UF IFAS UNIVERSITY of FLORIDA

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

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	Avena fatuas **(Common wild oat) 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	3	
2.02	Quality of climate match data (0-low; 1-intermediate; 2-high)	3	
2.03	Broad climate suitability (environmental versatil+B8:B24ity)	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	?	
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	y	2
3.03	Weed of agriculture	y	4
3.04	Environmental weed	y	4
3.05	Congeneric weed	y	2
4.01	Produces spines, thorns or burrs	n	0
4.02	Allelopathic	y	1
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	?	
4.07	Causes allergies or is otherwise toxic to humans	n	0
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 Histisols.	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 habitat	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	n	-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	n	-1
7.03	Propagules likely to disperse as a produce contaminant	y	1
7.04	Propagules adapted to wind dispersal	n	-1
7.05	Propagules water dispersed	n	-1
7.06	Propagules bird dispersed	n	-1
7.07	Propagules dispersed by other animals (externally)	y	1
7.08	Propagules dispersed by other animals (internally)	n	-1
8.01	Prolific seed production	y	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	?	
8.05	Effective natural enemies present in U.S.	y	-1
	Total Score	**21**	
	Implemented Pacific Second Screening	**n/a**	
	Risk Assessment Results	**HIGH RISK**	

section	# questions answered	satisfy minimum?
A	10	yes
B	10	yes
C	22	yes
total		yes

	Reference	Source data
1.01	We found no evidence of reduced weediness.	
1.02		
1.03		
2.01	1,2. *Avena* seems to be abundant in global hardiness zone 8 and 9, but is not very prevelant in zone 10. (See distribution map and global hardiness zone map). 3. One site suguests that *Avena* grasses can be grown as an annual in zone 3 to 9, and perennials in zones 4 to 10.	1. GBIF. https://www.gbif.org/species/2705297 (Accessed 28 June 2021). 2. Temperate Climate Permaculture. http://tcpermaculture.blogspot.com/2012/01/plant-hardiness-zones-maps-for-world.html (Accessed 28 June 2021). 3. GardenersHQ. https://www.gardenershq.com/Avena-wild-oat.php (Accessed 28 June 2021).
2.02	No computer analysis performed.	
2.03	1. Native to Europe, Central Asia, and Southwest Asia, 2,3. Present in Koppen Geiger Climate Zones Cfa, Cfb, Csa, Csb, Dfa, Dfb, BSk, BSh, BWh, BWk (See distribution map and Koppen Geiger Climate Classification Map).	1. GoBotany. https://gobotany.nativeplanttrust.org/species/avena/fatua/ (Accessed 28 June 2021). 2. GBIF. https://www.gbif.org/species/2705297 (Accessed 28 June 2021). 3. Britannica. Koppen Geiger Climate Classification Map. https://www.britannica.com/science/Koppen-climate-classification (Accessed 28 June 2021).
2.04	1. Mean annual rainfall: Lower limit is 250mm (9 inches) and upper limit is 1000mm (39 inches). 2. *Avena* is established in New Zealand's Cfb zones (2. See map), which can receive up to 1600mm (62 inches). Because of conflicting information and lack of evidence, we answered "?"	1. CABI. https://www.cabi.org/isc/datasheet/8058 (Accessed 28 June 2021) 2. NIWA. Overview of New Zealand's climate. https://niwa.co.nz/education-and-training/schools/resources/climate/overview (Accessed 28 June 2021). 3. GBIF. https://www.gbif.org/species/2705297 (Accessed 28 June 2021).
2.05	1. Introduced to temperate regions and present on all continents except Antarctica. 2. Introduced to North America by early European settlers as a weed of seed crops, and is frequently found as a contaminant in seed.	1. CABI. https://www.cabi.org/isc/datasheet/8058 (Accessed 28 June 2021) 2. GoBotany. https://gobotany.nativeplanttrust.org/species/avena/fatua/ (Accessed 30 June 2021).
3.01	1." Avena fatua is naturalised in many parts of the world where cereals are grown in Africa, Europe and Asia among other locations." 2. Considered a noxious weed in many parts of the world, and has spread from Eurasia to temperate areas worldwide. 3. "It is naturalized in some areas and considered a noxious weed in others."	1. BioNET-EAFRINET. https://keys.lucidcentral.org/keys/v3/eafrinet/weeds/key/weeds/Media/Html/Avena_fatua_(Common_Wild_Oat).htm (Accessed 30 June 2021). 2. GoBotany. https://gobotany.nativeplanttrust.org/species/avena/fatua/ (Accessed 30 June 2021). 3. iNaturalist. https://www.inaturalist.org/guide_taxa/821772 (Accessed 30 June 2021).
