Keywords: High Risk, Agricultural Weed, Annual Grass, Mechanical Dispersal, Wind-dispersed

Family: ***Poaceae***

Taxon: ***Chloris barbata***

Synonym: *Andropogon barbatus sensu L. 1771*
Chloris inflata Link
Chloris paraguaiensis Steud.

Common Name: giant finger grass
swollen fingergrass
airport grass
plush grass
purpletop chloris

Questionaire : current 20090513 **Assessor:** Assessor **Designation:** H(HPWRA)
Status: Assessor Approved **Data Entry Person:** Assessor **WRA Score 20**

101	**Is the species highly domesticated?**	**y=-3, n=0**	**n**
102	**Has the species become naturalized where grown?**	**y=1, n=-1**	
103	**Does the species have weedy races?**	**y=1, n=-1**	
201	**Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"**	**(0-low; 1-intermediate; 2-high) (See Appendix 2)**	**High**
202	**Quality of climate match data**	**(0-low; 1-intermediate; 2-high) (See Appendix 2)**	**High**
203	**Broad climate suitability (environmental versatility)**	**y=1, n=0**	**n**
204	**Native or naturalized in regions with tropical or subtropical climates**	**y=1, n=0**	**y**
205	**Does the species have a history of repeated introductions outside its natural range?**	**y=-2, ?=-1, n=0**	**y**
301	**Naturalized beyond native range**	**y = 1*multiplier (see Appendix 2), n= question 205**	**y**
302	**Garden/amenity/disturbance weed**	**n=0, y = 1*multiplier (see Appendix 2)**	**y**
303	**Agricultural/forestry/horticultural weed**	**n=0, y = 2*multiplier (see Appendix 2)**	**y**
304	**Environmental weed**	**n=0, y = 2*multiplier (see Appendix 2)**	
305	**Congeneric weed**	**n=0, y = 1*multiplier (see Appendix 2)**	**y**
401	**Produces spines, thorns or burrs**	**y=1, n=0**	**n**
402	**Allelopathic**	**y=1, n=0**	
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**	**n**
406	**Host for recognized pests and pathogens**	**y=1, n=0**	**y**
407	**Causes allergies or is otherwise toxic to humans**	**y=1, n=0**	
408	**Creates a fire hazard in natural ecosystems**	**y=1, n=0**	
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**	**n**
501	**Aquatic**	**y=5, n=0**	**n**
502	**Grass**	**y=1, n=0**	**y**
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**	**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**	**n**
703	**Propagules likely to disperse as a produce contaminant**	**y=1, n=-1**	**y**
704	**Propagules adapted to wind dispersal**	**y=1, n=-1**	**y**
705	**Propagules water dispersed**	**y=1, n=-1**	**n**
706	**Propagules bird dispersed**	**y=1, n=-1**	**y**
707	**Propagules dispersed by other animals (externally)**	**y=1, n=-1**	**y**
708	**Propagules survive passage through the gut**	**y=1, n=-1**	
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**	
803	**Well controlled by herbicides**	**y=-1, n=1**	**y**
804	**Tolerates, or benefits from, mutilation, cultivation, or fire**	**y=1, n=-1**	
805	**Effective natural enemies present locally (e.g. introduced biocontrol agents)**	**y=-1, n=1**	**n**

Designation: H(HPWRA) **WRA Score** **20**

Supporting Data:

