Assessment

Forest Plan Revision

Final At Risk and Potential Plant Species of Conservation Concern Report

Cypripedium parviflorum –Small Yellow Lady's Slipper (Courtesy of Kurt Hansen)

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for:
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February 16, 2017

Contents

Introduction

A draft of this report was released for public review on November 30, 2016 and feedback was requested by January 6, 2017. Changes made to the final report based on public feedback were to:

1. Evaluate four plant species identified in public feedback for potential Species of Conservation Concern using the criteria set forth in the 2012 planning rule. *Pinus flexilis* (Limber pine), *Penstemon nitidus* (Waxleaf penstemon), *Physaria brassicoides* (Double bladderpod), and *Almutaster pauciflorus* (Alkali Marsh Aster), were evaluated and not identified as potential species of conservation concern. Rationale is described in Appendix B Tables 12, 13 and 14 of this report.

2. Incorporate editorial corrections and clarifying language identified in public feedback.

3. Add four citations related to Limber Pine.

Biological plant diversity is one of the cornerstones of a healthy ecosystem. When species diversity is threatened or lacking, ecosystem integrity may be at risk. To mitigate potential loss of diversity, agencies have listed species at risk (endangered, threatened, or sensitive) to protect their viability and habitat. Monitoring of these species helps measure the extent of threats to ecosystems. This section addresses plant species considered important for their contribution to biological diversity and ecological integrity, and plants for which their long-term persistence in the plan area is at risk. For the assessment, plant species known to be native to the plan area were assessed to see if they should potentially fit into one of the categories directed and defined by the National Forest System Land Management Planning Final Rule and Record of Decision (2012 Planning Rule) detailed in 36 Code of Federal Regulations [CFR] § 219.9 and the associated directives in FSH 1909.12.5. These categories for "at-risk" species are: (1) federally recognized threatened, endangered, proposed, or candidate species; (2) species of conservation concern; (3) focal species; or (4) species of public interest.

Process, Methods and Existing Information Sources

The Northern Regional Forester's sensitive plant species list (2011) continues to be assessed during project-level environmental reviews and was used as part of the assessment for potential species of conservation concern.

Various floristic surveys in the assessment area were also used to help determine which plant species to consider for potential species of conservation concern. These include, but are not limited to, the following sources.

- Elliott and Elliott, 2009. Chrome-Iron Mountain Botanical Report. Big Timber Ranger District, Gallatin National Forest. Sweet Grass Co., MT.
- Elliott 2012. Floristic Inventory of the Northern Absaroka, Beartooth, and Gallatin Ranges (Wyoming and Montana). 1289 unique taxa, 833 species, and 425 genera from 89 families, including 36 Montana species of concern and 8 potential species of concern in Montana, 133 exotic species were identified.
- Hallman 2012. Final Report to the USFS Floristic Inventory of Custer National Forest, Ashland and Sioux Ranger Districts. 622 taxa in 83 families of which there were 14 species of concern, 3 potential species of concern, 9 noxious weeds, and 72 exotics were identified.

- Hartman and Nelson 2010. Floristic Survey of the Pryor Mountains. 386 species including five Montana species of concern were identified.
- Lesica 2012, Manual of Montana Vascular Plants
- McGregor et. al. 1986, Flora of the Great Plains
- Lesica (1993) Vegetation and Flora of the Line Creek Plateau Area, Carbon Co., MT. 16 Montana species of concern were identified.
- Montana Natural Heritage Program (MTNHP) dataset specific to species of concern tracked by the State and MTNHP online Field Guide.
- NatureServe online dataset that tracks global plant rankings.
- Pacific Northwest Herbarium, online database
- Rocky Mountain Herbarium, online database
- South Dakota Natural Heritage Program (SDNHP) rare plant list of species tracked by the State.
- Vanderhorst's (1994) Sensitive Plant Surveys in the Gallatin National Forest, MT where he identified 368 taxa including several Montana species of concern.
- Williams' (2012) Classification of the Grasslands, Shrublands, Woodlands, Forests and Alpine Vegetation Associations of the Custer National Forest Portion of the Beartooth Mountains identified 214 species including one Montana potential species of concern.
- Other local reports for the plan area and adjacent areas.

NatureServe, and the Montana and South Dakota Natural Heritage Programs provide rankings that categorize the risks to viability associated with each species they evaluate. These rankings, along with the other criteria in FSH 1909.12, Chapter 10, section 12.52, were used to develop the list of potential species of conservation concern for the Custer Gallatin. Appendix D of this report further describes Northern Region's Species of Conservation Concern identification process.

Scale

A variety of spatial extents are used depending on the analysis element:

Custer Gallatin National Forest (or assessment area): The assessment area covers approximately 3.4 million acres including private land inholdings.

Landscape Areas: The Custer Gallatin National Forest is broken into five unique landscape areas ranging from roughly 78,000 acres to 2.3 million acres, including private land inholdings. Within the Montane area are the (1) Madison, Gallatin, and Beartooth Mountain area; (2) Bridger, Bangtail, and Crazy Mountain area; and (4) Pryor Mountain area. Within the Pine Savanna area are the (4) Ashland Ranger District area; and (5) Sioux Ranger District area.

These two landscape areas depict ecologically different areas. The Montane area includes the Hebgen Lake, Bozeman, Gardiner, Yellowstone, and Beartooth Ranger Districts and the Pine Savanna area includes the Ashland and Sioux Ranger Districts. These two ecosystem areas are nested within the broader ecoregions (EPA Level III Ecoregions). An ecoregion provides a larger scale for planning and analysis that distinguishes common climatic and vegetation characteristics. Approximately 81 percent of the assessment area is in the Middle Rockies consisting of coniferous forest, alpine meadow, and shrubland-grassland steppe. Approximately 19 percent of the assessment area is in the Northwest Great

Plains Province consisting of ponderosa pine-shrubland-grassland steppe. A small amount of the assessment area (less than 1 percent) is in the Wyoming Basin province around the Pryor Mountains consisting of semi-desert shrubland-grassland. Within the Custer Gallatin National Forest sections are identified as subdivisions with similar geomorphic processes, stratigraphy, geologic origin, drainage networks, topography, and regional climate. Sections are drawn at a coarse scale and designed to be modified as needed. The sections for the Custer Gallatin have been refined into two areas, which are summarized as follows (USDA Forest Service 1994).

Montane areas of the Custer Gallatin National Forest fall within the Middle Rocky Mountain Steppe-Coniferous Forest-Alpine Meadow province. Pine Savanna areas of the Custer Gallatin fall within the Great Plains-Palouse Dry Steppe Province.

The Montane area is characterized by glaciated regions (most areas, not all) ranging with altitudinal zonation of semidesert vegetation, coniferous forests on the lower mountain slopes, and alpine tundra toward the top. Temperature and snowfall vary greatly with altitude. Winds are from the west/southwest, with much of their moisture precipitated where they cross the Pacific ranges. Due to aridity, forests are usually restricted to northern and eastern slopes. Although south- and west-facing slopes receive comparable precipitation, they are hotter and evaporation is higher. Consequently, they support fewer trees and are covered by shrubs and grasses. Lodgepole pine, Douglas-fir, subalpine fir, Engelmann spruce, limber pine and whitebark pine are the predominant conifer vegetation. The lower slopes of the mountains are dominated by grasslands and shrublands.

The Pine Savanna area is characterized by rolling plains and tablelands of moderate relief. The plains are notably flat, but there are occasional valleys, canyons, and buttes. Badlands and isolated mountains break the continuity of the plains. The area lies in the rain shadow east of the Rocky Mountains. The climate is a semiarid continental regime. Winters are cold and dry, and summers are warm to hot. Evaporation usually exceeds precipitation, and the total supply of moisture is low. Vegetation is a formation class of short grasses usually bunched and sparsely distributed. Scattered and shrubs, such as sagebrush, are supported in all gradations of cover, from semidesert to woodland. Many species of grasses and herbs grow in this area. Grasses include grama, wheatgrass, and needlegrass. On the driest sites ponderosa pine is short and generally open growth with grass understories. Moist north-facing sites have dense stands of taller ponderosa pine, with shrub and herb understories, including species of the mountain forests to the west. Draws and gullies (ravines) that support many hardwood trees (green ash, box elder, aspen) and shrubs also dissect the landscape.

Some attributes are summarized at large scales to provide context and incorporates representative trends (such as climate, wildfire, and insects). Most of the analysis occurs at the Custer Gallatin, ecosystem areas, or landscape area scales. However, some ecosystem components, such as species of special interest, are described at a more localized scale due to their ecological importance and/or limited distribution.

The temporal scale is from the turn of the 20th century when some floristic surveys were conducted and impacts from settlement and fire suppression started to shift. Fifty years into the future is the timeframe used for projected trends. See the Terrestrial Ecosystems Forested and Non-Forested Vegetation Reports (Sandbak 2017 and Reid 2017, respectively) for further detail, including landscape area descriptions and species richness.

Current Forest Plan Direction

The 1986 Custer and Gallatin forest plans provides management guidance to natural resource managers within the framework of Congressional intent (36 CFR 217). The Custer forest plan provides general management direction (page 3) that indicates "the goal for the management of threatened and endangered plant and animal species is to provide habitat that contributes to the recovery of the species". Within the framework of the 1986 Custer forest plan, direction is given to manage for retention of habitat of unique plant species which include sensitive species (Custer forest plan, p. 20 and Appendix VII). The Gallatin Forest Plan (as amended 2015) includes a Forest-wide standard that "habitat for regionally designated sensitive species on the Gallatin National Forest will be maintained in a suitable condition to support these species (p. II-19). The current forest plans do not contain specific standards or guidelines related to maintaining whitebark pine.

The 1986 Custer plan (page 17) indicates that no federally listed threatened or endangered plant species occur on the national forest at that time. Since that time, there continues to be no plants designated as threatened or endangered plant species that occur within the Custer Gallatin National Forest.

The existing forest plans operate under a policy for sensitive species, as outlined above, which are "those plant and animal species identified by a Regional Forester for which population viability is of concern" (FSM 2670.22). Both categories were established in order to maintain viable populations of species on NFS lands. The 2012 rule notes that Regional Forester Sensitive Species are similar to species of conservation concern, but concludes that the shift to species of conservation concern is more focused than the emphasis on sensitive species under the viability provisions of the 1982 rule. Sensitive species include all species, for which population viability is a concern, regardless of whether there is substantiated concern for persistence of the species in the plan area.

Existing Condition

Forest Service Sensitive Species

Forest Service sensitive species are defined as "Those plant and animal species identified by a Regional Forester for which population viability is a concern, as evidenced by: a) significant current or predicted downward trends in population numbers or density or b) significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution." The current Northern Region sensitive plant species list was developed in 2011. Suitable habitat for 34 currently listed Forest Service sensitive plant species exists on the Custer Gallatin National Forest. Twenty-seven of the 34 have known populations that occur on the national forest while seven species are not known, but are suspected to occur. The current Northern Region sensitive plants and their distribution by suitable ecological settings broken out by Montane and Pine Savanna ecosystems are found in Appendix C of this report. Upon final Regional Forester's determination of the Custer Gallatin's Plant Species of Conservation Concern list, the sensitive species list will be replaced with the Species of Conservation Concern list.

At-risk Plant Species - Federally Listed Species

Species federally listed as threatened or endangered, proposed, and candidate are listed by the United States Department of the Interior, U.S. Fish and Wildlife Service. Under provisions of the Endangered Species Act of 1973, Federal agencies are directed to conserve endangered and threatened species and to ensure that actions authorized, funded, or carried out by these agencies are not likely to jeopardize the continued existence of threatened or endangered species, or result in the destruction or adverse

modification of their critical habitats. These species are automatically considered "at risk" species under the 2012 planning rule.

There are no endangered plant species known within the Montana and South Dakota portions of the planning area. The three plants listed as threatened and occurring in Montana are water howellia (*Howellia aquatilis*), Spalding's catchfly (*Silene spaldingii*), and Ute ladies'-tresses (*Spiranthes diluvialis*). Water howellia and Spalding's catchfly are known west of the continental divide. Ute ladies'-tresses habitat is limited to areas within major river drainages of the Missouri, Jefferson, Beaverhead, Ruby, and Madison Rivers. Species occurrences and suitable habitat are not known on the Custer Gallatin National Forest. The two plants listed on the threatened or endangered species list as threatened and occurring in South Dakota are Western prairie fringed orchid (*Platanthera praeclara*) and Leedy's roseroot (*Rhodiola integrifolia* ssp. *leedyi*). Western prairie fringed orchid was last collected in eastern South Dakota in 1916. Leedy's roseroot is known from seven populations which include four in Minnesota; two in New York; and, one in the Black Hills of South Dakota. Species occurrences and suitable habitat are not known on the Custer Gallatin National Forest. As such, no further assessment will be conducted for the threatened species.

Whitebark pine (*Pinus albicaulis*), found within the assessment area, is candidate species for listing as threatened due to sufficient information on its biological status and threats. Whitebark pine is considered both a foundation and a keystone species. A keystone species is a species that has a disproportionately large effect on its environment relative to its abundance. As a foundation species it plays an ecological role in defining ecosystem structure, function and process (Tomback et al. 2001). Whitebark pine is often the first colonizer on high elevation sites with difficult growing conditions (high snow loads, poor soil development, and short growing seasons). Whitebark pine plays a role in regulating soil development, carbon storage, and capturing and retaining snow, which increases the quantity and duration of summer runoff. This lengthened snow melt provides water to feed streams and riparian communities longer into the growing season (USDA Forest Service 2006). Whitebark pine has a large protein rich seed that are an important food source for birds, squirrels, black and grizzly bears and other mammals (Tomback et al. 2001, IBGST 2013). Because of its size it is not wind disseminated and it relies almost exclusively on Clark's nutcrackers for seed dispersal (USDA Forest Service 2006).

Whitebark pine is a slow-growing, long-lived tree of the high mountains of southwestern Canada and western United States. It is of limited commercial use, but it is valued for watershed protection and aesthetics. Its seeds are an important food for grizzly bears and other wildlife of the high mountains. The whitebark pine cover type occurs at the high elevations, commonly on the Cold habitat type group (where it is perpetuated by disturbance) or Cold Timberline habitat type group (where it is the most common dominant). Minor components of subalpine fir, spruce, or lodgepole pine may occur. Whitebark is a shade intolerant, moderately fire resistant species. Concern about the species has arisen because in some areas whitebark pine cone crops have diminished as a result of successional replacement and insect and disease epidemics. Ongoing mortality to the exotic blister rust fungus has reduced its extent.

In 2010 there was a petition to list whitebark pine under the Endangered Species Act. The U.S. Fish and Wildlife Service conducted a 12-month status review (USDI 2011). The finding, published on July 19, 2011 (FR 76[138]: 42631-42654), determined that listing the species under the Endangered Species Act is warranted but precluded by higher priority listing actions. As a result, whitebark pine is a candidate species and the U.S. Fish and Wildlife Service has assigned it a listing priority number of 8, indicating the

threats are imminent and of moderate to low magnitude (USDI 2015). In August of 2011, the Northern Region designated whitebark pine as a sensitive species (USDA Forest Service 2011).

The findings in the listing identified interrelated threats to whitebark pine that raises concerns about the long-term viability of whitebark pine ecosystems (USDI 2011). These factors are discussed below; all of these are relevant to the Custer Gallatin National Forest.

- *Fire Suppression:* After a century of suppression, many whitebark stands are experiencing a species conversion to shade-tolerant trees, and a lack of suitable seedbeds for regeneration. The balance of a natural fire regime with related vegetative succession processes has been disrupted, and as a result whitebark pine has lost its competitive advantage (USDI 2011).
- *Climate Change:* In a warmer climate, the species' fundamental habitat may shift to cooler sites at higher elevations and latitudes. Recent studies indicate that whitebark pine is one of the most vulnerable tree species in the northern Rocky Mountains to climate change (Hansen and Phillips 2015). Climate suitability is projected to decline dramatically by the end of the century and the adaptive capacity of whitebark pine is thought to be relatively low because dispersal is fairly limited, it is often outcompeted by other subalpine conifers, and it is highly susceptible to mountain pine beetle and blister rust (Hansen and Phillips 2015).
- •*White Pine Blister Rust:* White pine blister rust (*Cronartium ribicola*) is an exotic fungal disease against which whitebark has limited resistance. Since blister rust was introduced to North America in 1910, it has spread through the range of five-needled pines. As this disease has moved into fragile, high-elevation ecosystems, normal successional pathways have been altered. Because the disease is exotic, these trees have limited defenses. Blister rust typically infects nearly all individuals of the host species, causing branch and stem cankers in trees that eventually kill most trees.
- *Mountain Pine Beetle:* Five-needled pines are susceptible to this aggressive bark beetle. In densely stocked stands, whitebark is more likely to be attacked because of stress from competition. Mountain pine beetle accelerates the loss of key mature cone-bearing trees.

Potential Plant Species of Conservation Concern

Under the 2012 Planning Rule, in addition to federally listed species, plant species at risk in the plan area will include designated species of conservation concern. This assessment reviews native plants identified as species of concern by the Montana Natural Heritage Program (MTNHP) and South Dakota Natural Heritage Program (SDNHP), as well as those of cultural significance. The Planning Rule states that a potential species of conservation concern is any native species "other than federally recognized threatened, endangered, proposed, or candidate species, that is known to occur in the plan area[1] and for which the Regional Forester has determined that the best available scientific information indicates substantial concern about the species' capability to persist over the long-term in the plan area" (36 CFR §219.9; FSH 1909.12 Chapter 10, part 12.52). In particular the following information is being assessed: (1) species' population and habitat distribution and abundance in the plan area, (2) threats and stressors

[1] Species suspected to have habitat on the Custer Gallatin National Forest that were identified in the Northern Region's Forest Service Sensitive Species list will be removed from consideration as a potential species of conservation concern since there is no recorded evidence that they are known to occur within the planning area.

to their known occurrences and available habitat, and (3) the management actions that would contribute to those threats and stressors.

The 2012 Planning Rule [36 CFR 219.7(c)(3)] recognized species of conservation concern, which is defined as "species, other than federally recognized threatened, endangered, proposed, or candidate species, that are known to occur in the plan area and for which the Regional Forester has determined that the best available scientific information indicates substantial concern about the species' capability to persist over the long-term in the plan area" (36 CFR 219.9(c)). Since many species are wide-ranging, and may occur on multiple areas, the 2012 rule allows the Regional Forester to coordinate with the responsible official to identify species of conservation concern known to occur in the plan area, and for which there is documented concern for persistence within that plan area. This approach is designed to build efficiency into the Forest Service's collective efforts to maintain the diversity of plant and animal communities (FR 77(68): 21175, April 9, 2012). The 2012 rule requires the Responsible Official to identify potential species of conservation concern for the plan area, and to assess existing information for those species in the assessment (36 CFR 219.6 (b)(5)). The list of potential species of conservation concern presented here has been developed in coordination with the Regional Office Botanist and planning staff, the Custer Gallatin National Forest interdisciplinary planning team, and in consultation with Montana and South Dakota Natural Heritage Programs.

Plant species were evaluated for potential species of conservation concern status during this assessment and in addition, will continue to be evaluated during the development of the proposed action for forest plan revision. As the Custer Gallatin National Forest continues public involvement in the plan revision process [through the development of the assessment, scoping, draft and final environmental impact statements, and record of decision[2]], the list may be modified to add to or remove species from the list, based on new information. If additional species of conservation concern are identified during this plan revision process or identified after the record of decision is signed, the Custer Gallatin National Forest will also consider and evaluate the need for additional plan components and/or monitoring questions as warranted. The list of species of conservation concern is determined by the Regional Forester in coordination with the Forest Supervisor of the Custer Gallatin National Forest. The identification of species of conservation concern is dynamic and may change over time, as with the "former" Regional Forester sensitive species list.

The 2012 forest planning rule provides direction for determining potential species of conservation concern. The list of potential species of conservation concern includes the following criteria (FSH 1909.12 Section 12.52):

- Plant species that *must* be considered are those with status ranks of G/T1 or G/T2 on the NatureServe ranking system and species that were removed within the past five years from the Federal list of threatened or endangered species, and other delisted species that the regulatory agency still monitors. Frenchman's Bluff Moonwort *(Botrychium gallicomontanum)* is ranked as globally imperiled to critically imperiled (G1G2).
- Plant species that *should* be considered are those with status ranks of G/T3 or S1 or S2 on the NatureServe ranking system; those listed as threatened or endangered by relevant States or federally recognized tribes; those identified as species of conservation concern in adjoining

[2] The Custer Gallatin National Forest planning record of decision does not make a decision that determines the species of conservation concern list, rather it determines that plan components of the selected alternative are adequate to "maintain a viable population of each of the species of conservation concern in the plan area" [36 CFR 219.9 (b)(1)].

National Forest System plan areas; those that have been petitioned for Federal listing and for which a positive "90-day finding" has been made; and those species for which the best available scientific information indicates there is local conservation concern about the species' capability to persist over the long term in the plan area due to: (1) significant threats, (2) declining trends in population and/or habitat, (3) restricted ranges, or (4) low population numbers or restricted ecological conditions within the plan area.

