Plant Assessment Form

For use with the "Criteria for Categorizing Invasive Non-Native Plants that Threaten Wildlands" by the California Exotic Pest Plant Council and the Southwest Vegetation Management Association (Warner et al. 2003)

Printable version, February 28, 2003
(Modified for use in Arizona, 07/02/04)

Table 1. Species and Evaluator Information

Species name (Latin binomial)**:**	*Panicum antidotale* Retz. (USDA 2005)
Synonyms:	None identified in USDA (2005).
Common names:	Blue panicum, blue panic grass, blue panic, Blue panicum, giant panic, perennial Sudan grass
Evaluation date (mm/dd/yy)**:**	05/21/04
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Committee review date:	05/21/04 and 07/16/04
List date:	07/16/04
Re-evaluation date(s):	

Table 2. Scores, Designations, and Documentation Levels

Question		Score	Documentation Level	Section Scores	Overall Score & Designations
1.1	Impact on abiotic ecosystem processes	**C**	Observational	**"Impact"** **Section 1 Score:** **C**	**"Plant Score"** **Overall Score:** **Low** **Alert Status:** **None**
1.2	Impact on plant community	**C**	Observational		
1.3	Impact on higher trophic levels	**D**	Observational		
1.4	Impact on genetic integrity	**U**	No information		
2.1	Role of anthropogenic and natural disturbance	**C**	Reviewed scientific publication	**"Invasiveness"** *For questions at left, an A gets 3 points, a B gets 2, a C gets 1, and a D or U gets=0. Sum total of all points for Q2.1-2.7:* **10 pts** **Section 2 Score:** **C**	
2.2	Local rate of spread with no management	**D**	Observational		
2.3	Recent trend in total area infested within state	**B**	Observational		
2.4	Innate reproductive potential	**A**	Reviewed scientific publication		
2.5	Potential for human-caused dispersal	**C**	Other published material		
2.6	Potential for natural long-distance dispersal	**C**	Other published material		
2.7	Other regions invaded	**B**	Other published material		RED FLAG **NO** Information you should know.
3.1	Ecological amplitude	**B**	Other published material	**"Distribution"** **Section 3 Score:** **C**	
3.2	Distribution	**D**	Observational		

Table 3. Documentation

Question 1.1 Impact on abiotic ecosystem processes *Score:* **C** *Doc'n Level:* **Obs.**
Identify ecosystem processes impacted: May impact soil water content, nutrient cycling, and light availability. At present in Arizona, abiotic impact is limited as this plant is no longer actively promoted and cannot seemingly survive unless acquiring supplemental water. It was historically promoted for wind erosion control.
Rationale: *Panicum antidotale* is a tall (5 to 7 feet tall), sometimes highly branched, sod-forming grass having both rhizomes and fibrous roots. The fibrous roots can reach depths of 18 inches (46 cm), potentially harvesting deep soil water (Skerman and Riveros 1990, Ruyle and Young 1997, CDFA 2002). *Panicum antidotale*'s ability to form dense stands with deep roots creates the potential depletion of resources on a site: light, water, nutrients. A potential exists for this plant to negatively impact the soil water table of a site, deplete nutrients from the soil, and/or shade an otherwise sunny and open site with its tall stature. When it was used commercially in Arizona, *P. antidotale* was used primarily as a pasture grass. This mostly occurred during the 1950 to 1970s (B. Munda, personal communication, 2004). In parts of the United States is it planted to control wind erosion. At present it is no longer promoted in Arizona as a pasture grass and has only a scattered presence in Arizona (B. Munda, F. Northham, and D. Robinett, personal communications, 2004). Bruce Munda and Dan Robinett (personal communications, 2004) report that they have not observed this plant spreading from where it is planted other than a few isolated stands along river drainages. It can only seemingly be successful if the location gets supplemental water; they report that this is rare. Although *P. antidotale* is reported to survive fire and send up new shoots, no information could be found about its potential for carrying fire. Given that *P. antidotale* is presently rare in this state, this does not seem to be a problem.
Sources of information: See cited literature. Also considered personal communications with B. Munda (Plant Resource Specialist, U.S. Department of Agriculture, Natural Resources Conservation Service, Plant Material Center, Tucson, Arizona, 2004), F. Northam (Weed Biologist [former Arizona Department of Agriculture Noxious Weed Coordinator], Tempe, Arizona, 2004), and D. Robinett (Rangeland Management Specialist, U.S. Department of Agriculture, Natural Resources Conservation Service, Tucson, Arizona, 2004). Score based on inference drawn from the literature and observations.

