

Taxon: Sabal palmetto	Family: Arecaceae
Common Name(s): blue palmetto cabbage palm cabbage palmetto	Synonym(s): Corypha palmetto Walter (basionym) Inodes palmetto (Walter) O. F. Cook Inodes schwarzii O. F. Cook

Assessor: No Assessor	Status: Assessor Approved	End Date: 20 Jul 2014
WRA Score: 5.0	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)		
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		
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		
409	Is a shade tolerant plant at some stage of its life cycle		

Qsn #	Question	Answer Option	Answer
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	y
411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets	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		
604	Self-compatible or apomictic		
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation	y=1, n=-1	n
607	Minimum generative time (years)	1 year = 1, 2 or 3 years = 0, 4+ years = -1	>3
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y=1, n=-1	n
702	Propagules dispersed intentionally by people	y=1, n=-1	y
703	Propagules likely to disperse as a produce contaminant	y=1, n=-1	n
704	Propagules adapted to wind dispersal	y=1, n=-1	n
705	Propagules water dispersed	y=1, n=-1	y
706	Propagules bird dispersed	y=1, n=-1	y
707	Propagules dispersed by other animals (externally)		
708	Propagules survive passage through the gut	y=1, n=-1	y
801	Prolific seed production (>1000/m ²)	y=1, n=-1	n
802	Evidence that a persistent propagule bank is formed (>1 yr)		
803	Well controlled by herbicides		
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y=1, n=-1	y
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)		

Supporting Data:

Qsn #	Question	Answer
101	Is the species highly domesticated?	n
	Source(s)	Notes
	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
	Zona, S. 1990. A monograph of Sabal (Arecaceae: Coryphoideae). Aliso, 12(4): 583-666	"Sabal palmetto is a common palm of Cuba and the Bahamas, peninsular Florida, coastal Georgia, and South Carolina; it finds its northernmost station on Cape Fear, Smiths Island, North Carolina."

202	Quality of climate match data	High
	Source(s)	Notes
	Zona, S. 1990. A monograph of Sabal (Arecaceae: Coryphoideae). Aliso, 12(4): 583-666	

203	Broad climate suitability (environmental versatility)	
	Source(s)	Notes
	Burns, R.M. & Honkala, B.H. 1990. Silvics of North America. Volume 2: Hardwoods. Agriculture Handbook 654. U.S. Department of Agriculture, Forest Service, Washington, DC.	"The climate within the natural range of cabbage palmetto is principally subtropical to warm temperate, humid, with an average annual rainfall of 1000 to 1630 mm. (39 to 64 in) and average annual minimum and maximum temperatures from about -4° to 36° C (25° to 97° F). Low winter temperatures apparently limit the horticultural range of the species, which now extends more than 160 km (100 mi) north and inland of its natural range (3)."
	Riffle, R.L. & Craft, P. 2003. An Encyclopedia of Cultivated Palms. Timber Press, Portland, OR.	[Cold tolerance may enable it to persist and grow at higher elevations of tropical Pacific islands] "The palm is one of the world's hardiest to cold, thriving in zones 8 through 11, and marginal in 7b; but, as is the case with most Sabal species, it is not good in these zones where summer temperatures are cool, and it struggles to grow in areas such as the Pacific Northwest of the United States."

Qsn #	Question	Answer
204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	Notes
	Zona, S. 1990. A monograph of Sabal (Arecaceae: Coryphoideae). <i>Aliso</i> , 12(4): 583-666	"Sabal palmetto is a common palm of Cuba and the Bahamas, peninsular Florida, coastal Georgia, and South Carolina; it finds its northernmost station on Cape Fear, Smiths Island, North Carolina."

205	Does the species have a history of repeated introductions outside its natural range?	y
	Source(s)	Notes
	Bonner, F.T. & Karrfalt, R.P. (eds.). 2008. <i>The Woody Plant Seed Manual</i> . USDA FS Agriculture Handbook 727. Government Printing Office, Washington, D.C.	"Cabbage palmetto has been planted widely as an ornamental."

301	Naturalized beyond native range	y
	Source(s)	Notes
	Landry, G. P., & Reese, W. D. 1996. Sabal palmetto naturalized in western Louisiana. <i>Principes</i> , 40: 177-178	"The cabbage palm, Sabal palmetto, has been discovered well-established in several localities near Lake Charles and the Calcasieu River in Calcasieu Parish, Louisiana. A group of palms, estimated at more than 200 plants (numerous seedlings, young plants, and several mature trees), occurs just east of the Calcasieu River near the base of the Interstate Highway 10 (I-10) bridge over the Calcasieu River." ... "The other two collections probably represents escapes from cultivation in the New Orleans area, which has an extensive cultivated palm flora. The range of S. palmetto otherwise extends from southeastern North Carolina to the Florida Panhandle; it also occurs in Cuba and the Bahamas." ... "The origin of the Calcasieu Parish cabbage palms is undoubtedly a large group of cultivated plants that is growing along a stretch of man-made beach on the north shore of Lake Charles on the south side of I-10. These palms were planted in the 1960s when the lakeside recreation area was developed. Ironically, the cultivated palms do not appear to be faring as well as their progeny. Over the years many of them have died and there are no volunteers at the beach site."
	Riffle, R.L. & Craft, P. 2003. <i>An Encyclopedia of Cultivated Palms</i> . Timber Press, Portland, OR.	[Refers to native habitat] "Because the cabbage palmetto readily naturalizes, it is unthreatened in its natural range;"

