

Assessment date 26 Sept 2016

<i>Gymnocoronis spilanthoides</i> ALL ZONES		Answer	Score
1.01	Is the species highly domesticated?	n	0
1.02	Has the species become naturalised where grown?		
1.03	Does the species have weedy races?		
2.01	Species suited to Florida's USDA climate zones (0-low; 1-intermediate; 2-high) North Zone: suited to Zones 8, 9 Central Zone: suited to Zones 9, 10 South Zone: suited to Zone 10	2	
2.02	Quality of climate match data (0-low; 1-intermediate; 2-high)	2	
2.03	Broad climate suitability (environmental versatility)	y	1
2.04	Native or naturalized in habitats with periodic inundation North Zone: mean annual precipitation 50-70 inches Central Zone: mean annual precipitation 40-60 inches South Zone: mean annual precipitation 40-60 inches	y	1
2.05	Does the species have a history of repeated introductions outside its natural range?	y	
3.01	Naturalized beyond native range	y	2
3.02	Garden/amenity/disturbance weed	n	0
3.03	Weed of agriculture	n	0
3.04	Environmental weed	y	4
3.05	Congeneric weed	n	0
4.01	Produces spines, thorns or burrs	n	0
4.02	Allelopathic	unk	0
4.03	Parasitic	n	0
4.04	Unpalatable to grazing animals	n	-1
4.05	Toxic to animals	n	0
4.06	Host for recognised pests and pathogens	unk	0
4.07	Causes allergies or is otherwise toxic to humans	unk	0
4.08	Creates a fire hazard in natural ecosystems	unk	0
4.09	Is a shade tolerant plant at some stage of its life cycle	y	1
4.10	Grows on infertile soils (oligotrophic, limerock, or excessively draining soils). North & Central Zones: infertile soils; South Zone: shallow limerock or Histisols.	n	0
4.11	Climbing or smothering growth habit	unk	0
4.12	Forms dense thickets	y	1
5.01	Aquatic	y	5
5.02	Grass	n	0
5.03	Nitrogen fixing woody plant	n	0
5.04	Geophyte	n	0
6.01	Evidence of substantial reproductive failure in native habitat	n	0
6.02	Produces viable seed	y	1

6.03	Hybridizes naturally	unk	-1
6.04	Self-compatible or apomictic	unk	-1
6.05	Requires specialist pollinators	n	0
6.06	Reproduction by vegetative propagation	y	1
6.07	Minimum generative time (years)	1	1
7.01	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y	1
7.02	Propagules dispersed intentionally by people	y	1
7.03	Propagules likely to disperse as a produce contaminant	unk	-1
7.04	Propagules adapted to wind dispersal	n	-1
7.05	Propagules water dispersed	y	1
7.06	Propagules bird dispersed	unk	-1
7.07	Propagules dispersed by other animals (externally)	y	1
7.08	Propagules dispersed by other animals (internally)	unk	-1
8.01	Prolific seed production	n	-1
8.02	Evidence that a persistent propagule bank is formed (>1 yr)	y	1
8.03	Well controlled by herbicides	n	1
8.04	Tolerates, or benefits from, mutilation or cultivation	y	1
8.05		?	
Total Score			17
Implemented Pacific Second Screening			no
Risk Assessment Results			High

section	# questions answered	satisfy minimum?
A		11 yes
B		7 yes
C		18 yes
total		36 yes

	Reference	Source data
1.01		Cultivated, but no evidence of selection for reduced weediness
1.02		Skip to 2.01
1.03		Skip to 2.01
2.01	<p>1. Global Plant Hardiness Zones for Phytosanitary Risk Analysis. http://naldc.nal.usda.gov/download/36586/PDF (Accessed: 9 September 2016) 2. GRIN US National Plant Germplasm System. https://npgsweb.ars-grin.gov/gringlobal/taxonomydetail.aspx?403701 (Accessed: 9 September 2016) 3. Dave's Garden. http://davesgarden.com/guides/pf/go/188141/#b (Accessed: 18 September 2016) 4. European and Mediterranean Plant Protection Organization. https://www.eppo.int/INVASIVE_PLANTS/observation_list/Gymnocoronis_spilanthoides.htm (Accessed: 20 September 2016) 5. Parsons, W. T., and E. G. Cuthbertson. 1992. Noxious Weeds of Australia. Inkata Press, Melbourne. (Accessed: 21 September 2016) 6. CABI Invasive Species Compendium. http://www.cabi.org/isc/datasheet/26246 (Accessed: 21 September 2016) 7. Queensland Government. http://keyserver.lucidcentral.org/weeds/data/media/Html/gymnocoronis_spilanthoides.htm (Accessed: 21 September 2016) 8. APHIS. USDA Weed Risk Assessment for <i>Gymnocoronis spilanthoides</i> (D. Don ex Hook. & Arn.) DC. (Asteraceae) - Senegal tea plants. https://www.aphis.usda.gov/plant_health/plant_pest_info/weeds/downloads/wra/Gymnocoronis_spilanthoides_WRA.pdf (Accessed: 21 September 2016)</p>	<p>1. Figure 3. Florida North Zone: Hardiness zones 8 and 9. Central Zone: Hardiness zones 9 and 10. South Zone: Hardiness zone 10. 2. Native to Brazil, Argentina, Paraguay, Uruguay, and Peru. 3. USDA Zones 8a through 11. 4. "Geographical distribution: Oceania: Australia (Queensland, New South Wales, South Australia, Tasmania, Victoria, Western Australia), New Zealand. Asia: India, Japan (Kyushu, Honshu). North America (native): Mexico. South America (native): Argentina (listed as a main weed), Bolivia, Brazil, Paraguay, Peru, Uruguay." 5. Native to tropical and sub-tropical America: Mexico to Argentina, India, and Australia 6. Native to Mexico, Argentina, Bolivia, Brazil, Bahia, Mato Grosso do Sul, Rio Grande do Sul, Paraguay, Peru, and Uruguay. 7 "Native to South America (i.e. Brazil, Bolivia, Peru, Argentina, Paraguay and Uruguay) and possibly also Mexico."; "Not yet widely naturalised, and currently restricted to isolated outbreaks in some parts of eastern Australia. It has been reported from south-eastern Queensland, the coastal districts of northern and central New South Wales, and is sparingly naturalised in central Victoria. Also known to be naturalised in India, Hungary and New Zealand." 8. USDA Hardiness Zones 7-13</p>
