Taxon: Sabal causiarum **Family:** Arecaceae

Common Name(s): palma de escoba
palma de sombrero
Puerto Rican hat palm
Puerto Rican palmetto

Synonym(s): Inodes causiarum O. F. Cook

Assessor: No Assessor **Status:** Assessor Approved **End Date:** 18 Jul 2014

WRA Score: 1.0 **Designation:** EVALUATE **Rating:** Evaluate

Keywords: Naturalized, Tropical Palm, Ornamental, Slow-growing, Bird-dispersed

Qsn #	Question	Answer Option	Answer
101	Is the species highly domesticated?	y=-3, n=0	n
102	Has the species become naturalized where grown?		
103	Does the species have weedy races?		
201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
202	Quality of climate match data	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
203	Broad climate suitability (environmental versatility)	y=1, n=0	n
204	Native or naturalized in regions with tropical or subtropical climates	y=1, n=0	y
205	Does the species have a history of repeated introductions outside its natural range?	y=-2, ?=-1, n=0	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)	n
304	Environmental weed	n=0, y = 2*multiplier (see Appendix 2)	n
305	Congeneric weed		
401	Produces spines, thorns or burrs	y=1, n=0	n
402	Allelopathic		
403	Parasitic	y=1, n=0	n
404	Unpalatable to grazing animals		
405	Toxic to animals	y=1, n=0	n
406	Host for recognized pests and pathogens		
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	n
408	Creates a fire hazard in natural ecosystems	y=1, n=0	n

Qsn #	Question	Answer Option	Answer
409	Is a shade tolerant plant at some stage of its life cycle	y=1, n=0	n
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	n
604	Self-compatible or apomictic		
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation	y=1, n=-1	n
607	Minimum generative time (years)	1 year = 1, 2 or 3 years = 0, 4+ years = -1	>3
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y=1, n=-1	n
702	Propagules dispersed intentionally by people	y=1, n=-1	y
703	Propagules likely to disperse as a produce contaminant	y=1, n=-1	n
704	Propagules adapted to wind dispersal	y=1, n=-1	n
705	Propagules water dispersed		
706	Propagules bird dispersed	y=1, n=-1	y
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
708	Propagules survive passage through the gut	y=1, n=-1	y
801	Prolific seed production (>1000/m2)		
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	n
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**
	Zona, S. 1990. A monograph of Sabal (Arecaceae: Coryphoideae). Aliso, 12(4): 583-666	No evidence

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

103	**Does the species have weedy races?**	
	Source(s)	**Notes**
	WRA Specialist. 2014. Personal Communication	NA

201	**Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"**	**High**
	Source(s)	**Notes**
	Acevedo-Rodríguez, P. & Strong, M.T. 2005. Monocotyledons and Gymnosperms of Puerto Rico and the Virgin Islands. Contributions from the United States National Herbarium 52: 1-415	"General distribution: Hispaniola (southern coasts of Haiti and the Dominican Republic), Puerto Rico and the Virgin Islands."

202	**Quality of climate match data**	**High**
	Source(s)	**Notes**
	Acevedo-Rodríguez, P. & Strong, M.T. 2005. Monocotyledons and Gymnosperms of Puerto Rico and the Virgin Islands. Contributions from the United States National Herbarium 52: 1-415	

203	**Broad climate suitability (environmental versatility)**	**n**
	Source(s)	**Notes**
	Riffle, R.L.& Craft, P. 2003. An Encyclopedia of Cultivated Palms. Timber Press, Portland, OR.	"...indigenous to Hispaniola, Puerto Rico, and the small island of Anegada in the British Virgin Islands, where it grows in open places on sandy soil at low elevations, often in large groves." ... "The species is adaptable to zones 8 through 11, except in regions where temperature regularly reaches 10°F; under these conditions, even large specimens will surely die."
	Floridata. 2012. Sabal causiarum. http://www.floridata.com/ref/s/saba_cau.cfm. [Accessed 18 Jul 2014]	"Hardiness: USDA Zones 8B - 11."

Qsn #	Question	Answer
204	**Native or naturalized in regions with tropical or subtropical climates**	**y**
	Source(s)	**Notes**
	Acevedo-Rodríguez, P. & Strong, M.T. 2005. Monocotyledons and Gymnosperms of Puerto Rico and the Virgin Islands. Contributions from the United States National Herbarium 52: 1-415	"General distribution: Hispaniola (southern coasts of Haiti and the Dominican Republic), Puerto Rico and the Virgin Islands."

