Taxon: Coccoloba uvifera **Family:** Polygonaceae

Common Name(s): Jamaican kino
platterleaf
sea grape

Synonym(s): Coccolobis uvifera (L.) Crantz
Polygonum uviferum L.

Assessor: HPWRA OrgData **Status:** Assessor Approved **End Date:** 31 May 2017

WRA Score: 7.0 **Designation:** H(HPWRA) **Rating:** High Risk

Keywords: Tropical Tree, Naturalized, Dense Stands, Polygamous-dioecious, 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)	y
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	y=1, n=0	n
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
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	y=1, n=-1	y
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)	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	y=-1, n=1	y
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y=1, n=-1	y
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)		

Supporting Data:

Qsn #	Question	Answer
101	**Is the species highly domesticated?**	**n**
	Source(s)	**Notes**
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	[No evidence of domestication] "This species is widely distributed in Central and South America at low altitude 100-800 m with an average rainfall of 800-1200 mm. C. uvifera is utilized in windbreaks, and land reclamation. The timber is used for furniture, turnery, and marquetry. The fruit is used to make jam and in the past gum was extracted from the tree."
	Brücher, H. 1989. Useful Plants of Neotropical Origin: and Their Wild Relatives. Springer-Verlag, Berlin Heidelberg	[No evidence] "Still collected only from the wild, but the species deserves domestication, especially for colonization of large sea beaches"

102	Has the species become naturalized where grown?	
	Source(s)	**Notes**
	WRA Specialist. 2017. Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	**Notes**
	WRA Specialist. 2017. 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**
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 30 May 2017]	"Native: Northern America : Mexico Southeastern U.S.A.: United States - Florida Southern America Caribbean: Antigua and Barbuda; Barbados; Dominica; Grenada; Guadeloupe; Martinique; Montserrat Central America: Belize; Costa Rica; Honduras; Nicaragua; Panama Western South America: Colombia; Ecuador"

202	Quality of climate match data	High
	Source(s)	**Notes**
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 30 May 2017]	

203	Broad climate suitability (environmental versatility)	n

Qsn #	Question	Answer
	Source(s)	**Notes**
	Parrotta, J.A. 1994. Coccoloba uvifera (L.) L. Sea grape, Uva de playa. SO-ITF-SM-74. USDA Forest Service, Southern Forest Experiment Station, New Orleans, LA	"The native range of sea grape includes the tropical very dry, dry, anc subtropical moist forest life zones (sensu Holdrige, 11). Within this range, mean annual rainfall varies from approximately 500 to 1600 mm without a dry season or a dry season lasting up to 8 months (32). Mean annual temperatures during the warmest months average about 28 ° C throughout the range. During the coolest months, mean temperatures range from 1s·c in the north to 26 ·c in the south (10, 28). In southern Florida, sea grape is subject to rare frosts (25)." ... "Sea grape is usually limited to coastal areas and is rarely found in inland forests (1, 8, 18). In Cuba and Jamaica, where sea grape grows best, it is found in moist forests up to 150 m in elevation (26)."
	Janick, J.& Paull, R.E. 2008. The Encyclopedia of Fruit & Nuts. CABI Publishing, Wallingford, UK	"The sea grape occurs along the American Atlantic, Caribbean and Pacific coasts of the tropics and subtropics between 25° and 10°S latitudes (Parrotta, 1994). Young trees are injured by 0°C while mature trees can withstand temperatures as low as -5°C for short periods." ... "It can be grown from sea level to 1000 m in the tropics. It docs not tolerate excess humidity although it needs a tropical climate."
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	"This species is widely distributed in Central and South America at low altitude 100-800 m with an average rainfall of 800-1200 mm." "Climatic amplitude (estimates) - Altitude range: 100 - 800 m - Mean annual rainfall: 800 - 1200 mm - Rainfall regime: bimodal - Dry season duration: > 6 months - Mean annual temperature: 12 - 38ºC - Mean maximum temperature of hottest month: 23 - 25ºC - Mean minimum temperature of coldest month: 12 - 38ºC - Absolute minimum temperature: > 5ºC"

204	**Native or naturalized in regions with tropical or subtropical climates**	**y**
	Source(s)	**Notes**
	Parrotta, J.A. 1994. Coccoloba uvifera (L.) L. Sea grape, Uva de playa. SO-ITF-SM-74. USDA Forest Service, Southern Forest Experiment Station, New Orleans, LA	"Sea grape is native to the coasts of southern Florida, Bermuda, the Bahamas, the West Indies, northern and eastern South America to Brazil, Mexico, Central America, and the Pacific coast of South America as far south as Peru ..." ... "The native range of sea grape includes the tropical very dry, dry, and subtropical moist forest life zones (sensu Holdrige, 11)."

205	**Does the species have a history of repeated introductions outside its natural range?**	**y**
	Source(s)	**Notes**
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 30 May 2017]	"Naturalized: Pacific North-Central Pacific: United States - Hawaii Cultivated: . also cult."

