European and Mediterranean Plant Protection Organization
Organisation Européenne et Méditerranéenne pour la Protection des Plantes

EPPO Prioritization Process for Invasive Alien Plants

14-19447

Andropogon virginicus (Poaceae)

Andropogon virginicus
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The prioritization process assessment for *Andropogon virginicus* (Poaceae) has been elaborated by the EPPO Secretariat integrating elements on the priotization assessment from the Russian Federation Plant Protection Organization and was reviewed by the EPPO Panel on Invasive Alien Plants in 2014.

Section A Prioritization process scheme for the elaboration of diffferent lists of invasive alien plants (pests or potential pests) for the area under assessment

Init1 - Enter the name of the pest
Andropogon virginicus Linnaeus

Synonyms: *Anatherum virginicum* (L.) Spreng., *Anatherum virginicum* (L.) Spreng. subvar. *tetrastachyum* (Elliott) Roberty, *Andropogon curtisianus* Steud., *Andropogon dissitiflorus* Michx., *Andropogon eriophorus* Scheele, *Andropogon tetrastachyus* Elliott, *Andropogon vaginatus* Elliott, *Andropogon virginicus* L. subsp. *genuinus* Hack., *Andropogon virginicus* L. subvar. *genuinus* Hack., *Andropogon virginicus* L. subvar. *typicus* Hack., *Andropogon virginicus* L. var. *genuinus* Fernald & Griscom, *Andropogon virginicus* L. var. *tetrastachyus* (Elliott) Hack., *Andropogon virginicus* L. var. *vaginatus* (Elliott) A. W. Wood, *Andropogon virginicus* L. var. *viridis* Hack., *Cinna lateralis* Walter, *Sorghum virginicum* (L.) Kuntze

Init2 - Indicate the taxonomic position and synonyms
Poaceae

Init3 - Clearly define the PRA area
The EPPO region (see map at http://www.eppo.int/ABOUT_EPPO/images/clickable_map.htm).

Init4 - Provide the reasons for performing this assessment, and report any risk analysis available for

the assessed species.
Andropogon virginicus (Poaceae) is a perennial grass native to North and Central America. This species has been introduced and naturalized in Australia, New Zealand and Japan. Prior to 2006, the only report from the EPPO region was in Georgia and the Russian Federation. In 2006, it was first found in France in a military camp. Because the population of *A. virginicus* has multiplied significantly in the infested area in France (from 2 to 500 plants in two years) and the species is considered to be invasive in other parts of the world, the French Plant Protection Organization (PPO) suggested adding *A. virginicus* to the EPPO Alert List. The Russian Federation PPO also performed a prioritization report assessment on *A. virginicus* which concluded that this species has a high spread potential and high potential environmental impact.

A.1 - Is the plant species known to be alien in all, or a significant part, of the area under assessment?
Yes
The species originates from North and Central America and is alien in the whole EPPO region.

A.2 - Is the plant species established in at least a part of the area under assessment?
Yes (for references and an updated distribution, please, check the EPPO PQR Database https://www.eppo.int/DATABASES/pqr/pqr.htm)

The species is established in the EPPO region: France, Georgia and the Russian Federation.
In France, the species was found in 2006 in the military camp 'Camp du Poteau' (Landes and Gironde departments) and has also been recorded in Arjuzanx (Landes).
In the Russian Federation, the species is established on the Black Sea coast of the Caucasus. *A.virginicus* was first recorded in 1947 in Georgia in the Autonomous Republic of Abkhazia near the Lake Bebsyr (Ochamchira (Очамчыра) region). The pathway of entry is not known. In the Autonomous Republic of Abkhazia, the species is widespread in the natural environment as well as in ruderal and disturbed land across the low-lying (up to 250 m) maritime part of the country (Колаковский, 1986) and is expanding its range in the Caucasus region. The most northern point of its spread is the region of Tuapse town (Туапсе) where in 1996 the population of this species was dominant in the area of a former vineyard on the marine terrace of the bank of the estuary (Зернов и др., 2000).

Map of occurrence of *A. virginicus* in the Black Sea coast of the Caucasus
(yellow dots – the Russian Federation, pink dots – Autonomous Republic of Abkhazia, green dots – Georgia)

The species is native to North America: Canada (Ontario), Mexico, USA (Alabama, Arkansas, California (alien), Connecticut, Delaware, District of Columbia, Florida, Georgia, Hawai (alien in West Maui), Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Mississippi, Missouri, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Virginia, West Virginia).
It is also native to Central America: Bahamas, Belize, Bermuda, Colombia, Costa Rica, Cuba, Dominican Republic, Guatemala, Honduras, Jamaica, Nicaragua, Panama, Puerto Rico, Trinidad and Tobago.