205	**Does the species have a history of repeated introductions outside its natural range?**	**y**
	Source(s)	**Notes**
	Georgi, N.J., Sarikou, S. and Thymakis, N. 2005. The Growth of Palms under Sheltered Mediterranean Conditions. Palms 49(4): 18 –194	"Also, several unusual palm species for the Mediterranean region, such us Archontophoenix cunninghamiana, Pritchardia lowreyana, Ravenea rivularis, Sabal causiarum, have done suprisingly well under these specific conditions."
	Dransfield, J. 1986. Flora of Tropical East Africa - Palmae. A.A. Balkema, Rotterdam, Netherlands	"Checklist of Palms Cultivated in East Africa" [List includes Sabal causiarum ... Distribution includes Upland Towns (UT), Coastal Towns (CT) and Amani (A)]
	Floridata. 2012. Sabal causiarum. http://www.floridata.com/ref/s/saba_cau.cfm. [Accessed 18 Jul 2014]	[Cultivated as an ornamental in Florida]

301	**Naturalized beyond native range**	**y**
	Source(s)	**Notes**
	Zona, S. 1990. A monograph of Sabal (Arecaceae: Coryphoideae). Aliso, 12(4): 583-666	"It is reported by Questel (I 94 1) to be naturalized on St. Barthelemy. It has been introduced on Guadeloupe, where it persists after cultivation."
	Kirk, T.K. 2009. Tropical Trees of Florida and the Virgin Islands: A Guide to Identification, Characteristics and Uses. Pineapple Press Inc., Sarasota, FL	"Sabal causiarum is a very slow-growing tree. Most specimens in the V.I. have been planted, although there are reports that it has become naturalized. It has not become naturalized in south Florida."

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

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

304	**Environmental weed**	**n**

Qsn #	Question	Answer
	Source(s)	**Notes**
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence

305	Congeneric weed	
	Source(s)	**Notes**
	Zona, S. 1990. A monograph of Sabal (Arecaceae: Coryphoideae). Aliso, 12(4): 583-666	[Genus has "weedy" traits that may contribute to its ability to become invasive] "These species, as well as S. bermudana, S. rosei, and S. pumos, are "weedy" species, colonizing gaps and patchy habitats." ... "Sabal is typically a weed of tropical grasslands, wetlands, or pastures-all unpredictable habitats-and appears to have many characteristics of an r strategist (early succession or canopy gap colonizer, high annual rate of fruit set, small seeds). Unlike many herbaceous or perennial weeds, Sabal has large, long-lived leaves"
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Sabal mexicana, Sabal minor & Sabal palmetto, included in weed lists, but detrimental impacts not verified]
	Meyer, J. Y., Lavergne, C., & Hodel, D. R. 2008. Time bombs in gardens: invasive ornamental palms in tropical islands, with emphasis on French Polynesia (Pacific Ocean) and the Mascarenes (Indian Ocean). Palms, 52(2): 71-83	No evidence

401	Produces spines, thorns or burrs	n
	Source(s)	**Notes**
	Acevedo-Rodríguez, P. & Strong, M.T. 2005. Monocotyledons and Gymnosperms of Puerto Rico and the Virgin Islands. Contributions from the United States National Herbarium 52: 1-415	[Genus Description] "Small to large, solitary, unarmed palms" [Species Description] "Large, heavy-trunked palm up to 16 m tall, the trunk gray, slightly rough in texture, and faintly ringed with leaf-scars. Petioles 1-2 m long, up to nearly 5 cm wide, equaling or exceeding the blades in length; hastula acute, up to 21 cm long or more, glabrous or nearly so, with margins often prominently upturned; blades usually 1.5-2 m long, with 60-120 segments per leaf, these 2.5-5.8 cm wide joined basally for ca. 49 % of their length, the free portion long-bifurcate; tissue firm, light green on upper (adaxial) side, usually somewhat glaucous beneath; numerous hair-like filaments borne from the sinuses between the segments."

