UF IFAS UNIVERSITY of FLORIDA

Assessment of Non-native Plants in Florida's Natural Areas

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ALL ZONES

Assessment date: 10/26/2023 Prepared by C. Wanamaker

***Bothriochloa bladhii* (Caucasian bluestem)**		**Answer**	**Score**
1.01	Is the species highly domesticated?	n	0
1.02	Has the species become naturalised where grown?	0	
1.03	Does the species have weedy races?	0	
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;	3	
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	1
3.02	Garden/amenity/disturbance weed	y	1
3.03	Weed of agriculture	?	
3.04	Environmental weed	y	2
3.05	Congeneric weed	y	1
4.01	Produces spines, thorns or burrs	n	0
4.02	Allelopathic	?	
4.03	Parasitic	n	0
4.04	Unpalatable to grazing animals	?	
4.05	Toxic to animals	n	0
4.06	Host for recognised pests and pathogens	y	1
4.07	Causes allergies or is otherwise toxic to humans	?	
4.08	Creates a fire hazard in natural ecosystems	y	1
4.09	Is a shade tolerant plant at some stage of its life cycle	n	0
4.10	Grows on infertile soils (oligotrophic, limerock, or excessively draining soils). North & Central Zones: infertile soils; South Zone: shallow limerock or	y	1
4.11	Climbing or smothering growth habit	n	0
4.12	Forms dense thickets	?	
5.01	Aquatic	n	0
5.02	Grass	y	1
5.03	Nitrogen fixing woody plant	n	0
5.04	Geophyte	n	0
6.01	Evidence of substantial reproductive failure in native	n	0
6.02	Produces viable seed	y	1

6.03	Hybridizes naturally	y	1
6.04	Self-compatible or apomictic	y	1
6.05	Requires specialist pollinators	n	0
6.06	Reproduction by vegetative propagation	y	1
6.07	Minimum generative time (years)	1 or fewer	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	?	
7.04	Propagules adapted to wind dispersal	n	-1
7.05	Propagules water dispersed	?	
7.06	Propagules bird dispersed	?	
7.07	Propagules dispersed by other animals (externally)	?	
7.08	Propagules dispersed by other animals (internally)	?	
8.01	Prolific seed production	y	1
8.02	Evidence that a persistent propagule bank is formed	?	
8.03	Well controlled by herbicides	y	-1
8.04	Tolerates, or benefits from, mutilation or cultivation	y	1
8.05	Effective natural enemies present in U.S.	?	
	Total Score	**18**	
	Implemented Pacific Second Screening	**no**	
	Risk Assessment Results	**reject**	

section	**# questions answered**	**satisfy minimum?**
A	10	yes
B	8	yes
C	16	yes
total	34	yes

	Evidence	Reference
1.01	While there is evidence of breeding efforts, there is no evidence to suggest such cultivation has reduced any traits associated with weediness. Cultivar "WW-B.Dahl" is noted specifically for its hardiness and high forage production (DeWald et al. 1995).	1. Dewald, C. L., Sims, P. L., & Berg, W. A. (1995). Registration of 'WW-B.Dahl' Old World Bluestem. Crop Science, 35(3), cropsci1995.0011183X003500030055x. https://doi.org/10.2135/cropsci1995.0011183X003500030055x
1.02	Skip	0
1.03	Skip	0
2.01	1-2. Present in the north zone of Florida, with questionable occurrences in south/central Florida.	1. Bothriochloa bladhii—Species Details. (n.d.). Atlas of Florida Plants. Retrieved November 6, 2023, from http://florida.plantatlas.usf.edu/plant.aspx?id=
2.02	No computer analysis performed, maximum score assigned.	0
2.03	1. B. baldhii is has a widespread distribution--its native range encompasses Australia, Asia, and Africa, but 2. it can also be found in the US states of Kans., Nebr., Okla., Colo., N.Mex., Tex., La., Mo., Ohio, Pacific Islands (Hawaii), and Florida. 3. demonstrates good winter hardiness.	1. Cook BG; Pengelly BC; Schultze-Kraft R; Taylor M; Burkart S; Cardoso Arango JA; González Guzmán JJ; Cox K; Jones C; Peters M. 2020. Tropical Forages: An interactive selection tool. 2nd and Revised Edn. International Center for Tropical Agriculture (CIAT), Cali, Colombia and International Livestock Research Institute (ILRI), Nairobi, Kenya. www.tropicalforages.info 2. Allred, K. W. Bothriochloa bladhii. In: Flora of North America Editorial Committee, eds. 1993+. Flora of North America North of Mexico [Online]. 25+ vols. New York and Oxford. Vol 25. http://floranorthamerica.org/Bothriochloa_bladhii. Accessed 11/9/2023. 3. Dewald, C. L., Sims, P. L., & Berg, W. A. (1995). Registration of 'WW-B.Dahl' Old World Bluestem. Crop Science, 35(3), cropsci1995.0011183X003500030055x. https://doi.org/10.2135/cropsci1995.0011183X003500030055x
2.04	1. "Occurs naturally on alluviums, but also in 'vleis' in areas with rainfall to >2,000 mm, often with a distinct dry season. A drought-hardy species, particularly if well grazed to reduce the amount of foliage and hence, water use. Cultivars have been successful mostly in areas with rainfall >750 mm, although can tolerate as low as 600 mm/yr. Can stand temporary waterlogging and flooding, but not tolerant of permanently wet conditions."	1. Cook BG; Pengelly BC; Schultze-Kraft R; Taylor M; Burkart S; Cardoso Arango JA; González Guzmán JJ; Cox K; Jones C; Peters M. 2020. Tropical Forages: An interactive selection tool. 2nd and Revised Edn. International Center for Tropical Agriculture (CIAT), Cali, Colombia and International Livestock Research Institute (ILRI), Nairobi, Kenya. www.tropicalforages.info