The species has also been introduced and is established in Australia (New South Wales, Queensland, Victoria), in Japan and in New Zealand.
World distribution maps are displayed in figure 1 and 2.

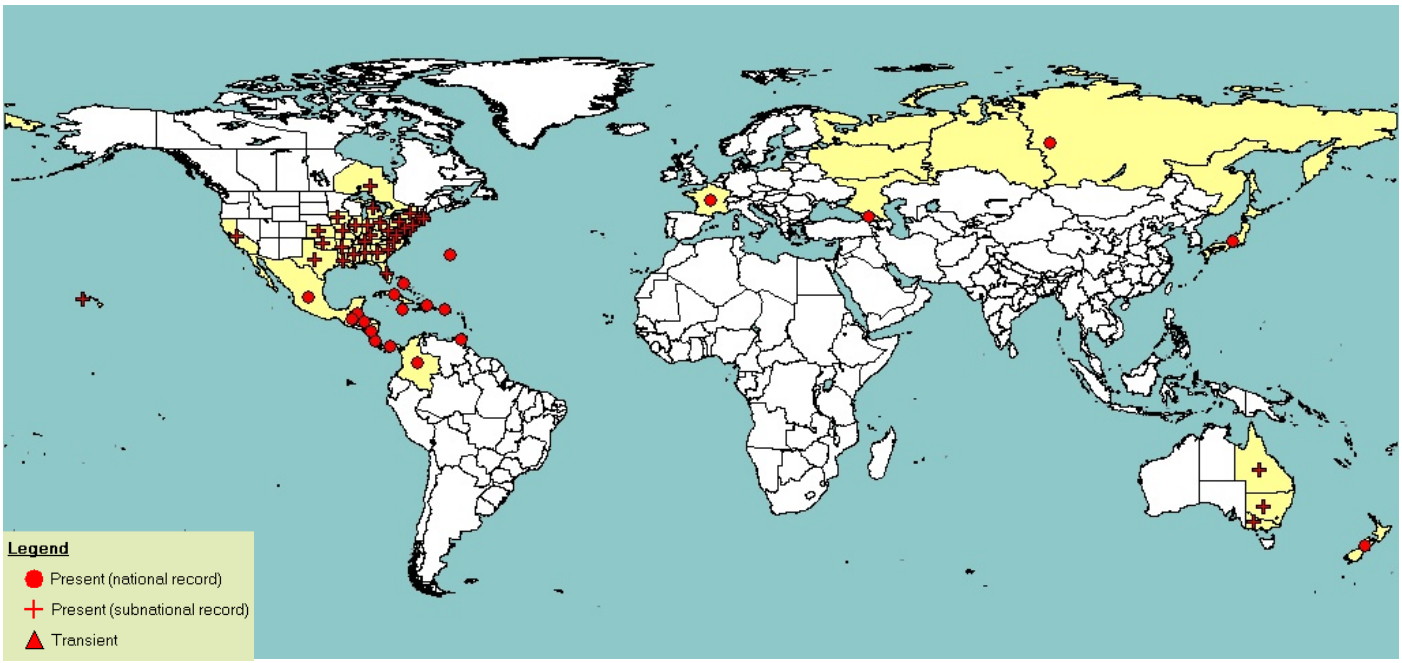

Figure 1: EPPO Worlwide distribution map for *Andropogon virginicus*.

Figure 2: GBIF worldwide distribution for *Andropogon virginicus*. Records are missing in the EPPO region (France, Georgia and in the Russian Federation).
Biodiversity occurrence data accessed through GBIF Data Portal, data.gbif.org, 2014-04-03.

The GBIF Niche Model, taking all the available parameters into account, indicates that the Atlantic and temperate and Mediterranean European areas would be suitable for *A. virginicus* to establish (Figure 3). This projection fits well with the distribution of the species, but underestimates its distribution in Central America. The potential distribution of the species could then be underestimated.
The temperate area is considered to be most suitable for *A. virginicus*, as well as the Atlantic area.

