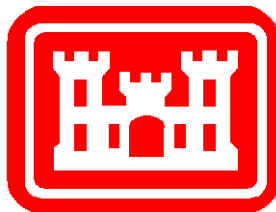


PUBLIC WORKS TECHNICAL BULLETIN 200-1-70
01 AUGUST 2010

**CONVERTING NON-NATIVE PLANT SPECIES OF
IMPROVED AND UNIMPROVED GROUNDS TO
LOW MAINTENANCE NATIVE PLANT SPECIES**



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DEPARTMENT OF THE ARMY
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Public Works Technical Bulletin

01 August 2010

No. 200-1-70

Facilities Engineering
Environmental

CONVERTING NON-NATIVE PLANT SPECIES OF
IMPROVED AND UNIMPROVED GROUNDS TO LOW
MAINTENANCE NATIVE PLANT SPECIES

1. Purpose.

a. This Public Works Technical Bulletin (PWTB) provides guidance for the conversion of improved and unimproved grounds to low maintenance native plant species that can be used on Army facilities. It delves into the establishment of native stands of grasses by providing examples of site preparation, installation, and maintenance. In addition an overview of native plants appropriate for Army facilities in various climate conditions is provided by geographical regions.

b. All PWTBs are available electronically (in Adobe Acrobat portable document format) through the World Wide Web (WWW) at the National Institute of Building Sciences' Whole Building Design Guide web page, which is accessible through URL:

http://www.wbdg.org/ccb/browse_cat.php?o=31&c=215

2. Applicability. This PWTB applies to all continental U.S. Army facilities.

3. References.

a. Army Regulation (AR) 200-1: *Environmental Protection and Enhancement*, 21 February 1997.

b. Army Regulation (AR) 420-1: Army Energy Program, *Army Facilities Management*, 19 February 2008.

c. Other references and resources are cited in Appendix H.

4. Discussion.

a. The costs, both environmental and financial, of periodic or regularly scheduled turf maintenance on cantonment and non-cantonment areas can dominate the budgets of installation Public Works and Natural Resources offices. Annually, Camp Atterbury, IN alone spends over \$1M on fuel, labor, and equipment associated with mowing of road right-always, ranges, cantonment, and other manicured areas. Conversion from non-native to a native stand could reduce maintenance burden and labor costs. Long-term sustainability of these monoculture turf areas is not feasible nor is it necessary to maintain cantonment and non-cantonment areas as one would a lawn or parade field. This concept of an aesthetically pleasing lawn is dated and does not comply with sustainability. The use of native species adapted to local conditions will go a long way towards achieving a reduction of energy, specifically in the use of petroleum, and will provide the DOD a method for maintaining low-cost, sustainable turf. Improving management by selecting appropriate locally adapted low-growing species will result in the reduction of mowing costs on small arms ranges, on improved and unimproved road right-of-ways, and other areas that require manicured aesthetics. Selected species may also significantly reduce the need for maintenance such as mowing, supplemental watering, and herbicide usage.

b. Suggested guidance in this PWTB includes ways for using mowing regimens, herbicides, and other techniques to make the switch from the current high maintenance vegetation to a more native population. Species that have been classified for low maintenance conversion have been identified by eco-region for use within the continental United States and are listed in this PWTB. Additional guidance is provided for converting an area to primarily native species more appropriate for training lands and cantonments. Conversion will maximize the success, efficiency, cost benefits, and esthetics of improved and unimproved areas on military installations.

c. This PWTB provides an overview of site preparation, installation, and maintenance of native plant species that have been shown to provide some level of improvement in turf maintenance. Nativity of plant species was determined and the native species were investigated for geographic range, growth

requirements, commercial availability, and utilization importance. Species that were selected were then chosen by low growing characteristics and separated based on geographical regions.

d. Appendix A contains information for site preparation, installation, and maintenance for successful conversion of an area into a native plant community.

e. Appendix B lists native plant species adapted to the Pacific Coast Region, which includes the states of California, Oregon, and Washington.

f. Appendix C lists native plant species adapted to the Western Mountain Region, which includes the states of Arizona, Colorado, Idaho, Montana, New Mexico, Nevada, Utah, and Wyoming.

g. Appendix D lists native plant species adapted to the Central Plains Region, which includes the states of Iowa, Illinois, Indiana, Kansas, Michigan, Minnesota, Missouri, North Dakota, Nebraska, Ohio, Oklahoma, South Dakota, Texas, and Wisconsin.

h. Appendix E lists native plant species adapted to the Southeast Region, which include the states of Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia.

i. Appendix F lists native plant species adapted to the Northeast Region, which includes the states of Connecticut, Massachusetts, Maine, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.

j. Appendix G contains general characteristics and growth requirements for native plant species documented in Appendices B-F. These characteristics include scientific and common name, plant type, and height, rate of vegetative spread, shade tolerance, minimum consecutive frost-free days, and tolerance to soil texture type, soil pH, precipitation, moisture use, drought, salinity, and fire.

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5. Points of Contact (POCs).

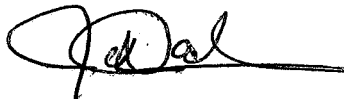
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Appendix A

Overview of Site Preparation, Installation and Maintenance of Native Plant Species

Introduction

This PWTB has three focus areas: (1) establishment of a native stand of grasses, (2) species mixes, and (3) reduction of maintenance. This Appendix will discuss methods of removing existing stands and the time frames for accomplishing removal. Next to be discussed will be choosing native species mixes with low maintenance to help reduce mowing costs for the following areas:

- High visibility and manicured areas such as parade fields, pathways, parks, etc.
- High impact areas such as maneuver corridors, training ranges, bivouac sites, and firing ranges (Figures A-1 and A-2) with species that tend to grow low, establish quickly to avoid erosion, are fire tolerant, and need minimal mowing (heights of less than 8 in. or 8-16 in. are desirable).
- Height-restricted areas where low growth species such as road sides, helicopter pads, runways, etc. are desirable.
- Finally, this bulletin addresses how to reduce maintenance for areas planted with native species (e.g., mowing regimens that could be implemented to reduce growth height; using growth regulators).



Figure A-1. Camp Atterbury test plot for low growing native species to reduce mowing requirements on firing ranges.



Figure A-2. Camp Atterbury test plot after establishment of low growing species.

Background

This bulletin provides an overview of native plant species best suited for lawn use. Literature has shown these plants to possess qualities favorable for reducing maintenance. Species possessing this trait were limited to include only those species native to the continental United States with low-growing characteristics, wide geographic ranges, broad growth requirements, commercial availability, and potential for success when used in land rehabilitation plantings. Many of these species are already components of widespread range seed mixes. However, all of the species in this bulletin have the potential to improve land sustainability and reduce maintenance.

Establishment

A stand of native plants can be established in several ways. The form used depends on several factors: (1) the size of the area to be established, (2) the environmental impact of using herbicides, (3) long-term maintenance post-establishment, and (4) potential or projected change in the use of that area.

Generally, two or possibly three situations may be present: (1) new construction with bare soil, (2) non-natives stands of species present, and (3) the possibility of natives and non-natives mixed together in existing stands. In the first case the land can be tilled, herbicide applied, and a variety of native species specifically listed for the particular region of the country planted. If the situation is other than bare soil, then one should follow the recommendations below under site preparation, installation, and maintenance.

