

THE FLORA OF HARDING COUNTY: A CENTURY OF BOTANY IN NORTHWESTERN SOUTH DAKOTA, USA

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ABSTRACT

We report the current knowledge of the vascular plant flora of Harding County, South Dakota, which includes 724 species. Introduced species have increased from five percent of the flora to 13% over the last century. Relatively small changes have occurred in plant species duration, species habit or major groups over 100 years. Mean coefficients of conservatism varied from 4.3 to 6.2 in eight areas across the county, with the lowest values in riparian areas and highest values in pine-dominated buttes.

Keywords

floristics, grassland, Northern Great Plains, South Dakota, vegetation

INTRODUCTION

This report documents vascular plant species from Harding County, South Dakota, from historical and recent plant collections. Literature describing the flora of Harding County is lacking. The most notable publication is by Visher (1914) who completed a species list for the county. Visher's publication was based upon collections made by him in 1910-1912, and collections made by Rowley in 1909, Fromme in 1910, and Over in 1911. Heidel and Dueholm (1995) reported on "sensitive" species in Custer National Forest in Carter County, Montana, and Harding County. Gabel and Simonson (2008) reported the vegetation present on sand dunes and adjacent areas in Harding and Perkins Counties.

Hansen (1985) and Hansen and Hoffman (1988) described land classifications based on potential natural vegetation for the study area, resulting in 26 designations of habitat types including steppe, shrub-steppe, woodland and forest habitats. Studies in areas adjacent to Harding County include a study of the flora of the Grand River National Grassland (Kopp 2004) in Perkins County, SD. Mincemoyer (2006) reported on the plant resources including "species of

concern” for south-central and southeast Montana. Harding County was also included in floristic studies by the Great Plains Flora Association (1986), Van Bruggen (1996) and the Flora of North America Editorial Committee (1993+). Our study objective is to report vascular plant species collected in Harding County through 2014, and to compare the current floristic makeup to that reported by Visher (1914) a century ago.

STUDY AREA

Harding County is the northwestern most county in South Dakota (Figure 1) with a land area of 691,786 ha and a population of 1353 (South Dakota Association of County Commissioners 2014). Land ownership includes about 12,092 ha managed by the Bureau of Land Management, and 29,756 ha managed by the U. S. Forest Service. The state of South Dakota owns about 102,325 ha (South Dakota Office of School and Public Lands 2014) and the remainder is privately owned. The Little Missouri River drains most of the western part of the county. The North Fork of the Moreau River drains the southern part of the county while the central and north central parts of the county are drained primarily by the South Fork of the Grand River (Johnson 1988). About 2,700 ha of the county is water. A diverse topography of the area includes gentle rolling plains to steep slopes, badlands, sand dunes, and numerous large buttes with sandstone cap rock that provide areas with greatest elevations (Hogan and Hogan Foubert 2001). Sand dune soils represent about 17,300 ha of the county. The largest buttes include the North and South Cave Hills, the East and West Short Pines and the Slim Buttes, which are covered with ponderosa pine (*Pinus ponderosa*) forest. The elevation ranges from 817 m in the southeast corner of the county near the Moreau River to 1224 m in the East Short Pines. Much of the surface area of the county is composed of sagebrush steppe and native and non-native grasslands with 88% used for livestock grazing (Johnson 1988).

The long-term average annual precipitation is 37 cm most of which falls in spring and as early summer thunder storms (Johnson 1988). Annual precipitation was 5 cm below the long-term average 32% of time the since 1894 and was 5 cm above the long-term average 26% of the years (High Plains Regional Climate Center 2014).

METHODS

Data for this project were obtained from vascular plant specimens collected during routine U.S. Forest Service activities, from a project at RM (acronyms follow Thiers 2014) in 2009-2010, and projects at BHSC from 2002-2013 (Gabel and Simonson 2008). Additional data were obtained from electronic databases queried for previous plant collections. Eleven databases were queried, and from those, four were found to contain significant information for this study. The four databases include Kartesz (2013), USDA NRCS (2014), Hartman et al. (2009), and the Black Hills State University Herbarium (2014). The USDA

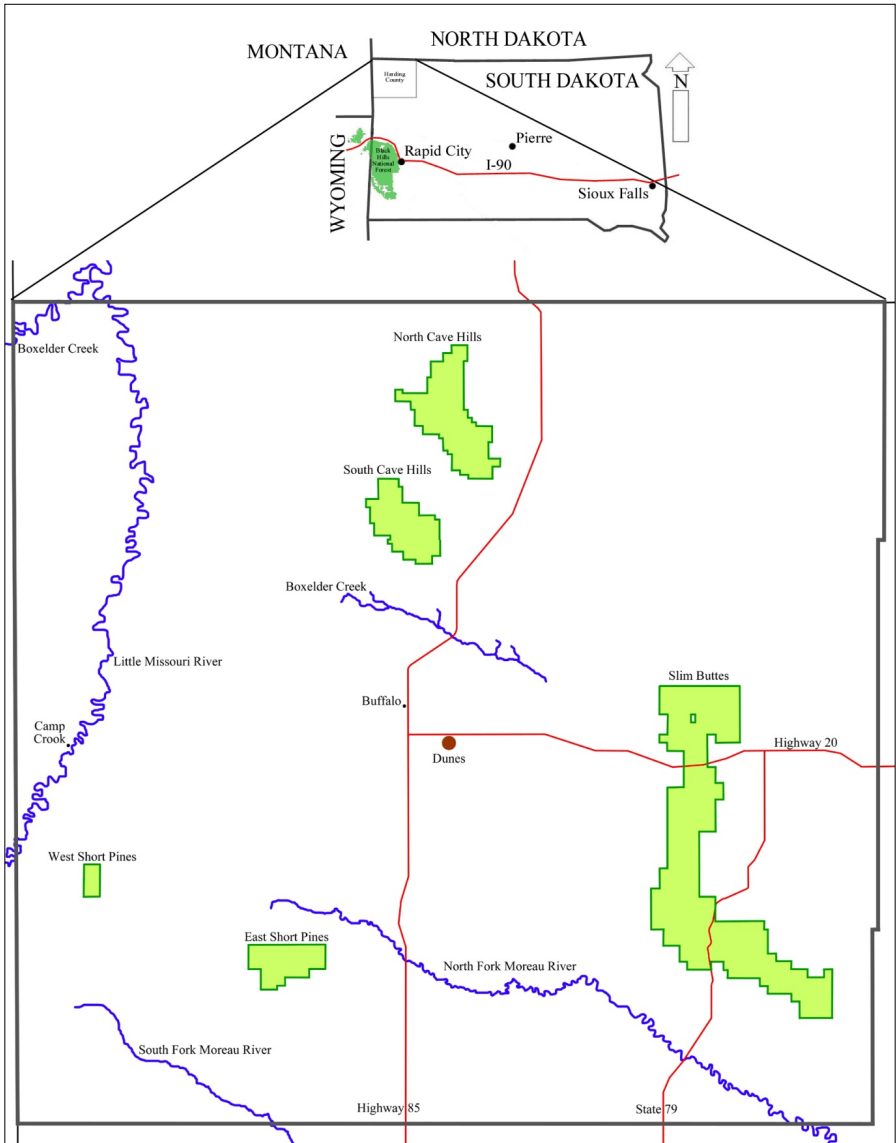


Figure 1. Location of project area and major areas sampled within Harding County, South Dakota.

NRCS and Kartesz sites often include county level information for plant species distributions. Of greater value were databases at RM, (which include specimens from USFS) and BHSC (which include data from DWU, GFND, NDA, NEB, NPWRC, SDC and SDU).

Visher collections were verified in several herbaria, primarily SDU and RM. Additional collections were made using the meander search method (Alberta Native Plant Council 2000). Plant names follow the Flora of North America (Flora

of North America Editorial Committee 1993+) or for families that have not yet been completed, USDA Plants (USDA, NRCS 2014), the Integrated Taxonomic Information System (ITIS 2014) or Tropicos (2014). Synonyms used in previous works were updated for ease of analyses. Comparisons were made between modern records and historical collections.

Coefficients of Conservatism (C values) for most native plant species were obtained from the Northern Great Plains Floristic Quality Assessment Panel (2001). Mean C values (\bar{C}) were determined by summing the C values and dividing by the total number of native species present. Values were calculated for the entire county and for eight physiographic areas within the county. Floristic quality index (FQI) values were also calculated by using the formula $FQI = \bar{C} \sqrt{N}$ for eight areas within Harding County and the entire county.

Climate data for Harding County, South Dakota, was compiled from all available recording station records and all available data within and near Harding County, South Dakota. The combined long-term monthly precipitation totals are from January 1893 to May 2014; the long-term average was calculated from all available data from Antelope Range Station SD (3/1/1951 to 1/31/2008), Camp Crook SD (1/1/1893 to 3/31/2013), Ellingson 1 NW SD (6/1/1909 to 8/31/1963), Harding 3 SE SD (12/2/1951 to 3/31/2013), Ludlow SD (3/11/1924 to 3/31/2013), Ralph 3 NW SD (6/1/1941 to 7/31/2003), Redig 9 NE SD (10/13/1914 to 12/31/2011), and Knobs MT (9/5/1951 to 3/31/2013) listed on the High Plains Regional Climate Center website (<http://www.hprcc.unl.edu/data/historical/> -- specifically monthly precipitation totals at http://www.hprcc.unl.edu/cgi-bin/cli_perl_lib/cliMAIN.pl?sd0223, [sd1294](http://www.hprcc.unl.edu/cgi-bin/cli_perl_lib/cliMAIN.pl?sd1294), [sd2614](http://www.hprcc.unl.edu/cgi-bin/cli_perl_lib/cliMAIN.pl?sd2614), [sd3560](http://www.hprcc.unl.edu/cgi-bin/cli_perl_lib/cliMAIN.pl?sd3560), [sd5048](http://www.hprcc.unl.edu/cgi-bin/cli_perl_lib/cliMAIN.pl?sd5048), [sd6907](http://www.hprcc.unl.edu/cgi-bin/cli_perl_lib/cliMAIN.pl?sd6907), [sd7062](http://www.hprcc.unl.edu/cgi-bin/cli_perl_lib/cliMAIN.pl?sd7062), and [mt4715](http://www.hprcc.unl.edu/cgi-bin/cli_perl_lib/cliMAIN.pl?mt4715)).

RESULTS

The oldest plant collection seen from Harding County was *Maianthemum racemosum* (L.) Link collected in 1893 by Williams (RM 443764). A list of vascular plant species present in Harding County reported by Visher (1914) contained 432 species names that are considered valid today. Work since that time has added 292 species to the flora of which 230 are native (Appendix 1). The cumulative number of species known from the county by decade is shown in Figure 2. In the intervening century, 63% of the original Visher era plant names have been changed (Flora of North America Editorial Committee 1993+; Integrated Taxonomic Information System 2014; Tropicos 2014).

Perhaps the most obvious change in the vegetation has been the increase of introduced species from five percent to 13% of the flora. The results from the comparisons of growth habit, major plant groups, and plant duration are in Figures 3-5. The data show that less than six percent change has occurred among any group or category within a group in the last 100 years. The largest change observed was a 5% increase in graminoids.

Mean coefficient of conservatism (\bar{C}) as determined based only on native species reported by Visher (1914) was 5.3, while \bar{C} including all Visher reported native species plus native species reported in this study was 5.4 in 2014. The

eight areas of the county with the most collections (plus data from sand dunes (Gabel and Simonson 2008)) are compared in Table 1. The highest \bar{C} value (6.2) was in the West Short Pines of the Custer National Forest, while the highest FQI value was from the Slim Buttes area, also in the Custer National Forest. The lowest \bar{C} value was calculated from the species in the Moreau River Valley (4.3), while the Shaw Creek plant species produced the lowest FQI value (20.1). Table 2 shows the average of \bar{C} by category for the eight locations of this study (plus sand dune data), indicating that stream valleys are higher in low (0-3) and intermediate (4-6) values, while four of five large pine forested butte areas have greater percentages of higher values (7-10). The East Short Pines have similar percentages for all three categories.