302	Garden/amenity/disturbance weed	
	Source(s)	Notes
	Palmpedia. 2014. Sabal palmetto. http://www.palmpedia.net/wiki/Sabal_palmetto . [Accessed 20 Jul 2014]	[Displays weedy traits] "In their natural range they are considered weedy as they readily propagate throughout the landscape, usually assisted by birds."

303	Agricultural/forestry/horticultural weed	
	Source(s)	Notes

Qsn #	Question	Answer
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence
	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). <i>Palms</i> , 52(2): 71-83	No evidence to date

304	Environmental weed	n
	Source(s)	Notes
	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). <i>Palms</i> , 52(2): 71-83	No evidence
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence

305	Congeneric weed	n
	Source(s)	Notes
	Zona, S. 1990. A monograph of <i>Sabal</i> (Arecaceae: Coryphoideae). <i>Aliso</i> , 12(4): 583-666	[Genus has "weedy" traits that may contribute to its ability to become invasive] "These species, as well as <i>S. bermudana</i> , <i>S. rosei</i> , and <i>S. pumos</i> , are "weedy" species, colonizing gaps and patchy habitats." ... " <i>Sabal</i> 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, <i>Sabal</i> has large, long-lived leaves"
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[<i>Sabal mexicana</i> , & <i>Sabal minor</i> 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). <i>Palms</i> , 52(2): 71-83	No evidence

Qsn #	Question	Answer
401	Produces spines, thorns or burrs	n
	Source(s)	Notes
	Zona, S. 1990. A monograph of Sabal (Arecaceae: Coryphoideae). <i>Aliso</i> , 12(4): 583-666	[No evidence] "Stocky to emergent palm to ca. 20 m tall; trunk ca. 20-35 cm DBH, brown to gray. Leaves 15-30, evenly green, strongly costapalmate, generally filiferous; petiole 2.2-4.2 cm wide and, 1-2 m long; hastula acute to acuminate 5.3-18.0 cm long, lepidote or glabrescent, margins of hastula erect and undulate, or flat or entire, rarely revolute; segments 50-95 per leaf, connate for ca. 350% of their length, middle segment 55-120 cm long, 2.5-4.2 cm wide, 0.2-0.4 mm thick, transverse commissures conspicuous and short or obscure, apex bifurcate for 16-62 cm."

402	Allelopathic	
	Source(s)	Notes
	Burns, R.M. & Honkala, B.H. 1990. <i>Silvics of North America. Volume 2: Hardwoods. Agriculture Handbook 654. U.S. Department of Agriculture, Forest Service, Washington, DC.</i>	[Unknown, but diversity of plant community associates suggests no] "Because cabbage palmetto can accommodate a wide range of sites, it is found in association with many plant species, especially in south Florida. It is found on severe sites such as dunes, salt flats, barrier islands, cactus thickets, and wet prairies. It is a common component of such diverse communities as freshwater cypress swamps, relic inland dune ridges, and rockland pine forests, where it grows with South Florida slash pine (<i>Pinus elliottii</i> var. <i>densa</i>) and various tropical hardwoods on limestone outcrops."

403	Parasitic	n
	Source(s)	Notes
	Zona, S. 1990. A monograph of Sabal (Arecaceae: Coryphoideae). <i>Aliso</i> , 12(4): 583-666	"Stocky to emergent palm to ca. 20 m tall; trunk ca. 20-35 cm DBH, brown to gray." [Arecaceae]

404	Unpalatable to grazing animals	
	Source(s)	Notes
	Bonner, F.T. & Karrfalt, R.P. (eds.). 2008. <i>The Woody Plant Seed Manual. USDA FS Agriculture Handbook 727. Government Printing Office, Washington, D.C.</i>	"It has no forage value and only limited usefulness for wildlife."
	Burns, R.M. & Honkala, B.H. 1990. <i>Silvics of North America. Volume 2: Hardwoods. Agriculture Handbook 654. U.S. Department of Agriculture, Forest Service, Washington, DC.</i>	[Fruit palatable. Palatability of foliage unknown] "Perhaps the most important uses are as an ornamental and as wildlife food. The sheer magnitude of its annual fruit crop is such that it provides a substantial part of the diet of many animals such as deer, bear, raccoon, squirrel, bobwhite, and wild turkey (12,13, 18, 19, 20)."
	McPherson, K., & Williams, K. 1998. The role of carbohydrate reserves in the growth, resilience, and persistence of cabbage palm seedlings (<i>Sabal palmetto</i>). <i>Oecologia</i> , 117(4): 460-468	[Palatability may change with age] "Although leaves of <i>S. palmetto</i> are fairly unpalatable, cattle graze young tissue, and repeated defoliation may partly account for the absence of <i>S. palmetto</i> from most pastures."