3.02	1. "A common weed of roadsides, railway lines, disturbed sites, waste areas, parks, gardens and disturbed and undisturbed natural habitats (e.g. grasslands, shrublands, open woodlands and along waterways)." 2. Inhabits distrubed areas and gardens. 3. Common weed in disturbed areas.	1. Weeds of Australia. https://keyserver.lucidcentral.org/weeds/data/media/Html/avena_fatua.htm (Accessed 29 June 2021). 2. UC IPM. http://ipm.ucanr.edu/PMG/WEEDS/wild_oat.html (Accessed 30 June 2021). 3. Sharma, G.P., Muhl, S.A., Esler, K.J. et al. 2010. Competitive interactions between the alien invasive annual grass Avena fatua and indigenous herbaceous plants in South African Renosterveld: the role of nitrogen enrichment. *Biological Invasions* 12, 3371-3378.

3.03	1. "A widespread species originating in Eurasia, *A. fatua* is one of the 10 worst annual weeds of temperate agricultural regions of the world." 2. The taxon "infest major winter and spring crops, including wheat, oat, barley, canola, maize, alfalfa, and sunflower, causing up to 70% yield losses depending on crop species and weed density." 3. *Avena fatua* is one of the world's worst agricultural weeds 4. "It is an especially serious weed in grain crops such as barley and wheat. A fatua invades and lowers the quality of a field crop, typically wheat or oat fields and competes for resources with the crops. It causes soil dryness and provides favourable conditions for diseases and pests." 5. Common agricultural weed.	1. Beckie, H.J., Francis, A., Hall, L.M. 2012. The Biology of Canadian Weeds. 27. *Avena fatua* L. *Canadian Journal of Plant Science*, 92, 1329-1357 2. Bajwa, A.A., Akhter, M.J., Iqbal, N., Peerzada, A.M., Hanif, Z., Manalil, S., Hashim, S., Ali, H.H., Kebaso, L., Frimpong, D., Namubiru, H., Chauhan, B.S. Biology and management of *Avena fatua* and *Avena ludoviciana*: two noxious weed species of agro-ecosystems. 2017. *Environ Sci Pollut Res Int,* 24, 19465-19479 3. CABI. https://www.cabi.org/isc/datasheet/8058 (Accessed 24 June 2021). 4. BioNET-EAFRINET. https://keys.lucidcentral.org/keys/v3/eafrinet/weeds/key/weeds/Media/Html/Avena_fatua_(Common_Wild_Oat).htm (Accessed 24 June 2021). 5. California Invasive Plant Council. https://www.cal-ipc.org/plants/profile/avena-fatua-profile/ (Accessed 24 June 2021).
3.04	1. Considered an environmental weed in Victoria, Australia. 2. "This species is regarded as an environmental weed in many parts of southern Australia (i.e. New South Wales, Victoria, South Australia and Western Australia) and was recently listed as a priority environmental weed in two Natural Resource Management regions." 3. Listed as an environmental weed.	1. White, M., Cheal, D., Carr, G. W., Adair, R., Blood, K. and Meagher, D.. 2018. Advisory list of environmental weeds in Victoria. Arthur Rylah Institute for Environmental Research Technical Report Series No. 287. 2. Weeds of Australia. https://keyserver.lucidcentral.org/weeds/data/media/Html/avena_fatua.htm (Accessed 29 June 2021). 3. Global Compendium of Weeds. http://www.hear.org/gcw/species/avena_fatua/ (Accessed 29 June 2021).
3.05	2. *Avena barbata* is on the noxious weed list in the U.S, and in Australia, it outcompetes native grasses and alters fire regimes. 2. Reported invasive in Australia, Chile, Hawaii, New Zealand, and Peru.	2. CABI. https://www.cabi.org/isc/datasheet/8057 (Accessed 28 June 2021). 2. PIER. http://www.hear.org/pier/species/avena_barbata.htm (Accessed 30 June 2021).