2.02		Native range is well known.
2.03	<p>1. The University of Melbourne. Köppen-Geiger Climate Map of the World. http://people.eng.unimelb.edu.au/mpeel/koppen.html (Accessed: 9 September 2016) 2. GRIN US National Plant Germplasm System. https://npgsweb.ars-grin.gov/gringlobal/taxonomydetail.aspx?403701 (Accessed: 9 September 2016) 3. European and Mediterranean Plant Protection Organization. https://www.eppo.int/INVASIVE_PLANTS/observation_list/Gymnocoronis_spilanthoides.htm (Accessed: 20 September 2016) 4. Parsons, W. T., and E. G. Cuthbertson. 1992. Noxious Weeds of Australia. Inkata Press, Melbourne. (Accessed: 21 September 2016) 5. CABI Invasive Species Compendium. http://www.cabi.org/isc/datasheet/26246 (Accessed: 21 September 2016) 6. Queensland Government. http://keyserver.lucidcentral.org/weeds/data/media/Html/gymnocoronis_spilanthoides.htm (Accessed: 21 September 2016)</p>	<p>1. Native to Köppen-Geiger Climate Zones: Af, Am, Aw, BWk, BWk, BSh, BSk, Csa, Csb, Cwa, Cwb, Cfa, and Cfb. 2. Native to Brazil, Argentina, Paraguay, Uruguay, and Peru. 3. "Geographical distribution: Oceania: Australia (Queensland, New South Wales, South Australia, Tasmania, Victoria, Western Australia), New Zealand. Asia: India, Japan (Kyushu, Honshu). North America (native): Mexico. South America (native): Argentina (listed as a main weed), Bolivia, Brazil, Paraguay, Peru, Uruguay." 4. Native to tropical and sub-tropical America: Mexico to Argentina, India, and Australia 5. Native to Mexico, Argentina, Bolivia, Brazil, Bahia, Mato Grosso do Sul, Rio Grande do Sul, Paraguay, Peru, and Uruguay. 6 "Native to South America (i.e. Brazil, Bolivia, Peru, Argentina, Paraguay and Uruguay) and possibly also Mexico."; "Not yet widely naturalised, and currently restricted to isolated outbreaks in some parts of eastern Australia. It has been reported from south-eastern Queensland, the coastal districts of northern and central New South Wales, and is sparingly naturalised in central Victoria. Also known to be naturalised in India, Hungary and New Zealand."</p>

2.04	<p>1. Climate Charts. World Climate Maps. http://www.climate-charts.com/World-Climate-Maps.html#rain (Accessed: 9 September 2016) 2. GRIN US National Plant Germplasm System. https://npgsweb.ars-grin.gov/gringlobal/taxonomydetail.aspx?403701 (Accessed: 9 September 2016) 3. European and Mediterranean Plant Protection Organization. https://www.eppo.int/INVASIVE_PLANTS/observation_list/Gymnocoronis_spilanthoides.htm (Accessed: 20 September 2016) 4. Parsons, W. T., and E. G. Cuthbertson. 1992. Noxious Weeds of Australia. Inkata Press, Melbourne. (Accessed: 21 September 2016) 5. CABI Invasive Species Compendium. http://www.cabi.org/isc/datasheet/26246 (Accessed: 21 September 2016) 6. Queensland Government. http://keyserver.lucidcentral.org/weeds/data/media/Html/gymnocoronis_spilanthoides.htm (Accessed: 21 September 2016)</p>	<p>1. Native and naturalized in areas with rainfall within these ranges. 2. Native to Brazil, Argentina, Paraguay, Uruguay, and Peru. 3. "Geographical distribution: Oceania: Australia (Queensland, New South Wales, South Australia, Tasmania, Victoria, Western Australia), New Zealand. Asia: India, Japan (Kyushu, Honshu). North America (native): Mexico. South America (native): Argentina (listed as a main weed), Bolivia, Brazil, Paraguay, Peru, Uruguay." 4. Native to tropical and sub-tropical America: Mexico to Argentina, India, and Australia 5. Native to Mexico, Argentina, Bolivia, Brazil, Bahia, Mato Grosso do Sul, Rio Grande do Sul, Paraguay, Peru, and Uruguay. 6 "Native to South America (i.e. Brazil, Bolivia, Peru, Argentina, Paraguay and Uruguay) and possibly also Mexico."; "Not yet widely naturalised, and currently restricted to isolated outbreaks in some parts of eastern Australia. It has been reported from south-eastern Queensland, the coastal districts of northern and central New South Wales, and is sparingly naturalised in central Victoria. Also known to be naturalised in India, Hungary and New Zealand."</p>
2.05	<p>1. CABI Invasive Species Compendium. http://www.cabi.org/isc/datasheet/26246 (Accessed: 9 September 2016) 2. Queensland Government. Business and Energy Portal. https://www.business.qld.gov.au/industry/agriculture/species/invasive-plants/restricted/senegal-tea (Accessed: 18 September 2016) 3. The CRC for Australian Weed Management. https://www.environment.gov.au/biodiversity/invasive/weeds/publications/guidelines/alert/pubs/g-spilanthoides.pdf (Accessed: 18 September 2016) 4. Flora of China. http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=242426474 (Accessed: 20 September 2016) 5. Kadono, Y. 2004. Alien aquatic plants naturalized in Japan: History and present status. <i>Global Environmental Research</i> 8(2):163-169. (Accessed: 20 September 2016) 6. CABI Invasive Species Compendium. http://www.cabi.org/isc/datasheet/26246 (Accessed: 21 September 2016)</p>	<p>1. Introduced to India, Senegal, Hungary, and Australia. 2. "Native to South America, Senegal tea is an aquatic perennial introduced to Australia as an aquarium plant." 3. "Senegal tea plant was introduced into Australia from India by the aquarium industry" 4. "Recently introduced, and now naturalized, in Guangxi, Taiwan, and Yunnan" 5. Introduced and naturalized in Japan 6. Introduced to Hungary, New South Wales, Queensland, Tasmania, Victoria, Western Australia, and New Zealand.</p>
