VEGETATION APPENDIX

INTRODUCTION

This appendix contains in-depth information for vegetation resources and management in the planning area. Information includes datum sources used in this plan and special status plant species in the planning area. This appendix also identifies the priority areas for invasive species management within the Miles City Field Office (MCFO).

DATUM SOURCES

For this resource management plan (RMP), geographic information system analysis of existing vegetation on lands administered by the Bureau of Land Management (BLM) was performed using an existing vegetation layer published by the Landscape Fire and Resource Management Planning Tools Project (LANDFIRE) (USFS and USDI 2007). The remainder of this appendix describes the origins and structure of the data layer used.

LANDFIRE is a 5-year, multi-partner project developed to consistently and comprehensively describe and map vegetation, wildland fuel, and fire regimes across the United States. This project is supported by the United States Department of Agriculture Forest Service Office of Fire and Aviation Management, the United States Department of Interior Office of Wildland Fire Coordination, and The Nature Conservancy.

Data mapped by the LANDFIRE Project is produced based on peer-reviewed science from the fields of remote sensing, ecosystem simulation, vegetation and disturbance ecology, predictive landscape mapping, landscape simulation, and fire behavior and effects modeling. Data products from this project are designed to facilitate national- and regional-level strategic planning and reporting of wildland fire management activities and are created as 30-meter grid spatial resolution raster data sets.

The LANDFIRE existing vegetation layers describe the following elements of existing vegetation for each LANDFIRE mapping zone: existing vegetation type, existing vegetation canopy cover, and existing vegetation height. Vegetation is mapped using predictive landscape models based on extensive field reference data, satellite imagery, biophysical gradient layers, and classification and regression trees.

The existing vegetation layer represents the current distribution of the terrestrial ecological systems classification developed by NatureServe for the western hemisphere (Corner et al. 2003). Individual existing vegetation types are mapped in LANDFIRE using decision tree models, field reference data, LandSat imagery, digital elevation model data, and biophysical gradient data.

The existing vegetation types have been cross-walked to existing vegetation classifications. These attributes are provided to help characterize and describe the existing vegetation types on a nationwide basis in terms of these existing vegetation classifications. The division, macrogroup, and group attributes are based on the Federal Geographic Data Committee Vegetation Subcommittee's vegetation classification standard and pertain to upper physiognomic levels of the National Vegetation Classification System (NVCS) hierarchy.

Division describes the dominant life forms (tree, shrub, dwarf shrub, herbaceous, or nonvascular) within the Vegetated Division of the hierarchy. Macrogroup describes the level in the classification hierarchy defined by the relative percent canopy cover of the tree, shrub, dwarf shrub, herb, and nonvascular life form in the uppermost strata during the peak of the growing season. Group describes the predominant leaf phenology of classes defined by tree, shrub, or dwarf shrub stratum (evergreen, deciduous, mixed evergreen-deciduous), and the average vegetation height for the herbaceous stratum (tall, medium, or short).

The LANDFIRE existing vegetation data layer obtained from the project has been updated at the MCFO for some site-specific conditions. A new attribute has been created to facilitate the Woody Ravines in Eastern Montana. Areas in Garfield County have also been validated by MCFO foresters.

Table 1 lists the existing vegetation types as mapped by the LANDFIRE Project on BLM-administered lands within the planning area. These types are sorted by NVCS order, class, and subclass. NVCS order was used to map and analyze vegetation classifications for this RMP.