405	Toxic to animals	n
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Qsn #	Question	Answer
	Source(s)	Notes
	Burns, R.M. & Honkala, B.H. 1990. <i>Silvics of North America. Volume 2: Hardwoods. Agriculture Handbook 654.</i> U.S. Department of Agriculture, Forest Service, Washington, DC.	[Fruit non-toxic] "Perhaps the most important uses are as an ornamental and as wildlife food. The sheer magnitude of its annual fruit crop is such that it provides a substantial part of the diet of many animals such as deer, bear, raccoon, squirrel, bobwhite, and wild turkey (12,13, 18, 19, 20)."
	Wagstaff, D.J. 2008. <i>International poisonous plants checklist: an evidence-based reference.</i> CRC Press, Boca Raton, FL	No reports of toxicity in genus

406	Host for recognized pests and pathogens	
	Source(s)	Notes
	Burns, R.M. & Honkala, B.H. 1990. <i>Silvics of North America. Volume 2: Hardwoods. Agriculture Handbook 654.</i> U.S. Department of Agriculture, Forest Service, Washington, DC.	"In its native environment, only a rising sea level, hurricanes, and organic soil fires are harmful to this species. It is apparently free of damaging insects and most other pathogens, although bole cankers have been reported (26). Seed predation by the bruchid beetle, as previously discussed, would be a major problem but for the large number of seed produced each year."
	Small, E. 2013. <i>North American Cornucopia: Top 100 Indigenous Food Plants.</i> CRC Press, Boca Raton, FL	"Phytoplasmas are specialized bacteria, discovered in 1967. They especially infect plants of tropical and subtropical areas, including some important crops, causing mild to fatal symptoms. Phytoplasmas are normally transmitted from plant to plant, by sap-sucking insects. A deadly phytoplasma named Date Palm Lethal Decline and Texas Phoenix Palm Decline affects several palm species, including cabbage palmettos. The disease was found in palms in Florida in 2006 and confirmed in cabbage palmetto in 2008. Quarantine regulations govern the sale and movement of palm species affected by the disease."

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	Notes
	Burns, R.M. & Honkala, B.H. 1990. <i>Silvics of North America. Volume 2: Hardwoods. Agriculture Handbook 654.</i> U.S. Department of Agriculture, Forest Service, Washington, DC.	[No evidence] "Cabbage palmetto is so called because of its edible terminal bud which tastes somewhat like that vegetable. The bud, also called swamp cabbage, is good both raw and cooked and is commercially canned and sold. Removal of the bud kills the tree, however. Cabbage palmetto was an important tree to the Seminole Indians, who often made their homes on cabbage-palm hammocks (23). They made bread meal from the fruit, which has a sweet, prunelike flavor, and they used the palm fronds to thatch their chickees (huts) and to make baskets (10,22,25). Many other uses of this tree are documented (17,22,26): pilings for wharfs because they resist attacks by seaworms, stems, hollowed out to form pipes for carrying water, ornamental table tops from polished stem cross-sections, canes, scrub brushes from the bark fibers and leaf sheaths, and logs for cribbing in early fortifications because they did not produce lethal splinters when struck by cannonballs."

Qsn #	Question	Answer
	Wong, M. 2006. Palms for Hawaii Landscapes. Landscape L-19. College of Tropical Agriculture and Human Resources, Honolulu, HI	[No evidence] "Palms are used for food in many ways." ... "Wine: Wine is made from the sap of <i>Borassus flabellifer</i> , <i>Caryota urens</i> , <i>Cocos nucifera</i> , <i>Elaeis guineensis</i> , <i>Phoenix dactylifera</i> , <i>Phoenix sylvestris</i> , and <i>Sabal palmetto</i> "
	Small, E. 2013. North American Cornucopia: Top 100 Indigenous Food Plants. CRC Press, Boca Raton, FL	[No evidence] "The Seminole Indians made extensive use of <i>S. palmetto</i> . The leaves were used to thatch their huts and to construct baskets, and the fruits and palm hearts were eaten. The trunks were employed to make house poles, food paddles, staffs, arrows, and a variety of 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	
	Source(s)	Notes
	McPherson, K., & Williams, K. 1998. Fire resistance of cabbage palms (<i>Sabal palmetto</i>) in the southeastern USA. <i>Forest Ecology and Management</i> , 109(1): 197-207	[A component of fire prone ecosystems. Could increase fire risk in introduced range] "Cabbage palm crowns are quite flammable and persistent leaf bases may accumulate pine needles and other flammable debris.." ... "Because the cabbage palm is susceptible to fire for only a short portion of its life history and most individuals in the susceptible class survive fires, even frequent fires are unlikely to eliminate successive seedling cohorts. It is likely that most of the individuals that died in fires were less than 3 years old and many may have been 1 year or less in age (McPherson and Williams, 1996)."