Site Preparation

Site preparation generally begins the fall prior to planting in the spring. To start, the existing vegetation must be cleared from the area of improvement. For the purpose of this PWTB, the suggestions for removal of the vegetation are separated into three categories based on the size of the area of improvement. Any of the following suggestions can be used for clearing the vegetation, but time, environmental concerns, and expense need to be factored in when choosing a method.

Area of improvement less than 1/2 acre

For under ½- acre, smothering is a common form for killing existing vegetation in anticipation of establishing a new stand. Common methods for smothering the vegetation are: (1) 6 in. of wood chips, heavy duty/thick gauge black plastic (the thicker the plastic the longer it will last when exposed to the environmental elements); (2) wet newspaper 20 sheets thick overlapped with wood chips; or (3) used newspaper or other paper material such as paper pulp covered by 1 foot of sand or organic matter. The "cover" must stay down for an entire growing season for all vegetation to be killed off before planting. These methods are high in labor and require maintenance during the growing season.

Area of improvement 1/2 to 1 acre

The vegetation in an area of improvement of 1/2 to 1 acre can be easily removed mechanically. Mechanical removal can be performed in one of two ways: with a sod-cutter or by tilling.

Using a sod cutter will strip off the top layer of grass and roots, leaving a bare area, so plan to have plants/seeds ready to plant immediately. In addition, removal of sod can be cumbersome.

If using tillage, one will need to till the area of improvement two to three times, approximately 1 week apart, prior to re-seeding to ensure that the current undesirable seed bank is sufficiently impacted.

Area of improvement over 1 acre

Vegetation in an area of improvement measuring more than 1 acre will need to be removed chemically. Chemical removal can be performed by using a glyphosate-based herbicide for broad spectrum impact. These herbicides have low toxicity and are non-persistent in the environment. Once the vegetation turns brown – usually in 10 days to 2 weeks – till it under and plant the area of improvement. It is important to read the recommendations on the herbicide label and use it according to directions. Unacceptable injury to non-target plants may result if label recommendations are not followed. In general once vegetation is killed off and the area tilled, seeding can take place 4 weeks after herbicide application.

Installation

Check with your local Natural Resource Conservation Service (NRCS), The Nature Conservancy (TNC), Land Rehabilitation and Maintenance (LRAM) or other local resources that can provide information to determine optional seeding dates for your local area. For zones 5A to 5B, for example, planting is generally recommended once the soil has warmed up in the spring, from 15 April to 15 June. The dates would be earlier in the year for areas south of this zone and later for areas north of this zone (Figure A-3). The time to plant native species should be decided specifically for your region by checking with local resources and as specified by the type of species you are planting. Some regions may prefer spring or early summer planting while others prefer fall or dormant plantings. In general plant cool season grasses in early spring and late summer or early fall and plant warm season grasses in late spring. Warm season grasses should not be planted in late summer or early fall. When developing your seed mix, discuss optimal seeding times with your vendor or consult with the U.S. Department of Agriculture's Plants Database.

For most areas it is possible to plant cool-season grasses during late September, October, or November. This timing allows the seeds to stratify in the soil. Precautionary measures need to be taken to plant during optimal times to avoid seed germination prior to spring. If germination occurs that same year, a winter freeze will kill seedlings (McClain 2003). Dormant sowing of an area in native species has shown positive correlation with establishment. Although successful seeding during a dormant period allows for stratification and optimal temperatures, most experts suggest planting during late spring or early summer for the best and most immediate results. If supplemental watering is difficult or impossible, consider planting during dormancy to take advantage of rainfall.

It is recommended to use pre-treated seed that has been soaked in warm water or treated with special chemicals such as sulphuric acid to help soften the seed coat (Forbes 1992). The treated seed is recommended because it can germinate in 7 to 10 days while non-treated seed can take 2 to 3 years to germinate (Daniels 1995). When selecting seed, it is worth asking about new cultivars because some natives are being selected to maintain a lower height. Another suggestion is mycorrhizal inoculation treatment for the promotion of germination and longevity.

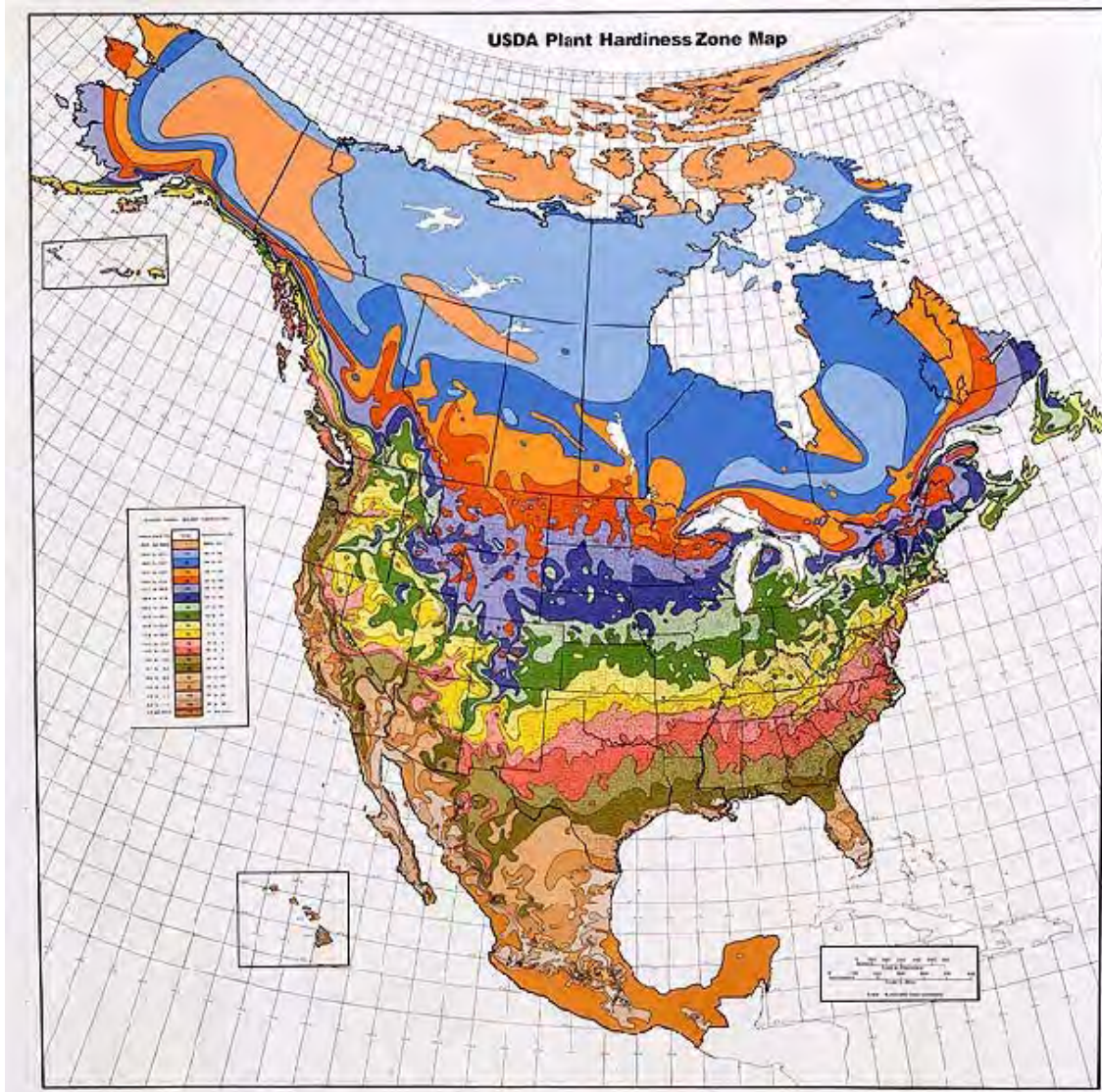


Figure A-3. USDA Plant Hardiness Zone Map
(<http://www.usna.usda.gov/Hardzone/ushzmap.html>)