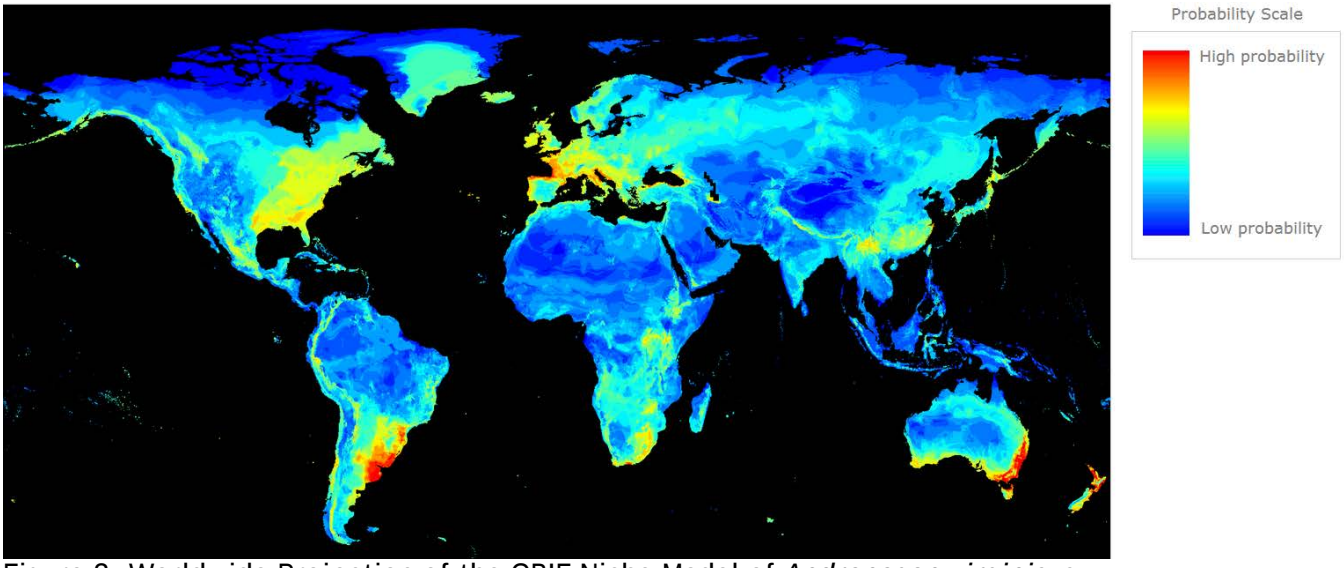

Figure 3: Worldwide Projection of the GBIF Niche Model of *Andropogon virginicus.*
Biodiversity occurrence data accessed through GBIF Data Portal, data.gbif.org, 2014-03-26.

Questions A.5, A.6, A.7 and A.8 all have to be assessed independently. The risk should be considered for the area under assessment where the species is able to establish and to cause damage. The risk should not be downgraded by making an average for the entire area under assessment, if it is different from the area of potential establishment.

As far as possible, evidence should be obtained from records of invasive behaviour in the area under assessment or in the EPPO region. Information on invasive behaviour elsewhere may also provide guidance.

It should be ensured that suitable habitats are present in the area under assessment, for instance, mangroves and some specific cropping systems are not found in the EPPO region.

Any impact through hybridization on native plant species, crops or wild crop relatives is also considered in this section.

A.5 - How high is the spread potential of the plant in the area under assessment?
High
Level of uncertainty: Low

Production of propagules by *A. virginus* is high. Each flowering culm may have as many as 50 racemes, and each raceme 8 to 12 spikelets. Survival of seedlings is high (Uchytil, 1992).
The fine achenes of the species are spread naturally by wind, by floating on water and can also adhere and be transported by waterfowl, on wool, fur or on people's clothes. The species is also likely to be spread by machinery (Pacific Island Ecosystems at Risk Website).
Concerning its natural spread potential, in 2 years the population of *A. virginicus* found in France increased from 2 plants to more than 500 (Granereau & Verloove, 2010).

A.6 - How high is the potential negative impact of the plant on native species, habitats and ecosystems in the area under assessment?

List natural and semi-natural habitats where the species in known to occur. It includes all EUNIS habitat types 1 (http://eunis.eea.europa.eu/habitats-code-browser.jsp), except I (Regularly or recently cultivated agricultural, horticultural and domestic habitats) and J (Constructed, industrial and other artificial habitats).
Medium

Level of uncertainty: High

According to the EUNIS nomenclature, the following natural or semi-natural habitats are invaded: Inland water surface: Littoral zone of inland surface waterbodies [C3]; Mires, bogs and fens: Raised and blanket bogs [D1]; Grasslands and lands dominated by forbs, mosses or lichens: Dry grasslands [E1], Messic grasslands [E2]; Seasonally wet and wet grasslands [E3]; Woodland fringes and clearings and tall forb stands [E5]; Sparsely wooded grasslands [E7]; Woodland, forest and other wooded land: Broadleaved deciduous woodland [G1]; Broadleaved evergreen woodland [G2]; Coniferous woodland [G3]; Mixed deciduous and coniferous woodland [G4]; Lines of trees, small anthropogenic woodlands, recently felled woodland, early-stage woodland and coppice [G5].