2.05	1-2. Material taken from India has been extensivedly tested/bred for use in forage in Texas and Oklahoma	1. Cook BG; Pengelly BC; Schultze-Kraft R; Taylor M; Burkart S; Cardoso Arango JA; González Guzmán JJ; Cox K; Jones C; Peters M. 2020. Tropical Forages: An interactive selection tool. 2nd and Revised Edn. International Center for Tropical Agriculture (CIAT), Cali, Colombia and International Livestock Research Institute (ILRI), Nairobi, Kenya. www.tropicalforages.info 2. Dewald, C. L., Sims, P. L., & Berg, W. A. (1995). Registration of 'WW-B.Dahl' Old World Bluestem. Crop Science, 35(3), cropsci1995.0011183X003500030055x. https://doi.org/10.2135/cropsci1995.0011183X003500030055x
3.01	Presence in multiple states in the US (see evidence in question 2.03), beyond where it was deliberately released, indicates reproductive and spreading populations.	0
3.02	1. B. bladhii can be found in pastures, open disturbed areas and along roadsides. 2. "Shows indications of becoming a weed of turf." 3. "grows along roadsides and in rangeland pastures, waste ground, and open disturbed areas"	1. Caucasian bluestem, Bothriochloa bladhii Cyperales: Poaceae - EDDMapS. (n.d.). EDDMapS.Org. Retrieved November 6, 2023, from https://www.eddmaps.org/species/subject.cfm?sub=18719 2. Cook BG; Pengelly BC; Schultze-Kraft R; Taylor M; Burkart S; Cardoso Arango JA; González Guzmán JJ; Cox K; Jones C; Peters M. 2020. Tropical Forages: An interactive selection tool. 2nd and Revised Edn. International Center for Tropical Agriculture (CIAT), Cali, Colombia and International Livestock Research Institute (ILRI), Nairobi, Kenya. www.tropicalforages.info 3. Allred, K. W. Bothriochloa bladhii. In: Flora of North America Editorial Committee, eds. 1993+. Flora of North America North of Mexico [Online]. 25+ vols. New York and Oxford. Vol 25. http://floranorthamerica.org/Bothriochloa_bla