3.01	<p>1. GRIN US National Plant Germplasm System. https://npgsweb.ars-grin.gov/gringlobal/taxonomydetail.aspx?403701 (Accessed: 9 September 2016) 2. Queensland Government. http://keyserver.lucidcentral.org/weeds/data/media/Html/gymnocoronis_spilanthoides.htm (Accessed: 9 September 2016) 3. Flora of China. http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=242426474 (Accessed: 20 September 2016) 4. Torok, K., Z. Botta-Dukat, I. Dancza, I. Nemeth, J. Kiss, B. Mihaly, and D. Magyar. 2003. Invasion gateways and corridors in the Carpathian Basin: Biological invasions in Hungary. <i>Biological Invasions</i> 5:349-356. (Accessed: 20 September 2016) 5. Kadono, Y. 2004. Alien aquatic plants naturalized in Japan: History and present status. <i>Global Environmental Research</i> 8(2):163-169. (Accessed: 20 September 2016)</p>	<p>1. Naturalized in Australia and New Zealand 2. "Not yet widely naturalised, and currently restricted to isolated outbreaks in some parts of eastern Australia. It has been reported from south-eastern Queensland, the coastal districts of northern and central New South Wales, and is sparingly naturalised in central Victoria. Also known to be naturalised in India, Hungary and New Zealand." 3. "Recently introduced, and now naturalized, in Guangxi, Taiwan, and Yunnan [native to South America; naturalized in Australia, Japan, and Pacific islands (New Zealand)]." 4. Introduced and naturalized in Hungary. 5. Introduced and naturalized in Japan</p>
3.02		No evidence
3.03		No evidence

3.04	<p>1. Queensland Government. http://keyserver.lucidcentral.org/weeds/data/media/Html/gymnocoronis_spilanthoides.htm (Accessed: 9 September 2016) 2. CABI Invasive Species Compendium. http://www.cabi.org/isc/datasheet/26246 (Accessed: 18 September 2016) 3. MPI. 2012. Senegal tea: <i>Gymnocoronis spilanthoides</i>. Ministry of Primary Industries (MPI), Wellington, New Zealand. http://www.biosecurity.govt.nz/pests/senegal-tea. (Accessed: 20 September 2016) 4. New Zealand Ministry for Primary Industries. National Pest Plant Accord. 2012. (Accessed: 21 September 2016) 5. The CRC for Australian Weed Management. https://www.environment.gov.au/biodiversity/invasive/weeds/publications/guidelines/alert/pubs/g-spilanthoides.pdf (Accessed: 21 September 2016) 6. Global Compendium of Weeds. http://www.hear.org/gcw/species/gymnocoronis_spilanthoides/ (Accessed: 21 September 2016)</p>	<p>1. "Senegal tea plant (<i>Gymnocoronis spilanthoides</i>) is regarded as an environmental weed in Queensland and New South Wales, and as a potential environmental weed or "sleeper weed" in other parts of Australia. Its distribution is relatively limited at present, but it is on the Alert List for Environmental Weeds, a list of 28 non-native plants that threaten biodiversity and cause other environmental damage."; "Senegal tea plant (<i>Gymnocoronis spilanthoides</i>) will invade and degrade natural wetlands and waterways by competing strongly with slower growing native plants. It will eventually replace the native plants, thereby also affecting the birds and other animals that are dependent upon them for food and shelter. Hence, Senegal tea plant (<i>Gymnocoronis spilanthoides</i>) poses a significant threat to the health of entire wetland ecosystems."; "Senegal tea plant (<i>Gymnocoronis spilanthoides</i>) infestations block waterways and drainage channels, and can therefore increase the damage caused by flooding. They can also impede recreational activities, interfere with irrigation and restrict navigation of waterways. Water quality may also be affected by this weed, particularly if large amounts of Senegal tea plant (<i>Gymnocoronis spilanthoides</i>) die off and rot under water." 2. "It grows very rapidly, up to 15 cm per week, and floating mats cover water bodies, blocking drainage channels and degrading natural wetlands by displacing native plants and animals as well as detracting from their environmental value, natural beauty and recreational potential." 3. "Senegal tea grows very quickly, and is known to rapidly cover water bodies with a floating mat, excluding other plants and the animals that rely on them " 4. "Senegal tea grows very quickly, and is known to rapidly cover water bodies with a floating mat, excluding other plants and the animals that rely on them. The</p>
3.05	<p>1. Mabberley, D. J. 2008. <i>Mabberley's Plant-Book: A Portable Dictionary of Plants, their Classification and Uses</i> (3rd edition). Cambridge University Press, New York, USA. 1021 pp. (Accessed: 20 September 2016) 2. Global Compendium of Weeds. http://www.hear.org/gcw/scientificnames/scinameg.htm (Accessed: 20 September 2016)</p>	<p>1. Genus contains very few species 2. No other plants in this genus are catalogued as a part of the Global Compendium of Weeds</p>
4.01	<p>1. Queensland Government. http://keyserver.lucidcentral.org/weeds/data/media/Html/gymnocoronis_spilanthoides.htm (Accessed: 9 September 2016) 2. Queensland Government. Business and Energy Portal. https://www.business.qld.gov.au/industry/agriculture/species/invasive-plants/restricted/senegal-tea (Accessed: 18 September 2016) 3. Flora of China. http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=242426474 (Accessed: 20 September 2016) 4. New Zealand Ministry for Primary Industries. National Pest Plant Accord. 2012. (Accessed: 21 September 2016)</p>	<p>Evidence of these features is not found in the descriptions of this plant</p>
4.02	<p>1. Ishitsuka, Fukushima, and Ookuma. Research on allelopathic activity of vegetables, ornamental plants and rice bran, and on the control effect of dried plant powder on paddy weeds [2008]. Food and Agriculture Organization of the United Nations. http://agris.fao.org/agris-search/search.do?recordID=JP2008003872 (Accessed: 20 September 2016)</p>	<p>1. "The allelopathic activity of 35 kinds of vegetables, ornamental plants and rice bran was screened by the Sandwich method using lettuce as the receptor plant. By this method, <i>Gymnocoronis spilanthoides</i>, gerbera, <i>Ophiopogon japonicus</i>, tomato, <i>Cyperus microiria</i>, <i>Gilia leptantha</i> and <i>Scabiosa atropurpurea</i> showed an equal degree of activity in comparison with hairy vetch, of which the allelopathic activity is reported to be high."; Plant was studied under unnatural conditions using the sandwich method, with a concentrated chemical sample</p>
