

Assessment date 25 March 2015

<i>Dioscorea sansibarensis</i> Pax (syn. <i>Dioscorea macroura</i>, <i>D. macabiha</i>) Zanzibar yam: Central & South Zone		Answer	Score
1.01	Is the species highly domesticated?	n	0
1.02	Has the species become naturalised where grown?		
1.03	Does the species have weedy races?		
2.01	Species suited to Florida's USDA climate zones (0-low; 1-intermediate; 2-high) North Zone: suited to Zones 8, 9 Central Zone: suited to Zones 9, 10 South Zone: suited to Zone 10	2	
2.02	Quality of climate match data (0-low; 1-intermediate; 2-high)	2	
2.03	Broad climate suitability (environmental versatility)	y	1
2.04	Native or naturalized in habitats with periodic inundation North Zone: mean annual precipitation 50-70 inches Central Zone: mean annual precipitation 40-60 inches South Zone: mean annual precipitation 40-60 inches	y	1
2.05	Does the species have a history of repeated introductions outside its natural range?	y	
3.01	Naturalized beyond native range	y	1
3.02	Garden/amenity/disturbance weed	n	0
3.03	Weed of agriculture	n	0
3.04	Environmental weed	n	0
3.05	Congeneric weed	y	1
4.01	Produces spines, thorns or burrs	n	0
4.02	Allelopathic		
4.03	Parasitic		
4.04	Unpalatable to grazing animals		
4.05	Toxic to animals	y	1
4.06	Host for recognised pests and pathogens		
4.07	Causes allergies or is otherwise toxic to humans		
4.08	Creates a fire hazard in natural ecosystems	unk	0
4.09	Is a shade tolerant plant at some stage of its life cycle	n	0
4.10	Grows on infertile soils (oligotrophic, limerock, or excessively draining soils). North & Central Zones: infertile soils; South Zone: shallow limerock or Histisols.	unk	0
4.11	Climbing or smothering growth habit	y	1
4.12	Forms dense thickets		
5.01	Aquatic	n	0
5.02	Grass	n	0
5.03	Nitrogen fixing woody plant	n	0
5.04	Geophyte	y	1
6.01	Evidence of substantial reproductive failure in native habitat	n	0
6.02	Produces viable seed	?	

6.03	Hybridizes naturally	n	-1
6.04	Self-compatible or apomictic	n	-1
6.05	Requires specialist pollinators	n	0
6.06	Reproduction by vegetative propagation	y	1
6.07	Minimum generative time (years)		
7.01	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)		
7.02	Propagules dispersed intentionally by people	y	1
7.03	Propagules likely to disperse as a produce contaminant	n	-1
7.04	Propagules adapted to wind dispersal	y	1
7.05	Propagules water dispersed	y	1
7.06	Propagules bird dispersed	n	-1
7.07	Propagules dispersed by other animals (externally)	y	1
7.08	Propagules dispersed by other animals (internally)	n	-1
8.01	Prolific seed production	n	-1
8.02	Evidence that a persistent propagule bank is formed (>1 yr)	y	1
8.03	Well controlled by herbicides		
8.04	Tolerates, or benefits from, mutilation or cultivation		
8.05	Effective natural enemies present in U.S.		
Total Score		9	
Implemented Pacific Second Screening		n/a	
Risk Assessment Results		High	

section	# questions answered	satisfy minimum?
A		11 yes
B		4 yes
C		18 yes
total		33 yes