Seeding rates are generally determined by the type of species, growth pattern, and ability to spread. The general rule for native species is to use 8 to 10 pounds of seed per acre or 1 pound per 4,000 square feet (Daniels 1995). For areas on slopes, with high erosion potential, or in an inaccessible area, doubling the seeding rate is recommended. When planting native species, it is critical to use a cover crop of either annual oats or rye. Do not use winter rye or winter wheat with native prairie species since they may inhibit germination of the native seed.

In general, seeding is accomplished in two ways: either broadcast or drilled in. Consider the size of the area when

determining the best way to plant. If the area is less than 1 to 2 acres, the seed can be hand broadcast. When hand broadcast, rake or harrow after seeding and use a roller to set the seed. If the area is greater than 2 acres, use a drill seeder. This will ensure soil-to-seed contact and, as a conservation tillage method, it is a more effective option. Treat existing weeds/vegetation with non-selective/glyphosate-based herbicide when drill seeding. Avoid deep tillage, which can expose an existing seed bank and contribute to competition. Other common means of seeding include rotary spreaders, hydroseeders, or hydraulic mulchers, recommended for extensively sloped areas. Depending on the soil quality, amendments may be required. Consult your local NRCS office for recommendations.

To help reduce erosion potential, consider using non-invasive introduced grasses with native grasses to provide soil stability – an “ecological bridge” until the natives become established. These techniques can also help to prevent invasive species from taking hold (Palazzo 2003). During high moisture events, the bridge species may take over. They are a better alternative than having an erosion issue or an invasion of weedy species (Palazzo 2003). As mentioned previously, take care when selecting varieties of native species to ensure survivability and optimization for desirable traits such as height and ability to control erosion. In areas with potential for high soil erosion, applying organic soil amendments and soil stabilizers through hydroseeding application can be part of the process (Brindle 2003). Biodegradable geotextiles such as a fiber core or jute erosion control blanket can be used to sustain the seed-to-soil contact.

Sources point out several grass species with the potential to be turf. Blue grama (*Bouteloua gracilis*) has potential as a turf grass but has a tendency to die out if soil moisture is too high (Mintenko 2002; Daniels 1995). Junegrass (*Koeleria macrantha*) is gaining popularity for dry sites (Daniels 1999). Other natives with potential as turf include broomsedge/common bluestem (*Andropogon virginicus*), all little bluestem (*Schizachyrium scoparium*) cultivars, sideoats grama (*Bouteloua curtipendula*), buffalo grass (*Buchloe dactyloides*), and red fescue (*Festuca rubra*). In addition the use of sedges (*Carex*) is another option to consider when establishing a mix for planting (Daniels 1999). For a list of site-specific species for specific regions see Appendices B, C, D, E, or F.

Maintenance

Supplemental watering is recommended to ensure germination and establishment. The ground should be kept moist but not soaked: on average general recommendations call for 1 in. of water per week. Once the seedlings are established, supplemental watering is not needed unless drought conditions are present.

To eliminate non-natives that may occur after sowing native species, mowing is suggested at a height (depending on species, 6 to 8 in. or 8 to 12 in.) that will reduce undesirable seed heads but not impact desirable natives, on a regular basis through the first season. For the following seasons, 2 to 5 years post-establishment, the recommendation is to mow high, once early in the spring or early summer and once late in the summer, followed by raking of the area to simulate a burn and removal of undesirable seed heads. If possible, a controlled burn is recommended over mowing for large areas. Small areas, or areas where controlled burns are restricted, can be mowed to simulate a burn (Moyes 2005). After control via mowing for a few years post-establishment, seed heads should be allowed to mature to ensure a stable seed bank.

Once the planting takes hold it should need only minimal maintenance. An inspection of the area once or twice a year is advised in order to remove invasive plants and to prevent the establishment of unwanted woody species. Remove noxious and invasive weeds by mowing, selective chemical application, or by hand pulling before the seed sets.

Conclusions

Appendices B-F provide plant species by geographic regions (shown in Figure A-4) and vegetation type. Appendix G is an overview of growth requirements for all plant species presented in this bulletin. Species lists were developed with the help from Easy Lawns: Low Maintenance Native Grasses for Gardeners Everywhere (Daniels 1999). For a site-specific planting guide, refer to Creating Vegetative Designs VegSpec website* created with the help of NRCS, U.S. Geological Survey, and the U.S. Army Corps of Engineers

* <http://vegspec.sc.egov.usda.gov/vegSpec/index.jsp>

(Engineer Research and Development Center, Construction Engineering Research Laboratory).

This PWTB provides the basics of establishing a low maintenance native stand of turf. The literature has shown that changing from non-native plant species to native plant species is possible with low maintenance and low growing characteristics if desired. Many native plant species not included in this PWTB still have the potential to be used if height requirements are not an issue. Thus, the species lists in the following appendices are by no means exhaustive. Use VegSpec and other resources to determine optimal species for the area you are planning to convert.

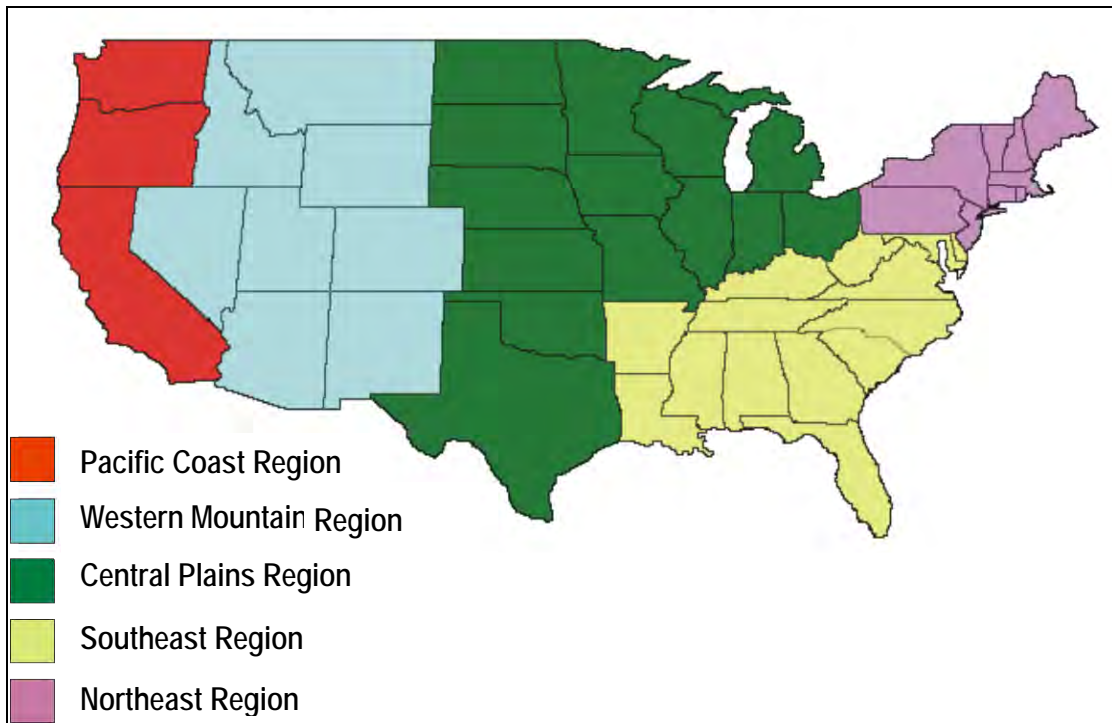


Figure A-4. Plant regions referred to in Appendices B-F.