4.03		<p>No evidence</p>

4.04	1. ISSG. 2012. Global Invasive Species Database. The World Conservation Union (IUCN), Invasive Species Specialist Group (ISSG). http://www.issg.org/database/welcome/ . (Accessed: 20 September 2016)	1. "Senegal tea is a resilient ornamental plant, it is also eaten by stock and has been noted as providing winter grazing in wet areas."; no evidence or traits suggesting unpalatability
4.05	1. ISSG. 2012. Global Invasive Species Database. The World Conservation Union (IUCN), Invasive Species Specialist Group (ISSG). http://www.issg.org/database/welcome/ . (Accessed: 20 September 2016)	1. "Senegal tea is a resilient ornamental plant, it is also eaten by stock and has been noted as providing winter grazing in wet areas."; no evidence of toxicity
4.06		No evidence that <i>Gymnocoronis spilanthoides</i> is a host to recognised pests and pathogens
4.07		Unlikely due to lack of evidence
4.08		No evidence, unlikely because this plant grows in wet areas
4.09	1. CABI Invasive Species Compendium. http://www.cabi.org/isc/datasheet/26246 (Accessed: 10 September 2016) 2. Dave's Garden. http://davesgarden.com/guides/pf/go/188141/#b (Accessed: 10 September 2016) 3. The CRC for Australian Weed Management. https://www.environment.gov.au/biodiversity/invasive/weeds/publications/guidelines/alert/pubs/g-spilanthoides.pdf (Accessed: 15 September 2016) 4. European and Mediterranean Plant Protection Organization. https://www.eppo.int/INVASIVE_PLANTS/observation_list/Gymnocoronis_spilanthoides.htm (Accessed: 21 September 2016)	1. "has the ability to continue growing even when completely submersed although growth rates are reduced and plants are smaller" 2. Full sun to partial shade. 3. " It survives and continues growing even when completely inundated." 4. "Although it is shade tolerant, it requires light to colonize a new location."
4.10	1. Queensland Government. Business and Energy Portal. https://www.business.qld.gov.au/industry/agriculture/species/invasive-plants/restricted/senegal-tea (Accessed: 18 September 2016) 2. New Zealand Ministry for Primary Industries. National Pest Plant Accord. 2012. (Accessed: 21 September 2016)	1. "Can grow over water surface or in wet, marshy soils." 2. "This is a perennial aquatic herb"
4.11	1. Queensland Government. http://keyserver.lucidcentral.org/weeds/data/media/Html/gymnocoronis_spilanthoides.htm (Accessed: 10 September 2016) 2. Queensland Government. Business and Energy Portal. https://www.business.qld.gov.au/industry/agriculture/species/invasive-plants/restricted/senegal-tea (Accessed: 15 September 2016) 3. Weedbusters. http://www.weedbusters.org.nz/weed-information/gymnocoronis-spilanthoides/59/ (Accessed: 21 September 2016)	1. "It forms a rounded bush (1-2.5 m tall) in more terrestrial habitats and a mat of tangled branches extending out over the water surface in aquatic habitats."; "The stems are initially upright (i.e. erect), but often gradually become low-growing or creeping (i.e. decumbent or prostrate)" 2. "Aquatic perennial that grows over water surface, producing runners and floating stems up to 2.5m long. On land, grows as rounded bush." 3. "Roots and seeds in shallow water and damp ground, matures and grows quickly, forms dense mats and scrambles over other species that live on the water margins."; insufficient evidence that scrambling behaviour is responsible for killing existing vegetation
4.12	1. Queensland Government. http://keyserver.lucidcentral.org/weeds/data/media/Html/gymnocoronis_spilanthoides.htm (Accessed: 9 September 2016) 2. Queensland Government. Business and Energy Portal. https://www.business.qld.gov.au/industry/agriculture/species/invasive-plants/restricted/senegal-tea (Accessed: 18 September 2016) 3. MPI. 2012. Senegal tea: <i>Gymnocoronis spilanthoides</i> . Ministry of Primary Industries (MPI), Wellington, New Zealand. http://www.biosecurity.govt.nz/pests/senegal-tea . (Accessed: 20 September 2016)	1. "It forms a rounded bush (1-2.5 m tall) in more terrestrial habitats and a mat of tangled branches extending out over the water surface in aquatic habitats."; "Senegal tea plant (<i>Gymnocoronis spilanthoides</i>) infestations block waterways and drainage channels, and can therefore increase the damage caused by flooding. They can also impede recreational activities, interfere with irrigation and restrict navigation of waterways." 2. "Forms floating mats, blocking irrigation ditches, shallow dams and waterways." 3. "The effects of flooding are made much worse because infestations block drainage channels....navigation may also be affected"

