

<b>Taxon:</b> <i>Prunus persica</i> (L.) Batsch	<b>Family:</b> Rosaceae
<b>Common Name(s):</b> peach peach tree	<b>Synonym(s):</b> <i>Amygdalus persica</i> var. <i>camelliiflora</i> <i>Amygdalus persica</i> var. <i>densa</i> <i>Prunus persica</i> var. <i>camelliiflora</i> hort. <i>Prunus persica</i> var. <i>densa</i> Makino <i>Prunus persica</i> var. <i>persica</i>

<b>Assessor:</b> Chuck Chimera	<b>Status:</b> Assessor Approved	<b>End Date:</b> 2 Aug 2018
<b>WRA Score:</b> 4.0	<b>Designation:</b> EVALUATE	<b>Rating:</b> Evaluate

**Keywords:** Fruit Tree, Sparsely Naturalized, Toxic Seeds, Edible Fruit, Self-Fertile

Qsn #	Question	Answer Option	Answer
101	Is the species highly domesticated?	y=-3, n=0	y
102	Has the species become naturalized where grown?	y=1, n=-1	y
103	Does the species have weedy races?		
201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	(0-low; 1-intermediate; 2-high) (See Appendix 2)	Low
202	Quality of climate match data	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
203	Broad climate suitability (environmental versatility)	y=1, n=0	y
204	Native or naturalized in regions with tropical or subtropical climates	y=1, n=0	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		
303	Agricultural/forestry/horticultural weed	n=0, y = 2*multiplier (see Appendix 2)	n
304	Environmental weed		
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		
403	Parasitic	y=1, n=0	n
404	Unpalatable to grazing animals	y=1, n=-1	n
405	Toxic to animals	y=1, n=0	y
406	Host for recognized pests and pathogens		
407	Causes allergies or is otherwise toxic to humans		

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)	y=1, n=0	y
411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets	y=1, n=0	n
501	Aquatic	y=5, n=0	n
502	Grass	y=1, n=0	n
503	Nitrogen fixing woody plant	y=1, n=0	n
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	y=1, n=0	n
601	Evidence of substantial reproductive failure in native habitat	y=1, n=0	n
602	Produces viable seed	y=1, n=-1	y
603	Hybridizes naturally	y=1, n=-1	y
604	Self-compatible or apomictic	y=1, n=-1	y
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	y
702	Propagules dispersed intentionally by people	y=1, n=-1	y
703	Propagules likely to disperse as a produce contaminant	y=1, n=-1	n
704	Propagules adapted to wind dispersal	y=1, n=-1	n
705	Propagules water dispersed		
706	Propagules bird dispersed	y=1, n=-1	n
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
708	Propagules survive passage through the gut	y=1, n=-1	y
801	Prolific seed production (>1000/m <sup>2</sup> )	y=1, n=-1	n
802	Evidence that a persistent propagule bank is formed (>1 yr)	y=1, n=-1	y
803	Well controlled by herbicides		
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?	y
	Source(s)	Notes
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 4, Fruits. Springer, New York	"Peaches probably originated from China, being one of the first fruit crop domesticated about 4,000 years ago. Cultivars grown today are derived largely from ecotypes native to southern China, an area with climate similar to that of the southeastern USA, a major peach growing region."
	Layne, D. R. & Bassi, D. (2008). The Peach: Botany, Production and Uses. CABI, Wallingford, UK	"The peach originated in China (Wang and Zhuang, 2001), where it is a symbol of long life (Fig. 2.1/Plate 25). Numerous pieces of evidence have revealed that China has the longest history of peach cultivation in the world. One discovery demonstrated that peach growing in China dates back to Neolithic times. When a Neolithic village site was discovered in Hemudu village, Yujao city, Zhejiang province in 1973, finds included wild peach stones dating back to 6000–7000 BC (Chen, 1994)."
102	Has the species become naturalized where grown?	y
	Source(s)	Notes
	Flora of North America Editorial Committee. (2014). Flora of North America: North of Mexico, Volume 9. Magnoliophyta: Picramniaceae to Rosaceae. Oxford University Press, New York and Oxford	"The fruits are popular on picnics, and peach saplings are commonly encountered anywhere pits are discarded. Escapes are usually short-lived; some escapes form naturalized populations."
103	Does the species have weedy races?	
	Source(s)	Notes
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	[Possibly weedy, although no weedy races specified]
201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	Low
	Source(s)	Notes
	Wu, Z. Y., P. H. Raven & D. Y. Hong, eds. 2003. Flora of China. Vol. 9 (Pittosporaceae through Connaraceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	"Although native to N China, truly wild peaches no longer exist. Peaches are important, fruit-bearing and ornamental plants cultivated throughout temperate and subtropical zones."
202	Quality of climate match data	High
	Source(s)	Notes
	Wu, Z. Y., P. H. Raven & D. Y. Hong, eds. 2003. Flora of China. Vol. 9 (Pittosporaceae through Connaraceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	"Although native to N China, truly wild peaches no longer exist. Peaches are important, fruit-bearing and ornamental plants cultivated throughout temperate and subtropical zones."

