Keywords: High Risk, Naturalized, Invasive Succulent, Spine-tipped leaves, Bird-dispersed

Family: ***Asparagaceae***

Taxon: ***Yucca aloifolia***

Synonym: *Dracaena lenneana Regel*
Yucca serrulata Haw.
Yucca yucatana Engelm.
Sarcoyucca aloifolia (L.) Linding.

Common Name: aloe yucca
Spanish bayonet
dagger plant

Questionaire : current 20090513 **Assessor:** Assessor **Designation:** H(HPWRA)
Status: Assessor Approved **Data Entry Person:** Assessor **WRA Score 14**

101	**Is the species highly domesticated?**	**y=-3, n=0**	**n**
102	**Has the species become naturalized where grown?**	**y=1, n=-1**	
103	**Does the species have weedy races?**	**y=1, n=-1**	
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**	**y**
204	**Native or naturalized in regions with tropical or subtropical climates**	**y=1, n=0**	**y**
205	**Does the species have a history of repeated introductions outside its natural range?**	**y=-2, ?=-1, n=0**	**y**
301	**Naturalized beyond native range**	**y = 1*multiplier (see Appendix 2), n= question 205**	**y**
302	**Garden/amenity/disturbance weed**	**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)**	
305	**Congeneric weed**	**n=0, y = 1*multiplier (see Appendix 2)**	**y**
401	**Produces spines, thorns or burrs**	**y=1, n=0**	**y**
402	**Allelopathic**	**y=1, n=0**	
403	**Parasitic**	**y=1, n=0**	**n**
404	**Unpalatable to grazing animals**	**y=1, n=-1**	**y**
405	**Toxic to animals**	**y=1, n=0**	
406	**Host for recognized pests and pathogens**	**y=1, n=0**	**n**
407	**Causes allergies or is otherwise toxic to humans**	**y=1, n=0**	
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**	**y=1, n=0**	**y**

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**	
604	**Self-compatible or apomictic**	**y=1, n=-1**	**y**
605	**Requires specialist pollinators**	**y=-1, n=0**	**n**
606	**Reproduction by vegetative fragmentation**	**y=1, n=-1**	**y**
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**	**y**
702	**Propagules dispersed intentionally by people**	**y=1, n=-1**	**y**
703	**Propagules likely to disperse as a produce contaminant**	**y=1, n=-1**	**n**
704	**Propagules adapted to wind dispersal**	**y=1, n=-1**	**n**
705	**Propagules water dispersed**	**y=1, n=-1**	**n**
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)**	**y=1, n=-1**	**n**
802	**Evidence that a persistent propagule bank is formed (>1 yr)**	**y=1, n=-1**	
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)**	**y=-1, n=1**	

Designation: H(HPWRA) **WRA Score** **14**

Supporting Data:

101	2012. Smith, G.F./Figueiredo, E./Crouch, N.R.. A first record of Yucca aloifolia L.(Agavaceae/Asparagaceae) naturalized in South Africa with notes on its uses and reproductive biology. Haseltonia. 17: 87-93.	[Is the species highly domesticated? No. Unlikely] Pellmyr (2003) has suggested that these characters—in conjunction with the absence of an endemic pollinator, core loss in the fruit, disjunct distribution range, and poorly synchronized flowering spread across many months—suggest that Y. aloifolia might be an escaped cultivar. He hypothesized that pre-Hispanic cultures developed Y. aloifolia as a cultivar of Y. elephantipes, one selected for its high vegetative propagation potential coupled to ethnobotanical value, in this instance use of the roots for soap. However, phylogenetic work conducted by Clary (1997) on Yucca DNA shows that Y. aloifolia is most closely related to Y. gloriosa, not Y. elephantipes. Although Y. elephantipes and Y. aloifolia both are tropical in distribution and have denticulate leaves and fleshy fruits, they appear not to be closely related within the Sarcocarpa clade in Yucca (Clary 1997). These data do not support a hypothesis that Y. aloifolia was domesticated from Y. elephantipes. Rather, it is suggested that Y. aloifolia is a unique species which has been on its own distinctive evolutionary path long separate from the common ancestor it shares with Y. elephantipes. It therefore is doubtful that Y. aloifolia was domesticated from another yucca species (K. Clary, personal communication). It would appear more likely that it was selected directly from the wild because of the useful characteristics that it already possessed."