409	Is a shade tolerant plant at some stage of its life cycle	
	Source(s)	Notes
	Gilman, E.F.& Watson, D.G. 2006. <i>Sabal palmetto</i> : Cabbage Palm. ENH-733. Revised. University of Florida IFAS Extension, Gainesville FL. http://edis.ifas.ufl.edu . [Accessed]	"Cabbage Palm is exceptionally easy to transplant and will thrive in full sun or partial shade."
	Burns, R.M. & Honkala, B.H. 1990. <i>Silvics of North America. Volume 2: Hardwoods. Agriculture Handbook 654.</i> U.S. Department of Agriculture, Forest Service, Washington, DC.	"Cabbage palmetto is classed as shade tolerant and is probably a climatic climax as well as a fire climax."
	McPherson, K., & Williams, K. 1998. The role of carbohydrate reserves in the growth, resilience, and persistence of cabbage palm seedlings (<i>Sabal palmetto</i>). <i>Oecologia</i> , 117(4): 460-468	[Probably does not tolerate deep shade] "Both the shade tolerance and slow growth rates of <i>S. palmetto</i> seedlings may be due, in part, to allocation to belowground TNC stores. Both Chapin et al. (1990) and Kobe (1997) have noted that, although allocation to TNC stores reduces plant growth rates, such opportunity costs are much smaller in low-resource environments than in high-resource environments. <i>S. palmetto</i> occurs in habitats and microsites where unfavorable conditions for photosynthesis may be common. These conditions could include periods of drought, flooding by fresh and salt water, tissue loss due to hurricanes, partial burial by falling vegetation, periodic fires, and deep shade."

Qsn #	Question	Answer
	Zona, S. 1990. A monograph of Sabal (Arecaceae: Coryphoideae). Aliso, 12(4): 583-666	[Seedlings can grow in shade, but plant is suppressed until a light gap is formed] "They thrive in high light intensity environments and commonly persist after forests are cleared for agricultural purposes. Recruitment in <i>S. palmetto</i> is a case in point. The species grows readily in oak forests in northern Florida, but seedlings under a closed canopy remain suppressed and form no aboveground stem. Stem elongation and sexual maturation await gap formation in the canopy. Along forest margins, on dunes, and in fields, growth and recruitment are immediate with no suppressed stage."

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	Notes
	Burns, R.M. & Honkala, B.H. 1990. Silvics of North America. Volume 2: Hardwoods. Agriculture Handbook 654. U.S. Department of Agriculture, Forest Service, Washington, DC.	"Cabbage palmetto can tolerate a broad range of soil pH, salinity, and drainage but prefers neutral to alkaline soils characterized by near-surface or exposed calcareous sands, marls, or limestone (10,15)." ... "The species is found on a wide range of soils including those in the orders Entisols, Alfisols, Ultisols, and Spodosols in south Florida. Drainage tends to be restricted, ranging from somewhat poorly to very poorly drained. All soils appear to have one characteristic in common, a high calcium content, which is indicated by either a high base saturation (Alfisols) or limestone, phosphatic rock, or sea shells in the profile. Soil series typical of the Alfisols are Boca, Bradenton, Parkwood, and Riviera. Typical Entisols are exemplified by the Pompano series. Charlotte, Oldsmar, and Wabasso soil series are typical Spodosols on which the species is found."
	Small, E. 2013. North American Cornucopia: Top 100 Indigenous Food Plants. CRC Press, Boca Raton, FL	"It is extremely salt-tolerant and can grow in brackish water but not seawater. It also tolerates salty winds, waterlogging, drought, and a wide range of soil conditions, and is very resistant to fire and hurricanes."

411	Climbing or smothering growth habit	n
	Source(s)	Notes
	Zona, S. 1990. A monograph of Sabal (Arecaceae: Coryphoideae). Aliso, 12(4): 583-666	"Stocky to emergent palm to ca. 20 m tall; trunk ca. 20-35 cm DBH, brown to gray."

412	Forms dense thickets	y
	Source(s)	Notes
	Burns, R.M. & Honkala, B.H. 1990. Silvics of North America. Volume 2: Hardwoods. Agriculture Handbook 654. U.S. Department of Agriculture, Forest Service, Washington, DC.	"The species often forms pure stands up to about 10 ha (25 acres) in freshwater areas, called river hammocks if they lie along a river, and cabbage-palm hammocks or palm savannas if they are on inland prairies."