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Appendix B

Native Plant Species Adapted to Pacific Coast Region

Table B-1. Native plant species adapted to Pacific Coast Region.

		Vegetation Type							
		Turf-type species			Meadow-type species				
Plant height	Species	0.5'-1'	1.5'-2'	above 2'	0.5'-1'	1.5'-2'	2.5'-3'	3.5'-5'	above 5'
		<i>Bouteloua gracilis</i>	<i>Agrostis pallens</i>	<i>Bouteloua curtipendula</i>	<i>Phyla nodiflora</i>	<i>Carex praegracilis</i>	<i>Achillea millefolium</i>	<i>Bromus carinatus</i>	
		<i>Carex pansa</i>	<i>Distichlis stricta/spicata</i>	<i>Pseudoroegneria spicata</i>		<i>Danthonia californica</i>	<i>Elymus canadensis</i>	<i>Deschampsia caespitosa</i>	
			<i>Festuca rubra</i>			<i>Festuca idahoensis</i>	<i>Elymus trachycaulus</i>	<i>Elymus glaucus</i>	
			<i>Poa secunda</i>			<i>Hordeum brachyantherum</i>	<i>Leymus triticoides</i>	<i>Festuca californica</i>	
						<i>Pascopyrum smithii</i>	<i>Nessella cernua</i>	<i>Melica californica</i>	
							<i>Nessella lepida</i>	<i>Leymus cinereus</i>	
							<i>Nessella pulchra</i>	<i>Monarda fistulosa</i>	
								<i>Solidago canadensis</i>	

* see Appendix H for resources used to develop table

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Appendix C

Native Plant Species Adapted to Western Mountain Region

Table C-1. Native plant species adapted to Western Mountain Region.

		Vegetation Type							
		Turf-type species			Meadow-type species				
Plant height	Species	0.5'-1'	1.5'-2'	above 2'	0.5'-1'	1.5'-2'	2.5'-3'	3.5'-5'	above 5'
		<i>Bouteloua gracilis</i>	<i>Agropyron dasystachyum</i>	<i>Bouteloua curtipendula</i>	<i>Phyla nodiflora</i>	<i>Gaillardia aristata</i>	<i>Achillea millefolium</i>	<i>Berlandiera lyrata</i>	
		<i>Buchloe dactyloides</i>	<i>Danthonia parryi</i>	<i>Deschampsia caespitosa</i>		<i>Linum perenne</i>	<i>Dalea purpurea</i>	<i>Deschampsia caespitosa</i>	
		<i>Koeleria macrantha</i>	<i>Distichlis stricta/spicata</i>	<i>Pseudoroegneria spicata</i>		<i>Pascopyrum smithii</i>	<i>Elymus canadensis</i>	<i>Leymus cinereus</i>	
		<i>Muhlenbergia cuspidata</i>	<i>Festuca arizonica</i>	<i>Sporobolus cryptandrus</i>		<i>Ratibida columnifera</i>	<i>Elymus trachycaulus</i>	<i>Monarda fistulosa</i>	
		<i>Muhlenbergia montana</i>	<i>Festuca rubra</i>	<i>Sporobolus heterolepis</i>			<i>Leymus triticoides</i>	<i>Solidago canadensis</i>	
		<i>Poa sandbergii</i>	<i>Muhlenbergia wrightii</i>	<i>Stipa comata</i>			<i>Schizachyrium scoparium</i>	<i>Solidago rigida</i>	
			<i>Oryzopsis hymenoides</i>						
			<i>Poa secunda</i>						

* see Appendix H for resources used to develop table

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Appendix D

Native Plant Species Adapted to Central Plains Region

Table D-1. Native plant species adapted to Central Plains Region.

		Vegetation Type							
		Turf-type species			Meadow-type species				
Plant height	Species	0.5'-1'	1.5'-2'	above 2'	0.5'-1'	1.5'-2'	2.5'-3'	3.5'-5'	above 5'
		<i>Bouteloua gracilis</i>	<i>Distichlis stricta/spicata</i>	<i>Andropogon virginicus</i>	<i>Anemone pulsatilla</i>	<i>Geum triflorum</i>	<i>Achillea millefolium</i>	<i>Deschampsia caespitosa</i>	<i>Andropogon gerardii</i>
		<i>Buchloe dactyloides</i>	<i>Festuca rubra</i>	<i>Bouteloua curtipendula</i>	<i>Phyla nodiflora</i>	<i>Pascopyrum smithii</i>	<i>Aster ericoides</i>	<i>Monarda fistulosa</i>	<i>Asclepias syriaca</i>
		<i>Festuca ovina</i>	<i>Poa secunda</i>	<i>Deschampsia caespitosa</i>	<i>Viola sp.</i>	<i>Ranunculus thomboideus</i>	<i>Elymus canadensis</i>	<i>Panicum virgatum</i>	<i>Sorghastrum nutans</i>
		<i>Koeleria macrantha</i>		<i>Deschampsia flexuosa</i>		<i>Sisyrinchium campestre</i>	<i>Elymus trachycaulus</i>	<i>Solidago canadensis</i>	
				<i>Pseudoroegneria spicata</i>			<i>Schizachyrium scoparium</i>		

* see Appendix H for resources used to develop table

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Appendix E

Native Plant Species Adapted to Southeast Regions

Table E-1. Native plant species adapted to Southeast Region.

		Vegetation Type							
		Turf-type species			Meadow-type species				
Plant height	Species	0.5'-1'	1.5'-2'	above 2'	0.5'-1'	1.5'-2'	2.5'-3'	3.5'-5'	above 5'
		<i>Bouteloua gracilis</i>	<i>Distichlis stricta/spicata</i>	<i>Agrostis hyemalis</i>	<i>Anemone pulsatilla</i>	<i>Echinacea purpurea</i>	<i>Achillea millefolium</i>	<i>Andropogon temarius</i>	<i>Andropogon gerardii</i>
		<i>Eragrostis spectabilis</i>	<i>Festuca rubra</i>	<i>Andropogon virginicus</i>	<i>Phyla nodiflora</i>	<i>Gaillardia aristata</i>	<i>Aster ericoides</i>	<i>Deschampsia caespitosa</i>	<i>Asclepias syriaca</i>
				<i>Bouteloua curtipendula</i>	<i>Rudbeckia hirta</i>	<i>Geum triflorum</i>	<i>Coreopsis sp.</i>	<i>Monarda fistulosa</i>	<i>Helianthus sp.</i>
				<i>Muhlenbergia capillaris</i>	<i>Viola sp.</i>	<i>Oenothera speciosa</i>	<i>Elymus canadensis</i>	<i>Panicum virgatum</i>	<i>Sorghastrum nutans</i>
						<i>Pascopyrum smithii</i>	<i>Elymus trachycaulus</i>	<i>Solidago canadensis</i>	
						<i>Ranunculus rhomboideus</i>	<i>Monarda citriodora</i>	<i>Solidago sp.</i>	
						<i>Sisyrinchium campestre</i>	<i>Schizachyrium scoparium</i>		
							<i>Tridens flavus</i>		

* see Appendix H for resources used to develop table

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Appendix F

Native Plant Species Adapted to Northeast Region

Table F-1. Native plant species adapted to Northeast Region.

