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VEGETATION APPENDIX



# VEGETATION APPENDIX

## Habitat Types and Biological Diversity

The land classification system developed by the University of Montana, Montana Gap Analysis Project (MT-GAP), was used to estimate acreages listed for this Appendix (Fisher et al. 1998).

### Grasslands

Grasslands cover approximately 7.9 million acres of the 13-county CBNG Planning Area. Of this acreage, 2.6 million acres are underlain by subbituminous or bituminous coal deposits. Grasslands are divided into five types (see Table VEG-1). Species richness data for these types are provided.

**Altered herbaceous habitats** include grasslands with 30 percent or more cover from introduced species and/or noxious weed species such as thistle (*Cirsium* spp.), cheat grass (*Bromus tectorum*), Japanese brome (*B. japonicus*), spotted knapweed (*Centaurea maculosa*), crested wheatgrass (*Agropyron cristatum*) or yellow sweetclover (*Melilotus officinalis*). Total herbaceous cover ranges from 20 to 80 percent on these sites, which are usually associated with disturbance and can have bare ground coverages in the 10 to 50 percent range (Fisher et al. 1998).

**Very Low Cover Grasslands** are semi-desert grasslands with total grass cover of 10 to 30 percent. They are dominated by short grasses and forbs such as blue grama (*Bouteloua gracilis*). These grasslands typically have a high amount of bare soil (20 to 60 percent) (Fisher et al. 1998).

**Low to Moderate Cover Grasslands** are the most abundant grassland type in Montana. They are the category that has the greatest potential for impact from CBM extraction (see Table VEG-1). Total grass coverages on these sites range from 20 to 70 percent and are dominated by short- to medium-height grasses and forbs, such as blue grama, green needlegrass (*Stipa viridula*), Idaho fescue (*Festuca idahoensis*), lupine (*Lupinus* spp.), arrowleaf balsamroot (*Balsamorhiza sagittata*), and bluebunch wheatgrass (*Agropyron spicatum*) (Fisher et al. 1998).

**Moderate to High Cover Grasslands** are dominated by medium to tall grass species, such as bluebunch wheatgrass, green needlegrass, big bluestem (*Andropogon gerardii*), switchgrass (*Panicum virgatum*), little bluestem (*Andropogon scoparium*),

and needle and thread (*Stipa comata*). Grass coverage on these grasslands ranges from 50 to 100 percent (Fisher et al. 1998).

**Montane Parklands and Subalpine Meadows** are the final type of grasslands classification for Montana lands. Total herbaceous cover in these moist locations can range from 30 to 100 percent and are dominated by species such as beargrass (*Xerophyllum tenax*), several species of sedge (*Carex* spp.), pinegrass (*Calamagrostis rubescens*), arnica (*Arnica* spp.), and subalpine daisy (*Erigeron peregrinus*) (Fisher et al. 1998).

### Shrublands

Of the 4.8 million acres designated as shrubland in the CBNG Planning Area, approximately 1.7 million acres are underlain by bituminous coal deposits. Shrublands in Montana are divided into seven categories: Mixed Mesic Shrubs, Mixed Xeric Shrubs, Silver Sage, Salt-Desert Shrubs, Mesic-Grassland Shrubs, Xeric-Grassland Shrubs, and Sagebrush (see Table VEG-2).

**Mixed Mesic Shrub** sites are characterized by 20 to 100 percent shrub cover. Dominant shrubs on these sites are alder (*Alnus* spp.), ceanothus (*Ceanothus* spp.), huckleberry (*Vaccinium* spp.), ninebark (*Physocarpus malvaceus*), snowberry (*Symphoricarpos* spp.), and western serviceberry (*Amelanchier alnifolia*).

**Mixed Xeric Shrub** sites are characterized by shrub cover ranging from 20 to 50 percent. Dominant shrubs for this type are bitterbrush (*Purshia tridentata*), creeping juniper (*Juniperus horizontalis*), greasewood (*Sarcobatus* spp.), mountain mahogany (*Cercocarpus* spp.), and rabbitbrush (*Chrysothamnus* spp.). Associated grass species cover from 5 to 40 percent of these sites and are predominantly bluebunch wheatgrass, blue grama, Idaho fescue, and western wheatgrass (*Agropyron smithii*).

**Silver Sage** sites are dominated by silver sage (*Artemisia cana*). This alkali-tolerant species is most abundant in the northeastern part of Montana on moist sites near riparian areas.