501	Aquatic	n
	Source(s)	Notes

Qsn #	Question	Answer
	Zona, S. 1990. A monograph of Sabal (Arecaceae: Coryphoideae). Aliso, 12(4): 583-666	"In the United States, it grows in mesic hammocks (with <i>Quercus virginiana</i> Mill.), pine flatwoods (associated with <i>Pinus elliottii</i> Engelm.), river banks, and dry beachside dunes and tidal flats (just above the <i>Juncus roemerianus</i> Scheele zone, in Florida)."

502	Grass	n
	Source(s)	Notes
	Zona, S. 1990. A monograph of Sabal (Arecaceae: Coryphoideae). Aliso, 12(4): 583-666	Arecaceae

503	Nitrogen fixing woody plant	n
	Source(s)	Notes
	Zona, S. 1990. A monograph of Sabal (Arecaceae: Coryphoideae). Aliso, 12(4): 583-666	Arecaceae

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	Notes
	Zona, S. 1990. A monograph of Sabal (Arecaceae: Coryphoideae). Aliso, 12(4): 583-666	"Stocky to emergent palm to ca. 20 m tall; trunk ca. 20-35 cm DBH, brown to gray."

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes
	Burns, R.M. & Honkala, B.H. 1990. Silvics of North America. Volume 2: Hardwoods. Agriculture Handbook 654. U.S. Department of Agriculture, Forest Service, Washington, DC.	[No evidence] "Cabbage palmetto is the most widely distributed of our native palm trees. Its range extends northward from the Florida Keys through its epicenter in south-central Florida to Cape Fear, NC. A disjunct population has been reported at Cape Hatteras, NC (16). From North Carolina south to the Florida line it hugs the coastline, usually occurring within 20 km (12 mi) of the ocean. In Florida, its northern boundary turns west through Gainesville and follows an ancient shoreline across the peninsula to the Gulf Coast. It then follows the shoreline westward to St. Andrews Bay where its range is slowly extending (3). Outside the United States, it is found in the Bahama Islands (23)."

Qsn #	Question	Answer
602	Produces viable seed	y
	Source(s)	Notes
	Burns, R.M. & Honkala, B.H. 1990. <i>Silvics of North America. Volume 2: Hardwoods. Agriculture Handbook 654.</i> U.S. Department of Agriculture, Forest Service, Washington, DC.	"Cabbage palmetto produces large numbers of fruits and seeds each year. In a cabbage-palm hammock in southwest Florida, an estimated 1,530,000/ha of ripe fruits (620,000/acre) were produced per year, of which 9 percent contained intact seeds after 6 months, 1 percent were infested by beetles, and 89 percent had been totally consumed or removed from the site (19)."
	Ellison, D. & Ellison, A. 2001. <i>Cultivated Palms of the World.</i> UNSW Press, Sydney, Australia	"Seed is freely available and germinates easily in 4 to 8 weeks."

603	Hybridizes naturally	
	Source(s)	Notes
	Zona, S. 1990. A monograph of <i>Sabal</i> (Arecaceae: Coryphoideae). <i>Aliso</i> , 12(4): 583-666	"Virtually nothing is known about whether hybridization in <i>Sabal</i> is possible and the relationship between hybridization and speciation in <i>Sabal</i> . 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 (Batabano, 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
	Bonner, F.T. & Karrfalt, R.P. (eds.). 2008. <i>The Woody Plant Seed Manual.</i> USDA FS Agriculture Handbook 727. Government Printing Office, Washington, D.C.	"Flowering and fruiting. The perfect white flowers of cabbage palmetto measure about 6 mm in diameter and are borne in drooping clusters 1.3 to 1.8 m long from June to August, depending upon latitude (Sargent 1965; Snyder 1952; West and Arnold 1947)."
	Henderson, A. 1986. A review of pollination studies in the <i>Palmae</i> . <i>The Botanical Review</i> , 52(3): 221-259	[Functionally self-incompatible] " <i>Sabal palmetto</i> (Walt.) Lodd. ex Schult. is monoecious with protogynous hermaphroditic flowers." [a state in hermaphroditic systems that is characterized by development of female organs or maturation of their products before the appearance of the corresponding male product thus inhibiting self-fertilization]
	Skyfield Tropical. 2014. <i>Sabal palmetto.</i> https://www.skyfieldtropical.com/encyclopedia/cabbage-palm/ . [Accessed 20 Jul 2014]	[Possibly Yes, although protogynous flowers may prevent natural self-pollination] "Flowering/Pollination: Self-fertile. Flower stalk to 4 feet long, yellow flowers."
	East, E. M. 1940. The distribution of self-sterility in the flowering plants. <i>Proceedings of the American Philosophical Society</i> 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 observations on individual isolated fruiting specimens include the following genera; <i>Acanthorhiza</i> H. Wendl., <i>Actinophloeus</i> Becc., <i>Areca</i> L., <i>Arenga</i> Labill., <i>Butia</i> Becc., <i>Caryota</i> L., <i>Elaeis</i> Jacq., <i>Guilielma</i> Mart., <i>Latania</i> Comm., <i>Livingstonia</i> R. Br., <i>Phoenix</i> L., <i>Rhaphis</i> L. f., <i>Roystonea</i> O. F. Cook, <i>Sabal</i> Adans, <i>Salacca</i> Reinw., <i>Thrinax</i> L. f. apud Sw., and <i>Washingtonia</i> H. Wendl."