Assessment date 25 March 2015

<i>Dioscorea sansibarensis</i> Pax (syn. <i>Dioscorea macroura</i>, <i>D. macabiha</i>) Zanzibar yam: North Zone		Answer	Score
1.01	Is the species highly domesticated?	n	0
1.02	Has the species become naturalised where grown?		
1.03	Does the species have weedy races?		
2.01	Species suited to Florida's USDA climate zones (0-low; 1-intermediate; 2-high) North Zone: suited to Zones 8, 9 Central Zone: suited to Zones 9, 10 South Zone: suited to Zone 10	0	
2.02	Quality of climate match data (0-low; 1-intermediate; 2-high)	1	
2.03	Broad climate suitability (environmental versatility)	y	1
2.04	Native or naturalized in habitats with periodic inundation North Zone: mean annual precipitation 50-70 inches Central Zone: mean annual precipitation 40-60 inches South Zone: mean annual precipitation 40-60 inches	y	1
2.05	Does the species have a history of repeated introductions outside its natural range?	y	
3.01	Naturalized beyond native range	y	1
3.02	Garden/amenity/disturbance weed	n	0
3.03	Weed of agriculture	n	0
3.04	Environmental weed	n	0
3.05	Congeneric weed	y	1
4.01	Produces spines, thorns or burrs	n	0
4.02	Allelopathic		
4.03	Parasitic		
4.04	Unpalatable to grazing animals		
4.05	Toxic to animals	y	1
4.06	Host for recognised pests and pathogens		
4.07	Causes allergies or is otherwise toxic to humans		
4.08	Creates a fire hazard in natural ecosystems	unk	0
4.09	Is a shade tolerant plant at some stage of its life cycle	n	0
4.10	Grows on infertile soils (oligotrophic, limerock, or excessively draining soils). North & Central Zones: infertile soils; South Zone: shallow limerock or Histisols.	unk	0
4.11	Climbing or smothering growth habit	y	1
4.12	Forms dense thickets		
5.01	Aquatic	n	0
5.02	Grass	n	0
5.03	Nitrogen fixing woody plant	n	0
5.04	Geophyte	y	1
6.01	Evidence of substantial reproductive failure in native habitat	n	0
6.02	Produces viable seed	?	

6.03	Hybridizes naturally	n	-1
6.04	Self-compatible or apomictic	n	-1
6.05	Requires specialist pollinators	n	0
6.06	Reproduction by vegetative propagation	y	1
6.07	Minimum generative time (years)		
7.01	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)		
7.02	Propagules dispersed intentionally by people	y	1
7.03	Propagules likely to disperse as a produce contaminant	n	-1
7.04	Propagules adapted to wind dispersal	y	1
7.05	Propagules water dispersed	y	1
7.06	Propagules bird dispersed	n	-1
7.07	Propagules dispersed by other animals (externally)	y	1
7.08	Propagules dispersed by other animals (internally)	n	-1
8.01	Prolific seed production	n	-1
8.02	Evidence that a persistent propagule bank is formed (>1 yr)	y	1
8.03	Well controlled by herbicides		
8.04	Tolerates, or benefits from, mutilation or cultivation		
8.05	Effective natural enemies present in U.S.		
Total Score		7	
Implemented Pacific Second Screening		n/a	
Risk Assessment Results		High	

section	# questions answered	satisfy minimum?
A		11 yes
B		4 yes
C		18 yes
total		33 yes

	Reference	Source data
1.01		Widely cultivated and domesticated, but no evidence of selection for reduced weediness
1.02		
1.03		
2.01	1. PERAL NAPPFAST Global Plant Hardiness (http://www.nappfast.org/Plant_hardiness/NAPPFAST%20Global%20zones/10-year%20climate/PLANT_HARDINESS_10YR%20lnd.tif). 2. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?409896 (20 March 2015). 3. Global Biodiversity Information Facility (GBIF.org [accessed 3/20/2015]).	N=N, C=Y, S=Y: No computer analysis was performed. 1. Global plant hardiness zones 10-13 Native to Africa: Sudan, Kenya, Tanzania, Uganda, Cameroon, Central African Republic, Congo, Gabon, Zaire, Benin, Cote D'Ivoire, Ghana, Nigeria, Togo, Angola, Mozambique, Zambia, Zimbabwe, and Madagascar.
2.02		see source data 2.01
2.03	1. Köppen-Geiger climate map (http://www.hydrol-earth-syst-sci.net/11/1633/2007/hess-11-1633-2007.pdf). 2. Global Biodiversity Information Facility (GBIF.org [accessed 3/20/2015]).	1 & 2. Distribution in the native/cultivated range occurs in Am, Aw, Bsh, Cwa, Cwb
2.04	1. Global Biodiversity Information Facility (GBIF.org [accessed 3/20/2015]). 2. Atlas of the Biosphere, Center for Sustainability and the Global Environment. University of Wisconsin, Madison (www.sage.wisc.edu [accessed 3/20/2015]).	N=Y, C=Y, S=Y 1. Global distribution falls in areas receiving 27-247cm ppt (9.5-97 inches)
2.05	1. Flora of North America (www.efloras.org [accessed 19 march 2015]) 2. PIER (www.hear.org/pier [accessed 20 March 2015]) 3. Hsu and Wang (2012) <i>Dioscorea sansibarensis</i> Pax (Dioscoreaceae), a newly naturalized plant in Taiwan. <i>Collection and Research</i> 25: 25-29.	1. An ornamental species native to tropical Africa, is widely cultivated for large unusually shaped leaves. 2. Naturalized in Singapore. 3. Described as naturalized in south China, Taiwan, Indonesia, Singapore, and tropical America.
3.01	1. PIER (www.hear.org/pier [accessed 20 March 2015]) 2. Hsu and Wang (2012) <i>Dioscorea sansibarensis</i> Pax (Dioscoreaceae), a newly naturalized plant in Taiwan. <i>Collection and Research</i> 25: 25-29.	1. Naturalized in Singapore. 2. Described as naturalized in south China, Taiwan, Indonesia, Singapore, and tropical America.
3.02		No evidence
3.03		No evidence
3.04		No evidence
3.05	1. Holm et al. (1979) <i>A geographical atlas of world weeds</i> . 2. USDA Plants database (http://plants.usda.gov accessed 3/23/2015)	1. <i>D. bulbifera</i> listed as serious weed in west polynesia. 2. <i>D. bulbifera</i> is a listed noxious weed in Florida and Alabama
4.01	1. Flora of North America (www.efloras.org [accessed 19 march 2015])	These features are not in the description of the species.
4.02		No evidence
4.03	1. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?409896 (20 March 2015).	1. Family Dioscoreaceae (not a parasitic family)
4.04		no evidence, but not likely as multiple sources describe the plant as toxic and poisonous