101	2006. Quattrocchi, U.. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymolog. CRC Press, Boca Raton, FL	[Is the species highly domesticated? No] No evidence
102	2013. WRA Specialist. Personal Communication.	NA
103	2013. 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.	[Species suited to tropical or subtropical climate(s) 2-High] "Native to Central America, the West Indies, and South America, now widely naturalized."
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.	[Quality of climate match data 2-High]
203	1995. Whistler, A.W.. Wayside Plants of the Islands: A Guide to the Lowland Flora of the Pacific Island. Isle Botanica, Honolulu, HI	[Broad climate suitability (environmental versatility)? No] "It is common in dry, disturbed places, such as roadsides, vacant lots, and pastures, mostly in the lowlands, but occasionally up to 600 m elevation. It is particularly common in the coastal areas and lowlands of Hawaii." [Restricted to low elevation tropical climates below 1000 m]
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.	[Native or naturalized in regions with tropical or subtropical climates? Yes] "Native to Central America, the West Indies, and South America, now widely naturalized."
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.	[Does the species have a history of repeated introductions outside its natural range? Yes] "Native to Central America, the West Indies, and South America, now widely naturalized."
205	2006. Quattrocchi, U.. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymolog. CRC Press, Boca Raton, FL	[Does the species have a history of repeated introductions outside its natural range? Yes] "a common weed species widespread in tropics and subtropics"
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 beyond native range? Yes] "in Hawaii naturalized in dry disturbed areas such as along roadsides and in vacant lots and pastures, 0-550 m, on Kure and Midway atolls and all of the main islands except Kaho`olawe. First collected on Oahu in 1902 (Pahu s.n., BISH)."
301	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	[Naturalized beyond native range? Yes] "It is widespread throughout the Kimberly on levee banks, road verges, disturbed sites and creek lines, and in parts of the Pilbara region."
301	2011. Reddy, G.P.. Survey of invasive plants on Guam and identification of the 20 most widespread. Micronesica. 41(2): 263–274.	[Naturalized beyond native range? Yes] "The present study documents that six grasses—P. maximum, P. paniculatum, M. floridulus, S. nodiflora, P. polystachion, C. aciculatus, and C. barbata—are among the 20 most widespread invasive species on Guam."
302	2004. OANRP Staff. U.S. Army Garrison Hawai`i, O`ahu Training Areas, Natural Resource Management Final Report. United States Army Garrison, Hawai'I Directorate of Public Works Environmental Division, Schofield Barracks, HI	[Garden/amenity/disturbance weed? Yes] "The largest Ka`ena Point C. celastroides population is divided into two sections, separated by a thirty meter wide band of common natives and weeds. Target weeds include L. leucocephala, A. farnesiana, and Atriplex semibaccata. This year the population was also treated for encroaching grass cover of Chloris barbata and Panicum Maximum." … "Since beginning management, NRS noticed a distinct increase of Chloris barbata and Panicum maximum grass. It appears that C. barbata is spreading into areas cleared of other weeds by NRS." [Exploiting disturbance caused by weed control]
302	2006. Quattrocchi, U.. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymolog. CRC Press, Boca Raton, FL	[Garden/amenity/disturbance weed? Yes] "a common weed species widespread in tropics and subtropics" ..."often growing on road verges, wasteland, levee banks, along roadsides, abandoned fields, pastures, grassy slopes in dry areas, disturbed sites and creek lines, sandy beaches, on lowlands and coastal areas, in dry regions in lower elevations, in disturbed dry and mesic areas…"
303	1983. Haselwood, E.L./Motter, G.G./Hirano, R.T. (eds.). Handbook of Hawaiian weeds. University of Hawaii Press, Honolulu	[Agricultural/forestry/horticultural weed? Yes] "A weed in pastures, cultivated areas, wastelands, and along roadsides." … "Young plant grazed by stock, but soon becomes unpalatable and a pest." [A valuable forage species that becomes a pest as it becomes unpalatable]