3.03	1-2. B. bladhii can be found in pastures, open disturbed areas and along roadsides.	1. Caucasian bluestem, Bothriochloa bladhii Cyperales: Poaceae - EDDMapS. (n.d.). EDDMapS.Org. Retrieved November 6, 2023, from https://www.eddmaps.org/species/subject.cfm?sub=18719 2.. Allred, K. W. Bothriochloa bladhii. In: Flora of North America Editorial Committee, eds. 1993+. Flora of North America North of Mexico [Online]. 25+ vols. New York and Oxford. Vol 25. http://floranorthamerica.org/Bothriochloa_bla
3.04	1. Missouri Inasive Plant Council lists B. bladhii as a rapidly spreading weed in natural areas. 2. On Colorado Department of Agriculture Noxious Weed Watchlist. 3. Considered invasive in Nebraska: "escaped into natural areas… Establishes easier than the native bluestems. Increases risk of wildfire due to standing dry vegetation. Competes with native vegetation."	1. https://moinvasives.org/moip-assessment/ 2. https://ag.colorado.gov/conservation/noxious-weeds/publications 3. https://neinvasives.com/species/plants/caucasian-bluestem
3.05	1-2. Bothriochloa ischeamum and Bothriochloa pertusa are both recognized weedy species.	1. Midwest Invasive Species Information Network (2022) Accessed via: https://www.misin.msu.edu/facts/detail/?project=misin&id=362&cname=Yellow+bluestem 2. Global Invasive Species Database (2023) Species profile: Bothriochloa pertusa. Downloaded from http://www.iucngisd.org/gisd/speciesname/Bot
4.01	No evidence.	0
4.02	No evidence.	0
4.03	No evidence.	0
4.04	1. "Palatability of WW-B.Dahl was similar to that of WW-IronMaster, Plains, WW-Spar, and Caucasian bluestem based onfree choice by stocker steers in animal acceptance trials atWoodward during 1979, 1980, and 1981. Average daily gainof steers grazing WW-B.Dahl was greater than that fromPlains, WW-Spar, and Caucasian bluestem in 1985 and 1987at the Southern Plains Experimental Range, Ft. Supply, OK.It is later in maturity, with a higher ratio of leaf to stem inlate summer, which promotes increased weight gains duringthis time." 2. "Less palatable than some other C4 grasses... becomes unpalatable with maturity and rust"	1. Dewald, C. L., Sims, P. L., & Berg, W. A. (1995). Registration of 'WW-B.Dahl' Old World Bluestem. Crop Science, 35(3), cropsci1995.0011183X003500030055x. https://doi.org/10.2135/cropsci1995.0011183X003500030055x 2. Cook BG; Pengelly BC; Schultze-Kraft R; Taylor M; Burkart S; Cardoso Arango JA; González Guzmán JJ; Cox K; Jones C; Peters M. 2020. Tropical Forages: An interactive selection tool. 2nd and Revised Edn. International Center for Tropical Agriculture (CIAT), Cali, Colombia and International Livestock Research Institute (ILRI), Nairobi, Kenya. www.tropicalforages.info
4.05	No evidence of toxicity.	0

4.06	1. "susceptible toergot [caused by Claviceps purpurea (Fr.:Fr) Tul.]"	1. Dewald, C. L., Sims, P. L., & Berg, W. A. (1995). Registration of 'WW-B.Dahl' Old World Bluestem. Crop Science, 35(3), cropsci1995.0011183X003500030055x. https://doi.org/10.2135/cropsci1995.0011183X003500030055x
4.07	No evidence.	0
4.08	1. Very fire tolerant. 2. "Increases risk of wildfire due to standing dry vegetation."	1. Cook BG; Pengelly BC; Schultze-Kraft R; Taylor M; Burkart S; Cardoso Arango JA; González Guzmán JJ; Cox K; Jones C; Peters M. 2020. Tropical Forages: An interactive selection tool. 2nd and Revised Edn. International Center for Tropical Agriculture (CIAT), Cali, Colombia and International Livestock Research Institute (ILRI), Nairobi, Kenya. www.tropicalforages.info 2. https://neinvasives.com/species/plants/caucasi
4.09	1. "It has low to moderate shade tolerance, occurring naturally in savannahs, open forests and grasslands."	1. Cook BG; Pengelly BC; Schultze-Kraft R; Taylor M; Burkart S; Cardoso Arango JA; González Guzmán JJ; Cox K; Jones C; Peters M. 2020. Tropical Forages: An interactive selection tool. 2nd and Revised Edn. International Center for Tropical Agriculture (CIAT), Cali, Colombia and International Livestock Research Institute (ILRI), Nairobi, Kenya. www.tropicalforages.info
4.10	1. "Stand establishment of WW-B.Dahl has been obtained onsoil types ranging from sandy loams to clays at soil pH rangesfrom 6.7 to 8.4...It is not recommendedfor use on coarse sandy soils." 2. Produces higher biomass on clay soils compared to soils with a high sand content, but grows well in soils with low N and K levels. 3. Grown as a forage on low fertility soils	1. Dewald, C. L., Sims, P. L., & Berg, W. A. (1995). Registration of 'WW-B.Dahl' Old World Bluestem. Crop Science, 35(3), cropsci1995.0011183X003500030055x. https://doi.org/10.2135/cropsci1995.0011183X003500030055x 2. Cooksley, D. G., Butler, K. L., Prinsen, J. H., & Paton, C. J. (1988). Influence of soil type on Heteropogon contortus-Bothriochloa bladhii dominant native pasture in south-eastern Queensland. Australian Journal of Experimental Agriculture, 28(5), 587–591. https://doi.org/10.1071/ea9880587 3. Cook BG; Pengelly BC; Schultze-Kraft R; Taylor M; Burkart S; Cardoso Arango JA; González Guzmán JJ; Cox K; Jones C; Peters M. 2020. Tropical Forages: An interactive selection tool. 2nd and Revised Edn. International Center for Tropical Agriculture (CIAT), Cali, Colombia and International Livestock Research Institute