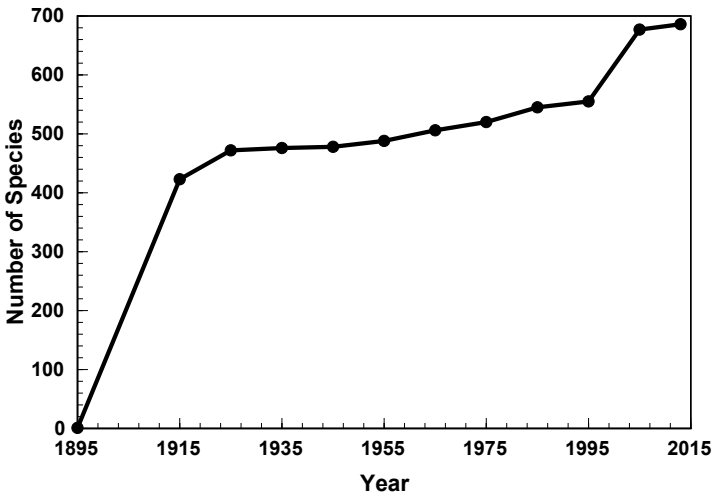


Figure 2. Cumulative number of species known from Harding County by decade.

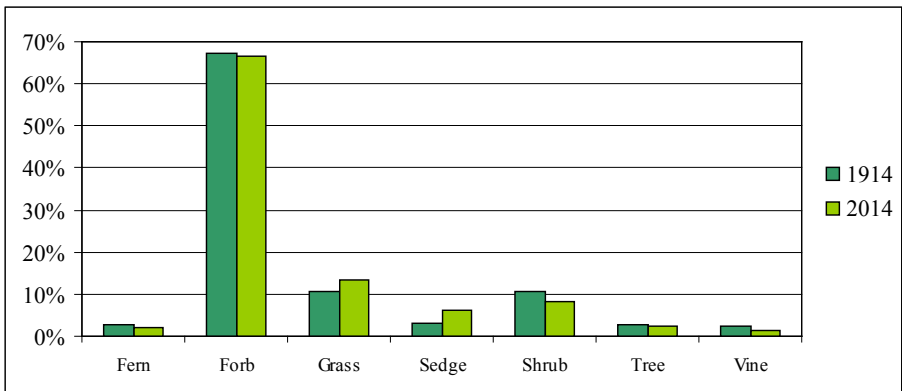


Figure 3. Percentages of life form types for vascular plant species from Harding County, SD. Dark green bars indicate percent species reported in 1914. Light green bars indicate percent of species in this study.

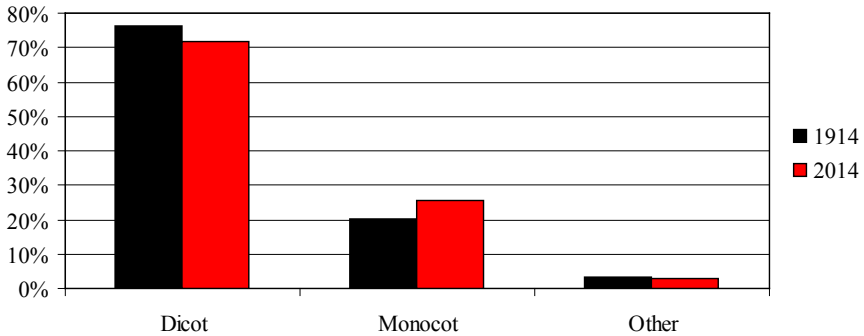


Figure 4. Percents of major vascular plant groups in Harding County, SD. Black bars indicate percent species reported in 1914. Red bars indicate percent of species in this study. “Dicots” include eudicots, and non-monocot paleoherbs. “Other” includes ferns, equisetophytes, lycophytes and conifers.

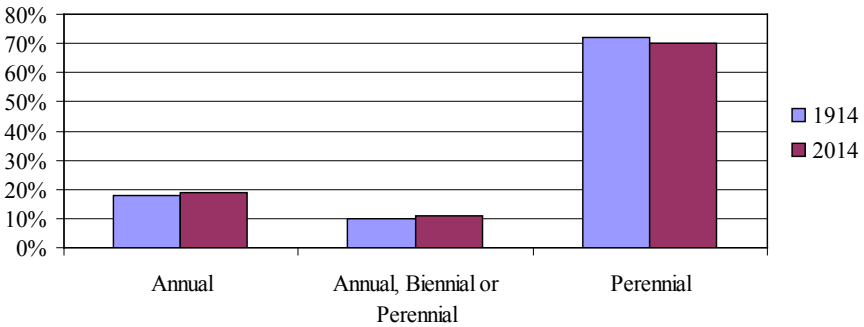


Figure 5. Percent vascular plant species by duration as reported by USDA NRCS Plants (2014). Left most bar of each pair represents species reported by Visher in 1914. Right bar of each pair represents data from this report. Middle pair of bars represents species that are reported as mixed duration by USDA NRCS (2014).

Table 1. Mean Coefficient of Conservatism values and floristic quality index values for eight sites in this study and sand dune values from Gabel and Simonson (2008) in Harding County, SD.

| Site | Slim Buttes | N. Cave Hills | S. Cave Hills | E. Short Pines | W. Short Pines | Moreau River | Little Missouri River | Shaw Creek | Sand Dunes |
|--------|-------------|---------------|---------------|----------------|----------------|--------------|-----------------------|------------|------------|
| mean C | 5.8 | 5.9 | 5.9 | 5.1 | 6.2 | 4.3 | 4.4 | 4.4 | 4.5 |
| FQI | 81.8 | 61.4 | 46.6 | 35 | 52.6 | 24.9 | 48.8 | 20.1 | 38.7 |

Table 2. Percents of Coefficients of Conservatism (C) by category for eight sites in this study and sand dune values from Gabel and Simonson (2008) in Harding County, SD.

| Site | Slim Buttes | N. Cave Hills | S. Cave Hills | E. Short Pines | W. Short Pines | Moreau River | Little Missouri River | Shaw Creek | Sand Dunes |
|------|-------------|---------------|---------------|----------------|----------------|--------------|-----------------------|------------|------------|
| 0-3 | 21 | 17 | 16 | 30 | 14 | 38 | 35 | 24 | 32 |
| 4-6 | 36 | 40 | 37 | 34 | 28 | 44 | 41 | 57 | 44 |
| 7-10 | 44 | 43 | 47 | 36 | 58 | 18 | 21 | 19 | 24 |

DISCUSSION

Of the 432 names determined to be valid from the Visher (1914) list, 271 of the taxa these names represent now have names different than they did in 1914. The name changes are due to either application of nomenclatural rules (e.g., using the earliest validly published name) or new knowledge that results in a better understanding of the phylogeny of plant groups.

The consistency of values for growth habit, major plant groups, and plant duration (Figures 3-5) was surprising. The greatest change observed (5%) was the increase in number of graminoids, probably a result of more thorough collection and study of grasses and sedges.

Of the species observed in Harding County but not included in Visher's (1914) list, 79% are native while 62 species are introduced (with slightly less than 1% categorized as both by USDA NRCS 2014). The Northern Great Plains Floristic Quality Assessment Panel (2001) reported that 83% of the vascular plant species in the Dakotas were native. We surmised that the majority of the native species not included in Visher's 1914 list have not been introduced since 1914, but were present and overlooked until recently. In contrast, the increase in introduced species was expected given the human disturbance within Harding County over the last 100 years and the invasiveness of many of those species. We noted that the increase to 13% of introduced species countywide was higher than the 8% introduced species in the dune areas of the county (Gabel and Simonson 2008), but less than the 17% recorded for North and South Dakota in 2001 (Northern Great Plains Floristic Quality Assessment Panel 2001).

Mean coefficients of conservatism for the entire county changed little (from 5.3 to 5.4) between 1914 and 2014, however, several areas show a contrast in \bar{C} values. Stream-related habitats were areas of lowest \bar{C} values, perhaps because of the congregation in stream valleys by domesticated grazing mammals (Knight 1994) and wildlife together with disturbance from frequent flooding that favors ruderal species. Other areas with relatively low \bar{C} values are sand dunes and surrounding swales ($\bar{C} = 4.5$) as reported by Gabel and Simonson (2008). The areas with highest \bar{C} values are in more rugged or less accessible areas because of greater topographic relief and great variation of elevation, light, slope, aspect, and soil moisture. The greater \bar{C} values for the five butte areas could also be the result of a greater level of sampling compared to riparian areas. Archaux et al. (2006) found a curvilinear relationship with level of exhaustiveness of sampling based on time. Differences among botanists, intensity of surveys, and number of different habitats investigated all influence the number of species that are recorded (Oredsson 2000). Plot size, plant size, and spatial patterns of individual plants also influence detection and frequency of species within an area (Bonham 2013). Time is another bias in species richness; generally greater time spent exploring an area results in greater species richness (Klimeš et al. 2001). Visher had just a few years to produce his list while the current list was assembled after a century of collection.

The FQI calculation is designed to limit the influence of area alone (Northern Great Plains Floristic Quality Assessment Panel 2001, Swink and Wilhelm 1979). The high FQI values for Slim Buttes could be partially due to the rela-

tively large land area. As an example, the Slim Buttes area at 23,537 ha is approximately 45 times larger than the area sampled in West Short Pines. While the West Short Pines area has a high diversity and high \bar{C} (6.2), the FQI is 52.6. In contrast the Slim Buttes area has $\bar{C} = 5.8$ and the largest FQI value in the study at 81.8.

Kostel (2006) studied the vascular plant species of the Buffalo Gap National Grassland (241,473 ha) and the Oglala National Grassland (38,235 ha) in southwestern South Dakota and northwestern Nebraska. For the Buffalo Gap National Grassland $\bar{C} = 4.4$ and FQI = 88.9, and for the Oglala National Grassland $\bar{C} = 4.4$ and FQI = 76.9.

Kopp (2004) reported 462 species from the Grand River National Grassland in Perkins County, SD (adjacent to Harding County). He also noted that the flora included 14% introduced species. Kopp reported a \bar{C} value of 4.6 for the Grand River National Grassland, with seven areas within the grassland ranging in \bar{C} values from 4.0 to 5.7 and FQI values from 29.4 to 60.1.

It has been reported by Hamlin et al. (2012) and Angelo (2014) that even in some well studied and highly populated areas there is little change in the total number of native species although introduced species increased dramatically. Angelo (2014) warned against assigning causes to vegetation changes without multidisciplinary studies.

Forty-seven Visher specimens represent species not on his 1914 list. Possible explanations for their omission include failure to transmit specimens to Aven Nelson at the Rocky Mountain Herbarium, University of Wyoming, who identified collections for Visher, possibly because they were thought to be duplicate specimens. Possibly the authors of the 1914 list grouped some specimens of closely related species, or in the last 100 years the interpretation of species boundaries has changed for some taxa. Problematic species are listed in Appendix 2.

The consistency of plant species, habitat types, duration and plant groups, the high number of native species and the relatively large values for \bar{C} and FQI lead us to conclude that the vascular flora of Harding County has remained relatively stable since Visher's 1914 work. This is further supported by an only 8% increase in introduced species compared to a 17% increase in exotic species for North and South Dakota during a similar time interval. The unregulated grazing (ca. 1870 and forward) that took place before enactment of the Taylor Grazing Act in 1934 caused unintended damage to soil, vegetation, streams and springs (Bureau of Land Management 2014), thus it is unknown what the vascular flora of Harding County might have lost before Visher's compilation.

Baseline studies, such as the present one, are critical to any understanding of environmental impacts and restoration efforts. While the overall vegetation of Harding County is apparently in good condition based on plant species composition, richness, and coefficients of conservatism, we anticipate greater human impacts in the near future and a resultant increase in the percent of introduced species and habitat degradation. For example, sagebrush habitat, important to sage grouse survival in Harding County, is continually being impacted with an array of anthropogenic disturbances. Single or isolated impacts may pose little risk alone, however, the cumulative impact is reducing, degrading and fragment-

ing sagebrush habitat (and other vegetation types). As a consequence, sage grouse (*Centrocercus urophasianus*), a species dependent on sagebrush habitat, are being extirpated in western South Dakota (Smith et al. 2004; South Dakota Department of Game, Fish and Parks 2014). In addition, sagebrush habitat in western South Dakota is important for other sagebrush obligate species, including Brewer's sparrow (*Spizella breweri*), sage thrasher (*Oreoscoptes montanus*), sage sparrow (*Amphispiza belli*), short-horned lizard (*Phrynosoma hernandesi*), sagebrush vole (*Lemmiscus curtatus*) and pronghorn (*Antilocapra americana*).