**Salt-Desert Shrub and Dry Salt Flat** sites are dominated by Saltsage (*Atriplex nuttallii*) at 10 to 40 percent cover. These sites are usually underlain by alkali-affected soils in dry, sandy, or saline-seep areas. Species associated with these sites are blue grama, Sandberg's bluegrass (*Poa secunda*), and threadleaf sedge (*Carex filifolia*). It occurs mainly in eastern and southeastern Montana.

**Mesic Shrub-Grassland Associations** are shrublands with co-dominance between shrubs and grasses that together cover 10 to 50 percent of the site. These are moist, ecotonal areas between shrub-dominated and grass-dominated sites. The grass and shrub species are those found in the respective classes that make up the association.

**Xeric Shrub-Grassland Associations** are shrublands with a co-dominance of xeric shrubs and grass species in the ecotone between grass- and xeric shrub-dominated sites with the same dominant species as those types. Cover of both shrubs and grasses on these sites range from 10 to 50 percent.

**Sagebrush** shrubland sites are dominated by big sagebrush (*Artemisia tridentata* spp. *tridentata*, *vaseyana*, and *wyomingensis*) and black sagebrush (*Artemisia nova*) at 20 to 80 percent cover. These are associated with the same grass species listed under the Mixed Xeric Shrub habitat type. Sagebrush shrublands are particularly characteristic of the counties that make up the CBNG Planning Area where more than 33 percent (1.6 million acres) of shrublands fall within this category (Fisher et al. 1998).

## Forests

Of the 2.8 million acres classified as forest in the CBNG Planning Area, almost 1.3 million acres are underlain by subbituminous or bituminous coal deposits. The acreages underlain with these coal beds within each forest type in the 13 counties affected by this project are given in Table VEG-3.

## Riparian Areas

Riparian areas cover about 1.0 million acres within the CBNG Planning Area. Almost 270,000 acres are underlain by subbituminous or bituminous coal beds.

Table VEG-4 gives the breakdown by type for riparian areas in the project area that are underlain by coal beds. The types with the most acreage are in the Graminoid and Forb and the Shrub categories.

**Graminoid and Forb Riparian** areas are characterized by herbaceous species at 30 to 100 percent cover and less than 15 percent cover of shrubs and trees. Standing water may be present in areas with cattail marshes. Plant species associated with this type are sedges (*Carex* spp.), cattails (*Typha* spp.), reedgrass (*Calamagrostis* spp.), rushes (*Juncus* spp.), saxifrage (*Saxifraga* spp.), and tufted hairgrass (*Deschampsia caespitosa*).

**Shrub Riparian** sites are dominated by shrub cover at 20 to 100 percent and tree cover at less than 15 percent. Standing water may be present in willow marshes in this category. Shrub species potentially present on shrub-dominated sites include alder (*Alnus* spp.), black hawthorn (*Crataegus douglasii*), birch (*Betula* spp.), currant (*Ribes* spp.), red-osier dogwood (*Cornus stolonifera*), rose (*Rosa* spp.), shrubby cinquefoil (*Potentilla fruticosa*), snowberry (*Symphoricarpos* spp.), thimbleberry (*Rubus parviflorum*), twinberry (*Lonicera involucrata*), Utah honeysuckle (*Lonicera utahensis*), and willows (*Salix* spp.) (Fisher et al. 1998).

## Barren Lands

Table VEG-5 shows that one classification, Badlands, has a significant number of species associated with it.

## Additional Tables

Additional Tables within this appendix include Tables VEG-6, VEG-7 and VEG-8; Table VEG-6 shows critically imperiled plant species in the state with potential habitat in the CBNG Planning Area, Table VEG-7 shows noxious weeds found in the state, and Table VEG-8 indicates plant species of special concern by county within the project area.

**TABLE VEG-1  
GRASSLAND TYPES AND ASSOCIATED WILDLIFE DIVERSITY**

<b>Grassland Types</b>	<b>Total Acres In Project Area With Underlying Subbituminous or Bituminous Coal Beds</b>	<b>Distribution</b>	<b>Species Richness*</b>
Altered Herbaceous Habitats	36,969	Found throughout Montana, but most concentrated in the northeastern part of the state.	66
Very Low Cover Grasslands	202,556	Associated with alkaline soils or with disturbance.	68
Low to Moderate Cover Grasslands	2,170,236	Occurs across the state in valleys and foothills and on south aspects in the mountains.	78
Moderate to High Cover Grasslands	141,856	Associated with wet sites primarily in the valleys of central and eastern Montana.	72
Montane Parklands and Subalpine Meadows	7,323	Found at mid- to upper elevations either within forests or above timberline.	62

\*Mean number of native terrestrial vertebrates species predicted by habitat type (Fisher et al. 1998). Species richness estimates are simple species counts and not intended to imply that areas with fewer species are not as important as areas with larger numbers of species.