- In addition, for all potential species of conservation concern, the best available scientific information must indicate substantial concern about the species' capability to persist over the long-term in the plan area. Information may come from a variety of sources, including Federal and State agencies, literature, local information on occurrence and population status, subbasin analyses, broad-scale assessments, and information available from local species experts and other organizations (FSH 1909.12 Section 12.52).
- Additional considerations for determining potential plant species of conservation concern are found in FSH 1909.12 Section 12.53, including but not limited to taxonomy, distribution, abundance, demographics, diversity, habitat requirements and condition, ecological function, important biological interactions, threats or limiting factors to persistence, influence of uncharacteristic natural events, effects of climate change and susceptibility to stressors caused by human activities.
- Using NatureServe, Montana Natural Heritage Program (MTNHP), South Dakota Natural Heritage Program databases, the current Regional Forester sensitive species list, and the sources listed under "Existing Information" section of this report, a master list of State plant species of concern for both Montana and South Dakota known or suspected to occur on the Custer Gallatin National Forest was compiled for this assessment (152 species). Of these, 40 were determined to be outside the plan area, leaving 112 species known in the plan area to be evaluated. NatureServe, MTNHP's Montana Field Guide and SDNHP online resources were also used to reference global and state ranks. State ranks are determined by professional botanists from around the states who meet to discuss plant species, viability and habitat, as well as appropriate state ranks. Any updates are posted on the MTNHP and SDNHP's websites. Few plant species have published information such as status reports and conservation strategies. Federally listed species have published information (such as population trends, viability, threats, monitoring data, and conservation strategies), which is required for listing. State-listed species occasionally have such information, but listing is predominantly based on expert opinion and panel consensus.
- There are 112 rare plant species known to occur in the plan area that are described as state species of concern in Montana and South Dakota and/or were designated as Northern Region sensitive species. Of the 112 rare plant species evaluated, 84 plant species are NOT identified as potential species of conservation concern (see Appendix B for the evaluation). These include 43 alpine species, 7 cool moist forest species, 9 grassland / shrubland species, 14 sparse vegetation species, and 11 riparian / wetland species. These include seven Northern Region sensitive species, which include *Aquilegia brevistyla, Botrychium ascendens, Balsamorhiza macrophylla, Astragalus barrii, Primula incana, Mertensia ciliata,* and *Gentian affinis*. A more detailed table, which displays the full evaluation of the 2012 planning rule components is available in the project record.
- Of the 112 rare species evaluated, 27 plant species are identified as potential species of conservation concern (see Appendix A for the more detailed evaluation). These include 1 alpine species, 1 broadleaf woodland species, 9 grassland / shrubland species, 10 sparse vegetation species, and 6 riparian / wetland species. These include 17 Northern Region sensitive species,

which include *Adoxa moschatellina, Asclepius ovalifolia, Botrychium gallicomontanum, Botrychium paradoxum, Carex gravida* var. *gravida, Cypripedium parviflorum, Drosera anglica, Eleocharis rostellata, Ericameria discoidea* var. *discoidea (*syn. *Haplopappus macronema* var. *macronema), Eriogonum visheri, Gentianopsis simplex, Lomatium nuttallii, Meesia triquetra, Mimulus nanus, Pyrrocoma carthamoides* var. *subsquarrosus, Salix barrattiana,* and *Shoshonea pulvinata*. Of the 27 species, 18 of the species' habitat components are likely to only occur in the Montane units of the plan area, 6 of the species' habitat components are likely to only occur in the Pine Savanna units and 3 species' habitat components are likely to occur in both the Montane and Pine Savanna landscapes (*Botrychium gallicomontanaum, Cypripedium parviflorum* and *Physaria didiocarpa* var. *lanata*) (see Table 2).

- The potential plant species of conservation concern list will eventually be refined with public input and additional consultation with area experts. See Appendix D for details of the identification process of potential species of conservation concern and species of conservation concern for plant species and for definitions of ranking codes.
- All potential plant species of conservation concern were grouped into species broad habitat type groupings, based on similar ecological conditions and habitat needs, for the purpose of identifying and evaluating relevant information about them. These groupings were made based on the ecological conditions necessary to maintain or recover each group member (FSH 1909.12 Section 12.54). Existing conditions and trend information for potential species of conservation concern is described in more detail in the Invasive Plants Report (LaMont & Reid 2017), the Terrestrial Ecosystems Forested and Non-Forested Vegetation Reports (Sandbak 2017 and Reid 2017, respectively) and the Aquatic and Riparian Report (Barndt, Reid, and Chaffin 2017). Table 2 lists potential plant species of conservation concern by habitat type group description and associated trends/threats by broad habitat type groups (see Appendix A for the more detailed evaluation).

Table 1. At risk plant species by habitat type group and relevant plan area trends and threats

At Risk Plant Species and Landscape Area where Found	Habitat Type Group Description	Relevant Trends and Threats in the Plan Area
Pinus albicaulis (whitebark pine) - Montane	**Cold Forest Habitat Type Group.** The highest elevation subalpine fir and lodgepole pine climax types, where whitebark pine may be present with lodgepole pine, subalpine fir, and Engelmann spruce. Most natural fires were low severity because of discontinuous fuels, although high severity occurred at long intervals. Whitebark pine would be favored with a natural fire regime. At timberline, whitebark pine is usually both the existing and climax vegetation because these types are above the cold limits of most other species; the natural fire regime was variable including low and mixed severity (generally 35-300+ year intervals) as well as stand-replacing fires at long intervals. 29% of the Montane units are classified as cold forest cover types.	Threats include fire suppression, white pine blister rust, mountain pine beetle, and climate change. After a century of suppression, many whitebark stands are experiencing a species conversion to shade-tolerant trees, and a lack of suitable seedbeds for regeneration. The balance of a natural fire regime with related vegetative succession processes has been disrupted, and as a result whitebark pine has lost its competitive advantage. White pine blister rust (*Cronartium ribicola*) is an exotic fungal disease against which whitebark has limited resistance. Because the disease is exotic, these trees have limited defenses. Five-needled pines are susceptible to this aggressive bark beetle. In densely stocked stands, whitebark is more likely to be attacked because of stress from competition. Mountain pine beetle accelerates the loss of key mature cone-bearing trees. In a warmer climate, the species' fundamental habitat may shift to cooler sites at higher elevations and latitudes. Recent studies indicate that whitebark pine is one of the more vulnerable tree species in the northern Rocky Mountains to climate change (Hansen and Phillips 2015). However, genetic variation may serve to offset some vulnerability to climate change.

Table 2. Potential plant species of conservation concern by habitat type group and relevant plan area trends and threats

Plants Evaluated for Potential Species of Conservation Concern and Landscape Area where Found	Habitat Type Group Description	Relevant Trends and Threats in the Plan Area
Salix barrattiana (Barratt's willow) - Montane	**Alpine Habitat Type Group.** Alpine communities are common but unique in the high elevations of the montane units of the assessment area. Approximately 121,000 acres of alpine vegetation occurs within the NFS lands of the assessment area. The alpine vegetation is dominated by various grasses, sedges, small shrubs and forbs that are able to withstand the severe environment characterized by high winds, low humidity, cold soil temperatures, high ultraviolet radiation, short growing season, low soil moisture, and great daily temperature fluctuations.	Elevation will play a large role in plant species composition in conjunction with predicted climate change. High elevation, alpine or other fringe type environments may see plant species composition change first. Invasive plants apparently have not yet become a serious problem in the alpine tundra of the CGNF, although yellow toadflax and Canada thistle are present above 9000 feet and has the potential to invade such areas in the future. Other threats in these settings include recreational use and trail construction/maintenance.

Plants Evaluated for Potential Species of Conservation Concern and Landscape Area where Found	**Habitat Type Group Description**	**Relevant Trends and Threats in the Plan Area**
Carex gravida var. gravida (heavy sedge) – Pine Savanna	**Broadleaf Woodlands Habitat Type Group.** Deciduous broadleaf woodlands in mesic settings include green ash woodlands which provides humid habitat for heavy sedge. They are best developed under conditions that favor snow entrapment, development of deeper soils, and concentration of moisture. These conditions are typical of ravines formed by ephemeral and intermittent streams where flooding is more sporadic or of short duration. Uplands are generally mixed grass prairies, shrublands and ponderosa pine forest. Soils are usually deep loams. Flooding is very short in duration when it occurs, as water is rapidly channeled downslope.	Threats to broadleaf woodlands include fire suppression, improper grazing, noxious species invasion, conifer colonization, and human activity. There may be loss of tree species to disease, insects, freezes and fire as well as shifts in warming and/or drying patterns as a result of climate change which may be beneficial to some species.
Asclepias ovalifolia (Oval-leaf milkweed) – Pine Savanna *Asclepias stenophylla* (narrowleaf milkweed) – Pine Savanna *Botrychium gallicomontanum* (Frenchman's Bluff moonwort) – Montane and Pine Savanna *Botrychium paradoxum* (peculiar moonwort) - Montane *Castilleja exilis* (annual Indian paintbrush) - Montane *Grayia spinosa* (spiny hopsage) - Montane *Oligoneuron album* (Syn: *Solidago ptarmicoides*) (prairie goldenrod) – Pine Savanna *Pyrrocoma carthamoides* var. *subsquarrosus* (Syn. *Haplopappus carthamoides* var. *subsquarrosus*) (Beartooth large-flowered goldenweed) - Montane *Sidalcea oregana* Oregon (checker-mallow) - Montane	**Grasslands / Shrublands Habitat Type Group.** Grasslands are dominated by cool-season perennial bunchgrasses and forbs, with sparse shrub and/or tree representation. Some warm-season grass occurs on the Ashland and Sioux Districts. Grasslands are usually forb species rich and may vary by moisture regime. Various shrub species may occur with low cover. Scattered pockets of ponderosa pine, limber pine, and Rocky Mountain juniper occur on shallow, skeletal soils or resistant bedrock. Grasslands range in size from small patches to large open parks, from montane to foothill zones. Mesic meadow grassland habitats occur at lower montane to subalpine elevations where soils, snow deposition, or windy conditions limit tree growth. Meadow habitats are generally moist, sometimes seasonally so and may dry up late in the summer. Meadows occur in mosaics with shrublands or forests, or are adjacent to alpine communities across the plan area. They are generally dominated by perennial graminoids and mesic forbs. Scattered shrubs or trees may be present, but are not abundant. These meadows are limited on the landscape and occupy fringe habitats adjacent to wetter meadows or forest swales. Shrublands occurs at all slopes, aspects, and soil types, within the plan area. The community can exhibit a variable extent of shrub diversity but is typically dominated by mountain or Wyoming big sagebrush. In some areas of volcanic origin, antelope bitterbrush may be co-dominant. The understory is often high in perennial bunchgrass and forb species diversity. Moist shrublands include shrubby cinquefoil, snowberry, birch, and willow.	Threats to grasslands include fire suppression, improper grazing, invasion species spread, tree encroachment, and human development. Threats to meadows include improper grazing, off-road vehicle use, hydrologic modifications, and potentially a reduction in snowpack resulting from warming trends. Threats to shrublands include invasive weed spread, fire exclusion, improper grazing, and conifer encroachment. Warming trends may also contribute to changes in the shrub communities as precipitation levels, fire frequency intervals, and fire intensities change.

Plants Evaluated for Potential Species of Conservation Concern and Landscape Area where Found	**Habitat Type Group Description**	**Relevant Trends and Threats in the Plan Area**
Adoxa moschatellina (muskroot) - Montane *Draba densifolia* (denseleaf draba) - Montane *Ericameria discoidea var. discoidea*; (Other Names: *Haplopappus macronema var. macronema*) (Whitestem Goldenbush or Discoid Goldenweed) - Montane *Eriogonum visheri* (Dakota buckwheat) – Pine Savanna *Heterotheca fulcrata* (rockyscree false goldenaster) - Montane *Lomatium nuttallii* (Nuttall Desert-Parsley) – Pine Savanna *Mimulus nanus* (dwarf purple monkeyflower) - Montane *Penstemon angustifolius var. angustifolius* (narrowleaf penstemon) – Pine Savanna *Physaria didymocarpa var. lanata* (wooly twinpod) – Pine Savanna *Shoshonea pulvinata* (Shoshonea) - Montane	**Sparsely Vegetated (i.e. talus, scree, rocky, exposed, badlands, etc.) Habitat Type Group.** Sparsely vegetated areas are often described as talus, rocky sites, disturbed sites, exposed sites, or badlands. This setting occupies the fringes of adjacent systems, particularly dry habitats. Tree and herbaceous cover is often low due to limited soil development and dry growing conditions, site disturbance, or rocky conditions. This habitat includes natural rock outcrops as well as scree (i.e., talus) and covers a wide range of rock types, varying from acidic to highly calcareous. Vegetation is sparse or largely lacking. Bryophytes and lichens often occur in crevices and flourish on open rock surfaces where the competition from vascular plants is absent. Species composition can vary widely, depending on the moisture regime and adjacent communities contributing to the seed source.	Sparsely vegetated habitats are often fragile systems. Although recreation and road construction are threats to these habitats, disturbance is often limited due to inaccessibility in the Montane units. Threats to the sparsely vegetated habitats in the Pine Savanna units include weed invasion, trampling from grazing, as well as shifts in warming and/or drying patterns. Shifts in warming or drying trends may also contribute to a change in range and/or distribution.

Plants Evaluated for Potential Species of Conservation Concern and Landscape Area where Found	**Habitat Type Group Description**	**Relevant Trends and Threats in the Plan Area**
Cypripedium parviflorum (small yellow lady's-slipper) – Montane and Pine Savanna *Drosera anglica (English sundew) - Montane* *Eleocharis rostellata (beaked spikerush) - Montane* *Gentianopsis simplex (hiker's gentian) - Montane* *Meesia triquetra (meesia moss) - Montane* *Thelypodium paniculatum (northwestern thelypody) - Montane*	**Riparian / Wetlands Habitat Type Group.** Riparian systems occur along creeks and rivers and occupy floodplains, and stream banks. This system is dependent on a hydrologic regime that has annual to episodic flooding. It is often comprised of a mosaic of communities dominated by trees but also includes a diverse shrub and herbaceous component. Cottonwoods and other dominant trees such as Engelmann spruce indicate riparian, and on drier sites, Douglas- fir, and Rocky mountain juniper may be present. Dominant shrubs may include several species of willow, mountain alder, river birch, dogwood, hawthorn, and on drier sites or the dry fringe, chokecherry, rose, silver buffaloberry, Rocky Mountain maple and/or snowberry. Proportionately montane riparian types make up 3% or less of the plan area in each landscape area and prairie riparian types are present on less than 1%. See the Aquatics and Riparian Report (Barndt, Reid, and Chaffin, 2017) for detailed information.	General threats to riparian and wetlands system include improper grazing, off-road vehicle use, invasive species, drought, recreation and climate change. General threats to wetlands include alteration of the original hydrology or hydric soils (i.e. diversion, draining, development, road construction, improper grazing, etc.). Established riparian and wetland protection measures are typically in place during Forest Service activity management such as use of best management practices, use of streamside management zones during tree harvest operations, etc. Invasive species also pose a threat to wetland plant communities. In light of changing precipitation patterns, climate change presents a potential threat as well. Threats to aquatic plant species can come from changes in hydrology and from aquatic plant invaders that can form dense carpets that block light, warmth and oxygen from the water.

Key Benefits to People

Like all native plant species, rare species have a specific niche in the ecosystem and a unique relationship to other plants and animals with which it lives. In addition to each species' inherent value as a member of the ecosystem it also has a unique genetic and chemical composition. This genetic information has unknown potential value for human use. For example, two little-known plants have recently made news because of their medicinal value. Rosy periwinkle, a Madagascar wildflower, contains compounds that are the best-known treatment for childhood leukemia. The Pacific yew, an understory tree of ancient forests in the Pacific Northwest, was recently discovered to contain the chemical toxol, which is the best hope for treatment of ovarian cancer. Had either of these species become extinct, these treatments would never have been discovered. Although many rare species are not known today to possess properties useful to humans, loss of species would eliminate forever the opportunity for future research that could discover potential uses.

Whitebark pine is a candidate for Federal listing as being a threatened species. Whitebark pine's greatest values are for wildlife habitat, watershed protection, and esthetics. Seeds are an important, highly nutritious food source for many seed eating birds and small mammals, as well as for black bears and grizzly bears. Blue grouse feed and roost in whitebark pine crowns during much of the year. This tree provides both hiding and thermal cover in sites where few if any other trees grow. The large, hollow trunks of old trees and snags provide home sites for cavity nesting birds. The seeds of whitebark pine were occasionally used as a secondary food source by Native Americans. Whitebark pine helps to stabilize snow, soil, and rocks on steep terrain and has potential for use in land-reclamation projects at high elevation. It provides shelter and fuel for hikers and campers and is an important component of the picturesque setting that lures thousands of visitors into the high mountains.

Trends and Drivers

At Risk Species - Whitebark Pine

The loss of whitebark has altered the structure, composition and pattern of high-elevation ecosystems, and threatened their long-term stability and integrity. This impacts hydrological processes and wildlife habitat values, such as grizzly bear food resources. The decline in whitebark pine is expected to continue into the future. See Terrestrial Ecosystem Forested Vegetation Report (Sandbak 2017) for complete discussion of drivers and trends relative to whitebark pine.

In response to the current situation in whitebark ecosystems, the Greater Yellowstone Coordinating Committee’s Whitebark Pine Subcommittee, which has worked successfully across boundaries and have developed a Whitebark Pine Strategy to promote the persistence of whitebark pine over time and space in the Greater Yellowstone area.

Potential Species of Conservation Concern

See Terrestrial Ecosystem Forested and Non-forested Vegetation reports for complete discussion of drivers and trends relative to habitats occupied by potential species of conservation.

In the face of warming trends, conservation of plant diversity will likely involve a number of approaches. The geographic ranges and habitat affiliations of sensitive plant species will be important considerations in developing conservation strategies. Monitoring of priority species and habitats, coupled with adaptive management, will form the basis for management responses. Ongoing and potential approaches include: control of invasive species to promote vegetation resilience, especially in high-priority habitats;

implementation of mitigation measures for land management projects occurring in sensitive areas; ecological restoration (i.e., for whitebark pine); conservation of critical habitats (such as peatlands, which are also important carbon sinks); off-site seed conservation (especially for globally rare species with narrow geographic ranges or habitat affinities); and continued establishment of protected areas such as research natural areas and botanical special areas (Shelly 2012).

Trends of potential species of conservation concern are difficult to quantify. Monitoring is inconsistent and species lists change often. Potential species of conservation concern occupying habitats that are often disturbed, such as roadsides, suitable timberlands, and high recreation use areas, would be prone to removal of suitable habitat as well as direct removal of individuals, although some potential species of conservation concern plans can respond favorably to these disturbances.

As these habitats are altered, species adapted to restricted habitats or specific microclimates would have lower survival rates than the more common native species with wider amplitude of habitats. Threats to these habitats include direct disturbance (from logging equipment, road building, road maintenance, grazing, and fire suppression activities), habitat alteration (such as canopy removal, edge effects from roads, herbicide, and fire exclusion), climate change, and invasive species.

Habitats that are less subjected to land management activities, such as rocky habitats and wetlands, are more likely to be intact. The main threats to these areas include invasive species and climate change. In the past, roads were built along streams and through wetlands. Now there are protections for these habitats, yet some roads are still on the landscape in those areas and may still be affecting those habitats.

Dry ecotones are considered to be among the most sensitive to climate change (Means 2011). Lower treeline woodlands are often thought to be invading or colonizing into more desirable sagebrush and grass types due to fire exclusion and other management actions such as grazing; however, ecotones also naturally move elevationally based on the dynamics of vegetation, climate and fire (Means 2011). Douglas-fir and ponderosa pine colonization can occur in ecotones and sagebrush/grassland areas. Drivers of this trend include fire exclusion, which would have killed colonizing trees when they were of a small size; grazing, which reduced fine fuel loads and further influenced fire exclusion; and summer droughts that enhanced sagebrush which functioned as nurse plants for establishing conifers.

The Montana Native Plant Society evaluated threats impacting Montana's plant species of concern and classified species according to their level of imperilment or risk as a result of these threats. Of the 27 species identified as potential plant species of conservation concern, one was ranked Category 1 - Highly Threatened (*Sildacea oregana*); eight are ranked Category 2 - Threatened (*Botrychium paradoxum*, *Carex gravida* var. *gravida*, *Cypripedium parviflorum, Draba densifolia, Drosera anglica, Lomatium nuttallii, Mimulus nanus,* and *Physaria didymorcarpa* var. *lanata*); eight are ranked as Category 3 (insignificant threats or no threats known); and 10 species were not ranked due to insufficient or conflicting information. See Appendix D for ranking definitions.

Information Needs

Forest Plan Information Needs: None identified.

Long-term Information Needs: Improved mapping of the current condition for whitebark pine is needed to focus restoration efforts. Continued surveys for plant species of conservation concern will help in the understanding of conservation effort needs.

Observations of potential at-risk species are based on a compilation of the most current Montana and South Dakota Natural Heritage Program databases, NatureServe, and/or other local information sources. In the future, conducting additional floristic and rare plant inventories and surveys, new observations on the Custer Gallatin National Forest will assist with additional analysis to refine the potential species of conservation concern list. Trend monitoring of known populations would also inform global and State rankings and the associated Custer Gallatin National Forest species of conservation concern list. Potential habitat models for several species are becoming available from state natural heritage programs and can be helpful when preparing for survey work.

Key Findings

There are no known federally listed threatened or endangered plant species on the Custer Gallatin National Forest. Whitebark pine is federally recognized as a candidate plant species that could be considered for Federal listing under the Endangered Species Act. Living whitebark are found on roughly 29 percent of the Montane units of the Custer Gallatin National Forest, but are in decline due to factors including fire suppression, climate change, white pine blister rust, and mountain pine beetle.

Suitable habitat for 34 currently listed Forest Service sensitive plant species exists on the Custer Gallatin. Twenty-seven of the 34 have known populations that occur on the national forest while 7 species are not known, but are suspected to occur. The final plant species of conservation concern list will replace the sensitive plant species list for the Custer Gallatin National Forest.

Of the 112 rare species evaluated, 27 plant species are identified as potential species of conservation concern. These include 1 alpine species, 1 broadleaf woodland species, 9 grassland / shrubland species, 10 sparse vegetation species, and 6 riparian / wetland species. This list includes 18 of the 34 Northern Region sensitive species.

Of the 27 species identified as potential species of conservation concern, 18 of the species' habitat components are likely to only occur in the Montane units of the plan area, 6 of the species' habitat components are likely to only occur in the Pine Savanna units and 3 species' habitat components are likely to occur in both the Montane and Pine Savanna landscapes

Potential species of conservation concern occupying habitats that are often disturbed, such as roadsides, suitable timberlands, and high recreation use areas, can be prone to removal of suitable habitat as well as direct removal of individuals, although some potential species of conservation concern plans can respond favorably to these disturbances.

If habitats are altered, species adapted to restricted habitats or specific microclimates will likely have lower survival rates than the more common native species with wider amplitude of habitats. Threats to these habitats include direct disturbance (such as logging equipment, road building, road maintenance, improper grazing, and fire suppression activities), habitat alteration (canopy removal, edge effects from roads, herbicide, and fire exclusion), warming trends, and invasive species.

Habitats that are less subjected to land management activities, such as rocky habitats and wetlands, are more likely to be intact. The main threats to these areas include invasive species and climate change. In the past, roads were built along streams and through wetlands. Now there are protections for these habitats, yet some roads are still on the landscape in those areas and may still be affecting those habitats.

Dry ecotones are considered to be among the most sensitive to climate change (Means 2011). Lower treeline woodlands are often thought to be invading or colonizing into more desirable sagebrush and grass types due to fire exclusion and other management actions such as grazing; however, ecotones also naturally move elevationally based on the dynamics of vegetation, climate and fire (Means 2011). Douglas-fir and ponderosa pine colonization can occur in ecotones and sagebrush/grassland areas. Drivers of this trend include fire exclusion which would have killed colonizing trees when they were of a small size; grazing, which reduced fine fuel loads and further influenced fire exclusion; and summer droughts that enhanced sagebrush which functioned as nurse plants for establishing conifers.

References

Barton, D. and S. Crispin. 2003. Globally Significant Plants in Southeastern Big Horn and Southwestern Rosebud Counties, Montana Prepared for: The Bureau of Land Management. 26 pp plus appendices.