Watching and hunting animals have become important human activities and retaining habitat is important for the continued survival of those organisms. Visher (1914) estimated that within the county there were six species of amphibians, 15 species of reptiles (eight were listed), 50 mammal species and 200 bird species. Kiesow (2006) reported six amphibians and 11 reptiles in Harding County. Higgins et al. (2002) reported 51 species of mammals, and the South Dakota Ornithologist's Union (1991) reported 229 species of birds from the county.

The South Dakota Department of the Environment and Natural Resources (2014) has reported that there are 89,843 leased mineral hectares within Harding County. Lawson et al. (2011) recommended that to limit impacts of oil drilling on birds, noise should be reduced at well sites, vegetation disturbance should be limited especially around drill pads and roads, perching sites for birds should be maintained, and road construction should be limited. We concur with these recommendations. Maintaining high native plant diversity will be key to maintaining high animal diversity, and this is ultimately dependent on ranchers and other land managers continuing to use responsible management practices.

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Appendix I. Vascular plant species of Harding County listed alphabetically by modern scientific names. Family names follow Stevens (2014), with abbreviations created by deleting “-aceae” from family names. C of C = Coefficients of Conservatism (Northern Great Plains Floristic Quality Assessment Panel 2001). “Visher 1914” indicates species listed by Visher (1914) with currently accepted name. Visher sp. = Visher specimen seen if value = 1. Source codes for databases: US = USDA NRCS Plants, BO = Biota of North America Project, RM = Rocky Mountain Herbarium, BH = Black Hills State University Herbarium, FSICC = USDA Forest Service at Camp Crook, SD, SDDA = South Dakota Department of Agriculture. Visher specimens in databases are noted by Vi, while Fromme specimens are indicated by Fr.

| Genus | Species | Family | C of C | Native/ Introduced | Visher 1914 | Visher sp. | Source |
|-------------|----------------|-------------|--------|--------------------|-------------|------------|--------------------------|
| Acer | negundo | Sapind. | 1 | N | 1 | 1 | US, BO, RM, Vi, BH Vi |
| Achillea | millefolium | Aster. | 3 | N/I | 1 | 1 | US, BO, RM Vi, BH Vi |
| Achnatherum | hymenoides | Po. | 5 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Agastache | foeniculum | Lami. | 7 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Agoseris | glauca | Aster. | 8 | N | 1 | 1 | US, BO, RM Vi, BH |
| Agrimonia | gryposepala | Rosaceae | 5 | N | 0 | 1 | BO, RM Vi, BH |
| Agrimonia | striata | Rosaceae | 5 | N | 1 | 1 | BO, RM, BH, Fr, Vi |
| Agropyron | cristatum | Poaceae | x | I | 0 | 0 | US, BO, RM, BH |
| Agrostemma | githago | Caryophyll. | x | I | 1 | 0 | US, BO, |
| Agrostis | gigantea | Po. | x | I | 0 | 0 | RM, BH |
| Agrostis | scabra | Po. | 1 | N | 0 | 1 | US, BO, RM Vi, BH Fr, Vi |
| Agrostis | stolonifera | Po. | x | I | 0 | 0 | BO, RM, BH |
| Agrostis | exarata | Po. | 10 | N | 0 | 0 | RM |
| Alisma | gramineum | Alismat. | 2 | N | 0 | 0 | BO, BH |
| Alisma | triviale | Alismat. | 2 | N | 1 | 1 | US, BO, RM, Vi, BH, Fr |
| Allium | geyeri | Alli. | 10 | N | 1 | 0 | BH |
| Allium | textile | Alli. | 7 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Almutaster | pauciflorus | Aster. | 10 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Alopecurus | aequalis | Po. | 2 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Alopecurus | arundinaceus | Po. | x | I | 0 | 0 | BO, BH |
| Alopecurus | carolinianus | Po. | 0 | N | 0 | 1 | US, BO, RM, BH Vi |
| Alyssum | alyssoides | Brassic. | x | I | 0 | 0 | BO, RM, BH |
| Alyssum | desertorum | Brassic. | x | I | 0 | 0 | RM, BH |
| Amaranthus | albus | Amaranth. | x | I | 1 | 1 | BO, RM Vi, BH Vi |
| Amaranthus | retroflexus | Amaranth. | 0 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Ambrosia | acanthicarpa | Aster. | 0 | N | 1 | 1 | BO, RM Vi, BH |
| Ambrosia | artemisiifolia | Aster. | 0 | N | 1 | 1 | BO, RM Vi |
| Ambrosia | psilostachya | Aster. | 2 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Ambrosia | trifida | Aster. | 0 | N | 1 | 1 | US, BO, BH Vi, Fr |
| Amelanchier | alnifolia | Ros. | 6 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Amelanchier | humilis | Ros. | 6 | N | 0 | 0 | US - Not Seen |

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|----------------|------------------|-----------|----|-----|---|---|--------------------------|
| Amelanchier | utahensis | Ros. | ? | N | 0 | 0 | BO, RM |
| Amorpha | canescens | Fab. | 9 | N | 1 | 0 | BO, RM |
| Anagallis | minima | Myrsin. | ? | N | 0 | 0 | RM |
| Andropogon | gerardii | Po. | 5 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Andropogon | hallii | Po. | 5 | N | 1 | 1 | US, BO, RM Vi, BH Fr, Vi |
| Androsace | occidentalis | Primul. | 5 | N | 1 | 0 | US, BO, RM, BH |
| Androsace | septentrionalis | Primul. | 5 | N | 0 | 0 | BO, BH |
| Anemone | cylindrica | Ranuncul. | 7 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Antennaria | corymbosa | Aster. | ? | N | 0 | 0 | BH |
| Antennaria | howellii | Aster. | 5 | N | 0 | 0 | BO, RM, BH |
| Antennaria | microphylla | Aster. | 7 | N | 0 | 0 | US, BO, RM, BH |
| Antennaria | neglecta | Aster. | 5 | N | 0 | 0 | BO, RM, BH |
| Antennaria | parvifolia | Aster. | 6 | N | 1 | 1 | US, BO, RM Vi, BH |
| Antennaria | rosea | Aster. | ? | N | 1 | 1 | RM, BH Fr |
| Apocynum | androsaemifolium | Apocyn. | 6 | N | 1 | 1 | US, BO, RM Vi, BH Fr |
| Apocynum | cannabinum | Apocyn. | 4 | N | 0 | 1 | US, BO, BH Fr |
| Arabis | pycnocarpa | Brassic. | 7 | N | 1 | 0 | US, BO, RM Vi |
| Arctium | minus | Aster. | x | I | 0 | 0 | BO - Not Seen |
| Arctostaphylos | uva-ursi | Eric. | 8 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Aristida | purpurea | Po. | 4 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Arnica | fulgens | Aster. | 10 | N | 0 | 0 | US, BO, RM, BH |
| Arnica | sororia | Aster. | 10 | N | 0 | 0 | BH |
| Artemisia | absinthium | Aster. | x | I | 0 | 0 | BO, BH |
| Artemisia | biennis | Aster. | 0 | N/I | 1 | 1 | US, BO, RM Vi, BH Vi |
| Artemisia | campestris | Aster. | 5 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Artemisia | cana | Aster. | 7 | N | 1 | 1 | US, BO, RM Vi, BH Fr |
| Artemisia | dracunculus | Aster. | 4 | N | 1 | 0 | US, BO, RM, BH |
| Artemisia | frigida | Aster. | 4 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Artemisia | longifolia | Aster. | 7 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Artemisia | ludoviciana | Aster. | 3 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Artemisia | tridentata | Aster. | 7 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Asclepias | pumila | Apocyn. | 7 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Asclepias | speciosa | Apocyn. | 4 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Asclepias | verticillata | Apocyn. | 3 | N | 1 | 0 | US, BO, BH |
| Asclepias | viridiflora | Apocyn. | 8 | N | 0 | 1 | US, BO, RM Vi, BH |
| Asparagus | officinalis | Asparag. | x | I | 1 | 1 | BO, RM Vi |
| Astragalus | agrestis | Fab. | 6 | N | 0 | 0 | US, BO, RM, BH |
| Astragalus | alpinus | Fab. | ? | N | 0 | 0 | BH |
| Astragalus | australis | Fab. | 9 | N | 0 | 0 | US, BO, RM, BH |
| Astragalus | bisulcatus | Fab. | 5 | N | 1 | 1 | US, BO, RM Vi, BH Vi |

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|---------------|----------------|-------------|----|---|---|---|--------------------------|
| Astragalus | canadensis | Fab. | 5 | N | 1 | 1 | BO, RM Vi, BH Fr |
| Astragalus | ceramicus | Fab. | 10 | N | 0 | 0 | US, BO, RM, BH |
| Astragalus | crassicaerpus | Fab. | 7 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Astragalus | flexuosus | Fab. | 4 | N | 0 | 1 | US, BO, RM Vi, BH |
| Astragalus | gilviflorus | Fab. | 7 | N | 0 | 0 | US, BO, RM, BH |
| Astragalus | gracilis | Fab. | 8 | N | 0 | 0 | US, BO, RM, BH |
| Astragalus | laxmannii | Fab. | 8 | N | 0 | 0 | US, BO, BH |
| Astragalus | lotiflorus | Fab. | 6 | N | 1 | 1 | US, BO, RM Vi, BH |
| Astragalus | missouriensis | Fab. | 7 | N | 0 | 0 | US, BO, RM, BH |
| Astragalus | pectinatus | Fab. | 8 | N | 0 | 0 | BH |
| Astragalus | plattensis | Fab. | 10 | N | 0 | 0 | RM, BH |
| Astragalus | purshii | Fab. | 10 | N | 1 | 0 | BH |
| Astragalus | racemosus | Fab. | 7 | N | 0 | 0 | US, BO, BH |
| Astragalus | simplicifolius | Fab. | ? | N | 0 | 1 | RM Vi |
| Astragalus | spatulatus | Fab. | 7 | N | 1 | 0 | US, BO, BH |
| Astragalus | tenellus | Fab. | 8 | N | 0 | 0 | US, RM, BH |
| Astragalus | vexilliflexus | Fab. | 10 | N | 1 | 1 | US, BO, RM Vi, BH Fr |
| Atriplex | argentea | Amaranth. | 6 | N | 1 | 1 | US, BO, RM Vi, BH |
| Atriplex | canescens | Amaranth. | 6 | N | 1 | 0 | US, BO, RM, BH |
| Atriplex | dioica | Amaranth. | 4 | N | 0 | 1 | US, BO, RM Vi |
| Atriplex | gardneri | Amaranth. | 6 | N | 0 | 1 | US, BO, RM Vi, BH |
| Atriplex | nuttallii | Amaranth. | 6 | N | 0 | 1 | BH Vi, Fr |
| Atriplex | patula | Amaranth. | x | I | 0 | 0 | US, BO, BH Fr |
| Atriplex | suckleyi | Amaranth. | 4 | N | 0 | 1 | US, RM Vi, BH Vi, Fr |
| Avena | fatua | Po. | x | I | 0 | 0 | BO, BH |
| Avenula | hookeri | Po. | 9 | N | 0 | 0 | BO, BH |
| Bacopa | rotundifolia | Plantagin. | 3 | N | 0 | 0 | US, BO, BH |
| Bassia | scoparia | Amaranth. | x | I | 0 | 0 | US, BO, RM, BH |
| Beckmannia | syzigachne | Po. | 1 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Berberis | repens | Berberid. | 8 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Besseyia | wyomingensis | Plantagin. | ? | N | 0 | 0 | BO, BH |
| Betula | occidentalis | Betul. | 8 | N | 1 | 1 | US, BO, BH Vi |
| Betula | papyrifera | Betul. | 8 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Bidens | cernua | Aster. | 3 | N | 1 | 1 | BO, BH Vi, Fr |
| Bidens | vulgata | Aster. | 1 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Boechera | collinsii | Brassic. | ? | N | 1 | 1 | RM Vi, BH Vi |
| Boechera | retrofracta | Brassic. | 5 | N | 0 | 1 | US, RM, BH Vi |
| Boechera | stricta | Brassic. | 8 | N | 0 | 0 | BH |
| Bolboschoenus | maritimus | Cyper. | 4 | N | 1 | 0 | BO, RM Vi, BH |
| Botrychium | virginianum | Ophiogloss. | 7 | N | 1 | 1 | US, BH Vi |

