

**Family:** *Annonaceae*

**Taxon:** *annona glabra*

**Synonym:** *Annona humboldtiana* Kunth  
*Annona humboldtii* Dunal  
*Annona palustris* L.

**Common Name:** corkwood  
mangrove apple  
monkey apple  
alligator-apple  
cow-apple  
pond-apple

<b>Questionnaire :</b>	current 20090513	<b>Assessor:</b>	Patti Clifford	<b>Designation:</b> H(HPWRA)
<b>Status:</b>	Assessor Approved	<b>Data Entry Person:</b>	Patti Clifford	<b>WRA Score</b> 10
101	Is the species highly domesticated?		y=-3, n=0	n
102	Has the species become naturalized where grown?		y=1, n=-1	
103	Does the species have weedy races?		y=1, n=-1	
201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"		(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
202	Quality of climate match data		(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
203	Broad climate suitability (environmental versatility)		y=1, n=0	
204	Native or naturalized in regions with tropical or subtropical climates		y=1, n=0	y
205	Does the species have a history of repeated introductions outside its natural range?		y=-2, ?=-1, n=0	y
301	Naturalized beyond native range		y = 1*multiplier (see Appendix 2), n= question 205	y
302	Garden/amenity/disturbance weed		n=0, y = 1*multiplier (see Appendix 2)	n
303	Agricultural/forestry/horticultural weed		n=0, y = 2*multiplier (see Appendix 2)	
304	Environmental weed		n=0, y = 2*multiplier (see Appendix 2)	y
305	Congeneric weed		n=0, y = 1*multiplier (see Appendix 2)	y
401	Produces spines, thorns or burrs		y=1, n=0	n
402	Allelopathic		y=1, n=0	
403	Parasitic		y=1, n=0	n
404	Unpalatable to grazing animals		y=1, n=-1	
405	Toxic to animals		y=1, n=0	n
406	Host for recognized pests and pathogens		y=1, n=0	
407	Causes allergies or is otherwise toxic to humans		y=1, n=0	n
408	Creates a fire hazard in natural ecosystems		y=1, n=0	n

409	Is a shade tolerant plant at some stage of its life cycle	y=1, n=0	y
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	y
411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets	y=1, n=0	y
501	Aquatic	y=5, n=0	n
502	Grass	y=1, n=0	n
503	Nitrogen fixing woody plant	y=1, n=0	n
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	y=1, n=0	n
601	Evidence of substantial reproductive failure in native habitat	y=1, n=0	n
602	Produces viable seed	y=1, n=-1	y
603	Hybridizes naturally	y=1, n=-1	
604	Self-compatible or apomictic	y=1, n=-1	n
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	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	y=1, n=-1	y
706	Propagules bird dispersed	y=1, n=-1	
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	y
802	Evidence that a persistent propagule bank is formed (>1 yr)	y=1, n=-1	n
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)	y=-1, n=1	

Designation: H(HPWRA)