605	Requires specialist pollinators	n
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Qsn #	Question	Answer
	Source(s)	Notes
	Zona, S. 1990. A monograph of Sabal (Arecaceae: Coryphoideae). Aliso, 12(4): 583-666	"Brown (1976) reported the major pollinators of <i>S. palmetto</i> to be the halictid bees <i>Augachlora pura pura</i> , <i>Agapostemon splendens</i> , and <i>Dialictus</i> spp. The introduced honeybee is also an active pollinator. Brown (1976) stated that the species is protogynous." ... "Sabal palmetto and <i>S. maritima</i> growing in the Jardin Botanico Nacional de Cuba, Havana, are visited by numerous species and individuals of Hymenoptera, viz., bees and wasps."
	Burns, R.M. & Honkala, B.H. 1990. Silvics of North America. Volume 2: Hardwoods. Agriculture Handbook 654. U.S. Department of Agriculture, Forest Service, Washington, DC.	"The fragrant flowers are pollinated by bees, although other insects may be of local importance (3)."

606	Reproduction by vegetative fragmentation	n
	Source(s)	Notes
	Ladybird Johnson Wildflower Center. 2014. Native Plant Database - Sabal palmetto. http://www.wildflower.org/plants/result.php?id_plant=SAPA . [Accessed 20 Jul 2014]	"Description: Propagation is only from seed. "
	Burns, R.M. & Honkala, B.H. 1990. Silvics of North America. Volume 2: Hardwoods. Agriculture Handbook 654. U.S. Department of Agriculture, Forest Service, Washington, DC.	"Vegetative Reproduction- No information available."

607	Minimum generative time (years)	>3
	Source(s)	Notes
	Riffle, R.L. & Craft, P. 2003. An Encyclopedia of Cultivated Palms. Timber Press, Portland, OR.	"It is slow growing when young and moderately slow when older."
	McPherson, K., & Williams, K. 1996. Establishment growth of cabbage palm, <i>Sabal palmetto</i> (Arecaceae). American Journal of Botany, 83(12): 1566-1570	[Presumably well in excess of 4 years to maturity] "Projected growth rates were slow. The fastest that a cabbage palm could develop an aboveground trunk, given the-measured growth rates, was estimated to be 14 yr. We estimated that the fastest growing 1% of the seedlings would develop an aboveground trunk by 33 yr, the fastest 10% would develop one by 42 yr, and half the seedlings would develop one by 59 yr"

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	n
	Source(s)	Notes
	Burns, R.M. & Honkala, B.H. 1990. Silvics of North America. Volume 2: Hardwoods. Agriculture Handbook 654. U.S. Department of Agriculture, Forest Service, Washington, DC.	[No evidence, and fruits/seeds lack means of external attachment] "The fruits are black, fleshy, drupelike berries, 5 to 13 mm (0.2 to 0.5 in) in diameter and averaging about 10 mm (0.4 in), each containing a single, hard, brown, spherical seed (2,3)." ... "The fruits mature in the fall and persist on the spadix until removed by wind, rain, or birds such as ring billed gulls, fish crows, cardinals, and blue jays."

702	Propagules dispersed intentionally by people	y
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Qsn #	Question	Answer
	Source(s)	Notes
	Bonner, F.T. & Karrfalt, R.P. (eds.). 2008. The Woody Plant Seed Manual. USDA FS Agriculture Handbook 727. Government Printing Office, Washington, D.C.	"Cabbage palmetto has been planted widely as an ornamental."
	Small, E. 2013. North American Cornucopia: Top 100 Indigenous Food Plants. CRC Press, Boca Raton, FL	"Cabbage palmetto is often grown as a low-maintenance garden and street tree in semitropical areas. In Florida, there have been extensive plantings along freeways. The tree is also widely cultivated in Hawaii."
	Wong, M. 2006. Palms for Hawaii Landscapes. Landscape L-19. College of Tropical Agriculture and Human Resources, Honolulu, HI	"The following palm species can be used to portray a strong "tropical" theme:" [Recommends <i>Sabal palmetto</i>]

