

Taxon: Euphorbia cyathophora Murray

Family: Euphorbiaceae

Common Name(s): dwarf poinsettia
fire-on-the-mountain
Mexican fire plant
painted spurge
paintedleaf
painted-leaf spurge
wild poinsettia

Synonym(s): Euphorbia barbellata Engelm.
Euphorbia graminifolia Michx.
Euphorbia heterophylla auct. N.
Poinsettia cyathophora (Murray)

Assessor: Chuck Chimera

Status: Assessor Approved

End Date: 25 Nov 2019

WRA Score: 10.0

Designation: H(Hawai'i)

Rating: High Risk

Keywords: Annual Herb, Environmental Weed, Toxic, Dense Stands, Explosively 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	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		
303	Agricultural/forestry/horticultural weed		
304	Environmental weed	n=0, y = 2*multiplier (see Appendix 2)	y
305	Congeneric weed	n=0, y = 1*multiplier (see Appendix 2)	y
401	Produces spines, thorns or burrs	y=1, n=0	n
402	Allelopathic		
403	Parasitic	y=1, n=0	n
404	Unpalatable to grazing animals	y=1, n=-1	n
405	Toxic to animals	y=1, n=0	y

Qsn #	Question	Answer Option	Answer
406	Host for recognized pests and pathogens		
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	n
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	y
411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets	y=1, n=0	y
501	Aquatic	y=5, n=0	n
502	Grass	y=1, n=0	n
503	Nitrogen fixing woody plant	y=1, n=0	n
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	y=1, n=0	n
601	Evidence of substantial reproductive failure in native habitat	y=1, n=0	n
602	Produces viable seed	y=1, n=-1	y
603	Hybridizes naturally		
604	Self-compatible or apomictic		
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation	y=1, n=-1	n
607	Minimum generative time (years)	1 year = 1, 2 or 3 years = 0, 4+ years = -1	1
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	n
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
708	Propagules survive passage through the gut	y=1, n=-1	n
801	Prolific seed production (>1000/m ²)	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	n
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
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[No evidence] "Native from eastern and southern United States to northern South America and the West Indies, naturalized in parts of the Old World; in Hawai'i naturalized in low elevation, dry, disturbed sites on Midway Atoll, Kaua'i, O'ahu, Moloka'i, and Maui."
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	[No evidence] "One species that exists on the boundary between being a weed and being genuinely cultivated is <i>Euphorbia cyathophora</i> "

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. (2019). Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. (2019). 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
	Whistler, W.A. 2000. Tropical Ornamentals: A Guide. Timber Press, Portland, OR	"native to the West Indies but is widely cultivated for the prominent red bases of the upper leaves."

Qsn #	Question	Answer
	<p>USDA, Agricultural Research Service, National Plant Germplasm System. (2019). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/. [Accessed 21 Nov 2019]</p>	<p>"Native Northern America NORTHEASTERN U.S.A.: United States [Indiana (w.), Ohio (s.w.), West Virginia] NORTH-CENTRAL U.S.A.: United States [Illinois, Iowa, Kansas, Minnesota (s.), Missouri, Nebraska, Oklahoma, South Dakota (s.e.), Wisconsin] SOUTHEASTERN U.S.A.: United States [Alabama, Arkansas, Florida (http://www.plantatlas.usf.edu/main.asp?plantID=616), Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia] SOUTH-CENTRAL U.S.A.: United States [New Mexico (s.), Texas] NORTHERN MEXICO: Mexico [Chihuahua, Coahuila de Zaragoza, Nuevo León, San Luis Potosí, Sinaloa, Sonora (e.), Tamaulipas, Zacatecas] SOUTHERN MEXICO: Mexico [Campeche, Chiapas, Colima, Guerrero, Hidalgo, Jalisco, México, Michoacán de Ocampo, Morelos, Nayarit, Oaxaca, Puebla, Quintana Roo, Veracruz de Ignacio de la Llave, Yucatán, Ciudad de México] Southern America CARIBBEAN: Anguilla, Bahamas, Barbados, Bermuda, Cayman Islands, Cuba, Dominica, Dominican Republic, Grenada, Guadeloupe, Haiti, Jamaica, Martinique, Montserrat, Netherlands Antilles, Turks and Caicos Islands, United States, [Puerto Rico, Virgin Islands, U.S.] Virgin Islands (British) CENTRAL AMERICA: Belize, Costa Rica, Guatemala, Honduras, Panama NORTHERN SOUTH AMERICA: Suriname, Venezuela WESTERN SOUTH AMERICA: Colombia, Ecuador [Azuay, Chimborazo] SOUTHERN SOUTH AMERICA: Argentina [Jujuy, Salta, Santiago del Estero]"</p>
	<p>Nellis, D.W. 1997. Poisonous plants and animals of Florida and the Caribbean. Pineapple Press Inc., Sarasota, FL</p>	<p>"This species is found worldwide in the tropics and warm temperate regions"</p>