4.01	No evidence of these characteristics.	
4.02	1. In a field experiment, the straw of *Avena fatua* "contains	1. Tinnin, R.O. and Muller, C.H. 1972. The Allelopathic Influence of Avena fatuaL The Allelopathic Mechanism. *Bullentin of the Torrey Botanical Club*, 99, 287-292. 2. Kato-Noguchi, H., Kosemura, S., Yamamura, S. et al. 1994. Allelopathy of oats. I. Assessment of allelopathic potential of extract of oat shoots and identification of an allelochemical. *J ournal of Chemical Ecology,* 20, 309-314. 3. Xingang Liu, Fajun Tian, Yingying Tian, Yanbing Wu, Fengshou Dong, Jun Xu, and Yongquan Zheng. 2016. Isolation and Identification of Potential Allelochemicals from Aerial Parts of Avena fatua L. and Their Allelopathic Effect on Wheat. *Journal of Agricultural and Food Chemistry*, 64, 3492-3501
4.03	substances which help control the composition of annual grasslands where *A. fatua* is dominant. 2. In a labortatory test, the results suggested "thatL-tryptophan may be an allelochemical which affects the growth or germination of different plant species".3. "The results of activity testing indicated that the aerial parts of wild oats had strong allelopathic potential and could cause different degrees of influence on surrounding plants. Moreover, these compounds could be key allelochemicals in wild-oat-infested wheat fields and interfere with wheat growth via allelopathy".	
4.04	Not in the parasite plant families.	
4.05	1. Used as animal feed. 2. *Avena fatua* is considered a good alternative feed source for swine.	1. CABI. https://www.cabi.org/isc/datasheet/8058 (Accessed 24 June 2021) 2. Beckie, H.J., Francis, A., Hall, L.M. 2012. The Biology of Canadian Weeds. 27. *Avena fatua* L. *Canadian Journal of Plant Science*, 92, 1329-1357
4.06	1. Used as animal feed.	1. CABI. https://www.cabi.org/isc/datasheet/8058 (Accessed 24 June 2021)
4.07	1. "Rauber (1977) and Sharma and van den Born (1978) found no obvious differences in susceptibility between *A. fatua* and *A. sativa*. Nevertheless, Madariaga and Scharen (1985) reported that Septoria tritici [Mycosphaerella graminicola] on *A. fatua* was not pathogenic to wheat. In a study by Barlow et al. (1999) results indicated that *A. fatua* was a poor host for the tarnished plant bug (Lygus hesperus)." Due to lack of evidence, we answered "unk"	
4.08	No evidence. 1. Seeds are edible.	1. Practical Plants. https://practicalplants.org/wiki/Avena_fatua (Accessed 30 June 2021).

4.09	1. Its congener *A. barbata* can alter fire regimes. 2. "Grasslands on the riverine plain in south western New South Wales dominated by *Avena* spp. and annual ryegrass (Lolium rigidum Gaudin), with a height of 0.9 m and fuel load of 2.1 t ha-1, supported a wildfire fire line intensity of ca. 20 000 kW m-1 that spread at 23 km h-1; one of the highest rates recorded for grasslands in southern Australia (Noble 1991)."	1. CABI. https://www.cabi.org/isc/datasheet/8057 (Accessed 30 June 2021). 2. Medd, R.W. 1996. Wild oats -- what is the problem? *Plant Protection Quarterly*, 11, 183-184.
4.10	1. Shade intolerant.	1. USDA Plants Database. https://plants.usda.gov/home/plantProfile?symbol=AVFA (Accessed 29 June 2021).
4.11	1. Grows well on poor soils. 2. Tolerates infertile soil. 3. Can grow on nutritionally poor soils.	1. California Invasive Plant Council. https://www.cal-ipc.org/plants/profile/avena-fatua-profile/ (Accessed 30 June 2021). 2. CABI. https://www.cabi.org/isc/datasheet/8058 (Accessed 30 June 2021) 3. Plants for a Future. https://pfaf.org/user/Plant.aspx?LatinName=Avena+fatua (Accessed 30 June 2021).
4.12	1. The taxon is a grass, and does not grow as a climbing or smothering plant.	1. USDA Plants Database. https://plants.usda.gov/home/plantProfile?symbol=AVFA (Accessed 29 June 2021).