**TABLE VEG-2  
SHRUBLAND TYPES AND ASSOCIATED DISTRIBUTION AND SPECIES RICHNESS**

Shrubland Types	Total Acres In Project Area With Underlying Subbituminous or Bituminous Coal Beds	Distribution	Species Richness*
Mixed Mesic Shrub	175,171	Found in western Montana and in draws or north slopes in eastern Montana	63
Mixed Xeric Shrub	668,043	Occur on dry rocky sites in valleys and low elevation mountain slopes.	75
Silver Sage	3,310	Primarily found in northeastern Montana on moist sites near riparian areas.	61
Salt-Desert Shrub and Dry Salt Flat	45,920	Usually associated with alkaline sites or blowouts in dry, sandy, or saline-seep areas in eastern Montana.	29
Sagebrush	525,753	Occur across the state in valleys and low- to mid-elevational mountain slopes.	74
Mesic Shrub-Grassland Associations	116,813	Found in central and eastern Montana valleys and some low mountain slope areas in moist ecotonal areas between shrub-dominated and grass-dominated sites.	75
Xeric Shrub-Grassland Associations	123,046	Occur primarily in eastern and central Montana valleys and some low mountain slopes on dry sites in valleys, in the ecotone between grass and xeric shrub dominated sites.	85

\*Mean number of native terrestrial vertebrates species predicted by habitat type for Montana (Fisher et al. 1998).

**TABLE VEG-3  
FOREST TYPES IN THE PROJECT AREA UNDERLAIN BY COAL BEDS**

<b>Forest Type</b>	<b>Total Acres In Project Area With Underlying Subbituminous or Bituminous Coal Beds</b>	<b>Distribution</b>	<b>Species Richness*</b>
Douglas-fir ( <i>Pseudotsuga menziesii</i> )	16,726	Occurs across the state, except for the northeastern corner, but primarily found in western and south-central Montana.	77
Douglas-fir with Lodgepole Pine	228	Occurs in western and south-central Montana on mid-upper elevational slopes.	72
Limber Pine ( <i>Pinus flexilis</i> )	4,838	Dry forest sites at lower elevations in central Montana and at higher elevations on limestone soils in central and eastern Montana.	53
Lodgepole Pine ( <i>Pinus contorta</i> )	781	Occurs primarily in western and south-central Montana in mountainous regions at cooler, mid-high elevations.	65
Low Density Xeric Forest	303,312	Occurs primarily in eastern Montana on low hills on the edge of grasslands.	83
Mixed Broadleaf Forest	54,241	Occurs across the state, primarily in moist forest areas or near riparian areas or woody draws.	90
Mixed Broadleaf & Conifer Forest	27,761	Occurs across the state, primarily in moist forest areas, near riparian areas or in woody draws.	82
Mixed Subalpine Forest	643	Occurs at mid-high elevations in western and south-central Montana, usually on north, east, and northwest aspects.	67
Mixed Whitebark Pine Forest	10	Occurs in high elevation forest stands at or near tree line in western and south-central Montana.	39
Mixed Xeric Forest	24,910	Occurs at low-mid elevations on dry forest sites in western Montana.	76
Ponderosa Pine	840,850	Occurs across the state, except in northeastern Montana at lower elevations on dry forest sites.	79
Rocky Mountain Juniper ( <i>Juniperus scopulorum</i> )	3,984	Occurs primarily in central and eastern Montana on dry forest sites.	58
Standing Burnt Forest	2,099	Occurs across the state in forested areas and includes only stands that have burned in the 5 years prior to 1998.	63
Utah Juniper ( <i>Juniperus osteosperma</i> )	4,953	Occurs primarily in central and eastern Montana on dry forest sites, particularly in Carbon County.	70

\*Mean number of native terrestrial vertebrate species predicted by habitat type (Fisher et al. 1998).

**TABLE VEG-4  
RIPARIAN AREAS IN THE PROJECT AREA UNDERLAIN BY COAL BEDS**

<b>Riparian Types</b>	<b>Total Acres In Project Area With Underlying Subbituminous or Bituminous Coal Beds</b>	<b>Distribution</b>	<b>Species Richness*</b>
Conifer	138	Occurs in riparian areas in western and south-central Montana.	114
Broadleaf	36,797	Occurs in riparian areas across Montana.	123
Mixed Broadleaf & Conifer	6,131	Occurs in riparian areas of western and south-central Montana.	134
Graminoid & Forb	114,397	Occurs across the state.	72
Mixed Riparian	30,411	Occurs across the state	104
Shrub	80,233	Occurs across the state.	110

\*Mean number of native terrestrial vertebrate species predicted by habitat type (Fisher et al. 1998).