402	Allelopathic	
	Source(s)	**Notes**
	FindTheBest.com, Inc. 2014. Sabal causiarum. http://plants.findthebest.com/l/1978/Sabal-causiarum. [Accessed 18 Jul 2014]	"Known Allelopath No"
	WRA Specialist. 2014. Personal Communication	Unknown

403	Parasitic	n

Qsn #	Question	Answer
	Source(s)	**Notes**
	Acevedo-Rodríguez, P. & Strong, M.T. 2005. Monocotyledons and Gymnosperms of Puerto Rico and the Virgin Islands. Contributions from the United States National Herbarium 52: 1-415	"Large, heavy-trunked palm up to 16 m tall, the trunk gray, slightly rough in texture, and faintly ringed with leaf-scars." [Arecaceae]

404	Unpalatable to grazing animals	
	Source(s)	**Notes**
	WRA Specialist. 2014. Personal Communication	Unknown

405	Toxic to animals	n
	Source(s)	**Notes**
	Wagstaff, D.J. 2008. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	No reports of toxicity in genus

406	Host for recognized pests and pathogens	
	Source(s)	**Notes**
	Tucker, C. M. 1927. Sabal causiarum (Cook) Beccari: A new host of the coconut bud-rot fungus. Journal of Agricultural Research 34: 879-888	"A bud rot of Sahal causiarum showing symptoms identical with those of coconut bud rot is recorded and described." ... "The results establish Saial causiarum as a host of PliytopMhora palmivora and indicate the necessity for including it in eradication work for the control of coconut bud rot." ... "Three hosts of the coconut bud-rot fungus—Cocos nucijera^ Borassus flabellifer, and Sabal causiarum—^have been definitely established. C. plumosa probably should be added to the list, although it has not been used as a host in cross-inoculation work."
	Floridata. 2012. Sabal causiarum. http://www.floridata.com/ref/s/saba_cau.cfm. [Accessed 18 Jul 2014]	"The only pest problems for this palm are leafhoppers and the ganoderma fungus."
	Howard, F.W., & Abreu, E. 2007. The Palm Leaf Skeletonizer, Homaledra sabalella (Lepidoptera: Coleophoridae): Status and Potential Pest Management Options. Proceedings of the Florida State Horticultural Society 120: 356-359	"The palm leaf skeletonizer [Homaledra sabalella (Chambers)] is a species of moth that in its larval stage feeds on palm fronds (Fig. 1). It is common throughout Florida and other southeastern states on its native host, cabbage palmetto [Sabal palmetto (Walter) Schultes & Schultes f.]. The natural range of the species extends to the Greater Antilles, including Cuba, Hispaniola, and Puerto Rico (Lepesme, 1947). Its principal natural host in Puerto Rico seems to be the Puerto Rico hat palm [Sabal causiarum (O.F. Cook) Beccari]. The fi rst author has seen this insect's damage on fronds of palma cana (Sabal domingensis Beccari) in the Dominican Republic. The larvae feed on the surfaces of the host fronds, producing tubes of silk interlaced with their frass within which they reside as they feed..."

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	**Notes**

Qsn #	Question	Answer
	Riffle, R.L.& Craft, P. 2003. An Encyclopedia of Cultivated Palms. Timber Press, Portland, OR.	[No evidence] "...the leaves have been used for many years to weave hats as well as baskets and other utensils."
	Wagstaff, D.J. 2008. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	No evidence of toxicity in genus

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	**Notes**
	Zona, S. 1990. A monograph of Sabal (Arecaceae: Coryphoideae). Aliso, 12(4): 583-666	[No evidence. Grows in moist zone] "In Puerto Rico, Sabal causiarum grows in the Subtropical Moist Forest Zone (Ewel and Whitmore 1973) in sandy soil (Cook l90l) from sea level to 100 m in elevation. Common associates are Cedrela odorataL., Delonix regta (Bojer) Raf., Erythrina poeppigiana (walp.) o. F. cook, Ficus laevigataYahl, Hymenaea courbaril L., and Tabebuia heterophylla (DC) Britton."
	Acevedo-Rodríguez, P. & Strong, M.T. 2005. Monocotyledons and Gymnosperms of Puerto Rico and the Virgin Islands. Contributions from the United States National Herbarium 52: 1-415	[Not occurring in fire prone areas] "This species, which grows naturally chiefly near sea level (up to 100 m), seems to be indifferent as to substrate, occurring on sandy soils in some areas but elsewhere over limestone and different types of igneous rock (e. g., andesite on Guana Island)."

