was pollinated by pollen from another flower of the same plant resulted 8 % fruit set and pollinated with pollen from another plant resulted 24 % fruit set."

605	Requires specialist pollinators	Y
	<b>Source(s)</b>	<b>Notes</b>



Qsn #	Question	Answer
	<p>Poulsen, A. D. 2007. <i>Etlingera</i> Giseke of Java. Gardens' Bulletin Singapore 59(1&amp;2): 145-172</p>	<p>"Inflorescence (including peduncle) to 47 cm, arising from the rhizome near base of leafy shoot, with 15–27 flowers, 4–14 open at a time. Peduncle 2–33 cm, subterranean, peduncular bracts cream to pale brown. Spike 8–10 x 3–5 cm, ovoid to cylindrical, flowers extending 2–4 cm above the bracts, length only including bracts: 6–8 cm. Sterile bracts: 4–5 forming a dense support, distichous (uppermost one sometimes in the middle), 4–6 x 1.5–3 cm, ± pale reddish brown or cream with ± reddish apex and pale brown margin, pubescent near base. Fertile bracts 4–7 x 0.7–1.5 cm, spatulate, membranous, cream, pale red or brown especially at apex, pubescent especially near base and apex. Bracteole 3.8–5 cm, pale red at least at apex, with two fissures of 6–15 mm, ± pubescent, apex 2-toothed, ciliate. Flower: calyx 7–8.3 cm, reaching base of anther and shorter than corolla lobes, pale pink with darker apex, with one fissure of 2.5–4 cm, glabrous, apex 3-toothed. Corolla tube 4.9–6.8 cm, cream, glabrous outside, tube inside with an irregular band c. 1 cm 2 cm below labellum; lobes reddish pink, glabrous, reaching beyond anther; dorsal lobe 21–31 x 9–11 mm, elliptic, apex rounded, hooded over the anther; lateral lobes 21–25 x 4–7 mm, elliptic, apex rounded, insertion oblique and converging; staminal tube 4–12 mm. Labellum 3-lobed, 50–65 x 21–25 mm, red with yellow in centre, glabrous, lateral lobes folded over stamen, pale to dark red at margin, margin finely plicate, central lobe c. 30 x 16 mm, spatulate, emarginate to 15 mm, rarely entire, dark red extended 40–50 mm beyond anther. Stamen 12 mm long: filament 3–7 x 3.5–5 mm (widest at base), white to pale red; anther 9–10 x 2.5–5.5 mm (widest at apex), emarginate to 2.5 mm, angled 120°, pink; thecae dehiscing from 1.5 mm above base to apex, glabrous. Style 8–8.5 cm, sparsely pubescent, flexistylous. Stigma 2.5 mm wide, white or pale pink, triangular to heart-shaped, ± hairy, ostiole apical, transverse. Ovary 5 mm long, densely pubescent; epigynous glands 5–7 mm long, bipartite, linear."</p>
	<p>Ibrahim, H.&amp; Setyowati, F.M., 1999. <i>Etlingera</i> Giseke [Internet] Record from Proseabase. de Guzman, C.C. and Siemonsma, J.S. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. <a href="http://www.proseanet.org">http://www.proseanet.org</a>. [Accessed 28 Jul 2016]</p>	<p>"The inflorescence is adapted for pollination by birds, such as the sunbird <i>Anthreptes malacensis</i>."</p>
	<p>Kubitzki, K. (ed.). 1998. The Families and genera of vascular plants. Volume IV. Flowering plants, Monocotyledons: Alismatanae and Commelinanae (except Gramineae). Springer-Verlag, Berlin, Heidelberg, New York</p>	<p>[Generic Description] "...geoflory in <i>Etlingera</i> (<i>A. chasma</i>) is connected with pollination by birds hopping on the ground."</p>

Qsn #	Question	Answer
606	<b>Reproduction by vegetative fragmentation</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	Poulsen, A. D. 2007. <i>Etlingera</i> Giseke of Java. Gardens' Bulletin Singapore 59(1&2): 145-172	"Rhizome long-creeping, subterranean (1.5–25 cm), stout, >2 cm in diameter, cream to pale brown, scales to 6 cm, brown, pubescent at base."
	Kubitzki, K. (ed.). 1998. The Families and genera of vascular plants. Volume IV. Flowering plants, Monocotyledons: Alismatanae and Commelinanae (except Gramineae). Springer-Verlag, Berlin, Heidelberg, New York	"VEGETATIVE REPRODUCTION. Most Zingiberaceae can be propagated by fragmenting the rhizome."