Question 1.2 Impact on plant community composition, structure, and interactions *Score:* **C** *Doc'n Level:* **Obs.**
Identify type of impact or alteration: *Panicum antidotale* has the ability to displace native plant species in some habitats in Arizona.
Rationale: Marshall et al. (2000) report that *P. antidotale* competes with and displaces native plant species (this information is anecdotal, based on expert opinion, for Arizona, with no studies to document this impact). As stated in question 1.1, *P. antidotale*'s ability to form dense stands with deep roots creates the potential depletion of resources on a site (light, water, nutrients) with the potential outcome the taking over habitat for native species and competition. *Panicum antidotale* has the potential to change the innate structure of a plant community. In some of the places it occurs it is a larger plant than many of Arizona's native species and it is sod-forming, forming small to large patches (with its rhizomes and extensive roots). It has been observed to form small patches, to the exclusion of other species, in the depressions where water collects in desert scrub; these water-collecting microsites often support (in similar situations) hardier individuals of

species of the surrounding vegetation or a variety of species differing from the surrounding flora, increasing species diversity.
Sources of information: See cited literature. Score based on inference drawn from the literature and observations.

Question 1.3 Impact on higher trophic levels *Score:* **D** *Doc'n Level:* **Obs.**
Identify type of impact or alteration: Likely changes in food resources and habitat structure. Impact likely severe for desert specialists that are infrequent in grasslands (e.g., desert tortoises and some lizards), which will probably suffer the greatest impact due to a conversion from desert to grassland.
Rationale: *Panicum antidotale* was brought into the United States as a range species for cattle and is reportedly toxic at late flowering stage when it accumulates large amounts of oxalic acid (causing kidney disorders; FAO website). A report by the Tucson Plant Materials Center (Undated) indicates that *P. antidotale* is used by antelope and California jackrabbits. It is unknown if it is palatable to other wildlife or if its toxic properties impact wildlife. In addition, *P. antidotale*'s stature and sod-forming properties could potentially impact smaller fauna if the patches were sufficiently large. In Arizona, however, *P. antidotale* is seemingly present in small patches in limited localities. Tucson Plant Materials Center (Undated) also reports that the seeds of *P. antidotale* are used by upland game birds (doves), song birds (horned lark, pyrrhuloxia), and sparrows.
Sources of information: See cited literature. Also considered information from the Food and Agriculture Organization (FAO) of the United Nations, Animal Feed Resources Information System for *Panicum antidotale*. Available online at: http://www.fao.org/ag/aga/AGAP/FRG/afris/Data/119.htm. Score based on inference drawn from the literature and observations.

Question 1.4 Impact on genetic integrity *Score:* **U** *Doc'n Level:* **No info**.
Identify impacts: Unknown.
Rationale: Native species within the genus *Panicum* do occur in Arizona (Kearney and Peebles 1960). Although reports on research for cross-species pollination and potential hybridization occur, no literature was found that specifically addresses the potential for hybridization between *P. antidotale* and Arizona's native panicums.
Sources of information: See cited literature. No information regarding the potential for hybridization with native panicums.

Question 2.1 Role of anthropogenic and natural disturbance in establishment *Score:* **C** *Doc'n Level:* **Rev. sci. pub.**
Describe role of disturbance: *Panicum antidotale* seems to benefit from anthropomorphic disturbance in Arizona (it requires planting/seeding), though in limited situations it can establish minimally with natural disturbance. Available water seems to be an important and a major limiting factor under all situations.
Rationale: Dan Robinett and B. Munda (personal communications, 2004) have observed that once *P. antidotale* is planted, it seems to 'stay in place'; where it persists following planting for forage, it is observed to have little to no spread. Dan Robinett (personal communication, 2004) has observed that it seemingly spreads only when it can acquire additional water, albeit, minimally; he has observed this in the stormwater drains and washes within the Tucson city area. Winkel and Roundy (1991) report that during a three-year trial measuring emergence of seeded plots treated with varying types of disturbance on the east slopes of the Baboquivari mountains southwest of Tucson, *P. antidotale* (type A-130) had comparatively little emergence on undisturbed (though all

competitive plants were removed with chemicals or cutting) to lightly trampled plots, moderate emergence on root-plowed plots (seeded immediately after treatment), and high emergence on heavily trampled plots during the wet year of 1987. Although 1988 was drier and 1989 even drier still, emergence was lower but the general pattern was similar on disturbed versus undisturbed plots. Interestingly, in the drier years, *P. antidotale* consistently emerged on the undisturbed plots in approximately the same frequencies as the wet year. They also noted that the slightly longer period of soil water availability in the wet year accompanied by seed burial during disturbance may explain the higher seedling emergence during a wet year.