Qsn #	Question	Answer
	Janick, J.& Paull, R.E. 2008. The Encyclopedia of Fruit & Nuts. CABI Publishing, Wallingford, UK	"The plant is valued for honey production. The species has been introduced as an ornamental in subtropical climates where it does well as an accent plant or in groups. It is also planted as a seashore windbreak in Hawaii and several tropical countries in the Asia-Pacific region. In coastal areas, it is used for dune stabilization and hedges."

301	Naturalized beyond native range	y
	Source(s)	**Notes**
	Wagner, W.L., Herbst, D.R.& Lorence, D.H. 2017. Flora of the Hawaiian Islands. Smithsonian Institution, Washington, D.C. http://botany.si.edu/. [Accessed 31 May 2017]	"Coccoloba uvifera (L.) L. Status: Naturalized Distribution: Mi/ O/ Mo (Kalaupapa peninsula)/ M/ H"
	Singhurst, J. R., & Holmes, W. C. (2014). New vascular plant records for far south Texas. Phytoneuron, 38, 1-4	"Coccoloba uvifera (Polygonaceae), sea grape, is reported for the first time as adventive in Texas, in the Gulf Prairies and Marshes vegetational region of Cameron County. It is used as an ornamental in the more southern part of Texas Gulf Coast." ... "Regardless of origin, the species may now be reported as naturalized within the state."
	Starr, F., Martz, K., & Loope, L.L. 2002. New plant records from the Hawaiian archipelago. Bishop Museum Occasional Papers. 69:16-27	"Coccoloba uvifera (sea grape) has recently been noted to germinate and spread at least on O'ahu (Herbst, 1998: 3; Wagner et al., 1999: 1060, 1888) and Maui (Oppenheimer & Bartlett, 2002: 11). On Midway and Hawai'i, C. uvifera is displaying the same tendencies. These collections represent new island records for Midway Atoll and Hawai'i Island. Material examined.MIDWAY ATOLL: Spit I, S end, a few plants were germinating and growing out of the coral rubble, sea level, 1 April 1999, Starr & Martz 990401-1.MAUI: E. Maui, Kanahä Beach, germinating from beach flotsam, sea level, 5 May 2000, Starr & Martz 000505-1. HAWAI'I: Kona, germinating out of beach flotsam and forming sea-side stands, sea level, 9 Apr 2000, Starr & Martz 000409-2."
	Little Jr., E.L. & Skolmen, R.G. 1989. Common forest trees of Hawaii: (native and introduced). USDA Agriculture Handbook No. 679. USDA Forest Service, Washington, D.C.	"In Hawaii, the species is planted as an ornamental and windbreak along sandy beaches, it escapes and becomes naturalized locally. It may be seen along most shorelines. A total of 955 trees have been planted in the forest reserves by the Division of Forestry, mostly in the Honouliuli Forest Reserve. It is doubtful that they became established naturally so far from the shoreline."

Qsn #	Question	Answer
	Oppenheimer, H. L. & Bartlett, R. T. 2002. New plant records from the main Hawaiian Islands. Bishop Museum Occasional Papers. 69: 1-14	"In the notes under Polygonaceae, Wagner et al. (1999: 1059) stated that although sea grape produces abundant fruit, seedlings had not been observed, and it was therefore not considered a naturalized taxon in the Hawaiian Islands. Herbst (1998: 3) later reported that it was indeed naturalized, at least on O'ahu. Little & Skolmen (1989: 116) stated that C. uvifera " in Hawai'i…escapes and becomes naturalized locally…and may be seen along most shorelines". Trees are producing viable seed at several sites where this species has been planted on Maui, with abundant seedlings beneath mature trees (Oppenheimer H89912, H89920, H99912). These do not represent truly naturalized populations, as most seedlings are destroyed during routine landscaping maintenance. However, at least one location is well established; it probably represents escapes from nearby resort plantings. Seedlings have also been observed at the mouth of Honokōhau Stream. Elsewhere in this year's Records it is documented from Midway Atoll and the island of Hawai'i (Starr et al., 2002: 24). Material examined. MAUI: West Maui, Lahaina Distr., Näpili, vicinity of Namalu Bay, in Scaevola coastal shrubland, 18–21 m, 28 Mar 2000, Oppenheimer H30017, H30018."
	Wysong, M., Hughes, G. & Wood, K.R. (2007). New Hawaiian plant records for the island of Moloka'i. Bishop Museum Occasional Papers 96: 1-8	"On Kalaupapa peninsula it can be found sparingly from the airport to Oceanview pavilion, where it has naturalized from ornamental plantings at both these locations."