**TABLE VEG-5  
BARREN LANDS**

<b>Barren Lands</b>	<b>Total Acres In Project Area With Underlying Subbituminous or Bituminous Coal Beds</b>	<b>Distribution</b>	<b>Species Richness*</b>
Badlands	208,766	Occurs primarily in central and eastern Montana on sites where bare soil or rock is the dominant cover. Patches of grass or shrubs total less than 10 percent cover. Tree canopy is less than 10 percent on treed sites.	48
Mines, Quarries, Gravel Pits	15,247	Occurs across Montana and are as named.	13
Mixed Barren Sites	48,150	Occurs across the state where live vegetation provides less than 10 percent cover.	17
Rock	24,563	Exposed rock, cliffs, talus slopes, or scree fields across the state.	14

\*Mean number of native terrestrial vertebrate species predicted by habitat type (Fisher et al. 1998).

**TABLE VEG-6**  
**STATE OF MONTANA CRITICALLY IMPERILED (S1) PLANT SPECIES WITH POTENTIAL HABITAT IN THE CBNG PLANNING AREA**

Common Name (Scientific Name)	Habitat
Daggett rock cress ( <i>Arabis demissa</i> var. <i>languida</i> )	Canyon bottoms and outwash plains with dry, stony soils derived from limestone in juniper woodland.
Swamp milkweed ( <i>Asclepias incarnata</i> )	Wet meadows and thickets.
Ovalleaf milkweed ( <i>Asclepias ovalifolia</i> )	Open pine woodland in seasonally moist meadow in southeastern Montana.
Narrowleaf milkweed ( <i>Asclepias stenophylla</i> )	Sandy soils of prairies and open pine woodland in southeastern Montana.
Wind River milkvetch ( <i>Astragalus oreganus</i> )	Sandy or clayey soil in desert shrublands and sagebrush grassland in the valley zone in south-central Montana.
Small camissonia ( <i>Camissonia parvula</i> )	Sandy calcareous soils of sagebrush steppe and juniper woodlands in the valleys.
Pregnant sedge ( <i>Carex gravida</i> )	Open woods, often in ravines with deciduous trees, on the plains of southeastern Montana.
Toothed Scandinavian sedge ( <i>Carex norvegica</i> ssp. <i>inserrulata</i> )	Moist alpine turf.
Birchleaf mountain-mahogany ( <i>Cercocarpus montanus</i> var. <i>glaber</i> )	Open slopes and breaks on the plains of eastern Montana.
Smooth goosefoot ( <i>Chenopodium subglabrum</i> )	Sparsely vegetated sand dunes and sandy terraces of major rivers on the plains of eastern Montana.
Yellow bee plant ( <i>Cleome lutea</i> )	Open, often-sandy soil of sagebrush steppe in the valleys.
Miner's candle ( <i>Cryptantha scoparia</i> )	Sandy soil of sagebrush steppe in the valleys.
Nine-anther dalea ( <i>Dalea enneandra</i> )	Gravelly grasslands slopes on the plains of eastern Montana.
Silky prairie clover ( <i>Dalea villosa</i> var. <i>villosa</i> )	Loose sand of sand dunes or eroded from sandstone outcrops in eastern Montana.
Scribner's panic grass ( <i>Dichanthelium oligosanthes</i> var. <i>scribnerianum</i> )	Open ponderosa pine woodlands of valleys and plains.
White arctic draba ( <i>Draba fladnizensis</i> )	Rocky, open soil in the alpine zone.
Porsild's draba ( <i>Draba porsildii</i> )	Moist, gravelly open soils in the alpine zone.
Entire-leaved avens ( <i>Dryas integrifolia</i> )	Stony, limestone-derived soil of exposed ridges and plateaus in the alpine zone.