Plant height Species	Vegetation Type								
	Turf-type species			Meadow-type species					
	0.5'-1'	1.5'-2'	above 2'	0.5'-1'	1.5'-2'	2.5'-3'	3.5'-5'	above 5'	
		<i>Agrostis alba</i>	<i>Bouteloua curtipendula</i>	<i>Antennaria plantaginifolia</i>	<i>Aster linariifolius</i>	<i>Achillea millefolium</i>	<i>Liatris spicata</i>	<i>Andropogon gerardii</i>	
	<i>Eragrostis spectabilis</i>	<i>Distichlis stricta/spicata</i>	<i>Deschampsia caespitosa</i>	<i>Chrysopsis falcata</i>	<i>Pascopyrum smithii</i>	<i>Aster ericoides</i>	<i>Monarda fistulosa</i>	<i>Asclepias syriaca</i>	
	<i>Festuca ovina</i>	<i>Festuca rubra</i>	<i>Deschampsia flexuosa</i>	<i>Chrysopsis mariana</i>	<i>Sisyrinchium angustifolium</i>	<i>Eupatorium hyssopifolium</i>	<i>Panicum virgatum</i>	<i>Sorghastrum nutans</i>	
			<i>Elymus canadensis</i>	<i>Viola pedata</i>		<i>Schizachyrium scoparium</i>	<i>Rudbeckia triloba</i>		
			<i>Elymus trachycaulus</i>				<i>Solidago canadensis</i>		
			<i>Muhlenbergia capillaris</i>				<i>Solidago odora</i>		

* see Appendix H for resources used to develop table

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Appendix G

General Characteristics and Growth Requirements for Native Plant Species

Table G-1. General characteristics and growth requirements for native plant species (sorted by scientific name).*

Species	Common Name	Ht	Plant Type	Vegetative Spread	Shade Tolerance**	Frost Free Days	Soil Texture Type	Soil pH	Precipitation Range	Moisture Use	Drought Tolerance	Salinity Tolerance	Fire Tolerance
<i>Achillea millefolium</i>	western yarrow	3'	forb	Yes	I	100	Coarse, Medium, No Fine	6.0- 8.0	8-26"	Medium	Medium	Low	High
<i>Agrostis alba</i>	redtop	2'	grass	Yes	None	90	Coarse, Medium, Fine	4.5-8.0	28-60"	High	Low	Low	None
<i>Agrostis pallens</i>	bentgrass	2'	grass	Yes	I	210	Fine, Medium, No Coarse	5.5 - 8.0	12-18"	High	Low	None	High
<i>Agropyron dasystachyum</i>	thickspike wheatgrass	2.3'	grass	Yes	None	90	Coarse, Medium, Fine	6.6-8.4	8-25"	Low	High	Low	High
<i>Agrostis hyemalis</i>	ticklegress	3.5'	grass	Yes	I	130	Fine, Medium, No Coarse	5.0-7.5	20-45"	High	Low	Medium	High
<i>Andropogon gerardii</i>	big bluestem	6'	grass	Yes	None	155	All Soils	5.0-7.5	12-55"	Low	High	Medium	High
<i>Andropogon ternarius</i>	silver bluestem	3.9'	grass	No	T	140	Coarse, Medium, No Fine	4.0-7.5	20-60"	Low	High	None	Medium
<i>Andropogon virginicus</i>	broomsedge	3'	grass	No	None	135	Fine, Medium, No Coarse	4.9-7.0	30-45"	Medium	High	None	High
<i>Anemone pulsatilla / Pulsatilla patens</i>	pasque flower	1'	forb	Yes	None	80	Fine, Medium, No Coarse	5.0-8.0	20-60"	Medium	Medium	Medium	None
<i>Antennaria plantaginifolia</i>	Parlin's pussytoes	1'	forb	Yes	I	90	All Soils	6.0-8.0	10-40"	Medium	High	None	Medium
<i>Asclepias syriaca</i>	common milkweed	6'	forb	Yes	I	90	All Soils	5.5-7.3	15-50"	medium	High	moderate	High
<i>Aster ericoides</i>	white heath aster	3'	forb	Yes	T	110	Coarse, Medium, No Fine	5.0-6.5	28-50"	Medium	High	None	High
<i>Aster linariifolius</i>	blue stiff aster	2'	forb	Yes	None	90	Coarse, Medium, No Fine	6.0-8.0	10-60"	Low	High	None	Medium
<i>Berlandiera lyrata</i>	chocolate flower	4'	forb	No	None	150	Fine, Medium, No Coarse	6.5-9.5	12-32"	Low	Medium	Medium	Low
<i>Bouteloua curtipendula</i>	sideoats grama	3'	grass	Yes	None	150	All Soils	5.5-8.5	6-25"	Medium	Medium	Low	Low
<i>Bouteloua gracilis</i>	blue grama	1'	grass	No	None	145	All Soils	6.5-8.5	8-22"	Medium	High	Medium	High
<i>Buchloe dactyloides</i>	buffalograss	0.5'	grass	Yes	None	145	Fine, Medium, No Coarse	6.5-8.0	7-32"	Medium	High	High	Medium

*See Appendix H for resources used to develop table

**Key to shade tolerance: I = Intermediate; T = Tolerant; None = no shade tolerance/intolerant.

Table G-1. Cont'd.

