

Family: Araceae

Taxon: Zantedeschia aethiopica

Synonym: Calla aethiopica L. (basionym)
Zantedeschia aethiopica var. minor Engl.

Common Name calla lily
altar-lily
arum-lily
pig-lily
trumpet-lily

Questionnaire : current 20090513 Assessor: Chuck Chimera Designation: H(HPWRA)
Status: Assessor Approved Data Entry Person: Chuck Chimera WRA Score 15

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)	Intermediate
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)	n
303	Agricultural/forestry/horticultural weed	n=0, y = 2*multiplier (see Appendix 2)	y
304	Environmental weed	n=0, y = 2*multiplier (see Appendix 2)	y
305	Congeneric weed	n=0, y = 1*multiplier (see Appendix 2)	n
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	y=1, n=-1	n
405	Toxic to animals	y=1, n=0	y
406	Host for recognized pests and pathogens	y=1, n=0	
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	y
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	
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	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)	y=1, n=-1	y
802	Evidence that a persistent propagule bank is formed (>1 yr)	y=1, n=-1	n
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 15

Supporting Data:

101	2011. Floridata. <i>Zantedeschia aethiopica</i> . Floridata.com, Tallahassee, Florida http://www.floridata.com/ref/Z/zant_aet.cfm	"There are six species and numerous hybrids and cultivars of calla lilies. All are strikingly beautiful, and even when not in flower, the large, tropical looking, spear shaped leaves make a lush statement, like bananas, cannas or ginger." [Although there are several cultivars of <i>Zantedeschia aethiopica</i> , this assessment refers to the original form native to South Africa, which has not been modified from its original form.]
102	2011. WRA Specialist. Personal Communication.	NA
103	2011. WRA Specialist. Personal Communication.	NA
201	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Native to South Africa...now widely escaped from cultivation in upland regions of the tropics"
201	2004. Rippey, E./Rowland, B.. Coastal plants: Perth and the south-west region. University of Western Australia Press, Crawley, Western Australia	"This plant, which thrives in a Mediterranean climate, was introduced for horticulture."
202	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Native to South Africa...now widely escaped from cultivation in upland regions of the tropics" [Native range well-known]
203	2001. Parsons, W.T./Cuthbertson, E.G.. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	"Plants produce large numbers of seed, the fresh seed germinating best in alternating temperature regimes of 15:5 deg. C and 20:10 deg. C. Germination rate decreases rapidly as temperatures rise above these values." [plants can survive, but may not reproduce as effectively in warmer temperatures]
203	2001. South African National Biodiversity Institute. PlantzAfrica.com - <i>Zantedeschia aethiopica</i> . http://www.plantzafrika.com/plantwxyz/zantedeschiaeth.htm	"The white arum forms large colonies in marshy areas ranging from the coast to an altitude of 2250m. Thus one will find them contending with humid, salt laden air at the coast and freezing, misty mountain grasslands at high altitudes. They are very versatile in the garden as a result. The leaves of the arum are very interesting in that they contain water stomata which can discharge excess water, by a process known as "guttation". This prevents water-logging and enables arum lilies to grow in wet conditions."
203	2011. Sustainable Gardening Australia. The Lowdown on Invasive Plants - <i>Zantedeschia aethiopica</i> (Arum Lily). http://www.sgaonline.org.au/invasive_zantedeschia.html	"It tolerates tropical through to cold climates, doesn't mind sun or shade, and will even tolerate frost down to -10°C. Not only that, it can withstand waterlogging for short periods, wind, salt and most soil types, including sandy."
204	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"naturalized on Kauai and Maui"
205	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"introduced to Europe in 1687, now widely escaped from cultivation in upland regions of the tropics in Asia and America"
301	1980. Healy, A.J./Edgar, E.. Flora of New Zealand Volume III: Adventive Cyperaceous, Petalous & Spathaceous Monocotyledons. P. D. Hasselberg, Government Printer, Wellington, New Zealand	"N. Scattered; more common in North Auckland, Auckland Hawkes Bay and Gisborne. S. Nelson-Buller; Westland; Canterbury-Gore Bay. Swampy areas and damp waste land." [New Zealand]
301	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"naturalized on Kauai and Maui"
301	2011. Sustainable Gardening Australia. The Lowdown on Invasive Plants - <i>Zantedeschia aethiopica</i> (Arum Lily). http://www.sgaonline.org.au/invasive_zantedeschia.html	" <i>Zantedeschia</i> is a weed throughout most of Australia, except the Northern Territory, having escaped from dumped garden waste and from rubbish dumps. The plant is still widely available in nurseries outside WA, and is grown in gardens throughout Australia, so its potential to continue to reek havoc is very high."
302	2003. Weber, E.. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	No evidence