Beatty, B. L., W. F. Jennings, and R. C. Rawlinson. 2003. *Botrychium ascendens* (trianglelobe moonwort), *B. crenulatum* (scalloped moonwort), and *B. lineare* (narrowleaf grapefern): A Technical Conservation Assessment. USDA Forest Service, Rocky Mountain Region. http://www.fs.fed.us/r2/projects/scp/assessments/Botrychiumlineare.pdf

Beatty, B.L., W.F. Jennings, and R.C. Rawlinson. 2004. *Pyrrocoma carthamoides* Hook. var. *subsquarrosa* (Greene) G. Brown & Keil (largeflower goldenweed): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/pyrrocomacarthamoidesvarsubsquarrosa.pdf

Carlson, J.C. and S. V. Cooper. 2003. Plant and Animal Resources and Ecological Condition of the Forks Ranch Unit of the Padlock Ranch, Big Horn County, Montana and Sheridan County, Wyoming. Report to the Padlock Ranch and the Montana BLM. Montana Natural Heritage Program, Helena. 25 pp. plus appendices.

Chadde, S. and G. Kudray. 2001. Conservation assessment for Spoon-leaf Moonwort (Botrychium spathulatum). USDA Forest Service, Eastern Region. 35 pp.

C.M. Costello, F.T. van Manen, M.A. Haroldson, M.R. Ebinger, S.L. Cain, K.A. Gunther & D.D. Bjornlie, 2014. Influence of whitebark pine decline on fall habitat use and movements of grizzly bears in the Greater Yellowstone Ecosystem. Ecology and Evolution 2014; 4(10): 2004–2018.

DeValice, R.L. and P. Lesica. 1993. Community Classification for Vegetation on BLM Lands, Pryor Mountains, Carbon County, Montana. Montana Natural Heritage Database. Prepared for BLM State Office. 78 pp.

Gabel, Mark, B.E. Nelson, Daryl Mergen, Kurt Hansen and Grace Kostel. 2014. The Flora of Harding County: A Century of Botany in Northwestern South Dakota, USA. Proceddings of the South Dakota Academy of Science, Vol. 93 (2014).

Elliott, E.R. and B.A. Elliott. 2009. Chrome-Iron Mountain Botanical Report. Big Timber Ranger District, Gallatin national Forest. Sweet Grass County, Montana. University of Wyoming. January 25, 2009. 22 pp.

Elliott, E.R. 2014. A Floristic Inventory of the Northern Absaroka, Beartooth, Gallatin Ranges, Wyoming and Montana, USA. 98 pp.

Faber-Langendoen, D., L. Master, J. Nichols, K. Snow, A. Tomaino, R. Bittman, G. Hammerson, B. Heidel, L. Ramsay, and B. Young. 2009. NatureServe Conservation Status Assessments: Methodology for Assigning Ranks. NatureServe, Arlington, VA.

Farrar, D.R., 2010. Unpublished Species Profile. *Botrychium gallicomontanum.*

Farrar, D.R., 2010. Unpublished Species Profile. *Botrychium hesperium.*

Farrar, D.R., 2010. Unpublished Species Profile. *Botrychium lanceolatum.*

Farrar, D.R., 2010. Unpublished Species Profile. *Botrychium spathulatum.*

Farrar, D.R., 2011. Unpublished Species Profile. *Botrychium ascendens.*

Farrar, D.R., 2011. Unpublished Species Profile. *Botrychium paradoxum.*

Farrar, D.R., 2011. Unpublished Species Profile. *Botrychium pinnatum.*

Farrar, D.R., 2011. Unpublished Species Profile. *Botrychium simplex.*

Fertig, W. 1998. The Status of Rare Plants on Shoshone National Forest 1995-1997 Survey Results. Prepared for the USDA Forest Service, Shoshone National Forest. 75 pp.

Fertig, W. 2000. State Species Abstract: *Koenigia islandica*. Wyoming Natural Diversity Database.

Fertig, W. and S. Markow. 2000. State Species Abstract: *Salix barrattiana*. Wyoming Natural Diversity Database.

Fertig, W and S. Mills. 2000. State Species Abstract: *Pyrrocoma carthamoides var. subsquarrosa.* Wyoming Natural Diversity Database.

Gabel, M., B.E. Nelson, D. Mergen, K. Hansen and G. Kostel 2014. The Flora of Harding County: A Century of Botany in Northwestern South Dakota, USA. Proceedings of the South Dakota Academy of Science Volume 93. 101-132.

Glisson, B. (2004, June 22). Physaria saximontana Rollins var. saximontana (Fremont County twinpod): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/physariasaximontanavarsaximontana.pdf

Hallman, H. 2012. Final Report to the USFS Floristic Inventory of Custer National Forest, Ashland and Sioux Ranger Districts. University of Wyoming. 20 pp.

Handley, J. and S. Laursen, 2002. Region 2 Sensitive Species Evaluation. Pyrrocoma carthamoides var. subsquarrosa (Absaroka Goldenweed).

Hansen, Paul L. and George R. Hoffman. 1987. The Vegetation of the Grand River/Cedar River, Sioux, and Ashland Districts of the Custer National Forest: A Habitat Type Classification. Gen. Tech. Rep. RM-157. Fort Collins, CO; USDA Forest Service, Rocky Mountain Forest and Range Experiment Station. 68 p.

Hartman, R.L. and B.E. Nelson. 2010. Flora of the East Pryor Mountains, Montana. 52 pp.

Heidel, B. 1993. Report on the Conservation Status of *Erigeron lackschewitzii*, A Candidate Threatened Species. Montana Natural Heritage Program, Helena, MT. 57 pp.

Heidel, B. 1997. Preliminary Botanical Survey of the Tongue River Area. Unpublished Report to Montana Department of Environmental Quality. Montana Natural Heritage Program, Helena, MT. 11 pp + app.

Heidel, B, 2001a. USFS Region 2 Assessment for *Asclepias ovalifolia*. 3 pp.

Heidel, B. 2001b. Monitoring *Shoshonea pulvinata* in the Pryor and Beartooth Mountains, Carbon County, Montana. 1999 Trend Report to the Bureau of Land Management, MT. Montana Natural Heritage Program, Helena, MT. 11 pp. plus appendices.

Heidel, B. 2004. Inventory of Barr's milkvetch (*Astragalus barrii*) in the Spring Creek Unit of Thunder Basin National Grassland. Prepared for Medicine Bow National Forest. Wyoming Natural Diversity Database, Laramie.

Heidel , B. (2004, March 24). *Sullivantia hapemanii var. hapemanii* (Coult. & Fisher) Coult. (Hapeman's coolwort): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/sullivantiahapemaniivarhapemanii.pdf

Heidel, B. 2011. Status Report of Sensitive Plant Species of Fen Habitats, Big Horn Mountains, North Central Wyoming. Prepared for the Bighorn National Forest. 74 pp.

Heidel, B. 2011. Status of Shoshonea pulvinata (Shoshonea), Park County, Wyoming. Prepared for the Bureau of Land Management – Cody Field Office. Wyoming Natural Diversity Database, Laramie, WY.

Heidel, B. L. and K. H. Dueholm. 1995. Sensitive plant survey in the Sioux District, Custer National Forest: 1994; Carter County, Montana and Harding County, South Dakota. Unpublished report to the Custer National Forest. Montana Natural Heritage Program, Helena. 95 pp. + app.

Heidel, B. and W. Fertig. 2000. Rare Plants of Bighorn Canyon National Recreation Area. Report to the National Fish and Wildlife Foundation and Bighorn Canyon National Recreation Area. Montana Natural Heritage Program, Helena and Wyoming Natural Diversity Database, Laramie. 63 pp. + app.

Heidel, B. and W. Fertig. 2002. Vascular Plant Species Checklist of Bighorn Canyon National Recreation Area, Montana and Wyoming. Prepared for the National Park Service, Bighorn Canyon National Recreation Area and the Greater Yellowstone Network. Wyoming Natural Diversity Database.

Heidel, B. and J. Handley. 2004. *Penstemon caryi* Pennell (Cary's beardtongue): A Technical Conservation Assessment. Prepared for the USDA Forest Service, Rocky Mountain Region, Species Conservation Project. USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/penstemoncaryi.pdf

Heidel, B. and J. Handley. 2004. *Physaria didymocarpa* (Hook.) Gray var. *lanata* A. Nels. (common twinpod): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/physariadidymocarpavarlan ata.pdf

Heidel, B. and J. Handley. 2015. State Species Abstract: *Botrychium hesperium*. Wyoming Natural Diversity Database.

Heidel, B., C. Jean and S. Crispin. 2002. Plant Species of Concern and Plant Associations of Powder River County, Montana. Report to the Bureau of Land Management. Montana Natural Heritage Program, Helena, MT. 23 pp. + app.

Heidel, B. L. and H. Marriott. 1996. Sensitive plant species survey of the Ashland District, Custer National Forest, Powder River and Rosebud Counties, Montana. Unpublished report to the Custer National Forest. Montana Natural Heritage Program, Helena, MT. 94 pp. + app.

Interagency Grizzly Bear Study Team (IGBST), 2013. Response of Yellowstone Grizzly Bears to Changes in Food Resources: A Synthesis. Final Report to the Interagency Grizzly Bear Committee and Yellostone Ecosystem Subcommittee.

Jackson, M. A. Gannon, H. Kearns, and K. Kendall. 2010. Current Status of Limber Pine in Montana. Forest Health Protection. Report 10-06. 14 pp.

Joan, R. S. Montagnes, 1990. The Habitat and Distribution of Meesia triquetra in North Ameica and Greeland. The Bryoloist 93(3), 1990. Pp. 349-352.

Joan, R. S. Montagnes, D.H. Vitt, 1991. Patterns of Morphological Variation in *Meesia triquetra* (Bryopsida: Meesiaceae) Over an Arctic-Boreal Gradient Systematic Botany, Vol. 16, No. 4 (Oct.-Dec., 1991), pp. 726-735.

Johnson, B. and D.A. Steingraeber, 2003. The Vegetation and Ecological Gradients of Calcareous mires in the South Park Valley, Colorado.

Johnson, P. 1962. The Occurrence of New Arctic-Alpine Species in the Beartooth Mountains, Wyoming-Montana. Madrofio. 6 pp.

Jones, G.P. 1991. Report on the proposed Bald Ridge Special Botanical Area. Unpublished report prepared for the USDA Forest Service, Shoshone National Forest by the Wyoming Natural Diversity Database, Laramie, WY.

Jones, G.P. and W. Fertig. 1999. Ecological evaluation of the potential Pat O'Hara Mountain Research Natural Area within the Shoshone National Forest, Park County, Wyoming. Unpublished report prepared for the Shoshone National Forest, USDA Forest Service by the Wyoming Natural Diversity Database, University of Wyoming.

Kearns, H.S.J., W.R. Jacobi, R.M. Reich, R.L. Flynn, K.S. Burns, and B. W. Geils. 2014. Risk of white pine blister rust to limber pine in Colorado and Wyoming, USA. Forest Pathology, 44 (2014) 21-38. 18 pp.

Lackschewitz, K. 1991. Vascular Plants of West-Central Montana. Identification Guidebook.

Ladyman, J.A.R. (2005, November 28). *Salix barrattiana* Hooker (Barratt's willow): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/salixbarrattiana.pdf

Ladyman, J.A.R. 2006. *Aquilegia brevistyla* (smallflower columbine): A Technical Conservation Assessment. Prepared for the USDA Forest Service, Rocky Mountain Region, Species Conservation Project. 94 pp.

Lesica, P. 1986. Vegetation and Flora of the Grove Creek Area, Carbon County, Montana. 19 pp.

Lesica, P. 1992. Monitoring Populations of *Shoshonea pulvinata* in the Pryor and Beartooth Mountains, Carbon County, Montana. 1992 Progress Report. Montana Natural Heritage Program. Prepared for BLM, Montana State Office. 13 pp.

Lesica, P. 1993. Monitoring Populations of *Shoshonea pulvinata* in the Pryor and Beartooth Mountains, Carbon County Montana. 1991-1993 Baseline Report. Montana Natural Heritage Program. Helena, Montana. Prepared for BLM, Miles City District, Miles City, Montana. 10 pp. plus appendices.

Lesica, P. 1993. Vegetation and Flora of the Line Creek Plateau Area, Carbon County, Montana. Prepared for USDA Forest Service, Intermountain Research Station, Missoula, MT. 21 pp.

Lesica, P. 1995a. Conservation status of *Haplopappus carthamoides var. subsquarrosus* in Montana. Unpublished report to the US Forest Service and the Bureau of Land Management. Montana Natural Heritage Program, Helena, MT. 22 pp. + app.

Lesica, P. 1995b. Conservation status of *Lesquerella lesicii* in Montana. Unpublished report to the US Forest Service and the Bureau of Land Management. Montana Natural Heritage Program, Helena, MT. 16 pp. + app.

Lesica. P. 2003. Conserving globally rare plants on lands administered by the Dillon Office of the Bureau of Land Management. Report to the USDI Bureau of Land Management, Dillon Field Office. Montana Natural Heritage Program, Helena, MT. 22 pp. + app.

Lesica, P. 2012. Proceedings Seventh Montana Plant Conservation Conference. February 15 and 16, 2012

Lesica, P. 2012. Manual of Montana Vascular Plants. Brit Press. 771 pp.

Lesica, P. and P. L. Achuff. 1992a. Distribution of vascular plant species of special concern and limited distribution in the Pryor Mountain Desert, Carbon County, Montana. Unpublished report to the Bureau of Land Management. Montana Natural Heritage Program, Helena, MT. 38 pp. + app.

Lesica, P. and P. L. Achuff. 1992b. Conservation status of *Eriogonum x lagopus* in southern Carbon County, Montana. Unpublished report to the Bureau of Land Management. Montana Natural Heritage Program, Helena, MT. 13 pp. + app.

Lesica, P. and J.S. Shelly. 1991. Sensitive, Threatened, and Endangered Vascular Plants of Montana. Montana Natural Heritage Program. Occasional Publication No. 1. 100 pp.

Logan, J.A., W.W. MacFarland, and L. WIllcox, 2012. Whitebark pine vulnerability to climate-driven mountain pine beetle disturbance in the Greater Yellowstone Ecosystem. Ecological Applications, 20(4), 2010, pp. 895–902

Lyman, J.C. 2005. *Shoshonea pulvinata* Evert & Constance (Shoshone carrot): a technical conservation assessment. USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/shoshoneapulvinata.pdf

Mathews, S.Y. 1989. Sensitive plant surveys, 1989: U.S. Forest Service, Region 1, Gallatin National Forest, Montana. Unpublished report to the USDA Forest Service, Gallatin National Forest, Bozeman, Montana. Montana Natural Heritage Program, Helena, MT. 85 pp.

McCarthy, J. C. 1996. A Floristic Survey of the Pryor Mountains, Montana. M.S. Thesis. Dept. of Biological Sciences, Montana State Univ., Bozeman.

McGregor, R.L, T.M. Barkley, R.E. Brooks, and E.K. Schofield, 1986. Flora of the Great Plains by the Great Plains Flora Association. University Press of Kansas. 1402 pp.

Means, R.E. 2011. Synthesis of Lower Treeline Limber Pine (*Pinus flexilis*) Woodland Knowledge, Research Needs, and Management Considerations. IN: Keane, R.E., D.F. Tomback, M.P. Murray, and C.M. Smith, eds 2011, The future of high-elevation, five-needle white pines in Western North America: Proceedings of the High Five Symposium, 28-30 June 2010, Missoula, MT. Proceedings RMRS-P-63. USDA Forest Service, Rocky Mountain Research Station. 376 p.

Mergen, D.E. (2006, July 17). *Cypripedium parviflorum* Salisb. (lesser yellow lady's slipper): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/cypripediumparviflorum.pdf

Mills, S. and W. Fertig. 2000. State Species Abstract: *Dosera anglica*. Wyoming Natural Diversity Database.

Mills, S. and W. Fertig. 1996. State Species Abstract: *Eriophorum gracile*. Wyoming Natural Diversity Database.

Mincemoyer, S. 2006. Surveys of Significant Plant Resources in Southeast and South-central Montana on the Billings and Miles City Field Offices of the Bureau of Land Management. Report to the USDI Bureau of Land Management, Billings and Miles City Field Offices. Montana Natural Heritage Program, Helena, MT. 22 pp. + appendices.

MTNHP, 2016. Montana Natural Heritage Program. A web based information database – http://fieldguide.mt.gov/displayClasses.aspx?Kingdom=Plantae. Montana Natural Heritage Program, Helena, MT.

NatureServe. 2016. NatureServe Conservation Status Factors. . A web based information database. http://www.natureserve.org/explorer .

Ode, David J. 1987. The Status of Dakota Wild Buckwheat (*Erigonum visheri* A. Nels.) in South Dakota. Report to the U. S. Fish and Wildlife Service, Endangered Species Office, Denver, Colorado. Report No. 87-8. November, 1987. 48 p., plus appendices.

Oechsli, L., 2003. Aquatic Integrity Areas: Upper Yellowstone River Basin. A joint project of American Wildlands, Pacific Rivers Council and Yellowstone to Yukon Conservation Initiative. 22 pp.

Pavek, D.S. and L.A. Schassberger. 1993. Status Review of *Aqoseris lackschewitzii,* USDA Forest Service, Region 1, Gallatin National Forest, Montana. 42 pp.

Reid, K. 2001. *Haplopappus carthamoides var. subsquarrosus* Monitoring in Seeley Pasture of Rock Creek Allotment. Unpublished memo to Beartooth District Ranger, USDA Forest Service. 13 pp.

Rocchio, J., M. March, and D.G. Anderson. (2006, March 20). *Epipactis gigantea* Dougl. ex Hook. (stream orchid): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/epipactisgigantea.pdf

Roe, L.S. 1992. Status review of *Aquileqia brevistyla*, Lewis & Clark National Forest. Montana Natural Heritage Program. Helena, MT. 4 7 pp.

Schassberger, L.A. 1988. Status review of *Astragalus barrii*: USDA Forest Service – Region 1, Custer National Forest, Montana. Unpublished report the USDA Forest Service. Montana Natural Heritage Program, Helena, MT. 21 pp. + appendices.

Schassberger, L.A. 1991. Preliminary Report to the Gallatin National Forest of Field Surveys for Claytonia lanceolate var. flava. Montana Natural Heritage Program, Helena, MT. 10 pp.

Schoettle, A.W. 2004. Ecological Role of Five-Needle Pines in Colorado: Potential Consequences of Their Loss. In Sniezko, R.A.; S. Samman; S.E. Schlarbaum; and H.B. Scott, eds. 2004. Breeding and genetic resources of five-needle pines: growth, adaptability and pest resistance; 2001 July 23-27; Medford, OR, USA. IUFRO Working Party 2.02.15. Proceedings RMRS-P-32. Fort Collins, CO: USDA, Forest Service, Rocky Mountain Research Station.

Schoettle, A. & Stritch, L. 2013. Pinus flexilis. The IUCN Red List of Threatened Species 2013: e.T42363A2975338. http://dx.doi.org/10.2305/IUCN.UK.2013-1.RLTS.T42363A2975338.en. International Union for Conservation of Nature, Accessed 2017. https://www.iucn.org

Shelly, J. S. 1988. Report on the Conservation status of *Shoshonea pulvinata*, a Candidate threatened species. Montana Natural Heritage Program, Helena, MT. 35 pp. + appendices.

Shelly, J. S. 1989. Status Review of *Claytonia lanceolata var. flava*. US Forest Service – Region 1, Beaverhead, Deerlodge, and Gallatin National Forests, Montana. Montana Natural Heritage Program. 30 pp.

Shelly, S. 1994. Unpublished report on *Gentianopsis simplex* in the East Rosebud Complex. 2 pp.

Shelly, S. 2012. Proceedings Seventh Montana Plant Conservation Conference. February 15 and 16, 2012

Schmoller, David. 1993. Status Survey for *Astragalus barrii*. USDA Forest Service – Region 2, Nebraska National Forest, Wall, SD.

Schmoller, David. 2000. An Element Stewardship Abstract. (ESA)

SDNHP (South Dakota Natural Heritage Program). 2016. Web based information – https://www.gfp.sd.gov/wildlife/threatened-endangered/rare-plant.aspx

Taylor, A. and R. Caners. 2002. Baseline survey for *Astragalus barrii* Barneby (Barr's milkvetch) and *Physaria didymocarpa var. lanata* A. Nels. (woolly twinpod) in eastern Big Horn and southwestern Rosebud counties, Montana. Report to the Bureau of Land Management. Montana Natural Heritage Program, Helena, MT. 8 pp. + app.

The Northern Great Plain Floristic Quality Assessment Panel, 2001, Coefficient of Conservatism for the Vascular Flora of the Dakotas and Adjacent Grasslands: U.S. Geological Survey, Biological Resources Division, Information and Technology Report USGS/ BRD/lTR- 200 1-000 1, 32 p.

USDA Forest Service, Custer National Forest Land and Resource Management Plan. 1986.

USDA Forest Service, Gallatin National Forest Land and Resource Management Plan. 1986.

USDA Forest Service, Northern Region, 1988. Regional Letter to Gallatin National Forest Regarding Plant Species of Concern. June 1, 1988. Pp. 3.

USDA Forest Service, Northern Region, 2011 Sensitive Species Lists for MT and SD.

USDA Forest Service, Shoshone National Forest. 1999. Ecological Evaluation of the Potential Pat O'Hara Mountain Research Natural Area within the Shoshone National Forest, Park County, Wyoming. Prepared by George P. Jones and Walter Fertig, WY Natural Diverstiy Database. 49 pp.

USDA Forest Service, Shoshone National Forest. 2000. Pyrrocoma Carthamoides Var. Subsquarrosa, Absaroka Goldenweed. 2 pp.

USDA 2016 PLANTS Database. http://plants.usda.gov/

USDI 2005. Bureau of Land Management Instruction Memorandum No. MT-2005-055. 2005 Montana/Dakotas Special Status Plant Species Policy.

USDI Fish and Wildlife Service. 2011. US Fish and Wildlife Service Federal Register. 50 CFR Part 17 [Docket No. FWS–R6–ES–2010–0047; MO 92210–0–0008] Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition To List *Pinus albicaulis* as Endangered or Threatened With Critical Habitat. https://www.fws.gov/mountain-prairie/species/plants/whitebarkpine/76FR42631.pdf

USDI Fish and Wildlife Service. 2015. US Fish and Wildlife Service Federal Register. 50 CFR Part 17. Endangered and Threatened Wildlife and Plants; Review of Native Species That Are Candidates for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petitions; Annual Description of Progress on Listing Actions; Notice. https://www.gpo.gov/fdsys/pkg/FR-2015-12-24/pdf/2015-32284.pdf

Vanderhorst, Jim. 1994. Sensitive plant surveys in the Gallatin Nation Forest, Montana. Montana Natural Heritage Program, Helena. 54 pp.