202	Quality of climate match data	High
	Source(s)	Notes
	<p>USDA, Agricultural Research Service, National Plant Germplasm System. (2019). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/. [Accessed 21 Nov 2019]</p>	

203	Broad climate suitability (environmental versatility)	y
	Source(s)	Notes
	<p>Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.</p>	<p>"in Hawai'i naturalized in low elevation, dry, disturbed sites"</p>
	<p>Prairie Moon Nursery. (2019). <i>Euphorbia cyathophora</i>. https://www.prairiemoon.com/. [Accessed 21 Nov 2019]</p>	<p>"USDA Zones: 4-10"</p>

Qsn #	Question	Answer
	Tropicos.org. 2019. Missouri Botanical Garden. http://www.tropicos.org/ . [Accessed 21 Nov 2019]	Collected over a broad latitudinal range (30°01'59"S to 05°28'55"S and 01°41'00"N to 40°28'11"N) and broad elevational range [0 m to 2900 m]

204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Native from eastern and southern United States to northern South America and the West Indies, naturalized in parts of the Old World; in Hawai'i naturalized in low elevation, dry, disturbed sites on Midway Atoll, Kaua'i, O'ahu, Moloka'i, and Maui. First collected on O'ahu in 1917 (Forbes 2443. 0, BISH)."
	Whistler, W.A. 2000. Tropical Ornamentals: A Guide. Timber Press, Portland, OR	"native to the West Indies but is widely cultivated for the prominent red bases of the upper leaves."
	Nellis, D.W. 1997. Poisonous plants and animals of Florida and the Caribbean. Pineapple Press Inc., Sarasota, FL	"This species is found worldwide in the tropics and warm temperate regions."

205	Does the species have a history of repeated introductions outside its natural range?	y
	Source(s)	Notes
	Smith, A.C. 1981. Flora Vitiensis Nova - A New Flora of Fiji (Spermatophytes Only). Volume 2. Pacific Tropical Botanical Garden, Lawai, HI	"In Fiji, an abundantly naturalized weed occurring from near sea level to about 100 m in clearings, along roadsides and trails, and in coconut plantations and canefields; it is often abundant in coastal areas, frequently on sandy beaches"
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Native from eastern and southern United States to northern South America and the West Indies, naturalized in parts of the Old World; in Hawai'i naturalized in low elevation, dry, disturbed sites on Midway Atoll, Kaua'i, O'ahu, Moloka'i, and Maui."
	Whistler, W. A. (1988). Checklist of the weed flora of western Polynesia. Technical Paper No. 194, South Pacific Commission, Noumea, New Caledonia	"Occasional in disturbed places on Niue, but more of an escaped ornamental in Tonga and Samoa"
	Sykes, W. R. (1970). Contributions to the flora of Niue. New Zealand Department of Scientific and Industrial Research Bulletin 200, Wellington	In Niue, "one of the commonest weeds of waste places all round the perimeter of the island. It is also found rather less frequently through the interior, in old plantations and by the roadside."

301	Naturalized beyond native range	y
	Source(s)	Notes

Qsn #	Question	Answer
	Parker, J. L. & Parsons, B. 2010. New plant records from the Big Island for 2008. Bishop Museum Occasional Papers 107: 41–43	" <i>Euphorbia cyathophora</i> Murray New island record In Hawai'i, wild poinsettia is known to be naturalized in low elevation, dry, disturbed sites on Midway Atoll, Kaua'i, o'ahu, Moloka'i, and Maui (Wagner et al. 1999). This voucher specimen was collected from a lone, small population in Nā'ālehu. However, in South Kona there were several larger populations found along roadsides. The source appears to be the fill/gravel that is being used in shoulder reconstructions along Hwy 11 in South Kona. Material examined. HAWAII: Ka'u Distr., Discovery Harbor subdivision in Nā 'ālehu (2107818N, 223686E), one small naturalized population flowering in coarse gravel/rock driveway in private property, 17 Jul 2008, J. Parker & R. McGuire BIED10."
	Smith, A.C. 1981. Flora Vitiensis Nova - A New Flora of Fiji (Spermatophytes Only). Volume 2. Pacific Tropical Botanical Garden, Lawai, HI	"In Fiji, an abundantly naturalized weed occurring from near sea level to about 100 m in clearings, along roadsides and trails, and in coconut plantations and canefields; it is often abundant in coastal areas, frequently on sandy beaches"
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Native from eastern and southern United States to northern South America and the West Indies, naturalized in parts of the Old World; in Hawai'i naturalized in low elevation, dry, disturbed sites on Midway Atoll, Kaua'i, O'ahu, Moloka'i, and Maui. First collected on O'ahu in 1917 (Forbes 2443. 0, BISH)."
	Whistler, W.A. 2000. Tropical Ornamentals: A Guide. Timber Press, Portland, OR	"Occasional in disturbed places on Niue, but more of an escaped ornamental in Tonga and Samoa"
	Sykes, W. R. (1970). Contributions to the flora of Niue. New Zealand Department of Scientific and Industrial Research Bulletin 200, Wellington	In Niue, "one of the commonest weeds of waste places all round the perimeter of the island. It is also found rather less frequently through the interior, in old plantations and by the roadside."

