Oplismenus undulatifolius **System:** Terrestrial

Kingdom	Phylum	Class	Order	Family
Plantae	Magnoliophyta	Liliopsida	Cyperales	Poaceae

Common name wavyleaf basketgrass (English)

Synonym *Oplismenus undulatifolius* , (Ard.) Beauv.
Panicum undulatifolium , Ard.

Similar species *Microstegium vimineum, Arthraxon hispidus*

Summary Wavyleaf basketgrass (*Oplismenus hirtellus* ssp. *undulatifolius*) is a newly discovered subspecies found in the United States which has established invasive populations in Maryland and Virginia. It establishes patchy to dense, carpeting populations quickly and is believed to displace native plants and alter environments. Rapid response efforts are underway to contain and eradicate this species from known locations by hand-pulling and herbicide use.

view this species on IUCN Red List

Species Description
Oplismenus hirtellus ssp. *undulatifolius* is a stoloniferous perennial which typically reaches 20-30 cm tall. It is low-lying grass which branches and roots at lower culm nodes. It has ovate, elongate, sharply pointed leaf blades 4-8 cm long x 1.5-2 mm wide that are arranged alternately. Scattered 1-2 mm hairs are present on the upper and lower leaf blade surfaces and the blades are horizontally rippled or undulating. The sheaths and culm axis are noticeably pilose with hairs 1-4 mm long. It has delicate stolons, 1-3 mm in diameter that sometimes creep beneath leaf litter, rooting and branching from nodes. It has relatively showy flowers for a grass and blooms in late August-November. It has racemes with 3-7 spikelets. Spikelets have very long awns (extended pointed tips) which secrete a sticky substance which is a specialisation for dispersal via adhering to passing animals. They also adhere to clothing and footwear. *Oplismenus hirtellus* ssp. *undulatifolius* has been described as looking like small bamboo. Distinguishing characteristics include a 3-veined first glume, a 5-veined second glume, a 7-veined lemma (Kyde & Marose, 2008; Peterson *et al*., 1999; Wavyleaf Basketgrass Task Force, 2009; Kyde, 2007).

Notes
There is much uncertainty concerning the taxonomy and origins of *O. hirtellus* ssp. *undulatifolius*. The Maryland and Virginia populations have been positively identified as ssp. *undulatifolius* and are currently referred to as such. Although the Integrated Taxonomic Information System (ITIS) currently lists wavyleaf basketgrass as *Oplismenus undulatifolius* researchers currently choose to recognize this taxon as a subspecies of *O. hirtellus*. The species *O. hirtellus* is native in tropical and subtropical areas in the Old and New World and the subspecies *setarius* is naturally occurring from NC south through FL and west to TX and AR and south into Central America and the Caribbean. An ornamental variegated pink, green and white form is sold as *O. hirtellus* “Variegatus,” “Ribbon grass,” or “basket grass,” for hanging baskets. While some have thought that this variegated ornamental form has reverted to the subspecies *undulatifolius*, APHIS indicates that the reversions of these widely purchased variegated plants, whether natural or chemically induced, are dissimilar enough morphologically to *O. hirtellus* ssp. *undulatifolius* to cast doubt on this possibility (Kerrie Kyde, pers. comm., 2010; Peterson *et al*., 1999).

Lifecycle Stages
Oplismenus hirtellus ssp. *undulatifolius* is believed to have a seed dormancy of up to five years, although this could be affected by weathering, oxygen, or other possible factors. It tolerates dense shade and leaves remain green into late fall after most trees have senesced and light frost has killed most other annual species (Wavyleaf Basketgrass Task Force, 2009).

Habitat Description
Oplismenus hirtellus ssp. *undulatifolius* inhabits temperate environments and has been recorded from coastal plain, piedmont, and montane regions. It may typically be found in full canopy hardwood forests, forest margins, and shady riparian zones. It does not tolerate direct sunlight and appears adaptable to a fairly wide range of pH (Kerrie Kyde, pers. comm. 2010; Peterson, 1999; Wavyleaf Basketgrass Task Force, 2009).

Reproduction
Wavyleaf basketgrass produces racemes with 3-7 spikelets from August through November. The awns secrete a sticky substance which adheres to passing animals and greatly enhances seed dispersal. It also produces stolons and may produce dense colonies (Kyde & Marose, 2008; Kerrie Kyde, pers. comm., 2010).

General Impacts
Oplismenus hirtellus ssp. *undulatifolius* spreads rapidly through wooded natural areas and disturbed environments. It may crowd out native herbaceous plants, and seems to prevent regeneration of native hardwood tree species. It has displaced native species in several locations of both Maryland and Virginia and may alter environments (Westbrooks & Imlay, 2009).

Management Info
Preventative measures: Maryland state agencies, the research community and regional organizations are designing an Early Detection Rapid Response protocol for *Oplismenus hirtellus* ssp. undulatifolius. A Wavyleaf Basketgrass Task Force has also been put together which includes efforts from the Maryland Department of Natural Resources, Anacostia Watershed Society (AWS), NPS, USDA, USGS, and others. A public education campaign was initiated that contacted adjacent state agencies and university personnel to share observations and field locations with others in the invasive plant community. Mapping of all known locations of the infestation is underway. Increasing public awareness and encouraging the report of any newly discovered populations of *O. hirtellus* ssp. undulatifolius is essential to containment. The Maryland Department of Natural Resources website provides current information MDDNR, 2009 (Westbrooks & Imlay, 2009; Wavyleaf Basketgrass Task Force, 2009).
Physical: *Oplismenus hirtellus* ssp. undulatifolius is fairly easily hand pulled. If all roots can be removed at nodes pulling is thought to be more effective than herbicide treatment when the population is small enough for weeding (Westbrooks & Imlay, 2009; Wavyleaf Basketgrass Task Force, 2009).
Chemical: *Oplismenus hirtellus* ssp. undulatifolius may be treated effectively with a 1-2% solution of glyphosate. Research has demonstrated that Envoy Plus, and Roundup WM work well. Envoy Plus is recommended as it is grass-specific. Current populations in Maryland and Virginia are still relatively small and eradication is still possible. Roundup has been found to work best late in the year, while grass inhibitors are more effective early in the season (Westbrooks & Imlay, 2009; Wavyleaf Basketgrass Task Force, 2009).
Efforts to prevent re-contamination are necessary. The management team for an infestation in Great Falls National Park, MD has considered having a separate set of gear for WLBG. The special clothing would be taken off and wrapped, hip-wader style then stored in decontamination boxes using hazard labels, and could be removed later in the season to prevent reestablishment of seeds (Wavyleaf Basket Grass Task Force, 2009).

Principal source:
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Westbrooks, Randy & Marc Imlay, August 2009. Wavyleaf Basketgrass – A New Invader of Deciduous Forests in Maryland and Virginia.
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