Qsn #	Question	Answer
203	Broad climate suitability (environmental versatility)	y
	Source(s)	Notes
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	"Climate A temperate zone fruit that grows better and produces better quality fruit in regions with warm summers. Dry weather at blossom time is preferred. <i>P. persica</i> is one of the least hardy of the stonefruits, but dormant buds can withstand about -20°C (Jackson and Looney, 1999). Climatic amplitude (estimates) - Altitude range: 50 - 220 m - Mean annual rainfall: 800 - 1400 mm - Rainfall regime: summer - Dry season duration: 3 - 5 months - Mean annual temperature: 18 - 23°C - Mean maximum temperature of hottest month: 24 - 30°C - Mean minimum temperature of coldest month: -25 - -22°C - Absolute minimum temperature: > -30°C"
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	"In Hawai'i Saucer Peach and Chinese Peach grow well at low elevations but bear better above 2,700'. The problem is in finding a location with both cool temperatures and sufficient rainfall. In Hawai'i, higher elevations that provide suitable temperatures are usually too dry for peaches. Peaches are fairly frequent in upcountry Maui in the area around Kula and Olinda, where they are grown as dooryard trees."
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 4, Fruits. Springer, New York	"Peach is a cool climate species that adapts well to temperate or sub-temperate areas with cool winters and a warm summer. Peach tree requires a winter chilling period for flowering and fruiting. On average, most cultivars have chilling requirements of 600–900 h."

Qsn #	Question	Answer
204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	Notes
	Oppenheimer, Hank L. 2003. New plant records from Maui and Hawai'i Counties. Bishop Museum Occasional Papers. 73: 3-30	"According to Skolmen (1980: 361), 13 individuals of a <i>Prunus</i> species were planted in Kula Forest Reserve in 1943. One of the collections cited may be from the offspring of these plantings; there are far more than 13 individuals, although none appeared to have spread very far. Material examined: MAUI: East Maui, Makawao Dist, Kalialinui, 640 m, lanky trees in gully bottom below waterfall, 29 Apr 2001, Oppenheimer H40143; Kula Forest Reserve, Waiohuli, 1951 m, in degraded subalpine shrubland, 20 May 2001, Oppenheimer H50121."
	Wu, Z. Y., P. H. Raven & D. Y. Hong, eds. 2003. Flora of China. Vol. 9 (Pittosporaceae through Connaraceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	"Although native to N China, truly wild peaches no longer exist. Peaches are important, fruit-bearing and ornamental plants cultivated throughout temperate and subtropical zones."
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	"In Hawai'i Saucer Peach and Chinese Peach grow well at low elevations but bear better above 2,700'. The problem is in finding a location with both cool temperatures and sufficient rainfall. In Hawai'i, higher elevations that provide suitable temperatures are usually too dry for peaches."

205	Does the species have a history of repeated introductions outside its natural range?	y
	Source(s)	Notes
	Wu, Z. Y., P. H. Raven & D. Y. Hong, eds. 2003. Flora of China. Vol. 9 (Pittosporaceae through Connaraceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	"Although native to N China, truly wild peaches no longer exist. Peaches are important, fruit-bearing and ornamental plants cultivated throughout temperate and subtropical zones."
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 4, Fruits. Springer, New York	"Peaches were introduced to Persia (Iran) along silk trading routes and was given the species epithet <i>persica</i> denoting Persia which was then believed to be its source of origin. Along the route of migration secondary centres of diversity originated (Middle Asia, Transcaucasus). Greeks and especially Romans distributed the peach throughout Europe and England around 300–400 BC. During the sixteenth to seventeenth centuries, Portuguese explorers brought the peach to south America and the Spaniard explorers introduced it to the northern Florida coast of North America. Native Americans and settlers distributed the peach across North America into southern Canada."

301	Naturalized beyond native range	y
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R. & Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"...the peach [ <i>Prunus persica</i> (L.) Batsch] occurs in the wild at least at Kipuka-puau, Hawai'i (L. Cuddihy, pers. comm.) and along the Peacock Flats Trail, Wai'anae Mountains, O'ahu (P. Higashino, pers. comm.), but these plants appear to represent persisting plantings or escapes."