4.11	1. " ascending to erect, tufted perennial with short rhizomes, sometimes rooting at the nodes of prostrate stems; foliage 40–80 cm, culms largely unbranched, 1–1.5 m high at maturity"	1. Cook BG; Pengelly BC; Schultze-Kraft R; Taylor M; Burkart S; Cardoso Arango JA; González Guzmán JJ; Cox K; Jones C; Peters M. 2020. Tropical Forages: An interactive selection tool. 2nd and Revised Edn. International Center for Tropical Agriculture (CIAT), Cali, Colombia and International Livestock Research Institute (ILRI), Nairobi, Kenya. www.tropicalforages.info
4.12	No evidence.	0
5.01	Terrestrial plant	0
5.02	1. Place in the Andropogoneae tribe of family Poaceae.	1. Cook BG; Pengelly BC; Schultze-Kraft R; Taylor M; Burkart S; Cardoso Arango JA; González Guzmán JJ; Cox K; Jones C; Peters M. 2020. Tropical Forages: An interactive selection tool. 2nd and Revised Edn. International Center for Tropical Agriculture (CIAT), Cali, Colombia and International Livestock Research Institute (ILRI), Nairobi, Kenya. www.tropicalforages.info
5.03	Graminoid	0
5.04	1. Rhizomes or stolons may be present, but no evidence of other underground storage tissues.	1. Schmidt, C. D., & Hickman, K. R. (2006). Stolon production by Caucasian bluestem (Bothriochloa bladhii). Transactions of the Kansas Academy of Science, 109(1), 74–76. https://doi.org/10.1660/0022-
6.01	No evidence.	0
6.02	1. "seeds are produced apomictically and seedlings are genetically identical to the maternal parent"	1. Dewald, C. L., Sims, P. L., & Berg, W. A. (1995). Registration of 'WW-B.Dahl' Old World Bluestem. Crop Science, 35(3), cropsci1995.0011183X003500030055x. https://doi.org/10.2135/cropsci1995.0011183X003500030055x
6.03	1. "Introgresses with Dichanthium and Capillipedium in native populations." 2. See De Wet & Harlan 1966 for a discussion on hybridization (note: they use an older synonym Bothriochloa intermedia).	1. Cook BG; Pengelly BC; Schultze-Kraft R; Taylor M; Burkart S; Cardoso Arango JA; González Guzmán JJ; Cox K; Jones C; Peters M. 2020. Tropical Forages: An interactive selection tool. 2nd and Revised Edn. International Center for Tropical Agriculture (CIAT), Cali, Colombia and International Livestock Research Institute (ILRI), Nairobi, Kenya. www.tropicalforages.info 2. De Wet, J. M. J., & Harlan, J. R. (1966). Morphology of the Compilospecies Bothriochloa intermedia. American Journal of Botany, 53(1), 94–98.