WRA Score 10

## Supporting Data:

101	2011. WRA Specialist. Personal Communication.	[Is the species highly domesticated? No] No evidence of domestication that reduces invasive ability.
102	2011. WRA Specialist. Personal Communication.	[Has the species become naturalized where grown?] NA
103	2011. WRA Specialist. Personal Communication.	[Does the species have weedy races?] NA
201	2011. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network (GRIN) [Online Database Index]. National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl">http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl</a>	[Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"? High] Native range: Cameroon; Gabon; Sao Tome and Principe; Cote D'Ivoire; Gambia; Guinea; Liberia; Nigeria; Senegal; Sierra Leone; United States - Florida [s.]; Mexico; Belize; Costa Rica; Guatemala; Honduras; Nicaragua; Panama; Antigua and Barbuda; Bahamas; Cuba; Dominica; Grenada; Guadeloupe; Hispaniola; Jamaica; Martinique; Montserrat; St. Lucia; St. Vincent and Grenadines; French Guiana; Guyana; Suriname; Venezuela; Brazil; Colombia; Ecuador [s.]
202	2011. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network (GRIN) [Online Database Index]. National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl">http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl</a>	[Quality of climate match data? High] Native range: Cameroon; Gabon; Sao Tome and Principe; Cote D'Ivoire; Gambia; Guinea; Liberia; Nigeria; Senegal; Sierra Leone; United States - Florida [s.]; Mexico; Belize; Costa Rica; Guatemala; Honduras; Nicaragua; Panama; Antigua and Barbuda; Bahamas; Cuba; Dominica; Grenada; Guadeloupe; Hispaniola; Jamaica; Martinique; Montserrat; St. Lucia; St. Vincent and Grenadines; French Guiana; Guyana; Suriname; Venezuela; Brazil; Colombia; Ecuador [s.]
203	2001. Department of Natural Resources Queensland. Weeds of national significance - pond apple ( <i>Annona glabra</i> ). National Weeds Strategy Executive Committee, Launceston <a href="http://www.weeds.org.au/docs/ponstrat.pdf">http://www.weeds.org.au/docs/ponstrat.pdf</a>	[Broad climate suitability (environmental versatility)?] "The plant can be found in a wide range of climates and ecosystems from rainforest creeks such as Jumrum Creek near Kuranda with 2000-2500 millimetres rain per annum to open forest at Paddy's Creek with 750 millimetres per year."
203	2011. Dave's Garden. PlantFishes: pond apple, alligator apple <i>Annona glabra</i> . Dave's Garden, <a href="http://davesgarden.com/guides/plf/go/2059/">http://davesgarden.com/guides/plf/go/2059/</a>	[Broad climate suitability (environmental versatility)?] USDA hardiness zones: 10a-11.
204	2011. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network (GRIN) [Online Database Index]. National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl">http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl</a>	[Native or naturalized in regions with tropical or subtropical climates? Yes] Native range: Cameroon; Gabon; Sao Tome and Principe; Cote D'Ivoire; Gambia; Guinea; Liberia; Nigeria; Senegal; Sierra Leone; United States - Florida [s.]; Mexico; Belize; Costa Rica; Guatemala; Honduras; Nicaragua; Panama; Antigua and Barbuda; Bahamas; Cuba; Dominica; Grenada; Guadeloupe; Hispaniola; Jamaica; Martinique; Montserrat; St. Lucia; St. Vincent and Grenadines; French Guiana; Guyana; Suriname; Venezuela; Brazil; Colombia; Ecuador [s.]
205	2007. Land Protection (Invasive Plants and Animals). Fact sheet: pond apple ( <i>Annona glabra</i> ). Land Protection (Invasive Plants and Animals) Australian Government, <a href="http://www.dpi.qld.gov.au/documents/Biosecurity_EnvironmentalPests/IPA-Pond-Apple-PP58.pdf">http://www.dpi.qld.gov.au/documents/Biosecurity_EnvironmentalPests/IPA-Pond-Apple-PP58.pdf</a>	[Does the species have a history of repeated introductions outside its natural range? Yes] "Originally introduced to Australia as grafting stock for commercially grown custard apple in 1912, pond apple has become a serious environmental weed in north Queensland with the potential to spread throughout northern Australia."
205	2011. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network (GRIN) [Online Database Index]. National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl">http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl</a>	[Does the species have a history of repeated introductions outside its natural range? Yes] Cultivated in Ghana; China; Taiwan; Malaysia; Philippines; Venezuela
301	2000. Meyer, J-Y.. Preliminary review of the invasive plants in the Pacific islands (SPREP Member Countries). Invasive species in the Pacific: A technical review and draft regional strategy. South Pacific Regional Environment Programme, Samoa	[Naturalized beyond native range? Yes] Dominant invader in Fiji; moderate invader in French Polynesia
301	2001. Department of Natural Resources Queensland. Weeds of national significance - pond apple ( <i>Annona glabra</i> ). National Weeds Strategy Executive Committee, Launceston <a href="http://www.weeds.org.au/docs/ponstrat.pdf">http://www.weeds.org.au/docs/ponstrat.pdf</a>	[Naturalized beyond native range? Yes] Weed of greatest concern in the Wet Tropics Bioregion, Australia.