TABLE 1.
EXISTING NVCS VEGETATION CLASSIFICATIONS FOUND ON BLM-ADMINISTERED LANDS WITHIN THE PLANNING AREA

NVCS Division	NVCS MacroGroup	NVCS Group	Existing Vegetation Type
Great Plains Grassland and Shrubland	Great Plains Mixedgrass Prairie and Shrubland	Northern Great Plains Mixedgrass Mesic Prairie Group	*Andropogon gerardii*
			Festuca idahoensis
			Hesperostipa curtiseta
			Pascopyrum smithii – Bouteloua gracilis
			Pascopyrum smithii
			Prunus virginiana
			Pseudoroegneria spicata – Bouteloua curtipendula
			Pseudoroegneria spicata – Bouteloua gracilis
			Pseudoroegneria spicata – Pascopyrum smithii
			Schizachyrium scoparium – Bouteloua (curtipendula, gracilis)
			Schizachyrium scoparium – Carex inops ssp. Heliophila
Great Plains Grassland and Shrubland	Great Plains Mixedgrass Prairie and Shrubland	Northern Great Plains Mixedgrass Dry Prairie Group	*Hesperostipa comata – Bouteloua gracilis*
			Hesperostipa comata – Carex filifolia
			Hesperostipa comate – Carex inops ssp.
			Hesperostipa curtiseta
			Juniperus horizontalis/Carex inops ssp.
			Juniperus horizontalis/Schizachyrium scoparium
			Rhus trilobata/Carex filifolia
			Rhus trilobata. Schizachyrium scoparium
			Schizachyrium scoparium – Bouteloua curtipendula
Western North American Cool Temperate Forest	Northern Rocky Mountain Lower Montane and Foothill Forest	Northwestern Great Plains-Black Hills Ponderosa Pine Forest and Woodland Group	*Pinus ponderosa/(Andropogon gerardii, Schizachyrium scoparium)* Woodland
			Pinus ponderosa/Juniperus communis Woodland
			Pinus ponderosa/Juniperus horizontalis Woodland
			Populus tremuloides/Prunus virginiana Forest
		Northern Rocky Mountain Ponderosa Pine Woodland and Savanna	*Pinus Ponderosa/Festuca idahoensis* Woodland
			Pinus ponderosa/Symphoricarpos albus Forest
Great Plains Cliff, Scree and Rock Vegetation	Great Plains Badlands Vegetation	Great Plains Badlands Vegetation Group	*Eriogonum pauciflorum – Gutierrezia sarothrae*
			Eroding Great Plains Badlands Sparse Vegetation
			Sarcobatus vermiculatus/Pseudoroegneria spicata Shrubland

SPECIAL STATUS SPECIES PLANTS

LAWS, REGULATIONS, AND POLICIES

Special status plant species management on BLM-administered land is authorized under and directed by the following laws, mandates, and guidance:

- Federal Land Policy and Management Act of 1976, as amended;
- Endangered Species Act of 1973, as amended;
- National Environmental Policy Act of 1969, as amended;
- Title 43, Code of Federal Regulations, Parts 24, 1610 and 4180;
- BLM Manual 6500 and 6840; and
- National and Montana BLM Policy.

BLM SENSITIVE SPECIES

The Montana Natural Heritage Program (MNHP) maintains the statewide rare plant database for the state of Montana. In 2006, the Montana Fish, Wildlife, and Parks (MFWP) and MNHP reported 3 BLM sensitive and 40 watch plant species of concern occurring in the planning area (Table 2). However, no federally listed, proposed, or candidate plants occur in the area (USFWS 2011). Detailed surveys were conducted in selected areas in Rosebud (Barton and Crispin 2003), Big Horn (Carlson and Cooper 2003), and Powder River (Heidel et al. 2002) counties, and researchers recorded no special status plant species in these areas.

Information on the three BLM sensitive species known to occur in the planning area is found below.

GEYER'S MILKVETCH

In eastern Montana, Geyer's milkvetch occurs only in the Hell Creek Recreation Area and the Charles M. Russell National Wildlife Refuge. It grows on sandy outcrops and terraces. In the Hell Creek Recreation Area, it occurs in very early, unstable successional habitat dominated by prairie sandreed (*Calamovilfa longifolia*) and Indian rice grass (*Oryzopsis hymenoides*). In the Charles M. Russell National Wildlife refuge, Geyer's milkvetch grows on outcrops of Fox Hill sandstone along the shores of Fort Peck Reservoir (MFWP and MNHP 2006). It is adapted to moderate levels of disturbance, but it may be affected by encroachment of nonnative annuals.

CRAWE'S SEDGE

Crawe's sedge has been documented from only one county in eastern Montana in Prairie County. This plant usually occurs in early successional riparian habitats that are occasionally flooded. Its response to livestock grazing or trampling is unknown. Crowe's sedge is a wetland plant and may be susceptible to hydrological changes.

BUR OAK

Bur oak is restricted in Montana to a single, but relatively large, occurrence in southern Carter County. It occurs on east-southeast trending bentonitic shale ridges and on alluvial terraces along the Thompson Creek tributary of the Little Missouri River (MFWP and MNHP 2006). Stands are generally open with native annuals and sedges or introduced grasses. Bur oak is fire resistant, and fire suppression may be reducing bur oak recruitment. Grazing of root sprouts and weeds may also reduce bur oak reproduction (MFWP and MNHP 2006).