303	2007. Hussey, B.M.J./Keighery, G. J./Dodd, J./Lloyd, S.G./Cousens, R.D.. Western Weeds. A Guide to the Weeds of Western Australia. The Weed Society of Western Australia, Victoria Park, WA	"forms dense stands in pastures and under trees in wetter areas...toxic to stock, especially cattle"
303	2009. Victorian Resources Online. Impact Assessment - White Arum Lily (<i>Zantedeschia aethiopica</i>) in Victoria. http://www.dpi.vic.gov.au/DPI/Vro/vrosite.nsf/pages/impact_white_arum_lily	"Dense infestations completely replace pasture species, reducing the available grazing area and, hence, pasture productivity, and it is known to cause stock deaths (Parsons & Cuthbertson 2001). Potential for greater than 5% reduction in yield."
303	2010. Department of Agriculture and Food. Declared plants database - Arum lily (<i>Zantedeschia aethiopica</i>). Government of Western Australia, http://www.agric.wa.gov.au/objtwr/imported_assets/content/pw/weed/decp/arum_lily.pdf	"Arum lily competes with valuable perennial pasture plants on summer land. It has been suspected of causing eczema in humans. Stock deaths have occurred from grazing arum lily."
304	2003. Weber, E.. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	"It is invasive because it forms dense patches that crowd out native plants and prevent their regeneration."
304	2004. Rippey, E./Rowland, B.. Coastal plants: Perth and the south-west region. University of Western Australia Press, Crawley, Western Australia	"It has become a serious environmental weed. It crowds out pasture and native plants, and it is toxic to stock. It has now been categorized by Agriculture Western Australia as a Declared Plant, and this obliges landholders to control the plants at their own expense."
305	2007. Randall, R.P.. Global Compendium of Weeds - Index [Online Database]. http://www.hear.org/gcw/	Other <i>Zantedeschia</i> spp. Listed as naturalized, but none mentioned to have any adverse impacts
401	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	No spines, thorns or burrs
402	2003. Weber, E.. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	No evidence of allelopathy
403	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	Not parasitic
404	2010. Department of Agriculture and Food. Declared plants database - Arum lily (<i>Zantedeschia aethiopica</i>). Government of Western Australia, http://www.agric.wa.gov.au/objtwr/imported_assets/content/pw/weed/decp/arum_lily.pdf	"Stock deaths have occurred from grazing arum lily." [Animals will apparently eat the plants and then become poisoned]
405	2007. Hussey, B.M.J./Keighery, G. J./Dodd, J./Lloyd, S.G./Cousens, R.D.. Western Weeds. A Guide to the Weeds of Western Australia. The Weed Society of Western Australia, Victoria Park, WA	"It is toxic to stock, especially cattle."
406	2009. Victorian Resources Online. Impact Assessment - White Arum Lily (<i>Zantedeschia aethiopica</i>) in Victoria. http://www.dpi.vic.gov.au/DPI/Vro/vrosite.nsf/pages/impact_white_arum_lily	"Can be infected with Cucumber mosaic virus and tomato spotted wilt virus (Griffiths 1992). Potential host of common agricultural diseases." [Unknown if <i>Z. aethiopica</i> is an important alternate host]
407	2006. Spencer, R.. Garden Plants as Environmental and Agricultural Weeds. Royal Botanic Gardens Melbourne, South Yarra, Australia http://www.rbg.vic.gov.au/__data/assets/pdf_file/0/020/8642/WEEDS-LATEST.pdf	"For humans or pets and livestock some species may cause chronic or acute poisoning, dermatitis or photosensitization. Toxic plants which pose a risk to children and pets include: <i>Datura</i> spp., Thornapple; and <i>Ricinus communis</i> , Castor Oil seeds; <i>Solanum nigrum</i> , Black-berry Nightshade, and <i>Zantedeschia aethiopica</i> , Arum Lily which, on Friday 1 September 2006, was subject to a Western Australia-wide ban imposed to prevent the further spread of the attractive but poisonous plant, which has invaded thousands of hectares of farmland, forests and wetlands in the south-west."
407	2011. Dave's Garden. PlantFiles: Arum Lily, Calla Lily, Large White Aethiopica - <i>Zantedeschia aethiopica</i> . http://davesgarden.com/guides/pf/go/768/	"Danger: All parts of plant are poisonous if ingested Handling plant may cause skin irritation or allergic reaction"