302	Garden/amenity/disturbance weed	y
	Source(s)	**Notes**
	Murphy, M. 2017. Plant Pono Specialist. BIISC Early Detection Technician. personal communication. 30 May.	"We are working more closely with the Hawaii Island Landscape Association (HILA) now. They want Coccoloba uvifera added to the no grow list." ... "The HILA guys think it's very invasive."
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	Included in weed lists from a number of locations.

303	Agricultural/forestry/horticultural weed	n
	Source(s)	**Notes**
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

304	Environmental weed	n
	Source(s)	**Notes**
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

305	Congeneric weed	
	Source(s)	**Notes**

Qsn #	Question	Answer
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	[Agricultural Weed] "Coccoloba acapulcensis Standl Polygonaceae Total N° of Refs: 2 Habit: Tree Preferred Climate/s: Tropical References: Global-A-1207, Mexico-A-87."
	Bacon, P., P.J. Terry, N. Waltham, & P.Castro S. (1997) An Electronic Atlas of World Weed and Invasive Plants. Version 1.0, 1997	C. acapulcensis was listed as principal weed in Mexico.

401	Produces spines, thorns or burrs	n
	Source(s)	**Notes**
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	[No evidence] "C. uvifera is a densely branched shrub or tree, which may reach 10-15 m in height with a d.b.h. of 50-70 cm. The bark is thin, smooth, brown; it has short petiolate leaves, thick coriaceous and rigid, orbicular or tranverse, mostly 8-20 cm wide, rounded or truncate at the apex, often emarginate, cordate at the base, minutely puberulent or glabrate beneath, often red or tinged with red or purple, the nerves, the rachis minutely puberulent. The flowers are whitish, fragrant, the pedicels twice ocreolae; fruit ovoid, 2 cm long or less, purple."

402	Allelopathic	n
	Source(s)	**Notes**
	Parrotta, J.A. 1994. Coccoloba uvifera (L.) L. Sea grape, Uva de playa. SO-ITF-SM-74. USDA Forest Service, Southern Forest Experiment Station, New Orleans, LA	[No evidence] "In Puerto Rican coastal dune forests, sea grape is typically associated with Chrysobalanus icaco L., Cocos nucifera L., Suriana maritima L., Terminalia catappa L., Thespesia populnea (L.) Soland ex Correa, and understory shrubs such as Dalbergia ecastaphylla (L.) Taubert, Opuntia spp., and Scaevola plumieri (L.) Vahl (6). In Jamaica, it grows in strand dune shrub formations with Borrichia arborescens (L.) DC., Scaevola plumieri, Suriana maritima, and Tournefortia gnaphalodes (L.) R. Br. (29)."

403	Parasitic	n
	Source(s)	**Notes**
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	"C. uvifera is a densely branched shrub or tree, which may reach 10-15 m in height with a d.b.h. of 50-70 cm." [No evidence]

404	Unpalatable to grazing animals	
	Source(s)	**Notes**

Qsn #	Question	Answer
	Parrotta, J.A. 1994. Coccoloba uvifera (L.) L. Sea grape, Uva de playa. SO-ITF-SM-74. USDA Forest Service, Southern Forest Experiment Station, New Orleans, LA	[Unknown. No fodder uses listed] "The edible fruits can be eaten raw, used in jellies, or fermented like grapes to make wine (8). Its flowers yield abundant nectar, and the resulting honey is of good quality, light amber in color, and spicy (8, 25). The bark of the stem, branches, and roots is rich in tannins, and the astringent red sap extracted from the cut bark, commercially known as West Indian or Jamaican kino, was formerly exported to Europe where it was used for tanning and dyeing (18, 26, 31). The astringent roots and bark have been used in traditional medicine in Puerto Rico and elsewhere in the Caribbean (16, 18)."

405	Toxic to animals	n
	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	[No evidence] "Coccoloba uvifera ... Astringent, tea of bark for diarrhea, dysentery; bark resin used against throat ailments. Roots for dysentery."
	Lim, T.K. 2013. Edible Medicinal And Non-Medicinal Plants. Volume 5, Fruits. Springer, Dordrecht	[No evidence] "The fruit is edible, the pulp can be eaten fresh or made into jams, jellies or fermented to make wine."

406	Host for recognized pests and pathogens	
	Source(s)	**Notes**
	Parrotta, J.A. 1994. Coccoloba uvifera (L.) L. Sea grape, Uva de playa. SO-ITF-SM-74. USDA Forest Service, Southern Forest Experiment Station, New Orleans, LA	"Damaging Agents.-Sea grape is a host for several potentially damaging insect species and pathogens throughout its range, although these agents rarely kill mature trees. Under adverse conditions, the leaves are susceptible to damage by certain pathogens (25). In southern Florida, Puerto Rico, and the Virgin Islands, these include Asteririna coccolobae Ferd. & Wmge, Lembosia tenella Lev., Pestalotia coccolobae Ell. & Ev., Phyllosticta coccolobae Ell. & Ev., Uredo coccolobae P. Henn., U. uviferae Syd., and Verticicladium effusum Earle (27, 30)."
	Gilman, E.F. & Watson, D.G. 1993, Coccoloba uvifera. Seagrape. Seagrape. Fact Sheet ST-175. Institute of Food and Agricultural Sciences, University of Florida, Gainesville FL. http://hort.ifas.ufl.edu/. [Accessed 31 May 2017]	"Pests: Stems are subject to Seagrape borer which can kill branches. A nipple gall causes raised, red nipples on the upper leaf surface. Diseases: No diseases are of major concern"