409	Is a shade tolerant plant at some stage of its life cycle	n
	Source(s)	**Notes**
	Riffle, R.L.& Craft, P. 2003. An Encyclopedia of Cultivated Palms. Timber Press, Portland, OR.	"It needs as much sun as possible, even in youth, and a free-draining soil."
	Floridata. 2012. Sabal causiarum. http://www.floridata.com/ref/s/saba_cau.cfm. [Accessed 18 Jul 2014]	"Light: Needs bright sunlight."
	Zona, S. 1990. A monograph of Sabal (Arecaceae: Coryphoideae). Aliso, 12(4): 583-666	"Most widespread species of Sabal (S. mauritiiformis, S. mexicana, S. palmetto, and S. yapa) as well as island endemics (S. causiarum, S. domingensis, and S. maritima) are small-fruited trees of the forest canopy. They thrive in high light intensity environments and commonly persist after forests are cleared for agricultural purposes."
	FindTheBest.com, Inc. 2014. Sabal causiarum. http://plants.findthebest.com/l/1978/Sabal-causiarum. [Accessed 18 Jul 2014]	"Shade Tolerance Intolerant"

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	**Notes**
	Floridata. 2012. Sabal causiarum. http://www.floridata.com/ref/s/saba_cau.cfm. [Accessed 18 Jul 2014]	"Adaptable to different soil types but prefers very well drained soils."
	Acevedo-Rodríguez, P. & Strong, M.T. 2005. Monocotyledons and Gymnosperms of Puerto Rico and the Virgin Islands. Contributions from the United States National Herbarium 52: 1-415	"seems to be indifferent as to substrate, occurring on sandy soils in some areas but elsewhere over limestone and different types of igneous rock (e. g., andesite on Guana Island)."

Qsn #	Question	Answer
411	**Climbing or smothering growth habit**	**n**
	Source(s)	**Notes**
	Acevedo-Rodríguez, P. & Strong, M.T. 2005. Monocotyledons and Gymnosperms of Puerto Rico and the Virgin Islands. Contributions from the United States National Herbarium 52: 1-415	"Large, heavy-trunked palm up to 16 m tall, the trunk gray, slightly rough in texture, and faintly ringed with leaf-scars."

412	**Forms dense thickets**	**y**
	Source(s)	**Notes**
	Henderson, A., Galeano, G. & Bernal, R. 1997. Field Guide to the Palms of the Americas. Princeton University Press, Princeton, NJ	"often forming dense and extensive colonies on sandy soils and coastal plains, from sea level to 100 m elevation."
	Lazell, J.D. 2005. Island: Fact and Theory in Nature. University of California Press, Berkeley and Los Angeles, CA	"Sabal causiarum ... Occurs in the thickets behind North Beach, also near the lower end of Grand Ghut and along the seacliffs at the northernmost end of the island. It appears absolutely indigenous at all of these sites. This species occurs elsewhere in the Virgin Islands only on Anegada..."

501	**Aquatic**	**n**
	Source(s)	**Notes**
	Acevedo-Rodríguez, P. & Strong, M.T. 2005. Monocotyledons and Gymnosperms of Puerto Rico and the Virgin Islands. Contributions from the United States National Herbarium 52: 1-415	"This species, which grows naturally chiefly near sea level (up to 100 m), seems to be indifferent as to substrate, occurring on sandy soils in some areas but elsewhere over limestone and different types of igneous rock (e. g., andesite on Guana Island)."

502	**Grass**	**n**
	Source(s)	**Notes**
	Acevedo-Rodríguez, P. & Strong, M.T. 2005. Monocotyledons and Gymnosperms of Puerto Rico and the Virgin Islands. Contributions from the United States National Herbarium 52: 1-415	Arecaceae

503	**Nitrogen fixing woody plant**	**n**
	Source(s)	**Notes**
	Acevedo-Rodríguez, P. & Strong, M.T. 2005. Monocotyledons and Gymnosperms of Puerto Rico and the Virgin Islands. Contributions from the United States National Herbarium 52: 1-415	Arecaceae

Qsn #	Question	Answer
504	**Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)**	**n**
	Source(s)	**Notes**
	Acevedo-Rodríguez, P. & Strong, M.T. 2005. Monocotyledons and Gymnosperms of Puerto Rico and the Virgin Islands. Contributions from the United States National Herbarium 52: 1-415	"Large, heavy-trunked palm up to 16 m tall, the trunk gray, slightly rough in texture, and faintly ringed with leaf-scars."