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|---------------|-----------------|------------|----|---|---|---|--------------------------|
| Bouteloua | curtipendula | Po. | 5 | N | 1 | 1 | BO, RM Vi, BH Vi, Fr |
| Bouteloua | dactyloides | Po. | 4 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Bouteloua | gracilis | Po. | 7 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Bouteloua | hirsuta | Po. | 7 | N | 0 | 0 | RM |
| Brickellia | eupatorioides | Aster. | 5 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Bromus | carinatus | Po. | ? | N | 0 | 0 | RM |
| Bromus | ciliatus | Po. | 10 | N | 1 | 1 | US, BO, BH Vi |
| Bromus | commutatus | Po. | x | I | 0 | 0 | RM |
| Bromus | inermis | Po. | x | I | 1 | 1 | BO, RM Vi, BH Fr |
| Bromus | japonicus | Po. | x | I | 0 | 0 | US, BO, RM, BH |
| Bromus | latiglumis | Po. | 8 | N | 1 | 0 | BH Fr |
| Bromus | porteri | Po. | 8 | N | 1 | 1 | RM, BH Fr |
| Bromus | squarrosus | Po. | x | I | 0 | 0 | RM, BH |
| Bromus | tectorum | Po. | x | I | 0 | 0 | US, BO, RM, BH |
| Calamagrostis | montanensis | Po. | 8 | N | 0 | 0 | BO, BH |
| Calamagrostis | stricta | Po. | 5 | N | 1 | 0 | US, BO, BH |
| Calamovilfa | longifolia | Po. | 5 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Callitriche | hermaphroditica | Plantagin. | 7 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Callitriche | heterophylla | Plantagin. | 10 | N | 0 | 1 | US, BO, RM Vi, BH |
| Callitriche | palustris | Plantagin. | 7 | N | 1 | 1 | RM Vi |
| Calochortus | nuttallii | Lili. | 8 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Calylophus | serrulatus | Onagr. | 7 | N | 0 | 1 | US, BO, RM Vi, BH Fr |
| Calystegia | sepium | Convolvul. | x | I | 1 | 1 | US, BO, RM Vi |
| Camelina | microcarpa | Brassic. | x | I | 0 | 0 | US, BO, RM, BH |
| Camelina | sativa | Brassic. | x | I | 1 | 0 | US, BO, BH |
| Campanula | rotundifolia | Campanul. | 7 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Capsella | bursa-pastoris | Brassic. | x | I | 1 | 0 | RM |
| Carex | atherodes | Cyper. | 4 | N | 0 | 0 | BO, BH |
| Carex | aurea | Cyper. | 8 | N | 1 | 1 | BO, RM Vi |
| Carex | backii | Cyper. | 10 | N | 0 | 0 | BH |
| Carex | brevior | Cyper. | 4 | N | 0 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Carex | canescens | Cyper. | ? | N | 0 | 0 | BH |
| Carex | duriuscula | Cyper. | 4 | N | 0 | 0 | US, BO, BH |
| Carex | filifolia | Cyper. | 7 | N | 0 | 0 | US, BO, RM, BH |
| Carex | gravida | Cyper. | 5 | N | 1 | 1 | US, BO, RM, BH |
| Carex | hoodii | Cyper. | ? | N | 0 | 0 | RM, BH |
| Carex | hystericina | Cyper. | 7 | N | 0 | 1 | BO, RM Vi, BH |
| Carex | inops | Cyper. | ? | N | 0 | 0 | US, BO, RM, BH |
| Carex | laeviconica | Cyper. | 6 | N | 0 | 1 | US, BO, RM Vi |
| Carex | laeviculmis | Cyper. | 10 | N | 0 | 1 | BH Vi |

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|---------------|---------------|--------------|----|-----|---|---|--------------------------|
| Carex | lasiocarpa | Cyper. | 4 | N | 1 | 0 | BH |
| Carex | molesta | Cyper. | 3 | N | 0 | 0 | US, BO, BH |
| Carex | peckii | Cyper. | 10 | N | 0 | 0 | BH |
| Carex | pellita | Cyper. | 4 | N | 0 | 1 | US, BO, BH Vi |
| Carex | pensylvanica | Cyper. | 8 | N | 0 | 1 | BH Vi |
| Carex | praeceptorum | Cyper. | ? | N | 0 | 1 | BH Vi |
| Carex | praegracilis | Cyper. | 5 | N | 0 | 0 | US, BO, RM, BH |
| Carex | rossii | Cyper. | 10 | N | 0 | 0 | BH |
| Carex | sartwellii | Cyper. | 5 | N | 1 | 1 | BO, RM Vi, |
| Carex | saximontana | Cyper. | 10 | N | 0 | 0 | BO, RM, BH |
| Carex | sprengelii | Cyper. | 7 | N | 0 | 1 | US, BO, RM Vi, BH Vi |
| Carex | torreyi | Cyper. | 10 | N | 1 | 1 | US, BO, RM Vi, BH |
| Carex | vallicola | Cyper. | 10 | N | 0 | 0 | US, BO, BH |
| Carex | vesicaria | Cyper. | 10 | N | 1 | 1 | BO - Not Seen |
| Carex | vulpinoidea | Cyper. | 2 | N | 0 | 1 | US, BO, RM, BH Vi |
| Carex | xerantica | Cyper. | 10 | N | 0 | 1 | US, BO, RM, BH Fr |
| Castilleja | sessiliflora | Orobanch. | 8 | N | 1 | 1 | US, BO, RM, BH Vi |
| Catabrosa | aquatica | Po. | 9 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Celastrus | scandens | Celastr. | 5 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Cenchrus | longispinus | Po. | 0 | N | 0 | 0 | US, BO, BH |
| Cerastium | arvense | Caryophyll. | 2 | N/I | 1 | 1 | US, BO, RM Vi, BH |
| Ceratophyllum | demersum | Ceratophyll. | 4 | N | 0 | 0 | BO, BH |
| Chaenactis | douglasii | Aster. | 9 | N | 1 | 1 | BO, BH Vi |
| Chamaerhodos | erecta | Ros. | 6 | N | 0 | 1 | US, BO, RM, BH Fr |
| Chamerion | angustifolium | Onagr. | 5 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Cheilanthes | feei | Pterid. | 10 | N | 0 | 0 | US, BO, BH |
| Chenopodium | berlandieri | Amaranth. | 0 | N | 0 | 0 | US, BO, RM Vi, BH Fr |
| Chenopodium | desiccatum | Amaranth. | 5 | N | 0 | 1 | US, BO, RM Vi, BH Fr |
| Chenopodium | fremontii | Amaranth. | 3 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Chenopodium | glaucum | Amaranth. | x | I | 1 | 1 | US, BO, RM Vi, BH Fr |
| Chenopodium | leptophyllum | Amaranth. | ? | N | 1 | 0 | BH |
| Chenopodium | pratericola | Amaranth. | 5 | N | 0 | 1 | BO, RM Vi, BH Vi |
| Chenopodium | rubrum | Amaranth. | 2 | N | 1 | 0 | BO, BH |
| Chenopodium | simplex | Amaranth. | 5 | N | 1 | 1 | US, BO, RM Vi, BH |
| Chenopodium | subglabrum | Amaranth. | 8 | N | 0 | 1 | BO, BH Fr |
| Chorispora | tenella | Brassic. | x | I | 0 | 0 | RM, BH |
| Cichorium | intybus | Aster. | x | I | 0 | 0 | FS/CC Hansen |
| Cicuta | maculata | Api. | 4 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Cirsium | arvense | Aster. | x | I | 0 | 0 | US, BO, RM, |
| Cirsium | canescens | Aster. | 8 | N | 1 | 1 | BO, RM Vi, BH |

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|---------------|-----------------|-------------|----|---|---|---|--------------------------|
| Cirsium | flodmanii | Aster. | 5 | N | 0 | 1 | US, BO, RM Vi, BH Vi |
| Cirsium | undulatum | Aster. | 7 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Cirsium | vulgare | Aster. | x | I | 0 | 0 | BO, RM |
| Clematis | ligusticifolia | Ranuncul. | 7 | N | 1 | 1 | US, BO, BH Fr |
| Collinsia | parviflora | Plantagin. | 10 | N | 0 | 0 | RM |
| Collomia | linearis | Polemoni. | 5 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Comandra | umbellata | Santal. | 8 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Conium | maculatum | Api. | x | I | 0 | 0 | US, BO, BH |
| Convolvulus | arvensis | Convolvul. | x | I | 0 | 0 | US, BO, RM |
| Conyza | canadensis | Aster. | 0 | N | 1 | 1 | US, RM Vi, BH Vi |
| Corallorhiza | maculata | Orchid. | 8 | N | 0 | 0 | BO, BH |
| Coreopsis | tinctoria | Aster. | 3 | N | 1 | 0 | US, BO - Not Seen |
| Corispermum | americanum | Amaranth. | ? | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Cornus | canadensis | Corn. | 10 | N | 1 | 1 | US, BO, RM Vi, |
| Cornus | sericea | Corn. | 5 | N | 1 | 1 | US, RM Vi, BH Vi, Fr |
| Corydalis | aurea | Papaver. | 4 | N | 1 | 1 | US, BO - Not Seen |
| Coryphantha | vivipara | Cact. | 10 | N | 1 | 1 | US, BO, RM Vi, |
| Crataegus | chrysoarpa | Ros. | 6 | N | 0 | 1 | US, BO, RM, BH Vi |
| Crataegus | succulenta | Ros. | 5 | N | 0 | 0 | BO, BH |
| Crepis | occidentalis | Aster. | 8 | N | 0 | 0 | US, BO, RM, BH |
| Crepis | runcinata | Aster. | 8 | N | 1 | 1 | US, BO, BH Vi |
| Cryptantha | celosioides | Boragin. | 8 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Cryptantha | fendleri | Boragin. | 4 | N | 0 | 0 | BO, BH |
| Cryptantha | thyrsoiflora | Boragin. | ? | N | 0 | 0 | US, RM |
| Cryptantha | torreyana | Boragin. | 6 | N | 0 | 0 | BH |
| Cyclachaena | xanthifolia | Aster. | 0 | N | 1 | 1 | BO, RM Vi, BH Vi |
| Cycloloma | atriplicifolium | Amaranth. | 1 | N | 0 | 0 | BH |
| Cymopterus | glomeratus | Api. | 8 | N | 0 | 0 | US, BH |
| Cymopterus | montanus | Api. | 8 | N | 0 | 0 | BH |
| Cyperus | schweintzii | Cyper. | 5 | N | 0 | 0 | BH |
| Cystopteris | fragilis | Dryopterid. | 8 | N | 1 | 1 | US, BO, RM Vi, BH |
| Dalea | candida | Fab. | 8 | N | 1 | 1 | US, BO, RM Vi, BH Fr |
| Dalea | purpurea | Fab. | 8 | N | 1 | 1 | US, BO, RM Vi, BH Fr |
| Dalea | villosa | Fab. | 8 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Dasiphora | fruticosa | Ros. | 5 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Delphinium | bicolor | Ranuncul. | 7 | N | 0 | 0 | BO, RM, BH |
| Delphinium | nuttallianum | Ranuncul. | ? | N | 0 | 0 | RM |
| Descurainia | pinnata | Brassic. | 1 | N | 1 | 1 | US, BO, RM Vi, BH |
| Dichanthelium | oligosanthes | Po. | 6 | N | 0 | 0 | RM |
| Dieteria | canescens | Aster. | 8 | N | 1 | 1 | US, BO, RM Vi, BH Fr |