5.01	<p>1. Queensland Government. http://keyserver.lucidcentral.org/weeds/data/media/Html/gymnocoronis_spilanthoides.htm (Accessed: 10 September 2016) 2. European and Mediterranean Plant Protection Organization. https://www.eppo.int/INVASIVE_PLANTS/observation_list/Gymnocoronis_spilanthoides.htm (Accessed: 15 September 2016) 3. Parsons, W. T., and E. G. Cuthbertson. 1992. Noxious Weeds of Australia. Inkata Press, Melbourne. (Accessed: 21 September 2016) 4. Ardenghi N. M. G., Barcheri G., Ballerini C., Cauzzi P. & Guzzon F. 2016: <i>Gymnocoronis spilanthoides</i> (Asteraceae, Eupatorieae), a new naturalized and potentially invasive aquatic alien in S Europe. — <i>Willdenowia</i> 46: 265–273. doi: http://dx.doi.org/10.3372/wi.46.46208 (Accessed: 21 September 2016) 5. New Zealand Ministry for Primary Industries. National Pest Plant Accord. 2012. (Accessed: 21 September 2016)</p>	<p>1. "This species has been widely cultivated as an aquarium or ornamental water plant in Australia."; "A weed of wetter tropical, sub-tropical and warmer temperate environments. It is particularly problematic along waterways, around lakes and dams, in swamps and wetlands, and along drains and channels."; "A long-lived (i.e. perennial) herbaceous plant that grows on damp ground or partially covered by water (i.e. a terrestrial or emergent aquatic herb)." 2. "semi-aquatic" 3. "internodes hollow, inflated and buoyant" 4. "<i>Gymnocoronis spilanthoides</i> (Asteraceae, Eupatorieae), a new naturalized and potentially invasive aquatic alien in S Europe" 5. "This is a perennial aquatic herb"</p>
5.02	<p>1. Flora of China. http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=242426474 (Accessed: 20 September 2016) 2. European and Mediterranean Plant Protection Organization. https://www.eppo.int/INVASIVE_PLANTS/observation_list/Gymnocoronis_spilanthoides.htm (Accessed: 20 September 2016) 3. GRIN US National Plant Germplasm System. https://npgsweb.ars-grin.gov/gringlobal/taxonomydetail.aspx?403701 (Accessed: 20 September 2016)</p>	<p>1. "Herbs" 2. "perennial herb" 3. "Family: Asteraceae"</p>
5.03	<p>1. Queensland Government. http://keyserver.lucidcentral.org/weeds/data/media/Html/gymnocoronis_spilanthoides.htm (Accessed: 20 September 2016) 2. CABI Invasive Species Compendium. http://www.cabi.org/isc/datasheet/26246 (Accessed: 20 September 2016)</p>	<p>1. "herbaceous plant" 2. Herbaceous; no evidence of nitrogen fixation</p>
5.04	<p>1. Queensland Government. http://keyserver.lucidcentral.org/weeds/data/media/Html/gymnocoronis_spilanthoides.htm (Accessed: 9 September 2016) 2. Queensland Government. Business and Energy Portal. https://www.business.qld.gov.au/industry/agriculture/species/invasive-plants/restricted/senegal-tea (Accessed: 18 September 2016) 3. Flora of China. http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=242426474 (Accessed: 20 September 2016) 4. New Zealand Ministry for Primary Industries. National Pest Plant Accord. 2012. (Accessed: 21 September 2016)</p>	<p>Evidence of these specialized structures not found in the descriptions of this plant</p>
6.01		<p>No evidence</p>
6.02	<p>1. Queensland Government. http://keyserver.lucidcentral.org/weeds/data/media/Html/gymnocoronis_spilanthoides.htm (Accessed: 9 September 2016) 2. Department of Agriculture and Fisheries. Biosecurity Queensland. https://www.daf.qld.gov.au/__data/assets/pdf_file/0012/70500/IPA-Senegal-Tea-Plant-PP50.pdf (Accessed: 9 September 2016) 3. Weed Science Society of America. http://wssa.net/wp-content/uploads/Gymnocoronis-spilanthoides.pdf (Accessed: 21 September 2016) 4. New Zealand Ministry for Primary Industries. http://www.biosecurity.govt.nz/pests/senegal-tea (Accessed: 21 September 2016) 5. European and Mediterranean Plant Protection Organization. https://www.eppo.int/INVASIVE_PLANTS/observation_list/Gymnocoronis_spilanthoides.htm (Accessed: 21 September 2016) 6. The CRC for Australian Weed Management. https://www.environment.gov.au/biodiversity/invasive/weeds/publications/guidelines/alert/pubs/g-spilanthoides.pdf (Accessed: 21 September 2016)</p>	<p>1. "The 'seeds' (i.e. achenes) are ribbed lengthwise, hairless (glabrous), and yellowish-brown in colour. They are about 5 mm long and there are no scales or bristles at the top of the seeds (i.e. they do not have a 'pappus')."; "This plant reproduces by seed and roots are readily produced at the joints (i.e. nodes) along the stems, enabling new plants to grow from stem fragments." 2. "Senegal tea spreads by broken stem and leaf fragments and seed." 3. "reproducing vegetatively and by seed" 4. "Seeds are produced by New Zealand plants." 5. "Most seeds germinate in spring, although some germination may continue into summer. A germination rate of 83% has been reported. Seedling growth is rapid." 6. "However, one aspect of Senegal tea plant's biology is making control easier than it might otherwise be. Council staff have found that the seed has not been contributing to its spread."</p>

6.03		No evidence
6.04	1. Queensland Government. http://keyserver.lucidcentral.org/weeds/data/media/Html/gymnocoronis_spilanthoides.htm (Accessed: 9 September 2016)	1. "These tiny flowers (about 4 mm long) have both male and female parts"; insufficient evidence
6.05	1. Kadono, Y. 2004. Alien aquatic plants naturalized in Japan: History and present status. <i>Global Environmental Research</i> 8(2):163-169. (Accessed: 20 September 2016) 2. Panetta, F. D. 2010. Seed persistence of the invasive aquatic plant, <i>Gymnocoronis spilanthoides</i> (Asteraceae). <i>Australian Journal of Botany</i> 57(8):670-674. (Accessed: 20 September 2016) 3. Malacalza, N. H., M. A. Caccavari, G. Fagúndez, and C. E. Lupano. 2005. Unifloral honeys of the province of Buenos Aires, Argentina. <i>Journal of the Science of Food and Agriculture</i> 85(8):1389-1396. (Accessed: 20 September 2016) 4. European and Mediterranean Plant Protection Organization. https://www.eppo.int/INVASIVE_PLANTS/observation_list/Gymnocoronis_spilanthoides.htm (Accessed: 21 September 2016)	1. Attracts butterflies as pollinators 2. Butterfly-attracting plant 3. Pollen grains from this plant detected in honey 4. "Moreover, the fragrant flowers of the plant attract butterflies (Monarchs in particular), and the plant may therefore be intentionally spread by butterfly enthusiasts."