601	**Evidence of substantial reproductive failure in native habitat**	**n**
	Source(s)	**Notes**
	Zona, S. 1990. A monograph of Sabal (Arecaceae: Coryphoideae). Aliso, 12(4): 583-666	"Sabat causiarum flowers in the months of April through August. The species in not endangered"

602	**Produces viable seed**	**y**
	Source(s)	**Notes**
	van der Burg, J., Freitas, J. & Debrot, D. 2014. Seed germination methods for native Caribbean trees and shrubs. Plant Research International, Wageningen, The Netherlands	"Appendix I. Seed collection, storage behaviour, germination methods and survival characteristics of selected Bonarian tree species" ... "Sabal causiarum - 94% germination after 21 days. Germination in sand."
	Floridata. 2012. Sabal causiarum. http://www.floridata.com/ref/s/saba_cau.cfm. [Accessed 18 Jul 2014]	"Propagation: From seed which germinates in 2-3 months. Warning - very slow growing! Regular irrigation and feeding will improve growth rate. "

603	**Hybridizes naturally**	**n**
	Source(s)	**Notes**
	Zona, S. 1990. A monograph of Sabal (Arecaceae: Coryphoideae). Aliso, 12(4): 583-666	[No evidence] "Virtually nothing is known about whether hybridization in Sabal is possible and the relationship between hybridization and speciation in Sabal. Hybridization has been implicated (Zona 1985, 1987) in the origin of one species, but evidence is purely circumstantial. Mixed populations of two or three species can be found in the wild (Bataban6, Cuba, for example), but such populations appear to contain no hybrid intermediates. Isolation barriers, beyond those of ecology, phenology, and pollinator specificity, are likely in play."

604	**Self-compatible or apomictic**	
	Source(s)	**Notes**
	Carrington, M.E., Gottfried, T.D. & Mullahey, J.J. 2003. Pollination Biology of Saw Palmetto (Serenoa repens) in Southwestern Florida. Palms 47(2): 95–103	[Related species capable of self-pollination] "Where saw palmetto is cultivated in greenhouses, nurseries or plantations, however, this study has shown that opportunities may exist for self- or crosspollination of flowers via hand-pollination."

Qsn #	Question	Answer
	East, E. M. 1940. The distribution of self-sterility in the flowering plants. Proceedings of the American Philosophical Society 82: 449-518	[Suspected of being self-compatible] "Self-sterility is unknown in this family. Though mostly moncecious through abortion, with a tendency toward dichogamy, I believe that all palms are self-fertile. My observa- tions on individual isolated fruiting specimens include the fol- lowing genera; Acanthorhiza H. Wendl., Actinophloeus Becc., Areca L., Arenga Labill., Butia Becc., Caryota L., Elaeis Jacq., Guilielma Mart., Latania Comm., Livingstona R. Br., Phoenix L., Rhaphis L. f., Roystonea 0. F. Cook, Sabal Adans, Salacca Reinw., Thrinax L. f. apud Sw., and Washingtonia H. Wendl."

605	Requires specialist pollinators	n
	Source(s)	**Notes**
	Acevedo-Rodríguez, P. & Strong, M.T. 2005. Monocotyledons and Gymnosperms of Puerto Rico and the Virgin Islands. Contributions from the United States National Herbarium 52: 1-415	"Inflorescences arcuate, conspicuously equaling or extending beyond the leaves; primary bracts strongly pointed; ultimate branchlets slender, glabrous, 3-8 cm long. Flowers white, slightly fragrant, 2.7-5.2 mm long at anthesis; filaments 2.8-4.5 mm long; pistil short, stout."
	Zona, S. 1990. A monograph of Sabal (Arecaceae: Coryphoideae). Aliso, 12(4): 583-666	"Sabal palmetto and S. maritima growing in the Jardin Botanico Nacional de Cuba, Havana, are visited by numerous species and individuals of Hymenoptera, viz., bees and wasps. Flowers of S. causiarum were collected in the Dominican Republic also with numerous bees. These observations suggest that Hymenoptera, especially solitary bees of the Megachilidae and Halictidae, are probably the principal pollinators for the genus. Sabal has many morphological traits that suit it to bee pollination."