302	Garden/amenity/disturbance weed	
	Source(s)	Notes
	Dave's Garden. (2019). Summer Poinsettia, Mexican Fire Plant, Mexican Poinsettia - <i>Euphorbia cyathophora</i> . https://davesgarden.com/guides/pf/go/641/ . [Accessed 21 Nov 2019]	"On Jul 1, 2007, Len123 from Adrian, MO (Zone 6a) wrote: very invasive. more of a weed than a flower. no flowers, not showy. I've read in south america gets in soybeans and glycoposphate based herbicides doesn't kill it. I have pulled diligently and keeps springing up." [Comment from Missouri gardener]
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	"One species that exists on the boundary between being a weed and being genuinely cultivated is <i>Euphorbia cyathophora</i> ... Native from the southern U.S. throughout tropical America and the West Indies, <i>E. cyathophora</i> was formerly cultivated in Hawaii and is now naturalized as a weed. It often volunteers in dry, low-elevation gardens on several islands and is allowed to persist once the showy flowering bracts appear."
	Inkson, T. (2015). Garden Escapees & Other Weeds of Bushland & Reserves. 3rd Edition. Great Lakes Council, New South Wales, Australia	"Painted spurge prefers sandy soils, particularly in disturbed sites. It is of most concern as a weed of hind-dune areas on beaches and is also relatively common in coastal and sub-coastal riparian zones."
	Nellis, D.W. 1997. Poisonous plants and animals of Florida and the Caribbean. Pineapple Press Inc., Sarasota, FL	"This plant is most common in disturbed areas and along roadsides."
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[A weed of disturbed areas in the Hawaiian Islands, but regarded as an environmental weed in Australia. See 3.04] "in Hawai'i naturalized in low elevation, dry, disturbed sites"

Qsn #	Question	Answer
303	Agricultural/forestry/horticultural weed	
	Source(s)	Notes
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Weed of: Orchards & Plantations" [Potentially. Impacts unquantified]

304	Environmental weed	y
	Source(s)	Notes
	US Fish and Wildlife Service. (2015). Common Plants of Midway Atoll NWR. Friends of Midway Atoll National Wildlife Refuge. https://www.friendsofmidway.org . [Accessed 22 Nov 2019]	"At Midway Atoll NWR, tends to grow in the Casuarina spp. forest (Sectors 32 and 33), although dense stands can occur anywhere, seriously degrading habitat for ground-nesting birds. Monotypic stands of this plant exist in front of and on the east side of the FWS Office in Sector 37. This plant is also found in Sectors 4, 5, 27, and 28; small batches appear in the vicinity of these sectors."
	Erskine, A., King, L. and Delaney, M. (2002). Vegetation Management Plan Seven Mile Beach, Lennox Head. Environmental Training and Employment (Northern Rivers) Inc. Lismore, Australia	"Euphorbiaceae <i>Euphorbia cyathophora</i> Painted Spurge Native of tropical America. An annual, erect herb, flowering most of the year. It is naturalized on coastal sands (Harden, 1990, p.425). It can form dense thickets up to 1.5 metres high (Cribb and Cribb, 1985, p.123) inhibiting native regeneration."
	Queensland Government. (2019). Weeds of Australia - <i>Euphorbia cyathophora</i> . http://keyserver.lucidcentral.org . [Accessed 21 Nov 2019]	"Painted spurge (<i>Euphorbia cyathophora</i>) is regarded as an environmental weed in Queensland and New South Wales. It is ranked among the top 200 environmental weeds in south-eastern Queensland and north-eastern New South Wales, and appears on numerous local environmental weed lists in these regions. This species prefers sandy soils, particularly in disturbed sites. It is of most concern as a weed of hind-dune areas on beaches and is also relatively common in coastal and sub-coastal riparian zones. In Queensland painted spurge (<i>Euphorbia cyathophora</i>) is most prevalent in the south-eastern parts of the state, but is also a weed of beaches and offshore islands in the north (e.g. in Townsville City, in Sarina Shire, on Heron Island and on Green Island). In New South Wales painted spurge (<i>Euphorbia cyathophora</i>) is mainly a problem in coastal sandy sites north of Coffs Harbour on the mid north coast. In Western Australia it is an occasional weed in the northern parts of the state (e.g. at Derby and Broome), has been recorded in suburban Perth, and is also present on offshore islands (i.e. on Koolan Island)."
	Reddy, G. V. (2011). Survey of invasive plants on Guam and identification of the 20 most widespread. <i>Micronesica</i> , 41(2), 263-274	"Species like <i>S. nodiflora</i> , <i>E. cyathophora</i> , <i>M. charantia</i> , <i>C. aciculatus</i> , <i>C. hypericifolia</i> , and <i>C. barbata</i> , although among the top 20 invasive plants on Guam, may not be presently causing serious damage to wildland ecosystems, but they are certainly not desirable species. Management practices must be developed immediately that prevent their further spread."