102	2013. WRA Specialist. Personal Communication.	NA
103	2013. WRA Specialist. Personal Communication.	NA
201	2000. Groman, J.D./Pellmyr, O.. Rapid evolution and specialization following host colonization in a yucca moth. Journal of Evolutionary Biology. 13(2): 223-236.	[Species suited to tropical or subtropical climate(s) 2-High] "Yucca aloifolia L. occurs in Mexico, the Caribbean, and on the dunes along the US Atlantic Coast (Trelease, 1902)."
201	2013. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Species suited to tropical or subtropical climate(s) 2-High] "Native: (links to other web resources are provided for some distributions) NORTHERN AMERICA (Check conservation status in U.S. & Canada in NatureServe Explorer database) Southeastern U.S.A.: United States - Alabama, Florida, Georgia, Louisiana [s.], Mississippi [s.], North Carolina, South Carolina, Virginia [s.e.] South-Central U.S.A.: United States - Texas [s.e.] Southern Mexico: Mexico - Veracruz, Yucatan SOUTHERN AMERICA Caribbean: Antigua and Barbuda; Guadeloupe; Jamaica; St. Lucia"
202	2013. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Quality of climate match data 2-High]
203	2012. Smith, G.F./Figueiredo, E./Crouch, N.R.. A first record of Yucca aloifolia L.(Agavaceae/Asparagaceae) naturalized in South Africa with notes on its uses and reproductive biology. Haseltonia. 17: 87-93.	[Broad climate suitability (environmental versatility)? Yes] "Most species of Yucca are exceedingly tolerant of extreme climatic conditions. The Free State Province, where Y. aloifolia has been collected (Figure 2), experiences very cold winters with temperatures regularly dropping well below 0º Celsius. In summer, extended spells of over 30º Celsius are not uncommon. The second collection site of Y. aloifolia (Figure 3) near Pietermaritzburg in KwaZulu-Natal similarly experiences frost, although not as extreme in intensity or duration. At neither of these localities (Figure 4) do the plants show even the slightest sign of damage from frost or heat injury."
204	1902. Trelease, W.. The Yucceae. Missouri Botanical Garden Annual Report. 1902: 27-133.	[Native or naturalized in regions with tropical or subtropical climates? Yes] "Virgin Isles, Jamaica, eastern coast of Mexico (Vera Cruz), the Bermudas, Atlantic and Gulf States southward from about Pamlico Sound; and occasionally escaping from cultivation as far inland as Monroe in northwestern Louisiana."
204	2003. Pellmyr, O.. Yuccas, Yucca Moths, and Coevolution: A Review. Annals of the Missouri Botanical Garden. 90(1): 35-55.	[Native or naturalized in regions with tropical or subtropical climates? Yes] "In addition to its distribution along the shoreline of southeastern North America, Y aloifolia is reportedly also established on Cuba, Jamaica, the Bahamas and Bermuda (Trelease, 1902), where pre-Hispanic cultures are suggested to have used its roots for soap (Engelmann, 1873)."
205	2012. Smith, G.F./Figueiredo, E./Crouch, N.R.. A first record of Yucca aloifolia L.(Agavaceae/Asparagaceae) naturalized in South Africa with notes on its uses and reproductive biology. Haseltonia. 17: 87-93.	[Does the species have a history of repeated introductions outside its natural range? Yes] "Although Yucca aloifolia is very widely cultivated (Hochstätter 2002), Thiede (2001) suggests that it occurs naturally only in Veracruz and Yucatán, Mexico."