303	2003. Macdonald, I.A.W./Reaser, J.K./Bright, C./Neville, L.E./Howard, G.W./Murphy, S.J./Preston, G. (eds.). Invasive alien species in southern Africa: national reports & directory of resources.. Global Invasive Species Programme, Cape Town, South Africa	[Agricultural/forestry/horticultural weed? Yes] "Table 3. List of introduced plants identified as serious pests in sugarcane (McIntyre 1991)." [Table in cludes Chloris barbata]
303	2013. CABI. Chloris barbata n: Invasive Species Compendium. CAB International, Wallingford, UK www.cabi.org/isc	[Agricultural/forestry/horticultural weed? Yes] "C. barbata is reported as a serious weed in Australia, Korea and Thailand, a principal weed in Cambodia and India, and a common weed in Hawaii, Malaysia and the Sudan (Holm et al., 1979). It was a serious weed of sugarcane in Hawaii before trifluralin was used for control (Santo, personal communication). C. barbata is a common weed in sugarcane, tree crops (papayas, macadamia nuts, coffee) and lawns in Hawaii (R.K. Nishomoto, University of Hawaii, personal communication) and occurs in groundnuts in India (Rajan et al., 1981) and tobacco in the Philippines (Pancho and Obien, 1983) and Thailand (Suwanarak et al., 1986). It occurs infrequently in coconut plantations in the northern Marshall Islands (Taylor, 1950). It has been reported as a weed of upland rice in India, Indonesia, Philippines, Sri Lanka, Thailand and Vietnam, of dry-seeded rice in India and Thailand, of wet-seeded rice (sprouted seeds sown on puddled soil) in Thailand, and of transplanted rice in India and the Philippines. It has also been reported as occurring in rice seedling nurseries in Thailand and in lowland rice in Indonesia (Moody, 1989). Yield losses of up to 20% in sugarcane are likely with heavy infestations of C. barbata. On Oahu, Hawaii, C. barbata developed resistance to herbicides and eventually entire fields were infested with high populations of C. barbata up to 1.5 m tall. In some cases, where sugarcane growth was poor, infestations were so severe that the crop was ploughed under and the field replanted (LT Santo, Hawaiian Sugar Planters' Association, personal communication)."
304	2006. Quattrocchi, U.. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymolog. CRC Press, Boca Raton, FL	[Environmental weed? Potentially. Primarily a disturbance-adapted weed] "a common weed species widespread in tropics and subtropics" ..."often growing on road verges, wasteland, levee banks, along roadsides, abandoned fields, pastures, grassy slopes in dry areas, disturbed sites and creek lines, sandy beaches, on lowlands and coastal areas, in dry regions in lower elevations, in disturbed dry and mesic areas…"
304	2011. Fish and Wildlife Service. Endangered and Threatened Wildlife and Plants; Listing 23 Species on Oahu as Endangered and Designating Critical Habitat for 124 Species; Proposed Rule. Federal Register. 76(148): 46362-46594.	[Environmental weed? Potentially Yes] "Nonnative plant threats to Bidens amplectens, the only species proposed for listing in this proposed rule that inhabits the coastal ecosystem on Oahu, include the understory and subcanopy species Asystasia gangetica (Chinese violet), Atriplex semibaccata (Australian saltbush), Leucaena leucocephala (koa haole), Pluchea indica (Indian fleabane), P. carolinensis (sourbush), and Verbesina encelioides (golden crown-beard) (DOFAW 2007, pp. 20 22, 54-58; HBMP 2008). Nonnative canopy species includes Prosopis pallida (kiawe) (DOFAW 2007, pp. 20-22, 54-58; HBMP 2008). In addition, Bidens amplectens is threatened by several nonnative grasses such as Cenchrus ciliaris (buffelgrass), Chloris barbata (swollen fingergrass), Digitaria insularis (sourgrass), and Panicum maximum (guinea grass) in this ecosystem (DOFAW 2007, pp. 20-22, 54-58; HBMP 2008). These nonnative plant species pose a serious threat (see ``Specific Nonnative Plant Species Impacts,'' below) to Bidens amplectens in this ecosystem."
304	2011. Reddy, G.P.. Survey of invasive plants on Guam and identification of the 20 most widespread. Micronesica. 41(2): 263–274.	[Environmental weed? Potentially in Guam] "The present study documents that six grasses—P. maximum, P. paniculatum, M. floridulus, S. nodiflora, P. polystachion, C. aciculatus, and C. barbata—are among the 20 most widespread invasive species on Guam." … "Species like S. nodiflora, E. cyathophora, M. charantia, C. aciculatus, C. hypericifolia, and C. barbata, 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."
305	2003. Weber, E.. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	[Congeneric weed? Yes] "Chloris virgata … A successful competitor to native grasses and forbs, this grass displaces native vegetation by forming dense swards. The species spreads mainly by vegetative growth."
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.	[Produces spines, thorns or burrs? Yes] "Annuals; culms erect or sometimes decumbent at base and rooting at lower nodes, 30-70 cm tall, glabrous. Sheaths 2-6 cm long, glabrous, compressed, shorter than internodes, usually pilose at throat; ligule ca. 0.5 mm long, membranous, minutely erose; blades flat, 2-12 cm long, 1-5 mm wide, upper blades decreasing in size to nearly obsolete, upper surface usually sparsely long pilose, margins scabrous."