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	Notes
	Zona, S. 1990. A monograph of <i>Sabal</i> (Arecaceae: Coryphoideae). <i>Aliso</i> , 12(4): 583-666	[Unlikely. Fruits & seeds relatively large, & long time to maturity would likely prevent any accidental contamination of produce] "Fruit spherical or somewhat oblate pyriform, black, with a medium thick pericarp' 8.1-13.9 mm in diameter, 8.0-13.8 mm high; seed oblate, 5.4-9.7 mm in diameter, 4.0-7'0 mm high"

704	Propagules adapted to wind dispersal	n
	Source(s)	Notes
	Zona, S. 1990. A monograph of <i>Sabal</i> (Arecaceae: Coryphoideae). <i>Aliso</i> , 12(4): 583-666	"Fruit spherical or somewhat oblate pyriform, black, with a medium thick pericarp' 8.1-13.9 mm in diameter, 8.0-13.8 mm high; seed oblate, 5.4-9.7 mm in diameter, 4.0-7'0 mm high, occasionally with a small protruding funicular remnant; embryo supraequatorial, very rarely equatorial."
	Burns, R.M. & Honkala, B.H. 1990. <i>Silvics of North America. Volume 2: Hardwoods. Agriculture Handbook 654.</i> U.S. Department of Agriculture, Forest Service, Washington, DC.	"The fruits mature in the fall and persist on the spadix until removed by wind, rain, or birds such as ring billed gulls, fish crows, cardinals, and blue jays." [Wind may dislodge fruit, but fruit morphology adapted for frugivory]

705	Propagules water dispersed	y
	Source(s)	Notes
	Zona, S. 1990. A monograph of <i>Sabal</i> (Arecaceae: Coryphoideae). <i>Aliso</i> , 12(4): 583-666	"In contrast, Brown (1913) suggested that water dispersal, hydrochory, was the principal mode of long-distance dispersal for <i>S. palmetto</i> . His experiments, floating mature dry fruit in 3.50% NaCl solution, showed that buoyancy varies among populations from low values of 0.0-3.00% floating after 3 weeks to 45.4% seeds afloat. Seed viability after 8 weeks in salt water ranged from 30% to 60%." ... "In Cuba, it is common in seasonally flooded savannas, swamps, and along water courses, as well as in disturbed vegetation. It is said to be an indicator of poor soil (Alain 1961)."

Qsn #	Question	Answer
	Burns, R.M. & Honkala, B.H. 1990. Silvics of North America. Volume 2: Hardwoods. Agriculture Handbook 654. U.S. Department of Agriculture, Forest Service, Washington, DC.	"In near-coast situations, however, the major means of dissemination appears to be by water. The distribution of cabbage palmetto along the Atlantic shoreline is attributed to the seed's buoyancy and tolerance of saltwater. Thus, the range of cabbage palmetto is a function of the speed and direction of estuarine and littoral currents along a shoreline. This fact explains the species spread northward along the Atlantic Coast and its expansion westward along the Gulf Coast (3)."

706	Propagules bird dispersed	y
	Source(s)	Notes
	Zona, S. 1990. A monograph of Sabal (Arecaceae: Coryphoideae). Aliso, 12(4): 583-666	"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." ... "Cruickshank (1950) reported the following birds feeding in s. palmetto: Larus delawarensis, Quiscalus mexicanus, Aphelocoma coerulescens, Cardinalis cardinalis, Cyanocitta cristata, and others."
	Landry, G. P., & Reese, W. D. 1996. Sabal palmetto naturalized in western Louisiana. Principes, 40: 177-178	"Dispersal of the seeds of cabbage palm can be attributed perhaps to birds, considering the one mile distance between the cultivated palms and the established ones. The absence of very young seedlings in the forested location further suggests that predators, perhaps birds and small mammals, must consume the numerous fruits."
	Burns, R.M. & Honkala, B.H. 1990. Silvics of North America. Volume 2: Hardwoods. Agriculture Handbook 654. U.S. Department of Agriculture, Forest Service, Washington, DC.	"The fruits mature in the fall and persist on the spadix until removed by wind, rain, or birds such as ring billed gulls, fish crows, cardinals, and blue jays."

707	Propagules dispersed by other animals (externally)	
	Source(s)	Notes
	Burns, R.M. & Honkala, B.H. 1990. Silvics of North America. Volume 2: Hardwoods. Agriculture Handbook 654. U.S. Department of Agriculture, Forest Service, Washington, DC.	[Rodents in Hawaiian Islands might also disperse seeds externally in seed caches] "Once on the ground, the fruits are eaten by numerous animals or cached by rodents; such caches result in dense patches of seedlings (3,14,19)."

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	[Feral pigs may play a role in dispersal in the Hawaiian Islands] "Mammals too play a large role in the dispersal of Sabal seeds in Florida; known dispersers are the Florida black bear, (Ursus americanus, and the raccoon, Procyon lotor (Maehr and Brady 1984; Martin et al. 1951). Seeds of S. palmetto and S. etonia, in apparently viable condition, have been found in bear dung (Zona pers. obs.)." ... "The bat Artibeus jamaicensis is reported to feed on fruits of S. palmetto l"S. parviflora"l in Cuba (Silva 1979)."