302	2001. Department of Natural Resources Queensland. Weeds of national significance - pond apple ( <i>Annona glabra</i> ). National Weeds Strategy Executive Committee, Launceston <a href="http://www.weeds.org.au/docs/ponstrat.pdf">http://www.weeds.org.au/docs/ponstrat.pdf</a>	[Garden/amenity/disturbance weed?] "Thickets of pond apple restrict access and impair outlooks and the general variety of the coastal recreational experience." [scored as an environmental weed]
303	2003. CRC. Weed management guide - pond apple <i>Annona glabra</i> . CRC Australian Weed Management, <a href="http://www.weeds.gov.au/publications/guidelines/wons/pubs/a-glabra.pdf">http://www.weeds.gov.au/publications/guidelines/wons/pubs/a-glabra.pdf</a>	[Agricultural/forestry/horticultural weed? Yes] "While pond apple is considered an environmental weed, its commercial impacts are also increasing as it spreads. It is now threatening the cane and cattle industries by growing in and along creeks, fence lines and farm drains. Unlike many weeds, it can invade and transform undisturbed areas."
304	2001. Department of Natural Resources Queensland. Weeds of national significance - pond apple ( <i>Annona glabra</i> ). National Weeds Strategy Executive Committee, Launceston <a href="http://www.weeds.org.au/docs/ponstrat.pdf">http://www.weeds.org.au/docs/ponstrat.pdf</a>	[Environmental weed? Yes] Weed of greatest concern in the Wet Tropics Bioregion, Australia. Wide ranges of habitats currently being invaded include: stream and riverbanks, paperbark and pandanus wetlands, sedge lands, mangrove communities and high tide zones on beaches. <i>Annona glabra</i> forms a dense understorey/subcanopy, replacing ferns, grasses, shrubs and sedges and prevents tree regeneration.
305	2009. Hall, M./Scholte, P./Al-khulaidi, A.W./Miller, A.G./Al-Qadasi, A.H./Al-Farhan, A./Al-Abbasi, T.M.. Arabia's last forests under threat II: remaining fragments of unique valley forest in southwest Arabia. <i>Edinburgh Journal of Botany</i> . 66: 263-281.	[Congeneric weed? Yes] "By far the most abundant tree is the naturalised invasive species <i>Annona squamosa</i> L., which covers large parts of riparian vegetation in Wadi Rijaf, Jabal Bura in southwest Arabia"
305	2011. Hosking, J.. Weed database. NSW, Australia Department of Agriculture,	[Congeneric weed?] <i>Annona reticulata</i> is naturalized in Queensland, Australia.
401	2011. Kral, R.. Flora of North America - <i>Annona glabra</i> . Missouri Botanical Garden, St. Louis, MO & Harvard University Herbaria, <a href="http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200008506">http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200008506</a>	[Produces spines, thorns or burrs? No] "Shrubs or trees , to ca. 15 m; trunks commonly buttressed at base. Principal leaves late deciduous; petiole 10-20mm. Leaf blade ovate to elliptic, 5-15 x 6(-8) cm, base broadly cuneate to rounded, apex acute to short-acuminate; surfaces glabrous. Inflorescences from leaf axils on new shoots, solitary flowers; peduncle stout, linear, club-shaped, to 2cm, becoming enlarged."
402	2011. WRA Specialist. Personal Communication.	[Allelopathic?] Unknown.
403	2011. Kral, R.. Flora of North America - <i>Annona glabra</i> . Missouri Botanical Garden, St. Louis, MO & Harvard University Herbaria, <a href="http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200008506">http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200008506</a>	[Parasitic? No] Annonaceae.
404	2011. WRA Specialist. Personal Communication.	[Unpalatable to grazing animals?] Unknown.
405	2008. Wagstaff, D.J.. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	[Toxic to animals? No] No evidence of toxicity.
405	2011. National Center for Biotechnology Information. PubMed. U.S. National Library of Medicine, Bethesda, Maryland <a href="http://www.ncbi.nlm.nih.gov/">http://www.ncbi.nlm.nih.gov/</a>	[Toxic to animals? No] No evidence of toxicity.
406	1972. Swanson, R.W./Baranowski, R.M.. Host range and infestation by the Caribbean fruit fly, <i>Anastrepha suspensa</i> (Diptera:Tephritidae), in South Florida. <i>Florida State Horticultural Society</i> . 85: 271-274. <a href="http://www.fshs.org/Proceedings/Password%20Protected">http://www.fshs.org/Proceedings/Password%20Protected</a>	[Host for recognized pests and pathogens?] Host for the Caribbean fruit fly ( <i>Anastrepha suspensa</i> ). [widespread]
407	2008. Wagstaff, D.J.. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	[Causes allergies or is otherwise toxic to humans? No] No evidence of toxicity.
407	2011. National Center for Biotechnology Information. PubMed. U.S. National Library of Medicine, Bethesda, Maryland <a href="http://www.ncbi.nlm.nih.gov/">http://www.ncbi.nlm.nih.gov/</a>	[Causes allergies or is otherwise toxic to humans? No] No evidence of toxicity or allergies.