Qsn #	Question	Answer
305	Congeneric weed	y
	Source(s)	Notes
	Weber, E. 2017. Invasive Plant Species of the World, 2nd Edition: A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	"Euphorbia esula ... Leafy spurge has become one of the worst invaders in northern America causing both ecological and economic damage."
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	Numerous Euphorbia species have become invasive weeds

401	Produces spines, thorns or burrs	n
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[No evidence] "Glabrous annual herbs; stems green, ascending, somewhat glaucous, 1-5 dm long."

402	Allelopathic	
	Source(s)	Notes
	WRA Specialist. (2019). Personal Communication	Unknown. No evidence found

403	Parasitic	n
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Glabrous annual herbs" [Euphorbiaceae. No evidence]

404	Unpalatable to grazing animals	n
	Source(s)	Notes
	Boodoo, A. A., Ramjee, R., Hulman, B., Dolberg, F., & Rowe, J. B. (1990). Evaluation of the basal forage diet of village cows. Livestock Research for Rural Development, 2 (1), 15-23	"Appendix 1: List of assorted fodder - grasses vegetable crop residues twigs shrubs creepers and tree foliage ... Euphorbia cyathophora ... 3 = sometimes used"
	Fuller, T.C. & McClintock, E.M. 1986. Poisonous plants of California: Issue 53 of California natural history guides. University of California Press, Berkeley and Los Angeles, CA	"Besides causing dermatitis, plants of this species have been suspected of poisoning children and livestock." [Accidental or intentional ingestion may occur]
	NTFP Product Database. (2019). Whiteinvolucre Euphorbia, Painted Spurge. https://ntfp.org/2016/01/whiteinvolucre-euphorbia-painted-spurge/ . [Accessed 22 Nov 2019]	[May be palatable despite reports of toxicity] "Leaves are also given to cattle to cure constipation."

405	Toxic to animals	y
	Source(s)	Notes

Qsn #	Question	Answer
	Fuller, T.C. & McClintock, E.M. 1986. Poisonous plants of California: Issue 53 of California natural history guides. University of California Press, Berkeley and Los Angeles, CA	"Besides causing dermatitis, plants of this species have been suspected of poisoning children and livestock."
	Boopathi, C.A. (2017). Medicinal & Poisonous Plants of India. MJP Publishers, Chennai	"The milky latex, sticky sap causes severe skin irritation and is toxic to livestock and humans."
	Nellis, D.W. 1997. Poisonous plants and animals of Florida and the Caribbean. Pineapple Press Inc., Sarasota, FL	"Toxic properties The acrid latex contains neither alkaloids nor glucosides, but probably obtains its toxic properties due to a resin."

406	Host for recognized pests and pathogens	
	Source(s)	Notes
	McMillan Jr, R. T., Borek, M., & Graves, W. R. (1997). Web blight of dwarf Hawaiian snowbush. Proc. Fla. State Hort. Soc. 110: 370	"A host of Thanatephorus cucumeris" [No mention as to its importance as an alternate host]
	Fulton, R. W., & Fulton, J. L. (1980). Characterization of a tymo-like virus common in poinsettia. Phytopathology, 70 (4), 321-324	"A virus commonly present in commercially grown Euphorbia pulcherrima was transmitted mechanically and by grafting to E. cyathophora and several other euphorbiaceae species and was tentatively designated poinsettia mosaic virus (PMV). No hosts were found except Euphorbia spp. and these were relatively insusceptible." [Apparently not an important or particularly virulent host of poinsettias]
	University of Guam. (2019). Euphorbia cyathophora. https://cnas-re.uog.edu/guam-weeds/euphorbia-cyathophora/ . [Accessed 22 Nov 2019]	"Fungal Pathogens: Botrytis"

407	Causes allergies or is otherwise toxic to humans	y
	Source(s)	Notes
	Boopathi, C.A. (2017). Medicinal & Poisonous Plants of India. MJP Publishers, Chennai	"A short twig can cause death in children. Dangerous irritation in stomach, mouth and throat. The latex causes diarrhoea and vomiting. In dangerous cases, delirium and dehydration may lead to death. Consumption of the latex and leaves have caused the death of a young children. The milky latex, sticky sap causes severe skin irritation and is toxic to livestock and humans."
	McMullen, C.K. 1999. Flowering plants of the Galápagos. Cornell University Press, Ithaca, NY	"Eating any of its parts can cause vomiting, diarrhea, shock, and even death. In addition, its milky sap can irritate the skin."
	Nellis, D.W. 1997. Poisonous plants and animals of Florida and the Caribbean. Pineapple Press Inc., Sarasota, FL	"The latex produces vomiting and diarrhea. In sever cases, dehydration and delirium may lead to death. Consumption of the leaf and latex have caused the death of a child."
	Bryson, C.T.& DeFelice, M.S. 2009. Weeds of the South. University of Georgia Press, Athens, GA	"Toxic Properties: Plants produce an irritant sap when wounded."