TABLE 2.
BLM SPECIAL STATUS PLANTS IN THE PLANNING AREA

Common Name	Scientific Name	Habitat Description	BLM Status	Counties of Occurrence
Lead plant	*Amorpha canescens*	Habitats include mesic to dry black soil prairies, sand prairies, gravel prairies, and hill prairies.	Watch	Carter, Rosebud
Ovalleaf milkweed	*Asclepias ovalifolia*	Open pine woodland in seasonally moist meadow	Watch	Carter, Sheridan
Narrowleaf milkweed	*Asclepias stenophylla*	Sandy soils of prairies and open pine woodland	Watch	Carter, Rosebud
Sweetwater milkvetch	*Astragalus aretioides*	Openings of Douglas-fir, exposed ridges and slopes, and foothills and mountain zone	Watch	Big Horn
Barr's milkvetch	*Astragalus barrii*	Sparsely vegetated knobs and buttes with dry, fine-textured, often calcareous soils	Watch	Big Horn, Carter, Powder River, Rosebud
Geyer's milkvetch	*Astragalus geyeri*	Loose, sandy soils, primarily in sandy alluvial plains and terraces	Sensitive	Garfield
Roundleaf water-hyssop	*Bacopa rotundifolia*	Muddy shores of ponds and streams in the valleys and on plains	Watch	Garfield
Crawe's sedge	*Carex crawei*	Wet, gravelly, or sandy soil along streams or pond margins in valleys and mountain foothills	Sensitive	Prairie
Pregnant sedge	*Carex gravida*	Green ash ravines and wooded draws	Watch	Big Horn, Powder River, Rosebud
New jersey tea	*Ceanothus herbaceus*	Open pine forests of hills and plains	Watch	Powder River
Bittersweet	*Celastrus scandens*	Riparian woodlands and thickets on the plains	Watch	Dawson
Chaffweed	*Centunculus minimus*	Vernally wet, sparsely vegetated soil around ponds and along streams in valleys and on plains	Watch	Sheridan
Birchleaf mountain-mahogany	*Cercocarpus montanus var. glaber*	Open slopes and breaks on plains	Watch	Treasure
Smooth goosefoot	*Chenopodium subglabrum*	Early successional, sparsely vegetated habitats in sand dunes and river sandbars or sandy terraces	Watch	Carter, Powder River, Sheridan
Yellow bee plant	*Cleome lutea*	Open, often sandy soil of sagebrush steppe in valleys	Watch	Big Horn
Fendler cat's-eye	*Cryptantha fendleri*	Open areas of sand dunes in sandhill areas	Watch	Sheridan

TABLE 2.
BLM SPECIAL STATUS PLANTS IN THE PLANNING AREA

Common Name	Scientific Name	Habitat Description	BLM Status	Counties of Occurrence
Schweinitz' flatsedge	*Cyperus schweinitzii*	Sparsely vegetated sand dunes on plains	Watch	Carter, Powder River, Sheridan
Nine-anther dalea	*Dalea enneandra*	Gravelly grassland slopes on plains	Watch	Richland, Rosebud
Silky Prairie clover	*Dalea villosa*	Loose sand of sand dunes or eroded from sandstone crops	Watch	Carter, Richland, Sheridan
Scribner's panic grass	*Dichanthelium oligosanthes var. scribnerianum*	*Pinus ponderosa/Mahonia repens* habitat at upper end of draws	Watch	Powder River
Visher's buckwheat	*Eriogonum visheri*	Barren, sedimentary rock outcrops; alluvium from those outcrops; and small exposures of soil substrates in badlands topography	Watch	Carter
Joe-pye weed	*Eupatorium maculatum*	Moist meadows, springs, margins of spring-fed streams, and swamp thickets	Watch	Big Horn
Nuttall desert-parsley	*Lomatium nuttallii*	Open, rocky, mid and lower slopes on sandstone, siltstone, or clayey shale from about 3,400- to 7,200-foot elevation	Watch	Big Horn, Rosebud
Bractless mentzelia	*Mentzelia nuda*	Sandy or gravelly soil of open hills and roadsides on plains	Watch	Dawson, Powder River, Roosevelt, Rosebud
Dwarf mentzelia	*Mentzelia pumila*	Open, usually sandy soil in desert shrubland and woodland	Watch	Big Horn
Blue toadflax	*Nuttallanthus texanus*	Open, sandy, or acid shale soils of grasslands and woodlands on the plains	Watch	Carter, Dawson
Narrowleaf penstemon	*Penstemon angustifolius*	Sandy grasslands on plains	Watch	Carter
Hot Spring phacelia	*Phacelia thermalis*	Widely varying habitats in open to partially wooded settings	Watch	Garfield
Plains phlox	*Phlox andicola*	Sandy soils in grasslands and ponderosa pine woodland	Watch	
Mealy primrose	*Primula incana*	Wet meadow habitats with relatively stable water	Watch	Sheridan