301	2004. Wu, S.-H./Hsieh, C.-F./Rejmánek, M.. Catalogue of the Naturalized Flora of Taiwan. Taiwania. 49(1): 16-31.	[Naturalized beyond native range? Possibly Taiwan] "Table 2. List of possibly naturalized species." [Includes Yucca aloifolia]
301	2010. Chambers, D./Holtum, J.A.M.. Feasibility of Agave as a Feedstock for Biofuel Production in Australia. RIRDC Publication No. 10/104. Rural Industries Research and Development Corporation, Barton, Australia	[Naturalized beyond native range? Yes] "In Australia six exotic Agavaceae from the genera Agave (A. americana, A. vivipara, A. sisalana), Furcraea (F. foetida, F. selloa) and Yucca (Yucca aloifolia) are considered naturalised (Figure 8.1; Forster 1987a; Bationoff et al 2002, Anon. 2006)." … "Yucca aloifolia is naturalised at several localities in Qld, NSW and WA (Figure 8.1). In Queensland, small populations are known on foreshores at seaside settlements (see also Bationoff & Franks 1997, 1998; Bationoff & Butler 2002). An inland population at higher altitudes (450m) has been present since at least 1948 and a large population of nearly 50 m across is likely to have been established over a century ago (Forster 1987b)."
301	2012. Smith, G.F./Figueiredo, E./Crouch, N.R.. A first record of Yucca aloifolia L.(Agavaceae/Asparagaceae) naturalized in South Africa with notes on its uses and reproductive biology. Haseltonia. 17: 87-93.	[Naturalized beyond native range? Yes] "Abstract: Although several species of Agave L. (Agavaceae/Asparagaceae) are known to have become established in southern Africa, particularly South Africa, this is the first time that evidence supported by herbarium specimens is documented for the occurrence of the agavoid Yucca aloifolia L. in the region. Notes are provided on the reproductive biology and uses of Y. aloifolia, with emphasis on South Africa." … "However, it is only Y. aloifolia L. that has become established in natural vegetation on the subcontinent."
301	2013. Queensland Government. Weeds of Australia - Yucca - Yucca aloifolia. http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Yucca_aloifolia.htm [Accessed 15 Nov 2013]	[Naturalized beyond native range? Yes] "This species is widespread but scattered in Australia, and is mainly found in coastal districts. It has been recorded in south eastern and central Queensland, in some parts of eastern New South Wales, in the ACT and in south-western Western Australia. It is also sparingly naturalised on Lord Howe Island. Also naturalised overseas in other parts of the Caribbean (e.g. Puerto Rico and the Virgin Islands) and in New Caledonia."
302	2006. Agricultural Geo-referenced Information System (AGIS). Weeds and Invasive Plants - Version 2.00. http://www.agis.agric.za/wip/ [Accessed 14 Nov 2013]	[Garden/amenity/disturbance weed? Included in a list of weeds & invasive plants] "Habitat: Disturbed sites around human habitation, drainage lines and dongas. " … "Invasive status: Category Not declared"
302	2011. Merino, F.F./Donat, P.M.. Invasive Plants in the Coastal Vegetal Communities in Valencia (Spain). Notulae Botanicae Horti Agrobotanici Cluj-Napoca. 39(1): 9-17.	[Garden/amenity/disturbance weed? Listed as invasive] "In the study 49 invasive species have been catalogued:" [Includes Yucca aloifolia]
303	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Agricultural/forestry/horticultural weed? No] No evidence
304	1998. Csurhes, S./Edwards, R.. Potential environmental weeds in Australia: Candidate species for preventative control. Biodiversity Group, Environment Australia, Canberra, Australia	[Environmental weed? No] "Yucca aloifolia is an evergreen plant (to c. 1.5m tall) with greyish-green, narrow, spear-like leaves arranged in a basal rosette. The flowers are white and bell-shaped, arranged in erect, terminal spikes. Propagation is by seed (Bodkin 1986). It is common around old habitation but does not yet appear to be fully naturalised (Harden 1993). It is present on the north coast of New South Wales and Queensland (Harden 1993)."
304	2013. Queensland Government. Weeds of Australia - Yucca - Yucca aloifolia. http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Yucca_aloifolia.htm [Accessed 15 Nov 2013]	[Environmental weed? Potentially] "Yucca (Yucca aloifolia) is regarded as an environmental weed in New South Wales and as a potential environmental weed or "sleeper weed " in other parts of Australia." [Designation as an environmental weed has not been supported with direct evidence in this reference. Information is therefore justification to categorize this species as a weed of unspecified impacts. See 3.02]
305	2006. Bovey, R.W.. Control of Yucca By Aerial Application of Herbicides. Journal of Range Management Archives. 17(4): 194-196.	[Congeneric weed? Yes] "Yucca (Yucca glauca Nutt.), also commonly called soapweed, beargrass, or Spanish bayonet, is a generally undesirable perennial that occurs on thousands of acres of rangeland in Nebraska and surrounding states."
305	2011. Young, S.L./Mues, N.L. /. Managing Soapweed Yucca. G2086. University of Nebraska–Lincoln Extension, Lincoln, NE ianrpubs.unl.edu/live/g2086/build/g2086.pdf	[Congeneric weed? Yes] "Soapweed yucca can infest pastures and rangeland, reducing beneficial plant populations and livestock production." … "It is used in landscapes as an ornamental, but generally is considered a nuisance in pastures, ranges, and rights-of-way. It can reach densities of up to 2,000 plants per acre."
401	2008. Kobayashi, K./Criley, R./Kaufman, A./Tsugawa, S./Ricordi, A./Clifford, P.. Barrier Plants. L-20. College of Tropical Agriculture and Human Resources (CTAHR, Honolulu, HI http://www.ctahr.hawaii.edu/freepubs	[Produces spines, thorns or burrs? Yes] "Spanish bayonet, dagger plant - Yucca aloifolia, Agavaceae. This plant's erect trunk is armed with sharp-pointed, dark green, straplike leaves." … "Do not plant Spanish bayonet near walkways, patios, or in areas frequented by children and pets. This plant can inflict painful puncture wounds even through heavy clothing."