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	Notes

Qsn #	Question	Answer
	Erskine, A., King, L. and Delaney, M. (2002). Vegetation Management Plan Seven Mile Beach, Lennox Head. Environmental Training and Employment (Northern Rivers) Inc. Lismore, Australia	[Although this plant may form dense stands in certain situations, it is an annual herb that does not accumulate a lot of biomass. No indication that this plant increase fire risk] "Euphorbiaceae Euphorbia cyathophora Painted Spurge Native of tropical America. An annual, erect herb, flowering most of the year. It is naturalized on coastal sands (Harden, 1990, p.425). It can form dense thickets up to 1.5 metres high (Cribb and Cribb, 1985, p.123) inhibiting native regeneration."
	Queensland Government. (2019). Weeds of Australia - Euphorbia cyathophora. http://keyserver.lucidcentral.org . [Accessed 22 Nov 2019]	[Fire hazards not listed among impacts] "This species prefers sandy soils, particularly in disturbed sites. It is of most concern as a weed of hind-dune areas on beaches and is also relatively common in coastal and sub-coastal riparian zones. In Queensland painted spurge (<i>Euphorbia cyathophora</i>) is most prevalent in the south-eastern parts of the state, but is also a weed of beaches and offshore islands in the north (e.g. in Townsville City, in Sarina Shire, on Heron Island and on Green Island). In New South Wales painted spurge (<i>Euphorbia cyathophora</i>) is mainly a problem in coastal sandy sites north of Coffs Harbour on the mid north coast. In Western Australia it is an occasional weed in the northern parts of the state (e.g. at Derby and Broome), has been recorded in suburban Perth, and is also present on offshore islands (i.e. on Koolan Island)."

409	Is a shade tolerant plant at some stage of its life cycle	n
	Source(s)	Notes
	Lady Bird Johnson Wildflower Center. (2019). Euphorbia cyathophora. https://www.wildflower.org . [Accessed 22 Nov 2019]	"Light Requirement: Sun"
	Dave's Garden. (2019). Summer Poinsettia, Mexican Fire Plant, Mexican Poinsettia - Euphorbia cyathophora. https://davesgarden.com/guides/pf/go/641/ . [Accessed 22 Nov 2019]	"Sun Exposure: Full Sun"
	Whistler, W.A. 2000. Tropical Ornamentals: A Guide. Timber Press, Portland, OR	"Well-drained soils in sunny places are preferred."

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	Notes
	Lady Bird Johnson Wildflower Center. (2019). Euphorbia cyathophora. https://www.wildflower.org . [Accessed 22 Nov 2019]	"Soil Description: Sandy, Sandy Loam, Medium Loam, Clay Loam"
	Dave's Garden. (2019). Summer Poinsettia, Mexican Fire Plant, Mexican Poinsettia - Euphorbia cyathophora. https://davesgarden.com/guides/pf/go/641/ . [Accessed 22 Nov 2019]	"Soil pH requirements: 6.1 to 6.5 (mildly acidic) 6.6 to 7.5 (neutral) 7.6 to 7.8 (mildly alkaline)"

411	Climbing or smothering growth habit	n
	Source(s)	Notes

Qsn #	Question	Answer
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Glabrous annual herbs; stems green, ascending, somewhat glaucous, 1-5 dm long."

412	Forms dense thickets	y
	Source(s)	Notes
	US Fish and Wildlife Service. (2015). Common Plants of Midway Atoll NWR. Friends of Midway Atoll National Wildlife Refuge. https://www.friendsofmidway.org . [Accessed 22 Nov 2019]	"At Midway Atoll NWR, tends to grow in the Casuarina spp. forest (Sectors 32 and 33), although dense stands can occur anywhere, seriously degrading habitat for ground-nesting birds. Monotypic stands of this plant exist in front of and on the east side of the FWS Office in Sector 37. This plant is also found in Sectors 4, 5, 27, and 28; small batches appear in the vicinity of these sectors."
	Erskine, A., King, L. and Delaney, M. (2002). Vegetation Management Plan Seven Mile Beach, Lennox Head. Environmental Training and Employment (Northern Rivers) Inc. Lismore, Australia	"Euphorbiaceae <i>Euphorbia cyathophora</i> Painted Spurge Native of tropical America. An annual, erect herb, flowering most of the year. It is naturalized on coastal sands (Harden, 1990, p.425). It can form dense thickets up to 1.5 metres high (Cribb and Cribb, 1985, p.123) inhibiting native regeneration."