Qsn #	Question	Answer
	<p>Wu, Z. Y., P. H. Raven &amp; D. Y. Hong, eds. 2003. Flora of China. Vol. 9 (Pittosporaceae through Connaraceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis</p>	<p>"Amygdalus persica ... Cultivated throughout China, escaped from cultivation in waste fields or on disturbed slopes; 1500-2200 m. Escaped from cultivation in at least Gansu, Hebei, and Shanxi." ... "Although native to N China, truly wild peaches no longer exist."</p>
	<p>West, C. J., &amp; Thompson, A. M. (2013). Small, dynamic and recently settled: responding to the impacts of plant invasions in the New Zealand (Aotearoa) archipelago. Pp. 285-311 In Foxcroft et al. (eds.). Plant Invasions in Protected Areas. Springer, Dordrecht</p>	<p>"It is often possible to anticipate a species' behaviour based on biological traits, however, <i>Prunus persica</i> (peach) proved an exception. This species generally requires considerable winter chilling for strong foliage growth and fruit crops (Lyle 2006) and it is likely that chilling would be required to break seed dormancy (Martinez-Gomez and Dicenta 2001). However, the climate on Raoul Island is humid and warm temperate, substantially different from the optimal conditions described for cultivation. Therefore, it was anticipated that seeds would rot and viability rapidly reduce. Despite this, <i>P. persica</i> naturalised away from planted individuals, most likely to have been inadvertently spread by staff on the island. Because of the amount of naturalisation and the tendency for felled, poisoned trees to resprout, <i>P. persica</i> was added to the eradication programme in 1994."</p>
	<p>Oppenheimer, Hank L. 2003. New plant records from Maui and Hawai'i Counties. Bishop Museum Occasional Papers. 73: 3-30</p>	<p>"Native to China, the peach is a commonly planted fruit tree at higher elevations in Hawai'i and is sparingly naturalized in the Kula region of East Maui. It has also been observed growing wild in Makawao Forest Reserve, in gulch bottoms of the Waiohiwi and Kahakapao drainages. Wagner et al. (1990: 1100, 1102) previously considered the peach in the wild on O'ahu and Hawai'i islands as persisting plantings or escapes. Humans, intermittent stream flow, domestic cattle, and feral ungulates are probably spreading the seeds. It is also locally naturalized in the eastern U.S., California, and southern Ontario, Canada (Little, 1980: 471-472). <i>P. persica</i> is a small, shrubby tree with deciduous, lanceolate, toothed leaves; solitary pink flowers have rounded petals, are sessile on the stem and appear before the leaves; the fleshy fruit is 5.0-7.5cm in diameter and covered with velvety hairs, with a large pitted stone (Neal, 1965: 395-396; Little, 1980: 471). According to Skolmen (1980: 361), 13 individuals of a <i>Prunus</i> species were planted in Kula Forest Reserve in 1943. One of the collections cited may be from the offspring of these plantings; there are far more than 13 individuals, although none appeared to have spread very far. Material examined: MAUI: East Maui, Makawao Dist, Kalialinui, 640 m, lanky trees in gully bottom below waterfall, 29 Apr 2001, Oppenheimer H40143; Kula Forest Reserve, Waiohuli, 1951 m, in degraded subalpine shrubland, 20 May 2001, Oppenheimer H50121."</p>
	<p>Webb, C. J., Sykes, W. R., &amp; Garnock-Jones, P. J. 1988. Flora of New Zealand Volume IV. Botany Division, DSIR, Christchurch, New Zealand</p>	<p>"<i>P. persica</i> is widely cultivated for its fr. and there are many cvs. In N. Auckland it occurs both as isolated trees and in small groups, often on the margins of old plantations." ... "Both the peach and nectarine often persist in old gardens as relics of cultivation and the latter is listed as wild for Canterbury by Healy, A. J., in Knox, G. A. (Ed.) The Natural History of Canterbury (1968)."</p>
	<p>Flora of North America Editorial Committee. (2014). Flora of North America: North of Mexico, Volume 9. Magnoliophyta: Picramniaceae to Rosaceae. Oxford University Press, New York and Oxford</p>	<p>"The fruits are popular on picnics, and peach saplings are commonly encountered anywhere pits are discarded. Escapes are usually short-lived; some escapes form naturalized populations."</p>

Qsn #	Question	Answer
302	Garden/amenity/disturbance weed	
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Cultivation escape or persists after planting] "...the peach [ <i>Prunus persica</i> (L.) Batsch] occurs in the wild at least at Kipuka-puauulu, Hawai'i (L. Cuddihy, pers. comm.) and along the Peacock Flats Trail, Wai'anae Mountains, O'ahu (P. Higashino, pers. comm.), but these plants appear to represent persisting plantings or escapes."
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	Cited as a weed in some situations, but impacts are generally not significant

303	Agricultural/forestry/horticultural weed	n
	Source(s)	Notes
	Wu, Z. Y., P. H. Raven & D. Y. Hong, eds. 2003. Flora of China. Vol. 9 (Pittosporaceae through Connaraceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	"Cultivated throughout China, escaped from cultivation in waste fields or on disturbed slopes"
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"persisting plantings or escapes."
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	[No evidence] "Major Pathway/s: Crop, Forestry, Herbal, Ornamental, Pasture Dispersed by: Humans, Animals, Flyers, Escapee"

304	Environmental weed	
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"persisting plantings or escapes." [No evidence from Hawaiian Islands]
	Queensland Government. (2018). Weeds of Australia. <i>Prunus persica</i> (L.) Batsch var. <i>persica</i> . <a href="http://keyserver.lucidcentral.org">http://keyserver.lucidcentral.org</a> . [Accessed 31 Jul 2018]	[Listed as an environmental weed, but no negative impacts have been described] "Widely naturalised in southern and eastern Australia (i.e. in eastern Queensland, eastern New South Wales, the ACT and south-eastern South Australia). Also sparingly naturalised in Victoria, naturalised on Lord Howe Island, and possibly naturalised in Western Australia. Notes Peach ( <i>Prunus persica</i> var. <i>persica</i> ) is regarded as an environmental weed in New South Wales and as a minor environmental weed in Victoria and South Australia."
	West, C. J., & Thompson, A. M. (2013). Small, dynamic and recently settled: responding to the impacts of plant invasions in the New Zealand (Aotearoa) archipelago. Pp. 285-311 In Foxcroft et al. (eds.). Plant Invasions in Protected Areas. Springer, Dordrecht	[Targeted for eradication, but impacts unspecified in this publication] "Because of the amount of naturalisation and the tendency for felled, poisoned trees to resprout, <i>P. persica</i> was added to the eradication programme in 1994."