Vanderhorst, J. 1996. Status report on Sensitive lady's slipper orchids (*Cypripedium calceolus var. parviflorum and Cypripedium passerinum*) on the Kootenai National Forest. Unpublished report to the Kootenai National Forest. Montana Natural Heritage Program, Helena. 27 pp. plus appendices.

Vanderhorst, J. 1997. Conservation assessment of sensitive moonworts (Botrychium subgenus Botrychium) on the Kootenai National Forest. Montana Natural Heritage Program, Helena, MT. 82 pp. plus appendices.

Vanderhorst, J., S. V. Cooper and B. L. Heidel. 1998. Botanical and vegetation surveys of Carter County, Montana. Unpublished report to the Bureau of Land Management. Montana Natural Heritage Program, Helena, MT. 116 pp. + app.

Visher, S.S. 1914. A Preliminary Report on the Biology of Harding County Northwestern South Dakota. South Dakota Geological Survey Bulletin number six. State Publishing Company, Pierre. 126 pp. https://archive.org/details/preliminaryrepor00vishrich

Williams, K.L. 2012. Classification of the Grasslands, Shrublands, Woodlands, Forests and Alpine Vegetation Associations of the Custer National Forest Portion of the Beartooth Mountains in Southcentral Montana. A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in Biological Sciences. Montana State University, Bozeman, MT. 400 pp.

Wolf, E.C., E. Gage, D.J. Cooper. 2006. *Drosera anglica* Huds. (English sundew): A Technical Conservation Assessment USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/droseraanglica.pdf

WYNDD (Wyoming Natural Diversity Database) 2016. http://www.uwyo.edu/wyndd/species-of-concern/plants/

Appendix A - At Risk Plant Species and Potential Species of Conservation Concern

Table 3 displays evaluation components for the one at-risk species, whitebark pine *(Pinus albicaulis),* found in the plan area.

Table 3. At-risk plant species

At Risk Plant Species	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends and Threats in the Plan Area	Rationale for Including as Potential Species of Conservation Concern	Best Available Scientific Information
Pinus albicaulis (whitebark pine)	USFWS – Candidate; G3G4; Fed. Candidate Spp; S3 - MT; FS Sensitive	Common in the montane units of the plan area. Not known from the Pryor Mtns. Habitat does not occur on the Ashland or Sioux Ranger Districts. In general, Whitebark pine is a common component of subalpine forests and a dominant species of treeline and krummholtz habitats. It occurs in almost all major mountain ranges of western and central Montana.	Cold Forest; Tolerates poor soils, steep slopes, windy exposures, and tree-line environments; subalpine to alpine.	Populations of whitebark pine in Montana and across most of western North America have been severely impacted by past mountain pine beetle outbreaks and by the introduced pathogen, white pine blister rust. The results of which have been major declines in whitebark pine populations across large areas of its range. Additionally, negative impacts associated with encroachment and increased competition from other trees, primarily subalpine fir have occurred as a result of fire suppression in subalpine habitats.	USFWS Ranked as Candidate Species for Federal Listing. There is sufficient information on biological status and threats to propose this species as threatened or endangered. Their consideration in environmental planning is suggested; however, none of the substantive or procedural provisions of ESA apply to candidate species.	MTNHP, 2016; MTNHP 2016 Dataset NatureServe, 2016; Elliott, 2014

The following tables display the 27 plant species identified as potential species of conservation concern. These include 1 alpine species, 1 broadleaf woodland species, 9 grassland / shrubland species, 10 sparse vegetation species, and 6 riparian / wetland species. Of these are 18 Northern Region sensitive species which include *Adoxa moschatellina*, *Asclepius ovalifolia, Botrychium gallicomontanum, Botrychium paradoxum, Carex gravida* var. *gravida, Cypripedium parviflorum, Drosera anglica, Eliocharis rostellata, Ericameria discoidea* var. *discoidea* (syn. *Haplopappus macronema* var. *macronema*), *Erigonum visheri, Gentianopsis simplex, Lomatium nuttallii, Meesia triquerta, Mimulus nanus, Pyrrocoma carthamoides* var. *subsquarrosus, Salix barrattiana,* and *Shoshonea pulvinata*. The tables display these plant species where continued long-term persistence in the planning area may be at risk, based on one or a combination of the following: (1) high risks of elimination state-wide and globally; (2) habitat is not relatively widespread; (3) relatively high probability of detrimental impacts or threats to persistence; (4) habitat is not well represented and considered as an important ecosystem component through other identified potential species of conservation concern (e.g. fen species group); and 5) sufficient data to conclude there is substantial concern. A more detailed table which displays the full evaluation of the 2012 planning rule components is available in the project record.

Table 4. Potential plant species of conservation concern on the Custer Gallatin National Forest in the Alpine Habitat Type Group

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends and Threats in the Plan Area	Rationale for Including as Potential Species of Conservation Concern	Best Available Scientific Information
Salix barrattiana (Barratt's willow)	G5; S2 - MT; SOC - MT; USFS Sensitive	In the plan area, a population is known in the plan area within the Line Creek Plateau Research Natural Area (1993 Wy Cr Headwaters - One male clone ~ 100 sq. meters on the MT/WY border.) (Lesica 1993). In general, rare in Montana. Known from two disjunct sites, one in Glacier National Park and one on the Beartooth Plateau.	Alpine Habitat Type Group. Cold, moist soil in the alpine zone.	The biggest vulnerability of *Salix barrattiana* lies in the small number of disjunct populations in the continental United States of America, where only two small isolated populations are known. One in Glacier National Park and one in the plan area on the Beartooth Plateau.	The low or no potential for sexual reproduction by the population in the plan area appears to be a threat to long-term population sustainability. This clone consists entirely of staminate plants. Without pistillate plants, sexual reproduction is not possible and long term survival of the clone is in doubt. Currently, the clone reproduces entirely by vegetative means (Ladyman 2005; Fertig & Markow 2000).	MTNHP, 2016; MTNHP 2016 Dataset NatureServe, 2016; Lesica 1993 Ladyman 2005; Fertig and Markow 2000

Table 5. Potential plant species of conservation concern on the Custer Gallatin National Forest in the Broadleaf Woodlands Habitat Type Group

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends and Threats in the Plan Area	Rationale for Including as Potential Species of Conservation Concern	Best Available Scientific Information
Carex gravida var. gravida (heavy sedge	G5; S3 - MT; SOC - MT; USFS Sensitive"	In the plan area, populations known on the Ashland and Sioux Ranger Districts. Observed at E. Fk Otter Cr and Hay Cr. (Ashland RD), and Chalk Buttes (Sioux District) in 2010. In general, Carex gravida has been found at a few widely scattered locations in eastern Montana, and is not generally abundant where it occurs. However, it is likely that the species is more abundant than the current data shows. "	Broadleaf Woodlands Habitat Type Group. Mesic / Humid Open woods, often in ravines with deciduous trees, on the plains.	Habitats include moist, green ash woodlands, which are attractive to livestock, and it may be particularly vulnerable to moderate grazing because of its cespitose growth form. These habitats are also quite vulnerable to invasion by non-native plants.	Peripheral habitat conditions in a very limited habitat. Threats include grazing and weed invasion.	NatureServe, 2106 online access; MTNHP, 2016 online access; MTNHP, 2016 CGNF Dataset; Hallman, 2012; Lesica & Marlow, 2013

Table 6. Potential plant species of conservation concern on the Custer Gallatin National Forest in the Grasslands/Shrublands Habitat Type Group

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends and Threats in the Plan Area	Rationale for Including as Potential Species of Conservation Concern	Best Available Scientific Information
Asclepias ovalifolia (Oval-leaf milkweed)"	G5?; S1S2 - MT; SOC - MT; USFS Sensitive	2010 Carter Co, MT (Hallman, 2012); 1994 Ice Box Springs-2 populations (Long Pines, MT; Sioux RD)(MTNHP 2016 Dataset for the CGNF), at the western edge of its Great Plains range, In general, found in Saskatchewan, Manitoba south to WY, SD, IL; collected in Carter and Sheridan Co, MT.	Grasslands/ Shrublands Habitat Type Group. Prairie. Sandy, gravelly or clayey soils of prairies and woodlands	This habitat type is vulnerable to weed invasion. South Dakota NHP does not track this species. Additional information on population levels, threats and trends are needed (MTNHP, 2016 online access).	Low population numbers within the plan area based on focused surveys for that portion of the plan area.	NatureServe, 2106 online access; MTNHP, 2016 online access; MTNHP, 2016 CGNF Dataset;
Asclepias stenophylla (narrowleaf milkweed)	G4G5; S2 - MT; SOC - MT;	In the plan area, observed in 1994 Chaulk Buttes and Little Noise Sp (Harding Co, SD); 2010 Sioux Long Pines (Carter Co., MT) (Hallman 2012) In general, in Montana, *Asclepias stenophylla* is known from only a few occurrences in two southeastern counties. So far, surveys in Montana have documented a total population that numbers only several hundred plants. Trends are unknown (MTNHP 2016).	Grasslands/ Shrublands Habitat Type Group. Prairie. Sandy sites.	This habitat type is vulnerable to weed invasion	Limited numbers in the plan area indicating concern for long-term persistence. Recent floristic surveys in portion of the plan area did not detect additional populations.	NatureServe 2106 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset;

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends and Threats in the Plan Area	Rationale for Including as Potential Species of Conservation Concern	Best Available Scientific Information
Botrychium gallicomontanum (Frenchman's Bluff moonwort)	G1G2; S1S2 - MT; S1 - SD SOC - MT; SOC - SD;"	In the plan area, observed in 2008 Park Co. (Elliott 2014) at 7,200 ft. elevation. In general, a globally rare species, recently documented in Montana from Glacier National Park and Park Co., MT. 3 observations in MT; An unpublished document by Donald Farrar (Iowa State University) indicates disjunct occurrences in northwestern MT, northwestern MN, and the Black Hills region of SD.	Grasslands/ Shrublands Habitat Type Group. In the plan area, there are no known data to develop population trends for this species. In general, this species is currently known from only five populations. (Farrer)."	Valley grassland, foothill, lower and upper montane, and Subalpine.	In the plan area, known from a single location. A globally rare species, recently documented in Montana from Glacier National Park and Park Co., MT. 3 observations in MT; an unpublished document by Donald Farrar (Iowa State University) indicates disjunct occurrences in northwestern MT, northwestern MN, and the Black Hills region of SD.	NatureServe 2016 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset; Elliott 2014 Farrar 2010
Botrychium paradoxum (peculiar moonwort)	G3G4; S3 - MT; SOC - MT; USFS Sensitive"	2008 about 8 plants at Chrome - Iron Mtn, Sweet Grass Co., MT, Yellowstone RD (Elliott and Elliott 2009; Elliott 2014); 49 Observations submitted for MT (MTNHP 2016).	Grasslands/ Shrublands Habitat Type Group. Meadows (Mesic Montane/ Subalpine). The persistence of Botrychium species may rely on a landscape with a mosaic of patches created by disturbances varying in frequency and intensity, where a series of local populations colonize, disperse, and disappear with the changing successional landscape (Chadde and Kudray 2001).	Threats to the species include mining, road maintenance and construction, trampling by hikers, over-collection, and alteration of soil and hydrological regimes. Weeds were not located at this site but, with the road so close the chance of introducing them is high (Elliott and Elliott, 2009).	Limited numbers and number of occurrences.	NatureServe 2016 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset; Elliott 2014 Elliott and Elliott 2009

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends and Threats in the Plan Area	Rationale for Including as Potential Species of Conservation Concern	Best Available Scientific Information
Castilleja exilis (annual Indian paintbrush)	G5; S2 - MT; SOC - MT; "	In the plan area, observed in Park Co., MT (Bear Cr); (MTNHP 2016 Dataset) In general, Annual Indian Paintbrush is known from a half dozen counties in southwest Montana with the majority of documented locations on private lands. 45 observations in MT	Grasslands/ Shrublands Habitat Type Group. Moist alkaline meadows in the valley zone.	In general, many areas of suitable habitat have been converted to agricultural uses and/or are used for livestock grazing. Additionally, populations are susceptible to hydrologic changes and may negatively impacted by invasive weeds (MTNHP, 2016)."	In the plan area, known from a single location in specialized habitat and vulnerable to weed invasion.	NatureServe, 2016 online access; MTNHP, 2016 online access; MTNHP, 2016 CGNF Dataset; "
Grayia spinosa (spiny hopsage)	G5; S2 - MT; SOC - MT; "	"In the plan area, observed in 1998, 1999, 2000 Gardiner (4); (MTNHP 2016 Dataset) In general, *Grayia spinosa* is located in Montana primarily in the Pryor Mountain Desert with a couple additional records from southwest Montana. In the Pryor Mountain area, it is known from less than a dozen, generally small occurrences. The total population of the species in the state likely numbers less than 2,000 individuals. 28 observations in MT (MTNHP 2016).	Grasslands/ Shrublands Habitat Type Group. Dry shrublands in the valleys and foothills usually on sandy-textured, alkaline soils at elevations below 5,000 ft (5,600 ft near Gardiner).	In general, as the plant is highly palatable, negative impacts associated with heavy grazing are possible. Cheatgrass invasion may also pose a threat to the species by reducing seedling establishment and increasing fire frequency (MTNHP, 2016)."	In the plan area, known from a single location in specialized habitat and vulnerable to weed invasion.	NatureServe 2016 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends and Threats in the Plan Area	Rationale for Including as Potential Species of Conservation Concern	Best Available Scientific Information
Oligoneuron album (Syn: *Solidago ptarmicoides*) (prairie goldenrod)	G5; S2S3 - MT; SOC - MT"	"In the plan area, a total of five occurrences all on the Sioux District. Four occurrences in the Long Pines, Carter Co., MT (Carter-West and Summers-West locations by Hallman, 2012 and Capitol Rock/Chiesman-East and Summers-South locations tracked by MTNHP) and one occurrence in the North Cave Hills (Pehlam-Juberg-North/Schleichart Divide area) (Hallman, 2012), Harding Co., SD In general, rare in Montana, where it has been documented from only a few locations on the eastern plains on the western edge of its range.	Grasslands/ Shrublands Habitat Type Group. Open, dry grasslands, often on sandy soil or limestone on the plains.	Western edge of species range. Vulnerable to weed invasion. Species is not very tolerant of disturbance (S. Shelly Pers. Comm. With D. Ode)	Western edge of species range. Vulnerable to weed invasion. Floristic surveys by Hallman indicate few occurrences in the plan area.	NatureServe 2016 online access; MTNHP 2016 online access; SDNHP 2016 S. Shelly Pers. Comm. With D. Ode; PNW Herbarium online data

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends and Threats in the Plan Area	Rationale for Including as Potential Species of Conservation Concern	Best Available Scientific Information
Pyrrocoma carthamoides var. *subsquarrosus* (Syn. *Haplopappus carthamoides* var. *subsquarrosus*) (Beartooth large-flowered goldenweed)	G4G5T3; S3 - MT; SOC - MT; USFS Sensitive"	In the plan area, observed in 1995 Indian Sp (2); 2006 Maurice Cr; 1995 and 1999 N Fk Grove Cr, 1995 Robertson Draw Area (3); 2006 Sheridan Campground; 2006 S Fk Grove Cr; 1995 Wolf Cr. In general, a regional endemic of southwest Montana and the Absaroka Mountains of northwest Wyoming. 46 observations in MT	Grasslands/ Shrublands Habitat Type Group. This plant is found most frequently and abundantly on moderate to steep slopes (10-50%) with a cool aspect (NW, N, NE, E); on warmer exposures, it tends to be sparser. Soils tend to be moderately deep, sandy, and high in coarse fragments. It occurs largely on soils derived, at least in part, from Madison limestone, though small satellite populations occur on soils derived from granitic materials (in the Rock Creek valley) and volcanics (in Wyoming).	In general, vulnerable to increased shrub and tree cover due to fire suppression and to competition from invasive plants (MTNHP, accessed 2016).	Regional endemic of southwest Montana and the Absaroka Mountains of northwest Wyoming. Although several populations are large, it is vulnerable to increased shrub and tree cover due to fire suppression and to competition from invasive plants."	NatureServe, 2016 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset; Lesica 1995; Beatty et al. 2004; Handley & Laursen 2002
Sidalcea oregana Oregon (checker-mallow)	G5; S2S3; SOC - MT	In the plan area, two occurrences on the Bozeman RD in Hyalite Canyon (Chisolm's Camp and Window Rock) (Vanderhorst, 1994) In general, known from two widely separate sites in Gallatin and Lake counties.	Grasslands/ Shrublands Habitat Type Group. Grasslands in the valley and montane zones.	In the plan area, vulnerable to weed invasion. In general, habitats occupied by the species are susceptible to weed invasion. MNPS category 1 - highly threatened by one or more activities	Limited occurrence in the plan area and vulnerable to weed invasion. Disjunct from main occurrences, located on eastern edge of range.	NatureServe 2016 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset; Vanderhorst 1994

Table 7. Potential plant species of conservation concern on the Custer Gallatin National Forest in the Sparsely Vegetated Habitat Type Group

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends and Threats in the Plan Area	Rationale for Including as Potential Species of Conservation Concern	Best Available Scientific Information
Adoxa moschatellina (muskroot)	G5; S3 - MT; S3 - SD; SOC - MT SOC - SD USFS Sensitive	In the plan area, three known population in East Rosebud and one near Boulder River, all in the AB Wilderness. East Rosebud population observed 1994, 1996, & 2006 and occur along the trail system. Boulder River pop. Observed 1998 (MTNHP 2016) In general, sparsely distributed across southwest Montana. Higher elevations of the Black Hills (MTNHP 2016).	Sparsely Vegetated Habitat Type Group. Rock/ Talus; Plants have been observed growing where cold air flow is channeled beneath rock slides; 3700 to 6700 ft. elev.	Populations are generally small, though they occur in habitats not generally impacted by human disturbance or invasive weeds. Building of trails may potentially impact populations.	Populations are generally small in specialized microhabitat. Though they occur in habitats not generally impacted by human disturbance or invasive weeds. Building and use of trails may potentially impact populations the three populations in East Rosebud, Carbon, Co., MT.	NatureServe 2106 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset
Draba densifolia (denseleaf draba)	G5; S2 - MT; SOC - MT;	In the plan area, observed in 1941 W Boulder River; 1981 Iron Mtn (MTNHP 2016 dataset). In general, this species is distributed in the western half of the state in four moderate to large populations, six small occurrences and nine historical or poorly documented occurrences. 22 observations in MT. (MTNHP 2016)	Sparsely Vegetated Habitat Type Group. Gravelly, open soil of rocky slopes and exposed ridges in the montane to alpine zones.	In the plan area, one known location is in the AB Wilderness and a location on Iron Mountain where there could be potential threats from mining activities.	Iron Mtn. site vulnerable to mineral related activities in the plan area.	NatureServe 2106 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset; Elliott 2014;

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends and Threats in the Plan Area	Rationale for Including as Potential Species of Conservation Concern	Best Available Scientific Information
Ericameria discoidea var. *discoidea;* (Other Names: *Haplopappus macronema* var. *macronema*) (Whitestem Goldenbush or Discoid Goldenweed)	G4G5T4; S2 - MT; SOC - MT; USFS Sensitive	In the plan area, 1995 Taylor Fk in Gallatin Co. (MTNHP 2016 CCGNF Dataset). In general, the range of this variety is from se. OR to sw. MT, south to CA and UT. In MT, known from Beaverhead and Gallatin counties. Peripheral.	Sparsely Vegetated Habitat Type Group. Grows in rocky, open, sparsely wooded slopes or coarse talus near or above treeline. Grows in partial shade but are usually associated with sparse vegetation. Seedlings may not be able to establish in dense vegetation.	In the plan area, vulnerable to grazing impacts and weed invasion.	Limited distribution in the plan area. Vulnerable to livestock grazing and weed invasion at the single known location.	NatureServe 2106 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset
Eriogonum visheri (Dakota buckwheat)	G3; S2 - MT; S3 - SD; SOC - MT; SOC - SD ; USFS Sensitive	Endemic. Harding Co., SD Slim Buttes - Irish Butte (S. of Mtn Ranch Sp. #1). In SD, this species is found in 78 other locations.	Sparsely Vegetated Habitat Type Group. Badlands; Clay Barrens, often bentonitic badlands slopes and outwashes in the plains.	In the plan area, vulnerable to livestock trailing at the single known location on the SD portion of the Sioux Ranger District.	Limited distribution in the plan area in SD. Vulnerable to livestock trailing at the single known location.	NatureServe 2106 online access; SDNHP 2016 online access; MTNHP 2016 online access
Heterotheca fulcrata (rockyscree false goldenaster)	G4G5; Not described in MT; An unpublished annotated specimen of *Heterotheca fulcrata* resides in the Rocky Mtn Herbarium (RM). It was collected in Meagher County, Montana. Meagher County, MT	In the plan area, observed in 2008 (Elliott, 2014) near Nye Picnic Area, Stillwater Co., MT at the northern extent of this species' range. In general, known from WY, CO, NV, UT, AZ, NM, and TX	Sparsely Vegetated Habitat Type Group. Limestone outcrops. 4,100-4,500 ft. elevation. Collected as a roadside park near limestone outcrop.	Vulnerable to recreational impacts to the single known location in the plan area.	Limited distribution and vulnerable to recreational impacts to the single known location in the plan area.	NatureServe 2106 online access; Elliott 2014

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends and Threats in the Plan Area	Rationale for Including as Potential Species of Conservation Concern	Best Available Scientific Information
Lomatium nuttallii (Nuttall Desert-Parsley)	G3; S2 - MT; SH - SD; SOC - MT; SOC - SD ; USFS Sensitive	Endemic. Rosebud Co., MT - Poker Jim Creek (MTNHP 2016 CGNF Dataset; Hallman, 2012) In general, there are few populations of Nuttall's desert-parsley in the upper Tongue River drainage of Montana and are disjunct from the main range of the species in southeastern Wyoming and adjacent Nebraska and Colorado (MTNHP 2016). Known in planning area in Rosebud County, MT (Hallman 2012) and in south Black Hills as a single collection in 1926 (SD G3 and SH) per SD Rare plant list	Sparsely Vegetated Habitat Type Group. Rocky, pine woodlands. Open, rocky, mid to lower hillslopes on sandstone, siltstone, or clayey shale	Limited distribution and susceptible to weed invasion.	Limited distribution and vulnerable to weed invasion. This species of is of cultural interest (Pers. Comm. w/H. LaPoint). Additional locations are likely to be found in the vicinity of the known occurrences with additional surveys (Barton and Crispin, 2003).	NatureServe 2106 online access; MTNHP, 2016 online access; MTNHP 2016 CGNF Dataset; Hallman 2012; Barton and Crispin 2003 Pers. Comm. w/ H. LaPoint 2016
Mimulus nanus (dwarf purple monkeyflower)	G5; S2S3 - MT; MT SOC; FS Sensitive	In the plan area, known on the Hebgen Lake RD, 2004. *Mimulus nanus* is only known from a few extent occurrences in the state, plus two historical collections. In general, *Mimulus nanus* is only known from a few extent occurrences in the state, plus two historical collections (MTNHP 2016).	Sparsely Vegetated Habitat Type Group. Open slopes (low-elevation). Dry, open, often gravelly or sandy slopes in the valleys and foothills. Open woods and stream banks at mid-elevations in the montane zone.	In the plan area, Habitat is vulnerable to weed invasion, potential recreation use, and bison management activities. In general, populations are generally small and in habitats susceptible to weed invasion. At least a few of the occurrences contain scattered spotted knapweed plants.	Limited distribution. Habitat is vulnerable to weed invasion, potential recreation use, and bison management activities.	NatureServe 2106 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset;