A. virginicus forms monospecific stands and releases highly persistent allelopathic substances (Rice, 1972), displacing other species. These substances are also released by decaying material which have been observed in the USA to inhibit the growth of *Amaranthus palmeri* (Aamaranthaceae), *Bromus japonicus* (Poaceae) or *Schizachyrium scoparium* (Poaceae) (Uchytil, 1992).
A. virginicus dead material is an excellent fuel for fires. In areas where it occurs, both fire intensities and acreage burnt have increased, which may change the structure and composition of the ecosystems (Smith, 1998). The species cover also increases with burns (Smith, 1998). It is dormant during the rainy season, which leads to increased erosion in some areas (Mueller-Dombois, 1973 in Smith, 1998). SEREP (2000) also notes that, as the species has a tendency to form dense mats of dead matter, it results in increasing runoff and accelerated erosion.
The species is reported to be able to form continuous cover in abandoned agricultural land after 4 to 5 years. But once established, it depends upon periodic disturbance to maintain its abundance (Uchytil, 1992).
As little information is available on the ability of the species to form continuous cover over the years, the uncertainty is assessed as high.

A.7 - How high is the potential negative impact of the plant on agriculture, horticulture or forestry in the area under assessment?

The habitats and the situations in which the species has negative impact on agriculture, horticulture or forestry should be listed. It includes EUNIS habitat (http://eunis.eea.europa.eu/habitats-code-browser.jsp) I (Regularly or recently cultivated agricultural, horticultural and domestic habitats) and J (Constructed, industrial and other artificial habitats).
Low
Level of uncertainty: Medium

According to the EUNIS nomenclature, the following habitats are invaded: Regularly or recently cultivated agricultural, horticultural and domestic habitats: Cultivated areas of gardens and parks [I2]; Constructed, industrial and other artificial habitats: Extractive industrial site [J3], Transport networks and other constructed hard-surfaced areas [J4], Highly artificial man-made waters and associated structures [J5], Waste deposit [J6].

A. virginicus is considered unpalatable and of low forage value (Uchytil, 1992). However as the species is mainly reported to invade poorly managed and/or marginal areas of pastures, the pastoral impact is thought to be minor. In forestry, control or suppression of this species may be necessary to enable the establishment of the plantation species (Groninger *et al*., 2004).

A.8 - How high are the potential additional impacts (e.g. on animal and human health, on infrastructures, on recreational activities, other trade related impacts such as market losses)?
Low
Level of uncertainty: Medium

As seeds can catch in wool, they may be recognised as minor contaminants (Parsons & Cuthbertson, 2001 in Victorian Department of Primary Industries, Undated).
The species provides grazing in summer and spring, but palatability quickly decreases as the summer progresses (USDA NRCS, 2009). Dried material remains over summer and represents a potential fire hazard (Parsons & Cuthbertson, 2001). The species has the potential to moderately increase the fuel load and the fire intensity (Victorian Department of Primary Industries, Undated).

Responses to questions on impacts (A.6, A.7 and A.8) should be reported in the matrix in Fig. 2 in order to categorize the species. The highest score should be considered; however, impacts listed in question A.8 cannot be taken on their own as the highest impacts. Only if A.6 and/or A.7 is medium and A.8 is high should the overall impact be considered high.
Those species that have both a high spread potential and a high impact (either on cultivated or uncultivated ecosystems) are included in the list of invasive alien plants. Species with either medium spread or impacts are included in the observation list of invasive alien plants. Species with low spread and high impact are included in the observation list of invasive alien plants. All other species are registered on the list of minor concern.
The conclusions of the process can be presented in a matrix (see Fig. 2).

		A5 -Spread potential		
		Low	Medium	High
Adverse impacts (maximum rating from questions A6, A7. and A.8)	Low	List of minor concern	List of minor concern	List of minor concern
	Medium	List of minor concern	Observation list of invasive alien plants	Observation list of invasive alien plants
	High	Observation list of invasive alien plants	Observation list of invasive alien plants	List of invasive alien plants

Fig. 2 matrix combining spread potential and adverse impacts.

The answer provided to question A.5 on the spread potential of the species assessed was:
High
The answer provided to question A.6 on negative impact on native species, habitats and ecosystems was:
Medium
The answer provided to question A.7 on negative impact on agriculture, horticulture or forestry was:
Low
The answer provided to question A.8 on additional impacts was:
Low

According to the ratings provided, the assessed species falls into the:
Observation list of invasive alien plants

A.9 - The overall uncertainty for Part A of the EPPO prioritization process for invasive alien plants should be summarized:
High
The species is only at its initial stage of invasion in the EPPO region and little data is available. Where the species has been introduced (Australia, New Zealand, Japan), there is little information on the impacts of the species. The uncertainty is therefore considered as high.

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