305	Congeneric weed	y
	Source(s)	Notes

Qsn #	Question	Answer
	Schrader, G., & Starfinger, U. (2009). Risk analysis for alien plants in European forests, illustrated by the example of <i>Prunus serotina</i> . Pp. 195-215 in Kohli, R. K. et al. (eds.). <i>Invasive Plants and Forest Ecosystems</i> . CRC Press, Boca Raton, FL	"The conclusions for <i>P. serotina</i> are that it can enter, establish, and spread in the PRA area. It is evident that it can become a major threat to biodiversity and to economic goals. Therefore, management options should be analyzed to reduce the risks posed by this plant." ... "Most of the management options mentioned earlier are not applicable to <i>P. serotina</i> . Since the species has severe negative impacts through its forming of tall and dense stands as well as its rapid spread, any large-scale use of the species will lead to severe negative impacts. As control is also hardly feasible and the beneficial effects of <i>P. serotina</i> are comparatively small, the result of the risk analysis should be a cancellation of any intended plantings, at least in and near forests."

401	Produces spines, thorns or burrs	n
	Source(s)	Notes
	Flora of North America Editorial Committee. (2014). <i>Flora of North America: North of Mexico, Volume 9. Magnoliophyta: Picramniaceae to Rosaceae</i> . Oxford University Press, New York and Oxford	[No evidence] "Trees, not suckering, 30–100 dm, not thorny. Twigs with terminal end buds, glabrous. Leaves deciduous; petiole 5–10(–15) mm, <not winged>, glabrous, sometimes glandular distally, glands –4, <discoïd>; blade oblong to lanceolate, <folded along midribs, often falcate>, (5–)7–15 × 2–4.5 cm, base cuneate to obtuse, margins crenulate-serrulate, teeth blunt, glandular, apex acuminate, surfaces glabrous."

402	Allelopathic	
	Source(s)	Notes
	Seigler, D. S. (2006). Basic pathways for the origin of allelopathic compounds. Pp. 11-61 in <i>In Allelopathy</i> . Springer, Dordrecht.	[Possibly Yes] "The dimer propelargonidin and the corresponding monomer afzelachin inhibit growth of rice seedlings and may be responsible for limited growth of peach seedlings (Ohigashi et al. 1982). Secretion of propelargonidin may explain, in part, the problem with replanting peaches, <i>Prunus persica</i> (Ohigashi et al. 1982). Interestingly, (+)- catechin and procyanidins promote growth of callus cultures of other <i>Prunus</i> species (Feucht and Treutter, 1999)."

403	Parasitic	n
	Source(s)	Notes
	Flora of North America Editorial Committee. (2014). <i>Flora of North America: North of Mexico, Volume 9. Magnoliophyta: Picramniaceae to Rosaceae</i> . Oxford University Press, New York and Oxford	"Trees, not suckering, 30–100 dm, not thorny." [Rosaceae. No evidence]

404	Unpalatable to grazing animals	n
	Source(s)	Notes



Qsn #	Question	Answer
	Scott, J. D., & Townsend, T. W. (1985). Deer damage and damage control in Ohio's nurseries, orchards and Christmas tree plantings: the grower's view. Pp. 205-214 In Second Eastern Wildlife Damage Control Conference (1985)	"Table 2, Plant species and summary of damage characteristics of plants most commonly listed by growers incurring deer damage." [Prunus persica stems, twigs, buds & bark are damaged by deer]
	Masters, R., Mitchell, P. & Dobbs, S. 2010. Ornamental and garden plants: controlling deer damage F-6427. Oklahoma State University Cooperative Extension Unit. <a href="http://www.icwdm.org">http://www.icwdm.org</a> . [Accessed 1 Aug 2018]	"Woody Plants—Frequently Damaged" [Includes Prunus persica browsed by white-tailed deer ( <i>Odocoileus virginianus</i> )]

405	Toxic to animals	y
	Source(s)	Notes
	Quattrocchi, U. 2012. CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	"Wilted leaves, twigs, stems and seeds are poisonous, highly toxic, cyanogenic glycoside, amygdalin, may be fatal if ingested. Peach ( <i>Prunus persica</i> ) and apricot ( <i>Prunus armeniaca</i> ) have pits with enough toxin to cause poisoning and death in humans and animals."

406	Host for recognized pests and pathogens	
	Source(s)	Notes
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	"Fruit flies, the major pest of peaches, can be controlled by spraying or with bait traps."
	Gilman, E.F. & Watson, D.G. 1994. Prunus persica: Peach. Fact Sheet ST-513. Institute of Food and Agricultural Sciences, University of Florida, Gainesville, FL. <a href="http://hort.ufl.edu/">http://hort.ufl.edu/</a> . [Accessed 2 Aug 2018]	"Peach trees are actually plagued by so many different pests and diseases that they should probably only be planted by the horticulturally dedicated homeowner" ... "Pest resistance: very sensitive to one or more pests or diseases which can affect tree health or aesthetics"
	WRA Specialist. 2018. Personal Communication	Affected by a number of widespread pests & pathogens, but unclear whether or not peaches are an important alternate host for other commercially important crops

407	Causes allergies or is otherwise toxic to humans	
	Source(s)	Notes
	Quattrocchi, U. 2012. CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	[Potentially Yes, but seeds & other plant parts unlikely to be ingested] "Wilted leaves, twigs, stems and seeds are poisonous, highly toxic, cyanogenic glycoside, amygdalin, may be fatal if ingested. Peach ( <i>Prunus persica</i> ) and apricot ( <i>Prunus armeniaca</i> ) have pits with enough toxin to cause poisoning and death in humans and animals."