402	2012. Tantiado, R.G./Saylo, M.C.. Allelopathic Potential of Selected Grasses (Family Poaceae) on the Germination of Lettuce Seeds (Lactuca sativa). International Journal of Bio-Science and Bio-Technology. 4(2): 28-34.	[Allelopathic? Not in this study] "Allelopathic potential of the three grass species extract on the germination of lettuce seed using soil germination assay. The control group yields similar result with the filter paper assay. Among the experimental groups, most lettuce seeds were induced to germinate in C. barbata while most lettuce seeds are inhibited to germinate in S. spontaneum."
402	2013. CABI. Chloris barbata n: Invasive Species Compendium. CAB International, Wallingford, UK www.cabi.org/isc	[Allelopathic? Potentially Yes] "Fresh root extracts of C. barbata collected from South Arcot, Tamil Nadu, inhibited growth of ragi (Eleusine coracana) seeds (Jeyamurthy and Lakshmanachary, 1989)."
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.	[Parasitic? No] "Annuals; culms erect or sometimes decumbent at base and rooting at lower nodes, 30-70 cm tall, glabrous."
404	1983. Haselwood, E.L./Motter, G.G./Hirano, R.T. (eds.). Handbook of Hawaiian weeds. University of Hawaii Press, Honolulu	[Unpalatable to grazing animals? Yes - Older plants] "Young plant grazed by stock, but soon becomes unpalatable and a pest."
404	2001. Zavaleta, E.S./Hobbs, R.J./Mooney, H.A.. Viewing invasive species removal in a whole-ecosystem context. Trends in Ecology & Evolution. 16(8): 454-459.	[Unpalatable to grazing animals? No] "Rabbit eradication on Round Island, Mauritius, led to strong recovery of three endemic or locally restricted tree species" … "However, rabbit removal also caused the spectacular release of a previously sparse exotic grass Chloris barbata, rendering it a significant component of the vegetation on the island." … "Introduced goats Capra hircus and rabbits Oryctolagus cuniculus replaced the tortoises as herbivores, suppressing numerous introduced grazing-intolerant plant species until the late 20th century. However, the eradication of exotic herbivores from Round Island and Ile aux Aigrettes in the 1970s and 1980s released populations of exotic weeds such as Chloris barbata on Round Island…"
404	2006. Quattrocchi, U.. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymolog. CRC Press, Boca Raton, FL	[Unpalatable to grazing animals? No] "high food value, fodder and forage, best grazed in mixture with other grasses, unpalatable when old, good fodder up to the time of flowering, young plants grazed by stock, suitable as hay when mixed with legumes…"
405	2006. Quattrocchi, U.. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymolog. CRC Press, Boca Raton, FL	[Toxic to animals? No evidence] "high food value, fodder and forage, best grazed in mixture with other grasses, unpalatable when old, good fodder up to the time of flowering, young plants grazed by stock, suitable as hay when mixed with legumes…"
405	2008. Wagstaff, D.J.. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	[Toxic to animals? No evidence]
406	2013. CABI. Chloris barbata n: Invasive Species Compendium. CAB International, Wallingford, UK www.cabi.org/isc	[Host for recognized pests and pathogens? Yes] "C. barbata is a host of a number of rice insect pests and diseases, including the white backed planthoppers, Sogatella furcifera (Vaidya and Kalode, 1982; Catindig et al., 1988, 1991) and Sogatodes pusanus [Tagosodes pusanus] (Catindig et al., 1989), the rice bug Leptocorisa oratorius (Rajapakse and Kulasekera, 1980), the rice earcutting caterpillar Mythimna separata (Catindig et al., 1991, 1994), the rice-feeding tiger moth Creatonotus gangis (Catindig et al., 1991, 1993), the cereal thrips Haplothrips ganglbaurei (Ananthakrishnan and Thangavelu, 1976), the rice whitefly Aleurocybotus indicus (Alam, 1989), and sheath blight Rhizoctonia solani [Thanatephorus cucumeris] (Kannaiyan and Prasad, 1979). It is also an ovipositional host of the rice leaffolder, Cnaphalocrocis medinalis (Barrion et al., 1991). It is also the principal alternative host of the grass seed-feeding thrips, Chirothrips mexicanus, which infests the cultivated crop pearl millet, Pennisetum typhoides [Pennisetum glaucum] (Ananthakrishnan and Thirumalai, 1977)."
407	2005. Nalini, A.S./TalwaiI, S./Uppar, D.S.. Airborne Pollen Grains of Wasteland Weeds in Hubli - Dharwad. Karnataka Journal of Agricultural Sciences. 18(4): 1084-1086.	[Causes allergies or is otherwise toxic to humans? Pollen a possible allergen to susceptible people] "In general, a detailed month wise pollen count indicated, high pollen count during the month of August and January in rural area. The pollen grains of Lantana camara, Iscilema laxum, Chloris barbata and the pollens of family Poaceae were the main contributors during January, whereas the pollen grains of Parthenium hysterophorus, Dicanthium annulatum and Chloris barbata were the principle contributors during August. Similarly, in urban area, the high peak was observed during January and the dominant species were Chloris barbata, Lantana camara, Dicanthium annulatum and grass pollen."
407	2008. Wagstaff, D.J.. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	[Causes allergies or is otherwise toxic to humans? No evidence of toxicity]
408	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.	[Creates a fire hazard in natural ecosystems? Possibly] "in Hawaii naturalized in dry disturbed areas such as along roadsides and in vacant lots and pastures, 0-550 m…" [Probably contributes to fuel load in dry areas, but unlikely to exclusively increase fire risk]