5.01	1. The taxon can form dense infestations. 2. Plant height varies from 25 cm to 120 cm. Due to lack of evidence, we answered "unk"	1. BioNET-EAFRINET. https://keys.lucidcentral.org/keys/v3/eafrinet/weeds/key/weeds/Media/Html/Avena_fatua_(Common_Wild_Oat).htm (Accessed 30 June 2021). 2. CABI. https://www.cabi.org/isc/datasheet/8058 (Accessed 30 June 2021).
5.02	1. Not aquatic.	1. USDA Plants Database. https://plants.usda.gov/home/plantProfile?symbol=AVFA (Accessed 29 June 2021).
5.03	1. The taxon is a grass.	1. USDA Plants Database. https://plants.usda.gov/home/plantProfile?symbol=AVFA (Accessed 29 June 2021).
5.04	1. Not nitrogen fixing.	1. USDA Plants Database. https://plants.usda.gov/home/plantProfile?symbol=AVFA (Accessed 29 June 2021).
6.01	No evidence.	
6.02	No evidence. 1. The taxon is considered invasive in its native range. 2. Sustaining populations in native range.	1. CABI. https://www.cabi.org/isc/datasheet/8058 (Accessed 29 June 2021). 2. GBIF. https://www.gbif.org/species/2705297 (Accessed 29 June 2021).
6.03	1. Propagated by seed. 2. Germination ranges from 100-60%.	1. USDA Plants Database. https://plants.usda.gov/home/plantProfile?symbol=AVFA (Accessed 29 June 2021). 2. Kew Seed Information Database. https://data.kew.org/sid/SidServlet?ID=2935&Num=9fQ (Accessed 29 June 2021). 3.
6.04	1. Hybridizes with *A. sativa.* 2. Hybridizes with cultivated oats. 3. *Avena sativa* hybridizes readily with *A. fatua.*	1.The Jepson Herbarium. https://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=15321 (Accessed 29 June 2021). 2. Sonoran Desert Naturalist. http://www.arizonensis.org/sonoran/fieldguide/plantae/avena_fatua.html (Accessed 29 June 2021). 3. SEINet. https://swbiodiversity.org/seinet/taxa/index.php?taxauthid=1&taxon=6998&clid=2692 (Accessed 29 June 2021).
6.05		1. Jäck, O., Menegat, A. & Gerhards, R. 2017. Winter wheat yield loss in response to *Avena fatua* competition and effect of reduced herbicide dose rates on seed production of this species. *J Plant Dis Prot ,* 124, 371-382. 2. : S. K. Jain and D. R. Marshall. 1967. Population Studies in Predominantly Self-Pollinating Species. X. Variation in Natural

6.06	1. Mainly self-pollinating. 2. *Avena fatua* is a self-pollinating species. 3. "The species is normally self-pollinating, with natural outcrossing occurring only rarely (Sharma and Vanden Born 1978)."	Populations of *Avena fatua* and *A. barbata. The American Naturalist* , 101, 19-33. 3. Beckie, H.J., Francis, A., Hall, L.M. 2012. The Biology of Canadian Weeds. 27. *Avena fatua* L. *Canadian Journal of Plant Science*, 92, 1329-1357
6.07	No evidence.	
7.01	1. *Avena fatua* is not known to reproduce vegetatively. 2. Seed propagated.	1. Sharma, M.P. and Vanden Born, W.H. 1978. The Biology of Canadian Weeds.: 27. *Avena fatua* L. *Canadian Journal of Plant Science,* 58, 141-157. 2. CABI. https://www.cabi.org/isc/datasheet/8058 (Accessed 24 June 2021).
7.02	1. Annual grass.	1. USDA Plants Database. https://plants.usda.gov/home/plantProfile?symbol=AVFA (Accessed 29 June 2021).
7.03	1. Pathways include land vehicles.	1. CABI. https://www.cabi.org/isc/datasheet/8058 (Accessed 30 June 2021).
7.04	1. Seeds have been introduced to many temperate ranges as a seed contaminant. There is no evidence the taxon is intentionally dispersed by people.	1. CABI. https://www.cabi.org/isc/datasheet/8058 (Accessed 30 June 2021).