607	<b>Minimum generative time (years)</b>	<b>2</b>
	<b>Source(s)</b>	<b>Notes</b>
	Ibrahim, H.& Setyowati, F.M., 1999. <i>Etlingera</i> Giseke [Internet] Record from Proseabase. de Guzman, C.C. and Siemonsma, J.S. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. <a href="http://www.proseanet.org">http://www.proseanet.org</a> . [Accessed 28 Jul 2016]	" <i>Etlingera</i> starts flowering in the second year after planting a piece of rhizome." [Probably longer if propagated from seeds]

701	<b>Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Poulsen, A. D. 2007. <i>Etlingera</i> Giseke of Java. Gardens' Bulletin Singapore 59(1&2): 145-172	"Infructescence: head to 12 cm, globose, bracts persistent, 5–15 fruits per head, fruit 4.5 x 3.5 cm, pyriform, flat-topped with irregular radiating roughly papillose ridges up to 6 mm high, brownish (red when young), pubescent. Seeds 2–3 mm across." [No means of external attachment]

702	<b>Propagules dispersed intentionally by people</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	Dave's Garden. 2016. Ginger <i>Etlingera megalochelios</i> . <a href="http://davesgarden.com/guides/pf/go/166247/">http://davesgarden.com/guides/pf/go/166247/</a> . [Accessed 28 Jul 2016]	Cultivated as an ornamental

703	<b>Propagules likely to disperse as a produce contaminant</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Ibrahim, H.& Setyowati, F.M., 1999. <i>Etlingera</i> Giseke [Internet] Record from Proseabase. de Guzman, C.C. and Siemonsma, J.S. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. <a href="http://www.proseanet.org">http://www.proseanet.org</a> . [Accessed 28 Jul 2016]	" <i>Etlingera</i> is propagated chiefly by rhizome fragments, but sometimes by seed as well." [No evidence, and seed may be rare in cultivation]

704	<b>Propagules adapted to wind dispersal</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>

Qsn #	Question	Answer
	Poulsen, A. D. 2007. <i>Etilingera</i> Giseke of Java. Gardens' Bulletin Singapore 59(1&2): 145-172	"Infructescence embedded in the soil, head ca 5 x 7–8 cm, bracts not persistent; fruit 2.5–3.5 cm across, rounded, not ridged, sometimes slightly warty at apex, pale brown or pink, densely pubescent. Seeds up to 4 mm across, angular."

705	Propagules water dispersed	
	Source(s)	Notes
	Asiatic Green. 2009. Gingers. <a href="http://www.asiaticgreen.com/gingers.htm">www.asiaticgreen.com/gingers.htm</a>	" <i>Etilingera megalochelios</i> (Singapore, Malaysia, Indonesia) Often found in open areas such as abandoned plantations, gardens or places near rivers or streams." [Distribution suggests potential dispersal by water]

706	Propagules bird dispersed	
	Source(s)	Notes
	Poulsen, A. D. 2007. <i>Etilingera</i> Giseke of Java. Gardens' Bulletin Singapore 59(1&2): 145-172	"Infructescence embedded in the soil, head ca 5 x 7–8 cm, bracts not persistent; fruit 2.5–3.5 cm across, rounded, not ridged, sometimes slightly warty at apex, pale brown or pink, densely pubescent. Seeds up to 4 mm across, angular." [Presence of fruit near ground may prevent or minimize bird dispersal]
	Kubitzki, K. (ed.). 1998. The Families and genera of vascular plants. Volume IV. Flowering plants, Monocotyledons: Alismatanae and Commelinanae (except Gramineae). Springer-Verlag, Berlin, Heidelberg, New York	[Generic description] "In some <i>Amomum</i> and <i>Etilingera</i> species the single fleshy fruits adhere to each other to form a collective fruit (syncarp) the shape of a small pineapple. The fruit wall is acid and juicy and seeds may be spread by birds or small mammals, but there are no observations on this."