409	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.	[Is a shade tolerant plant at some stage of its life cycle? No. Occurs in open habitats] "in dry disturbed areas such as along roadsides and in vacant lots and pastures"
409	2002. Bullock, D.J./North, S.G./Dulloo, M.E./Thorsen, M.. The impact of rabbit and goat eradication on the ecology of Round Island, Mauritius. Pp 53-63 in Turning the tide: the eradication of invasive species. IUCN, Gland, Switzerland	[Is a shade tolerant plant at some stage of its life cycle? No] "Observations suggest the following successional stages and their key constituent species (non-native species in bold):" … "Closed vegetation, shade intolerant, grazing intolerant. Mainly annuals. Cenchrus, C. barbata, Digitaria. Potentially Dactyloctenium, Heteropogon"
409	2009. Rivera, O.A.M.. Vascular Flora of the Guánica Dry Forest, Puerto Rico. MSc Thesis. University of Puerto Rico, Mayagüez, P.R.	[Is a shade tolerant plant at some stage of its life cycle? No] "This is a common tufted annual grass in open disturbed areas of the forest. It is a widespread species of sandy shores, waste areas and cultivated fields."
410	2003. Barkworth, M.E.. Chloris, published in Barkworth et al. (eds.), Flora of North America vol. 25. http://herbarium.usu.edu/webmanual [Accessed 12 Sep 2013]	[Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)? Yes] "Chloris barbata grows in subtropical and tropical coastal regions on loams, limestone derived soils, and along beaches."
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.	[Climbing or smothering growth habit? No] "Annuals; culms erect or sometimes decumbent at base and rooting at lower nodes, 30-70 cm tall, glabrous."
412	1979. Smith, A.C.. Flora Vitiensis Nova - A New Flora of Fiji (Spermatophytes Only). Volume 1. Pacific Tropical Botanical Garden, Lawai, HI	[Forms dense thickets? No] "occurs from sea level to about 30 m in open sunny places where earth is compacted" [No evidence in Fiji]
412	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.	[Forms dense thickets? No] "in Hawaii naturalized in dry disturbed areas such as along roadsides and in vacant lots and pastures, 0-550 m, on Kure and Midway atolls and all of the main islands except Kaho`olawe. First collected on Oahu in 1902 (Pahu s.n., BISH)." [Not reported to form dense thickets or monocultures in the Hawaiian Islands]
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.	[Aquatic? No] "in Hawaii naturalized in dry disturbed areas such as along roadsides and in vacant lots and pastures, 0-550 m…" [Terrestrial]
502	2006. Quattrocchi, U.. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymolog. CRC Press, Boca Raton, FL	[Grass? Yes] Poaceae
503	2006. Quattrocchi, U.. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymolog. CRC Press, Boca Raton, FL	[Nitrogen fixing woody plant? No] Poaceae
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.	[Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)? No] "Annuals; culms erect or sometimes decumbent at base and rooting at lower nodes, 30-70 cm tall, glabrous."
601	2006. Quattrocchi, U.. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymolog. CRC Press, Boca Raton, FL	[Evidence of substantial reproductive failure in native habitat? No] "a common weed species widespread in tropics and subtropics"
602	2013. CABI. Chloris barbata n: Invasive Species Compendium. CAB International, Wallingford, UK www.cabi.org/isc	[Produces viable seed? Yes] "C. barbata is propagated by seed."
603	1999. Whistler, W.A./Steele, O.. Botanical survey of the United States of America Kwajalein Atoll (USAKA) Islands. Prepared for Oak Ridge Institute for Science and Education and the U. S. Army Environmental Center.	[Hybridizes naturally? Possibly] ""It apparently hybridizes with Lepturus repens to produce a plant called Lepturopetium marshallense"
604	1997. Li, X./Paech, N./Nield, J./Hayman, D./Langridge, P.. Self-incompatibility in the grasses: evolutionary relationship of the S gene from Phalaris coerulescens to homologous sequences in other grasses. Plant Molecular Biology. 34(2): 223-232.	[Self-compatible or apomictic? Unknown for C. barbata] "Table 1. Taxonomic positions of grass species used in this study." [Chloris striate - Self-incompatible = No. Related species not self-incompatible]