408	2001. Department of Natural Resources Queensland. Weeds of national significance - pond apple ( <i>Annona glabra</i> ). National Weeds Strategy Executive Committee, Launceston <a href="http://www.weeds.org.au/docs/ponstrat.pdf">http://www.weeds.org.au/docs/ponstrat.pdf</a>	[Creates a fire hazard in natural ecosystems? No] "Time between fires is lengthened due to the reduction in understorey in infested areas"
409	2007. Land Protection (Invasive Plants and Animals). Fact sheet: pond apple ( <i>Annona glabra</i> ). Land Protection (Invasive Plants and Animals) Australian Government, <a href="http://www.dpi.qld.gov.au/documents/Biosecurity_EnvironmentalPests/IPA-Pond-Apple-PP58.pdf">http://www.dpi.qld.gov.au/documents/Biosecurity_EnvironmentalPests/IPA-Pond-Apple-PP58.pdf</a>	[Is a shade tolerant plant at some stage of its life cycle? Yes] "Pond apple is opportunistic and tends to establish in disturbed areas affected by floods or cyclones, but it can also establish in relatively undisturbed environments. While seedlings need light for rapid growth they can remain dormant in semi-shaded conditions until a gap in the canopy is created."
410	2001. Department of Natural Resources Queensland. Weeds of national significance - pond apple ( <i>Annona glabra</i> ). National Weeds Strategy Executive Committee, Launceston <a href="http://www.weeds.org.au/docs/ponstrat.pdf">http://www.weeds.org.au/docs/ponstrat.pdf</a>	[Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)? Yes] "Pond apple is adapted to a wide range of soils including moist sand depressions, steep hillsides on metamorphic soils and the high tide mark on rocky coastal shores."
410	2011. Izel. <i>Annona glabra</i> . <a href="http://www.izelplants.com">http://www.izelplants.com</a> , <a href="http://www.izelplants.com/plants/botanical-name-list/trees/item/annonna-glabra">http://www.izelplants.com/plants/botanical-name-list/trees/item/annonna-glabra</a>	[Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)? Yes] Soil tolerance: acid, neutral, alkaline, poor, loam, sandy, clay.
411	2011. Kral, R.. Flora of North America - <i>Annona glabra</i> . Missouri Botanical Garden, St. Louis, MO & Harvard University Herbaria, <a href="http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200008506">http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200008506</a>	[Climbing or smothering growth habit? No] Tree.
412	2001. Department of Natural Resources Queensland. Weeds of national significance - pond apple ( <i>Annona glabra</i> ). National Weeds Strategy Executive Committee, Launceston <a href="http://www.weeds.org.au/docs/ponstrat.pdf">http://www.weeds.org.au/docs/ponstrat.pdf</a>	[Forms dense thickets? Yes] Forms dense thickets capable of replacing whole ecosystems.
412	2003. CRC. Weed management guide - pond apple <i>Annona glabra</i> . CRC Australian Weed Management, <a href="http://www.weeds.gov.au/publications/guidelines/wons/pubs/a-glabra.pdf">http://www.weeds.gov.au/publications/guidelines/wons/pubs/a-glabra.pdf</a>	[Forms dense thickets? Yes] Over time the dense thickets it forms can gradually replace everything else in the canopy and create an undesirable new habitat.
501	2011. Kral, R.. Flora of North America - <i>Annona glabra</i> . Missouri Botanical Garden, St. Louis, MO & Harvard University Herbaria, <a href="http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200008506">http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200008506</a>	[Aquatic? No] Terrestrial.
502	2011. Kral, R.. Flora of North America - <i>Annona glabra</i> . Missouri Botanical Garden, St. Louis, MO & Harvard University Herbaria, <a href="http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200008506">http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200008506</a>	[Grass? No] Annonaceae.
503	2011. Kral, R.. Flora of North America - <i>Annona glabra</i> . Missouri Botanical Garden, St. Louis, MO & Harvard University Herbaria, <a href="http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200008506">http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200008506</a>	[Nitrogen fixing woody plant? No] Annonaceae
504	2011. Kral, R.. Flora of North America - <i>Annona glabra</i> . Missouri Botanical Garden, St. Louis, MO & Harvard University Herbaria, <a href="http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200008506">http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200008506</a>	[Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)? No] Tree.
601	2011. WRA Specialist. Personal Communication.	[Evidence of substantial reproductive failure in native habitat? No] No evidence.
602	2003. CRC. Weed management guide - pond apple <i>Annona glabra</i> . CRC Australian Weed Management, <a href="http://www.weeds.gov.au/publications/guidelines/wons/pubs/a-glabra.pdf">http://www.weeds.gov.au/publications/guidelines/wons/pubs/a-glabra.pdf</a>	[Produces viable seed? Yes] "The plants have grey bark, usually with a single trunk but multiple-stemmed plants are also common since several seedlings may germinate together."
602	2008. Janick, J./Paull, R.E.. The encyclopedia of fruit & nuts. Cabi Publishing, Wallingford, UK	[Produces viable seed? Yes] <i>Annona</i> spp. are usually propagated by seed.