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

Qsn #	Question	Answer
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 4, Fruits. Springer, New York	[Known from cultivation & generally not occurring in fire prone areas] "Peach is a cool climate species that adapts well to temperate or sub-temperate areas with cool winters and a warm summer. Peach tree requires a winter chilling period for flowering and fruiting."
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[No evidence from Hawaiian Islands] "persisting plantings or escapes."
	Wu, Z. Y., P. H. Raven & D. Y. Hong, eds. 2003. Flora of China. Vol. 9 (Pittosporaceae through Connaraceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	[No evidence] "Cultivated throughout China, escaped from cultivation in waste fields or on disturbed slopes; 1500-2200 m. Escaped from cultivation in at least Gansu, Hebei, and Shanxi."

409	Is a shade tolerant plant at some stage of its life cycle	
	Source(s)	Notes
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 4, Fruits. Springer, New York	"It grows best in full sun."
	Gilman, E.F. & Watson, D.G. 1994. <i>Prunus persica</i> : Peach. Fact Sheet ST-513. Institute of Food and Agricultural Sciences, University of Florida, Gainesville, FL. <a href="http://hort.ufl.edu/">http://hort.ufl.edu/</a> . [Accessed 2 Aug 2018]	"Peach trees should be located in full sun or partial shade on very well-drained, moist, acid soils."

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	Notes
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 4, Fruits. Springer, New York	"Peach trees are extremely sensitive to poorly drained soils. In areas of poor drainage, roots will die, resulting in stunted growth and eventual death of the tree. Although peach trees will grow well in a wide range of soil types, a deep soil ranging in texture from a sandy loam to a sandy clay loam is preferred."

411	Climbing or smothering growth habit	n
	Source(s)	Notes
	Flora of North America Editorial Committee. (2014). Flora of North America: North of Mexico, Volume 9. Magnoliophyta: Picramniaceae to Rosaceae. Oxford University Press, New York and Oxford	"Trees, not suckering, 30–100 dm, not thorny."

412	Forms dense thickets	n
	Source(s)	Notes
	Wu, Z. Y., P. H. Raven & D. Y. Hong, eds. 2003. Flora of China. Vol. 9 (Pittosporaceae through Connaraceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	[No description from regions of origin] "Cultivated throughout China, escaped from cultivation in waste fields or on disturbed slopes; 1500 -2200 m."

Qsn #	Question	Answer
	Sullivan, J. J., Williams, P. A., Timmins, S. M., & Smale, M. C. (2009). Distribution and spread of environmental weeds along New Zealand roadsides. <i>New Zealand Journal of Ecology</i> , 33(2): 190-204	[No evidence from New Zealand] "Populations of some feral fruit tree species are dependent on continuous seed input from passing cars (Smith 1986) and this applies in New Zealand where apple ( <i>Malus × domestica</i> ) and peach ( <i>Prunus persica</i> ) trees are scattered through the lowlands even though they do not appear to regenerate naturally (PAW and MCS, pers. obs.). Such dispersal is often clumped around picnic grounds and other access points close to roads, as are weeds in illegally dumped garden waste"
	Flora of North America Editorial Committee. (2014). <i>Flora of North America: North of Mexico, Volume 9. Magnoliophyta: Picramniaceae to Rosaceae</i> . Oxford University Press, New York and Oxford	[No evidence from North American flora] "The fruits are popular on picnics, and peach saplings are commonly encountered anywhere pits are discarded. Escapes are usually short-lived; some escapes form naturalized populations."
	Oppenheimer, Hank L. 2003. New plant records from Maui and Hawai'i Counties. <i>Bishop Museum Occasional Papers</i> . 73: 3-30	[No formation of dense stands on Maui 50+ years after introduction] "According to Skolmen (1980: 361), 13 individuals of a <i>Prunus</i> species were planted in Kula Forest Reserve in 1943. One of the collections cited may be from the offspring of these plantings; there are far more than 13 individuals, although none appeared to have spread very far."

501	Aquatic	n
	Source(s)	Notes
	Flora of North America Editorial Committee. (2014). <i>Flora of North America: North of Mexico, Volume 9. Magnoliophyta: Picramniaceae to Rosaceae</i> . Oxford University Press, New York and Oxford	[Terrestrial] "Trees, not suckering, 30–100 dm, not thorny." ... Roadsides, fencerows, abandoned farms, streamsides, canyons; 0–2300 m"

502	Grass	n
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2018. 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 31 Jul 2018]	Family: Rosaceae Subfamily: Amygdaloideae Tribe: Amygdaleae

503	Nitrogen fixing woody plant	n
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2018. 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 31 Jul 2018]	Family: Rosaceae Subfamily: Amygdaloideae Tribe: Amygdaleae

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	Notes

Qsn #	Question	Answer
	Flora of North America Editorial Committee. (2014). Flora of North America: North of Mexico, Volume 9. Magnoliophyta: Picramniaceae to Rosaceae. Oxford University Press, New York and Oxford	"Trees, not suckering, 30–100 dm, not thorny. Twigs with terminal end buds, glabrous. Leaves deciduous; petiole 5–10(–15) mm, <not winged>, glabrous, sometimes glandular distally, glands –4, <discoïd>; blade oblong to lanceolate, <folded along midribs, often falcate>, (5–)7–15 × 2–4.5 cm, base cuneate to obtuse, margins crenulate-serrulate, teeth blunt, glandular, apex acuminate, surfaces glabrous."