501	Aquatic	n
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Terrestrial] "Glabrous annual herbs" ... in Hawai'i naturalized in low elevation, dry, disturbed sites"

502	Grass	n
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2019). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 22 Nov 2019]	Family: Euphorbiaceae Subfamily: Euphorbioideae Tribe: Euphorbieae Subtribe: Euphorbiinae

503	Nitrogen fixing woody plant	n
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2019). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 22 Nov 2019]	Family: Euphorbiaceae Subfamily: Euphorbioideae Tribe: Euphorbieae Subtribe: Euphorbiinae

Qsn #	Question	Answer
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	Notes
	Bryson, C.T.& DeFelice, M.S. 2009. Weeds of the South. University of Georgia Press, Athens, GA	"Erect annual herb ... Roots fibrous from slender taproot" [With taproot, but not a perennial plant]

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[No evidence. Widespread native and introduced range] "Native from eastern and southern United States to northern South America and the West Indies, naturalized in parts of the Old World; in Hawai'i naturalized in low elevation, dry, disturbed sites on Midway Atoll, Kaua'i, O'ahu, Moloka'i, and Maui."

602	Produces viable seed	y
	Source(s)	Notes
	Queensland Government. (2019). Weeds of Australia - <i>Euphorbia cyathophora</i> . http://keyserver.lucidcentral.org . [Accessed 22 Nov 2019]	"Painted spurge (<i>Euphorbia cyathophora</i>) reproduces by seed. The capsules open explosively when mature, expelling the seeds short distances. They may also be spread by water movement and is dumped garden waste."
	Whistler, W.A. 2000. Tropical Ornamentals: A Guide. Timber Press, Portland, OR	"Propagate by seeds"
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Seeds ovoid-cylindrical, the ends truncate or rounded, 2.5-3 mm long, the surface finely and sharply tuberculate, ecarunculate."

603	Hybridizes naturally	
	Source(s)	Notes
	WRA Specialist. (2019). Personal Communication	Unknown. No evidence found

Qsn #	Question	Answer
604	Self-compatible or apomictic	
	Source(s)	Notes
	Selbo, S. M., & Carmichael, J. S. (1999). Reproductive biology of leafy spurge (<i>Euphorbia esula</i> L.): breeding system analysis. <i>Canadian Journal of Botany</i> , 77(11), 1684-1688	"Abstract: Leafy spurge (<i>Euphorbia esula</i> L.) represents a non-native, invasive weed that dominates many regions across North America. While many research efforts are aimed at controlling the growth and spread of this plant, relatively little is known about its breeding system. This study provides evidence that leafy spurge is self-compatible, with selfed plants producing roughly half as many seeds as outcrossed plants. Unpollinated flowers failed to set seed and thus preliminary tests for apomixis were negative. However, microscopic examination of pollinated flowers revealed that pollen tubes did not appear to enter ovules in either selfed or outcrossed flowers. Therefore, leafy spurge exhibits structural evidence that suggests pseudogamy may play a role in the reproductive strategies of this invasive weed." [Unknown for <i>E. cyathophora</i> , but related species are self-compatible]

605	Requires specialist pollinators	n
	Source(s)	Notes
	Zomlefer, W.B. 1994. <i>Guide to Flowering Plant Families</i> . The University of North Carolina Press, Chapel Hill & London	"Most euphorbs easily attract pollinators (mostly flies) with the nectar secreted by the extrastaminal disc or glands"
	Nellis, D.W. 1997. <i>Poisonous plants and animals of Florida and the Caribbean</i> . Pineapple Press Inc., Sarasota, FL	"The abundant nectar is gathered by bees and produces an acrid, unpleasant honey."

606	Reproduction by vegetative fragmentation	n
	Source(s)	Notes
	Queensland Government. (2019). <i>Weeds of Australia - Euphorbia cyathophora</i> . http://keyserver.lucidcentral.org . [Accessed 25 Nov 2019]	"Painted spurge (<i>Euphorbia cyathophora</i>) reproduces by seed. The capsules open explosively when mature, expelling the seeds short distances. They may also be spread by water movement and is dumped garden waste."
	Whistler, W. A. (1988). Checklist of the weed flora of western Polynesia. Technical Paper No. 194, South Pacific Commission, Noumea, New Caledonia	"Propagate by seeds"

607	Minimum generative time (years)	1
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. <i>Manual of the flowering plants of Hawaii</i> . Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Glabrous annual herbs; stems green, ascending, somewhat glaucous, 1-5 dm long."