606	Reproduction by vegetative fragmentation	n
	Source(s)	**Notes**
	Floridata. 2012. Sabal causiarum. http://www.floridata.com/ref/s/saba_cau.cfm. [Accessed 18 Jul 2014]	[No evidence. Single trunked palm propagated from seed] "This palm is distinguished from other Sabals by its massive smooth gray trunk which can grow up to 4 ft (1.2 m) in diameter!" ... "Propagation: From seed which germinates in 2-3 months. Warning - very slow growing!"

607	Minimum generative time (years)	>3
	Source(s)	**Notes**
	Kirk, T.K. 2009. Tropical Trees of Florida and the Virgin Islands: A Guide to Identification, Characteristics and Uses. Pineapple Press Inc., Sarasota, FL	"Sabal causiarum is a very slow-growing tree. Most specimens in the V.I. have been planted, although there are reports that it has become naturalized. It has not become naturalized in south Florida."
	Floridata. 2012. Sabal causiarum. http://www.floridata.com/ref/s/saba_cau.cfm. [Accessed 18 Jul 2014]	[Presumablu 4+ years] "Propagation: From seed which germinates in 2-3 months. Warning - very slow growing!"

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

Qsn #	Question	Answer
	Zona, S. 1990. A monograph of Sabal (Arecaceae: Coryphoideae). Aliso, 12(4): 583-666	[Unlikely. No means of external attachment] "Fruit spherical or occasionally oblate-pyriform, black, 7.1-10.8 mm in diameter, 7 .5-10.4 mm high; seed oblate concave, 5.9-7.8 mm in diameter, 4.3-5.7 mm high; embryo supraequatorial, rarely equatorial or subequatorial"

702	Propagules dispersed intentionally by people	y
	Source(s)	**Notes**
	Ellison, D. & Ellison, A. 2001. Cultivated Palms of the World. UNSW Press, Sydney, Australia	"It is widely used in landscaping and thrives in warm-temperate to tropical climates if given adequate water in hot weather. Seed is freely available and germinates within 1 to 2 months."
	Floridata. 2012. Sabal causiarum. http://www.floridata.com/ref/s/saba_cau.cfm. [Accessed 18 Jul 2014]	[Ornamental uses] "One of the most striking Sabal species is Sabal causiarum, the Puerto Rican hat palm."

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	**Notes**
	Zona, S. 1990. A monograph of Sabal (Arecaceae: Coryphoideae). Aliso, 12(4): 583-666	[Unlikely. Fruits & seeds relatively large, & long time to maturity would likely prevent any accidental contamination of produce] "Fruit spherical or occasionally oblate-pyriform, black, 7.1-10.8 mm in diameter, 7 .5-10.4 mm high; seed oblate concave, 5.9-7.8 mm in diameter, 4.3-5.7 mm high"

704	Propagules adapted to wind dispersal	n
	Source(s)	**Notes**
	Acevedo-Rodríguez, P. & Strong, M.T. 2005. Monocotyledons and Gymnosperms of Puerto Rico and the Virgin Islands. Contributions from the United States National Herbarium 52: 1-415	"Fruits globose to globose-pyriform, often asymmetric; seeds oblate-concave, 5.9-8 (-10) mm in diam., dark glossy brown."

705	Propagules water dispersed	
	Source(s)	**Notes**
	Acevedo-Rodríguez, P. & Strong, M.T. 2005. Monocotyledons and Gymnosperms of Puerto Rico and the Virgin Islands. Contributions from the United States National Herbarium 52: 1-415	[Unknown if fruits are buoyant, or if seeds remain viable if exposed to sea water] "This species, which grows naturally chiefly near sea level (up to 100 m), seems to be indifferent as to substrate, occurring on sandy soils in some areas but elsewhere over limestone and different types of igneous rock..."

706	Propagules bird dispersed	y
	Source(s)	**Notes**
	Barnés Jr, V. 1946. The birds of Mona Island, Puerto Rico. The Auk, 63(3): 318-327	"Columba leucocephala" ... "Flocks were seen feeding on the seeds of the cogollo palm (Sabal causiarum) in the vicinity of Uvero." ... "Stomach contents of 17 birds consisted of fruits of papaya and cogollo palm (Sabal causiarum), drupes of jaguey (Ficus sp.), and large red berries of the cerezo."