4.05	1. African Plant Database (http://www.ville-ge.ch [accessed 19 March 2015]). 2. Flora of North America (www.efloras.org [accessed 19 March 2015]) 3. Dave's Garden (www.davesgarden.com [accessed 19 March 2015]) 4. As reviewed in Useful Tropical Plants, <i>Dioscorea sansibarensis</i> (www.tropical.theferns.info [accessed 19 March 2015])	1. The whole plant is described as "very toxic". 2. Both tubers and bulbils are toxic. 3. parts of the plant are poisonous if ingested. 2. Plant produces dioscorine, dihydrodioscorine, and other unnamed alkaloids. The tuber has been used as an ordeal poison, both the tuber and the bulbil has been used to poison animals such as wild pigs, and the plant has been used in fish poison.
4.06		No evidence
4.07	1. Dave's Garden (www.davesgarden.com [accessed 19 March 2015])	1. All parts of the plant are poisonous if ingested.
4.08	1. UDSA Forest Service FEIS (http://www.fs.fed.us/database/feis) 2. Morisawa, TunyaLee. 1999. Weed notes-- <i>Dioscorea</i> species: <i>Dioscorea bulbifera</i> , <i>D. alata</i> , <i>D. sansibarensis</i> , [Online]. In: Control methods--plants. In: Global Invasive Species Team (GIST). Arlington, VA: The Nature Conservancy (Producer). : http://www.invasive.org/gist/moredocs/diospp01.pdf	1. Vines climbing into the canopy can serve as ladder fuels and could encourage crown fires. However, changes in fire regimes and behavior are described as speculative and highlight the need for more information about how yams may affect the fire ecology of invaded habitats.
4.09	1. Urban Forest (uforest.org [19 March 2015])	No evidence of shade tolerance 1. Described as a "sun-loving"
4.10	1. Global soil map (http://www.globalsoilmap.net accessed 3/25/2015) 2. Global Biodiversity Information Facility (GBIF.org [accessed 3/20/2015]).	N & C=Unk, S=Unk 1. Ultisols, Oxisols, possibly Alfisols. Not enough information to answer, but it is likely soil types match for North zone (Ultisols)
4.11	1. Urban Forest (uforest.org [19 March 2015]) 2. Hsu and Wang (2012) <i>Dioscorea sansibarensis</i> Pax (<i>Dioscoreaceae</i>), a newly naturalized plant in Taiwan. <i>Collection and Research</i> 25: 25-29.	1. Aggressive growth is capable of smothering trees when it climbs over and covers the canopy. 2. Habitat described as climbing over thickets
4.12		No evidence
5.01	1. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?409896 (20 March 2015).	1. Family <i>Dioscoreaceae</i>
5.02	1. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?409896 (20 March 2015).	1. Family <i>Dioscoreaceae</i>
5.03	1. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?409896 (20 March 2015).	1. Family <i>Dioscoreaceae</i>
5.04	1. African Plant Database (http://www.ville-ge.ch [accessed 19 March 2015]). 2. UDSA Forest Service FEIS (http://www.fs.fed.us/database/feis)	1. characterized as geophyte in description. 2. Life form listed as geophyte
6.01	1. Hsu and Wang (2012) <i>Dioscorea sansibarensis</i> Pax (<i>Dioscoreaceae</i>), a newly naturalized plant in Taiwan. <i>Collection and Research</i> 25: 25-29.	No evidence 1. evidence of very low (if any) seed production, however the primary means of reproduction is the production and dispersal of bulbils which has been described as producing "thousands of aerial bulbils".
6.02	1. PIER (www.hear.org/pier [accessed 20 March 2015])	1. Propagation listed as "seed", but see source data 6.01
6.03	1. UDSA Forest Service FEIS (http://www.fs.fed.us/database/feis)	No evidence, unlikely as plants are described as flowering infrequently ("Because synchronous flowering, fruit production, and successful seed set are extremely rare for yams...")
6.04	Morisawa (1999) untitled <i>Dioscorea</i> fact sheet. The Nature Conservancy, Wildland Invasive Species Program. Tncweeds.ucdavis.edu .	1. Plants are dioecious