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|--------------|--------------|-------------|----|---|---|---|--------------------------|
| Distichlis | spicata | Po. | 2 | N | 1 | 1 | US, BO, RM, BH Vi |
| Draba | nemorosa | Brassic. | 1 | N | 1 | 0 | US, BO, RM, BH |
| Draba | reptans | Brassic. | 1 | N | 0 | 0 | RM, BH |
| Drymocallis | arguta | Ros. | 8 | N | 1 | 0 | US, BO, RM |
| Drymocallis | glandulosa | Ros. | ? | N | 0 | 0 | RM |
| Dryopteris | filiX-mas | Dryopterid. | 10 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Dysphania | ambrosioides | Amaranth. | x | I | 1 | 0 | BO, BH |
| Dysodia | papposa | Aster. | 0 | N | 0 | 0 | US, BO, RM |
| Echinacea | angustifolia | Aster. | 7 | N | 1 | 1 | US, BO, RM Vi, BH Fr |
| Echinochloa | crus-galli | Po. | x | I | 1 | 0 | BH |
| Echinochloa | muricata | Po. | 0 | N | 0 | 1 | BO, RM Vi, BH Vi, Fr |
| Echinocystis | lobata | Cucurbit. | 3 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Elaeagnus | angustifolia | Elaeagn. | x | I | 0 | 0 | RM |
| Eleocharis | acicularis | Cyper. | 3 | N | 1 | 1 | US, BO, RM Vi, BH Fr |
| Eleocharis | erythropoda | Cyper. | 2 | N | 0 | 1 | US, RM, BH Fr |
| Eleocharis | macrostachya | Cyper. | 4 | N | 0 | 0 | US, BH |
| Eleocharis | palustris | Cyper. | ? | N | 1 | 1 | US, BO, RM, BH Vi |
| Eleocharis | parvula | Cyper. | 10 | N | 0 | 0 | BO, BH |
| Ellisia | nyctelea | Boragin. | 0 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Elyhordeum | macounii | Po. | ? | N | 1 | 1 | BO, BH Vi |
| Elymus | canadensis | Po. | 3 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Elymus | elymoides | Po. | 6 | N | 0 | 0 | US, BO, BH |
| Elymus | glaucus | Po. | 10 | N | 1 | 0 | US, BO, RM |
| Elymus | lanceolatus | Po. | 7 | N | 1 | 1 | US, BO, RM, BH Vi |
| Elymus | repens | Po. | 0 | I | 0 | 0 | BO, BH |
| Elymus | trachycaulus | Po. | 6 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Elymus | villosus | Po. | 4 | N | 0 | 1 | BO, RM, BH Fr |
| Elymus | virginicus | Po. | 4 | N | 1 | 0 | BO, BH Fr |
| Elymus | wiegandii | Po. | ? | N | 0 | 0 | BH |
| Epilobium | brachycarpum | Onagr. | ? | N | 0 | 0 | RM |
| Epilobium | ciliatum | Onagr. | 3 | N | 1 | 1 | BO, BH Fr |
| Epilobium | leptocarpum | Onagr. | ? | N | 1 | 1 | RM Vi |
| Equisetum | arvense | Equiset. | 4 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Equisetum | hyemale | Equiset. | 3 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Equisetum | laevigatum | Equiset. | 3 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Equisetum | variegatum | Equiset. | 10 | N | 0 | 0 | RM |
| Equisetum | x ferrissii | Equiset. | 3 | N | 0 | 0 | RM |
| Eragrostis | cilianensis | Po. | x | I | 0 | 0 | US, BO, RM, BH |
| Ericameria | nauseosa | Aster. | 4 | N | 1 | 1 | US, BO, RM, BH Vi, Fr |
| Erigeron | annuus | Aster. | 3 | N | 1 | 1 | US, BO, RM Vi, BH Vi |

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|-------------|----------------|-----------|----|---|---|---|--------------------------|
| Erigeron | caespitosus | Aster. | 10 | N | 0 | 0 | BO, RM |
| Erigeron | compositus | Aster. | 10 | N | 0 | 0 | US, BO, RM, BH |
| Erigeron | divergens | Aster. | 10 | N | 1 | 1 | US, BO, RM Vi, BH Fr |
| Erigeron | glabellus | Aster. | 7 | N | 1 | 1 | BO, RM Vi, BH |
| Erigeron | pumilus | Aster. | 8 | N | 1 | 0 | US, BO - Not Seen |
| Erigeron | radicatus | Aster. | 10 | N | 0 | 0 | BH |
| Erigeron | strigosus | Aster. | 3 | N | 0 | 1 | US, BO, RM, BH Fr |
| Eriogonum | annuum | Polygon. | 6 | N | 1 | 1 | US, BO, RM Vi, BH Fr |
| Eriogonum | cernuum | Polygon. | 9 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Eriogonum | flavum | Polygon. | 7 | N | 1 | 1 | US, BO, RM, BH Fr |
| Eriogonum | pauciflorum | Polygon. | 5 | N | 1 | 1 | US, BO, RM Vi, BH Fr |
| Eriogonum | visheri | Polygon. | 8 | N | 1 | 1 | BO, BH |
| Eriogonum | x nebraskense | Polygon. | ? | N | 0 | 0 | RM |
| Erysimum | asperum | Brassic. | 3 | N | 1 | 1 | BO, RM Vi, BH |
| Erysimum | cheiranthoides | Brassic. | x | I | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Erysimum | inconspicuum | Brassic. | 7 | N | 1 | 1 | US, BO, RM, BH Fr |
| Euphorbia | esula | Euphorbi. | x | I | 0 | 0 | RM, SDDA |
| Euphorbia | geyeri | Euphorbi. | 1 | N | 0 | 0 | BH |
| Euphorbia | glyptosperma | Euphorbi. | 0 | N | 1 | 0 | US, BO, RM Vi, BH Vi, Fr |
| Euphorbia | hexagona | Euphorbi. | 2 | N | 0 | 0 | BO, BH Vi |
| Euphorbia | missurica | Euphorbi. | 4 | N | 0 | 1 | US, BO, RM Vi, BH Vi |
| Euphorbia | serpyllifolia | Euphorbi. | ? | N | 0 | 0 | RM |
| Euphorbia | spathulata | Euphorbi. | 5 | N | 1 | 1 | US, BO, BH Vi |
| Fallopia | convolvulus | Polygon. | x | I | 1 | 1 | US, BO, RM Vi, BH Fr |
| Festuca | saximontana | Po. | 8 | N | 0 | 0 | BH |
| Fragaria | vesca | Ros. | 6 | N | 1 | 0 | BO, RM |
| Fragaria | virginiana | Ros. | 4 | N | 0 | 1 | BO, RM Vi, BH |
| Fraxinus | pennsylvanica | Ole. | 5 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Fritillaria | atropurpurea | Lili. | 10 | N | 1 | 1 | US, BO, RM, BH Vi |
| Gaillardia | aristata | Aster. | 5 | N | 0 | 0 | BO, BH |
| Galium | boreale | Rubi. | 4 | N | 1 | 1 | US, BO, RM Vi, BH Fr |
| Galium | trifidum | Rubi. | 8 | N | 0 | 1 | BO, BH Fr |
| Galium | triflorum | Rubi. | 7 | N | 1 | 0 | US, BO - Not Seen |
| Galium | aparine | Rubi. | 0 | N | 0 | 0 | RM |
| Gayophytum | diffusum | Onagr. | ? | N | 1 | 1 | BH Fr |
| Gentiana | affinis | Gentian. | 10 | N | 1 | 1 | BO, RM Vi, BH |
| Gentianella | amarella | Gentian. | 7 | N | 1 | 1 | US, BO, RM Vi, BH |
| Geranium | bicknellii | Gerani. | 3 | N | 0 | 0 | BO, BH |
| Geranium | carolinianum | Gerani. | 5 | N | 0 | 0 | US, BO, RM |
| Geum | aleppicum | Ros. | 4 | N | 1 | 1 | US, BO, RM Vi, BH Fr |

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|--------------|--------------|------------|----|-----|---|---|--------------------------|
| Geum | canadense | Ros. | 4 | N | 1 | 1 | BO, RM, BH Fr |
| Geum | triflorum | Ros. | 8 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Gleditsia | triacanthos | Fab. | 6 | N | 0 | 0 | RM |
| Glyceria | grandis | Po. | 4 | N | 0 | 1 | US, BO, RM, BH Vi |
| Glyceria | striata | Po. | 6 | N | 1 | 1 | US, BO, RM Vi, |
| Glycyrrhiza | lepidota | Fab. | 2 | N | 1 | 0 | US, BO, RM, BH |
| Gratiola | neglecta | Plantagin. | 0 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Grindelia | hirsutula | Aster. | ? | N | 1 | 1 | RM Vi |
| Grindelia | squarrosa | Aster. | 1 | N | 1 | 1 | US, BO, BH |
| Gutierrezia | sarothrae | Aster. | 6 | N | 1 | 1 | US, BO, BH Vi, Fr |
| Hackelia | deflexa | Boragin. | 0 | N | 0 | 1 | US, BO, RM Vi, BH |
| Hackelia | virginiana | Boragin. | 0 | N | 0 | 1 | BO, BH Fr |
| Hedeoma | drummondii | Lami. | 4 | N | 1 | 1 | US, BO, RM Vi, BH Fr |
| Hedeoma | hispidula | Lami. | 2 | N | 1 | 1 | BO, BH Fr |
| Helianthemum | bicknellii | Cist. | 10 | N | 0 | 0 | RM |
| Helianthus | annuus | Aster. | 0 | N | 1 | 1 | US, BO, RM Vi |
| Helianthus | maximiliani | Aster. | 5 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Helianthus | pauciflorus | Aster. | 8 | N | 0 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Helianthus | petiolaris | Aster. | 0 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Heracleum | maximum | Api. | 3 | N | 1 | 1 | BO, RM Vi, BH Fr |
| Hesperis | matronalis | Brassic. | x | I | 0 | 0 | RM |
| Hesperostipa | comata | Po. | 6 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Hesperostipa | spartea | Po. | 8 | N | 0 | 0 | RM, BH |
| Heterotheca | villosa | Aster. | 3 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Heuchera | richardsonii | Saxifrag. | 8 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Hieracium | umbellatum | Aster. | 6 | N | 1 | 1 | BO, RM Vi, BH Fr |
| Hordeum | jubatum | Po. | 0 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Hordeum | pusillum | Po. | 0 | N | 0 | 1 | US, BO, RM Vi, BH Vi |
| Hordeum | vulgare | Po. | x | I | 0 | 0 | BO, BH |
| Humulus | lupulus | Cannab. | 3 | N/I | 1 | 1 | US, BO, RM Vi, BH Vi |
| Hymenopappus | filifolius | Aster. | 8 | N | 1 | 1 | US, BO, RM Vi, BH |
| Hymenopappus | tenuifolius | Aster. | 8 | N | 0 | 1 | US, BO, BH Fr |
| Ipomopsis | congesta | Polemoni. | 8 | N | 0 | 1 | US, BO, BH Vi, Fr |
| Iva | axillaris | Aster. | 4 | N | 0 | 0 | US, BO, RM, BH |
| Juncus | arcticus | Junc. | 5 | N | 1 | 1 | US, BO, RM Vi, BH |
| Juncus | bufonius | Junc. | 1 | N | 0 | 0 | US, BO, RM, BH Fr |
| Juncus | dudleyi | Junc. | 4 | N | 0 | 0 | US, BO, BH |
| Juncus | interior | Junc. | 5 | N | 0 | 1 | US, BO, RM Vi, BH Vi |
| Juncus | longistylis | Junc. | 10 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Juncus | nodosus | Junc. | 7 | N | 1 | 1 | US, BO, RM Vi, BH Vi |