401	2012. Smith, G.F./Figueiredo, E./Crouch, N.R.. A first record of Yucca aloifolia L.(Agavaceae/Asparagaceae) naturalized in South Africa with notes on its uses and reproductive biology. Haseltonia. 17: 87-93.	[Produces spines, thorns or burrs? Yes] "Leaves erect, long-lived, persistent when dry, stem-clasping, densely and rosulately crowded along stems, stiff, leathery, flattened, slightly thickened-fleshy, 10–40 × 2.0–6.5 cm; leaf margins saw-tooth-like (sharply denticulate to serrulate) or more rarely smooth; leaf tips very sharp."
402	2013. WRA Specialist. Personal Communication.	[Allelopathic? Unknown]
403	2012. Smith, G.F./Figueiredo, E./Crouch, N.R.. A first record of Yucca aloifolia L.(Agavaceae/Asparagaceae) naturalized in South Africa with notes on its uses and reproductive biology. Haseltonia. 17: 87-93.	[Parasitic? No] "Medium-sized to robust, clump-forming, stem and leaf-succulent plants." [Agavaceae/ Asparagaceae]
404	2002. Loewer, H.P.. Solving deer problems: how to keep them out of the garden, avoid them on the road, and deal with them anywhere!. Globe Pequot, Guilford, CT	[Unpalatable to grazing animals? Yes, due to spiny leaves] "Yuccas are large-scale American desert plant found in most of the country. They produce stiff, sword-shaped leaves up to four feet long, often tipped with a needle-like spine."
404	2005. Kent, D.. Firescaping: creating fire-resistant landscapes, gardens, and properties in California's diverse environments. Wilderness Press, Berkeley, CA	[Unpalatable to grazing animals? Yes, due to spiny leaves] Categorized as deer resistant
404	2012. Smith, G.F./Figueiredo, E./Crouch, N.R.. A first record of Yucca aloifolia L.(Agavaceae/Asparagaceae) naturalized in South Africa with notes on its uses and reproductive biology. Haseltonia. 17: 87-93.	[Unpalatable to grazing animals? Yes] "Figure 1. Section of a living fence of Yucca aloifolia in flower. The plants were established from large stem cuttings planted where they were intended to grow as part of an impenetrable livestock enclosure." … "With their spine-tipped leaves and general nonpalatability to stock, yuccas sometimes are used as boundary or rough fence plants, particularly in more arid areas (Howes 1946)."
405	2013. Plants for a Future Database. Yucca aloifolia. http://www.pfaf.org/user/Plant.aspx?LatinName=Yucca+aloifolia [Accessed 14 Nov 2013]	[Toxic to animals? Unknown] "The roots contain saponins[222]. Whilst saponins are quite toxic to people, they are poorly absorbed by the body and so tend to pass straight through. They are also destroyed by prolonged heat, such as slow baking in an oven. Saponins are found in many common foods such as beans[K]. Saponins are much more toxic to some creatures, such as fish, and hunting tribes have traditionally put large quantities of them in streams, lakes etc in order to stupefy or kill the fish[K]."
406	2007. Gilman, E.F.. Yucca aloifolia: Spanish Bayonet. Revised. FPS-614. University of Florida IFAS Extension, Gainesville, FL http://edis.ifas.ufl.edu/pdffiles/FP/FP61400.pdf	[Host for recognized pests and pathogens? No] "Pest resistance: no serious pests are normally seen on the plant" … "Pest problems include scale and yucca moth larvae, which may bore through and weaken the terminal shoot. Pests and Diseases Leaf spot can be a problem in areas with poor air circulation."
407	2001. Kanerva, L./Estlander, T./Petman, L./Mäkinen-Kiljunen, S.. Occupational allergic contact urticaria to yucca (Yucca aloifolia), weeping fig (Ficus benjamina), and spathe flower (Spathiphyllum wallisii). Allergy. 56: 1008–1011.	[Causes allergies or is otherwise toxic to humans? Possibly to susceptible individuals] "A 22-year-old male gardener and caretaker of plants developed CU and rhinoconjunctivitis when exposed to decorative houseplants. He had worked in his present job for 15 months before skin symptoms developed on the eyelids and lower arms, and later spread to the hands and the entire skin. Contact with especially weeping fig, yucca, and spathe flower caused immediate skin symptoms. He underwent allergologic investigation half a year later. Occasionally, he had had work-related hand dermatitis, developing as a consequence of CU, and conforming to protein contact dermatitis." … "In Finland, four yucca species, Yucca aloifolia (Fig. 1), Y. gloriosa, Y. elephantipes (25), and Y. filamentosa, are commonly cultivated. Yucca and some other Agavaceae plants, such as Agave americana, may contain saponin and minute, sharp, irritating crystals of calcium oxalate (26, 27). Plant thorns and splinters from yucca plants may induce deep granulomata (26), but we have not found reports of yucca allergy."
407	2012. Smith, G.F./Figueiredo, E./Crouch, N.R.. A first record of Yucca aloifolia L.(Agavaceae/Asparagaceae) naturalized in South Africa with notes on its uses and reproductive biology. Haseltonia. 17: 87-93.	[Causes allergies or is otherwise toxic to humans? No evidence] "These authors noted that all parts of Yucca flower [inflorescence] stalks were eaten by the indigenous peoples of the southwestern American deserts, either boiled or raw. One could speculate on the relative palatability of stalks that do not bear fruits, on which basis sterile forms of Y. aloifolia might have been selected as a food cultivar."
407	2013. Brown, S.H.. Yucca aloifolia. University of Florida, IFAS Extension, Fort Myers, FL http://lee.ifas.ufl.edu/Hort/GardenPubsAZ/Spanish_bayonet.pdf	[Causes allergies or is otherwise toxic to humans? Injury from spines may lead to secondary infection] "It is strongly recommended not to plant it in yards or in landscapes where children are often present. The spines can cause infection. It can also be surrounded by a ground cover or low growing plants to protect the unwary from harm."
408	2005. Kent, D.. Firescaping: creating fire-resistant landscapes, gardens, and properties in California's diverse environments. Wilderness Press, Berkeley, CA	[Creates a fire hazard in natural ecosystems? No] Recommended as a fire-resistant plant