707	Propagules dispersed by other animals (externally)	
	Source(s)	Notes
	Poulsen, A. D. 2007. <i>Etilingera</i> Giseke of Java. Gardens' Bulletin Singapore 59(1&2): 145-172	"Infructescence: head to 12 cm, globose, bracts persistent, 5–15 fruits per head, fruit 4.5 x 3.5 cm, pyriform, flat-topped with irregular radiating roughly papillose ridges up to 6 mm high, brownish (red when young), pubescent. Seeds 2–3 mm across." [No means of external attachment, but related taxa have fruits carried away by rodents & possibly externally dispersed]

708	Propagules survive passage through the gut	y
	Source(s)	Notes
	Phillipps, Q. & Phillipps, K. (2016). Phillipps' Field Guide to the Mammals of Borneo and Their Ecology. Princeton University Press, Princeton & Oxford	" <i>Etilingera megalochelios</i> . The seeds of this wild ginger, common at Danum, are dispersed by mousedeer"
	Poulsen, A. D. 2007. <i>Etilingera</i> Giseke of Java. Gardens' Bulletin Singapore 59(1&2): 145-172	"Infructescence embedded in the soil, head ca 5 x 7–8 cm, bracts not persistent; fruit 2.5–3.5 cm across, rounded, not ridged, sometimes slightly warty at apex, pale brown or pink, densely pubescent. Seeds up to 4 mm across, angular."

801	Prolific seed production (>1000/m2)	

Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Poulsen, A. D. 2007. <i>Etlingera Giseke</i> of Java. Gardens' Bulletin Singapore 59(1&2): 145-172	[Unknown] "Infructescence embedded in the soil, head ca 5 x 7–8 cm, bracts not persistent; fruit 2.5–3.5 cm across, rounded, not ridged, sometimes slightly warty at apex, pale brown or pink, densely pubescent. Seeds up to 4 mm across, angular."

<b>802</b>	<b>Evidence that a persistent propagule bank is formed (&gt;1 yr)</b>	
	<b>Source(s)</b>	<b>Notes</b>
	Royal Botanic Gardens Kew. (2016) Seed Information Database (SID). Version 7.1. <a href="http://data.kew.org/sid/">http://data.kew.org/sid/</a> . [Accessed ]	Unknown

<b>803</b>	<b>Well controlled by herbicides</b>	
	<b>Source(s)</b>	<b>Notes</b>
	WRA Specialist. 2016. Personal Communication	Unknown. No information on herbicide efficacy or chemical control of this species

<b>804</b>	<b>Tolerates, or benefits from, mutilation, cultivation, or fire</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	Ibrahim, H.& Setyowati, F.M., 1999. <i>Etlingera Giseke</i> [Internet] Record from Proseabase. de Guzman, C.C. and Siemonsma, J.S. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. <a href="http://www.proseanet.org">http://www.proseanet.org</a> . [Accessed 28 Jul 2016]	" <i>Etlingera</i> is propagated chiefly by rhizome fragments, but sometimes by seed as well." [This and other <i>Etlingera</i> species are able to regrow from rhizomes after cutting]
	Poulsen, A. D. 2007. <i>Etlingera Giseke</i> of Java. Gardens' Bulletin Singapore 59(1&2): 145-172	"Rhizome long-creeping, subterranean (1.5–25 cm), stout, >2 cm in diameter, cream to pale brown, scales to 6 cm, brown, pubescent at base."

<b>805</b>	<b>Effective natural enemies present locally (e.g. introduced biocontrol agents)</b>	
	<b>Source(s)</b>	<b>Notes</b>
	WRA Specialist. 2016. Personal Communication	Unknown

**Summary of Risk Traits:**

High Risk / Undesirable Traits

- Elevation range exceeds 1000 m in tropics
- Grows in tropical climates
- Spread by rhizomes & seeds
- Seeds & propagules possibly dispersed by deer & intentionally by people
- Spreads vegetatively
- Able to resprout after cutting
- Limited ecological information makes accurate risk prediction difficult

Low Risk Traits

- No reports of invasiveness or negative impacts
- Unarmed (no spines, thorns or burrs)
- Non-toxic
- Ornamental
- Requires specialized pollinators (may limit seed set outside native range)

Second Screening Results for Low Stature Shrubby Life Form

(A) Reported as a weed of cultivated lands? No

Outcome = Accept (Low Risk)