603	2011. WRA Specialist. Personal Communication.	[Hybridizes naturally? Unknown.
604	2001. Department of Natural Resources Queensland. Weeds of national significance - pond apple ( <i>Annona glabra</i> ). National Weeds Strategy Executive Committee, Launceston <a href="http://www.weeds.org.au/docs/ponstrat.pdf">http://www.weeds.org.au/docs/ponstrat.pdf</a>	[Self-compatible or apomictic? No] "Fruit set is limited by floral biology; the flowers are hermaphroditic but do not self-pollinate and pollination is most probably brought about by beetles."
605	2001. Department of Natural Resources Queensland. Weeds of national significance - pond apple ( <i>Annona glabra</i> ). National Weeds Strategy Executive Committee, Launceston <a href="http://www.weeds.org.au/docs/ponstrat.pdf">http://www.weeds.org.au/docs/ponstrat.pdf</a>	[Requires specialist pollinators? No] "Fruit set is limited by floral biology; the flowers are hermaphroditic but do not self-pollinate and pollination is most probably brought about by beetles."
605	2008. Janick, J./Paull, R.E.. The encyclopedia of fruit & nuts. Cabi Publishing, Wallingford, UK	[Requires specialist pollinators? No] "Beetles of the Nitidulidae family are the main insect pollinators of <i>Annona</i> flowers. Nitidulid beetles ( <i>Carpophilus</i> and <i>Uroporus</i> spp.) are the important pollinators of <i>Annona</i> flowers with wind and self-pollination being low (1.5%)."
606	2008. Janick, J./Paull, R.E.. The encyclopedia of fruit & nuts. Cabi Publishing, Wallingford, UK	[Reproduction by vegetative fragmentation? No] " <i>Annona</i> spp. are usually propagated by seed.
606	2011. Dave's Garden. PlantFishes: pond apple, alligator apple <i>Annona glabra</i> . Dave's Garden, <a href="http://davesgarden.com/guides/pf/go/2059/">http://davesgarden.com/guides/pf/go/2059/</a>	[Reproduction by vegetative fragmentation? No] Propagation Methods: From woody stem cuttings From hardwood cuttings From seed; direct sow outdoors in fall By grafting
607	2001. Department of Natural Resources Queensland. Weeds of national significance - pond apple ( <i>Annona glabra</i> ). National Weeds Strategy Executive Committee, Launceston <a href="http://www.weeds.org.au/docs/ponstrat.pdf">http://www.weeds.org.au/docs/ponstrat.pdf</a>	[Minimum generative time (years)? 2] Plants are believed to reach reproductive maturity in two years.
607	2003. CRC. Weed management guide - pond apple <i>Annona glabra</i> . CRC Australian Weed Management, <a href="http://www.weeds.gov.au/publications/guidelines/wons/pubs/a-glabra.pdf">http://www.weeds.gov.au/publications/guidelines/wons/pubs/a-glabra.pdf</a>	[Minimum generative time (years)? 2] Plants start reproducing after two years.
701	2011. WRA Specialist. Personal Communication.	[Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)? No] No evidence.
702	2007. Land Protection (Invasive Plants and Animals). Fact sheet: pond apple ( <i>Annona glabra</i> ). Land Protection (Invasive Plants and Animals) Australian Government, <a href="http://www.dpi.qld.gov.au/documents/Biosecurity_EnvironmentalPests/IPA-Pond-Apple-PP58.pdf">http://www.dpi.qld.gov.au/documents/Biosecurity_EnvironmentalPests/IPA-Pond-Apple-PP58.pdf</a>	[Propagules dispersed intentionally by people? Yes] "Originally introduced to Australia as grafting stock for commercially grown custard apple in 1912, pond apple has become a serious environmental weed in north Queensland with the potential to spread throughout northern Australia."
702	2011. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network (GRIN) [Online Database Index]. National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl">http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl</a>	[Propagules dispersed intentionally by people? Yes] Cultivated in Ghana; China; Taiwan; Malaysia; Philippines; Venezuela
703	2007. Land Protection (Invasive Plants and Animals). Fact sheet: pond apple ( <i>Annona glabra</i> ). Land Protection (Invasive Plants and Animals) Australian Government, <a href="http://www.dpi.qld.gov.au/documents/Biosecurity_EnvironmentalPests/IPA-Pond-Apple-PP58.pdf">http://www.dpi.qld.gov.au/documents/Biosecurity_EnvironmentalPests/IPA-Pond-Apple-PP58.pdf</a>	[Propagules likely to disperse as a produce contaminant? No] "The fruit is spherical, about 5–15 cm in diameter and green in colour. Fruit have the appearance of a smooth-skinned custard apple. The ripe fruit falls from the tree when yellow/orange, and turns black on the ground. The flesh turns orange at maturity. Each fruit contains 100–200 seeds that are similar in size and shape to pumpkin seed." [No evidence of produce contamination]
704	2001. Department of Natural Resources Queensland. Weeds of national significance - pond apple ( <i>Annona glabra</i> ). National Weeds Strategy Executive Committee, Launceston <a href="http://www.weeds.org.au/docs/ponstrat.pdf">http://www.weeds.org.au/docs/ponstrat.pdf</a>	[Propagules adapted to wind dispersal? No] Dispersed by water, animals and flightless birds.
705	2001. Department of Natural Resources Queensland. Weeds of national significance - pond apple ( <i>Annona glabra</i> ). National Weeds Strategy Executive Committee, Launceston <a href="http://www.weeds.org.au/docs/ponstrat.pdf">http://www.weeds.org.au/docs/ponstrat.pdf</a>	[Propagules water dispersed Yes] "Water is the main dispersal agent. Flood waters and ocean currents carry pond apple fruits and seeds appear to remain viable after prolonged periods in salt or fresh water."