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes
	Wu, Z. Y., P. H. Raven & D. Y. Hong, eds. 2003. Flora of China. Vol. 9 (Pittosporaceae through Connaraceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	[Native range no longer relevant, but cultivated plants presumably not experiencing reproductive failure] "Cultivated throughout China, escaped from cultivation in waste fields or on disturbed slopes; 15002200 m. Escaped from cultivation in at least Gansu, Hebei, and Shanxi. Although native to N China, truly wild peaches no longer exist. Peaches are important, fruit-bearing and ornamental plants cultivated throughout temperate and subtropical zones."

602	Produces viable seed	y
	Source(s)	Notes
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 4, Fruits. Springer, New York	"Commercially, peaches are propagated by asexual methods such as grafting, budding (e.g. T-budding) and stem cuttings as they do not come true to type from seeds."
	Layne, D. R. & Bassi, D. (2008). The Peach: Botany, Production and Uses. CABI, Wallingford, UK	"Seeds are highly germinable after stratification, their chilling requirement being related to the chilling requirement of the mother tree (Pérez, 1990; Pérez et al., 1993)."

603	Hybridizes naturally	y
	Source(s)	Notes
	Das, B., Ahmed, N., & Singh, P. (2011). Prunus diversity-early and present development: a review. International Journal of Biodiversity and Conservation, 3(14), 721-734	"Hybridization readily takes place between <i>P. amygdalus</i> and <i>P. persica</i> (Kester and Asay, 1988)."
	Layne, D. R. & Bassi, D. (2008). The Peach: Botany, Production and Uses. CABI, Wallingford, UK	"Interspecific hybrid cultivars (from controlled or natural hybridization of a combination of Prunus species including <i>P. persica</i> , <i>P. dulcis</i> , <i>P. domestica</i> , <i>P. cerasifera</i> , <i>P. insititia</i> , <i>P. davidiana</i> , <i>P. spinosa</i> , <i>P. salicina</i> )."

Qsn #	Question	Answer
604	Self-compatible or apomictic	y
	Source(s)	Notes
	Layne, D. R. & Bassi, D. (2008). The Peach: Botany, Production and Uses. CABI, Wallingford , UK	"Peach is an insect-pollinated species and it is self-fertile. Even if some genotypes show a low fruit set, no evidence has ever been reported of self-incompatibility as happens in most other <i>Prunus</i> species. Flower fertilization from self-pollination is generally high (ranging from 10 to 90% of fruit set), resulting in a high number of fruitlets (Szabò and Nyéki, 1999);"
605	Requires specialist pollinators	n
	Source(s)	Notes
	Layne, D. R. & Bassi, D. (2008). The Peach: Botany, Production and Uses. CABI, Wallingford , UK	"Peach is an insect-pollinated species and it is self-fertile."
606	Reproduction by vegetative fragmentation	n
	Source(s)	Notes
	Gilman, E.F. & Watson, D.G. 1994. <i>Prunus persica</i> : Peach. Fact Sheet ST-513. Institute of Food and Agricultural Sciences, University of Florida, Gainesville, FL. <a href="http://hort.ufl.edu/">http://hort.ufl.edu/</a> . [Accessed 2 Aug 2018]	"Propagation is by cuttings or grafting."
	Layne, D. R. & Bassi, D. (2008). The Peach: Botany, Production and Uses. CABI, Wallingford , UK	[Propagated asexually, but no evidence of natural vegetative spread] "Peach cultivars, like the majority of fruit tree species, are genetically heterozygous and therefore propagated exclusively by asexual methods. This is considered necessary because reproduction from seed produces individuals that differ appreciably from one another and from the parent tree. Thus, although current propagation techniques make it possible to obtain self rooted varieties, grafting desirable scions on to suitable rootstocks still represents the most common propagation technique for peach." ... "Propagation from seed still represents the most widely adopted method for nursery production of peach seedling rootstocks."
607	Minimum generative time (years)	2
	Source(s)	Notes
	Layne, D. R. & Bassi, D. (2008). The Peach: Botany, Production and Uses. CABI, Wallingford , UK	"Seedlings bear their first harvest from 2 to 3 years after obtaining the seeds, depending on climatic and cultivation conditions." ... "the generation cycle for peach is approximately 3 years (a short cycle compared with most tree fruit species; Sherman and Lyrene, 1983);"
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y
	Source(s)	Notes
	Oppenheimer, Hank L. 2003. New plant records from Maui and Hawai'i Counties. Bishop Museum Occasional Papers. 73: 3-30	"Humans, intermittent stream flow, domestic cattle, and feral ungulates are probably spreading the seeds."