6.06	1. Queensland Government. http://keyserver.lucidcentral.org/weeds/data/media/Html/gymnocoronis_spilanthoides.htm (Accessed: 9 September 2016) 2. Department of Agriculture and Fisheries. Biosecurity Queensland. https://www.daf.qld.gov.au/__data/assets/pdf_file/0012/70500/IPA_Senegal-Tea-Plant-PP50.pdf (Accessed: 9 September 2016) 3. The CRC for Australian Weed Management. https://www.environment.gov.au/biodiversity/invasive/weeds/publications/guidelines/alert/pubs/g-spilanthoides.pdf (Accessed: 18 September 2016) 4. Weed Science Society of America. http://wssa.net/wp-content/uploads/Gymnocoronis-spilanthoides.pdf (Accessed: 21 September 2016) 5. European and Mediterranean Plant Protection Organization. https://www.eppo.int/INVASIVE_PLANTS/observation_list/Gymnocoronis_spilanthoides.htm (Accessed: 21 September 2016)	1. "This plant reproduces by seed and roots are readily produced at the joints (i.e. nodes) along the stems, enabling new plants to grow from stem fragments." 2. "Senegal tea spreads by broken stem and leaf fragments and seed." 3. "The fibrous root system develops at any node in contact with water or moist soil." 4. "reproducing vegetatively and by seed" 5. "Broken stem fragments or leaves are spread by water currents, and can also be accidentally spread by machinery (e. g. boats, trailers, etc.) or animal hooves, and grow into a new plant when settling in a stream bed, and then form new colonies."
6.07	1. Queensland Government. http://keyserver.lucidcentral.org/weeds/data/media/Html/gymnocoronis_spilanthoides.htm (Accessed: 9 September 2016) 2. The CRC for Australian Weed Management. https://www.environment.gov.au/biodiversity/invasive/weeds/publications/guidelines/alert/pubs/g-spilanthoides.pdf (Accessed: 18 September 2016) 3. European and Mediterranean Plant Protection Organization. https://www.eppo.int/INVASIVE_PLANTS/observation_list/Gymnocoronis_spilanthoides.htm (Accessed: 18 September 2016)	1. "It grows very quickly in fertile environments, with growth rates exceeding 15 cm a week being reported." 2. "Senegal tea plant grows very quickly in fertile environments, with growth rates exceeding 150 mm a week."; "Plants become dormant during winter and new growth reshoots from the crown and nodes during the following spring." 3. "G. spilanthoides is a perennial that lives for several years. Most seeds germinate in spring, although some germination may continue into summer. A germination rate of 83% has been reported. Seedling growth is rapid. Flowering starts in late spring or early summer and lasts until the cooler weather of late autumn."; "Plants are dormant during winter and new growth reshoots from the crown and nodes during the following spring. The species is recorded to be very hardy, and to be able to have a growth rate exceeding 15 cm per week."

7.01	<p>1. Queensland Government. http://keyserver.lucidcentral.org/weeds/data/media/Html/gymnocoronis_spilanthoides.htm (Accessed: 9 September 2016) 2. Department of Agriculture and Fisheries. Biosecurity Queensland. https://www.daf.qld.gov.au/__data/assets/pdf_file/0012/70500/IPA-Senegal-Tea-Plant-PP50.pdf (Accessed: 9 September 2016) 3. The CRC for Australian Weed Management. https://www.environment.gov.au/biodiversity/invasive/weeds/publications/guidelines/alert/pubs/g-spilanthoides.pdf (Accessed: 18 September 2016) 4. Heenan, P. B., P. J. de Lange, D. S. Glenny, I. Breitwieser, P. J. Brownsey, and C. C. Ogle. 1999. Checklist of dicotyledons, gymnosperms, and pteridophytes naturalised or casual in New Zealand: additional records 1997-1998. <i>New Zealand Journal of Botany</i> 37:629-642. (Accessed: 20 September 2016) 5. European and Mediterranean Plant Protection Organization. https://www.eppo.int/INVASIVE_PLANTS/observation_list/Gymnocoronis_spilanthoides.htm (Accessed: 21 September 2016)</p>	<p>1. "The seeds and stem fragments are dispersed by water and in dumped aquarium waste. Seeds are also spread in mud attached to animals and vehicles." 2. "Senegal tea spreads by broken stem and leaf fragments and seed. Seeds can be spread by water and in soil on vehicle tyres and on animals' feet."; "All removed plant material should be placed in a sealed plastic bag, left in the sunlight to decompose and then disposed of at a council-approved landfill tip. Alternatively, the material should be removed and left in the sun to dry, and then burnt. Care must be taken not to leave broken plant pieces in the area."; "The most important method of spread in Australia is through cultivation and sale as an aquarium or ornamental water plant, and through dumping of fish tank contents into waterways." 3. "It is mainly spread by the careless disposal of aquarium plants or deliberate cultivation for sale."; "Seeds can also be spread in mud attached to animals or machinery" 4. Population established at a waste facility in New Zealand 5. "can also be accidentally spread by machinery (e. g. boats, trailers, etc.)"</p>