Species	Common Name	Ht	Plant Type	Vegetative Spread	Shade Tolerance*	Frost Free Days	Soil Texture Type	Soil pH	Precipitation Range	Moisture Use	Drought Tolerance	Salinity Tolerance	Fire Tolerance
<i>Bromus carinatus</i>	California brome	4'	grass	No	None	150	Coarse, Medium, No Fine	5.5-8.0	8-20"	Low	Medium	Medium	Low
<i>Carex pansa</i>	dune sedge	1'	sedge	Yes	I	150	Coarse, Medium, No Fine	4.5-7.5	20-50"	Medium	Medium	None	Medium
<i>Carex praegracilis</i>	slender sedge	2'	sedge	Yes	I	80	All Soils	5.3-6.8	10-24"	Medium	Low	None	High
<i>Chrysopsis falcata</i>	yellow Maryland aster	0.5'-1'	forb	No	None	90	Coarse, Medium, No Fine	4.5-6.5	40-60"	Medium	Low	None	None
<i>Chrysopsis mariana</i>	Maryland aster	1'-2.5'	forb	No	I	90	Coarse, Medium, No Fine	6.5-7.5	40-70"	High	None	None	None
<i>Coreopsis sp.</i>	tickseed	3'	forb	Yes	None	70	Fine, Medium, No Coarse	7.0-8.0	40-70"	High	Low	Low	Medium
<i>Dalea purpurea</i>	purple prairieclover	3'	forb	No	None	120	All Soils	6.0-8.0	16-24"	Medium	Medium	None	Medium
<i>Danthonia californica</i>	California oatgrass	2'	grass	Yes	None	90	Fine, Medium, No Coarse	6.0-7.0	6-40"	Medium	Medium	Low	High
<i>Danthonia parryi</i>	perry oatgrass	1'-2'	grass	No	None	120	All Soils	6.0-8.0	10-30"	dry	High	High	High
<i>Deschampsia caespitosa</i>	tufted hairgrass	3.5'	grass	No	None	100	All Soils	5.0-7.0	14-24"	Low	Low	Low	High
<i>Deschampsia flexuosa</i>	crinkled hairgrass	2.5'	grass	No	T	80	Coarse, Medium, No Fine	4.8-6.8	32-55"	Medium	Medium	None	High
<i>Distichlis stricta/spicata</i>	inland saltgrass	1.5'	grass	Yes	None	80	Fine, Medium, No Coarse	6.5-10.5	5-70"	Medium	Medium	High	High
<i>Echinacea purpurea</i>	purple coneflower	1.2'	forb	Yes	None	90	All Soils	6.5-7.2	14-40"	Medium	Low	Low	Medium
<i>Elymus canadensis</i>	Canada wildrye	3'	grass	No	T	90	All Soils	5.0-8.0	20-45"	Medium	Medium	Medium	Low
<i>Elymus glaucus</i>	blue wildrye	3.5'	grass	No	T	110	All Soils	5.8-8.5	16-60"	Low	High	Medium	High
<i>Elymus trachycaulus</i>	slender wheatgrass	3'	grass	Yes	None	90	Fine, Medium, No Coarse	5.6-9.0	8-25"	Low	High	High	High
<i>Eragrostis spectabilis</i>	purple lovegrass / petticoat grass	1'	grass	Yes	None	100	Coarse, Medium, No Fine	4.0-7.5	10-60"	Low	High	None	None
<i>Eupatorium hyssopifolium</i>	hyssop-leaved boneset	1'-3'	forb	Yes	I	90	All Soils	6.0-8.0	10-60"	dry	High	Medium	High
<i>Festuca arizonica</i>	Arizona fescue	2'	grass	No	None	150	Fine	6.5-7.5	10-16"	Low	Medium	None	Low
<i>Festuca californica</i>	California fescue	4'	grass	No	None	200	Fine, Medium, No Coarse	6.1-7.5	12-20"	Medium	High	Low	High
<i>Festuca idahoensis</i>	Idaho fescue	2'	grass	No	I	130	All Soils	5.6-8.4	12-20"	Medium	Low	None	Medium

*Key to shade tolerance: I = Intermediate; T = Tolerant; None = no shade tolerance/intolerant.

Table G-1. Cont'd.

Species	Common Name	Ht	Plant Type	Vegetative Spread	Shade Tolerance*	Frost Free Days	Soil Texture Type	Soil pH	Precipitation Range	Moisture Use	Drought Tolerance	Salinity Tolerance	Fire Tolerance
<i>Festuca ovina</i>	sheep harding fescue	0.5'	grass	No	I	90	Coarse, Medium, No Fine	5.5-7.5	12-30"	Low	High	None	Medium
<i>Festuca rubra</i>	red fescue	2'	grass	Yes	I	90	Fine, Medium, No Coarse	5.0-7.5	30-70"	Medium	Medium	Low	High
<i>Gaillardia aristata</i>	blanket flower	2'	forb	No	None	100	Coarse, Medium, No Fine	5.5-7.9	16-30"	Medium	Medium	Low	Low
<i>Geum triflorum</i>	prairiesmoke	0.5'-1.5'	forb	No	I	100	All Soils	5.6-7.5	16-40"	Medium	High	Low	Low
<i>Grindelia squarrosa</i>	gumweed	3'	forb	Yes	None	130	Coarse, Medium, No Fine	6.5-8.0	10-40"	low	High	Medium	Low
<i>Helianthus nuttalli</i>	Nuttall sunflower	10'	forb	Yes	None	120	Fine, Medium, No Coarse	5.9-7.5	12-20"	Medium	Low	None	Medium
<i>Helianthus sp.</i>	sunflowers	2'-12'	forb	No	I	80	All Soils	5.5-7.8	12-60"	Medium	Medium	Low	None
<i>Hordeum brachyantherum</i>	meadow barley	2'	grass	No	None	100	All Soils	6.0-8.5	20-80"	Medium	Medium	Medium	High
<i>Koeleria macrantha</i>	junegrass	1.5'	grass	No	T	150	Coarse, Medium, No Fine	6.0-8.0	14-20"	High	High	None	High
<i>Leymus cinereus</i>	basin wildrye	5'	grass	Yes	None	90	All Soils	5.5-9.0	8-20"	High	Medium	High	High
<i>Leymus triticoides</i>	creeping / beardless wildrye	3'	grass	Yes	None	110	Fine, Medium, No Coarse	6.0-9.0	7-60"	High	High	Medium	High
<i>Liatris spicata</i>	purple gayfeather	4.5'	forb	Yes	I	165	Fine, Medium, No Coarse	5.6-7.5	35-60"	Medium	Low	Low	High
<i>Linum perenne</i>	blue flax	1'-2'	forb	No	I	60	Coarse, Medium, No Fine	6.0-8.0	10-30"	Low	Medium	Low	High
<i>Melica californica</i>	oniongrass	4'	grass	Yes	I	240	Coarse, Medium, No Fine	6.0-7.5	14-24"	Low	Medium	None	High
<i>Monarda citriodora</i>	lemon mint	3'	forb	Yes	I	100	All Soils	6.0-8.0	10-30"	Low	High	Medium	Low
<i>Monarda fistulosa</i>	wild bergamont	5'	forb	Yes	T	150	Fine, Medium, No Coarse	6.0-8.0	20-60"	High	Low	Low	None
<i>Muhlenbergia capillaris</i>	muhly grass	3'	grass	No	None	120	All Soils	5.8-6.8	30-90"	High	Low	High	High
<i>Muhlenbergia cuspidata</i>	stonehill muhly	1.5'	grass	No	None	85	Coarse, Medium, No Fine	5.0-6.7	18-40"	Low	High	None	High
<i>Muhlenbergia montana</i>	mountain muhly	1.5'	grass	Yes	None	90	Coarse, Medium, No Fine	6.5-7.5	13-30"	Medium	High	None	Low

*Key to shade tolerance: I = Intermediate; T = Tolerant; None = no shade tolerance/intolerant.

Table G-1. Cont'd.