706	2001. Department of Natural Resources Queensland. Weeds of national significance - pond apple ( <i>Annona glabra</i> ). National Weeds Strategy Executive Committee, Launceston <a href="http://www.weeds.org.au/docs/ponstrat.pdf">http://www.weeds.org.au/docs/ponstrat.pdf</a>	[Propagules bird dispersed? ] Cassowaries disperse the seeds in Australia. [However they are flightless birds.]
706	2007. Land Protection (Invasive Plants and Animals). Fact sheet: pond apple ( <i>Annona glabra</i> ). Land Protection (Invasive Plants and Animals) Australian Government, <a href="http://www.dpi.qld.gov.au/documents/Biosecurity_EnvironmentalPests/IPA-Pond-Apple-PP58.pdf">http://www.dpi.qld.gov.au/documents/Biosecurity_EnvironmentalPests/IPA-Pond-Apple-PP58.pdf</a>	[Propagules bird dispersed? o] "The fruit is spherical, about 5–15 cm in diameter and green in colour. Fruit have the appearance of a smooth-skinned custard apple. The ripe fruit falls from the tree when yellow/orange, and turns black on the ground. The flesh turns orange at maturity. Each fruit contains 100–200 seeds that are similar in size and shape to pumpkin seed."
707	2007. Land Protection (Invasive Plants and Animals). Fact sheet: pond apple ( <i>Annona glabra</i> ). Land Protection (Invasive Plants and Animals) Australian Government, <a href="http://www.dpi.qld.gov.au/documents/Biosecurity_EnvironmentalPests/IPA-Pond-Apple-PP58.pdf">http://www.dpi.qld.gov.au/documents/Biosecurity_EnvironmentalPests/IPA-Pond-Apple-PP58.pdf</a>	[Propagules dispersed by other animals (externally)? No] "The fruit is spherical, about 5–15 cm in diameter and green in colour. Fruit have the appearance of a smooth-skinned custard apple. The ripe fruit falls from the tree when yellow/orange, and turns black on the ground. The flesh turns orange at maturity. Each fruit contains 100–200 seeds that are similar in size and shape to pumpkin seed." [No means of external attachment.]
708	2001. Department of Natural Resources Queensland. Weeds of national significance - pond apple ( <i>Annona glabra</i> ). National Weeds Strategy Executive Committee, Launceston <a href="http://www.weeds.org.au/docs/ponstrat.pdf">http://www.weeds.org.au/docs/ponstrat.pdf</a>	[Propagules survive passage through the gut? Yes] "Animals including fruit bats, cassowaries and feral pigs spread seeds within and between catchments." "Fruit bats have been seen carrying whole fruit into the Innisfail swamp and seeds passing through pigs and cassowaries remain viable."
801	2003. CRC. Weed management guide - pond apple <i>Annona glabra</i> . CRC Australian Weed Management, <a href="http://www.weeds.gov.au/publications/guidelines/wons/pubs/a-glabra.pdf">http://www.weeds.gov.au/publications/guidelines/wons/pubs/a-glabra.pdf</a>	[Prolific seed production (>1000/m <sup>2</sup> )? Yes] The edible fruit looks like a smooth skinned custard apple, is similar in shape to a mango and 50–150 mm in diameter. It contains about 140 pumpkin-like seeds