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends and Threats in the Plan Area	Rationale for Including as Potential Species of Conservation Concern	Best Available Scientific Information
Penstemon angustifolius var. *angustifolius* (narrowleaf penstemon)	G5; S2S3 - MT; MT SOC;	In the plan area, observed 1994, Little Noise Sp, Macnab Campground, Plum Cr, Twentytwo Sp, and West Plum Cr Reservoir; 1996 Belltower Butte; Camp Needmore; 2010 Ekalaka Hills and Long Pines In general, at the western extent of its range. Over a dozen, small extant and/or presumed extant occurrences are known in southeast Montana, plus a few historical collections from the same area. Only one of the known populations appears to be relatively large. Additional suitable, but unsurveyed habitat likely exists in eastern Montana (MTNHP, 2016).	Sparsely Vegetated Habitat Type Group. Sandy-soiled, prairie grasslands on hills and slopes. Plants are often most abundant on sandy blowouts and other sparsely vegetated areas.	In the plan area, vulnerable to weed invasion	Small average population size and vulnerable to weed invasion	NatureServe 2106 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset; Hallman 2012
Physaria didymocarpa var. *lanata* (wooly twinpod)	G5T2; S2S3 - MT SOC - MT	In the plan area, known in Park Co., MT in planning area (Elliott 2014). In general, only a few known occurrences in Montana, including two potentially large populations (MTNHP 2016).	Sparsely Vegetated Habitat Type Group. Sandy, often calcareous soil of open grassland or shrubland slopes in the plains.	In the plan area, vulnerable to weed invasion. In general, oil and gas development, coalbed methane, and invasive weeds have the potential to detrimentally impact populations (MTNHP 2016)	Disjunct occurrence in the plan are from Bighorn County, MT populations. Vulnerable to weed invasion.	NatureServe 2106 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset; Elliott 2014

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends and Threats in the Plan Area	Rationale for Including as Potential Species of Conservation Concern	Best Available Scientific Information
Shoshonea pulvinata (Shoshonea)	G2G3; S2 - MT; SOC - MT USFS Sensitive	In the plan area, observed 1984 and 1987 Lost Water Canyon; 1986, 2005, 2012 Meeteetse Spires; 1995 Inferno Canyon; 1987 and 1995 Mystery Cave - Sykes Rd. (MTNHP 2016 CGNF dataset). In general, a regional endemic to the Absaroka and Owl Creek Mountains of northwest Wyoming and adjacent Montana.	Sparsely Vegetated Habitat Type Group. Open, exposed limestone outcrops, ridgetops, and canyon rims, in thin rocky soils.	In the plan area, narrow endemic vulnerable to regional stochastic (random) events; vulnerable to trampling by wild horses. In general, threats include regional stochastic events and climate change. Some populations may be prone to trampling from wild horses.	Narrow endemic with global distribution limited to 12 occurrences. Seven occurrences located in the plan area in the Pryor Mtns (6) and east flank of the Beartooths (1). Occurrences are composed of mats that are comprised of hundreds or even thousands of individual plants. The total number of plants is estimated to be 12,000 in Montana (Lyman, 2005). *S. pulvinata* is ranked between globally imperiled and vulnerable (G2G3) by NatureServe; imperiled (S2) by the Wyoming Natural Diversity Database (also known from the Absaroka and Owl Creek mountains of northwestern Wyoming); and critically imperiled (S1) by the MTNHP. *Shoshonea pulvinata* is designated as sensitive in Regions 1 and 2 of the Forest Service and is included on Wyoming BLM State Sensitive Species List. It was once listed as a Category 2 species on the Federal Endangered Species List, but the U.S. Fish and Wildlife Service has discontinued the use of this designation. Restricted to relatively barren, calcareous soils, but locally abundant on these sites. Population trends were stable as last reported in 2005, and threats include regional stochastic events and climate change (NatureServe, 2016 online access).	NatureServe 2106 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset; Lyman 2005 Heidel 2011.

Table 8. Potential plant species of conservation concern on the Custer Gallatin National Forest in the Riparian/Wetlands Habitat Type Group

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends and Threats in the Plan Area	Rationale for Including as Potential Species of Conservation Concern	Best Available Scientific Information
Cypripedium parviflorum (small yellow lady's-slipper)	G5; S3? - SD; S3S4 - MT; SOC - SD PSOC - MT USFS Sensitive	Known on CNF and GNF. Wickham Campground (Long Pines). In general, in MT, many occurrences known from the western half of the state, including a dozen or so historical or poorly documented sites.	Riparian / Wetlands Habitat Type Group. Damp, mossy woods; seeps, moist forest-meadows; fens. Valley to lower montane.	In MT, a variety of land uses and activities, including development, grazing and timber harvesting may have detrimental impacts to populations. However, yellow lady's-slipper appears to be tolerant to some disturbances at low levels and the number of populations scattered over a wide area reduces the risk to the species.	Local conservation concern due to low population numbers in restricted habitat within the plan area. Because this species often occupies small areas, one small, spatially-isolated disturbance event could possibly destroy all reproducing plants. Local conservation concern due to low population numbers in restricted habitat within the plan area.	NatureServe, 2106 online access; MTNHP 2016 online access; SDNHP 2016 online access; MTNHP 2016 CGNF Dataset; Hallman 2012; Mergen 2006
Drosera anglica (English sundew)	G5; S3 - MT; SOC - MT USFS Sensitive	Observed 1943 Hell Roaring Cr; 2007 Reed Lake (MTNHP 2016 CGNF Dataset); and 2008 in Park County, MT (Elliott, 2014). These occurrences are somewhat disjunct from others in NW MT. In general, *Drosera anglica* has a scattered distribution over a very broad range. Widespread in Western MT. This species has a circumboreal distribution and is widespread and abundant in many regions. Globally it is not threatened with extinction in the near future and is ranked as G5, apparently secure and geographically isolated and near the southern extent of the species' range (Wolf et al. 2006).	Riparian / Wetlands Habitat Type Group. Floating bogs, swamps, and sedge meadows, with soils that are saturated or in very shallow standing water at 6400-8000 feet in WY (WYNDD) or 3800-9000 feet in MT (Lesica/Shelly 1991).Sunny, very wet, and weakly acidic or calcareous bogs and fens. It often appears in shallow pools in the minerotrophic water tracks of patterned peatlands (NatureServe).	The primary threat is the loss of peatland habitat through drainage or peat mining. Logging and trampling by visitors can also damage populations of this species.	Local conservation concern due to low population numbers in restricted habitat within the plan area. Because this species often occupies small areas, one small, spatially-isolated disturbance event could possibly destroy all reproducing plants. Local conservation concern due to low population numbers in restricted habitat within the plan area.	NatureServe, 2106 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset; Elliott 2014; Heidel, 2011; Wolf et al. 2006 Lesica, P. & J. S. Shelly 1991

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends and Threats in the Plan Area	Rationale for Including as Potential Species of Conservation Concern	Best Available Scientific Information
Eleocharis rostellata (beaked spikerush)	G5; S1 - SD; S3 - MT; SOC - SD SOC - MT USFS Sensitive	1998 Bear Cr; 1999 Dry Fk Cr (MTNHP 2016 CGNF Dataset); 31 observations in MT.	Riparian / Wetlands Habitat Type Group. soils, associated with warm springs or fens in the valley and foothills zones.	Vulnerable to stochastic events	Local conservation concern due to low population numbers in restricted habitat within the plan area. Because this species often occupies small areas, one small, spatially-isolated disturbance event could possibly destroy all reproducing plants. Local conservation concern due to low population numbers in restricted habitat within the plan area.	NatureServe, 2106 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset
Gentianopsis simplex (hiker's gentian)	G5; S2 - MT; SOC - MT; USFS Sensitive	1989 and 1991 Carbon Co. - E Rosebud (Shelly); 2008 Sweet Grass and Park Co, MT (Elliott). In general, rare in Montana, where it is known from several widely scattered locations. Current population levels and trends are unknown, though potential threats to known populations appear to be minimal or non-existent at this time. Additional sites are likely to be documented if surveys were to be conducted.	Riparian / Wetlands Habitat Type Group. Fens, wet meadows, seeps	In plan area, vulnerable to livestock grazing.	Local conservation concern due to one population possibly extirpated and one in a mining area; other locations in the plan area are within the AB Wilderness Area.	NatureServe, 2106 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset; S. Shelly; Pers. Comm. With R. Clark

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends and Threats in the Plan Area	Rationale for Including as Potential Species of Conservation Concern	Best Available Scientific Information
Meesia triquetra (meesia moss)	G5; S2 - MT; SOC - MT; USFS Sensitive	In plan area, observed in 1987 West Fork Rock Cr (Beartooth RD) (MTNHP 2016 dataset). In general, Greenland; Canada: AB, BC, MB, NL, NT, NU, ON, QC, YT; USA: AK, CA, MI, MN, MT, NE, NJ, NY, OR, SD, VT; n Eurasia (FNA 2014). In Montana: Carbon, Flathead, Glacier, Lincoln, Ravalli, Sanders, and Teton Counties	Riparian / Wetlands Habitat Type Group. Fens, bogs, wetlands, and wet woods	In plan area, the population is in a designated Wilderness Area. However, vulnerable to recreational trampling due to proximity to trailhead. In general, susceptible to changes in hydrology. Over the last century, fen habitats have been impacted by grazing, water diversion, water impoundment, drainage projects, road construction, commercial harvest of peat and sphagnum moss, and succession in the absence of fire. Changes in water regime, nutrient inputs, and succession lead to the disappearance of fen communities and species. Livestock can trample and destroy bryophyte cover. Commercial collecting of peat depletes bryophyte diversity in mires, although some species require periodic disturbance. Many peatlands are converting to forest in the absence of fire and few new peatlands are forming. Scientific collecting can also deplete populations of rare mosses such as Meesia.	Low population numbers and restricted habitat within the plan area.	NatureServe, 2106 online access; MTNHP, 2016 online access; MTNHP, 2016 CGNF Dataset;

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends and Threats in the Plan Area	Rationale for Including as Potential Species of Conservation Concern	Best Available Scientific Information
Thelypodium paniculatum (northwestern thelypody)	G2; SH - MT; SOC - MT;	In the plan area, observed in 2008 Gallatin County, MT. (Elliott, 2014). In general, known from an 1899 collection in Beaverhead County, although Dorn (1984) also reports it for Madison County. This species is known from ID, MT, WY and CO (MTNHP 2016).	Riparian / Wetlands Habitat Type Group. Moist alkaline meadows. Northwestern thelypody grows in wet sedge meadows where the water level may cover basal portions of the plant. It appears to favor meadows and stream bottoms that remain wet for most of the season. Two localities in Yellowstone National Park are in very wet sedge meadows. (MTNHP 2016).	In the plan area, vulnerable to recreational impacts due to location near trailhead. The known location is not in a permitted livestock grazing allotment. In general, based on available habitat information, this species could be vulnerable to riparian grazing or hydrologic changes.	Global rank and specialized habitat that is vulnerable to potential impacts; one occurrence in plan area is near trailhead activity.	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016; Elliott 2014

Appendix B – Evaluated Plant Species in the Plan Area but NOT Identified as Potential Species of Conservation Concern

The following 84 plant species were evaluated per the 2012 planning rule and are not identified as Potential Species of Conservation Concern. These include 43 alpine species, 7 cool moist forest species, 9 grassland / shrubland species, 14 sparse vegetation species, and 11 riparian / wetland species. Of these are seven Northern Region sensitive species which include *Aquilegia brevistyla, Botrychium ascendens, Balsamorhiza macrophylla, Astragalus barrii, Primula incana, Mertensia ciliata,* and *Gentian affinis*. The following tables display the evaluation of species by habitat type group and planning rule elements considered. A more detailed table which displays the full evaluation of the 2012 Planning Rule components is available in the project record.

Table 9. Evaluated plant species known in the Alpine Habitat Type Group of the plan area not identified as potential species of conservation concern

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends / Threats in the Plan Area	Rationale for Not Including as Potential Species of Conservation Concern	Best Available Scientific Information
Agrostis mertnsii (Northern bentgrass)	G5; S3? - MT; Status Under Review - MT (once was pSOC)	In the plan area, observed in 2008 in Park and Carbon Counties, MT. (Elliott, 2014). In general, Few collections from Montana. Probably undercollected due to small stature, demure appearance and difficulty of accessing its alpine habitat (MTNHP, 2016).	Alpine Habitat Type Group. Moist meadows above timberline.	In the plan area, no known threats.	Insufficient information on distribution and abundance	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016; Elliott 2014
Carex capitata (Capitate Sedge)	G5; S3; Status Under Review - MT	In the plan area - observed in 2008 in Carbon & Sweet Grass counties, MT of CNF. Elliot (2014)	Alpine Habitat Type Group. Open, dry or wet places at high altitudes in the mountains.	In the plan area, no known threats.	Insufficient information on distribution and abundance	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016; Elliott 2014
Carex incurviformis (coastal sand sedge)	G4G5; S2 - MT; SOC - MT	In the plan area, one population last observed in 1991 on CGNF on Hebgen RD near Targhee Pass (MTNHP 2016 Dataset for the CGNF). In general, circumpolar south to CA and CO. Five known occurrences in Montana, three are in Wilderness areas or Glacier National Park. However, all populations are apparenly small to moderate in size based on limited survey data for the species.	Alpine Habitat Type Group. Wet rock ledges and moist tundra in the alpine zone.	In the plan area, no known threats. In general, this species has been removed from USFS R1 Sensitive Species due to threats being reduced. All occurrences are in alpine habitat that is not generally subject to human impacts (MTNHP, 2016).	Lack of current sufficient information. Previously removed from R1 Sensitive Spp. list due to minimal threats.	MTNHP 2016; MTNHP 2016 Dataset; NatureServe 2016

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends / Threats in the Plan Area	Rationale for Not Including as Potential Species of Conservation Concern	Best Available Scientific Information
Carex multicostata (many-ribbed sedge)	G5: S2S3 - MT; SOC - MT	In the plan area, one population S. of Livingston in Mill Cr. - along roads in Davis Chico Subdivision (1989); and two from Gallatin Co. (1921 and 1977). 1999 Blackmore Cr, 1989 Counts Cr, and 1921 N Fk Muddy Creek (MTNHP 2016 dataset). Although observations have been reported, Lesica (2012) reports that he has seen no specimens from MT and does not include it in his key for MT. In general, BC to MT, south to CA, NV and UT. A rare species in Montana, scattered in the mountains of the southwest (two populations from Beaverhead Co. (1959) and south-central portions of the state. Very little data are available for the species in Montana.	Alpine Habitat Type Group. In the plan area, subalpine meadow. In MT, the spp. Is known from above timberline on the GNF.	In the plan area, no known threats. In general, very little data are available for the species in Montana. However, the potential for negative impacts to the populations appears to be low (MTNHP, 2016).	Lack of current sufficient information.	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016; Elliott 2014; Mathews, S.Y. 1989. Per April 22. 1990 memo from Livingston to the files
Carex stevenii (Steven's Scandinavian sedge)	G5T4?; S2? - MT; SOC - MT	I the plan area, known in Carbon Co. observed in 1984 on Froze to Death Mtn; and in 2008 Elliott Inventory In general, ID, MT, WY, UT, CO and NM. Rare in Montana, where it is currently known from a few scattered sites in mountainous areas across the southern half of the state.	Alpine Habitat Type Group. Found along streams and in wet meadows in the montane and subalpine and growing in moist turf in the alpine.	In the plan area, no known threats.	Lack of current sufficient information.	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016; Elliott 2014
Dactylina ramulosa (Dactylina Lichen)	G4G5; S2; SOC - MT	In the plan area, known in CNF (Cooke City) (MTNHP, 2016 dataset) In general, in MT, known from several locations in the western and south-central regions. An arctic-alpine, circumpolar species (MTNHP, 2016)	Alpine Habitat Type Group. Found on soil developing from calcareous schists	In the plan area, no known threats.	Lack of current sufficient information.	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016; (http://dbiodbs.univ.trieste.it/italic/italic07?s=691&us=admin)

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends / Threats in the Plan Area	Rationale for Not Including as Potential Species of Conservation Concern	Best Available Scientific Information
Draba fladnizensis var. *pattersonii* (White Arctic Draba)	G4; S2? - MT; SOC - MT	In the plan area, observed in Carbon and Park Counties, MT in 1995 at Kock Peak; 1996 N of Froze-to-Death Mtn (MTNHP 2016 dataset); 2008 (Elliott 2014) In general, rare in Montana, where it is currently known from a few scattered alpine locations in the southern half of the state.	Alpine Habitat Type Group. Alpine fell fields. Additional sites are likely to be documented in the future and the species does not appear to be at significant risk due to the remoteness of its habitat. Rhyzomatous species.	In the plan area, no known threats. In general, this species has been removed from USFS R1 Sensitive Species due to threats being reduced.	Lack of current sufficient information. Previously removed from R1 Sensitive Spp. list due to minimal threats.	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016; Elliott 2015
Draba globosa (Round-fruited Draba)	G3; S2S3 - MT; SOC - MT	In the plan area, observed in 1981 in Taylor Basin (former GNF), perhaps in the wilderness (June 1, 1988 R1 Ltr to GNF) and 1984 SW of Coffin Mtn (MTNHP 2016 dataset). Four other populations west of the GNF In general, regional endemic of southwestern Montana, central Colorado, northern Utah and western and southern Wyoming.	Alpine Habitat Type Group.	In the plan area, no known threats. In general, this species has been removed from USFS R1 Sensitive Species due to threats being reduced.	Lack of current sufficient information. Previously removed from R1 Sensitive Spp. list due to minimal threats.	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016; June 1, 1988 R1 Ltr to GNF; Elliott 2016 (Elliott 2014 shows legend as being in MT, but species list and draft SOC/PSOC list indicates this was located in Park County, WY, not MT)
Draba paysonii var. *paysonii* (Payson's whitlow-grass)	G5T3; S3 - MT; Status Under Review (once was pSOC) - MT	In the plan area, observed in 2008 in Carbon, Gallatin, and Park Counties, MT. (Elliott, 2014). In general, Regional endemic of W Montana and W Wyoming	Alpine Habitat Type Group. Found only in calcareous soil in Alpine and subalpine.	In the plan area, no known threats.	Lack of current sufficient information.	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016; Elliott 2016

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends / Threats in the Plan Area	Rationale for Not Including as Potential Species of Conservation Concern	Best Available Scientific Information
Draba porsildii (Porsild's draba)	G3G4; S2S3 - MT; SOC - MT	In the plan area, In general, only known in Montana from a few collections on the Beartooth Plateau and the Madison Range.	Alpine Habitat Type Group.	In the plan area, no known threats. In general, this species has been removed from USFS R1 Sensitive Species due to threats being reduced. Its high-elevation habitat is relatively inaccessible, and there are no obvious threats. Additional sites are likely to be documented (MTNHP, 2016).	Lack of current sufficient information. Previously removed from R1 Sensitive Spp. list due to minimal threats.	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016; Lesica, 1993
Draba ventosa (Wind River Draba)	G3; S2S3 - MT; SOC - MT	In the plan area, Madison Co - observed in 1946 Kock Peak; 1981 Eastside of Koch Basin (MTNHP 2016 Dataset) and Park (Elliot, 2014) counties, MT. In general, *Draba ventosa* is known from one site in the Madison Range and has been reported from a second site in the Snowcrest Range.	Alpine Habitat Type Group. Alpine bedrock and scree. Draba ventosa occurs in scree and shifting talus of slopes near or above treeline, often but not always on limestone parent material.	In the plan area, no known threats. In general, this species has been removed from USFS R1 Sensitive Species due to threats being reduced. Its high-elevation habitat is relatively inaccessible, and there are no obvious threats. Additional sites are likely to be documented (MTNHP, 2016).	Lack of current sufficient information. Previously removed from R1 Sensitive Spp. list due to minimal threats.	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016; Elliott 2014
Erigeron flabellifolius (Fan-leaved Fleabane)	G5; S3 - MT; SOC - MT	In the plan area, observed in Beartooth Mtns: 1947 Beartooth Hwy; 1991 Beartooth Highway border; 1991 Rock Cr Vista; and 1981 W Boulder Plateau. Crazy Mtns: 1960 Trespass Cr; 1981 Sundance Pass; 1993 Sunset Lake; 1997 Crazy Peak; 2000 Conical Peak; 2006 Cottonwood Lake; 2011 Sunset Lake (MTNHP 2016 CGNF dataset); 1993 (Lesica) In general, regional endemic of SW Montana and NW Wyoming.	Alpine Habitat Type Group. Restricted to rocky, alpine habitats in the mountains of south-central Montana.	In the plan area, no known threats. In general, this species has been removed from USFS R1 Sensitive Species due to threats being reduced (r1). Though uncommon and restricted in distribution, the high elevation habitat tends to reduce the potential for any impacts to the species (MTNHP, 2016).	Lack of general threats to alpine habitat. Previously removed from the R1 Sensitive Spp. List due to minimal threats.	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016; Lesica, 1993; Vanderhorst, 1994