Sources of information: See cited literature. Also considered personal communications with B. Munda (Plant Resource Specialist, U.S. Department of Agriculture, Natural Resources Conservation Service, Plant Material Center, Tucson, Arizona, 2004) and D. Robinett (Rangeland Management Specialist, U.S. Department of Agriculture, Natural Resources Conservation Service, Tucson, Arizona, 2004).

Question 2.2 Local rate of spread with no management *Score:* **D** *Doc'n Level:* **Obs.**

Describe rate of spread: *Panicum antidotale* seems to have a limited, low rate of spread with no management. Available water seems to be an important factor regulating this species' spread.

Rationale: Skerman and Riveros (1990) note that *P. antidotale* has a slow spread rate from fallen seed in natural situations. During the 1950s to the 1970s, *P. antidotale* was planted and promoted for cattle forage on rangelands in Arizona. Dan Robinett and B. Munda (personal communications, 2004) have observed that *P. antidotale* seems to 'stay in place' where it persists following planting for forage, with little to no spread. In addition, D. Robinett has observed that it seemingly spreads only when it can acquire additional water, albeit, minimally. He has observed this in the stormwater drains and washes within the Tucson city area (D. Robinett, personal communication, 2004). *Panicum antidotale* has been planted at a few localities in southern Arizona along floodplains and washes where it now persists in a few scattered stands. In many areas outside Tucson, D. Robinett (personal communication, 2004) has observed that *P. antidotale* has died out when no longer used for pasture and once the irrigation was removed. On the east slope of the Huachuca Mountains it was planted in the late 1970s during wet years on root-plowed mesquite areas, where it established and still persists, but hasn't spread "one inch" outside of the root-plowed strips (D. Robinett, personal communication, 2004).

Sources of information: See cited literature. Also considered personal communications with B. Munda (Plant Resource Specialist, U.S. Department of Agriculture, Natural Resources Conservation Service, Plant Material Center, Tucson, Arizona, 2004) and D. Robinett (Rangeland Management Specialist, U.S. Department of Agriculture, Natural Resources Conservation Service, Tucson, Arizona, 2004).

Question 2.3 Recent trend in total area infested within state *Score:* **B** *Doc'n Level:* **Obs.**

Describe trend: Minimally increasing.

Rationale See questions 2.1 and 2.2. Given that *P. antidotale* was planted during the 1950s to 1970s in Arizona, and has been observed to die out, generally, in those areas when additional water was removed, it seemingly is declining in total area. It must be noted, however, that it more recently has established a small presence in Organ Pipe Cactus National Monument in Sonoran desertscrub, in low areas that collect water along the international border (Guertin and Halvorson 2003; D. Casper, personal communication, 2004). *Panicum antidotale* tended to be planted in uplands and floodplains within the state, where it seems to have declined in total area.

Sources of information: See cited literature. The Guertin and Halvorson (2003) citation reflects P. Guertin's observation during a U.S. Geological Survey mapping project for non-native plants on the Pipe Cactus National Monument. Also considered a personal communication with D. Casper (Biological Technician, National Park Service, Organ Pipe Cactus National Monument, Ajo, Arizona, 2004).