407	Causes allergies or is otherwise toxic to humans	n
	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	[No evidence] "Coccoloba uvifera ... Astringent, tea of bark for diarrhea, dysentery; bark resin used against throat ailments. Roots for dysentery."
	Lim, T.K. 2013. Edible Medicinal And Non-Medicinal Plants. Volume 5, Fruits. Springer, Dordrecht	[No evidence] "The fruit is edible, the pulp can be eaten fresh or made into jams, jellies or fermented to make wine."

408	Creates a fire hazard in natural ecosystems	n

Qsn #	Question	Answer
	Source(s)	**Notes**
	Parrotta, J.A. 1994. Coccoloba uvifera (L.) L. Sea grape, Uva de playa. SO-ITF-SM-74. USDA Forest Service, Southern Forest Experiment Station, New Orleans, LA	"The native range of sea grape includes the tropical very dry, dry, anc subtropical moist forest life zones (sensu Holdrige, 11). Within this range, mean annual rainfall varies from approximately 500 to 1600 mm without a dry season or a dry season lasting up to 8 months (32)."

409	Is a shade tolerant plant at some stage of its life cycle	
	Source(s)	**Notes**
	Parrotta, J.A. 1994. Coccoloba uvifera (L.) L. Sea grape, Uva de playa. SO-ITF-SM-74. USDA Forest Service, Southern Forest Experiment Station, New Orleans, LA	"Reaction to Competition.-Sea grape is a light-demanding species that does not compete well with grasses, herbs, or other trees at the seedling· stage.· Seedling and sapling growth rates are markedly slower under light shade than in full sunlight (author, personal observation)."
	Janick, J.& Paull, R.E. 2008. The Encyclopedia of Fruit & Nuts. CABI Publishing, Wallingford, UK	"This is a light-demanding species that requires full sun but can grow under partial shade."

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	**Notes**
	Rauch, F.D. & Weissich, P.R. 2000. Plants for Tropical Landscapes: A Gardener's Guide. University of Hawaii Press, Honolulu, HI	"It is adapted to most soil conditions, including pure beach sand."
	Parrotta, J.A. 1994. Coccoloba uvifera (L.) L. Sea grape, Uva de playa. SO-ITF-SM-74. USDA Forest Service, Southern Forest Experiment Station, New Orleans, LA	"It is very salt tolerant (22) and grows well in nearly pure sands and rocky substrates along the coast. It can survive on calcareous soils, including oolitic limestone, and on dry or wet soils derived from igneous rocks, as long as these sites are freely drained (7, 25). It grows best in well-drained, loamy sands with pH values greater than 7.5 (2, 32)."
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	"Soil descriptors - Soil texture: light - Soil types: sandy soils"

411	Climbing or smothering growth habit	n
	Source(s)	**Notes**
	Little Jr., E.L. & Skolmen, R.G. 1989. Common forest trees of Hawaii: (native and introduced). USDA Agriculture Handbook No. 679. USDA Forest Service, Washington, D.C.	"A small introduced evergreen tree 20–30 ft (6–9 m) high and 1 ft (0.3 m) in trunk diameter, with widely spreading rounded crown of few coarse branches, often branching near base."

412	Forms dense thickets	y
	Source(s)	**Notes**
	Maschinski, J. et al. (2003). Restoration of Jacquemontia reclinata to the south Florida ecosystem. Final report to the United States Fish and Wildlife Service for grant agreement, 1448-40181. Fairchild Tropical Garden Research Center, Miami, FL	"In South Beach Park, subpopulations of J. reclinata occur in large dune openings that alternate with dense monospecific stands of Coccoloba uvifera and Serenoa repens."

Qsn #	Question	Answer
	Parrotta, J.A. 1994. Coccoloba uvifera (L.) L. Sea grape, Uva de playa. SO-ITF-SM-74. USDA Forest Service, Southern Forest Experiment Station, New Orleans, LA	"It is very salt tolerant (22) and grows well in nearly pure sands and rocky substrates along the coast."

501	Aquatic	n
	Source(s)	**Notes**
	Parrotta, J.A. 1994. Coccoloba uvifera (L.) L. Sea grape, Uva de playa. SO-ITF-SM-74. USDA Forest Service, Southern Forest Experiment Station, New Orleans, LA	[Terrestrial] "Coccoloba. uvifera (L.) L., commonly known as sea grape, uva de playa or uvero in Spanish, and raisin bord-de-mer in French, is a small, low-branching shrub or tree that grows up to 15 m in height." ... "Sea grape is one of the first species to colonize sandy and rocky shores."