6.05	1. UDSA Forest Service FEIS (http://www.fs.fed.us/database/feis)	No evidence, unlikely as plants are described as flowering infrequently ("Because synchronous flowering, fruit production, and successful seed set are extremely rare for yams...")
6.06	1. Hsu and Wang (2012) <i>Dioscorea sansibarensis</i> Pax (Dioscoreaceae), a newly naturalized plant in Taiwan. <i>Collection and Research</i> 25: 25-29.	2. vegetatively propagates through the production of bulbils.
6.07		Unknown, plants flower infrequently, rarely set seed, and the primary means of reproduction is vegetative bulbils.
7.01	1. UDSA Forest Service FEIS (http://www.fs.fed.us/database/feis)	1. "Although yam bulbils are easily dislodged from the parent [45], primarily dispersed by gravity, and often fall near the parent plant, secondary dispersal by water, animals, or humans can increase dispersal distance."
7.02	1. Xenoflora llc. http://xenoflora.com/product/dioscorea-sansibarensis/	1. Plants available on the internet. Described as " <i>Dioscorea sansibarensis</i> is a very cool vine with its large, batwing foliage."
7.03		No evidence
7.04	1. African Plant Database (http://www.ville-ge.ch [accessed 19 March 2015]). 2. Flora of North America (www.efloras.org [accessed 19 March 2015])	1 & 2. Seeds are winged at both ends.
7.05	1. UDSA Forest Service FEIS (http://www.fs.fed.us/database/feis) 2. Morisawa, TunyaLee. 1999. Weed notes-- <i>Dioscorea</i> species: <i>Dioscorea bulbifera</i> , <i>D. alata</i> , <i>D. sansibarensis</i> , [Online]. In: Control methods--plants. In: Global Invasive Species Team (GIST). Arlington, VA: The Nature Conservancy (Producer). : http://www.invasive.org/gist/moredocs/diospp01.pdf	1. "Although yam bulbils are easily dislodged from the parent [45], primarily dispersed by gravity, and often fall near the parent plant, secondary dispersal by water, animals, or humans can increase dispersal distance." 2. Mature bulbils float in water suggesting that flood waters may be a form of dispersal.
7.06		No evidence
7.07	1. UDSA Forest Service FEIS (http://www.fs.fed.us/database/feis)	1. secondary dispersal by water, animals, or humans can increase dispersal distance.
7.08		Unlikely bulbils are dispersed internally, unknown if seeds dispersed in this manner
8.01	1. Hsu and Wang (2012) <i>Dioscorea sansibarensis</i> Pax (Dioscoreaceae), a newly naturalized plant in Taiwan. <i>Collection and Research</i> 25: 25-29.	1. evidence of very low (if any) seed production, however the primary means of reproduction is the production and dispersal of bulbils which has been described as producing "thousands of aerial bulbils".
8.02	Morisawa (1999) untitled <i>Dioscorea</i> fact sheet. The Nature Conservancy, Wildland Invasive Species Program. Tncweeds.ucdavis.edu .	1. Considering the bulbils as the primary mode of reproduction, evidence that these bulbils remain viable a year or more.
8.03		No evidence
8.04		No evidence
8.05		No evidence