Species	Common Name	Ht	Plant Type	Vegetative Spread	Shade Tolerance*	Frost Free Days	Soil Texture Type	Soil pH	Precipitation Range	Moisture Use	Drought Tolerance	Salinity Tolerance	Fire Tolerance
<i>Muhlenbergia wrightii</i>	spike muhly	2'	grass	Yes	None	120	Coarse, Medium, No Fine	5.8-7.5	13-17"	Medium	Medium	None	Low
<i>Nessella cernua</i>	Nodding Needle Grass	2.5'	grass	No	none	280	Fine, Medium, No Coarse	5.8-7.2	12-18"	Low	Medium	None	High
<i>Nessella lepida</i>	foothill needlegrass	3'	grass	No	None	300	Fine, Medium, No Coarse	5.8-7.2	12-18"	Low	Medium	None	High
<i>Nessella pulchra</i>	purple needlegrass	3'	grass	No	I	270	All Soils	6.0-7.5	14-40"	Medium	Medium	Low	High
<i>Oenothera speciosa</i>	showy primrose	0.5' - 1.5'	forb	Yes	None	130	Fine, Medium, No Coarse	6.0-8.0	20-40"	Low	Medium	Low	Low
<i>Oryzopsis hymenoides</i>	Indian ricegrass	2'	grass	No	None	90	Coarse, Medium, No Fine	6.6-8.6	6-16"	Low	High	Low	High
<i>Panicum virgatum</i>	switchgrass	5'	grass	Yes	None	120	All Soils	4.5-8.0	12-60"	Medium	Medium	Medium	High
<i>Pascopyrum smithii</i>	western wheatgrass	2'	grass	Yes	None	90	Fine, Medium, No Coarse	4.5-9.0	8-36"	Medium	High	High	High
<i>Pediomelum esculentum</i>	breadroot	1'	forb	No	None	120	Coarse, Medium, No Fine	6.0-8.0	10.0-40"	low	high	low	medium
<i>Penstemon palmeri</i>	Palmer penstemon	3.5'	forb	No	None	140	Coarse, Medium, No Fine	6.0-8.0	6-14"	Low	High	None	High
<i>Phyla nodiflora</i>	turkey tangle fogfruit	0.5'	forb	Yes	T	110	All Soils	6.0-8.5	10-40"	Low	Medium	Medium	None
<i>Poa sandbergii</i>	sandberg bluegrass	1.5'	grass	No	I	90	Coarse, Medium, No Fine	6.0-8.0	8-16"	Low	High	Low	Medium
<i>Poa secunda</i>	Sandberg bluegrass	1.5'	grass	No	T	90	Coarse, Medium, No Fine	6.0-8.0	8-16"	Low	High	Low	Medium
<i>Polygonum pennsylvanicum</i>	Pennsylvania smartweed	4'	forb	No	None	95	All Soils	4.0-8.5	12-60"	Medium	Medium	Low	High
<i>Pseudoroegneria spicata</i>	bluebunch wheatgrass	3'	grass	No	T	90	All Soils	6.6-8.4	8-35"	Low	High	Low	High
<i>Ranunculus rhomboideus</i>	prairie buttercup	rarely 1.5'	forb	No	I	41	All Soils	6.0-8.0	10-50"	Low	High	Medium	High
<i>Ratibida columnifera</i>	Mexican hat coneflower	1'-2'	forb	No	I	90	All Soils	5.9-7.0	16-40"	Medium	Medium	Low	High
<i>Rudbeckia hirta</i>	black-eyed Susan	1'	forb	No	None	150	Fine, Medium, No Coarse	6.0-7.0	28-65"	Medium	Medium	None	Medium
<i>Rudbeckia triloba</i>	black-eyed Susan	2'-5'	forb	No	I	90	medium	<6.8	10-40"	Low	High	None	High
<i>Schizachyrium scoparium</i>	little bluestem	3'	grass	No	None	100	All Soils	5.0-8.5	12-45"	Low	High	None	Medium
<i>Sisyrinchium angustifolium</i>	blue-eyed grass	2'	forb	No	I	180	Fine, Medium, No Coarse	5.0-7.0	32-60"	Medium	Low	None	High

*Key to shade tolerance: I = Intermediate; T = Tolerant; None = no shade tolerance/intolerant.

Table G-1. Cont'd.

Species	Common Name	Ht	Plant Type	Vegetative Spread	Shade Tolerance*	Frost Free Days	Soil Texture Type	Soil pH	Precipitation Range	Moisture Use	Drought Tolerance	Salinity Tolerance	Fire Tolerance
<i>Sisyrinchium campestre</i>	blue-eyed grass	0.5'-1.5'	forb	No	None	90	medium	6.0-8.0	20-40"	Medium	Low	Low	Low
<i>Solidago canadensis</i>	Canada goldenrod	3.5'	forb	Yes	None	80	All Soils	5.0-7.5	16-60"	Medium	Medium	None	High
<i>Solidago odora</i>	sweet goldenrod	2'-4'	forb	No	I	60	Fine, Medium, No Coarse	6.0-8.0	10-30"	Low	High	Low	High
<i>Solidago rigida</i>	stiff goldenrod	1'-5'	forb	No	I	80	Fine, Medium, No Coarse	5.0-7.5	14-60"	Medium	High	None	High
<i>Solidago sp.</i>	goldenrods	1'-5'	forb	Yes	None	90	Coarse, Medium, No Fine	5.5-7.5	12-35"	Low	High	Low	High
<i>Sorghastrum nutans</i>	indiangrass	6'	grass	Yes	None	120	All Soils	5.0-8.0	11-45"	Medium	Medium	Medium	High
<i>Sporobolus cryptandrus</i>	sand dropseed	3'	grass	No	I	150	Coarse, Medium, No Fine	6.6-8.0	8-16"	Low	High	Medium	Medium
<i>Sporobolus heterolepsis</i>	prairie dropseed	2.3'	grass	No	I	100	Coarse, Medium, No Fine	6.0-7.2	20-35"	Low	Medium	None	High
<i>Stipa comata</i>	needle-and-thread	1'-4'	grass	No	None	130	Fine, Medium, No Coarse	6.6-8.4	5-20"	Low	High	None	High
<i>Tridens flavus</i>	purpletop	2.5'	grass	No	None	150	All Soils	4.5-6.5	17-60"	Low	High	None	High
<i>Viola pedata</i>	bird's foot violet	0.5'-1'	forb	No	I	90	Fine, Medium, No Coarse	7.0-8.0	10-30"	Low	High	None	High
<i>Viola sp.</i>	violet species	0.5'-1'	forb	Yes	T	90	Fine, Medium, No Coarse	4.5-9	6-8"	Medium	High	Low	High

*Key to shade tolerance: I = Intermediate; T = Tolerant; None = no shade tolerance/intolerant.

Appendix H

References and Resources

Brindle, F.A. 2003. *Use of Native Vegetation and Biostimulants for Controlling Soil Erosion on Steep Terrain*. Transportation Research Record No. 1819, Volume 1, Eighth International Conference on Low-Volume Roads 2003.

Why do ones below start with "*"?

*Creating Vegetative Designs VegSpec. January 2008. NRCS, USGS, U.S. Army Corps of Engineers (ERDC-CERL), <http://vegspec.sc.egov.usda.gov/vegSpec/index.jsp>

*Daniels, S. 1995. *The Wild Lawn Handbook: Alternatives to the Traditional Front Lawn*. New York, NY: Macmillan USA.

*Daniels, S. 1999. *Easy Lawns: Low Maintenance Native Grasses for Gardeners Everywhere*. 112p. index, illus. New York, NY: Brooklyn Botanic Garden.

Dewey, D.W., P.G. Johnson, and R.K. Kjelogren. 2006. *Effects of Irrigation and Mowing on Species Diversity of Grass and Wildflower Mixtures for the Intermountain West*. Native Plants Journal Fall 2006 Vol #7.3: Indiana University.