**TABLE VEG-6**  
**STATE OF MONTANA CRITICALLY IMPERILED (S1) PLANT SPECIES WITH POTENTIAL HABITAT IN THE CBNG PLANNING AREA**

Common Name (Scientific Name)	Habitat
Eaton's daisy ( <i>Erigeron eatonii</i> ssp. <i>eatonii</i> )	Open areas in mountains and foothills.
Beautiful fleabane ( <i>Erigeron formosissimus</i> var. <i>viscidus</i> )	Meadows and forest openings in the montane and subalpine zones.
Smooth buckwheat ( <i>Eriogonum salsuginosum</i> )	Barren, often bentonitic soil of badlands in the valleys.
Visher's buckwheat ( <i>Eriogonum visheri</i> )	Barren, often bentonitic badlands slopes and outwashes in the plains.
Sheared cotton-grass ( <i>Eriophorum callitrix</i> )	Wet, organic soil of fens and seep areas in alpine tundra.
Hiker's gentian ( <i>Gentianopsis simplex</i> )	Fens, meadows, and seeps, usually in areas of crystalline parent material, in the montane and subalpine zones.
Hutchinsia ( <i>Hutchinsia procumbens</i> )	Vernally moist, alkaline soil of sagebrush steppe in the valley to lower montane zones.
Coville's rush ( <i>Juncus covillei</i> var. <i>covillei</i> )	Open, moist to wet, sandy or gravelly soils along valley rivers.
Large-fruited kobresia ( <i>Kobresia macrocarpa</i> )	Moist tundra, solifluction* slopes, and gravelly lake shores in the alpine zone.
Island koenigia ( <i>Koenigia islandica</i> )	Wet, open, gravelly soil in seepage areas in the alpine zone.
Lesica's bladderpod ( <i>Lesquerella lesicii</i> )	Gravelly, limestone-derived soil of open ridges and slopes among Douglas-fir and mountain mahogany woodlands in the montane zone.
Nuttall's desert parsley ( <i>Lomatium nuttallii</i> )	Dry, rocky slopes of open pine woodland in the plains.
Desert dandelion ( <i>Malacothrix torreyi</i> )	Dry, sandy sagebrush steppe in the valley and foothill zones.
Bractless mentzelia ( <i>Mentzelia nuda</i> )	Sandy or gravelly soil of open hills and roadsides on the plains of eastern Montana
Nama ( <i>Nama densum</i> )	Sandy soil of sagebrush desert in the valleys.
Blue toadflax ( <i>Nuttallanthus texanus</i> )	Open, sandy or acid shale soils of grasslands and woodlands on the plains of eastern Montana.
Alpine poppy ( <i>Papaver kluanensis</i> )	Open, rocky slopes with delayed snowmelt in the alpine zone.
Large flowered beardtongue ( <i>Penstemon grandiflorus</i> )	Sandy soils of valley plains.
Double bladderpod ( <i>Physaria brassicoides</i> )	Stony or sandy soil of open grassland slopes on the plains in southeastern Montana.
Woolly twinpod ( <i>Physaria didymocarpa</i> var. <i>lanata</i> )	Sandy, often calcareous soil of open grassland or shrubland slopes in the plains.
Slender-branched popcorn-flower ( <i>Plagiobothrys leptocladus</i> )	Dry mud on the shores of ponds in plains and foothills.

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TABLE VEG-6

STATE OF MONTANA CRITICALLY IMPERILED (S1) PLANT SPECIES WITH POTENTIAL HABITAT IN THE CBNG PLANNING AREA

Common Name (Scientific Name)	Habitat
Short-leaved bluegrass ( <i>Poa curta</i> )	Sparsely vegetated soil of Douglas-fir forest floor in the montane zone.
Low arctic cinquefoil ( <i>Potentilla hyparctica</i> )	Moist turf in the alpine zone.
Platte cinquefoil ( <i>Potentilla plattensis</i> )	Grasslands and sagebrush steppe in the valley and montane zones in south-central Montana.
One-flowered cinquefoil ( <i>Potentilla uniflora</i> )	Open, gravelly slopes and ridgetops in the alpine zone.
Bur oak ( <i>Quercus macrocarpa</i> )	Low, shale-derived hills on the plains.
Arctic buttercup ( <i>Ranunculus gelidus</i> )	Moist, open soil on tundra and talus slopes in the alpine zone.
Persistent-sepal yellow-cress ( <i>Rorippa calycina</i> )	Riverbanks and shorelines in the valleys on the plains on the Missouri and Yellowstone Rivers.
Barratt's willow ( <i>Salix barrattiana</i> )	Cold, moist soil in the alpine zone.
Yellow marsh saxifrage ( <i>Saxifraga hirculus</i> )	Wet, organic soil of fen in the alpine zone.
Clasping groundsel ( <i>Senecio amplexans</i> )	Stony, open soil and talus of slopes in or near the alpine zone.
Shoshonea ( <i>Shoshonea pulvinata</i> )	Open, exposed limestone outcrops, ridgetops, and canyon rims, in thin rocky soils.
Prairie aster ( <i>Solidago ptarmicoides</i> )	Open, dry grasslands, often on sandy soil or limestone on the plains of eastern Montana.
Few-flowered goldenrod ( <i>Solidago sparsiflora</i> )	Sandy soil of grasslands or open woodlands on the plains.
Slender wedgegrass ( <i>Sphenopholis intermedia</i> )	Wet areas in the valleys or foothills.
Small dropseed ( <i>Sporobolus neglectus</i> )	Natural and disturbed grasslands.
Fleshy stitchwort ( <i>Stellaria crassifolia</i> )	Moist or wet meadows, often along streams, in the foothills to alpine zones.
Letterman's needlegrass ( <i>Stipa lettermanii</i> )	Limestone talus and dry fescue grassland in the valley and foothill zones in southern Montana.
Poison suckleya ( <i>Suckleya suckleyana</i> )	Playas and disturbed alkaline soils on the plains.
Nannyberry ( <i>Viburnum lentago</i> )	Openings in riparian forests on the plains.