605	1994. Zomlefer, W.B.. Guide to Flowering Plant Families. The University of North Carolina Press, Chapel Hill & London	[Requires specialist pollinators? NO] Poaceae [anemophilous. Wind-pollinated]
606	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.	[Reproduction by vegetative fragmentation? Yes] "culms erect or sometimes decumbent at base and rooting at lower nodes, 30-70 cm tall, glabrous."
607	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.	[Minimum generative time (years)? 1] "Annuals; culms erect or sometimes decumbent at base and rooting at lower nodes, 30-70 cm tall, glabrous."
607	2006. Quattrocchi, U.. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymolog. CRC Press, Boca Raton, FL	[Minimum generative time (years)? 1+] "Annual or short-lived perennial…"
701	1983. Haselwood, E.L./Motter, G.G./Hirano, R.T. (eds.). Handbook of Hawaiian weeds. University of Hawaii Press, Honolulu	[Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas) Yes] "A weed in pastures, cultivated areas, wastelands, and along roadsides."
702	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.	[Propagules dispersed intentionally by people? No] "in Hawaii naturalized in dry disturbed areas such as along roadsides and in vacant lots and pastures, 0-550 m, on Kure and Midway atolls and all of the main islands except Kaho`olawe." [Probably an intentional introduction in the past, but currently regarded as a weed and probably only inadvertently dispersed at this time]
702	2012. Aoyama, Y./Kawakami, K./Chiba, S.. Seabirds as adhesive seed dispersers of alien and native plants in the oceanic Ogasawara Islands, Japan. Biodiversity and Conservation. 21(11): 2787-2801.	[Propagules dispersed intentionally by people? No] "C. barbata appears to be dispersed by wind, humans, and seabirds." [Unintentional dispersal by mechanical adhesion]
703	2013. CABI. Chloris barbata n: Invasive Species Compendium. CAB International, Wallingford, UK www.cabi.org/isc	[Propagules likely to disperse as a produce contaminant? Yes. A common crop weed likely to be moved as a seed contaminant in other crops] "C. barbata is a common weed in sugarcane, tree crops (papayas, macadamia nuts, coffee) and lawns in Hawaii (R.K. Nishomoto, University of Hawaii, personal communication) and occurs in groundnuts in India (Rajan et al., 1981) and tobacco in the Philippines (Pancho and Obien, 1983) and Thailand (Suwanarak et al., 1986). It occurs infrequently in coconut plantations in the northern Marshall Islands (Taylor, 1950). It has been reported as a weed of upland rice in India, Indonesia, Philippines, Sri Lanka, Thailand and Vietnam, of dry-seeded rice in India and Thailand, of wet-seeded rice (sprouted seeds sown on puddled soil) in Thailand, and of transplanted rice in India and the Philippines. It has also been reported as occurring in rice seedling nurseries in Thailand and in lowland rice in Indonesia (Moody, 1989). Yield losses of up to 20% in sugarcane are likely with heavy infestations of C. barbata. On Oahu, Hawaii, C. barbata developed resistance to herbicides and eventually entire fields were infested with high populations of C. barbata up to 1.5 m tall. In some cases, where sugarcane growth was poor, infestations were so severe that the crop was ploughed under and the field replanted (LT Santo, Hawaiian Sugar Planters' Association, personal communication)."
704	2012. Aoyama, Y./Kawakami, K./Chiba, S.. Seabirds as adhesive seed dispersers of alien and native plants in the oceanic Ogasawara Islands, Japan. Biodiversity and Conservation. 21(11): 2787-2801.	[Propagules adapted to wind dispersal? Yes] "Seabird dispersal was suggested to be one of the several dispersal methods for C. barbata. In our analysis of this species, only one model incorporating all factors was selected. Island area and distance from inhabited islands were selected as affecting factors that likely reflect the effect of wind dispersal, because light seeds of this species be readily dispersed by wind (Ridley 1930). C. barbata appears to be dispersed by wind, humans, and seabirds."
705	2012. Aoyama, Y./Kawakami, K./Chiba, S.. Seabirds as adhesive seed dispersers of alien and native plants in the oceanic Ogasawara Islands, Japan. Biodiversity and Conservation. 21(11): 2787-2801.	[Propagules water dispersed? No] "C. barbata appears to be dispersed by wind, humans, and seabirds."