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|-------------------|-----------------|------------|----|---|---|---|--------------------------|
| Juncus | torreyi | Junc. | 2 | N | 1 | 1 | BO, RM Vi, BH Fr |
| Juniperus | communis | Cupress. | 5 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Juniperus | horizontalis | Cupress. | 6 | N | 0 | 1 | US, BO, RM Vi, BH Vi |
| Juniperus | scopulorum | Cupress. | 4 | N | 1 | 1 | BO, RM Vi, BH Vi |
| Koeleria | macrantha | Po. | 7 | N | 1 | 1 | US, BO, BH Vi, Fr |
| Krascheninnikovia | lanata | Amaranth. | 8 | N | 1 | 1 | US, BO, BH |
| Lactuca | canadensis | Aster. | 6 | N | 0 | 0 | RM |
| Lactuca | serriola | Aster. | x | I | 0 | 0 | US, BO, RM, |
| Ladeania | lanceolata | Fab. | 6 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Lappula | squarrosa | Boragin. | x | I | 0 | 0 | BO, BH |
| Lappula | occidentalis | Boragin. | 2 | N | 1 | 1 | US, BO, RM, BH |
| Lemna | minor | Ar. | 9 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Lemna | turionifera | Ar. | 1 | N | 0 | 0 | BO, RM |
| Lepidium | densiflorum | Brassic. | 0 | N | 0 | 1 | BO, RM Vi, BH Vi, Fr |
| Lepidium | perfoliatum | Brassic. | x | I | 0 | 0 | RM |
| Lepidium | virginicum | Brassic. | 0 | N | 1 | 0 | US, BO, BH |
| Leptochloa | fusca | Po. | ? | N | 0 | 0 | US, BO, BH |
| Leptosiphon | septentrionalis | Polemoni. | 10 | N | 0 | 0 | US, BO, BH |
| Leucocrinum | montanum | Asparag. | 10 | N | 1 | 0 | US, BO, BH |
| Liatrix | punctata | Aster. | 7 | N | 1 | 1 | US, BO, RM Vi, BH Fr |
| Limosella | aquatica | Plantagin. | 2 | N | 0 | 0 | US, BO, RM, BH |
| Linnaea | borealis | Caprifoli. | 10 | N | 1 | 0 | US, BO - Not Seen |
| Linum | compactum | Lin. | ? | N | 0 | 1 | US, BO, RM Vi |
| Linum | lewisii | Lin. | 6 | N | 1 | 0 | US, BO, RM, BH |
| Linum | perenne | Lin. | x | I | 0 | 0 | BH |
| Linum | rigidum | Lin. | 5 | N | 1 | 1 | US, BO, RM Vi, BH Fr |
| Lithospermum | incisum | Boragin. | 7 | N | 1 | 0 | US, BO, RM, BH |
| Logfia | arvensis | Aster. | x | I | 0 | 0 | RM |
| Lomatium | foeniculaceum | Api. | 6 | N | 0 | 0 | US, BO, RM, BH |
| Lomatium | macrocarpum | Api. | 8 | N | 1 | 0 | US, BO - Not Seen |
| Lotus | purshianus | Fab. | 3 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Lupinus | argenteus | Fab. | 8 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Lupinus | pusillus | Fab. | 6 | N | 1 | 1 | US, BO, RM Vi, BH Fr |
| Lycopus | americanus | Lami. | 4 | N | 1 | 1 | US, BO, BH Vi |
| Lycopus | asper | Lami. | 4 | N | 1 | 1 | BO, RM Vi, BH Fr |
| Lygodesmia | juncea | Aster. | 2 | N | 1 | 1 | US, BO, RM Vi, BH |
| Lysimachia | ciliata | Myrsin. | 6 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Madia | glomerata | Aster. | 1 | N | 1 | 1 | BO, RM Vi, BH Vi, Fr |
| Maianthemum | racemosum | Asparag. | 9 | N | 0 | 0 | BO, RM |
| Maianthemum | stellatum | Asparag. | 5 | N | 1 | 1 | US, BO, RM Vi, BH Vi |

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|---------------|---------------|-------------|----|---|---|---|--------------------------|
| Malva | neglecta | Malv. | x | I | 0 | 0 | RM |
| Malva | pusilla | Malv. | x | I | 0 | 0 | RM |
| Marsilea | vestita | Marsile. | 2 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Matricaria | discoidea | Aster. | x | I | 0 | 0 | BO, BH |
| Medicago | lupulina | Fab. | x | I | 0 | 0 | BH |
| Medicago | sativa | Fab. | x | I | 0 | 0 | US, BO, BH |
| Melilotus | officinalis | Fab. | x | I | 1 | 1 | US, BO, RM, BH Fr |
| Mentha | arvensis | Lami. | 3 | N | 1 | 1 | US, BO, RM Vi, BH Fr |
| Mentzelia | decapetala | Loas. | 5 | N | 1 | 1 | US, BO, RM Vi, BH Fr |
| Mentzelia | dispersa | Loas. | 2 | N | 0 | 0 | BO, RM, BH |
| Mertensia | ciliata | Boragin. | 10 | N | 0 | 0 | BO, BH |
| Mertensia | lanceolata | Boragin. | 9 | N | 0 | 0 | US, BO, RM Vi, BH Vi |
| Mertensia | oblongifolia | Boragin. | 9 | N | 0 | 1 | US, BH Vi |
| Microseris | nutans | Aster. | ? | N | 0 | 0 | RM, BH |
| Microsteris | gracilis | Polemoni. | ? | N | 0 | 0 | RM |
| Mirabilis | albida | Nyctagin. | 6 | N | 1 | 0 | BO, RM |
| Mirabilis | linearis | Nyctagin. | 7 | N | 1 | 1 | US, BO, RM Vi, BH Fr |
| Mirabilis | nyctaginea | Nyctagin. | 2 | N | 1 | 1 | US, BO, RM, BH Fr |
| Moehringia | lateriflora | Caryophyll. | 8 | N | 0 | 0 | RM |
| Monarda | fistulosa | Lami. | 5 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Monolepis | nuttalliana | Amaranth. | 3 | N | 1 | 1 | US, BO, RM Vi, BH |
| Muhlenbergia | asperifolia | Po. | 2 | N | 1 | 1 | US, BO, RM Vi BH Fr |
| Muhlenbergia | cuspidata | Po. | 8 | N | 0 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Muhlenbergia | glomerata | Po. | 10 | N | 0 | 0 | RM |
| Muhlenbergia | mexicana | Po. | 4 | N | 0 | 1 | BO, RM Vi |
| Muhlenbergia | racemosa | Po. | 4 | N | 1 | 1 | US, BO, RM, BH Vi, Fr |
| Mulgedium | pulchellum | Aster. | 1 | N | 1 | 1 | US, BO, BH Fr |
| Munroa | squarrosa | Po. | 0 | N | 0 | 0 | BO, RM, BH |
| Musineon | divaricatum | Api. | 6 | N | 0 | 0 | US, BO, RM, BH |
| Myosurus | minimus | Ranuncul. | 2 | N | 0 | 0 | RM |
| Nassella | viridula | Po. | 5 | N | 0 | 0 | US, BO, RM, BH |
| Navarretia | intertexta | Polemoni. | 5 | N | 0 | 1 | US, BH Vi, Fr |
| Nepeta | cataria | Lami. | x | I | 0 | 0 | RM |
| Nothocalais | cuspidata | Aster. | 10 | N | 1 | 1 | US, RM, BH |
| Nuttallanthus | texanus | Plantagin. | 5 | N | 0 | 0 | US, BO, RM, BH |
| Oenothera | albicaulis | Onagr. | 5 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Oenothera | biennis | Onagr. | 0 | N | 1 | 1 | US, BH Vi |
| Oenothera | cespitosa | Onagr. | 8 | N | 1 | 1 | US, BO, RM Vi, BH |
| Oenothera | coronopifolia | Onagr. | 6 | N | 1 | 1 | BO, BH Fr |
| Oenothera | curtiflora | Onagr. | 1 | N | 0 | 0 | US, BO, BH |

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|----------------|---------------|-------------|----|---|---|---|--------------------------|
| Oenothera | flava | Onagr. | 8 | N | 1 | 1 | BO, RM Vi, BH |
| Oenothera | laciniata | Onagr. | 1 | N | 1 | 0 | BO, RM |
| Oenothera | nuttallii | Onagr. | 8 | N | 1 | 1 | BO, RM Vi, BH Fr |
| Oenothera | serrulata | Onagr. | 7 | N | 1 | 1 | US, BO, RM Vi, BH Fr |
| Oenothera | suffrutescens | Onagr. | 4 | N | 1 | 1 | US, BO, RM Vi, BH Fr |
| Oenothera | villosa | Onagr. | ? | N | 1 | 1 | US, BO, RM Vi, BH Fr |
| Oenopsis | multicaulus | Aster. | 4 | N | 0 | 0 | BO, BH |
| Opuntia | fragilis | Cact. | 5 | N | 1 | 1 | BO, RM Vi, BH Vi |
| Opuntia | polyacantha | Cact. | 3 | N | 1 | 1 | US, BO, RM Vi, BH |
| Orobanche | fasciculata | Orobanch. | 9 | N | 0 | 0 | US, BO, BH |
| Orobanche | ludoviciana | Orobanch. | 10 | N | 1 | 1 | US, BO, BH Vi |
| Orthocarpus | luteus | Orobanch. | 6 | N | 1 | 1 | US, BO, RM Vi, BH Fr |
| Osmorhiza | longistylis | Api. | 7 | N | 1 | 1 | BO, BH Vi |
| Oxalis | dillenii | Oxalid. | 5 | N | 0 | 0 | RM |
| Oxytropis | campestris | Fab. | 8 | N | 1 | 1 | BO, BH |
| Oxytropis | lagopus | Fab. | ? | N | 0 | 0 | BH |
| Oxytropis | lambertii | Fab. | 5 | N | 1 | 1 | US, BO, RM, BH Vi |
| Oxytropis | sericea | Fab. | 6 | N | 0 | 1 | BO, RM Vi, BH |
| Packera | cana | Aster. | 8 | N | 0 | 0 | US, BO, RM, BH |
| Packera | plattensis | Aster. | 6 | N | 0 | 0 | US, BO, RM, |
| Panicum | capillare | Po. | 0 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Panicum | virgatum | Po. | 5 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Parietaria | pensylvanica | Urtic. | 3 | N | 0 | 0 | BO, RM, BH |
| Paronychia | sesseliflora | Caryophyll. | 7 | N | 1 | 1 | US, BO, RM, BH Vi, Fr |
| Parthenocissus | vitacea | Vit. | 2 | N | 1 | 1 | US, RM Vi, BH Vi |
| Pascopyrum | smithii | Po. | 4 | N | 1 | 1 | US, BO, BH Vi, Fr |
| Pediemelum | argophyllum | Fab. | 4 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Pediemelum | cuspidatum | Fab. | 8 | N | 0 | 0 | BO, BH |
| Pediemelum | esculentum | Fab. | 9 | N | 0 | 0 | US, BO, RM, BH |
| Pellaea | glabella | Pterid. | 10 | N | 1 | 0 | BON, RM, BH |
| Penstemon | albidus | Plantagin. | 7 | N | 1 | 1 | US, BO, RM Vi, BH Fr |
| Penstemon | angustifolius | Plantagin. | 9 | N | 1 | 0 | US, BO, RM, BH |
| Penstemon | cyaneus | Plantagin. | ? | N | 0 | 0 | RM |
| Penstemon | eriantherus | Plantagin. | 10 | N | 1 | 0 | US, BO, RM, BH |
| Penstemon | glaber | Plantagin. | 7 | N | 0 | 0 | US, BO, RM, BH |
| Penstemon | gracilis | Plantagin. | 6 | N | 0 | 1 | US, BO, RM Vi, BH |
| Penstemon | nitidus | Plantagin. | 7 | N | 0 | 0 | BO, RM, BH |
| Perideridia | montana | Api. | ? | N | 0 | 1 | RM Vi |
| Peritoma | serrulata | Cleom. | 2 | N | 0 | 1 | US, BO, RM, BH Vi, Fr |
| Persicaria | amphibia | Polygon. | 0 | N | 1 | 0 | US, BO - Not Seen |