Question 2.4 Innate reproductive potential	*Score:* **A** *Doc'n Level:* **Rev. sci. pub.**
Describe key reproductive characteristics: *Panicum antidotale* has seeds possessing dormancy characteristics and long-term viability. It also has rhizomes, with the potential to reproduce vegetatively.	
Rationale: *Panicum antidotale* reproduces both by seeds produced sexually and vegetatively by its rhizomes (Skerman and Riveros 1990, CDFA 2002). Up to two years following *P. antidotale* seed maturation, maximum germination can occur. At 5 to 8 years, 80% germination can be reached, at 11 years 25% germination can be reached, and at 13 years 3% germination can be reached (Myers 1940 cited in the FAO website, Skerman and Riveros 1990). When kept under dry storage *P. antidotale* seed had germination percentages of 82.33±6.24 and 83.33±4.26 at one and two years, respectively, 69.33±3l.2% at three years, 37.33±2.94% at four years, and 19±2.74% at six years (Parihar and Rai 1985). Barrow and Havstad (1995 in Simonin 2000) note that in a seeding trial in the northern Chihuahuan Desert, *P. antidotale* seed survived cattle grazing, passing through cattle guts and subsequently germinating successfully.	
Sources of information: See cited literature. Also considered information from the Food and Agriculture Organization (FAO) of the United Nations website for *Panicum antidotale* Retz. Available online at: http://www.fao.org/WAICENT/FAOINFO/AGRICULT/AGP/AGPC/doc/GBASE/Data/pf000275.htm.	

Question 2.5 Potential for human-caused dispersal	*Score:* **C** *Doc'n Level:* **Other pub.**
Identify dispersal mechanisms: Because *P. antidotale* is occasionally used for livestock feed and soil stabilization but has declined notably in use in Arizona, it is limited in potential for dispersal in this state.	
Rationale: *Panicum antidotale* can be dispersed with human activities, as a contaminant in seed or hay (GRIN 2000, CDFA 2002). It was brought into Arizona as an experimental feed. Seed can also survive and successfully germinate following ingestion and excretion by cattle (Barrow and Havstad 1995 in Simonin 2000). In research in New Mexico, it has experimentally been placed in gelatin capsules for spread by cattle through ingestion and subsequent dispersion for germination and establishment. Yet as noted previously, *P. antidotale* has been decreasing primarily because its use for cattle forage has not been promoted since the 1970s (B. Munda, personal communication, 2004)	
Sources of information: See cited literature. Also considered personal communications with B. Munda (Plant Resource Specialist, U.S. Department of Agriculture, Natural Resources Conservation Service, Plant Materials Center, Tucson, Arizona, 2004).	

Question 2.6 Potential for natural long-distance dispersal	*Score:* **C** *Doc'n Level:* **Other pub**.
Identify dispersal mechanisms: *Panicum antidotale* can be dispersed long distances by soil movement, water, animals, or wind.	
Rationale: *Panicum antidotale* can supposedly be dispersed at great distances by soil movement, water, animals, or wind, yet no specific distance estimations were stated in the literature (GRIN 2000, CDFA 2002). As stated in question 1.3, Tucson Plant Materials Center (Undated) reports that *P. antidotale* is used by antelope and California jackrabbits, upland game birds (doves), song birds (horned lark, pyrrhuloxia), and sparrows. Barrow and Havstad (1995 in Simonin 2000) have noted that *P. antidotale* seeds survived cattle ingestion, with little subsequent loss in germination. Although no information was found, this may also apply to other faunal species.	
Sources of information: See cited literature.	

Question 2.7 Other regions invaded	*Score:* **B** *Doc'n Level:* **Other pub.**
Identify other regions: Mojave desert (Mojave desertscrub and in stabilized dunes) vegetation types in Utah and California; exists in Texas in unidentified vegetation types.	

Rationale: *Panicum antidotale*'s native habitat is the sand dunes and dry river beds of northwest Pakistan, Afghanistan, and Iran; it is also a native of India and Yemen (Skerman and Riveros 1990, GRIN 2000).

In Utah it has been noted in a creosotebush-blackbrush community (Mojave desertscrub) and in the stabilized dunes south of Ivins (Welsh et al. 1993). Hickman (1993) has noted *P. antidotale* in the southern Mojave Desert, but no specific vegetation type was mentioned (e.g., desert riparian versus desertscrub). Hatch and Pluhar (1980) identify *P. antidotale* as occurring in Texas in the coastal bend, south Texas, south and west Central Texas, and north to the Panhandle border (no specific vegetation types noted). Roalson and Allred (1995) note the occurrence *P. antidotale* in New Mexico, but no associated vegetation type was identified.

Sources of information: See cited literature. See additional flora checklist table following Worksheet B.

Question 3.1 Ecological amplitude *Score:* **B** *Doc'n Level:* **Other pub.**

Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: *Panicum antidotale* was introduced into the United States from India, via Australia (Ruyle and Young 1997, CDFA 2002) in 1912 (Magness et al. 1971 in NewCROP 1999, Tucson Plant Materials Center Undated). Several accessions and selections have been released: A-130 from Australia, P-15630 from Afghanistan, and a Seedling Drought Tolerant (SDT; selected from type A-130) type (Wright and Dobrenz 1970 in Frasier et al. 1985, Tucson Plant Materials Center Undated, FAO website). A-130 was tested and released in 1950 by the Tucson Plant Materials Center (Undated).