6.04	1. "Facultative or obligate apomict" 2. "seeds are produced apomictically and seedlings are genetically identical to the maternal parent"	1. Cook BG; Pengelly BC; Schultze-Kraft R; Taylor M; Burkart S; Cardoso Arango JA; González Guzmán JJ; Cox K; Jones C; Peters M. 2020. Tropical Forages: An interactive selection tool. 2nd and Revised Edn. International Center for Tropical Agriculture (CIAT), Cali, Colombia and International Livestock Research Institute (ILRI), Nairobi, Kenya. www.tropicalforages.info 2. Dewald, C. L., Sims, P. L., & Berg, W. A. (1995). Registration of 'WW-B.Dahl' Old World Bluestem. Crop Science, 35(3), cropsci1995.0011183X003500030055x. https://doi.org/10.2135/cropsci1995.0011183X003500030055x
6.05	0	0
6.06	1." B. bladhii also produces short rhizomes."2." it occurs subspontanous spread in lawn in the botanical garden of the University of Bucharest…. Bothriochloa bladhii plants from our botanical garden undergo manly a vegetative multiplication. " (Georgescu & Armanu 2009). 3. reproduces via stolons	1. Caucasian bluestem, Bothriochloa bladhii Cyperales: Poaceae - EDDMapS. (n.d.). EDDMapS.Org. Retrieved November 6, 2023, from https://www.eddmaps.org/species/subject.cfm?sub=18719 2. 3. Schmidt, C. D., & Hickman, K. R. (2006). Stolon production by Caucasian bluestem (Bothriochloa bladhii). Transactions of the Kansas Academy of Science, 109(1), 74–76.
6.07	1. Perennial but flowers annually. "It is possible to obtain a light crop early in the growing season, and a heavy crop later in the season"	1. Cook BG; Pengelly BC; Schultze-Kraft R; Taylor M; Burkart S; Cardoso Arango JA; González Guzmán JJ; Cox K; Jones C; Peters M. 2020. Tropical Forages: An interactive selection tool. 2nd and Revised Edn. International Center for Tropical Agriculture (CIAT), Cali, Colombia and International Livestock Research Institute (ILRI), Nairobi, Kenya. www.tropicalforages.info
7.01	Commonly found in roadsides, street swales, etc.	1. Allred, K. W. Bothriochloa bladhii. In: Flora of North America Editorial Committee, eds. 1993+. Flora of North America North of Mexico [Online]. 25+ vols. New York and Oxford. Vol 25. http://floranorthamerica.org/Bothriochloa_bladhii. Accessed 11/9/2023.
7.02	Introduced as a forage candidate.	0
7.03	No evidence	0
7.04	No evidence, but there are no obvious adaptations to the seed for wind-dispersal.	0
7.05	No evidence.	0
7.06	No evidence.	0

7.07	No evidence, but the seeds do have awns, which may be an adaptation for attaching and spreading via animals.	0
7.08	No evidence.	0
8.01	1. " Small plot yields of up to 500 kg/ha clean seed have been achieved." 2. Mean seed weight listed at 0.53g	1. Cook BG; Pengelly BC; Schultze-Kraft R; Taylor M; Burkart S; Cardoso Arango JA; González Guzmán JJ; Cox K; Jones C; Peters M. 2020. Tropical Forages: An interactive selection tool. 2nd and Revised Edn. International Center for Tropical Agriculture (CIAT), Cali, Colombia and International Livestock Research Institute (ILRI), Nairobi, Kenya. www.tropicalforages.info 2. Society for Ecological Restoration, International Network for Seed Based Restoration and Royal Botanic Gardens Kew. (2023) Seed Information Database (SID). Available from: https://ser-sid.org/species/c5ab9ed0-1707-4cb3-969b-
8.02	No evidence.	0
8.03	1. "Tolerant of pre- and post-emergent (2–3-leaf stage) applications of metsulfuron methyl and triasulfuron. Susceptible to imazapic in both pre- and post-emergent treatments."	1. Cook BG; Pengelly BC; Schultze-Kraft R; Taylor M; Burkart S; Cardoso Arango JA; González Guzmán JJ; Cox K; Jones C; Peters M. 2020. Tropical Forages: An interactive selection tool. 2nd and Revised Edn. International Center for Tropical Agriculture (CIAT), Cali, Colombia and International Livestock Research Institute (ILRI), Nairobi, Kenya. www.tropicalforages.info
8.04	1. "Tolerant of heavy grazing by cattle and sheep, adjusting growth habit to prostrate to accommodate pressure. Grazing should be managed to maintain as leafy a sward as possible, entailing increasing grazing pressure at flowering if necessary."	1. Cook BG; Pengelly BC; Schultze-Kraft R; Taylor M; Burkart S; Cardoso Arango JA; González Guzmán JJ; Cox K; Jones C; Peters M. 2020. Tropical Forages: An interactive selection tool. 2nd and Revised Edn. International Center for Tropical Agriculture (CIAT), Cali, Colombia and International Livestock Research Institute (ILRI), Nairobi, Kenya. www.tropicalforages.info
8.05	No evidence.	0