706	2012. Aoyama, Y./Kawakami, K./Chiba, S.. Seabirds as adhesive seed dispersers of alien and native plants in the oceanic Ogasawara Islands, Japan. Biodiversity and Conservation. 21(11): 2787-2801.	[Propagules bird dispersed? Yes. Externally bird-dispersed] "Species composition of seeds attached to seabirds and frequency of attachment" … "In total, 41 black-footed albatrosses, 45 Bulwer's petrels, 45 wedge-tailed shearwaters, and 29 brown boobies were captured (Table 1). Seeds of nine plant species (C. echinatus, C. barbata, B. diffusa, O. corniculata, S. nigrum, C. didymus, Youngia japonica, Digitaria pruriens, and Sporobolus diander) were collected from the birds. The three most common species (C. echinatus, C. barbata, and B. diffusa) and C. didymus are alien species. Seeds were attached to 16–32 % of birds for each species (Fig. 2). All seeds were found on feathers, and none on the feet."
707	2012. Aoyama, Y./Kawakami, K./Chiba, S.. Seabirds as adhesive seed dispersers of alien and native plants in the oceanic Ogasawara Islands, Japan. Biodiversity and Conservation. 21(11): 2787-2801.	[Propagules dispersed by other animals (externally)? Yes] "Cenchrus echinatus has fruits with spines and C. barbata has seeds with awns as adhesive structures"
708	2006. Quattrocchi, U.. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymolog. CRC Press, Boca Raton, FL	[Propagules survive passage through the gut? Unknown] "high food value, fodder and forage, best grazed in mixture with other grasses, unpalatable when old, good fodder up to the time of flowering, young plants grazed by stock, suitable as hay when mixed with legumes…" [Unlikely that seeds would be ingested, as grass becomes unpalatable as it reached maturity]
801	1999. Galinato, M.I./Moody, K./Piggin, C.M.. Upland rice weeds of south and southeast Asia. International Rice Research Institute, Los Baños, Philippines	[Prolific seed production (>1000/m2)? Yes] "This hardy plant can produce many tillers and is a strong competitor in crops." … "It propagates by seed and is prolific, producing up to 26,000 seeds / plant"
802	2004. Shaukat, S.S./Siddiqui, I.A.. Spatial pattern analysis of seeds of an arable soil seed bank and its relationship with above-ground vegetation in an arid region. Journal of Arid Environments. 57(3): 311-327.	[Evidence that a persistent propagule bank is formed (>1 yr)? Unknown] "Table 1 Descriptive statistics of the soil seed bank" [Chloris barbata is present in the seed bank, but seed longevity is unknown]
802	2008. Royal Botanic Gardens Kew. Seed Information Database (SID). Version 7.1. http://data.kew.org/sid/	[Evidence that a persistent propagule bank is formed (>1 yr)? Possibly] "Storage Behaviour: Orthodox"
803	1999. Galinato, M.I./Moody, K./Piggin, C.M.. Upland rice weeds of south and southeast Asia. International Rice Research Institute, Los Baños, Philippines	[Well controlled by herbicides? Yes] "Chemical. The weed can be controlled by early postemergence application (1-3 leaves) of fenoxaprop-P-ethyl (34 g / ha). Beyond the 3-leaf stage, higher rates are recommended."