Panicum antidotale is tolerant of salinity (Ryan et al. 1975 cited in the FAO website). Trew (1954 cited in FAO website) reports that *P. antidotale* grows best on fertile soils and well-drained soils. *Panicum antidotale* prefers heavy loams or dark clay soils high in lime (Trew 1954 cited in the FAO website). Field studies showed that *P. antidotale* seed emerged best from depths less than 0.47 inches (1.2 cm) (Winkel et al. 1991 in Roundy et al. 1993). *Panicum antidotale* emergence is seemingly more successful on the more disturbed sites, though available moisture also plays a part (Winkel and Roundy 1991). *Panicum antidotale* is well suited as a warm-season pasture grass in Arizona (Tucson Plant Materials Center Undated). It is best adapted to areas having summer rainfall and areas having annual precipitation totals between 19.7 to 29.5 inches (50 to 75 cm) or lands that are irrigated (FAO website). *Panicum antidotale* is not winter-hardy in northern locations (Magness et al. 1971 in NewCROP 1999) and does not tolerate extended periods of freezing temperatures elsewhere (CDFA 2002). *Panicum antidotale* prefers full sunlit sites and does not tolerate shade well (CDFA 2002, FAO website).

Rationale: See above and Worksheet B.

Sources of information: See cited literature citations. Also considered information from the Food and Agriculture Organization (FAO) of the United Nations website for *Panicum antidotale* Retz. Available online at: http://www.fao.org/WAICENT/FAOINFO/AGRICULT/AGP/AGPC/doc/GBASE/Data/pf000275.htm. Score based on Working Group discussion and known distribution and extent.

Question 3.2 Distribution *Score:* **D** *Doc'n Level:* **Obs.**

Describe distribution: See question 3.1 and Worksheet B.

Rationale: In Arizona it seems to occur along our larger rivers in the southern part of the state, but needs additional water to persist; it has not been observed in sand dunes in the western part of our state, as in its native area. It was mostly planted in floodplains and uplands of Arizona (Sonoran desertscrub and semi-desert grassland), yet persists seemingly only on the floodplains in scattered patches except for one noted population on the east slope of the Huachuca Mountains (S. McLaughlin, B. Munda, and

D. Robinett, personal communications, 2004). Steve McLaughlin (personal communication, 2004) stated he observed *P. antidotale* in a rather large patch in the floodplain bordering the Santa Cruz River at the Canoa Ranch site. At this locale, the vegetation type has changed over the last 100 years because of disturbance on the landscape.

The following represents information from various Natural Resources Conservation Service field offices as accessed by B. Munda (personal communication, 2004):

San Carlos: small planting north of the town of San Carlos appears approximately 5 acres +/- was planted in the past. A few remnant plants remain from this old planting with the current stand still in rows and appears to be less than one acre now. Near Globe, by the drive-in theatre in a drainage way: +/- 2 acres.

Safford: District Conservationist is not aware of any plantings.

Douglas: small planting on Nimon Hopkins ranch east of Douglas. Site was started from one sprig and is in a dry sandy wash that receives flood waters. Planting probably done in the 60s or early 70s. The total area is small 0.05 acre or less. The available information seems to indicate that it has increased but not much. Elevation is 4000 feet. The area was grazed (may still be) and the grazing kept the plant(s) grazed down.

Sources of information: Personal communications with S. McLaughlin (Professor, Arid Lands Department, University of Arizona, Tucson, 2004), B. Munda (Plant Resource Specialist, U.S. Department of Agriculture, Natural Resources Conservation Service, Plant Material Center, Tucson, Arizona, 2004), and D. Robinett (Rangeland Management Specialist, U.S. Department of Agriculture, Natural Resources Conservation Service, Tucson, Arizona, 2004). Score based on Working Group discussion and known distribution and extent.

Worksheet A. Reproductive Characteristics

Complete this worksheet to answer Question 2.4.