408	2012. Smith, G.F./Figueiredo, E./Crouch, N.R.. A first record of Yucca aloifolia L.(Agavaceae/Asparagaceae) naturalized in South Africa with notes on its uses and reproductive biology. Haseltonia. 17: 87-93.	[Creates a fire hazard in natural ecosystems? No evidence] "Medium-sized to robust, clump forming, stem and leaf-succulent plants." [Succulent perennial with presumably low flammability]
409	1996. Nelson, G.. The shrubs and woody vines of Florida: a reference and field guide. Pineapple Press Inc, Sarasota, FL	[Is a shade tolerant plant at some stage of its life cycle? Yes] "It requires well-drained soil and does well in full sun or shade."
409	2007. Gilman, E.F.. Yucca aloifolia: Spanish Bayonet. Revised. FPS-614. University of Florida IFAS Extension, Gainesville, FL http://edis.ifas.ufl.edu/pdffiles/FP/FP61400.pdf	[Is a shade tolerant plant at some stage of its life cycle? Yes] "Growing in full sun or partial shade, Spanish bayonet does well on any well-drained soil and should be watered sparingly, if at all. Plants can also tolerate nearly full shade."
409	2008. Kobayashi, K./Criley, R./Kaufman, A./Tsugawa, S./Ricordi, A./Clifford, P.. Barrier Plants. L-20. College of Tropical Agriculture and Human Resources (CTAHR, Honolulu, HI http://www.ctahr.hawaii.edu/freepubs	[Is a shade tolerant plant at some stage of its life cycle?] "It prefers full sun but does well in partial sun."
410	1996. Garrett, H.. Howard Garrett's Plants for Texas. University of Texas Press, Austin, TX	[Tolerates a wide range of soil conditions? Yes] "Grows in any soil."
410	2007. Gilman, E.F.. Yucca aloifolia: Spanish Bayonet. Revised. FPS-614. University of Florida IFAS Extension, Gainesville, FL http://edis.ifas.ufl.edu/pdffiles/FP/FP61400.pdf	[Tolerates a wide range of soil conditions ? Yes] "Soil tolerances: alkaline; sand; acidic; loam"
410	2013. Brown, S.H.. Yucca aloifolia. University of Florida, IFAS Extension, Fort Myers, FL http://lee.ifas.ufl.edu/Hort/GardenPubsAZ/Spanish_bayonet.pdf	[Tolerates a wide range of soil conditions? Yes] "Spanish bayonet is adaptable to a wide range of well-drained soils and is suitable for planting on coastal sands and sand dunes."
411	2012. Smith, G.F./Figueiredo, E./Crouch, N.R.. A first record of Yucca aloifolia L.(Agavaceae/Asparagaceae) naturalized in South Africa with notes on its uses and reproductive biology. Haseltonia. 17: 87-93.	[Climbing or smothering growth habit? No] "Medium-sized to robust, clump-forming, stem and leaf-succulent plants."
412	1988. Godfrey, R.K.. Trees, Shrubs, and Woody Vines of Northern Florida and Adjacent Georgia and Alabama. University of Georgia Press, Athens, GA	[Forms dense thickets? Possibly] "Besides the foregoing growth habit, buds often form near the base of a relatively elongate stem and these by the same process can form a thicket."
412	2012. Michael, P. (ed.). The Master Weed Wackers Manual. A compilation of the most common weeds found on Port Macquarie Landcare sites.. Port Macquarie Landcare Group, Inc., Port Macquarie, NSW	[Forms dense thickets? Yes] "A hardy plant that forms impenetrable of tough leaves, spiny leaves."
501	2012. Smith, G.F./Figueiredo, E./Crouch, N.R.. A first record of Yucca aloifolia L.(Agavaceae/Asparagaceae) naturalized in South Africa with notes on its uses and reproductive biology. Haseltonia. 17: 87-93.	[Aquatic? No] "Medium-sized to robust, clump-forming, stem and leaf-succulent plants."
502	2012. Smith, G.F./Figueiredo, E./Crouch, N.R.. A first record of Yucca aloifolia L.(Agavaceae/Asparagaceae) naturalized in South Africa with notes on its uses and reproductive biology. Haseltonia. 17: 87-93.	[Grass? No] Agavaceae/ Asparagaceae
503	2012. Smith, G.F./Figueiredo, E./Crouch, N.R.. A first record of Yucca aloifolia L.(Agavaceae/Asparagaceae) naturalized in South Africa with notes on its uses and reproductive biology. Haseltonia. 17: 87-93.	[Nitrogen fixing woody plant? No] Agavaceae/ Asparagaceae
504	2012. Smith, G.F./Figueiredo, E./Crouch, N.R.. A first record of Yucca aloifolia L.(Agavaceae/Asparagaceae) naturalized in South Africa with notes on its uses and reproductive biology. Haseltonia. 17: 87-93.	[Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)? No] "Medium-sized to robust, clump forming, stem and leaf-succulent plants. Roots thin, wiry, reddish brown. Stems cylindrical to slightly enlarged at the base, 3–many, erect or leaning, 3–5 m tall, simple or sparingly branched higher up, fibrous, covered in remains of dead leaves. Leaves erect, long lived, persistent when dry, stem-clasping, densely and rosulately crowded along stems, stiff, leathery, flattened, slightly thickened-fleshy, 10–40 × 2.0–6.5 cm; leaf margins saw-tooth-like (sharply denticulate to serrulate) or more rarely smooth; leaf tips very sharp."