TABLE 2.
BLM SPECIAL STATUS PLANTS IN THE PLANNING AREA

Common Name	Scientific Name	Habitat Description	BLM Status	Counties of Occurrence
		tables		
Dwarf woolly-heads	*Psilocarphus brevissimus*	Drying mud of ponds and other vernally wet soil in valleys and on plains	Watch	Rosebud
Bur oak	*Quercus macrocarpa*	On bentonitic shale ridges trending WNW to ESE; also at alluvial terraces along Thompson Creek tributary of Little Missouri River	Sensitive	Carter
Persistent-sepal Yellow-cress	*Rorippa calycina*	Sparsely vegetated, moist sandy to muddy banks of streams, stock ponds, and man-made reservoirs near high water line	Watch	Big Horn, McCone, Rosebud, Treasure
Few-flowered goldenrod	*Solidago sparsiflora*	Sandy, well-drained soils of unglaciated broken and rolling plains in variety of semi-open settings	Watch	Garfield
Slender wedgegrass	*Sphenopholis intermedia*	Wet areas in valleys or foothills	Watch	Big Horn
Longleaf dropseed	*Sporobolus asper*	Open forests and grasslands on plains	Watch	Carter
Wyoming sullivantia	*Sullivantia hapemanii*	Calcareous rock walls and bounders at springs, waterfalls, and streambanks	Watch	Big Horn

INVASIVE SPECIES TREATMENT

Priority Treatment Areas for Invasive Species: Using Early Detection Rapid Response, treatment areas would be prioritized in publicly accessible areas due to higher traffic use that increase the potential spread of invasive species. Riparian areas are also an area of higher priority due to the constant seed source from the water movement. It is imperative to control invasive species in these areas to eliminate infestations from appearing further down river. Emergency stabilization and rehabilitation areas are important areas to eliminate weed infestations due to the disturbances that are created from wildland fires. These disturbances open a window of opportunity to treat infestations that were previously occurring and are now weakened from the fire activity. Another priority area is special status species habitat areas. These areas are important to maintain in order for wildlife to flourish in their natural habitat.

CHEATGRASS

Cheatgrass invasion and subsequent effects to wildfire frequency and severity and related sagebrush habitats is not considered a threat in the MCFO. Although cheatgrass occurs within the MCFO, healthy northern mixed-grass prairie plant communities have demonstrated resiliency to cheatgrass expansion. This resiliency has been illustrated by researchers at USDA's Agricultural Research Service at Fort Keogh in Miles City. Haferkamp (2001) studying annual bromes including cheatgrass in eastern Montana, anticipates no ecological shift of northern mixed-grass prairies toward annual grass dominance. Amount and abundance of annual bromes occurring on Northern Great Plains rangeland is cyclic, depending on seedbank, temperature, and amount and distribution of precipitation, (Haferkamp, 2001). He goes on to say expansion of annual bromes in mixed–grass prairie communities is buffered by two long-lived perennial grasses (western wheatgrass and blue grama), especially where grazing management maintains healthy native mixed-grass prairie vegetation. Vermeire et al. (2011) studied effects of fire on perennial and annual grasses (including cheatgrass) and found increased production of western wheatgrass and decreased annual grass production following summer fire in the northern mixed-grass prairie.

Climate change modeling by Bradley (2009) contrasts the maximum potential future cheatgrass expansion scenario with maximum potential future contraction scenario to illustrate and highlight the uncertainty in atmospheric-ocean general circulation models. Bradley's models show, depending primarily on future precipitation conditions, suitable land area for cheatgrass expansion could increase by as much as 45% or decrease by as much as 70% by 2100. The maximum area shown encompasses a large swath of Montana and approximately 50% of the MCFO, however Bradley's median precipitation change scenario (used to identify the most likely future climate change) depicts no increase in cheatgrass climatic habitat within the MCFO.

This page left intentionally blank.