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends / Threats in the Plan Area	Rationale for Not Including as Potential Species of Conservation Concern	Best Available Scientific Information
Erigeron grandiflorus (large-flower fleabane)	G4; S1S3 - MT; SOC - MT	In the plan area, observed in 1993 at Glacier Lake Trail and Quad Cr (MTNHP 2016 CGNF Dataset); and 2008 (Elliott 2014); In general, Sweet Grass and Carbon counties; AK south to WY (MTNHP, 2016).	Alpine Habitat Type Group.	In the plan area, no known threats. In general, this species has been removed from USFS R1 Sensitive Species due to threats being reduced.	Lack of current sufficient information. Previously removed from R1 Sensitive Spp. list due to minimal threats.	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016; Elliott 2014
Eriophorum callitrix (sheathed cotton-grass)	G5; S2S3 - MT; SOC - MT	In the plan area, observed in 1991 Line Cr Plateau and Quad Creek (MTNHP 2016 DGNF Dataset); and in 1993 (Lesica), 2008 (Elliott, 2014) In general, rare in Montana, where it is has been documented only from the Beartooth Plateau. Additional occurrences likely exist on the Beartooth Plateau.	Alpine Habitat Type Group.	In the plan area, no known threats. In general, this species has been removed from USFS R1 Sensitive Species due to threats being reduced (R1). Based on the locality and habitat of the known sites, the species does not appear to be at a high degree of risk from human impacts (MTNHP).	Lack of current sufficient information. Previously removed from R1 Sensitive Spp. list due to minimal threats.	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016; Elliott 2014; Lesica, 1993
Gentiana prostrata (Moss Gentian)	G4G5; SU - MT (Unrankable - lack of info); Status under Review - MT	In the plan area - observed in 1993 Line Cr Plateau (Lesica, 1993). In general, circumboreal, south in western N. America to CA and CO; S. America.	Alpine Habitat Type Group. Moist tundra, rock ledges, and gravelly soil in the alpine zone.	In the plan area, no known threats.	Insufficient information on distribution and abundance	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016; Lesica, 1993
Gentianella tenella (Slender Gentian)	G4G5; SU - MT (Unrankable - lack of info); Status under Review - MT	In the plan area - observed in 1993 Line Cr Plateau (Lesica, 1993). In general, circumboreal, south in N. America to Que., NM, and CA.	Alpine Habitat Type Group. Moist tundra, boulder fields, or rock ledges near or in alpine zone.	In the plan area, no known threats.	Insufficient information on distribution and abundance	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016; Lesica, 1993

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends / Threats in the Plan Area	Rationale for Not Including as Potential Species of Conservation Concern	Best Available Scientific Information
Juncus triglumis var. *albescens* (Three-flowered Rush)	G5; S3 - MT; SOC - MT	In the plan area, observed in 1989 Pine Cr Lake (Park Co.); 1996 Froze-to-Death plateau (Carbon Co.) (MTNHP 2016 dataset). In general, rare in Montana, where it is known from a few, moist, alpine sites in Glacier National Park and the Absaroka-Beartooth Mountains. 17 observations in MT (MTNHP 2016).	Alpine Habitat Type Group. Wet, organic soils and moist, well-developed turf in the alpine zone.	In the plan area, no known threats. In general, this species has been removed from USFS R1 Sensitive Species due to threats being reduced (r1). The potential for negative impacts from human-caused activities appears to be minimal (MTNHP, 2016).	Lack of general threats to alpine habitat. Previously removed from the R1 Sensitive Spp. List due to minimal threats.	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016;
Juncus triglumis var. *triglumis* (Three-flowered rush)	G5T5; SU - MT (Unrankable - lack of info); Status under Review - MT	In the plan area - observed in 1993 Line Cr Plateau (Lesica, 1993). In general, circumpolar south to UT and CO	Alpine Habitat Type Group. Wet, open gravelly soil around seeps and streams and organic soil of boggy areas above timberline.	In the plan area, no known threats.	Insufficient information on distribution and abundance	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016; Lesica, 1993
Kobresia sibirica (large-fruited kobresia)	G5; S2 - MT; SOC - MT	In the plan area, observed in 1993 Line Cr Plateau and Wyoming Cr Headwaters (Lesica, 1993). In general, rare in Montana. Only known in the state from a small area of the Beartooth Plateau.	Alpine Habitat Type Group.	In the plan area, no known threats. In general, this species has been removed from USFS R1 Sensitive Species due to threats being reduced.	Lack of current sufficient information. Previously removed from R1 Sensitive Species list due to minimal threats.	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016; Lesica, 1993
Kobresia simpliciuscula (simple kobresia)	G5; S3 - MT; SOC - MT	In the plan area, observed in 1985 Big Ice Cave; 1989 Pine Cr Lake (MTNHP, 2016). In general, in Montana, where it is known from over a dozen sites from montane wetlands to mesic, alpine tundra. The species has a wide distribution and is scattered across the mountainous portion of the state. 19 observations in MT (MTNHP, 2016).	Alpine Habitat Type Group. Montane fens to moist tundra in the alpine zone.	In the plan area, no known threats. In general, this species has been removed from USFS R1 Sensitive Species due to threats being reduced (r1).	Lack of general threats to alpine habitat. Previously removed from the R1 Sensitive Species List due to minimal threats.	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016; Lesica, 1993

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends / Threats in the Plan Area	Rationale for Not Including as Potential Species of Conservation Concern	Best Available Scientific Information
Koenigia islandica (island koenigia)	G3Q; S2? - MT; SOC - MT	In general, rare in Montana, where it is only known from several, high elevation sites on the Beartooth Plateau. In general, circumpolar, extending south in North America to scattered alpine summits in the Rocky Mountains as far south as Colorado.	Alpine Habitat Type Group.	In the plan area, no known threats. In general, this species has been removed from USFS R1 Sensitive Species due to threats being reduced (R1). The known occurrences and their habitat do not appear to be at any significant risk of adverse impacts from human activities (MTNHP, 2016).	Lack of current sufficient information. Previously removed from R1 Sensitive Species list due to minimal threats.	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016; Lesica, 1993
Micranthes apetala (tiny swamp saxifrage)	G5; S2 - MT; SOC - MT	In the plan area, observed 1987 Silver Run Peak. In general, known from two occurrences, one in the East Pioneers and one in the Absaroka-Beartooth Wilderness. Both occurrences are known from single specimen collections.	Alpine Habitat Type Group. Moist, open, often gravelly soil in meadows and on rock ledges in the montane to alpine zones.	In the plan area, no known threats. In general, this species has been removed from USFS R1 Sensitive Species due to threats being reduced. Though little data are available for the species in Montana, the alpine habitat in which it grows is not generally subject to negative impacts from human disturbance (MTNHP, 2016).	Lack of current sufficient information. Previously removed from R1 Sensitive Species list due to minimal threats.	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016;
Noccaea parviflora (Syn. *Thlaspi parviflorum*) (Small-flowered Pennycress)	G3: S3 - MT; SOC - MT	In the plan area, observed in 1965 Cooke Guard Station; 1991 Hwy 212 - MT border and Quad Cr; 1994 Line Cr Plateau and WY Cr (MTNHP 2016 Dataset and Lesica, 1993) In general, this species is a regional endemic, known in Montana from several southwestern counties. 26 observations in MT (MTNHP 2016).	Alpine Habitat Type Group.	In the plan area, no known threats. In general, this species has been removed from USFS R1 Sensitive Species due to threats being reduced (R1). It is a small, short-lived plant that likely requires some disturbance to maintain its habitat (MTNHP 2016).	Lack of general threats to alpine habitat. Previously removed from the R1 Sensitive Species List due to minimal threats.	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016; Lesica, 1993

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends / Threats in the Plan Area	Rationale for Not Including as Potential Species of Conservation Concern	Best Available Scientific Information
Oxytropis deflexa var. *foliolosa* (nodding locoweed)	G5T3T5; S2S3 - MT; SOC - MT	In the plan area, observed in 1991 Koch Basin; 1991, 2006, 2007 No-Man Ridge. In general, rare in Montana, where it has been documented from a few, high-elevation sites in the mountains of the southwest portion of the state.	Alpine Habitat Type Group. Gravelly, dry, limestone-derived slopes in the alpine zone.	In the plan area, no known threats.	Lack of current sufficient information.	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016; (Williams 2012 identified the species in the Beartooths, but not the variety)
Papaver radicatum ssp. *kluanensis* (alpine poppy)	G5T3T4; S2S3 - MT; SOC - MT	In the plan area, observed in 1981 Silver Run Peak and Sundance Pass; 1996 Crazy Peak. In general, circumpolar, sporadically south to NM; known from Carbon and Sweet Grass counties, MT	Alpine Habitat Type Group. Open, rocky slopes with delayed snowmelt in the alpine zone.	In the plan area, no known threats. In general, this species has been removed from R1 Sensitive Species list due to threats being reduced. Habitat is generally remote, eliminating most potential threats (MTNHP, 2016)	Lack of current sufficient information. Previously removed from R1 Sensitive Spp. list due to minimal threats.	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016;
Pedicularis oederi (Oeder's Lousewort)	G5: S3S4 - MT; pSOC - MT	In the plan area, observed in 2008 in Carbon & Stullwater Counties, MT. (Elliott, 2014). In general, one observation in MT (MTNHP 2016)	Alpine Habitat Type Group. Alpine turf.	In the plan area, no known threats. In general, this species has been removed from R1 Sensitive Species list due to threats being reduced (R1).	Lack of general threats to alpine habitat. Previously removed from the R1 Sensitive Spp. List due to minimal threats.	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016;
Pedicularis pulchella (Mountain Lousewort)	G3: S3 - MT; SOC - MT	In the plan area, observed on Gallatin Peak (unknown date); 1921 Spread Cr; 1981 W Boulder Plateau and W Chippy Cr; 1982 Lava Lake; 1985 E Pryor Mtn; 1993 Mount Rearguard (MTNHP 2016 Dataset) In general, restricted to high elevation areas of southern Montana. Limited data are available for the species and it may be more common than the few collections indicate. 17 observations in MT (MTNHP, 2016).	Alpine Habitat Type Group. Turf, fellfields, meadows; upper subalpine, alpine	In the plan area, no known threats. In general, this species has been removed from R1 Sensitive Species list due to threats being reduced (R1).	Lack of general threats to alpine habitat. Previously removed from the R1 Sensitive Spp. List due to minimal threats.	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016;

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends / Threats in the Plan Area	Rationale for Not Including as Potential Species of Conservation Concern	Best Available Scientific Information
Penstemon whippleanus (Whipple's beardtongue)	G5; S2; SOC - MT	In the plan area, known from the Coch Peak area within the Wilderness. 1946 Taylor peaks; 2007 Snowslide Mountain. In general, Whipple's beardtongue occurs at the edge of its range in Montana, and is known here from just two collections, only one of which is recent. Eastern ID and southwestern MT, south to UT, CO, AZ, and NM. Peripheral.	Alpine Habitat Type Group. This species inhabits open, rocky slopes in meadows and scattered timber of the subalpine and alpine zones.	In the plan area, no known threats. In general, this species has been removed from R1 Sensitive Species list due to threats being reduced. The species occupies high elevation, rocky habitat that is relatively unthreatened (MTNHP, 2016).	Lack of current sufficient information. Previously removed from R1 Sensitive Spp. list due to minimal threats.	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016; June 1, 1988 R1 Ltr to GNF
Phippsia algida (icegrass)	G5; S2S3 - MT; SOC - MT	In the plan area, observed in 1991 Line Cr Plateau; 1981 and 1987 Silver Run Plateau; 1993 WY Cr Headwaters; 1983 E Rosebud Plateau; 1984 Froze-to-Death Plateau (MTNHP 2016 Dataset). In general, rare in Montana, where it has been documented from only a few sites on the Beartooth Plateau.	Alpine Habitat Type Group. Wet, gravelly soil of seeps and along streams in the alpine zone.	In the plan area, no known threats. In general, this species has been removed from USFS R1 Sensitive Species due to threats being reduced.	Lack of current sufficient information. Previously removed from R1 Sensitive Species list due to minimal threats.	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016; Lesica, 1993
Physaria saximontana var. *dentata* (Rocky Mountain Twinpod)	G3T3: S3 - MT; SOC - MT	In the plan area, observed near Bozeman (unknown date); 2007Cone Peak; 2006 Koch Basin; 2011 Sunlight Lake (MTNHP 2016 dataset); 2009 Park, Carbon, and Sweet Grass Co. (Elliott, 2014) In general, a state endemic known from several counties across central and southern Montana mountain ranges. 23 observations in MT (MTNHP 2016)	Alpine Habitat Type Group. Typically found in limestone-derived talus, fellfields, and gravelly slopes at moderate to high elevations.	In the plan area, no known threats. In general, this species has been removed from USFS R1 Sensitive Species due to threats being reduced (r1).	Lack of general threats to alpine habitat. Previously removed from the R1 Sensitive Species List due to minimal threats.	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016; Elliott 2014

Plants Evaluated for Potential Species of Conservation Concern	**Conserva-tion Categories**	**Distribution and Abundance in the Plan Area**	**Habitat Description**	**Relevant Trends / Threats in the Plan Area**	**Rationale for Not Including as Potential Species of Conservation Concern**	**Best Available Scientific Information**
Potentilla brevifolia (short-leaved cinquefoil)	G4; S2S3 - MT; SOC - MT;	In the plan area, observed unknown date Bozeman; 2007 Cone Peak; 2006 Koch Basin; 2011 Sunlight Lake (MTNHP 2016 dataset); observed in 2009 Park, Carbon, and Sweet Grass Co. (Elliott, 2014). In general, rare in Montana, where it is currently only from a few collections from the Madison Range (MTNHP, 2016).	Alpine Habitat Type Group. Open, rocky, granite-derived soil and scree slopes in the alpine zone.	In the plan area, no known threats. In general, this species has been removed from USFS R1 Sensitive Species due to threats being reduced. The remote, high-elevation habitat should greatly minimize the potential for any negative impacts to the viability of the species in the state (MTNHP, 2016).	Lack of current sufficient information. Previously removed from R1 Sensitive Species list due to minimal threats.	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016; Elliott 2014
Potentilla hyparctica (low arctic cinquefoil)	G4G5; S2; SOC - MT	In plan area, observed in 1993 Jasper Lake; 1993 Mount Rearguard (Carbon Co) (MTNHP 2016 dataset). In general, rare in Montana, where it is currently only from a couple collections from the Beartooth Mtns (MTNHP, 2016).	Alpine Habitat Type Group. Moist turf in the alpine zone.	In the plan area, no known threats. In general, this species has been removed from USFS R1 Sensitive Species due to threats being reduced. The remote, high-elevation habitat should greatly minimize the potential for any negative impacts to the viability of the species in the state (MTNHP, 2016).	Lack of current sufficient information. Previously removed from R1 Sensitive Species list due to minimal threats.	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016;
Potentilla nivea var. *pentaphylla* (Five-leafed Cinquefoil)	G5T4: S3 - MT; SOC - MT	In the plan area, observed in 2008 in Park County, MT. (Elliott, 2014). In general, 22 observations in MT (MTNHP, 2016)	Alpine Habitat Type Group. Dry, gravelly soil of exposed ridges and slopes in the montane to alpine zones.	In the plan area, no known threats. In general, this species has been removed from USFS R1 Sensitive Species due to threats being reduced (R1). In MT, though several large populations are known and most populations, as well as the species' habitat, are not being negatively impacted (MTNHP, 2016).	Lack of general threats to alpine habitat. Previously removed from the R1 Sensitive Species. List due to minimal threats.	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016;

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends / Threats in the Plan Area	Rationale for Not Including as Potential Species of Conservation Concern	Best Available Scientific Information
Ranunculus grayi (Arctic Buttercup)	G4G5: S3 - MT; SOC - MT	In the plan area, in Stillwater and Madison Counties, MT - observed in 1973 Granite Range; 2002 Moose Cr (MTNHP 2016 Dataset) In general, 12 occurrences in MT; 16 observations in MT (MTNHP, 2016)	Alpine Habitat Type Group. Gravelly, usually moist, sparsely-vegetated soils of benches, moraines and open slopes near timberline or in the alpine zone.	In plan area, no known threats. In general, this species has been removed from USFS R1 Sensitive Species due to threats being reduced (R1). Low to medium threats (MTNHP, 2016)	Lack of general threats to alpine habitat. Previously removed from the R1 Sensitive Species List due to minimal threats.	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016;
Ranunculus hyperboreus (High Northern Buttercup)	G5; S3S4 - MT; pSOC -MT	In the plan area, observed in 2008 Carbon County, MT. (Elliott, 2014). In general, known from several southwest and south-central counties in Montana. See rank details for additional information.	Alpine Habitat Type Group. Wet soil around ponds, seeps, springs and along streams from montane to alpine.	In the plan area, no known threats.	Insufficient information on distribution and abundance	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016; Elliott 2014
Rhizoplaca haydenii (Hayden's rimmed navel lichen)	G2G3; S1S2; SOC - MT	In the plan area, known on Beartooth RD - Beartooth Pass (MTNHP, 2016 dataset) In general, known from a few locations in south-central to southeastern Montana. This species is also likely to be found in appropriate habitats in southwestern Montana. Both subspecies are found in Montana; *R. haydenii* ssp. *haydenii* and *R. haydenii* ssp *arbuscula*	Alpine Habitat Type Group. Soil crust lichen. Found on cold dry steppe to alpine habitats. Thallus loosely attached or free on windswept, sparsely vegetated, rocky calcareous soils.	In the plan area, no known threats.	Lack of current sufficient information. No threats for this G2G3 species' habitat are listed by Natureserve.	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016
Sagina nivalis (arctic pearlwort)	G4; S2S3; SOC - MT	In the plan area, observed in 1987 Sliver Run Peak (MTNHP 2016 Dataset). In general, rare in Montana, where it is known from Glacier National Park and the Beartooth Plateau.	Alpine Habitat Type Group. Moist, shaded cliffs in the alpine zone.	In the plan area, no known threats. In general, this species has been removed from R1 Sensitive Species list due to threats being reduced (R1). The remote, high-elevation habitat should greatly minimize the potential for any negative impacts to the viability of the species in the state (MTNHP 2016).	Lack of current sufficient information. Previously removed from R1 Sensitive Species list due to minimal threats.	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016;

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends / Threats in the Plan Area	Rationale for Not Including as Potential Species of Conservation Concern	Best Available Scientific Information
Saxifraga hirculus (yellow marsh saxifrage)	G5; S1S2; SOC - MT	In the plan area, observed in 1993 Crescent Lake (MTNHP 2016 Dataset). In general, Known from one small population in the Absaroka-Beartooth Wilderness.	Alpine Habitat Type Group. Wet, organic soil in the alpine zone.	In the plan area, no known threats. In general, this species has been removed from R1 Sensitive Species list due to threats being reduced (R1). Though little data are available for the species in Montana, the alpine habitat in which it grows is not generally subject to negative impacts from human disturbance (MTNHP 2016).	Lack of current sufficient information. Previously removed from R1 Sensitive Species list due to minimal threats.	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016
Selaginella watsonii (Watson's Spikemoss)	G4; S3? - MT; Status Under Review - MT	In the plan area - observed in 1993 Line Cr Plateau (Lesica, 1993).	Alpine Habitat Type Group.	In the plan area, no known threats.	Insufficient information on distribution and abundance	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016; Lesica, 1993
Senecio amplectans var. *holmii* (Holm's ragwort)	G4; S1S2; SOC - MT	In the plan area, observed in 1993 Hwy 212 Quad Cr In general, in MT, only known from the Beartooth (Line Creek) Plateau.	Alpine Habitat Type Group. Stony, open soil and talus of slopes in or near the alpine zone.	In the plan area, no known threats. In general, this species has been removed from R1 Sensitive Species list due to threats being reduced.	Lack of current sufficient information. Previously removed from R1 Sensitive Species list due to minimal threats. Quad Cr occurrence may have been lost due to landslides in 2005 because it was not re-located in followup surveys.	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016; Lesica, 1993
Solorina bispora (chocolate chip lichen)	G3G5; S1S2; SOC - MT	In plan area, known on Beartooth RD - Beartooth Pass (1997) (MTNHP, 2016 dataset) In general, known from a few locations in western Montana (5 observations).	Alpine Habitat Type Group. On calcareous soil or humus on moist sites in alpine to subalpine habitats.	In the plan area, no known threats.	Lack of current sufficient information.	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016;

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends / Threats in the Plan Area	Rationale for Not Including as Potential Species of Conservation Concern	Best Available Scientific Information
Stellaria crassifolia Fleshy Stitchwort	G5; S2; SOC - MT	In the plan area, observed in 1991 (Bitterroot Native Growers); but Lesica in 1993 only found S. longipes on Line Cr Plateau. In general, rare in Montana where it is known from a few sparsely distributed locations that are mostly poorly documented (MTNHP, 2016).	Alpine Habitat Type Group.	In the plan area, no known threats. In general, this species has been removed from R1 Sensitive Species list due to threats being reduced.	Lack of current sufficient information. Previously removed from R1 Sensitive Species list due to minimal threats.	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016; Lesica, 1993 Bitterrooth Native Growers, 1991
Townsendia condensata (cushion Townsend-daisy)	G4; S1S2; SOC - MT	In the plan area, observed in 1949 Ram Pasture (Park Co.) (June 1, 1988 R1 Ltr to GNF). In general, known from AB south to CA, UT and WY;	Alpine Habitat Type Group. Open, rocky, often limestone-derived soil of exposed ridges and slopes near or above treeline.	In the plan area, known from the Gallatin NF alpine; relatively unthreatened (MTNHP 2016) In general, this species has been removed from R1 Sensitive Species list due to threats being reduced.	Lack of current sufficient information. Previously removed from R1 Sensitive Species list due to minimal threats.	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016; June 1, 1988 R1 Ltr to GNF

Table 10. Evaluated plant species known in the Cool Moist Forest Habitat Type Group of the plan area not identified as potential species of conservation concern

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends / Threats in the Plan Area	Rationale for Not Including as Potential Species of Conservation Concern	Best Available Scientific Information
Aquilegia brevistyla (short-styled columbine)	G5; S2S3 - MT; SOC - MT; USFS Sensitive	In the plan area in 1967, one *Aquilegia brevistyla* occurrence was reported along the Boulder R. in Montana. From location information, it is not clear if specimen was actually collected from the Gallatin National Forest (Region 1) or from private land. *Aquilegia brevistyla* has not been found in the area since this original collection despite subsequent surveys (Mathews 1989, Ladyman 2006; Montana Natural Heritage Program 2016). In general, extirpated/possibly extirpated (NatureServe 2016 online access). 20 miles above the town of McLeod along the Boulder River. Specimen in fruit but identification questionable. R. Dorn commented "Probably *A. coerulea James*"; A. Plantenberg 1983 commented: "no"; S. Shelly commented "Floral measurements inconclusive." S. Matthews comments: "plant pressed such that flowers cannot be properly measured." Surveys in 28-30 July 1989, by S. Matthews, did not find *Aquilegia brevistyla* or *A. coerula*. Note: NOT FOUND since 1967. During the last three decades searches made on parts of 99 sections where suitable habitat occurred (Ladyman 2006). Eastern Alaska to Ontario south to British Columbia and southern Manitoba. Disjunct in eastern Montana and the Black Hills of SD and WY. In MT, there have been 69 observations in the Little Belt Mtns of the LCNF (MTNHP 2016)	Cool Moist Forest Habitat Type Group. Forest (Mesic); woodland or meadow habitats and in rock crevices; Open woods and stream banks at mid-elevations in the montane zone.	Insufficient information. No information on abundance and habitat conditions.	Insufficient information. No information on abundance and habitat conditions.	"NatureServe 2106 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset; Elliott 2014; Ladyman 2006; Roe, 1992; Mathews, 1989"