7.02	<p>2. Department of Agriculture and Fisheries. Biosecurity Queensland. https://www.daf.qld.gov.au/__data/assets/pdf_file/0012/70500/IPA-Senegal-Tea-Plant-PP50.pdf (Accessed: 9 September 2016) 2. The Water Garden. http://www.watergarden.org/Water-Snowball (Accessed: 18 September 2016) 3. The CRC for Australian Weed Management. https://www.environment.gov.au/biodiversity/invasive/weeds/publications/guidelines/alert/pubs/g-spilanthoides.pdf (Accessed: 18 September 2016) 4. European and Mediterranean Plant Protection Organization. https://www.eppo.int/INVASIVE_PLANTS/observation_list/Gymnocoronis_spilanthoides.htm (Accessed: 21 September 2016)</p>	<p>1. "The most important method of spread in Australia is through cultivation and sale as an aquarium or ornamental water plant, and through dumping of fish tank contents into waterways." 2. Available for purchase online 3. "It is mainly spread by the careless disposal of aquarium plants or deliberate cultivation for sale." 4. "The plant is imported and used for aquaria. It is recorded to have been introduced into Australia and India by the aquarium industry. Imports are reported in small quantities in Austria, Estonia, France, Hungary, the Netherlands and Switzerland, but their quantities may increase in the future. In Japan, the species has also been sold as a "water purification plant", although there is no scientific evidence of this fact. Moreover, the fragrant flowers of the plant attract butterflies (Monarchs in particular), and the plant may therefore be intentionally spread by butterfly enthusiasts."</p>
7.03	<p>1. Gao, H., and Z. Chen. 2011. <i>Gymnocoronis</i>: A new naturalized genus in Eastern China [abstract]. <i>Journal of Zhejiang A&F University</i> 28(6):992-994. (Accessed: 20 September 2016)</p>	<p>1. Reported to enter China by cargo, but unknown if this means through trade or as a contaminant</p>
7.04	<p>1. The CRC for Australian Weed Management. https://www.environment.gov.au/biodiversity/invasive/weeds/publications/guidelines/alert/pubs/g-spilanthoides.pdf (Accessed: 18 September 2016) 2. Parsons, W. T., and E. G. Cuthbertson. 2001. <i>Noxious weeds of Australia</i> (2nd edition). CSIRO Publishing, Collingwood, Victoria, Australia. 698 pp. (Accessed: 20 September 2016) 3. European and Mediterranean Plant Protection Organization. https://www.eppo.int/INVASIVE_PLANTS/observation_list/Gymnocoronis_spilanthoides.htm (Accessed: 21 September 2016)</p>	<p>1. "The seeds are quite heavy and most drop near the parent plant or can be spread by flowing water." 2. Seeds are too heavy to be dispersed by wind 3. "Seeds are relatively heavy and are usually dropped near the parent plant"</p>
7.05	<p>1. Queensland Government. http://keyserver.lucidcentral.org/weeds/data/media/Html/gymnocoronis_spilanthoides.htm (Accessed: 9 September 2016) 2. Department of Agriculture and Fisheries. Biosecurity Queensland. https://www.daf.qld.gov.au/__data/assets/pdf_file/0012/70500/IPA-Senegal-Tea-Plant-PP50.pdf (Accessed: 9 September 2016) 3. The CRC for Australian Weed Management. https://www.environment.gov.au/biodiversity/invasive/weeds/publications/guidelines/alert/pubs/g-spilanthoides.pdf (Accessed: 18 September 2016) 4. Parsons, W. T., and E. G. Cuthbertson. 2001. <i>Noxious weeds of Australia</i> (2nd edition). CSIRO Publishing, Collingwood, Victoria, Australia. 698 pp.</p>	<p>1. "The seeds and stem fragments are dispersed by water and in dumped aquarium waste. Seeds are also spread in mud attached to animals and vehicles." 2. "Senegal tea spreads by broken stem and leaf fragments and seed. Seeds can be spread by water and in soil on vehicle tyres and on animals' feet." 3. "The seeds are quite heavy and most drop near the parent plant or can be spread by flowing water."; "Vegetative spread occurs when any part of the stem that includes a node breaks away from the main plant, eg in fast flowing water." 4. Stem fragments are buoyant and disperse through streamflow</p>
7.06		No evidence

7.07	<p>1. Queensland Government. http://keyserver.lucidcentral.org/weeds/data/media/Html/gymnocoronis_spilanthoides.htm (Accessed: 9 September 2016) 2. Department of Agriculture and Fisheries. Biosecurity Queensland. https://www.daf.qld.gov.au/__data/assets/pdf_file/0012/70500/IPA-Senegal-Tea-Plant-PP50.pdf (Accessed: 9 September 2016) 3. The CRC for Australian Weed Management. https://www.environment.gov.au/biodiversity/invasive/weeds/publications/guidelines/alert/pubs/g-spilanthoides.pdf (Accessed: 18 September 2016) 4. Parsons, W. T., and E. G. Cuthbertson. 2001. Noxious weeds of Australia (2nd edition). CSIRO Publishing, Collingwood, Victoria, Australia. 698 pp. (Accessed: 20 September 2016) 5. Weedbusters. http://www.weedbusters.org.nz/weed-information/gymnocoronis-spilanthoides/59/ (Accessed: 21 September 2016)</p>	<p>1. "The seeds and stem fragments are dispersed by water and in dumped aquarium waste. Seeds are also spread in mud attached to animals and vehicles." 2. "Senegal tea spreads by broken stem and leaf fragments and seed. Seeds can be spread by water and in soil on vehicle tyres and on animals' feet." 3. "Seeds can also be spread in mud attached to animals or machinery" 4. Stick to animal hooves via mud 5. Weedbusters suggests that grazing should not be used for control because the livestock might release seeds and stem fragments while grazing, spreading the plant further.</p>
7.08		unk