801	2004. Setter, S.D./Setter, M.J./Campbell, S.D.. Longevity of pond apple ( <i>Annona glabra</i> L.) seeds and implications for management. <a href="http://www.cabdirect.org/abstracts/20053008781.html;jsessionid=C627E295CBC3160310BD7C746E1AC40C">http://www.cabdirect.org/abstracts/20053008781.html;jsessionid=C627E295CBC3160310BD7C746E1AC40C</a>	[Prolific seed production (>1000/m <sup>2</sup> )? Yes] "Stands of the invasive woody weed pond apple ( <i>Annona glabra</i> ) now dominate many wetland and riparian habitats in northern Queensland, Australia. One of the major concerns to land managers attempting to control pond apple is its very high annual seed production and associated potential for large-scale seedling regrowth following implementation of control activities."
802	2001. Department of Natural Resources Queensland. Weeds of national significance - pond apple ( <i>Annona glabra</i> ). National Weeds Strategy Executive Committee, Launceston <a href="http://www.weeds.org.au/docs/ponstrat.pdf">http://www.weeds.org.au/docs/ponstrat.pdf</a>	[Evidence that a persistent propagule bank is formed (>1 yr)?]The size and longevity of the seed bank is not yet known.
802	2004. Setter, S.D./Setter, M.J./Campbell, S.D.. Longevity of pond apple ( <i>Annona glabra</i> L.) seeds and implications for management. <a href="http://www.cabdirect.org/abstracts/20053008781.html;jsessionid=C627E295CBC3160310BD7C746E1AC40C">http://www.cabdirect.org/abstracts/20053008781.html;jsessionid=C627E295CBC3160310BD7C746E1AC40C</a>	[Evidence that a persistent propagule bank is formed (>1 yr)? No] "To better understand the seed bank dynamics of pond apple, a series of studies has been initiated, with research focused on determining the size and longevity of seed banks. This information will provide an indication of the potential regrowth that can be expected and for how long landholders will need to retreat infestations. One of the experiments undertaken involved placing freshly collected seeds (contained in mesh bags) in the field at depths of 0, 2 and 10 cm belowground. Seeds were exhumed and examined after 3, 6, 9, 12, 24, 30 and 36 months. Freshly collected pond apple seeds were highly viable (99%) and most germinated within three months when buried at a depth of 2 cm. The soil surface provided the least favoured environment for field germination, yet 88% still germinated within six months. The high field germination of pond apple seeds in combination with some natural mortality resulted in very few viable seeds (<3%) remaining in the seed bank 12 months after burial. Subsequent retrievals of buried packets recorded no viable seeds, although a single seedling was found growing from a surface located bag at the 30-month sampling period. These results suggest that the seed bank of pond apple should be largely depleted within one year and totally exhausted within three years, provided that no further seed input occurs."
802	2008. Janick, J./Paull, R.E.. The encyclopedia of fruit & nuts. Cabi Publishing, Wallingford, UK	[Evidence that a persistent propagule bank is formed (>1 yr)? No] " <i>Annona</i> species are usually propagated by seed. A rapid loss of seed viability occurs (6 months) and seeds should be planted as soon as possible after removal from the fruit."