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y
	Source(s)	Notes

Qsn #	Question	Answer
	Attorney-General's Department. (2008). Rumah Baru-Freight and Passenger Facilities, Cocos (Keeling) Islands Environmental Management Plan. https://www.environment.gov.au/ . [Accessed 25 Nov 2019]	"Euphorbia cyathophora ... Common introduced weed on road verges" [Distribution along roadsides suggest seeds are either being dispersed inadvertently along roads by vehicles or in soil]
	Queensland Government. (2019). Weeds of Australia - Euphorbia cyathophora. http://keyserver.lucidcentral.org . [Accessed 25 Nov 2019]	"The capsules open explosively when mature, expelling the seeds short distances. They may also be spread by water movement and is dumped garden waste."
	Nellis, D.W. 1997. Poisonous plants and animals of Florida and the Caribbean. Pineapple Press Inc., Sarasota, FL	"This plant is most common in disturbed areas and along roadsides."

702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	Whistler, W.A. 2000. Tropical Ornamentals: A Guide. Timber Press, Portland, OR	"It is often grown as a border plant in gardens or in cemeteries, particularly in areas of poor soil where few other ornamental species can survive. It is perhaps more commonly found as a weed. "

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	Notes
	Biosecurity Australia. (2005). Final Report for the Import Risk Analysis for Table Grapes from Chile. Biosecurity Australia, Canberra, Australia	"Dispersal mechanism indicates that seed is unlikely to contaminate grape bunches." [No evidence of produce contamination]
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Dispersed by: Humans, Escapee"
	Queensland Government. (2019). Weeds of Australia - Euphorbia cyathophora. http://keyserver.lucidcentral.org . [Accessed 25 Nov 2019]	"Painted spurge (Euphorbia cyathophora) reproduces by seed. The capsules open explosively when mature, expelling the seeds short distances. They may also be spread by water movement and is dumped garden waste."

704	Propagules adapted to wind dispersal	n
	Source(s)	Notes
	Queensland Government. (2019). Weeds of Australia - Euphorbia cyathophora. http://keyserver.lucidcentral.org . [Accessed 25 Nov 2019]	"The capsules open explosively when mature, expelling the seeds short distances. They may also be spread by water movement and is dumped garden waste." [Short distance dispersal by ejection or gravity, but not by wind]

705	Propagules water dispersed	y
	Source(s)	Notes
	Queensland Government. (2019). Weeds of Australia - Euphorbia cyathophora. http://keyserver.lucidcentral.org . [Accessed 25 Nov 2019]	"This species is a weed of disturbed sites, waste areas, roadsides, creek banks (i.e. riparian areas) and plantation crops (e.g. sugar cane and pineapples) in tropical, sub-tropical and warmer temperate environments. However, it is most abundant as a weed of coastal environs and offshore islands." ... "The capsules open explosively when mature, expelling the seeds short distances. They may also be spread by water movement and is dumped garden waste."

Qsn #	Question	Answer
706	Propagules bird dispersed	n
	Source(s)	Notes
	Queensland Government. (2019). Weeds of Australia - <i>Euphorbia cyathophora</i> . http://keyserver.lucidcentral.org . [Accessed 25 Nov 2019]	"Painted spurge (<i>Euphorbia cyathophora</i>) reproduces by seed. The capsules open explosively when mature, expelling the seeds short distances. They may also be spread by water movement and is dumped garden waste."

707	Propagules dispersed by other animals (externally)	n
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Capsules broadly ovoid, 3-4 mm long. Seeds ovoid-cylindrical, the ends truncate or rounded, 2.5-3 mm long, the surface finely and sharply tuberculate, ecarunculate."
	Queensland Government. (2019). Weeds of Australia - <i>Euphorbia cyathophora</i> . http://keyserver.lucidcentral.org . [Accessed 25 Nov 2019]	"Painted spurge (<i>Euphorbia cyathophora</i>) reproduces by seed. The capsules open explosively when mature, expelling the seeds short distances. They may also be spread by water movement and is dumped garden waste."

708	Propagules survive passage through the gut	n
	Source(s)	Notes
	Queensland Government. (2019). Weeds of Australia - <i>Euphorbia cyathophora</i> . http://keyserver.lucidcentral.org . [Accessed 25 Nov 2019]	"Capsules broadly ovoid, 3-4 mm long. Seeds ovoid-cylindrical, the ends truncate or rounded, 2.5-3 mm long, the surface finely and sharply tuberculate, ecarunculate."
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Capsules broadly ovoid, 3-4 mm long. Seeds ovoid-cylindrical, the ends truncate or rounded, 2.5-3 mm long, the surface finely and sharply tuberculate, ecarunculate." [Not fleshy-fruited; unlikely fruit/seeds would be ingested]