408	2003. Weber, E.. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	No evidence
408	2009. Victorian Resources Online. Impact Assessment - White Arum Lily (<i>Zantedeschia aethiopica</i>) in Victoria. http://www.dpi.vic.gov.au/DPI/Vro/vrosite.nsf/page/s/impact_white_arum_lily	"On Eclipse island WA it is forming monospecific stands and replacing a low open heath community (Keighery 1997). Heath ecosystems are adapted to fire (Groves 1994) and the succulent nature of <i>Z. aethiopica</i> foliage may lead to a reduction in fire frequency and intensity."
409	1982. Everett, T.H.. The New York Botanical Garden Illustrated Encyclopedia of Horticulture. Garland Publishing, Inc., New York, NY	"Except in dry climates, where a little part-day shade is helpful, full exposure to sun gives the best results."
409	2001. South African National Biodiversity Institute. PlantzAfrica.com - <i>Zantedeschia aethiopica</i> . http://www.plantzafrika.com/plantwxyz/zantedeschiaeth.htm	" <i>Zantedeschia aethiopica</i> grows from 0.6-1 m but may get taller in the shade. It has lush looking dark green leaves with an arrow head shape. The size varies according to the amount of shade...It can be planted as a foliage plant in deep shade under trees but will not flower well in this position."
409	2011. Dave's Garden. PlantFiles: Arum Lily, Calla Lily, Large White Aethiopica - <i>Zantedeschia aethiopica</i> . http://davesgarden.com/guides/pf/go/768/	"Sun Exposure: Full Sun"
409	2011. Plants for a Future Database. <i>Zantedeschia aethiopica</i> . PFAF, http://www.pfaf.org/user/Plant.aspx?LatinName=Zantedeschia%20aethiopica	"It can grow in semi-shade (light woodland) or no shade." [Shade tolerant, but most reference refer to optimal growth in sun]
410	2011. Backyard Gardener. <i>Zantedeschia aethiopica</i> . http://www.backyardgardener.com/plantname/pd_71b0.html	"pH Range: 5.5 to 7.5 Soil Range: Sandy Loam to Clay Loam"
410	2011. Sunny Gardens. <i>Zantedeschia aethiopica</i> . http://www.sunnYGardens.com/garden_plants/zantedeschia/zantedeschia_1723.php	"It can be grown as a water plant, and tolerates many types of soil."
410	2011. Sustainable Gardening Australia. The Lowdown on Invasive Plants - <i>Zantedeschia aethiopica</i> (Arum Lily). http://www.sgaonline.org.au/invasive_zantedeschia.html	"it can withstand waterlogging for short periods, wind, salt and most soil types, including sandy."
411	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Large herbs up to 0.75 m tall" [not climbing or smothering]
412	2003. Weber, E.. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	"It is invasive because it forms dense patches that crowd out native plants and prevent their regeneration."
501	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Large herbs up to 0.75 m tall" [terrestrial]
502	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	Araceae
503	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	Araceae [not a Nitrogen fixing woody plant]
504	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"stems usually subterranean, short, erect."
504	2003. Weber, E.. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	"Rhizome fragments are carried by streams...Scattered plants can be hand pulled or dug out, the rootstock must be removed." [Can spread by rhizome fragments. Yes to 6.06]