Reaches reproductive maturity in 2 years or less	**[Yes]**	**No**	**1 pt.**
Dense infestations produce >1,000 viable seed per square meter	**[Yes]**	**No**	**2 pt.**
Populations of this species produce seeds every year.	**[Yes]**	**No**	**1 pt.**
Seed production sustained for 3 or more months within a population annually	**Yes**	**[No]**	**1 pt.**
Seeds remain viable in soil for three or more years	**[Yes]**	**No**	**2 pt.**
Viable seed produced with *both* self-pollination and cross-pollination	**[Yes]**	**No**	**1 pt.**
Has quickly spreading vegetative structures (rhizomes, roots, etc.) that may root at nodes	**[Yes]**	**No**	**1 pt.**
Fragments easily and fragments can become established elsewhere	**Yes**	**No**	**2 pt.**
Resprouts readily when cut, grazed, or burned	**[Yes]**	**No**	**1 pt.**
	Total pts: 9 Total unknowns: 1		
	Score : A		

Note any related traits:

Worksheet B. Arizona Ecological Types

(*sensu* Brown 1994 and Brown et al. 1998)

Major Ecological Types	Minor Ecological Types	Code*
Dunes	dunes	
Scrublands	Great Basin montane scrub	
	southwestern interior chaparral scrub	
Desertlands	Great Basin desertscrub	
	Mohave desertscrub	
	Chihuahuan desertscrub	
	Sonoran desertscrub	**D**
Grasslands	alpine and subalpine grassland	
	plains and Great Basin shrub-grassland	
	semi-desert grassland	**D** (planted)
Freshwater Systems	lakes, ponds, reservoirs	
	rivers, streams	
Non-Riparian Wetlands	Sonoran wetlands	
	southwestern interior wetlands	
	montane wetlands	
	playas	
Riparian	Sonoran riparian	**D**
	southwestern interior riparian	**D**
	montane riparian	
Woodlands	Great Basin conifer woodland	
	Madrean evergreen woodland	
Forests	Rocky Mountain and Great Basin subalpine conifer forest	
	montane conifer forest	
Tundra (alpine)	tundra (alpine)	

*A means >50% of type occurrences are invaded; B means >20% to 50%; C means >5% to 20%; D means present but ≤5%; U means unknown (unable to estimate percentage of occurrences invaded).

Table 1. Floral Checklist for *Panicum antidotale* Based on Surveys by Location

Location	Occurrence	Major Ecological Type	Minor Ecological Type
Gila River, just north of Navajo Point (Graham County) with riparian species, 2570 feet, Specimen 8489 collected by M. Baker (Arizona State University Herbarium catalogue record #182581).	Present	Non-Riparian Wetlands	Southwestern interior wetlands, surrounded by semi-desert grassland
Flora for the Santa Teresa Mountains (Graham County) (Buegge 1998).	Present	No information	No information
Bordering Santa Cruz at Canoa Ranch site (S. McLaughlin, Professor, Arid Lands Department, University of Arizona, Tucson, personal communication, 2004).	Present	No information	No information
Flora for the San Pedro National Conservation Area, Cochise County; (Flora of the San Pedro Riparian National Conservation Area: Cochise County, Arizona. Undated. Available online at: http://ls.la.asu.edu/herbarium/uppersanpedro/index.html).	Present	No information	No information
Found in Yavapai County at about 4000 feet (McDougal 1973).	Present	No information	No information
Plants of the West Branch of the Santa Cruz; scattered along the margin of the West Branch channel Mauz 2001).	Present	Riparian	Sonoran riparian, surrounded by semi-desert grassland
The following is developed from information available at http://seinet.asu.edu/bioExplorer/ChecklistChoices.jsp. The ecological types were described either within the context of the link or from other known information about specific locations.			
Buckeye Hills Recreational Area, Arizona	Not present	Desertlands	Sonoran desertscrub
Camp Creek, Arizona; Sonoran desert-chaparral transition	Not present	No information	No information
Canyon de Chelly, Arizona	Not present	Desertlands	Great Basin desertscrub
Castle Dome Mountains, Arizona	Not present	Desertlands	Sonoran desertscrub
Chiricahua National Monument	Not present	Forests/ Woodlands/ Grasslands	Montane conifer forest/ Madrean evergreen woodland/ Semi-desert grassland
Hassayampa River Preserve	Present	Riparian	Sonoran riparian
Lake Pleasant Regional Park, Arizona	Not present	Desertlands/ Freshwater Systems	Sonoran desertscrub/ lakes, ponds, reservoirs
McDowell Mountains Regional Park, Arizona	Not present	Desertlands	Sonoran desertscrub
Organ Pipe Cactus National Monument	Present	Desertlands	Sonoran desertscrub
Papago Park, Arizona	Not present	No information	No information
Phoenix Flora (wild plants)	Present	No information	No information