Druse, K., and M. Roach. 1994. *The Natural Habitat Garden*. 1st ed. New York: Clarkson Potter.

Forbes, J.C., and R.D. Watson. 1992. *Plants in Agriculture*. Cambridge, MA: Cambridge University Press.

Fraser, J.G., J.E. Anderson. 1980. *Wear Tolerance and Regrowth between Cuttings of Some Grasses Under Two Moisture Levels*. Las Cruces, N.M.: New Mexico State University. Agricultural Experiment Station no. 418.

*Haddock, M.J. 2005. *Wildflowers and Grasses of Kansas: A Field Guide*. Lawrence, KS: University Press of Kansas.

*Haller, K.S. 1994. *Walking with Wildflowers: A Field Guide to the St. Louis Area*. Columbia, MO: University of Missouri Press.

Land Rehabilitation and Maintenance (LRAM). April 2009, <http://sill-www.army.mil/itam/LRAM.htm>

* Denotes sources used to develop native plant species tables in Appendices B through G.

PWTB 200-1-70
01 August 2010

*Maddox, V.L., J.M. Goatley Jr., H.W. Philley, J.V. Krans, B.R. Stewart, and D.W. Wells. 2003. *Evaluation of Native Grass Cultivars for Mississippi Golf Course Natural Areas under Variable Management*. Part I-Soil pH of 5.2. Bulletin 1132. Mississippi Agriculture & Forestry Experiment Station, Office of Agriculture Communications, a unit of the Division of Agriculture, Forestry, and Veterinary Medicine at Mississippi State University.

*Maddox, V.L., J.M. Goatley Jr., H.W. Philley, J.V. Krans, B.R. Stewart, and D.W. Wells. 2004. *Evaluation of Native Grass Cultivars for Mississippi Golf Course Natural Areas under Variable Management*. Part II-Soil pH of 6.5. Bulletin 1137. Mississippi Agriculture & Forestry Experiment Station, Office of Agriculture Communications, a unit of the Division of Agriculture, Forestry, and Veterinary Medicine at Mississippi State University.

Masters, R.A., and R.L. Sheley. 2001. *Invited synthesis paper: Principles and practices for managing rangeland invasive plants*. *J. Range Manage*, 54:502-517.

*McClain, W.E. 2003. *Prairie Establishment and Landscaping*. Technical Publication #2. Revised edition. Springfield, IL: Division of Natural Heritage. Illinois Department of Natural Resources.

Miller, C.F., and J.A. Dickerson. November 1999. *The Use of Native Warm Season Grasses for Critical Area Stabilization*. Proceedings of the 2nd Eastern Native Grass Symposium, Baltimore, MD.

*Mintenko, A.S., S.R. Smith, and D.J. Cattani. Nov-Dec 2002. Turfgrass evaluation of native grasses for the northern great plains region. *Crop Science* 42(6):2018-2024.

Moyes, A.B., M.S. Witter, and J.A. Gamon. 2005. Restoration of native perennials in a California annual grassland after prescribed spring burning and solarization. *Restoration Ecology* 13(4).

*Munz, P.A., P.M. Faber, D. Lake, and P.A. Munz. 2003. *Introduction to Shore Wildflowers of California, Oregon, and Washington*. California natural history guides. rev. ed. Vol. 67. Berkeley: University of California Press.

Natural Resources Conservation Service (NRCS). April 2008, <http://www.nrcs.usda.gov>

* Denotes sources used to develop native plant species tables in Appendices B through G.

PWTB 200-1-70
01 August 2010

- *Newcomb, L. 1977. *Newcomb's Wildflower Guide: An Ingenious New Key System for Quick, Positive Field Identification of the Wildflowers, Flowering Shrubs and Vines of Northeastern and North Central North America* [Wildflower guide]. 1st ed. Boston: Little, Brown.
- *Packard, S., and C.F. Mutel (editors). 2005. *The Tallgrass Restoration Handbook for Prairies, Savannas, and Woodlands*. First Island Press edition 1997, Science and Practice of Ecology Restoration series edition 2005.
- *Palazzo, A.J., K.B. Jensen, B.L. Waldron, T.J. Cary. Jul-Oct 2005. Effects of tank tracking on range grasses. *Journal of Terramechanics* 42(3-4):177-191.
- Palazzo, A.J., S.E. Hardy, and K.B. Jensen. 2003. *Improved Native Grasses and Establishment Methods for use on Military Training Lands*. ERDC/CRREL TR-03-20. Hanover, NH: U.S. Army Engineer Research and Development Center, <http://www.crrel.usace.army.mil/techpub/CRREL%5FReports/reports/TR03-20.pdf>
- *Plant Finder, Kemper Center for Home Gardening. March 2008. Missouri Botanical Garden <http://www.mobot.org/gardeninghelp/plantfinder/Search.asp>
- Roadside Use of Native Plants. *1998 Revised Guidance for the Native Wildflower Planting Requirement*. December 2007. Washington, DC: United States Department of Transportation, Federal Highway Administration, http://www.fhwa.dot.gov/environment/rdsduse/rdus3_1.htm
- *Shaw, R.J. 1995. *Utah Wildflowers: A Field Guide to Northern and Central Mountains and Valleys*. Logan, UT: Utah State University Press.
- Sheley, R.L., J.M. Mangold, and J.L. Anderson. 2006. *Potential for Successional Theory To Guide Restoration of Invasive-Plant-Dominated Rangeland*. Ecological Monographs, USDA-ARS 365-379. Eastern Oregon Agricultural Research Center.
- *Stubbendieck, J.L., S.L. Hatch, L.M. Landholt, and J.L. Stubbendieck. 2003. *North American Wildland Plants: A Field Guide*. Lincoln, NE: University of Nebraska Press.
- The Nature Conservancy (TNC). 2009. <http://www.nature.org/>

* Denotes sources used to develop native plant species tables in Appendices B through G.

PWTB 200-1-70
01 August 2010

- *U.S. Department of Agriculture, Natural Resources Conservation Service. December 2007. The PLANTS Database. Baton Rouge, LA: National Plant Data Center,
<http://plants.usda.gov>
- U.S. Army Corps of Engineers. 2008.
<http://www.nww.usace.army.mil/>
- U.S. Army Engineer Research and Development Center (ERDC). April 2008,
http://www.erdcpub.usace.army.mil/pls/erdcpub/www_welcome.navigation_page?tmp_next_page=2364539
- USDA Plant Hardiness Zone Map, USDA Hardiness Zones and Average Annual Minimum Temperature Range. January 2008. The United States National Arboretum,
<http://www.usna.usda.gov/Hardzone/hrdzon3.html>,
<http://www.usna.usda.gov/Hardzone/ushzmap.html>
- *Vance, F.R. 1999. *Wildflowers of the northern great plains*. 3rd ed. Minneapolis, MN: University of Minnesota Press.
- Warm Season Grass (WSG) Vs. Cool Season Grass (CSG). January 2008,
<http://www.stockseed.com/prairiegrasses-wsg-vs-csg.asp>
- *Weston, J. *Using Native Plants in the Golf Course Landscape*. December 2007. Reprinted from the USGA Green Section Record January/February 1990. 28(1):12-16,
http://www.usga.org/turf/articles/management/bunkers/using_native_plants.html

* Denotes sources used to develop native plant species tables in Appendices B through G.

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