Qsn #	Question	Answer
	Sullivan, J. J., Williams, P. A., Timmins, S. M., & Smale, M. C. (2009). Distribution and spread of environmental weeds along New Zealand roadsides. <i>New Zealand Journal of Ecology</i> , 33(2): 190-204	"Populations of some feral fruit tree species are dependent on continuous seed input from passing cars (Smith 1986) and this applies in New Zealand where apple ( <i>Malus × domestica</i> ) and peach ( <i>Prunus persica</i> ) trees are scattered through the lowlands even though they do not appear to regenerate naturally (PAW and MCS, pers. obs.). Such dispersal is often clumped around picnic grounds and other access points close to roads, as are weeds in illegally dumped garden waste (Sullivan et al. 2005, pers. obs.)."
	Henderson, L. (1991). Invasive alien woody plants of the Orange Free State. <i>Bothalia</i> , 21(1): 73-89	" <i>Prunus persica</i> . another member of the Rosaceae is widespread but appears to have a more limited ability to spread. It is usually confined to roadsides, railway lines, disturbed ground around habitation and at bridges over rivers which suggests that its distribution is largely determined by the dispersal of its seed by humans."
	Flora of North America Editorial Committee. (2014). <i>Flora of North America: North of Mexico, Volume 9. Magnoliophyta: Picramniaceae to Rosaceae</i> . Oxford University Press, New York and Oxford	[Discarded pits are the source of unintentional dispersal] "The fruits are popular on picnics, and peach saplings are commonly encountered anywhere pits are discarded. Escapes are usually short-lived; some escapes form naturalized populations."
	Medeiros, A.C., Loope, L.L. & Chimera, C.G. 1998. Flowering Plants and Gymnosperms of Haleakala National Park. Technical Report 120. Pacific Cooperative Studies Unit, Honolulu, HI	[Growing in heavily trafficked areas from discarded pits] "Small trees growing along trails and roadsides, apparently originating from discarded peach pits. 6800-8400 ft. "

702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	CAB International, 2005. <i>Forestry Compendium</i> . CAB International, Wallingford, UK	"More than 70 countries produce annual production statistics for peaches and nectarines, world production being about 11 Mt, with the Mediterranean Basin, and China, Japan and Korea being the main centres of production. Most of the peach industry produces fruit for the fresh market, while California, Greece, Australia and South Africa produce more firm clingstone peaches for processing (peach halves, slices or fruit juices). Increased production in recent years has been mostly for fresh market consumption, aided by cultivars that extend the growing season (Jackson and Looney, 1999)."
	Staples, G.W. & Herbst, D.R. 2005. <i>A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places</i> . Bishop Museum Press, Honolulu, HI	"Native to China, <i>P. persica</i> is an extremely important edible fruit in warm-temperate climates, with numerous cultivars." ... "In Hawai'i saucer peach and Chinese peach grow well at low elevations but bear better above 2,700'."

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	Notes
	Lim, T.K. (2012). <i>Edible Medicinal and Non-Medicinal Plants. Volume 4, Fruits</i> . Springer, New York	"Seed is red-brown, oval shaped and 1.5–2 cm long, bitter." [No evidence. Unlikely given large seed size]

Qsn #	Question	Answer
704	<b>Propagules adapted to wind dispersal</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 4, Fruits. Springer, New York	"Seed is red-brown, oval shaped and 1.5–2 cm long, bitter."

705	<b>Propagules water dispersed</b>	
	<b>Source(s)</b>	<b>Notes</b>
	Hewitt, A. (2013). Revisiting Tony Price’s (1979) account of the native vegetation of Duck River and Rookwood Cemetery, western Sydney. <i>Cunninghamia</i> , 13(1), 25-124	"Species restricted to drainage lines, creeks:" [Includes <i>Prunus persica</i> , suggesting possible water dispersal]
	Oppenheimer, Hank L. 2003. New plant records from Maui and Hawai’i Counties. <i>Bishop Museum Occasional Papers</i> . 73: 3-30	[Possibly Yes] "Humans, intermittent stream flow, domestic cattle, and feral ungulates are probably spreading the seeds."

706	<b>Propagules bird dispersed</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Wotton, D. M., & McAlpine, K. G. (2015). Seed dispersal of fleshy-fruited environmental weeds in New Zealand. <i>New Zealand Journal of Ecology</i> , 39(2), 155-169	" <i>Prunus persica</i> is the only single-seeded weed in New Zealand lacking potential seed dispersers because its fruits are too large to swallow whole."
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 4, Fruits. Springer, New York	"Seed is red-brown, oval shaped and 1.5–2 cm long, bitter." [Seeds too large for most birds in the Hawaiian Islands to ingest & disperse internally]
	Farrar, D. R. (2001). Exotic and invasive woody plant species in Iowa. <i>Journal of the Iowa Academy of Science</i> 108(4), 154-157	"Table 1. Exotic woody species and hybrids naturalized in Iowa. Species marked as on the list are those considered invasive or potentially invasive. Dispersal indicates the principal means by which these species migrate to new sites or persist after establishment." [Includes <i>Prunus persica</i> - Dispersal = other. Distinguished from other taxa which are listed as bird-dispersed]
	Henderson, L. (1991). Invasive alien woody plants of the Orange Free State. <i>Bothalia</i> , 21(1): 73-89	[Speculation that crows could disperse seeds. Possible that gamebirds could move seeds in the Hawaiian Islands] " <i>Prunus persica</i> . another member of the Rosaceae is widespread but appears to have a more limited ability to spread." ... "Its fruit may also be dispersed by crows. Many large-seeded fruits, including those of <i>Prunus</i> spp. are known to be dispersed by crows (Ridley 1930)."