502	Grass	n
	Source(s)	**Notes**
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 31 May 2017]	Family: Polygonaceae Subfamily: Eriogonoideae

503	Nitrogen fixing woody plant	n
	Source(s)	**Notes**
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 31 May 2017]	Family: Polygonaceae Subfamily: Eriogonoideae

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	**Notes**
	Lim, T.K. 2013. Edible Medicinal And Non-Medicinal Plants. Volume 5, Fruits. Springer, Dordrecht	"A tall shrub to a small tree 2–15 m high with a bole of 30–60 cm with spreading or sprawling branches and a sparse crown. Stem with grey brown bark that peels off in fl akes, with reddish sap, twigs green and puberulent when young, grey at maturity, glabrous or pubescent."

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	**Notes**
	Brücher, H. 1989. Useful Plants of Neotropical Origin: and Their Wild Relatives. Springer-Verlag, Berlin Heidelberg	"Often abundant on the sea beaches of the Atlantic and Pacific Ocean in Central America and the Antilles."
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	[No evidence] "Stand establishment using natural regeneration"

602	Produces viable seed	y

Qsn #	Question	Answer
	Source(s)	**Notes**
	Oppenheimer, H. L. & Bartlett, R. T. 2002. New plant records from the main Hawaiian Islands. Bishop Museum Occasional Papers. 69: 1-14	"Trees are producing viable seed at several sites where this species has been planted on Maui, with abundant seedlings beneath mature trees (Oppenheimer H89912, H89920, H99912)."
	Parrotta, J.A. 1994. Coccoloba uvifera (L.) L. Sea grape, Uva de playa. SO-ITF-SM-74. USDA Forest Service, Southern Forest Experiment Station, New Orleans, LA	"Trees grown from seeds usually begin to flower and fruit in 6 to 8 years (25)." ... "Natural regeneration is abundant in the vicinity of mature trees."

603	Hybridizes naturally	y
	Source(s)	**Notes**
	Howard, R. (1957).Studies in the genus Coccoloba, III. The Jamaican species. Journal of the Arnold Arboretum, 38(1), 81-106	"It is clear from field observation of the living plants and from study of the specimens prepared that C. litoralis is a hybrid between C. uvifera and C. tenuifolia and that the correct name for this taxon is C. X jamaicensis Lind." ... "Several populations of hybrids involving C. uvifera as one parent are known from the Antilles." ... "The fruit in all of the hybrids observed have been sterile, but the specimens seen in the field are relatively numerous. It appears that C. uvi/era is receptive to cross pollination from other species of Coccoloba, but there is some genetic disturbance preventing the formation of fertile fruits and viable embryos."

604	Self-compatible or apomictic	
	Source(s)	**Notes**
	Parrotta, J.A. 1994. Coccoloba uvifera (L.) L. Sea grape, Uva de playa. SO-ITF-SM-74. USDA Forest Service, Southern Forest Experiment Station, New Orleans, LA	"Sea grape is dioecious with male and female flowers borne on separate trees."
	Madriz, R., & Ramírez, N. (1996). Biología reproductiva de Coccoloba uvifera (Polygonaceae) una especie poligamo-dioica. Revista de Biología Tropical, 44(3): 105-115	[Depends on whether monoecious plants are introduced, although these also have low seed production following selfing] "Abstract: The reproductive biology of Coccoloba uvifera (L.) Jacq. (Polygonaceae) was studied in the Venezuelan coastal zone. Morphological and experimental analysis of floral traits indicated that C. uvifera had two flower types, based on stamens and pistil size. C. uvifera is polygamous - dioecious (monoecious, female and male individuals) at population level. Experimentally monoecious individuals were self - compatible, and a low proportion of fruit and seeds were produced by self - pollination. The number of flowers per in florescence, fruits per in frutescence and fruit weight were higher in dioecious than in monoecious individuals. Pollination was done small insects, mainly hymenopterans. The pollination system is generalist according to insect visitation, frequency, pollen load and site of pollen transportation. Fruit are dispersed by bats. Apparently, the polygamous - dioecious condition in C. uvifera originated in a hermaphrodite ancestor and monoecism is an a intermediate condition."

Qsn #	Question	Answer
605	**Requires specialist pollinators**	**n**
	Source(s)	**Notes**
	Madriz, R., & Ramírez, N. (1996). Biología reproductiva de Coccoloba uvifera (Polygonaceae) una especie poligamo-dioica. Revista de Biología Tropical, 44(3): 105-115	"Pollination was done small insects, mainly hymenopterans. The pollination system is generalist according to insect visitation, frequency, pollen load and site of pollen transportation."