803	2001. Department of Natural Resources Queensland. Weeds of national significance - pond apple ( <i>Annona glabra</i> ). National Weeds Strategy Executive Committee, Launceston <a href="http://www.weeds.org.au/docs/ponstrat.pdf">http://www.weeds.org.au/docs/ponstrat.pdf</a>	[Well controlled by herbicides? Yes] Herbicides available for woody weeds have proved effective. Trees have been controlled by stem injection using triclopyr plus picloram or by glyphosate. Triclopyr plus picloram can also be used for basal bark spraying and treatment of
804	2001. Department of Natural Resources Queensland. Weeds of national significance - pond apple ( <i>Annona glabra</i> ). National Weeds Strategy Executive Committee, Launceston <a href="http://www.weeds.org.au/docs/ponstrat.pdf">http://www.weeds.org.au/docs/ponstrat.pdf</a>	[Tolerates, or benefits from, mutilation, cultivation, or fire? Yes] "The plant tolerates some mutilation or damage. Cut stems may strike if they come into immediate contact with wet soil."
805	2001. Department of Natural Resources Queensland. Weeds of national significance - pond apple ( <i>Annona glabra</i> ). National Weeds Strategy Executive Committee, Launceston <a href="http://www.weeds.org.au/docs/ponstrat.pdf">http://www.weeds.org.au/docs/ponstrat.pdf</a>	[Effective natural enemies present locally (e.g. introduced biocontrol agents)?] Biological control has not been investigated for pond apple.