707	<b>Propagules dispersed by other animals (externally)</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Lim, T.K. (2012). Edible Medicinal and Non-Medicinal Plants. Volume 4, Fruits. Springer, New York	"Seed is red-brown, oval shaped and 1.5–2 cm long, bitter." [Seeds large & lack means of external attachment]
	Nakamoto, A., Kinjo, K., & Izawa, M. (2009). The role of Orii’s flying fox ( <i>Pteropus dasymallus inopinatus</i> ) as a pollinator and a seed disperser on Okinawa-jima Island, the Ryukyu Archipelago, Japan. <i>Ecological research</i> , 24(2), 405-414	"Table 2 Dispersal types of seeds and characteristics of fruits used by Orii’s flying-foxes on Okinawa-jima Island" [ <i>Prunus persica</i> carried in the mouth & dropped by flying-foxes]

708	<b>Propagules survive passage through the gut</b>	<b>y</b>
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Oppenheimer, Hank L. 2003. New plant records from Maui and Hawai'i Counties. Bishop Museum Occasional Papers. 73: 3-30	"Humans, intermittent stream flow, domestic cattle, and feral ungulates are probably spreading the seeds."
	Nakamoto, A., Kinjo, K., & Izawa, M. (2009). The role of Orii's flying fox ( <i>Pteropus dasymallus inopinatus</i> ) as a pollinator and a seed disperser on Okinawa-jima Island, the Ryukyu Archipelago, Japan. <i>Ecological research</i> , 24(2), 405-414	"Table 2 Dispersal types of seeds and characteristics of fruits used by Orii's flying-foxes on Okinawa-jima Island" [ <i>Prunus persica</i> carried in the mouth & dropped by flying-foxes]

801	Prolific seed production (>1000/m2)	n
	<b>Source(s)</b>	<b>Notes</b>
	CAB International, 2005. <i>Forestry Compendium</i> . CAB International, Wallingford, UK	[Large, single-seeded fruit] "The fruits are fleshy and pubescent downy drupes enclose a hard, furrowed one-seeded stone. Peaches are either freestone, semi-freestone or clingstone. The seed, used for medicinal purposes, is 1.2-1.9 x 0.8-1.2 cm, 0.2-0.4 cm thick and a flattened long-ovate in shape, with a bitter taste."

802	Evidence that a persistent propagule bank is formed (>1 yr)	y
	<b>Source(s)</b>	<b>Notes</b>
	West, C. J., & Thompson, A. M. (2013). Small, dynamic and recently settled: responding to the impacts of plant invasions in the New Zealand (Aotearoa) archipelago. Pp. 285-311 In Foxcroft et al. (eds.). <i>Plant Invasions in Protected Areas</i> . Springer, Dordrecht	"The longevity of seeds was unexpected, and seedlings are still germinating more than 12 years after the adult trees were removed (Fig. 14.1a). It would appear that <i>P. persica</i> on Raoul Island has physiological seed dormancy (sensu Finch-Savage and Leubner-Metzger 2006) and that the difference between winter and summer temperatures is sufficient to break seed dormancy for a proportion of the seed bank each year."

803	Well controlled by herbicides	
	<b>Source(s)</b>	<b>Notes</b>
	West, C. J., & Thompson, A. M. (2013). Small, dynamic and recently settled: responding to the impacts of plant invasions in the New Zealand (Aotearoa) archipelago. Pp. 285-311 In Foxcroft et al. (eds.). <i>Plant Invasions in Protected Areas</i> . Springer, Dordrecht	[Resprouts after herbicide treatment. Chemicals unspecified] "Because of the amount of naturalisation and the tendency for felled, poisoned trees to resprout, <i>P. persica</i> was added to the eradication programme in 1994."
	WRA Specialist. 2018. Personal Communication	Unknown. No specific information on herbicide efficacy or chemical control of this generally desired, intentionally cultivated plant



Qsn #	Question	Answer
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y
	Source(s)	Notes
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	"- Ability to coppice; pollard"
	West, C. J., & Thompson, A. M. (2013). Small, dynamic and recently settled: responding to the impacts of plant invasions in the New Zealand (Aotearoa) archipelago. Pp. 285-311 In Foxcroft et al. (eds.). Plant Invasions in Protected Areas. Springer, Dordrecht	"Because of the amount of naturalisation and the tendency for felled, poisoned trees to resprout, <i>P. persica</i> was added to the eradication programme in 1994."

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Unknown. Limited information on natural populations in the Hawaiian islands] "persisting plantings or escapes."

**Summary of Risk Traits:**

## High Risk / Undesirable Traits

- Broad climate suitability (primarily temperate but also grown in subtropical climates)
- Sparsely naturalizing on Maui, Hawaiian Islands; widely introduced & persisting or naturalized elsewhere
- Regarded as a potential environmental weed in Australia & New Zealand
- Wilted leaves, twigs, stems & seeds poisonous to animals & people (if accidentally ingested)
- Tolerates many soil types
- Reproduces by seeds
- Hybridizes with other *Prunus* species
- Self-fertile & pollinated by several generalist insect pollinators
- Reaches maturity in 2-3 years from seed
- Seeds dispersed unintentionally (discarded pits) & intentionally by people; possibly water, & animals
- Seeds exhibit physiological seed dormancy & may form a persistent seed bank
- Able to coppice & resprout after cutting

## Low Risk Traits

- A domesticated plant with a long history of cultivation
- Despite reports of naturalization & weediness, evidence of impacts is usually lacking or unspecified
- Unarmed (no spines, thorns, or burrs)
- Palatable to deer & probably other browsing animals (in spite of reports of toxicity)
- May require full sun to thrive
- Not reported to spread vegetatively
- Fruits with large, single seeds that are unlikely to be dispersed without human assistance (or larger frugivorous animals)

## Second Screening Results for Tree/tree-like shrubs

(A) Shade tolerant or known to form dense stands?> Not known to form dense stands. Tolerant of partial shade

(B) Bird or clearly wind-dispersed?> Possibly dispersed by larger birds, but humans are the primary vector for dispersal

Outcome = Evaluate