606	Reproduction by vegetative fragmentation	n
	Source(s)	**Notes**
	Gilman, E.F. & Watson, D.G. 1993, Coccoloba uvifera. Seagrape. Seagrape. Fact Sheet ST-175. Institute of Food and Agricultural Sciences, University of Florida, Gainesville FL. http://hort.ifas.ufl.edu/. [Accessed 31 May 2017]	"Propagation is by seed or cuttings."
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	No evidence

607	Minimum generative time (years)	>3
	Source(s)	**Notes**
	Janick, J.& Paull, R.E. 2008. The Encyclopedia of Fruit & Nuts. CABI Publishing, Wallingford, UK	"The juvenile period is from 4 to 8 years from seed and 2-3 years for vegetatively propagated plants."
	Parrotta, J.A. 1994. Coccoloba uvifera (L.) L. Sea grape, Uva de playa. SO-ITF-SM-74. USDA Forest Service, Southern Forest Experiment Station, New Orleans, LA	"Trees grown from seeds usually begin to flower and fruit in 6 to 8 years (25)."

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	n
	Source(s)	**Notes**
	Parrotta, J.A. 1994. Coccoloba uvifera (L.) L. Sea grape, Uva de playa. SO-ITF-SM-74. USDA Forest Service, Southern Forest Experiment Station, New Orleans, LA	"The seeds are dispersed by fruit-eating birds."
	Little Jr., E.L. & Skolmen, R.G. 1989. Common forest trees of Hawaii: (native and introduced). USDA Agriculture Handbook No. 679. USDA Forest Service, Washington, D.C.	[No means of external attachment] "Fruits elliptical or egg-shaped, with thin fleshy covering (hypanthium) and with calyx at apex, sour or sweetish, enclosing one elliptical seed (achene) 3⁄8 inch (10 mm) long."

702	Propagules dispersed intentionally by people	y
	Source(s)	**Notes**
	CAB International, 2005. Forestry Compendium. CAB International, Wallingford, UK	"C. uvifera is utilized in windbreaks, and land reclamation. The timber is used for furniture, turnery, and marquetry. The fruit is used to make jam and in the past gum was extracted from the tree."
	Little Jr., E.L. & Skolmen, R.G. 1989. Common forest trees of Hawaii: (native and introduced). USDA Agriculture Handbook No. 679. USDA Forest Service, Washington, D.C.	"In Hawaii, the species is planted as an ornamental and windbreak along sandy beaches, it escapes and becomes naturalized locally. It may be seen along most shorelines. A total of 955 trees have been planted in the forest reserves by the Division of Forestry, mostly in the Honouliuli Forest Reserve. It is doubtful that they became established naturally so far from the shoreline."

Qsn #	Question	Answer
	Parrotta, J.A. 1994. Coccoloba uvifera (L.) L. Sea grape, Uva de playa. SO-ITF-SM-74. USDA Forest Service, Southern Forest Experiment Station, New Orleans, LA	"It was introduced to the Philippines and Zanzibar during the 1940's, and has been planted as a seashore windbreak in Hawaii (25)."

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	**Notes**
	Parrotta, J.A. 1994. Coccoloba uvifera (L.) L. Sea grape, Uva de playa. SO-ITF-SM-74. USDA Forest Service, Southern Forest Experiment Station, New Orleans, LA	"The elliptic or egg-shaped fruits are grouped in clusters resembling bunches of grapes. Individual fruits measure about 2 cm in diameter and are purple when ripe. They are composed of a single elliptic seed (achene) about 1 cm long surrounded by an edible, tartly sweet pulp and a thin, fleshy covering." [No evidence. Relatively large fruit & seeds unlikely to become a contaminant]

704	Propagules adapted to wind dispersal	n
	Source(s)	**Notes**
	Parrotta, J.A. 1994. Coccoloba uvifera (L.) L. Sea grape, Uva de playa. SO-ITF-SM-74. USDA Forest Service, Southern Forest Experiment Station, New Orleans, LA	"The elliptic or egg-shaped fruits are grouped in clusters resembling bunches of grapes. Individual fruits measure about 2 cm in diameter and are purple when ripe. They are composed of a single elliptic seed (achene) about 1 cm long surrounded by an edible, tartly sweet pulp and a thin, fleshy covering." ... "The seeds are dispersed by fruit-eating birds."

705	Propagules water dispersed	y
	Source(s)	**Notes**
	Oppenheimer, H. L. & Bartlett, R. T. 2002. New plant records from the main Hawaiian Islands. Bishop Museum Occasional Papers. 69: 1-14	"Seedlings have also been observed at the mouth of Honokōhau Stream." [Seeds are bird-dispersed but may be secondarily moved by water]

706	Propagules bird dispersed	y
	Source(s)	**Notes**
	Parrotta, J.A. 1994. Coccoloba uvifera (L.) L. Sea grape, Uva de playa. SO-ITF-SM-74. USDA Forest Service, Southern Forest Experiment Station, New Orleans, LA	"The seeds are dispersed by fruit-eating birds."