Table 1. Floral Checklist for *Panicum antidotale* Based on Surveys by Location—continued

Location	Occurrence	Major Ecological Type	Minor Ecological Type
Pinal Mountains	Not present	Woodlands/ Scrublands/ Forest	Great Basin conifer woodland and Madrean evergreen woodland/ southwestern interior chaparral scrub/ Montane Conifer Forest
San Tan Semi-Regional Park	Not present	Desertlands	Sonoran desertscrub
Seven Springs, Arizona	Not present	Desertlands/ Scrublands/ Grasslands/ Riparian	Sonoran desertscrub/ southwestern interior chaparral scrub/ semi-desert grassland/ Sonoran riparian
Sierra Ancha Wilderness Area, Arizona (Globe to Young)	Not present	No information	No information
Sierra Estrella Mountains Regional Park, Arizona	Not present	Desertlands	Sonoran desertscrub
South Mountain (south of Phoenix)	Not present	Desertlands	Sonoran desertscrub
Superstition Mountains Wilderness	Not present	Desertlands/ Scrublands/ Grasslands	Sonoran desertscrub/ southwestern interior chaparral scrub/ semi-desert grassland
Thunderbird Semi-Regional Park	Not present	No information	No information
Tonto National Forest; combined Camp Creek area (actually Rackensack Canyon), Pinal Mountains, Seven Springs Area, Sierra Ancha Wilderness Area, Superstition Wilderness Area, and Usery Mountain Park	Not present	No information	No information
Upper San Pedro River; St. David to Mexican border	Present	Riparian/ Grasslands	Southwestern interior riparian/ Semi-desert grassland
Usery Mountain Semi-Regional Park	Not present	No information	No information
West Fork of Oak Creek; northern section of the Red Rock / Secret Mt. Wilderness	Not present	Riparian/ Woodlands/ Forests	Southwestern interior riparian/ Great Basin conifer woodland and Madrean evergreen woodland/ Montane conifer forest
White Tank Mountains Regional Park	Not present	Desertlands	Sonoran desertscrub
Has been seeded in Pima, Pinal, Cochise, and Santa Cruz Counties (D. Robinett, Rangeland Management Specialist, U.S. Department of Agriculture, Natural Resources Conservation Service, Tucson, Arizona, 2004, personal communication concerning *Panicum antidotale* and its presence in Arizona.	Present in Pima County and Cochise County	Desertlands (possibly Riparian)/ Grasslands	Sonoran Desert floodplains and drainages in Tucson (in the Altar Valley and Santa Cruz wash floodplains) and the Tohono O'odham Nation (Vamori, San Simon, and Santa Rosa wash floodplains): persists as scattered stands (this is either Sonoran desertscrub or Sonoran riparian or both). Grassland and mesquite on east slope of Fort Huachuca,

Table 1. Floral Checklist for *Panicum antidotale* Based on Surveys by Location—continued

Location	Occurrence	Major Ecological Type	Minor Ecological Type
It has not survived plantings in which irrigation was taken away in floodplains in Mammoth, Redington, Guevavi, and Tubac (2000 to 3500 feet).			approximately 4500 feet with mean annual precipitation of 15 inches on loamy and clayloam soils (semi-desert grassland). Urban: stormwater drains in Tucson.
Seeded in the Verde Valley in the 1970s (B. Munda, Plant Resource Specialist, U.S. Department of Agriculture, Natural Resources Conservation Service, Plant Materials Center, Tucson, Arizona, 2004, personal communication concerning *Panicum antidotale* and its presence in Arizona).	Present	No information	No information
California (Hickman 1993)	Present	Desertlands	Mojave desertscrub and Sonoran desertscrub
New Mexico (Roalson and Allred. 1995)	Present	No information	No information
Texas (coastal bend, south Texas, south- and west-central Texas, north to Panhandle border; Hatch and 1980)	Present	No information	No information
Utah (Welsh et al. 1993)	Present	Desertlands/ Dunes	Creosotebush-blackbrush community (Mojave desertscrub) at 885 to 950 m (Washington County). Stabilized dunes, south of Ivins.

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