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends / Threats in the Plan Area	Rationale for Not Including as Potential Species of Conservation Concern	Best Available Scientific Information
Aquilegia formosa var. formosa (Sitka Columbine)	G5; S3 - MT; SOC - MT;"	In plan area, two observations 2008 GNF (Elliott, 2014). In general, known from several areas in southwest Montana. However, only four of these are large, high quality populations. 17 observations in MT. Effects of human disturbance, such as logging, on the species are uncertain (MTNHP, 2016)."	Cool Moist Forest Habitat Type Group. Montane / subalpine meadows, aspen	Insufficient information. No information on abundance and habitat conditions.	Insufficient information. No information on abundance and habitat conditions.	"NatureServe 2106 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset; Elliott 2014;"
Botrychium lanceolatum var. lanceolatum (Lanceleaf Moonwort)	G5; S3 - MT; SOC - MT;	In the plan area, observed in 2009 Yellowstone RD-Chrome-Iron Mtn Elliott & Elliott, 2009; Elliott, 2014) and one in the AB Wilderness. In general, Reported from approximately two dozen sites. Population levels are poorly documented. As this species was not previously tracked in the state, it may be under-reported (MTNHP, 2016)."	Cool Moist Forest Habitat Type Group. In a variety of habitats from wet to moist, grassy and rocky slopes, meadows, woods, roadsides, and edges of lakes, generally at fairly high elevations.	Presumed to be relatively common and widespread. Potential mining activity in the known habitat.	Presumed to be relatively sufficiently common and widespread such that viability in the plan area is probably secure and not adversely impacted by management activities. Continuing to build occurrence records to confirm abundance is optimal for species with few sites documented to date, but special management for these taxa is presumed unnecessary (Pers. Comm., S. Shelly)	NatureServe 2106 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset; Elliot & Elliott 2009; and Elliott 2014; Shelly 2016 Pers. Comm. w/S. Popovich
Botrychium pinnatum (Northern Moonwort)	G4? S3 - MT; SOC - MT;"	In plan area, observed in 2008 Park Co., MT in the AB Wilderness (Elliott, 2014) In general, 40 observations in MT"	Cool Moist Forest Habitat Type Group. Wide variety of habitats, including wet to moist grassy slopes, streambanks, roadsides, and mossy woods, generally in the mountains. In Idaho and Oregon, found in shaded cedar forest.	Presumed to be relatively common and widespread.	Presumed to be relatively sufficiently common and widespread such that viability in the plan area is probably secure and not adversely impacted by management activities. Continuing to build occurrence records to confirm abundance is optimal for species with few sites documented to date, but special management for these taxa is presumed unnecessary (Pers. Comm., S. Shelly)	NatureServe 2106 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset; Elliott 2014; Shelly 2016 Pers. Comm. w/S. Popovich

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends / Threats in the Plan Area	Rationale for Not Including as Potential Species of Conservation Concern	Best Available Scientific Information
Botrychium simplex var. simplex (least Moonwort)	G5; S2 - MT; SOC – MT S3 - SD SOC - SD"	In the plan area, observed in 2008 Chrome-Iron Mtn, Sweetgrass Co, MT., GNF (~4 plants)(Elliot 2014); It is not known to occur within the plan area in SD (SD GFP, 2017 Letter). In general, 16 Observations submitted for MT.	Cool Moist Forest Habitat Type Group. Various mesic sites from low to moderate elevation, however in plan area, observation was at 9,500 ft (Elliott 2014) including roadsides and other disturbed habitats. Sites are generally open with montane meadows and grasslands being the most common habitats occupied by the species.	Presumed to be relatively common and widespread. Potential mining activity in the known habitat.	Presumed to be relatively sufficiently common and widespread such that viability in the plan area is probably secure and not adversely impacted by management activities. Continuing to build occurrence records to confirm abundance is optimal for species with few sites documented to date, but special management for these taxa is presumed unnecessary (Pers. Comm., S. Shelly)	NatureServe 2106 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset; Elliott 2014 Shelly 2016 Pers. Comm. w/S. Popovich
Carex stenoptila (small-winged sedge)	G2; S2S3 - MT; SOC - MT;"	In the plan area, observed in Specimen Cr 1956, Contact Mtn 1991; Elk Lake 1994, Phantom Cr 1996; West Bridger Cr 1995; and W Fk Rock Cr 1990 (MTNHP, 2016 dataset). In general, a globally rare species, which is known from several widely scattered locations in Montana. Very little data are available for the species in Montana, as the sites are known only from specimen collections with sparse information."	Cool Moist Forest Habitat Type Group. Dry, often rocky soil of open forests and moist soil along streams. Montane and subalpine.		Insufficient information. No information on abundance and habitat conditions.	

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends / Threats in the Plan Area	Rationale for Not Including as Potential Species of Conservation Concern	Best Available Scientific Information
Erigeron formosissumus var. viscidus (Beautiful Fleabane)	G5; S1S3 - MT; SOC - MT"	In the plan area, observed in Mill Cr., Park Co., MT. The Mill Cr. Location is 2.4 air miles SSW of confluence of Davis and Mill Creeks. Per April 22. 1990 memo from Livingston to the files; known along roads in Davis Chico Subdivision (Mathews, S.Y. 1989. and June 1, 1988 R1 Ltr to GNF, and MTNHP 2016). In general, for populations known from Gravely Range and Crazy Mountains. Occurrence in Crazy Mtns. Is from 1938 and not mapped; documented in 1989 on the GNF in Mill Creek s. of Livingston.	Cool Moist Forest Habitat Type Group. Montane / subalpine meadoows and forest openings	In plan area, insufficient information. No information on abundance and habitat conditions. In general, additional data are needed to establish its conservation status (MTNHP, 2016)	Insufficient information. No information on abundance and habitat conditions.	NatureServe 2106 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset; Mathews, 1989; R1 Ltr to GNF, 1988"

Table 11. Evaluated plant species known in the Warm Dry Forest Habitat Type Group of the plan area not identified as potential species of conservation concern

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends / Threats in the Plan Area	Rationale for Not Including as Potential Species of Conservation Concern	Best Available Scientific Information
Dichanthelium oligosanthes var. *scribnerianum* (Scribner's panic grass)	G5T5; S1S2 - MT; SOC - MT	In the plan area, two observations on Ashland District in 1995 Cabin Cr; 1995 E Fk Otter Cr (MTNHP 2016 dataset); four new occurrences on the Sioux RD, 2010 (Hallman, 2012); Six total observations in common habitat. In general, only one large-sized population is known in the state, two others are very small, and the fourth occurrence is known only from a historical collection. Known from widely separated sites in southeastern and northwestern Montana. The largest occurrence in the state lies adjacent to Highway 93 and negative impacts associated with expansion of the highway is likely.	Warm Dry Forest Habitat Type Group. Dry woodlands to mesic sandy woodlands. Occurrences in eastern Montana may be negatively impacted by cattle grazing. Invasive weeds and forest encroachment are also problems at this site.	In the plan area, unknown trends/threats. In general, occurrences in eastern Montana may be negatively impacted by cattle grazing. Invasive weeds and forest encroachment may also present problems.	Scattered locations within the plan area in abundant potential habitat.	NatureServe 2106 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset; Hallman 2012"

Table 12. Evaluated plant species known in the Grasslands/Shrublands Habitat Type Group of the plan area not identified as potential species of conservation concern

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends / Threats in the Plan Area	Rationale for Not Including as Potential Species of Conservation Concern	Best Available Scientific Information
Balsamorhiza macrophylla (large-leaved balsamroot)	G3G5; S3S4 - MT; pSOC - MT; USFS Sensitive"	1989 population on ridge between Flint and Cinnamon Creeks, 0.5 to 1.0 air miles west of US HWY 89. Another population 5 miles up Cabin Creek from HWY 89 (1931 collection). In general, this species is a Great Basin species occurring in the Wasatch area of N. Utah, extending into the Mtns of SE Idaho, through W. Wyoming to the edge of the Snake River plains, then extending E. to Clark Co., ID and N. to Gallatin Co, MT. This species occurs in Montana at the edge of its range where it is known from three southwestern Montana mountain ranges. Most of the known populations are moderate to large in size and in generally good-quality habitat.	Grassland / Shrubland Habitat Type Group. Grassland/Sagebrush in montane zones.	Invasive weeds are not a problem at sites occupied by this species and livestock grazing at some of the sites do not appear to be negatively impacting the species (Pers. comm, S. LaMont / R. Clark).	Occurrences in the plan area do not appear to be vulnerable to livestock or weed invasion. In addition, removed from MT State List in 2013. Status re-determined as relatively low risk, low to moderate priority due to combination of moderate population levels, low threat levels, and habitat trends that appear to be stable. Additionally, the species does not appear to be restricted to rare habitats nor have intrinsic characteristics that make it especially vulnerable. Status re-determined as relatively low risk, low to moderate priority due to combination of moderate population levels, low threat levels, and habitat trends that appear to be stable (MTNHP 2016)	NatureServe 2106 online access; MTNHP 2016 online access; Mathews 1989

Plants Evaluated for Potential Species of Conservation Concern	**Conserva-tion Categories**	**Distribution and Abundance in the Plan Area**	**Habitat Description**	**Relevant Trends / Threats in the Plan Area**	**Rationale for Not Including as Potential Species of Conservation Concern**	**Best Available Scientific Information**
Botrychium ascendens (Upward-lobed Moonwort)	G3; S3 - MT; SOC - MT; USFS Sensitive"	In the plan area, observed in 2008 – about 4 plants were located at Contact Mtn; Yellowstone RD(Elliott and Elliott, 2019; Elliott, 2014); In general, 54 Observations submitted for MT (MTNHP 2016). Frequent in northwest Montana and on Forest; widespread in western North America (Pers. Comm, S. Shelly).	Grassland / Shrubland Habitat Type Group. Various Mesic Sites, low to mod. elevation disturbed areas. Occurs in open habitats and microsites with evidence of slight to moderate disturbances. This species appears to be successful colonizer of disturbed habitat, such as the edges of trails or old roads and in abandoned fields (Beatty et. al., 2003).	Weeds were not located at this site (Elliott and Elliott, 2009). In general, threats to the species include mining, road construction, trampling by hikers, overcollection, and alteration of soil and hydrological regimes (MTNHP, 2016). The persistence of Botrychium species may rely on a landscape with a mosaic of patches created by disturbances varying in frequency and intensity, where a series of local populations colonize, disperse, and disappear with the changing successional landscape (Chadde and Kudray 2001).	Insufficient information. Habitat sufficient that probably more, possibly many more populations exist, such that viability is not of concern and pSCC is not warranted at this time (Pers. Comm. S. Shelly).	NatureServe 2016 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset; Elliott 2014 Elliott and Elliott 2009 Beatty et. al. 2003 Chadde and Kudray 2001 S. Shelly Pers. Comm. With S. Popovich 2016

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends / Threats in the Plan Area	Rationale for Not Including as Potential Species of Conservation Concern	Best Available Scientific Information
Botrychium hesperium (Western moonwort)	G4; S3 - MT; SOC - MT; USFS Sensitive"	In the plan area, observed in 2008 Chrome-Iron Mtn and 2008 northward at Contact Mtn; Yellowstone RD, Sweet Grass Co., MT; ~15 plants were located over the two sites (Elliott and Elliott, 2009; Elliott, 2014). In general, 49 Observations submitted for MT (MTNHP 2016). Frequent in northwest Montana and on Forest; widespread in western North America (Pers. Comm, S. Shelly).	Grassland / Shrubland Habitat Type Group. Various mesic sites. The persistence of Botrychium species may rely on a landscape with a mosaic of patches created by disturbances varying in frequency and intensity, where a series of local populations colonize, disperse, and disappear with the changing successional landscape (Chadde and Kudray 2001).	In the plan area, weeds were not located at this site (Elliott and Elliott, 2009). In general, threats to the species include mining, road construction, trampling by hikers, overcollection, and alteration of soil and hydrological regimes.	Presumed to be relatively sufficiently common and widespread such that viability in the plan area is probably secure and not adversely impacted by management activities. Continuing to build occurrence records to confirm abundance is optimal for species with few sites documented to date, but special management for these taxa is presumed unnecessary (Pers. Comm. S. Shelly, 2016).	NatureServe 2016 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset; Elliott 2014 Elliott and Elliott 2009
Festuca idahoensis (Idaho fescue)	G5; S5 - MT; Unranked - SD but tracked by SDNHP"	In the plan area, widely known from the montane units, fewer occurrences on the Ashland RD, and one occurrence in a remote, fairly inaccessible relict site atop a high butte dividing Davis Draw and Jenkins area, N Cave Hills, SD. In general, through western North America, except in the extreme north latitudes (Lesica, 2012).	Grassland / Shrubland Habitat Type Group. Grasslands and meadows; all elevations.	This species is common in the MT portion of the plan area. The single occurrence in the SD portion of the plan area have minimal threats.	This species is common in the MT portion of the plan area. The single occurrence in the SD portion of the plan area have minimal threats.	NatureServe 2016 online access; MTNHP 2016 online access; SDNHP 2016 Lesica 2012; McGregor Et. Al., 1986; PNW Herbarium online data"

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends / Threats in the Plan Area	Rationale for Not Including as Potential Species of Conservation Concern	Best Available Scientific Information
Microseris nutans (nodding silver-puffs)	G5; SH - SD; SOC - SD"	In the plan area, one occurrence in MT in the Ekalaka Hills (Hallman, 2012). In general, known in Harding Co. SD north of the East Short Pines on the eastern edge of its range; Two historical collections from north Black Hills per SD rare plant list info (Gabel, 2014). Not a MT SOC - 41 Observations submitted for MT (MTNHP, 2016). "	Grassland / Shrubland Habitat Type Group. Moist grasslands, meadows, sagebrush steppe, open forest; valleys, montane	Common in the Montana portion of the plan area. Occurrence in the MT portion of the plan area is on the eastern edge of the range.	Common in the Montana portion of the plan area. Occurrence in the MT portion of the plan area is on the eastern edge of the range.	NatureServe 2016 online access; MTNHP 2016 online access; MSDNHP 2016
Penstemon nitidus (shining penstemon)	G5; S2 - SD; SOC – SD S4 – MT	In the plan area, this species is common in the MT portion of the plan area (Sioux – one MT Long Pines 2009; Ashland – one Bloom Cr 1992; one FS Rd. 135 west of Otter Cr 1993; Pryors – two N of Sage Cr 2008; two Custer NF/Crow Boundary 2008; Beartooths two at Robertson Draw 1990 and 2007; West Bridger Cr. 1995; Gardiner one off Road 348 – 2008; one 8 mi. sw of Livingston 1949; Crazy Mtns – one Middle Fk Cottonwood Cr 1946). One occurrence in the SD portion of the plan area (Slim Buttes). In general, BC to MB south to WA, CO and ND.	Grassland / Shrubland Habitat Type Group. Plains, hills and slopes	In the plan area, there is insufficient information showing substantial concern for the species' long-term persistence. In general, this habitat type group can be vulnerable to weed invasion, but not currently posing a threat.	Common in the Montana portion of the plan area. Occurrence in the SD portion of the plan area is on the eastern edge of the range. In the plan area, there is insufficient information showing substantial concern for the species' long-term persistence.	NatureServe 2016 online access; MTNHP 2016 online access; SDNHP 2016 PNW Herbarium online data"
Solidago velutina var. *sparsiflora* (syn. *Solidago sparsiflora*) (three-nerved goldenrod)	G5?; SU - SD SOC; SH - MT SOC"	In plan area, a 1991 occurrence is tracked in the Slim Buttes (SW Bonniwell-East) by SDNHP. A 1991 occurrence noted for Graham Cr, a trib. of Boulder River in Sweet Grass, Co., MT (Evert per PNW Herbarium online data). In general, OR to MT south to CA, AZ, NM, TX, Mexico (Lesica, 2012). In SD, a few scattered collections from w SD & BH's. Conservation status uncertain, more information needed (SDMNHP, 2016)."	Grassland / Shrubland Habitat Type Group. Sandy, well-drained soils of unglaciated broken and rolling plains in a variety of semi-open settings, including open woods, woodland margins and rocky slopes	In the plan area, threats are unknown. In general, this habitat type group can be vulnerable to weed invasion.	Insufficient information; insufficient information to re-locate sites (S. Shelly Pers. Comm. With D. Ode, 2016)	NatureServe 2016 online access; MTNHP 2016 online access; SDNHP 2016 CGNF Dataset; Lesica 2012; McGregor Et. Al., 1986; PNW Herbarium online data"

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends / Threats in the Plan Area	Rationale for Not Including as Potential Species of Conservation Concern	Best Available Scientific Information
Pinus flexilis (Limber Pine)	G4 S5 - MT	In the plan area, observed in all land units except the Ashland and Sioux RDs. In general, known from the northern and central Rocky Mountains, and the Great Basin regions from British Columbia and Alberta in Canada, south through Oregon, Idaho, Montana, Wyoming, Nevada, Utah, Colorado to New Mexico.	Grass/Shrubland Habitat Type Group: Rocky slopes and ridges; montane, occasionally subalpine, rarely plains and valleys. Often found in dry limestone substrates.	Presently, there is higher abundance in the plan area than that which would have occurred historically. Insect and disease occurs in the plan area, but there is not sufficient scientific information available to conclude substantial concern to long term persistence in the plan area (pers. comm. D. Sandbak).. In general, changing fire regimes combined with the poor competitiveness with other species and poor regeneration due to blister rust and other insects/disease cause concern for altering distribution and survival in the West.	Current global ranking is "Apparently Secure" (uncommon but not rare; some cause for long-term concern due to declines or other factors). The state of MT conservation ranking indicates that this species is secure. Limber pine is a generalist and pioneer species, as well is cold and drought tolerant, making it capable of growing in a wide variety of environmental and physiological circumstances. Presence and distribution in the plan area exceed that which has been modelled as its natural range of variation. This is likely due to past fire suppression. Although general trends across the west show some declines, there is not sufficient scientific information available to conclude substantial concern for long-term persistence in the plan area (Pers. Comm. with local Silviculturist, D. Sandbak).	MTNHP 2016; VMAP/FIA 2016 Datasets NatureServe 2016; Consortium of Pacific Northwest Herbarium Jackson 2010 Schoettle, 2004 Schoettle et al, 2013 Kearns et al 2014 FIA database and SIMPPLLE Model

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends / Threats in the Plan Area	Rationale for Not Including as Potential Species of Conservation Concern	Best Available Scientific Information
Stipa lettermanii (Letterman's needlegrass)	G5; S1S3 - MT; SOC - MT	In the plan area, 1996 Knowl Lake (Castle Lake) Park Co.; 1999 Layout Creek - Pryors (MTNHP 2016); 2008 in Carbon Co. (Elliott, 2014). Four occurrences in the plan area as noted in PNW Herbarium online database. In general, sporadic over much of North America. Documented from several locations in the southern portion of the state. However, population levels, site characteristics and related information needed to determine the species' status are lacking (MTNHP, 2016).	Grassland / Shrubland Habitat Type Group. Limestone talus and dry fescue grassland in the valley and foothill zones. Less driven by disturbance, occurs in less-disturbed sagebrush sites in the mountains (low sage and mountain big sage) (S. Shelly Pers. Comm. with M. Lavin).	In the plan area, occurs within the AB Wilderness area. Threats are minimal. In general, although several populations are large, it is vulnerable to increased shrub and tree cover due to fire suppression and to competition from invasive plants and associated herbicide treatment (MTNHP, accessed 2016).	Insufficient information. Information on site characteristics and population levels is lacking according to MTNHP website, and state rank is S1S3. In the plan area, threats to known location are minimal.	NatureServe 2016 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset; PNW Herbarium online data; S. Shelly Pers. Comm. With M. Lavin 2016"
Thelypodium sagittatum (slender thelypody)	G4; S2 - MT; SOC - MT	"In the plan area, observed in 1988 Buttermilk Cr; 2004 Hebgen Dam Spillway. In general, Southeastern WA to CA, east to MT and WY.	Grassland / Shrubland Habitat Type Group. Moist, alkaline meadows, often with greasewood or shrubby cinquefoil, in the valley to montane zones. Known from numerous occurrences in extreme southwestern Montana.	In the plan area, threats are unknown. In general, this habitat type group can be vulnerable to weed invasion."	Insufficient information; two occurrences in the plan area are in highly disturbed right-of-ways along a highway and Hebgen Lake spillway. Native habitat uncertain.	NatureServe 2106 online access; MTNHP 2016 online access

Table 13. Evaluated plant species known in the Sparse Vegetation Habitat Type Group of the plan area not identified as potential species of conservation concern

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends / Threats in the Plan Area	Rationale for Not Including as Potential Species of Conservation Concern	Best Available Scientific Information
Allium simillimum (dwarf onion)	G4; S2? - MT; SOC - MT	In the plan area, observed in 1947, Hebgen RD on Targhee Pass (MTNHP 2016 Dataset). In general, found in Central and southwest ID, southwest MT. Regional endemic. Rare in Montana, where it is known from only a few locations in the southwest portion of the state near the Idaho border. Available survey data are limited for the species in Montana - 10 observations in MT (MTNHP, 2016).	Sparse Vegetation Habitat Type Group. Montane / sparsely vegetated; Moist, often gravelly soil of meadows and grasslands in the montane or lower subalpine zone.	In the plan area, unknown threats.	Insufficient information due to the historic nature of this record.	NatureServe 2106 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset
Astragalus aretioides (Sweetwater milkvetch)	G4; S2S3 - MT; SOC - MT;	In the plan area, known in the Pryor Mountains. In general, this species is a reginal regional endemic from Montana south through Wyoming to Colorado and Utah.	Sparse Vegetation Habitat Type Group. Exposed ridges and outcrops.	In the plan area, minimal threats. In general, threats to the species' viability in Montana appear to be minimal. Trend data are unavailable (MTNHP, 2016). The viability of the species in the state is Not Threatened or the Threats are Insignificant. Associated threats are either not known to exist, are not likely to occur in the near future or are not known to be having adverse impacts that will severely affect the species' viability in the state (MTNPS, 2016)."	Minimal threats to long-term persistence; some populations occur with Lost Water Canyon RNA.	NatureServe 2106 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset; MT NPS 2016 Threat Eval."