601	2003. Weber, E.. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	No evidence
602	2003. Weber, E.. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	"The short-lived seeds are dispersed by water, birds and mammals."
603	2006. Takashi, K./Koji, I./Genjiro, M.. Compatibility of Interspecific Hybridization in <i>Zantedeschia</i> . Journal of the Japanese Society for Horticultural Science. 75(3): 273-275.	"Abstract;Two cultivars of <i>Zantedeschia aethiopica</i> (group 1) and 21 cultivars in other <i>Zantedeschia</i> spp. (group 2) were hybridized to investigate the cross-compatibility of each combination. From a total of 757 crosses from 37 hybrid combinations that were attempted, 3,144 resulting embryos were cultured. As a result, 175 embryos representing 26 combinations formed shoots, but all hybrids were albino and viable only in vitro. Some hybrids had plastids of both parents, but no relationship between the appearance of albino hybrids and plastid inheritance could be detected. (author abst.)" [Unknown if natural hybridization occurs]
604	2011. WRA Specialist. Personal Communication.	Unknown
605	1996. Singh Y./vanWyk, A.E./Baijnath, H.. Floral biology of <i>Zantedeschia aethiopica</i> (L) Spreng (Araceae). South African Journal of Botany. 62: 146–150.	"cantharophilous" [beetle pollinated]
605	2011. Plants for a Future Database. <i>Zantedeschia aethiopica</i> . PFAF, http://www.pfaf.org/user/Plant.aspx?LatinName=Zantedeschia%20aethiopica	"The flowers are monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and are pollinated by Insects."
606	2003. Weber, E.. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	"Rhizome fragments are carried by streams."
607	2001. Parsons, W.T./Cuthbertson, E.G.. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	"Seedling plants may not flower until the third or fourth year."
701	2011. California Invasive Plant Council. <i>Zantedeschia aethiopica</i> (calla lily). http://www.cal-ipc.org/ip/management/plant_profiles/Zantedeschia_aethiopica.php	"Calla lily reproduces by bird-dispersed seeds and vegetatively via rhizomes, which may be spread by moving soil or garden cuttings."
702	2003. Weber, E.. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	Ornamental
703	2003. Weber, E.. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	No evidence and no means of external attachment
704	2003. Weber, E.. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	"The short-lived seeds are dispersed by water, birds and mammals." [not wind-dispersed]
705	2003. Weber, E.. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	"The short-lived seeds are dispersed by water, birds and mammals."
706	2003. Weber, E.. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	"The short-lived seeds are dispersed by water, birds and mammals."
707	2001. South African National Biodiversity Institute. PlantzAfrica.com - <i>Zantedeschia aethiopica</i> . http://www.plantzafrika.com/plantwxyz/zantedesc_aeth.htm	No means of external attachment
708	2003. Weber, E.. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	"The short-lived seeds are dispersed by water, birds and mammals."
708	2009. Victorian Resources Online. Impact Assessment - White Arum Lily (<i>Zantedeschia aethiopica</i>) in Victoria. http://www.dpi.vic.gov.au/DPI/Vro/vrosite.nsf/pages/impact_white_arum_lily	"Foxes and stock consume the seed and also aid dispersal (Blood 2001, Moore 1997)."

801	2011. Sustainable Gardening Australia. The Lowdown on Invasive Plants - <i>Zantedeschia aethiopica</i> (Arum Lily). http://www.sgaonline.org.au/invasive_zantedeschia.html	"The seed of <i>Zantedeschia</i> is attractive to birds, and with up to 500 seeds per flower head, they can be spread far and wide."
802	2001. Parsons, W.T./Cuthbertson, E.G.. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	"Seeds, however, are particularly short-lived, which results in a general absence of a viable seed bank in the soil from year to year."
802	2003. Weber, E.. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	"The short-lived seeds are dispersed by water, birds and mammals."
802	2011. Weeds Australia. Weed Identification - <i>Zantedeschia aethiopica</i> . Australian Weeds Committee, http://www.weeds.org.au/cgi-bin/weedident.cgi?tpl=plant.tpl&ibra=all&card=H10	"Seeds germinate readily, but do not remain viable from year to year."
803	2003. Weber, E.. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	"Scattered plants can be hand pulled or dug out, the rootstock must be removed. Seed production can be prevented by spraying plants with 2,4-D, glyphosate or chlorsulfuron before fruits are becoming ripe. Follow-up programmes may be necessary to treat regrowth and seedlings."
803	2010. Department of Agriculture and Food. Declared plants database - Arum lily (<i>Zantedeschia aethiopica</i>). Government of Western Australia, http://www.agric.wa.gov.au/objtwr/imported_assets/content/pw/weed/decp/arum_lily.pdf	"Glyphosate can be used at 1:100 but results are only fair. Reasonable alternative to 2,4 D in restricted spraying areas. Use chlorsulfuron in areas where restrictions apply to use of 2,4 D...Gramoxone...# This is a very effective treatment as it appears to reduce the underground rhizomes or tubers...Application through blanket wiper is also very effective for all the above chemicals. "
804	2001. Parsons, W.T./Cuthbertson, E.G.. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	"Single plants or small groups are better grubbed than treated chemically, taking care to remove all the fleshy rhizomes to minimize regrowth." [Removing above ground biomass will not kill plant]
805	2011. WRA Specialist. Personal Communication.	Unknown