S1: At high risk because of extremely limited and/or rapidly declining numbers, range, and/or habitat, thus making it highly vulnerable to extirpation in the state.

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**TABLE VEG-7**  
**STATE OF MONTANA NOXIOUS WEEDS**

Common Name	Scientific Name	Category
Hoary cress or White top	<i>Cardaria draba</i>	1
Diffuse knapweed	<i>Centaurea diffusa</i>	1
Spotted knapweed	<i>Centaurea maculosa</i>	1
Russian knapweed	<i>Centaurea repens</i>	1
Yellow starthistle	<i>Centaurea solstitialis</i>	3
Rush skeletonweed	<i>Chondrilla juncea</i>	3
Oxeye daisy	<i>Chrysanthemum leucanthemum</i>	1
Canada thistle	<i>Cirsium arvense</i>	1
Field bindweed	<i>Convolvulus arvensis</i>	1
Common crupina	<i>Crupina vulgaris</i>	3
Houndstongue	<i>Cynoglossum officinale</i>	1
Leafy spurge	<i>Euphorbia esula</i>	1
Orange hawkweed	<i>Hieracium aurantiacum</i>	2
Yellow-devil hawkweed	<i>Hieracium floribundum</i>	2
Kingdevil hawkweed	<i>Hieracium piloselloides</i>	2
Meadow hawkweed	<i>Hieracium pratense</i>	2
Common St. Johnswort	<i>Hypericum perforatum</i>	1
Yellowflag iris	<i>Iris pseudacorus</i>	3
Dyer's woad	<i>Isatis tinctoria</i>	2
Perennial pepperweed	<i>Lepidium latifolium</i>	2
Dalmatian toadflax	<i>Linaria dalmatica</i>	1
Yellow toadflax	<i>Linaria vulgaris</i>	1
Purple loosestrife	<i>Lythrum salicaria</i>	2
Wandlike loosestrife	<i>Lythrum virgatum</i>	2
Eurasian watermilfoil	<i>Myriophyllum spicatum</i>	3
Sulfur cinquefoil	<i>Potentilla recta</i>	1
Tall buttercup	<i>Ranunculus acris</i>	2
Tansy ragwort	<i>Senecio jacobaea</i>	2
Tamarisk (Saltcedar)	<i>Tamarix spp.</i>	2
Common tansy	<i>Tanacetum vulgare</i>	1

Source: The University of Montana – Missoula, Invaders Database System, June 2004.

1 = Noxious weed: currently established and generally widespread in many counties.

2 = Noxious weed: recently introduced and rapidly spreading.

3 = Noxious weeds: not detected in the state or found only in small, scattered, localized infestations.