7.05	1. It was introduced to North America by European settlers as a contaminant in seeds. 2. *Avena fatua* is a contaminant of cereal seed. 3. "Movement over longer distances is most likely the result of importation of contaminated grain."	1. Government of Canada. https://inspection.canada.ca/plant-health/seeds/seed-testing-and-grading/seeds-identification/avena-fatua/eng/1473681928384/1473681928951 (Accessed 24 June 2021). 2. BioNET-EAFRINET. https://keys.lucidcentral.org/keys/v3/eafrinet/weeds/key/weeds/Media/Html/Avena_fatua_(Common_Wild_Oat).htm (Accessed 24 June 2021). 3. CABI. https://www.cabi.org/isc/datasheet/8058 (Accessed 24 June 2021)
7.06	1. Taxon has small brown hairs. 2. "the florets/lemmas of *A. fatua* are always to some degree hairy." *A. fatua* has relatively large seeds and fall close to the parent plant. Even thought the taxon has hairs, there is no evidence of dispersal by wind.	1. Beckie, H.J., Francis, A., Hall, L.M. 2012. The Biology of Canadian Weeds. 27. *Avena fatua* L. *Canadian Journal of Plant Science*, 92, 1329-1357 2. CABI. https://www.cabi.org/isc/datasheet/8058 (Accessed 24 June 2021)
7.07	1. There is no evidence of dispersal by wind or water.	1. CABI. https://www.cabi.org/isc/datasheet/8058 (Accessed 24 June 2021)
7.08	No evidence.	
8.01	1. Awns facilitate dispersal by attaching to the coats of wooly animals 2. "Animal; Diaspore is carried accidentally; Assumption based upon diaspore morphology; (McIntyre et al., 1995)" 3. Dispersed by farm animals.	1. Beckie, H.J., Francis, A., Hall, L.M. 2012. The Biology of Canadian Weeds. 27. *Avena fatua* L. *Canadian Journal of Plant Science*, 92, 1329-1357 2. Kew Seed Information Database. https://data.kew.org/sid/SidServlet?ID=2935&Num=9fQ (Accessed 29 June 2021). 3. BioNET-EAFRINET. https://keys.lucidcentral.org/keys/v3/eafrinet/weeds/key/weeds/Media/Html/Avena_fatua_(Common_Wild_Oat).htm (Accessed 29 June 2021)
8.02	1. Used as animal feed. We found no evidence seeds remain viable through gut passage.	1. CABI. https://www.cabi.org/isc/datasheet/8058 (Accessed 29 June 2021).
8.03	1. *A. fatua* is an annual plant and produces up to 1000 seeds per plant. 2. "In spring barley in Idaho, *A. fatua* seed production was 180 to 9950 seeds m–2 as plant densities increased from 8 to 1100 plants m–2, respectively (Wille et al. 1998). In Washington state, *A. fatua* planted at 3-m spacing in bare ground produced an average of 19 tillers with 1070 seeds per plant (Morrow and Gealy 1983)."	1. Rauber R, 1977. The importance of biotic factors for the long-term development and limitation of wild oat populations (*Avena fatua* L.). Proceedings of the EWRS Symposium on Different Methods of Weed Control and their Integration. *Uppsala*, 1, 29-36 2. Beckie, H.J., Francis, A., Hall, L.M. 2012. The Biology of Canadian Weeds. 27. *Avena fatua* L. *Canadian Journal of Plant Science*, 92, 1329-1357
8.04	1. "While some of the seeds may germinate shortly after they are	1 A. I. Hsiao, G. I. Mc Intyre and J. A. Hanes. 1983. Seed Dormancy in *Avena fatua*. I. Induction of Germination by Mechanical Injury. *Botanical Gazette*, 144, 217-2222. 2. Hay, J.R. and Cumming, B.G. 1959. A Method for Inducing Dormancy in Wild Oats *(Avena fatua* L.). *Weeds*, 7, 34-40. 3. Kew Seed Information Database. https://data.kew.org/sid/SidServlet?ID=2935&Num=9fQ (Accessed 29 June 2021). 4. . Beckie, H.J., Francis, A., Hall, L.M. 2012. The Biology of Canadian Weeds. 27. *Avena fatua* L. *Canadian Journal of Plant Science*, 92, 1329-1357
8.05	shed from the plant, others may not germinate until the following spring or may remain dormant in the soil for several years (Banting1966)." 2. Remains viable for atleast 3 years. 3. Seeds are orthodox 4. The taxon has a "large and persistent seed bank with variable degrees of primary seed dormancy."	