601	2003. Pellmyr, O.. Yuccas, Yucca Moths, and Coevolution: A Review. Annals of the Missouri Botanical Garden. 90(1): 35-55.	[Evidence of substantial reproductive failure in native habitat? No] "Yucca aloifolia is the single exception to the lack of evidence for pollinators other than the moths. Introduced as a garden plant in Europe no later than 1596, in Australia by 1885, and in Melanesia by 1880, it has been reported on several occasions to set fruit in locations outside North America even though there never have been any coincident moth reports."
602	2003. Pellmyr, O.. Yuccas, Yucca Moths, and Coevolution: A Review. Annals of the Missouri Botanical Garden. 90(1): 35-55.	[Produces viable seed? Yes] "Yucca aloifolia is the single exception to the lack of evidence for pollinators other than the moths. Introduced as a garden plant in Europe no later than 1596, in Australia by 1885, and in Melanesia by 1880, it has been reported on several occasions to set fruit in locations outside North America even though there never have been any coincident moth reports."
602	2007. Gilman, E.F.. Yucca aloifolia: Spanish Bayonet. Revised. FPS-614. University of Florida IFAS Extension, Gainesville, FL http://edis.ifas.ufl.edu/pdffiles/FP/FP61400.pdf	[Produces viable seed? Yes] "Propagation is by division of the suckers or by cuttings of any size at any season. Occasionally plants are grown from seed."
602	2012. Smith, G.F./Figueiredo, E./Crouch, N.R.. A first record of Yucca aloifolia L.(Agavaceae/Asparagaceae) naturalized in South Africa with notes on its uses and reproductive biology. Haseltonia. 17: 87-93.	[Produces viable seed? Yes] "Additionally, we have observed seed set in Y. aloifolia in southern Africa, although this is only occasional."
603	1902. Trelease, W.. The Yucceae. Missouri Botanical Garden Annual Report. 1902: 27-133.	[Hybridizes naturally? Possibly] "The ecological facts stated, however, are consistent with the morphological suggestion that Y. gloriosa may be a hybrid between Y. aloifolia and Y. filamentosa,"
603	2012. Rentsch, J.D./Leebens-Mack, J.. Homoploid hybrid origin of Yucca gloriosa: intersectional hybrid speciation in Yucca (Agavoideae, Asparagaceae). Ecology and evolution. 2(9): 2213-2222.	[Hybridizes naturally? Possibly Yes] "The data presented here provide strong support for the hybrid origin of Y. gloriosa as the result of pollen dispersal from Y. filamentosa to the maternal parent, Y. aloifolia. Yucca gloriosa appears to be a later generation hybrid that is reproductively isolated from its parents, likely due to differences in flowering phenology."
604	1998. Kubitzki, K. (ed.). The Families and genera of vascular plants. Volume III. Flowering plants, Monocotyledons: Lilianae (except Orchidaceae). Springer-Verlag, Berlin, Heidelberg, New York	[Self-compatible or apomictic? Yes] "Self-compatibility has been demonstrated in Manfreda and Polianthes (Verhoek-Williams 1975), in Yucca (Dodd and Linhart 1994; Richter and Weis 1995),"
604	2012. Smith, G.F./Figueiredo, E./Crouch, N.R.. A first record of Yucca aloifolia L.(Agavaceae/Asparagaceae) naturalized in South Africa with notes on its uses and reproductive biology. Haseltonia. 17: 87-93.	[Self-compatible or apomictic? Yes] "Although the well-known yucca– yucca moth pollination syndrome is one of the most often-cited examples of co evolutionary mutualism, albeit often over-simplistically (Baker 1986; Pellmyr 2003), Y. aloifolia has long been recognized as exceptional in this regard (Trelease 1902), with self-compatibility and erratic fruit formation observed in the absence of any specific moth (Lepidoptera, Prodoxidae) pollinator in regions as widespread as Australia, Melanesia, Europe, and the Middle East (Pellmyr 2003)."
605	2000. Phillips, S.J./Comus, P.W. (eds.). A Natural History of the Sonoran Desert. University of California Press, Berkeley and Los Angeles, CA	[Requires specialist pollinators? No. But seed set may be limited without moth pollination] "Yucca aloifolia of the southeastern U.S. is pollinated by bees."
605	2003. Pellmyr, O.. Yuccas, Yucca Moths, and Coevolution: A Review. Annals of the Missouri Botanical Garden. 90(1): 35-55.	[Requires specialist pollinators? No] "The aberrant Y. aloifolia L. occurs in the northern Caribbean and along the U.S. Mexican Gulf and southern Atlantic coasts; it reproduces vegetatively but is not known to have a native pollinator."
606	2003. Pellmyr, O.. Yuccas, Yucca Moths, and Coevolution: A Review. Annals of the Missouri Botanical Garden. 90(1): 35-55.	[Reproduction by vegetative fragmentation? Yes] "It is also possible that Y aloifolia is under limited selection for maintaining sexual reproduction, as it reproduces very vigorously by vegetative propagation. This happens both through rapid clonal extension and establishment by broken off plant part…"
606	2012. Smith, G.F./Figueiredo, E./Crouch, N.R.. A first record of Yucca aloifolia L.(Agavaceae/Asparagaceae) naturalized in South Africa with notes on its uses and reproductive biology. Haseltonia. 17: 87-93.	[Reproduction by vegetative fragmentation? Yes] "The spread of Y. aloifolia in southern Africa—and other yuccas for that matter—is almost invariably through vegetative means. Y. aloifolia is particularly capable of rapid clonal extension and establishment by snapped-off plant parts…"
607	2013. Shoot Gardening. Yucca aloifolia (Spanish bayonet). http://www.shootgardening.co.uk/plant/yucca-aloifolia [Accessed 14 Nov 2013]	[Minimum generative time (years)? 4+] "10-20 years To maturity"
701	2012. Michael, P. (ed.). The Master Weed Wackers Manual. A compilation of the most common weeds found on Port Macquarie Landcare sites.. Port Macquarie Landcare Group, Inc., Port Macquarie, NSW	[Propagules likely to be dispersed unintentionally? Yes] "Dispersal: Spread by humans as a horticultural plant. Seed that drops near the plant can form new individuals enabling the patch to spread, but seed and plant parts such as stem segments and rosettes can be spread through the dumping of garden waste and as a contaminant of soil etc."