803	2004. OANRP Staff. U.S. Army Garrison Hawai`i, O`ahu Training Areas, Natural Resource Management Final Report. United States Army Garrison, Hawai'I Directorate of Public Works Environmental Division, Schofield Barracks, HI	[Well controlled by herbicides? Yes] "This year, NRS have determined through trials that C. barbata can be controlled with Fusilade II with little impact on non-grass native vegetation in the area." … "Chloris barbata. In order to determine an effective means of treating C. barbata with minimal impacts to native plants, 1m by 1m plots containing both native, non native vegetation, and C. barbata were established. The following herbicide treatments were applied to two plots for replication: target C. barbata using Fusilade II with handsprayer, Glypro at a 2% concentration with handsprayer, and Garlon 4 20% concentration with squirt bottle directed at the base of grass clumps. A Weed Control Plot Data Sheet was used to monitor the change in vegetation cover over the time of the trial. Data showed that all herbicide treatments killed the target weed, however Fusilade II was the only herbicide that had little to no negative impact on native plants. The first large-scale spraying effort of C. barbata in the C. celastroides patch at Ka`ena Point took place this year, and the results of this spraying will hopefully confirm that Fusilade II is in fact an effective treatment for C. barbata."
803	2013. CABI. Chloris barbata n: Invasive Species Compendium. CAB International, Wallingford, UK www.cabi.org/isc	[Well controlled by herbicides? Yes] "Glyphosate is used to control C. barbata in tree crops in Hawaii and spot applications of glyphosate or glufosinate are used in lawns (RK Nishimoto, University of Hawaii, personal communication). In Andhra Pradesh, India, fluchloralin effectively controlled C. barbata and other narrow-leaved weeds in irrigated groundnuts (Rajan et al., 1981). In tobacco in Thailand, clopomydim, fenoxaprop-ethyl, haloxyfop-methyl and fluazifop-butyl gave good control of the narrow-leaved weeds, including C. barbata, but could not control all of the broadleaved weeds. Fluazifop-butyl + bifenox, haloxyfop methyl + dimethazone [withdrawn] and fenoxaprop-ethyl + dimethazone [withdrawn] controlled all the annual weeds for longer than 4 weeks and did not damage the crop (Suwanarak et al., 1986)."
804	2013. WRA Specialist. Personal Communication.	[Tolerates, or benefits from, mutilation, cultivation, or fire? Unknown]
805	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.	[Effective natural enemies present locally (e.g. introduced biocontrol agents)? No evidence] "in Hawaii naturalized in dry disturbed areas such as along roadsides and in vacant lots and pastures, 0-550 m, on Kure and Midway atolls and all of the main islands..." [No limiting factors apparent in Hawaiian Islands]

Summary of Risk Traits

High Risk / Undesirable Traits

- Thrives in tropical climates
- Widely naturalized
- Disturbance weed
- An agricultural weed
- Related Chloris species have become invasive
- Potentially allelopathic
- Loses palatability when older
- Host of a number of rice insect pests and diseases
- Annual (reaches maturity in one growing season)
- Seeds dispersed by wind, birds and people (through external adhesion)
- Capable of spreading vegetatively by rooting at lower nodes
- Can produce large numbers of seeds

Low Risk Traits

- Requires full sun
- New growth palatable to animals
- Herbicides may provide effective control