**TABLE VEG-8  
PLANT SPECIES OF CONCERN IN THE PLANNING AREA**

Common Name	Scientific Name	Known to Occur in the 13 Counties	Additional Information		
			MT	BLM	USFS
Musk-root	<i>Adoxa moschatellina</i>	Carbon and Stillwater	S2	S	S
Lead plant	<i>Amorpha canescens</i>	Carter and Rosebud	SH	S	
Short-styled columbine	<i>Aquilegia brevistyla</i>	Sweet Grass	S2		S
Daggett rock cress	<i>Arabis demissa var. languida</i>	Carbon	S1	S	
Swamp milkweed	<i>Asclepias incarnata</i>	Carbon	S1		
Ovalleaf milkweed	<i>Asclepias ovalifolia</i>	Carter	S1		S
Narrowleaf milkweed	<i>Asclepias stenophylla</i>	Carter and Rosebud	S1	S	
Sweetwater milkvetch	<i>Astragalus aretioides</i>	Big Horn and Carbon	S2	S	
Barr's milkvetch	<i>Astragalus barrii</i>	Big Horn, Carter, Powder River, and Rosebud	S2S3	S	S
Geyer's milkvetch	<i>Astragalus geyeri</i>	Carbon and Custer	S2	S	
Gray's milkvetch	<i>Astragalus grayi</i>	Carbon	S2	S	
Wind River milkvetch	<i>Astragalus oregonus</i>	Carbon	S1	S	
Obscure evening-primrose	<i>Camissonia andina</i>	Carbon	S2	S	
Small camissonia	<i>Camissonia parvula</i>	Carbon	S1	S	
Pregnant sedge	<i>Carex gravida</i> var. <i>gravida</i>	Big Horn, Powder River, and Rosebud	S1		
Toothed Scandinavian sedge	<i>Carex norvegica</i> ssp. <i>inserrulata</i>	Carbon and Stillwater	S1		
Birchleaf mountain-mahogany	<i>Cercocarpus montanus</i> var. <i>glaber</i>	Treasure	S1S2		
Smooth goosefoot	<i>Chenopodium subglabrum</i>	Carter, Custer, and Powder River	S1		
Yellow bee plant	<i>Cleome lutea</i>	Big Horn and Carbon	S1	S	

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**PLANT SPECIES OF CONCERN IN THE PLANNING AREA**

Common Name	Scientific Name	Known to Occur in the 13 Counties	Additional Information		
			MT	BLM	USFS
Miner's candle	<i>Cryptantha scoparia</i>	Carbon	S1	S	
Schweinitz flatsedge	<i>Cyperus schweinitzii</i>	Carter, Custer, and Powder River	S2	S	
Small yellow lady's-slipper	<i>Cypripedium parviflorum</i>	Stillwater and Sweet Grass	S2S3	S	S
Nine-anther dalea	<i>Dalea enneandra</i>	Custer	S1		
Silky prairie clover	<i>Dalea villosa</i> var. <i>villosa</i>	Carter	S1		
Scribner's panic grass	<i>Dichanthelium oligosanthes</i> var. <i>scribnerianum</i>	Powder River	S1	S	
White arctic draba	<i>Draba fladnizensis</i>	Carbon and Stillwater	S1		
Porsild's draba	<i>Draba porsildii</i>	Carbon	S1		
Entire-leaved avens	<i>Dryas integifolia</i>	Golden Valley	S1		
Beaked spikerush	<i>Eleocharis rostellata</i>	Carbon and Sweet Grass	S2		S
Long sheath waterweed	<i>Elodea longivaginata</i>	Stillwater	S2	S	
Giant helleborine	<i>Epipactis gigantea</i>	Carbon	S2		S
Eaton's daisy	<i>Erigeron eatonii</i> ssp. <i>eatonii</i>	Sweet Grass	S1		
Beautiful fleabane	<i>Erigeron formosissimus</i> var. <i>viscidus</i>	Carbon	S1		
Smooth buckwheat	<i>Eriogonum salsuginosum</i>	Carbon	S1	S	
Visher's buckwheat	<i>Eriogonum visherii</i>	Carter	S1	S	
Sheathed cotton-grass	<i>Eriophorum callitrix</i>	Carbon	S1		
Hiker's gentian	<i>Gentianopsis simplex</i>	Carbon	S1		S