801	Prolific seed production (>1000/m2)	n
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Qsn #	Question	Answer
	Source(s)	Notes
	Burns, R.M. & Honkala, B.H. 1990. Silvics of North America. Volume 2: Hardwoods. Agriculture Handbook 654. U.S. Department of Agriculture, Forest Service, Washington, DC.	[Probably No. Density equates to 153 fruits/m ²] "Cabbage palmetto produces large numbers of fruits and seeds each year. In a cabbage-palm hammock in southwest Florida, an estimated 1,530,000/ha of ripe fruits (620,000/acre) were produced per year, of which 9 percent contained intact seeds after 6 months, 1 percent were infested by beetles, and 89 percent had been totally consumed or removed from the site (19)."

802	Evidence that a persistent propagule bank is formed (>1 yr)	
	Source(s)	Notes
	Bonner, F.T. & Karrfalt, R.P. (eds.). 2008. The Woody Plant Seed Manual. USDA FS Agriculture Handbook 727. Government Printing Office, Washington, D.C.	"Palmetto seeds are orthodox in storage behavior. Cabbage palmetto seeds have been stored successfully at 5 °C for up to 8 weeks (Carpenter 1987)."
	Titus, J. H. 1991. Seed bank of a hardwood floodplain swamp in Florida. <i>Castanea</i> , 56(2): 117-127	"The three most common woody seedlings in the swamp, <i>Persea palustris</i> , <i>Sabal palmetto</i> and <i>Acer rubrum</i> were not present in the seed bank."

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	Y
	Source(s)	Notes
	Small, E. 2013. North American Cornucopia: Top 100 Indigenous Food Plants. CRC Press, Boca Raton, FL	"It is extremely salt-tolerant and can grow in brackish water but not seawater. It also tolerates salty winds, waterlogging, drought, and a wide range of soil conditions, and is very resistant to fire and hurricanes."
	Ladybird Johnson Wildflower Center. 2014. Native Plant Database - Sabal palmetto. http://www.wildflower.org/plants/result.php?id_plant=SAPA . [Accessed 20 Jul 2014]	"Old leaves brown and hang from the base of the crown. Unless they are trimmed away, this creates great habitat for desirable birds and undesirable rodents. The decision to trim or not to trim is a matter of preference. The tree does fine either way. A delicacy known as swamp cabbage is produced from the bud or embryonic leaves of the tree, thus the common name. Removing the bud kills the palm so this practice is discouraged. Trunk wounds also seriously harm or kill the tree. "

Qsn #	Question	Answer
	<p>McPherson, K., & Williams, K. 1998. Fire resistance of cabbage palms (<i>Sabal palmetto</i>) in the southeastern USA. <i>Forest Ecology and Management</i>, 109(1): 197-207</p>	<p>"We conclude that pine flatwoods invaded by cabbage palms will not be restored by reintroduction of fire and may be permanently changed. There is a developmental stage in the life history of cabbage palms that is susceptible to fire, but it is so short and mortality is so low that no realistic fire frequency is likely to cause significant decreases in palm populations. High fire frequencies, therefore, appear insufficient to explain the rarity of cabbage palms in frequently burned plant communities in the southeastern USA, and reduced fire frequencies could not have caused observed cabbage palm invasions of flatwoods. Recurring disturbances such as fire or logging may promote dominance by species like the cabbage palm because other species often sustain more damage than the palm. This type of disturbance regime could lead to a species-impooverished, palm-dominated system."</p>
	<p>Burns, R.M. & Honkala, B.H. 1990. <i>Silvics of North America. Volume 2: Hardwoods. Agriculture Handbook 654.</i> U.S. Department of Agriculture, Forest Service, Washington, DC.</p>	<p>[Suggests wind, fire and bud removal will kill trees] "Cabbage palmetto has been rated the most wind-resistant south Florida tree but it nevertheless suffered extensive damage from Hurricane Donna in 1960, particularly on Palm Key in Florida Bay (9). Cabbage palmetto growing on organic soil or deep humus deposits are killed by fire burning in this organic layer because of root mortality and loss of mechanical support." ... "Cabbage palmetto is so called because of its edible terminal bud which tastes somewhat like that vegetable. The bud, also called swamp cabbage, is good both raw and cooked and is commercially canned and sold. Removal of the bud kills the tree, however."</p>

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

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 dense stands in native range
- Seeds dispersed by birds & intentionally by people
- Seeds buoyant & dispersed by water
- Trees tolerant of fire and strong winds

Low Risk Traits

- Despite naturalization, no reports of detrimental impacts found
- Unarmed (no spines, thorns or burrs)
- Non-toxic
- Ornamental
- Not reported to spread vegetatively
- Slow growing & long time to reproductive maturity

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