702	2007. Gilman, E.F.. Yucca aloifolia: Spanish Bayonet. Revised. FPS-614. University of Florida IFAS Extension, Gainesville, FL http://edis.ifas.ufl.edu/pdffiles/FP/FP61400.pdf	[Propagules dispersed intentionally by people? Yes] "Spanish bayonet makes a wonderful accent at entryways or in a shrub border. Their striking texture adds an accent to any garden. Plants eventually form attractive, multi stemmed clumps."
702	2010. Chambers, D./Holtum, J.A.M.. Feasibility of Agave as a Feedstock for Biofuel Production in Australia. RIRDC Publication No. 10/104. Rural Industries Research and Development Corporation, Barton, Australia	[Propagules dispersed intentionally by people? Yes] "Agavaceae from Central America, including Agave americana, Furcraea foetida, Yucca aloifolia, Y. filamentosa and Y. gloriosa, were cultivated horticulturally in NSW and SA as early as 1843 (Swinbourne 1982) and in Queensland by 1864 (Anon. 1908a)."
703	2000. Groman, J.D./Pellmyr, O.. Rapid evolution and specialization following host colonization in a yucca moth. Journal of Evolutionary Biology. 13(2): 223-236.	[Propagules likely to disperse as a produce contaminant? No] "Vigorous reproduction occurs via rhizomes, whereas sexual reproduction in the United States is severely limited due to the absence of a native pollinating yucca moth." [Limited seed set and lack of cultivation with other commercial plant products makes contamination unlikely]
704	2012. Smith, G.F./Figueiredo, E./Crouch, N.R.. A first record of Yucca aloifolia L.(Agavaceae/Asparagaceae) naturalized in South Africa with notes on its uses and reproductive biology. Haseltonia. 17: 87-93.	[Propagules adapted to wind dispersal? No] "Fruits large, pendent, baccate to somewhat ovate, purple, turning black, woody to chartaceous when dry. Seeds black, round to ovate, 5–7 mm in diameter."
705	2012. Smith, G.F./Figueiredo, E./Crouch, N.R.. A first record of Yucca aloifolia L.(Agavaceae/Asparagaceae) naturalized in South Africa with notes on its uses and reproductive biology. Haseltonia. 17: 87-93.	[Propagules water dispersed? No] "Fruits large, pendent, baccate to somewhat ovate, purple, turning black, woody to chartaceous when dry. Seeds black, round to ovate, 5–7 mm in diameter."
706	1895. Webber, H.J.. Studies on the Dissemination and Leaf Reflexion of Yucca aloifolia and Other Species. Missouri Botanical Garden Annual Report. 1895: 91-112.	[Propagules bird dispersed? Yes] "Extended observations through three seasons have fully confirmed the fact that the mocking bird (Mimus polyglottus) is a very important factor in aloifolia dissemination, especially in what may be termed long distance dissemination. The mocking bird is very abundant throughout the range of aloifolia and may be the only animal disseminator of this species. At least I have not been able to observe any other bird or animal eating its fruits. It is not improbable that the fruit of aloifolia has become especially adapted for dissemination by the mocking bird or some small bird of similar habits." ... "Many seeds are also scattered by being twitched to some distance by the bird, in freeing its bill from the adhering pulp and seeds."
706	1902. Trelease, W.. The Yucceae. Missouri Botanical Garden Annual Report. 1902: 27-133.	[Propagules bird dispersed? Yes] "As a rule, the fruits of the baccate species of Yucca and of Samuela are promptly eaten by birds, rats, etc., but domesticated animals are said to like them, and, being quite sugary, they are enjoyed by the Indian and Mexican children, who commonly call them figs or dates."
706	2012. Smith, G.F./Figueiredo, E./Crouch, N.R.. A first record of Yucca aloifolia L.(Agavaceae/Asparagaceae) naturalized in South Africa with notes on its uses and reproductive biology. Haseltonia. 17: 87-93.	[Propagules bird dispersed? Yes] "Fruits large, pendent, baccate to somewhat ovate, purple, turning black, woody to chartaceous when dry. Seeds black, round to ovate, 5–7 mm in diameter."
707	2012. Smith, G.F./Figueiredo, E./Crouch, N.R.. A first record of Yucca aloifolia L.(Agavaceae/Asparagaceae) naturalized in South Africa with notes on its uses and reproductive biology. Haseltonia. 17: 87-93.	[Propagules dispersed by other animals (externally)? No]"Fruits large, pendent, baccate to somewhat ovate, purple, turning black, woody to chartaceous when dry. Seeds black, round to ovate, 5–7 mm in diameter." [Adapted for consumption and internal dispersal by birds and other frugivores]
708	1895. Webber, H.J.. Studies on the Dissemination and Leaf Reflexion of Yucca aloifolia and Other Species. Missouri Botanical Garden Annual Report. 1895: 91-112.	[Propagules survive passage through the gut? Yes] "The fruit of aloifolia, which is fleshy throughout and persistent, is principally disseminated by the mocking bird. This is accomplished by the bird swallowing the seeds while eating the pulp. The seeds remain uninjured and are evacuated in good condition for germination."
801	2000. Groman, J.D./Pellmyr, O.. Rapid evolution and specialization following host colonization in a yucca moth. Journal of Evolutionary Biology. 13(2): 223-236.	[Prolific seed production (>1000/m2)? No] "Vigorous reproduction occurs via rhizomes, whereas sexual reproduction in the United States is severely limited due to the absence of a native pollinating yucca moth."
801	2012. Smith, G.F./Figueiredo, E./Crouch, N.R.. A first record of Yucca aloifolia L.(Agavaceae/Asparagaceae) naturalized in South Africa with notes on its uses and reproductive biology. Haseltonia. 17: 87-93.	[Prolific seed production (>1000/m2)? Not in South Africa] "The reasons for low seed set—with fruiting and non fruiting inflorescences within populations and even individual plants—and the converse potential for higher sexual productivity, require further study, given the possibility of intrapopulational variation in visitor guilds, and autogamy or geitonogamy (Pellmyr 2003)."
802	2008. Royal Botanic Gardens Kew. Seed Information Database (SID). Version 7.1. http://data.kew.org/sid/	[Evidence that a persistent propagule bank is formed (>1 yr)? Unknown. Several Yucca species have orthodox seeds]
802	2013. WRA Specialist. Personal Communication.	[Evidence that a persistent propagule bank is formed (>1 yr)? Unknown] Limited seed production may preclude establishment of a persistent seed bank