**TABLE VEG-8**  
**PLANT SPECIES OF CONCERN IN THE PLANNING AREA**

Common Name	Scientific Name	Known to Occur in the 13 Counties	Additional Information		
			MT	BLM	USFS
Northern rattlesnake-plantain	<i>Goodyera repens</i>	Wheatland	S2S3		S
Bractless hedge-hyssop	<i>Gratiola ebracteata</i>	Yellowstone	S1		
Spiny hopsage	<i>Grayia spinosa</i>	Carbon	S2	S	
Beartooth large-flowered goldenweed	<i>Haplopappus carthamoides</i> var. <i>subsquarrosus</i>	Carbon	S2	S	S
Hutchinsia	<i>Hutchinsia procumbens</i>	Carbon	S1	S	
Coville's rush	<i>Juncus covillei</i> var. <i>covillei</i>	Sweet Grass	S1		
Large-fruited kobresia	<i>Kobresia macrocarpa</i>	Carbon	S1		
Island koenigia	<i>Koenigia islandica</i>	Carbon	S1		
Leptodactylon	<i>Leptodactylon caespitosum</i>	Carbon	S2	S	
Lesica's bladderpod	<i>Lesquerella lesicii</i>	Carbon	S1	S	
Nuttall's desert parsley	<i>Lomatium nuttallii</i>	Big Horn and Rosebud	S1	S	
Desert dandelion	<i>Malacothrix torreyi</i>	Carbon	S1	S	
White-bract stickleaf	<i>Mentzelia montana</i>	Custer	SH	S	
Bractless mentzelia	<i>Mentzelia nuda</i>	Custer, Powder River, and Rosebud	S1	S	
Dwarf mentzelia	<i>Mentzelia pumila</i>	Carbon	S2	S	
Nama	<i>Nama densum</i>	Carbon	S1	S	
Blue toadflax	<i>Nuttallanthus texanus</i>	Carter	S1		
Alpine poppy	<i>Papaver kluanensis</i>	Carbon and Sweet Grass	S1		
Narrowleaf penstemon	<i>Penstemon angustifolius</i>	Carter	S2	S	
Large flowered beardtongue	<i>Penstemon grandiflorus</i>	Custer	S1		
Plains phlox	<i>Phlox andicola</i>	Carter, Powder River, and Rosebud	S2	S	

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**PLANT SPECIES OF CONCERN IN THE PLANNING AREA**

Common Name	Scientific Name	Known to Occur in the 13 Counties	Additional Information		
			MT	BLM	USFS
Double bladderpod	<i>Physaria brassicoides</i>	Carter and Powder River	S2	S	
Woolly twinpod	<i>Physaria didymocarpa</i> var. <i>lanata</i>	Big Horn and Rosebud	S1	S	
Slender-branched popcorn-flower	<i>Plagiobothrys leptocladus</i>	Custer	S1	S	
Short-leaved bluegrass	<i>Poa curta</i>	Carbon	S1	S	
Low arctic cinquefoil	<i>Potentilla hyparctica</i>	Carbon	S1		
Platte cinquefoil	<i>Potentilla plattensis</i>	Carbon	S1	S	
One-flowered cinquefoil	<i>Potentilla uniflora</i>	Carbon	S1		
Mealy primrose	<i>Primula incana</i>	Carbon	S2	S	S
Bur oak	<i>Quercus macrocarpa</i>	Carter	S1	S	
Arctic buttercup	<i>Ranunculus gelidus</i>	Stillwater	S1		
Persistent-sepal yellow-cress	<i>Rorippa calycina</i>	Big Horn, Custer, Rosebud, Treasure, and Yellowstone	S1	S	
Barratt's willow	<i>Salix barrattiana</i>	Carbon	S1		S
Yellow marsh saxifrage	<i>Saxifraga hirculus</i>	Carbon	S1		
Clasping groundsel	<i>Senecio amplexans</i> var. <i>holmii</i>	Carbon	S1		
Shoshonea	<i>Shoshonea pulvinata</i>	Carbon	S1	S	S
Prairie aster	<i>Solidago ptarmicoides</i>	Carter	S1		
Few-flowered goldenrod	<i>Solidago sparsiflora</i>	Stillwater	S1	S	
Slender wedgegrass	<i>Sphenopholis intermedia</i>	Big Horn	S1		
Small dropseed	<i>Sporobolus neglectus</i>	Wheatland	S1		
Fleshy stitchwort	<i>Stellaria crassifolia</i>	Carbon	S1		

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PLANT SPECIES OF CONCERN IN THE PLANNING AREA**

Common Name	Scientific Name	Known to Occur in the 13 Counties	Additional Information		
			MT	BLM	USFS
Letterman's needlegrass	<i>Stipa lettermanii</i>	Big Horn and Carbon	S1		
Poison suckleya	<i>Suckleya suckleyana</i>	Musselshell	S1		
Wyoming sullivantia	<i>Sullivantia hapemanii</i>	Big Horn and Carbon	S2	S	
Small-flowered pennycress	<i>Thlaspi parviflorum</i>	Carbon	S2	S	
Nannyberry	<i>Viburnum lentago</i>	Big Horn	S1		

S = sensitive

S1: At high risk because of extremely limited and/or rapidly declining numbers, range and/or habitat, making it highly vulnerable to extirpation in the state.

S2: At risk because of very limited and/or declining numbers, range and/or habitat, making it vulnerable to extirpation in the state.

S3: At risk because of very limited and/or declining numbers, range and/or habitat, making it vulnerable to extirpation in the state.

SH: Possibly extinct - species known from only historical occurrences, but may nevertheless still be extant; further searching is needed.