707	Propagules dispersed by other animals (externally)	n
	Source(s)	**Notes**
	Parrotta, J.A. 1994. Coccoloba uvifera (L.) L. Sea grape, Uva de playa. SO-ITF-SM-74. USDA Forest Service, Southern Forest Experiment Station, New Orleans, LA	[No evidence and no means of external attachment] "The elliptic or egg-shaped fruits are grouped in clusters resembling bunches of grapes. Individual fruits measure about 2 cm in diameter and are purple when ripe. They are composed of a single elliptic seed (achene) about 1 cm long surrounded by an edible, tartly sweet pulp and a thin, fleshy covering." ... "The seeds are dispersed by fruit-eating birds."

708	Propagules survive passage through the gut	y

Qsn #	Question	Answer
	Source(s)	**Notes**
	Madriz, R., & Ramírez, N. (1996). Biología reproductiva de Coccoloba uvifera (Polygonaceae) una especie poligamo-dioica. Revista de Biología Tropical, 44(3): 105-115	"Fruit are dispersed by bats."
	Liu, H., Platt, S. G., & Borg, C. K. (2004). Seed dispersal by the Florida box turtle (Terrapene carolina bauri) in pine rockland forests of the lower Florida Keys, United States. Oecologia, 138(4), 539-546	"Table 1 Physical attributes, descriptive statistics, and the frequency of occurrence of diaspores found in the feces of 145 Florida box turtles from Key Deer National Wildlife Refuge, Florida" [Includes Coccoloba uvifera - Seeds germinated successfully after recovery from turtle feces]
	Godinez-Alvarez, H. (2004). Pollination and seed dispersal by lizards: a review. Revista Chilena de Historia Natural, 77 (3), 569-577	"TABLE 2 Quantity and quality components of seed dispersal by lizards. Quantity: (1) lizard abundance, (2) fruit removal and/or handling time, (3) number of seeds per scat, (-) not evaluated. Quality: (1) seed germination after gut passage and/or passage time through the digestive tract, (2) habitat use by lizards, (-) not evaluated" [Coccoloba uvifera seed reported to germinate after gut passage from lizards]

801	**Prolific seed production (>1000/m2)**	
	Source(s)	**Notes**
	Parrotta, J.A. 1994. Coccoloba uvifera (L.) L. Sea grape, Uva de playa. SO-ITF-SM-74. USDA Forest Service, Southern Forest Experiment Station, New Orleans, LA	[Unknown, but unlikely in natural settings. Fruit 1-seeded, and seeds relatively large] "Trees grown from seeds usually begin to flower and fruit in 6 to 8 years (25). In tests conducted in Puerto Rico, average seed weights for two samples of 50 fresh seeds with a moisture content of 38 and 47 percent, respectively, were 0.72 ± 0.03 and 0.96 ± 0.02 g per seed, or between 1,040 and 1,400 seeds per kg (author, personal observation). Expressed on an ovendried-weight basis, there are between 1,980 and 2,260 seeds per kg ."

802	**Evidence that a persistent propagule bank is formed (>1 yr)**	
	Source(s)	**Notes**
	Royal Botanic Gardens Kew. (2017) Seed Information Database (SID). Version 7.1. Available from: http://data.kew.org/sid/. [Accessed 31 May 2017]	"Storage Behaviour: Orthodox? Storage Conditions: Viability maintained for 12 months in hermetic air-dry storage at 5°C (Riley, 1981)"

Qsn #	Question	Answer
	Vargas-Simón, G., & Pire, R. (2010). Effect of two storage conditions on germination of seagrape (Coccoloba uvifera (L.) Jacq.) seeds. Revista de la Facultad de Agronomía, Universidad del Zulia, 27(4), 559-573	[Seeds stored at room temperature remain viable for 15 months] "Abstract : The sea grape is an important plant because the multiple benefits that provides, mainly as a fruit in season. It is commercially propagated by cuttings, but for purposes of species conservation and/or restoration programs, the best option is reproduction by seeds. The aim of this study was to evaluate different variables in their germination respect to time and storage conditions. Pseudofruits were collected in the locality of Centla, Tabasco State, Mexico, and the achenes, including dry seed, were placed under two storage conditions: natural (27.2±1.8°C) and cool environment (4.0±1.5°C). The germination percentage, germination rate, vigor index, and period of seed dormancy at 0, 4, 8, 12 and 15 months of storage were assessed. A completely randomized design with 2×4 factorial arrangements of the treatments, plus a control was used. Twenty seeds, plus achenes were sown per plot in 15 cm diameter sterilized Petri dishes, using towel paper as substrate. Under conditions of natural environment the best responses were 94.5% for germination, 14 days for germination speed, 18.4 as the vigor index, and 10 days for dormancy, which significantly surpassed the values for seeds stored under refrigeration. On the other hand, seed germination under refrigeration decreased as the storage time increased, reaching after 15 months 19.5% less germination when compared to seeds under room temperature. It was found that the viability of this species is subject to the conditions of the seed storage. "