803	2011. Young, S.L./Mues, N.L. /. Managing Soapweed Yucca. G2086. University of Nebraska–Lincoln Extension, Lincoln, NE ianrpubs.unl.edu/live/g2086/build/g2086.pdf	[Well controlled by herbicides? Probably Yes. Herbicides effective on other Yucca species] "Effective control of yucca with herbicides is highly dependent on timing and placement. A directed spray using Remedy® and diesel fuel or vegetable oil is effective for controlling yucca. By mixing Remedy (15 percent) with diesel fuel or vegetable oil (85 percent), an application to the center of the whorl with a single spray nozzle (5500 X1) will allow the herbicide to be absorbed directly into the meristematic tissue for complete uptake. It is important to add the herbicide to the spray tank first and then add enough oil to get the total volume desired. In addition, the duration of application to the whorl must be for at least two seconds. Use a timer or slowly count (e.g., “21, 22”) to ensure a two-second application." … "Broadcast applications of herbicides, such as Roundup Ultra®, Reward®, and Roundup Ultra or Reward® plus Ally® had varying rates of control at eight weeks after treatment. Control of yucca was 48 percent with 6 quarts of Roundup Ultra®, which was greater than for Reward® (Table II). Adding Ally® improved control; however, it was still less than 70 percent regardless of timing."
803	2012. Michael, P. (ed.). The Master Weed Wackers Manual. A compilation of the most common weeds found on Port Macquarie Landcare sites.. Port Macquarie Landcare Group, Inc., Port Macquarie, NSW	[Well controlled by herbicides? Yes] "CHEMICAL: Use cut-paste or drill/chisel and inject with undiluted glyphosate (eg RoundUp Biactive)."
803	2013. Lewis, M.. How to Kill a Yucca aloifolia. http://homeguides.sfgate.com/kill-yucca-aloifolia-63970.html [Accessed 14 Nov 2013]	[Well controlled by herbicides? Possibly. Cut stems may require retreatment] "Paint a high-concentrate, ready-to use glyphosate on the cut trunks within five minutes of cutting. This works best in the spring when yuccas are actively growing. If your Spanish bayonet resprouts, cut it again and repaint the glyphosate on the cut ends. If you prefer not to use an herbicide, proceed to the next step."
804	2003. Pellmyr, O.. Yuccas, Yucca Moths, and Coevolution: A Review. Annals of the Missouri Botanical Garden. 90(1): 35-55.	[Tolerates, or benefits from, mutilation, cultivation, or fire? Yes] "...in coastal North Carolina, local residents disseminate the plant by cutting stems in 10-cm pieces that are tossed on the ground in disturbed sandy sites (J. Groman, pers. comm.)."
804	2009. Kubiak, P.J.. Fire responses of bushland plants after the January 1994 wildfires in northern Sydney. Cunninghamia. 11(1): 131-165.	[Tolerates, or benefits from, mutilation, cultivation, or fire? Yes. Resprouts after fires] "Appendix 1. Observations on fire responses (after 100% leaf scorch) of vascular plants in the Lane Cove River (LCR) (observations mainly Jan 1994 – Oct 1999) and Narrabeen Lagoon (NL) (Mar – Oct 1994) catchments, following the fires of January 1994." [Yucca aloifolia - R = majority of adult plants resprouted after the fires]
804	2013. Brown, S.H.. Yucca aloifolia. University of Florida, IFAS Extension, Fort Myers, FL http://lee.ifas.ufl.edu/Hort/GardenPubsAZ/Spanish_bayonet.pdf	[Tolerates, or benefits from, mutilation, cultivation, or fire? Yes] "Clumps about 15 years of age or older may bloom reluctantly or not at all. If this happens, cut them back to about 3 feet or shorter to reinvigorate them. They can also be cut back to the ground without killing them."
805	2013. WRA Specialist. Personal Communication.	[Effective natural enemies present locally (e.g. introduced biocontrol agents)? Unknown]

Summary of Risk Traits

High Risk / Undesirable Traits

- Broad climate suitability, including tropical climates
- Naturalized in South Africa, Australia and elsewhere
- A weedy plant with potentially negative environmental impacts
- Other yucca species have become invasive
- leaf margins saw-toothlike (sharply denticulate to serrulate); leaf tips very sharp
- Spiny leaves make plants unpalatable to animals
- Possible toxins and allergens to animals and people
- Shade tolerant
- Tolerates many soil types
- Can from dense thickets
- Self-compatible, although seed production may be limited without cross-pollination
- Spreads vegetatively
- Fleshy-fruited, and seeds, when produced, dispersed by birds and other frugivorous animals
- Can resprout if only aboveground vegetative material is removed

Low Risk Traits

- Limited seed production outside native range
- Used as a barrier plant
- Long time to reproductive maturity
- Limited seed production makes long distance and inadvertent dispersal unlikely
- Herbicides may provide effective control