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|----------------|---------------|-------------|---|-----|---|---|--------------------------|
| Persicaria | lapathifolia | Polygon. | 1 | N | 1 | 1 | US, BO, RM Vi |
| Persicaria | pensylvanicum | Polygon. | 0 | N | 1 | 0 | US - Not Seen |
| Phacelia | hastata | Hydrophyll. | 5 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Phacelia | heterophylla | Hydrophyll. | ? | N | 0 | 0 | RM |
| Phalaris | arundinacea | Po. | 0 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Phemeranthus | parviflorus | Monti. | 8 | N | 1 | 1 | US, BO, RM |
| Phleum | pratense | Po. | x | I | 1 | 1 | US, BO, RM Vi, BH Vi |
| Phlox | alyssifolia | Polemoni. | 9 | N | 1 | 1 | US, BO, RM, BH Vi |
| Phlox | andicola | Polemoni. | 7 | N | 0 | 1 | US, BO, BH Vi |
| Phlox | hoodii | Polemoni. | 6 | N | 1 | 0 | BO, RM, BH |
| Phragmites | australis | Po. | 0 | N/I | 0 | 0 | BO, BH |
| Physalis | heterophylla | Solan. | 5 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Physalis | longifolia | Solan. | 0 | N | 0 | 1 | US, BO, RM Vi |
| Physaria | arenosa | Brassic. | 6 | N | 1 | 1 | RM Vi, BH |
| Physaria | brassicoides | Brassic. | 8 | N | 0 | 0 | US, BO, RM Vi, BH Vi |
| Physaria | ludoviciana | Brassic. | 6 | N | 0 | 1 | US, BO, RM Vi, BH Fr |
| Physaria | montana | Brassic. | 8 | N | 0 | 0 | BH |
| Physaria | spatulata | Brassic. | 8 | N | 0 | 1 | BO, RM Vi |
| Picradeniopsis | oppositifolia | Aster. | 2 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Pinus | ponderosa | Pin. | 6 | N | 1 | 1 | US, BO, RM Vi, BH |
| Piptatherum | micranthum | Po. | 8 | N | 0 | 0 | US, BO, RM, BH |
| Plagiobothrys | scouleri | Boragin. | 0 | N | 0 | 0 | US, BH |
| Plantago | eriopoda | Plantagin. | 5 | N | 0 | 0 | BO, BH |
| Plantago | elongata | Plantagin. | 3 | N | 1 | 0 | BO, BH |
| Plantago | lanceolata | Plantagin. | x | I | 1 | 1 | BO, RM Vi |
| Plantago | major | Plantagin. | x | I | 1 | 1 | US, BO, RM, BH Vi, Fr |
| Plantago | patagonica | Plantagin. | 1 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Plantago | rugelii | Plantagin. | 0 | N | 1 | 1 | US, BO, RM Vi |
| Platanthera | aquilonis | Orchid. | 9 | N | 0 | 1 | US, BO, RM, BH Vi |
| Platanthera | dilatata | Orchid. | ? | N | 0 | 1 | BO, RM Vi |
| Poa | arida | Po. | 8 | N | 1 | 0 | US, BO, RM, BH |
| Poa | bulbosa | Po. | x | I | 0 | 0 | RM |
| Poa | compressa | Po. | x | I | 0 | 0 | BO, RM, BH |
| Poa | fendleriana | Po. | 8 | N | 0 | 0 | BO, RM, BH |
| Poa | interior | Po. | 5 | N | 1 | 1 | US, RM, BH Fr |
| Poa | palustris | Po. | 4 | N | 1 | 0 | BO, RM BH |
| Poa | pratensis | Po. | x | I | 0 | 1 | US, BO, RM, BH Vi |
| Poa | secunda | Po. | 8 | N | 1 | 1 | BO, RM, BH Vi |
| Polanisia | dodecandra | Cleom. | 2 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Polygala | alba | Polygal. | 5 | N | 1 | 1 | US, BO, RM Vi, BH Fr |

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|-----------------|------------------|--------------|----|---|---|---|--------------------------|
| Polygala | verticillata | Polygal. | 8 | N | 1 | 0 | US, BO, RM, BH |
| Polygonum | achoreum | Polygon. | x | I | 0 | 0 | US, BO, BH |
| Polygonum | aviculare | Polygon. | x | I | 1 | 1 | BO, RM Vi, BH Vi |
| Polygonum | douglasii | Polygon. | 3 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Polygonum | ramosissimum | Polygon. | 3 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Polygonum | spergulariiforme | Polygon. | ? | N | 0 | 0 | RM |
| Populus | x acuminata | Salic. | 3 | N | 0 | 0 | US, BO, RM Vi |
| Populus | balsamifera | Salic. | 6 | N | 0 | 0 | BO, BH |
| Populus | deltoides | Salic. | 4 | N | 1 | 1 | US, BO, RM Vi |
| Populus | tremuloides | Salic. | 4 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Potamogeton | diversifolius | Potamogeton. | 4 | N | 0 | 1 | BH Vi |
| Potamogeton | pusillus | Potamogeton. | 2 | N | 0 | 0 | BO, BH |
| Potamogeton | foliosus | Potamogeton. | 2 | N | 0 | 1 | BO, RM Vi |
| Potentilla | arguta | Ros. | 8 | N | 0 | 0 | US, BO, BH |
| Potentilla | biennis | Ros. | ? | N | 1 | 1 | US, BO, BH Vi |
| Potentilla | bipinnatifida | Ros. | 9 | N | 0 | 1 | RM Vi |
| Potentilla | concinna | Ros. | 8 | N | 1 | 1 | US, BO - Not Seen |
| Potentilla | gracilis | Ros. | 5 | N | 0 | 1 | RM Vi |
| Potentilla | macounii | Ros. | 8 | N | 0 | 0 | RM |
| Potentilla | norvegica | Ros. | 0 | N | 1 | 1 | US, BO, RM Vi, BH Fr |
| Potentilla | pensylvanica | Ros. | 9 | N | 1 | 1 | US, BO, RM, BH Vi |
| Potentilla | rubricaulis | Ros. | 9 | N | 0 | 1 | BH Fr |
| Prosartes | trachycarpa | Lili. | 10 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Prunus | americana | Ros. | 4 | N | 1 | 1 | US, BO, RM Vi, BH Fr |
| Prunus | pensylvanica | Ros. | 8 | N | 0 | 0 | BO - Not Seen |
| Prunus | pumila | Ros. | 8 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Prunus | virginiana | Ros. | 4 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Pseudoroegneria | spicata | Po. | 9 | N | 0 | 1 | BO, BH Fr |
| Pterospora | andromedea | Eric. | ? | N | 1 | 1 | US, BO, RM, BH Vi |
| Puccinellia | nuttalliana | Po. | 4 | N | 1 | 1 | US, BO, BH Vi |
| Pulsatilla | patens | Ranuncul. | 9 | N | 1 | 0 | US, BO, BH |
| Pyrola | asarifolia | Pyrol. | 8 | N | 1 | 1 | US, BO, BH Vi |
| Pyrola | elliptica | Pyrol. | 10 | N | 1 | 1 | US, BO, BH Vi |
| Ranunculus | abortivus | Ranuncul. | 2 | N | 1 | 1 | US, BO, RM Vi, BH |
| Ranunculus | aquatilis | Ranuncul. | ? | N | 0 | 1 | RM Vi |
| Ranunculus | cymbalaria | Ranuncul. | 3 | N | 1 | 1 | US, RM, BH Vi, Fr |
| Ranunculus | glaberrimus | Ranuncul. | 8 | N | 0 | 0 | BO, BH |
| Ranunculus | longirostris | Ranuncul. | 7 | N | 0 | 1 | US, BO, BH Vi |
| Ranunculus | macounii | Ranuncul. | 4 | N | 1 | 1 | BO, RM Vi, BH Fr |
| Ranunculus | pensylvanicus | Ranuncul. | 4 | N | 1 | 0 | RM |

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|---------------|-----------------|-------------|---|-----|---|---|--------------------------|
| Ranunculus | scleratus | Ranuncul. | 3 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Ratibida | columnifera | Aster. | 3 | N | 1 | 1 | US, BO, RM Vi, BH Fr |
| Rhus | glabra | Anacardi. | 4 | N | 0 | 0 | BO, BH |
| Rhus | trilobata | Anacardi. | 7 | N | 1 | 1 | US, BO, RM, BH Fr |
| Ribes | americanum | Grossulari. | 7 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Ribes | aureum | Grossulari. | 6 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Ribes | cereum | Grossulari. | 7 | N | 1 | 1 | US, BO, RM, BH Fr |
| Ribes | missouriense | Grossulari. | 4 | N | 0 | 0 | US - Not Seen |
| Ribes | oxyacanthoides | Grossulari. | 5 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Rorippa | palustris | Brassic. | 2 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Rorippa | sinuata | Brassic. | 4 | N | 1 | 1 | US, BO, RM Vi |
| Rosa | acicularis | Ros. | 8 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Rosa | arkansana | Ros. | 3 | N | 1 | 1 | US, BO, RM Vi, BH Fr |
| Rosa | blanda | Ros. | 8 | N | 0 | 0 | BH |
| Rosa | nutkana | Ros. | ? | N | 0 | 0 | RM |
| Rosa | woodsii | Ros. | 5 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Rubus | idaeus | Ros. | 5 | N/I | 1 | 1 | US, BO, RM Vi, BH Vi |
| Rumex | crispus | Polygon. | x | I | 0 | 0 | US, BO, RM, BH |
| Rumex | fueginus | Polygon. | 1 | N | 0 | 0 | US, RM |
| Rumex | occidentalis | Polygon. | 7 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Rumex | patientia | Polygon. | x | I | 0 | 0 | RM |
| Rumex | stenophyllus | Polygon. | x | I | 0 | 0 | RM |
| Rumex | triangulivalvis | Polygon. | 1 | N | 0 | 1 | BO, RM Vi, BH Vi |
| Rumex | utahensis | Polygon. | ? | N | 0 | 1 | RM Vi |
| Rumex | venosus | Polygon. | 3 | N | 1 | 1 | US, BO, RM Vi, BH |
| Sagittaria | cuneata | Alismat. | 6 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Salix | amygdaloides | Salic. | 3 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Salix | bebbiana | Salic. | 8 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Salix | discolor | Salic. | 7 | N | 0 | 0 | BO, BH |
| Salix | eriocephala | Salic. | 5 | N | 0 | 1 | RM Vi, BH |
| Salix | exigua | Salic. | 3 | N | 1 | 1 | BO, RM Vi, BH Vi |
| Salix | interior | Salic. | 3 | N | 0 | 0 | US, BO, BH |
| Salix | lutea | Salic. | 5 | N | 0 | 1 | BH Vi |
| Salsola | collina | Amaranth. | x | I | 0 | 1 | BO, BH Fr |
| Salsola | tragus | Amaranth. | x | I | 1 | 1 | US, BO, RM Vi, BH |
| Sanicula | marilandica | Api. | 7 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Sarcobatus | vermiculatus | Sarcobat. | 5 | N | 0 | 0 | US, BO, BH |
| Schedonnardus | paniculatus | Po. | 1 | N | 0 | 1 | US, BO, BH Vi |
| Schizachne | purpurascens | Po. | 8 | N | 0 | 0 | BO, RM, BH |
| Schizachyrium | scoparium | Po. | 6 | N | 1 | 1 | BO, RM Vi, BH Fr |