Qsn #	Question	Answer
	Acevedo-Rodríguez, P. & Strong, M.T. 2005. Monocotyledons and Gymnosperms of Puerto Rico and the Virgin Islands. Contributions from the United States National Herbarium 52: 1-415	[Genus] "Fruits globose to sub-pyriform, brown or black when ripe, 1 -seeded; mesocarp fleshy, endocarp membranous." [Species] "Fruits globose to globose-pyriform, often asymmetric; seeds oblate-concave, 5.9-8 (-10) mm in diam., dark glossy brown."

707	Propagules dispersed by other animals (externally)	n
	Source(s)	**Notes**
	Zona, S. 1990. A monograph of Sabal (Arecaceae: Coryphoideae). Aliso, 12(4): 583-666	[Unlikely. Fruits/seeds lack means of external attachment. Rodents may carry seeds away & provide some external dispersal, but would most likely act as seed predators] "Fruit spherical or occasionally oblate-pyriform, black, 7.1-10.8 mm in diameter, 7 .5-10.4 mm high; seed oblate concave, 5.9-7.8 mm in diameter, 4.3-5.7 mm high"

708	Propagules survive passage through the gut	y
	Source(s)	**Notes**
	Zona, S. 1990. A monograph of Sabal (Arecaceae: Coryphoideae). Aliso, 12(4): 583-666	[Presumably survives gut passage] "Animal dispersal (zoochory), a "syndrome" suggested by fleshy fruit (van der Pijl 1982), plays a role in the local dispersal of Sabal (Zona and Henderson 1989). Both birds and mammals are known to consume Sabal fruit."

801	Prolific seed production (>1000/m2)	
	Source(s)	**Notes**
	Zona, S. 1990. A monograph of Sabal (Arecaceae: Coryphoideae). Aliso, 12(4): 583-666	[Unknown. Large tree with relatively small fruit for a palm] "Massive palm to ca. 10 m tall; trunk 35-60 cm DBH, smooth and gray." ... "Fruit spherical or occasionally oblate-pyriform, black, 7.1-10.8 mm in diameter, 7 .5-10.4 mm high"

802	Evidence that a persistent propagule bank is formed (>1 yr)	
	Source(s)	**Notes**
	Orozco-Segovia, A., Batis, A.I., Rojas-Arechiga, M. & Mendoza, A. 2003. Seed Biology of Palms: A Review. Palms 47(2): 79–94	"However, it is known that many species show rapid germination, such as Jubaea chilensis and Sabal causiarum that require only 13–20 and 12–22 days, respectively for full germination (Wagner 1982, Carpenter 1989), while others take more than five years to start germinating (e.g. Chamaedorea seifrizii) (Wagner 1982)."
	Royal Botanic Gardens Kew. 2008. Seed Information Database (SID). Version 7.1. http://data.kew.org/sid/. [Accessed 18 Jul 2014]	[Unknown] "Storage Behaviour: Orthodox?"

803	Well controlled by herbicides	
	Source(s)	**Notes**
	WRA Specialist. 2014. Personal Communication	No information on herbicide efficacy or chemical control of this species

804	Tolerates, or benefits from, mutilation, cultivation, or fire	n

Qsn #	Question	Answer
	Source(s)	**Notes**
	FindTheBest.com, Inc. 2014. Sabal causiarum. http://plants.findthebest.com/l/1978/Sabal-causiarum. [Accessed 18 Jul 2014]	"Fire Resistance - No" ... "Resprout Ability- No"

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

Summary of Risk Traits:

High Risk / Undesirable Traits
• Thrives in tropical climates
• Reported to be naturalized
• Genus has "weedy" traits that may contribute to its ability to become invasive
• Tolerates many soil types
• Forms thickets in native range
• Seeds dispersed by birds & intentionally by people

Low Risk Traits
• Despite naturalization, no reports of detrimental impacts found
• Unarmed (no spines, thorns or burrs)
• Non-toxic
• Ornamental
• Leaves used to weave hats & baskets
• Not reported to spread vegetatively
• Slow growing & long time to reproductive maturity
• Will not resprout after cutting or fire

Second Screening Results for Tree/tree-like shrubs

(A) Shade tolerant or known to form dense stands?> Yes. Forms dense stands in native range
(B) Bird-dispersed?> Dispersed by birds
(C) Life cycle <4 years? No. Reaches maturity in 4+ years
Outcome = Evaluate further