8.01	<p>1. The CRC for Australian Weed Management. https://www.environment.gov.au/biodiversity/invasive/weeds/publications/guidelines/alert/pubs/g-spilanthoides.pdf (Accessed: 18 September 2016) 2. APHIS. USDA Weed Risk Assessment for <i>Gymnocoronis spilanthoides</i> (D. Don ex Hook. & Arn.) DC. (Asteraceae) - Senegal tea plants. https://www.aphis.usda.gov/plant_health/plant_pest_info/weeds/downloads/wra/Gymnocoronis_spilanthoides_WRA.pdf (Accessed: 20 September 2016) 3. Vivian-Smith, G., D. Hinchliffe, and J. Weber. 2005. Fecundity and germination of the invasive aquatic plant, Senegal tea (<i>Gymnocoronis spilanthoides</i> (D. Don) DC.) [abstract]. <i>Plant Protection Quarterly</i> 20(4):145-147. (Accessed: 20 September 2016)</p>	<p>1. "Recent research has shown that seed production in infestations near Brisbane is extremely low, less than 1% of its potential, which indicates that spread of Senegal tea plant by seed is not very important there." 2&3. "The following data come from a study of the reproductive potential of <i>G. spilanthoides</i> plants in two urban populations in Australia (Vivian-Smith et al., 2005). Researchers observed (not directly measured) about 0-100 and 0-10 inflorescences (capitula) per square meter. They measured 11.8 and 4.3 seeds produced per capitulum. They obtained germination rates of up to 83 percent (Vivian-Smith et al., 2005). Thus, assuming maximum flowering, seed set, and germination, plants can produce 980 (100 X 11.8 X 0.83) seeds per square meter. This is much lower than the 5,000 viable seeds per square meter threshold for prolific reproduction."</p>
8.02	<p>1. Panetta, F. D. 2010. Seed persistence of the invasive aquatic plant, <i>Gymnocoronis spilanthoides</i> (Asteraceae). <i>Australian Journal of Botany</i> 57(8):670-674. (Accessed: 20 September 2016) 2. European and Mediterranean Plant Protection Organization. https://www.eppo.int/INVASIVE_PLANTS/observation_list/Gymnocoronis_spilanthoides.htm (Accessed: 21 September 2016)</p>	<p>1. Concluded in a three year seed burial experiment that seeds can retain their viability in soil for more than a year 2. "A germination rate of 83% has been reported."</p>
8.03	<p>1. Department of Agriculture and Fisheries. Biosecurity Queensland. https://www.daf.qld.gov.au/__data/assets/pdf_file/0012/70500/IPA-Senegal-Tea-Plant-PP50.pdf (Accessed: 9 September 2016) 2. The CRC for Australian Weed Management. https://www.environment.gov.au/biodiversity/invasive/weeds/publications/guidelines/alert/pubs/g-spilanthoides.pdf (Accessed: 18 September 2016)</p>	<p>1. "Senegal tea can be sprayed only between August and April. Repeat treatments may be necessary."; "DO NOT spray directly onto water surface and/or non-target species"; "Metsulfuron-methyl only: DO NOT apply more than three times per year Applications should be 30 days apart, Minimise off target damage and water pollution by spraying towards the bank, Care must be taken when mixing to avoid soil contamination that may lead to surface or ground water contamination" (Unlikely that it is safe for other desirable plants) 2. "Follow-up work will be required: Once the initial infestation is controlled, follow-up monitoring and control will be required to ensure that reinfestation does not occur."; "Because it is found mainly in water, the potential impacts of herbicides on nontarget plants and animals must also be carefully managed."; "Apart from the ease with which it spreads from small fragments, the other main difficulty in dealing with Senegal tea plant is that it is very hard to kill. Herbicides traditionally effective on most other similar plants kill only the upper parts of the plant. Any material that is below the water line is not killed, and can regrow and form new plants"</p>

8.04	<p>1. The CRC for Australian Weed Management. https://www.environment.gov.au/biodiversity/invasive/weeds/publications/guidelines/alert/pubs/g-spilanthoides.pdf (Accessed: 18 September 2016)</p> <p>2. Weedbusters. http://www.weedbusters.org.nz/weed-information/gymnocoronis-spilanthoides/59/ (Accessed: 21 September 2016)</p> <p>3. Department of Agriculture and Fisheries. Biosecurity Queensland. https://www.daf.qld.gov.au/__data/assets/pdf_file/0012/70500/IPA-Senegal-Tea-Plant-PP50.pdf (Accessed: 21 September 2016)</p> <p>4. European and Mediterranean Plant Protection Organization. https://www.eppo.int/INVASIVE_PLANTS/observation_list/Gymnocoronis_spilanthoides.htm (Accessed: 21 September 2016)</p>	<p>1. Australian government asks citizens to seek professional help when attempting to manage this species because the plant can spread extremely easy through improperly handled waste or dislodged stem fragments</p> <p>2. "Stems and rootstock resprout and seed bank can reinfest bared sites, so followup 3 monthly until this weed is eliminated. Don't graze the area, as stock will release fragments."</p> <p>3. "Care must be taken not to leave broken plant pieces in the area"</p> <p>4. "Broken stem fragments or leaves are spread by water currents, and can also be accidentally spread by machinery (e. g. boats, trailers, etc.) or animal hooves, and grow into a new plant when settling in a stream bed, and then form new colonies."</p>
8.05	<p>1. Queensland Government. Business and Energy Portal. https://www.business.qld.gov.au/industry/agriculture/species/invasive-plants/restricted/senegal-tea (Accessed: 18 September 2016)</p>	<p>1. "No know biological control agents."; no evidence of natural enemies of effective biological control methods</p>