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|----------------|-----------------|--------------|----|---|---|---|--------------------------|
| Schoenoplectus | acutus | Cyper. | 5 | N | 1 | 0 | BO, RM, BH |
| Schoenoplectus | americanus | Cyper. | 4 | N | 1 | 1 | RM Vi |
| Schoenoplectus | maritimus | Cyper. | 4 | N | 0 | 0 | BO, BH |
| Schoenoplectus | pungens | Cyper. | 4 | N | 0 | 1 | US, BO, RM, BH Fr |
| Schoenoplectus | tabernaemontani | Cyper. | 3 | N | 0 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Scirpus | atrocinctus | Cyper. | 10 | N | 0 | 0 | BO, BH |
| Scirpus | pallidus | Cyper. | 5 | N | 0 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Scrophularia | lanceolata | Scrophulari. | 5 | N | 0 | 0 | RM |
| Sedum | lanceolatum | Crassul. | 9 | N | 0 | 0 | RM, BH |
| Selaginella | densa | Selaginell. | 6 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Selaginella | rupestris | Selaginell. | 10 | N | 0 | 0 | BO, BH |
| Senecio | crassulus | Aster. | ? | N | 0 | 0 | BH |
| Senecio | integerrimus | Aster. | 7 | N | 0 | 0 | US, BO, RM, BH |
| Setaria | italica | Po. | x | I | 0 | 0 | BO, BH |
| Setaria | viridis | Po. | x | I | 1 | 1 | US, BO, BH Fr |
| Shepherdia | argentea | Elaeagn. | 5 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Shinnersoseris | rostrata | Aster. | 10 | N | 1 | 1 | US, BO, RM Vi |
| Silene | antirrhina | Caryophyll. | 3 | N | 0 | 0 | US, BO, RM, BH |
| Silene | drummondii | Caryophyll. | 5 | N | 1 | 1 | US, BO, RM Vi, BH |
| Silene | latifolia | Caryophyll. | x | I | 0 | 0 | BH |
| Sinapis | arvensis | Brassic. | x | I | 1 | 1 | US, BO, RM Vi, BH Vi |
| Sisymbrium | altissimum | Brassic. | x | I | 0 | 1 | US, BO, BH Fr |
| Sisyrinchium | montanum | Irid. | 8 | N | 0 | 1 | US, BO, RM, BH Vi |
| Sium | suave | Api. | 3 | N | 0 | 0 | US, BO, BH |
| Smilax | lasiocarpa | Smilac. | 8 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Solanum | rostratum | Solan. | 0 | N | 1 | 1 | US, BO, RM, BH Fr |
| Solanum | triflorum | Solan. | 0 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Solidago | canadensis | Aster. | 8 | N | 0 | 1 | RM |
| Solidago | gigantea | Aster. | 4 | N | 1 | 1 | US, BO, RM Vi, BH Fr |
| Solidago | missouriensis | Aster. | 5 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Solidago | mollis | Aster. | 6 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Solidago | nemoralis | Aster. | 6 | N | 1 | 1 | US, BO, RM, BH Vi, Fr |
| Solidago | ptarmicoides | Aster. | ? | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Solidago | rigida | Aster. | 4 | N | 1 | 1 | BO, RM Vi, BH Fr |
| Solidago | speciosa | Aster. | 10 | N | 0 | 0 | US, BO, RM |
| Solidago | velutina | Aster. | ? | N | 0 | 0 | BO, BH |
| Sonchus | asper | Aster. | x | I | 1 | 1 | US, BO, RM Vi, BH Vi |
| Sorghum | bicolor | Po. | x | I | 0 | 0 | BO, BH |
| Spartina | gracilis | Po. | 6 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Spartina | pectinata | Po. | 5 | N | 0 | 1 | US, BO, RM Vi, BH Fr |

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|----------------|----------------|--------------|---|-----|---|---|--------------------------|
| Sphaeralcea | coccinea | Malv. | 4 | N | 1 | 1 | US, BO, RM Vi, BH Fr |
| Sphenopholis | obtusata | Po. | 7 | N | 0 | 0 | BO, RM, BH |
| Spiranthes | romanzoffiana | Orchid. | 9 | N | 0 | 0 | US, BO, BH |
| Sporobolus | compositus | Po. | 4 | N | 0 | 0 | BO, BH |
| Sporobolus | cryptandrus | Po. | 6 | N | 0 | 0 | US, BO, RM, BH |
| Stenotus | armerioides | Aster. | 7 | N | 0 | 0 | US, BO, RM, BH |
| Stephanomeria | runcinata | Aster. | ? | N | 0 | 0 | RM |
| Stephanomeria | tenuifolia | Aster. | ? | N | 0 | 0 | RM |
| Strophostyles | leiosperma | Fab. | 6 | N | 1 | 0 | US, BO - Not Seen |
| Stuckenia | pectinata | Potamogeton. | 0 | N | 0 | 0 | US, BO, RM, BH |
| Suaeda | calceoliformis | Amaranth. | 2 | N | 1 | 1 | US, BO, BH Vi, Fr |
| Suaeda | nigra | Amaranth. | 1 | N | 1 | 0 | US, BO, RM, BH |
| Symphoricarpos | albus | Caprifoli. | 8 | N | 1 | 1 | BO, RM Vi, BH Vi |
| Symphoricarpos | occidentalis | Caprifoli. | 3 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Symphyotrichum | boreale | Aster. | ? | N | 0 | 0 | RM |
| Symphyotrichum | ericoides | Aster. | 2 | N | 1 | 1 | US, BO, BH Vi, Fr |
| Symphyotrichum | falcatum | Aster. | 4 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Symphyotrichum | laeve | Aster. | 5 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Symphyotrichum | lanceolatum | Aster. | 3 | N | 1 | 1 | US, BO, RM Vi, BH Fr |
| Symphyotrichum | oblongifolium | Aster. | 8 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Syringa | vulgaris | Ole. | x | I | 0 | 0 | RM |
| Taraxacum | erythrospermum | Aster. | x | I | 0 | 0 | US, RM, BH |
| Taraxacum | officinale | Aster. | x | N/I | 0 | 0 | BH |
| Tetraneuris | acaulis | Aster. | 6 | N | 1 | 1 | US, BO, RM Vi, BH Fr |
| Thalictrum | dasyarpum | Ranuncul. | 7 | N | 1 | 1 | US, BO, RM Vi, BH Fr |
| Thermopsis | rhombifolia | Fab. | 6 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Thinopyrum | intermedium | Po. | x | I | 0 | 0 | BO, RM, BH |
| Thlaspi | arvense | Brassic. | x | I | 0 | 0 | BO, RM, BH |
| Townsendia | exscapa | Aster. | 8 | N | 0 | 0 | BH |
| Toxicodendron | rydbergii | Anacardi. | 3 | N | 1 | 1 | US, BO, RM Vi, BH Vi, Fr |
| Toxicoscordion | venenosum | Melanthi. | 7 | N | 1 | 1 | US, BO, RM Vi, |
| Tradescantia | bracteata | Commelin. | 7 | N | 0 | 1 | US, BO, BH Vi |
| Tradescantia | occidentalis | Commelin. | 5 | N | 1 | 1 | US, BO, RM, BH Vi, Fr |
| Tragopogon | dubius | Aster. | x | I | 0 | 0 | US, BO, RM, BH |
| Tragopogon | pratensis | Aster. | x | I | 0 | 0 | RM |
| Trifolium | fragiferum | Fab. | x | I | 0 | 0 | BO, BH |
| Triglochin | maritima | Juncagin. | 5 | N | 1 | 1 | US, BO, RM Vi, BH Fr |
| Triglochin | palustris | Juncagin. | 8 | N | 0 | 0 | US, BO, RM, BH Vi |
| Triodanis | leptocarpa | Campanul. | 8 | N | 0 | 0 | US, BO, RM, BH |
| Triodanis | perfoliata | Campanul. | 6 | N | 0 | 0 | US, BO, BH |

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|---------------|--------------|--------------|---|-----|---|---|-----------------------|
| Tripterocalyx | micranthus | Nyctagin. | 7 | N | 0 | 1 | US, BO, BH Vi, Fr |
| Triticum | aestivum | Po. | x | I | 0 | 0 | BH |
| Turritis | glabra | Brassic. | 6 | N | 0 | 0 | US, BO, BH |
| Typha | latifolia | Typh. | 2 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Typha | angustifolia | Typh. | x | I | 0 | 0 | RM |
| Ulmus | americana | Ulm. | 3 | N | 0 | 0 | RM |
| Ulmus | pumila | Ulm. | x | I | 0 | 0 | RM |
| Ulmus | rubra | Ulm. | 5 | N | 1 | 1 | BO, RM Vi, BH Vi |
| Urtica | dioica | Urtic. | 0 | N/I | 1 | 1 | US, BO, RM Vi, BH Vi |
| Vaccaria | hispanica | Caryophyll. | x | I | 1 | 1 | US, BO, RM Vi, BH Fr |
| Verbena | bracteata | Verben. | 0 | N | 0 | 0 | US, BO, RM, BH |
| Verbena | stricta | Verben. | 2 | N | 1 | 0 | BO, BH |
| Veronica | peregrina | Plantagin. | 0 | N | 0 | 0 | US, BO, BH |
| Veronica | americana | Plantagin. | 5 | N | 1 | 1 | US, BO, RM Vi, BH Vi, |
| Viburnum | lentago | Caprifoli. | 8 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Vicia | americana | Fab. | 3 | N | 1 | 1 | US, BO, RM Vi, BH |
| Viola | adunca | Viol. | 8 | N | 0 | 0 | US, BO, RM, BH |
| Viola | canadensis | Viol. | 4 | N | 1 | 1 | BO, RM Vi |
| Viola | nephrophylla | Viol. | 8 | N | 0 | 1 | US, BO - Not Seen |
| Viola | nuttallii | Viol. | 8 | N | 0 | 0 | US, BO, RM, BH |
| Viola | pedatifida | Viol. | 8 | N | 0 | 0 | US, BO, RM, BH |
| Viola | sororia | Viol. | 2 | N | 1 | 1 | BO, RM Vi |
| Viola | vallicola | Viol. | 8 | N | 1 | 0 | RM |
| Vitis | riparia | Vit. | 3 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Vulpia | octoflora | Po. | 0 | N | 0 | 0 | US, BO, RM, BH Fr |
| Woodsia | oregana | Dryopterid. | 8 | N | 0 | 0 | US, BO, RM, BH |
| Woodsia | scopulina | Dryopterid. | ? | N | 1 | 1 | US, BO, RM Vi, BH |
| Xanthisma | grindeloides | Aster. | 8 | N | 1 | 1 | US, BO, RM Vi, BH |
| Xanthisma | spinulosum | Aster. | 7 | N | 1 | 1 | US, BO, BH Vi |
| Xanthium | strumarium | Aster. | 0 | N | 1 | 1 | BO, RM, BH Fr |
| Xylorhiza | glabriuscula | Aster. | 4 | N | 0 | 0 | US, BO, BH |
| Yucca | glauca | Agav. | 6 | N | 1 | 1 | US, BO, RM Vi, BH Vi |
| Zannichellia | palustris | Potamogeton. | 2 | N | 0 | 0 | US, BO, BH |
| Zea | mays | Po. | x | I | 0 | 0 | BO, BH |

Appendix 2. List of problematic species records. USDA = USDA NRCS (2014); BONAP = Kartesz (2013); RM = Hartman et al. (2009); BHSC = Black Hills State University Herbarium (2014)

Alopecurus pratensis was collected by Visher from adjacent Perkins County in 1912. It has not been seen in Harding County.

Argemone intermedia (*Argemone polyanthemis*) was reported by Visher (1914), but records of more recent collections have not been observed (USDA, BONAP, RM, BHSC).

Atriplex powellii was reported as present in Carter County, MT, adjacent to Harding County, by BONAP.

Carex siccata was listed by Visher, but specimens from Harding County have not been observed. It is present in the Black Hills, approximately 150-200 km to the south.

Carum carvi is found in the Black Hills, but has not been seen in Harding County, nor have specimens from Visher been located.

Chenopodium watsonii specimens from Harding County have not been located. The species is present in the Black Hills.

Crataegus sheridana listed by Visher in Harding County, but specimen not seen, present in Carter Co., MT.

Cyperus squarrosus specimens from Harding County have not been observed. The species is present in other counties in South Dakota.

Epilobium leptocarpum is listed by USDA, BONAP, and RM as occurring only farther west. SDU has a Visher specimen labeled as this species.

Festuca idahoensis has been recorded as present (Bonap 2014). Specimens of the species have not been seen, and Heidel and Dueholm (1995) have suggested that the listing may have been because of an error in identification.

Festuca rubra specimens have not been seen from Harding County, but a Visher specimen is present at RM from adjacent Perkins Co.

Mentzelia nuda is noted by Visher (1914), but no specimens have been seen, and it is not known otherwise from Harding County.

Oxalis stricta is on Visher's list, but no specimens of *O. stricta* have been seen from that county.

Poa cusickii is on Visher's list, but no specimens from Harding County have been seen. BONAP lists as present from adjacent Carter Co., MT

Populus angustifolia specimens have not been seen from Harding County. Visher could have observed *Populus x acuminata*.

Ranunculus rhomboideus was not seen in Harding County, but is present in the Black Hills.

Rorippa curvisiliqua (*R. lyrata*) has not been found in Harding County.

Salix lucida is not known from Harding County. Perhaps the specimens were *Salix amygdaloides*.