801	Prolific seed production (>1000/m ²)	y
	Source(s)	Notes
	Rogers, R. W. (2000). Weeds in the germinable seed populations from the Heron Island National Park, Great Barrier Reef. <i>Proceedings of the Royal Society of Queensland</i> , 109: 131-134	"Abstract: Soil seed collected from two apparently natural and two disturbed (weedy) communities on Heron Island, a coral cay on the Great Barrier Reef, contained nine species of easily germinable seed. Seed of the weed <i>Conyza sumatrense</i> was found in each of the four communities, having mean seed numbers ranging from 70 +/- 153 seeds m ⁻² to 14,924 +/- 11,152 seeds m ⁻² . <i>Euphorbia cyathophora</i> was less common and found only in disturbed sites with a mean density in those sites of 832 +/- 426 seeds m ⁻² . Because of their capacity to build up seed banks in a short time, weeds may pose a threat to the native vegetation of Heron Island." [Potentially reaches densities over >1000 m ⁻²]
	University of Guam. (2019). <i>Euphorbia cyathophora</i> . https://cnas-re.uog.edu/guam-weeds/euphorbia-cyathophora/ . [Accessed 25 Nov 2019]	"Seed: ovoid-cylindrical, ends truncate or rounded, surface tuberculate, ecarunculate; germination over extended periods in fields, seeds explode from capsules; produces 4500 per plant over growing season; lack dormancy; not light sensitive"

Qsn #	Question	Answer
802	Evidence that a persistent propagule bank is formed (>1 yr)	n
	Source(s)	Notes
	University of Guam. (2019). <i>Euphorbia cyathophora</i> . https://cnas-re.uog.edu/guam-weeds/euphorbia-cyathophora/ . [Accessed 22 Nov 2019]	[Seeds lack dormancy] "Seed: ovoid-cylindrical, ends truncate or rounded, surface tuberculate, ecarunculate; germination over extended periods in fields, seeds explode from capsules; produces 4500 per plant over growing season; lack dormancy; not light sensitive"

803	Well controlled by herbicides	y
	Source(s)	Notes
	Inkson, T. (2015). <i>Garden Escapees & Other Weeds of Bushland & Reserves</i> . 3rd Edition. Great Lakes Council, New South Wales, Australia	"Control: Hand pull/dig bagging all plant parts and removing from site, Foliar spray."
	Mousley, J. (2010). <i>Weed Profile - Painted Spurge</i> . Clarence Landcare Inc. http://www.clarencelandcare.com.au . [Accessed 25 Nov 2019]	"Herbicide Application and Rates: <i>Euphorbia cyathophora</i> Painted Spurge 1:100 + surfactant - Spray parts glyphosate: parts water OR metsulfuron-methyl 1-2g/10L water + non-ionic surfactant (0.1% or 1ml/L)"

804	Tolerates, or benefits from, mutilation, cultivation, or fire	n
	Source(s)	Notes
	Inkson, T. (2015). <i>Garden Escapees & Other Weeds of Bushland & Reserves</i> . 3rd Edition. Great Lakes Council, New South Wales, Australia	"Hand pull/dig bagging all plant parts and removing from site, Foliar spray."
	Mousley, J. (2010). <i>Weed Profile - Painted Spurge</i> . Clarence Landcare Inc. http://www.clarencelandcare.com.au . [Accessed 25 Nov 2019]	"Manual: Hand pull making sure that roots are pulled and any plant material containing seeds is taken off site and disposed of appropriately (eg; bag, solarise and compost)."

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. <i>Manual of the flowering plants of Hawaii</i> . Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Naturalized on at least five main Hawaiian Islands, with no evidence of limiting factors] in Hawai'i naturalized in low elevation, dry, disturbed sites on Midway Atoll, Kaua'i, O'ahu, Moloka'i, and Maui. First collected on O'ahu in 1917 (Forbes 2443. 0, BISH)."

Summary of Risk Traits:

High Risk / Undesirable Traits

- Broad latitudinal range
- Thrives in tropical climates
- Naturalized on Midway Atoll, Kauai, Oahu, Molokai, Maui and Hawaii (Hawaiian Islands), and widely naturalized elsewhere
- A weed of disturbed sites and an environmental weed in Australia and Midway Atoll
- Other *Euphorbia* species are invasive
- Toxic to animals and people
- Tolerates many soil types
- Able to form dense thickets
- Reproduces by seeds
- An annual, reaching maturity in one growing season
- Mature capsules open explosively, expelling seeds short distances.
- Seeds also dispersed by water, in dumped garden waste, and intentionally cultivated by people as an ornamental
- Prolific seed production

Low Risk Traits

- Unarmed (no spines, thorns, or burrs)
- Palatable to grazing animals (despite toxicity)
- Valued as an ornamental
- Grows in full sun (shade may inhibit spread)
- Not reported to spread vegetatively
- Herbicides and mechanical methods may provide effective control