803	Well controlled by herbicides	y
	Source(s)	**Notes**

Qsn #	Question	Answer
	SFGate. 2017. How to Kill a Seagrape. http://homeguides.sfgate.com/kill-seagrape-63730.html. [Accessed 31 May 2017]	"1 Cut down the seagrape with a chainsaw or handsaw. Seagrape is a multi-trunked tree or shrub, so cut the trunks individually to make the job more manageable. 2 Cut the main trunk to within about 4 inches of the soil. Chip away the bark along the outside of the stump, near the cut surface to expose even more of the wood; use a hatchet to chip the bark. 3 Prepare a 25-percent solution of glyphosate or triclopyr herbicide in a disposable container. Some products are water-soluble, while others must be mixed with a surfactant, such as diesel fuel or vegetable oil. You can often find products with these active ingredients that are pre mixed to the proper percentage solution. If you must mix your own herbicide, follow the label on the product for the exact mixing ratios. 4 Brush the herbicide solution onto the exposed cut stump, using a disposable paintbrush. While you can apply the herbicide across the entire cut surface, it is especially important to apply the herbicide generally around the outer edge and sides of the tree stump. Apply the herbicide as soon as possible or within four hours after cutting the stump so the fresh cut doesn't heal. 5 Allow the herbicide to penetrate the stump, where it is transpired into the roots. The roots should be completely dead within a few weeks. 6 Grind the dead stump down below soil grade using a stump grinder, dig up the dead stump or pull the stump out of the ground. Another less strenuous option is to cover the stump with high nitrogen fertilizer which speeds the rate of decay. The nitrogen option is much more time consuming than the other options, but the wood will eventually soften and you can easily chip it away."

804	Tolerates, or benefits from, mutilation, cultivation, or fire	y
	Source(s)	**Notes**
	Janick, J.& Paull, R.E. 2008. The Encyclopedia of Fruit & Nuts. CABI Publishing, Wallingford, UK	"If left without pruning it becomes a vase-shaped multiple-stemmed tree."
	Gilman, E.F. & Watson, D.G. 1993, Coccoloba uvifera. Seagrape. Seagrape. Fact Sheet ST-175. Institute of Food and Agricultural Sciences, University of Florida, Gainesville FL. http://hort.ifas.ufl.edu/. [Accessed 31 May 2017]	[Tolerates regular pruning] "Pruning requirement: requires pruning to develop strong structure" ... "it can be pruned into a dense hedge, screen, or windbreak." ... "It is also used as a seaside hedge in commercial landscapes, but requires hand pruning, since the large leaves do not lend themselves well to shearing." ... "Pruning is required two or three times during the first 10 years after planting to train the multiple trunks so they are well-attached to the tree."
	SFGate. 2017. How to Kill a Seagrape. http://homeguides.sfgate.com/kill-seagrape-63730.html. [Accessed 31 May 2017]	[Will resprout if not treated with herbicide] "While some might find the contorted branches of this shade tree appealing, if you want to get rid of your seagrape, you must kill the plant entirely to prevent sprouts from the roots."

Qsn #	Question	Answer
805	**Effective natural enemies present locally (e.g. introduced biocontrol agents)**	
	Source(s)	**Notes**
	Little Jr., E.L. & Skolmen, R.G. 1989. Common forest trees of Hawaii: (native and introduced). USDA Agriculture Handbook No. 679. USDA Forest Service, Washington, D.C.	"In Hawaii, the species is planted as an ornamental and windbreak along sandy beaches, it escapes and becomes naturalized locally." [Unknown. No mention of pests or pathogens limiting plant's ability to grow or reproduce]

Summary of Risk Traits:

High Risk / Undesirable Traits
• Thrives in tropical climates
• Naturalized on main Hawaiian Islands and Texas
• Regarded as invasive in Hawaiian Islands & elsewhere
• Other species may be invasive
• Tolerates many soil types
• Forms pure stands in native range
• Reproduces by seeds
• Hybridizes with other species
• Seeds dispersed by birds, bats, lizards, turtles, water & intentionally by people
• Able resprout after cutting

Low Risk Traits
• Distribution generally limited to coastal areas & lower elevations
• Unarmed (no spines, thorns, or burrs)
• Non-toxic
• Prefers full sun, but tolerates partial shade (may limit ability to invade shaded environments)
• Ornamental & medicinal uses
• Polygamous – dioecious (most plants dioecious, but limited numbers may be capable of selfing and low seed set)
• Not reported to spread vegetatively
• Reaches maturity in 4-8 years
• Herbicides may provide effective control