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends / Threats in the Plan Area	Rationale for Not Including as Potential Species of Conservation Concern	Best Available Scientific Information
Astragalus barrii (Barr's milkvetch)	G3; S3 - MT; S3 - SD; SOC - MT SOC - SD USFS Sensitive	In the plan area, this endemic include 1988-2008 observations for Ashland populations (Home Creek Area (1 populations); Lyon Creek Area (2 populations); Bloom Creek Area (2 populations); Otter Creek Area (9 populations); King Creek Area (1 population)); and 1943 West of Ekalaka Hills (Non-NFS lands). Not known from the SD portion of the Sioux District (SD GFP, 2017 Letter) In general, Barr's Milkvetch is endemic to southwestern South Dakota, northeastern Wyoming, Nebraska and southeastern Montana.	Sparse Vegetation Habitat Type Group. It is restricted to barren outcrops on ridges and hills derived from fine parent materials; representing harsh, localized habitats on the landscape. Badlands: Gullied knolls, buttes, and barren hilltops, often on calcareous soft shale and siltstone.	Primary threats are from energy development and related activities which are not imminent threats (Pers. Comm., D. Siefert, 2016).	Abundant observations and minimal imminent threats. In Montana, it is known from numerous watersheds, several of which contain large, expansive populations. The habitat occupied by this species is not typically suitable for grazing, and the location of its habitat makes it less vulnerable to all but large-scale developments. Potential resource extraction in southeast Montana may eventually impact the species. Invasive weeds have the potential to be a threat but currently are not posing problems to the species.	NatureServe 2106 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset; Schassberger, 1988, 1990

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends / Threats in the Plan Area	Rationale for Not Including as Potential Species of Conservation Concern	Best Available Scientific Information
Botrychium spathulatum (Spatulate Moonwort)	G3; S1 - MT; SOC - MT;	In the plan area, observed in 2008, Park Co, MT. - GNF. (Elliot 2014) In general, 5 observations in MT. One of the rarest moonwort species in Montana, reported from 2 sites in northwest Montana. Population levels at these sites are undocumented (MTNHP 2016). *B. spathulatum* was reported to occur around the margins of the upper Great Lakes and lower James Bay, in the St. Lawrence Valley, and in the western mountains from northwest Montana to Alaska. Because of the similarity of the species to western forms of *B. ascendens* and *B. minganense* the western occurrences have been questioned. However recent collections from Alaska, the Yukon and Southeastern British Columbia have proved to be genetically identical to *B. spathulatum* from the Great Lakes, confirming the widespread occurrence of this taxon in northwestern North America (Farrar 2010).	Sparse Vegetation Habitat Type Group. In plan area, they were observed between 8500-9200 elevation range in sparsely vegetated talus; (Elliott, 2014). Meadows and open forests, often in areas of moderate disturbance or sparsely vegetated soil in the valley and montane zones (MTNHP, 2016). In general, It frequently grows in the company of a diversity of moonwort species (Farrar, 2010).	In the plan area, known in the AB Wilderness; threats are minimal. In general, threats may include natural succession due to the species' apparent preference for open habitats, but little is known regarding its response to site changes over time. At least some populations appear resilient to moderate anthropogenic disturbance (Natureserve, 2016).	Insufficient information exists to assess plan area rarity/threats (Pers. Comm. S. Shelly, 2016).	NatureServe 2106 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset; Elliott 2014; Farrar 2010; S. Shelly pers. Comm. With S. Popovich 2016
Chaenactis douglasii (dusty maiden)	G5; SU - SD; SOC - SD	In the plan area, known from an occurrence in the northern Slim Buttes, SD (observed 1994) (SDNHP, 2016) on the eastern edge of its range. Other occurrences have been noted by SD GFP (2017) which includes the West Short Pines (Visher 1914), and an old record from southern Slim Buttes. In general, western Canada and the western United States from British Columbia to Saskatchewan, and south to California to New Mexico, with a few isolated populations in Nebraska and the Dakotas.	Sparse Vegetation Habitat Type Group. Stony or sandy, poorly vegetated soil	Insufficient information in SD. However, this species is common in the MT portion of the plan area. In general, invasive weeds have the potential to be a threat but currently are not posing problems to the species..	SD state rank indicates there is insufficient information in SD regarding long-term persistence. In addition, this species is common in the MT portion of the plan area. Minimal imminent threats.	NatureServe 2106 online access; SDNHP 2016 CGNF Dataset;

Plants Evaluated for Potential Species of Conservation Concern	**Conserva-tion Categories**	**Distribution and Abundance in the Plan Area**	**Habitat Description**	**Relevant Trends / Threats in the Plan Area**	**Rationale for Not Including as Potential Species of Conservation Concern**	**Best Available Scientific Information**
Cirsium pulcherrimum (Wyoming Thistle)	G5; S3 - MT; SOC - MT	In the plan area, known from 2008 along stockman trail - Pryors (Hartman & Nelson, 2010) In general, from Eastern Montana, south to Wyoming, N. Colorado, NE Utah, NW Nebraska and west to SE Idaho.	Sparse Vegetation Habitat Type Group. Sparsely vegetated soils of washes and steep, eroded gullies in dissected or badlands topography.	In the plan area, minimal threats to the one known population in the plan area (Pryor Mountains).	Minimal threats to the one known population in the plan area.	NatureServe 2106 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset; Hartman & Nelson 2010
Erigeron eatonii	G5; SH = MT	In the plan area, 1945 observation Haystack Peak; one collection (Evert, 1998) from Beartooth Mountains: Gallatin National Forest: along East Fork Boulder Trail, ca 3 mi SE of Box Canyon Guard Station, 45 mi SW of Big Timber. In plan area, location is on the northern edge of this species range. In general, WA to MT south to CA, AZ and CO (MTNHP, 2016).	Sparse Vegetation Habitat Type Group. Sagebrush steppe and open forest	Unknown threats in the plan area.	Insufficient information	NatureServe 2106 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset;
Eritrichium howardii (Howard's Forget-me-not)	G4; S4 - MT; SOC - MT	In the plan area, observed in 2008 in Carbon and Sweet Grass Counties, MT. (Elliott 2014). In general, a regional endemic of northern Wyoming, Montana, and Idaho.	Sparse Vegetation Habitat Type Group. Gravelly, calcareous soil of exposed ridges and flats in grasslands, woodlands; valleys, montane.	In the plan area, minimal threats	Minimal threats at known locations.	NatureServe 2106 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset; Elliott 2014; Hartman & Nelson 2010

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends / Threats in the Plan Area	Rationale for Not Including as Potential Species of Conservation Concern	Best Available Scientific Information
Mimulus floribundus (floriferous monkeyflower)	G5; SH - MT; SOC - MT	In the plan area, an observation in 2008 (W. Boulder River meadows near slough - in AB Wilderness Area) (Elliott, 2014) and two observations in Stillwater Co., MT about 1 mi SW of Woodbine Campground inside AB Wilderness Area (Evert, 1991 Voucher specimen - RM Herbarium). In general, BC, AB south to CA and NM	Sparse Vegetation Habitat Type Group. Vernally moist cliffs	In the plan area, known within AB Wilderness Area; threats are minimal	Insufficient information on trends and threats to assess long-term persistence; the known populations occurring within the AB Wilderness.	NatureServe 2106 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset; Hallman 2012; Evert 1991 Voucher Specimen per RM Herbarium online 2016
Penstemon caryi (Cary's beardtongue)	G3; S3 - MT; SOC - MT	In the plan area, 1985, 1986 and 1994 Big Ice Cave; 1983, 1985, and 1994 Bridge Hollow - Demijohn Hollow; 1986 and 1995 Bear Cr Canyon - Ridge; 1986 Big Coulee; 1995 Burnt Timber Ridge Rd; 1995 Inferno-King Canyons (2); 1995 Sykes Ridge Rd-Mystery Cave-Layout; 1995 Westside of Lost Water Canyon1995 Bear Canyon (MTNHP 2016 dataset); 2008 Hartman (Hartman 2010) In general, restricted in Montana to the Pryor Mountains.	Sparse Vegetation Habitat Type Group. Stony, calcareous soils in Douglas-fir forests, juniper woodlands, sagebrush steppe from the montane to lower subalpine zone; Occurs in a variety of habitats and has been found along some roadcuts.	In the plan area, threats unknown	Common in the plan area with no evidence of downward trend. Previously removed from the FS Sensitive Species list.	NatureServe 2106 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset; Hartman 2010

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends / Threats in the Plan Area	Rationale for Not Including as Potential Species of Conservation Concern	Best Available Scientific Information
Physaria brassicoides (Double bladderpod)	G5; S3 - MT	In the plan area, known from eight populations in MT: 5 – Ashland; 3 – Sioux RD (Ekalaka Hills, Chalk Buttes, and Long Pines) and a historic record on the Sioux in SD from the Slim Buttes. In general, endemic to a restricted area of the northern Great Plains, and is known in Montana only from a handful of populations.	Sparse Vegetation Habitat Type Group. All Montana populations occur on sparsely vegetated, steep, eroding, south-facing slopes of highly dissected breaklands and badlands. Substrate parent materials include both sandstone and shale, and these plants sometimes grow at the contact zone where sandstone overlies shale. The soft, eroding shale slopes do not support stable vegetation and have 80-90% exposed substrate.	Primary threats are from energy development and related activities which are not imminent threats (Pers. Comm., D. Siefert, 2016).	Insufficient information regarding long-term persistence. Minimal imminent threats. The habitat occupied by this species is not typically suitable for grazing, and the location of its habitat makes it less vulnerable to all but large-scale developments. This species could be vulnerable to any potential resource extraction in southeast Montana. Invasive weeds have the potential to be a threat but currently are not posing problems to the species.	NatureServe 2106 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset; PNW Herbarium website Rocky Mtn. Herbarium website Hallman 2012 Heidel and Duholm 1995 Vanderhorst 1988.
Physaria ludoviciana (Silver Bladderpod)	G5; S2S3 - MT SOC - MT	In the plan area, five observations in 2010 Carter Co, MT - Long Pines and Harding Co., SD in N Cave Hills (Hallman 2012). In general, rare in Montana. Primarily a plains species which barely enters eastern Montana (MTNHP 2016).	Sparse Vegetation Habitat Type Group. Restricted to sandy sites on the plains, often around sandstone outcrops.	Insufficient information	Insufficient information	NatureServe 2106 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset; Hallman 2012

Plants Evaluated for Potential Species of Conservation Concern	**Conserva-tion Categories**	**Distribution and Abundance in the Plan Area**	**Habitat Description**	**Relevant Trends / Threats in the Plan Area**	**Rationale for Not Including as Potential Species of Conservation Concern**	**Best Available Scientific Information**
Physaria saximontana var. *dentata* (rocky mountain twinpod)	G3T3; S3 - MT; SOC - MT	"In the plan area, observed (Unknown date) near Bozeman; 2007 Cone Peak; 2006 Koch Basin; 2011 Sunlight Lake (MTNHP 2016 dataset); 2008 Park, Carbon, and Sweet Grass Co. (Elliott 2014) In general, state endemic known from several counties across central and southern Montana mountain ranges (MTNHP, 2016)."	Sparse Vegetation Habitat Type Group. Typically found in limestone-derived talus, fellfields, and gravelly slopes at moderate to high elevations.	Habitat threats are minimal.	Habitat threats are minimal.	NatureServe 2106 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset; Elliott 2014
Polystichum kruckebergii (Kruckeberg's Swordfern)	G4; S2S3; SOC - MT	In the plan area, 1998 Heather Lake - Park Co (MTNHP 2016 dataset). In general, sparsely distributed across western Montana on alpine and subalpine cliffs and talus slopes (MTNHP, 2016).	Sparse Vegetation Habitat Type Group. Cliff crevices and talus slopes in montane to alpine zones.	In the plan area, minimal threats.	Minimal threats to long-term persistence.	NatureServe 2106 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset;
Stenotus armerioides (syn. *Haplopappus armerioides*) (thrift mock goldenweed)	G4G5; SOC - SD	In the plan area, Common in the plan area in MT and known from 3 locations in SD (N Cave Hills, S Cave Hills, and Slim Buttes). In general, grasslands, sagebrush steppe, open slopes, confined to calcareous soils west of the Continental Divide; plains, valleys	Sparse Vegetation Habitat Type Group. Rimrocks; boulders fields	In the plan area, minimal threats in this habitat.	Common in the plan area; minimal threats	NatureServe 2106 online access; MTNHP 2016 online access; SDNHP 2016 CGNF Dataset;

Table 14. Evaluated plant species known in the Riparian/Wetlands Habitat Type Group of the plan area not identified as potential species of conservation concern

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends / Threats in the Plan Area	Rationale for Not Including as Potential Species of Conservation Concern	Best Available Scientific Information
Almutaster pauciflorus (Alkali Marsh Aster) (Synonym: Aster pauciflorus)	G4 SOC – SD SH - SD	In the plan area, one historic record known from nw SD (1959) which may be on the Sioux District In general, Sheridan and Wheatland counties, MT; NW Territories south to CA, AZ, NM, TX and ND	Riparian / Wetlands Habitat Type Group. Wet, usually calcareous soil of fens, wet meadows; plains	In the plan area, insufficient information. In general, may be vulnerable to hydrologic changes and grazing.	Insufficient information; status of historic record unknown.	SDNHP 2016; MTNHP 2016 NatureServe 2016;
Bacopa rotundifolia (Roundleaf Water-hyssop)	G5; S3? - MT; SOC - MT	In the plan area, observed in 2010 from Powder River Co.: Ashland RD (county record) (Hallman, 2012); In general, a rare species known in Montana from only a few observations in the central and eastern portions of the state. 5 Observations submitted for MT. Additional populations of the species are likely to occur in Montana.	Riparian / Wetlands Habitat Type Group. Emergent Marsh	In the plan area, insufficient information. In general, the species is widely distributed and appears tolerant of brackish waters as well as some degree of nutrient enrichment. As such, it is unclear to what extent the species' viability is at risk in the state and whether it responds negatively to human-induced impacts to water quality.	Insufficient information; Recent 2010 discovery in plan area located on edge of stock pond within active grazing allotment. Native status uncertain at this location due to the constructed nature of the habitat.	MTNHP 2016; MTNHP 2016 Dataset NatureServe 2016; Hallman 2012

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends / Threats in the Plan Area	Rationale for Not Including as Potential Species of Conservation Concern	Best Available Scientific Information
Castilleja miniata subsp. *miniata* (giant red Indian paintbrush) (syn. *Castilleja gracillima* (slender Indian paintbrush))	G3G4 Q; S2 - MT; SOC - MT	In the plan area, observed in GNF locations of Daly Cr 1933; Grayling Cr 1989; Hebgen SW 1992 and 1999; Snowflake Springs 1993; Gallatin River 1994; Sheep Creek Allotment 1995; Colter Pass 1995; Moose Allotment 1995 and 1997; West Yellowstone 1997; Buttermilk Cr 1999 (MTNHP 2016 dataset and Mathews, S.Y. 1989). From a different dataset, PNW Herbarium, Sweet Grass County: 4 specimens; Stillwater County: 7 specimens; Park County: 17 specimens; Gallatin County: 20 specimens; Carbon County: 6 specimens for a total of herbarium specimens in the plan area being 54. In general, per MTNHP website, Northwestern WY and adjacent MT to central ID; most BC occurrences are in the Kootenai River Valley contiguous with northern ID and northwestern MT, yet the species is not present in these sectors of the adjoining states, a peculiarly disjunct distribution that might call for closer taxonomic review. 29 observations in MT	Riparian / Wetlands Habitat Type Group. along willow-dominated stream courses in sagebrush-grassland settings.	In the plan area, threats unknown. In general, the most likely threats would stem from environmental rather than man-caused events. Disturbance and re-establishment probably occur at relatively frequent intervals due to the stream and river bank habitats where populations occur (MTNHP, 2016).	Common in the plan area (12 observations as documented in local survey documents; 54 specimens collected from the plan area per PNW Herbarium online database. 44 additional specimens collected in other areas of MT per PNW Herbarium online database for a total of 98 specimens from Montana.	NatureServe 2106 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset; Mathews, 1989
Celastrus scandens (bittersweet)	G5; SH - MT; pSOC - MT	10 occurrences in plan area (one in MT and 9 in SD where the species is not ranked) In general, SK to QC south to WY, TX, TN and NC	Riparian / Wetlands Habitat Type Group. Riparian woodlands and thickets on the plains.	Vulnerable to hydrologic changes	Most occurrences in the plan area are in SD where the species is not ranked as a SOC	NatureServe 2106 online access; MTNHP 2016 online access; Hallman 2012

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends / Threats in the Plan Area	Rationale for Not Including as Potential Species of Conservation Concern	Best Available Scientific Information
Elodea bifoliata (Long-sheath Waterweed)	G4G5; S2? - MT; SOC - MT	In the plan area, observed in 1999 W. Rosebud, Stillwater County (MTNHP 2016 dataset). In general, rare in Montana, where it is currently known from a few widely scattered locations across the state. 9 obervations in MT (MTNHP 2016).	Riparian / Wetlands Habitat Type Group. Shallow water of ponds and lakes on the plains. West Rosebud Lake location is an impounded feature.	In the plan area, insufficient information In general, MNPS rated threats as low	Insufficient information on status and native origin in the plan area at this time	NatureServe 2106 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset;
Equisetum variegatum var. *variegatum* (variegated scouring rush)	G5; S1 - SD; SOC - SD	In the plan area, observed in Harding Co.: Slim Buttes (Hallman 2012; Gabel, et. al., 2014 for Harding, Co., SD.) In general, known in Harding County; Few occurrences in the Black Hills per SD rare plant list info (SDNHP). Circumpolar	Riparian / Wetlands Habitat Type Group. Wet, often calcareous, gravelly soil along seeps, streams, lakes at all elevations (SDNHP). It prefers open, lime-rich sites, often those that flood in winter. It occurs in dune slacks, mountain flushes and beside lakes, rivers and canals (Gabel, 2014).	In the plan area, insufficient information.	insufficient information on status and native origin in the plan area at this time (S. Shelly pers. Comm. w/D. Ode, 2016)	NatureServe 2106 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset; Hallman 2012; S. Shelly pers. Comm. With D. Ode 2016
Gentiana affinis (prairie gentian)	G5; S3 - MT; S2 - SD; SOC - SD; USFS Sensitive	Collected in 1910 from SD “Cave Hills” & described as abundant. Spring fed springs (most in hardwood draws) in the N. and S. Cave Hills were extensively surveyed in 1994. No plants were found. In general, also known in montane meadows of the Black Hills, SD.	Riparian / Wetlands Habitat Type Group. Wet meadows, shores, springs, seepage areas and low prairie	In the plan area, insufficient information	One historical record in SD. Insufficient information.	R1 Sensitive Species and SD SOC list; GeoWest, 1994

Plants Evaluated for Potential Species of Conservation Concern	**Conserva-tion Categories**	**Distribution and Abundance in the Plan Area**	**Habitat Description**	**Relevant Trends / Threats in the Plan Area**	**Rationale for Not Including as Potential Species of Conservation Concern**	**Best Available Scientific Information**
Juncus covillei (Colville's rush)	G5; S2S3; SOC - MT	In the plan area, observed in Park Co - Historic location in Big Timber Canyon, 1983 in private land (MTNHP 2016 CGNF Dataset) but part of waived private lands as part of a USFS grazing allotment. In general, rare and peripheral in Montana. Currently known from approximately a half-dozen widely scattered wetland/riparian sites in the mountainous portion of the state (MTNHP, 2016).	Riparian / Wetlands Habitat Type Group. Moist, gravelly or sandy soil along major water courses in the valley zone.	In the plan area, there is insufficient information to determine threats. Where present within a grazing allotment on waived private lands, it is likely to be in secondary rangeland where grazing impacts would be minimal.	Insufficient information	NatureServe 2106 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset;
Mertensia ciliata (mountain (or steamside) bluebells)	G5; S1 - SD; SOC - SD; S4 – MT USFS Sensitive	Known in Tepee Canyon of Slim Buttes; West Short Pines – 1912 Collection (land ownership unknown); Slim Butte population is located on the lower slope of a steep north facing slope. Targeted surveys in 1994 could not relocate. In general, OR to MT south to CA, NM and CO	Riparian / Wetlands Habitat Type Group. Valley bottoms associated with springs, seeps, and spring fed water courses; occasionally found in non-wetlands.	In the plan area, threats are minimal to historic location in SD.	Secure in MT portion of the plan area. SD occurrence in remote/inaccessible ravine and was not relocated during 1994 survey.	Gabel et. Al 2014 - Flora of Harding Co., SD; GeoWest Contract)
Paludella squarrosa (angled paludella moss)	G3G5; S1S2 - MT; SOC - MT	In plan area, observed in 1987 West Fork Rock Cr (Beartooth RD) In general, Greenland; Canada: AB, BC, MB, NL, NT, NS, NU, ON, QC, SK, YT; USA: AK, CO, IA, ME, MI, MN, MT, NY, VT; n Eurasia. In Montana: Beaverhead, Carbon, Glacier, and Park Counties (MTNHP, 2016)	Riparian / Wetlands Habitat Type Group. Wetland/Bog	In plan area, threats unknown. In general, susceptible to changes in hydrology.	Insufficient information	NatureServe 2106 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset;

Plants Evaluated for Potential Species of Conservation Concern	**Conserva-tion Categories**	**Distribution and Abundance in the Plan Area**	**Habitat Description**	**Relevant Trends / Threats in the Plan Area**	**Rationale for Not Including as Potential Species of Conservation Concern**	**Best Available Scientific Information**
Primula incana (Mealy Primrose)	G4G5; S3 - MT; SOC - MT; USFS Sensitive	1923, Historically known to occur on the CNF in East Rosebud, Carbon Co., MT; Beartooth RD (MTNHP 2016 CGNF dataset). Extirpated/possibly extirpated (NatureServe, 2016 online access). In general, from Utah and Colorado north to Alaska and east to Quebec. Rare in southern Utah, Colorado, Wyoming, North Dakota,and Montana, more common in Canada from British Columbia east to western Manitoba, rare in the Yukon and Alaska (where it is limited to stable flood plains along rivers (MTNHP 2016)).	Riparian / Wetlands Habitat Type Group. Wet meadows, springs and shores, often where alkaline; calcareous bog meadows; wet meadows & quaking bogs; NOT found in alpine or subalpine areas.	In plan area, threats unknown. In general, livestock grazing or hydrologic alterations.	Insufficient information	NatureServe 2106 online access; MTNHP 2016 online access; MTNHP 2016 CGNF Dataset

Plants Evaluated for Potential Species of Conservation Concern	Conserva-tion Categories	Distribution and Abundance in the Plan Area	Habitat Description	Relevant Trends / Threats in the Plan Area	Rationale for Not Including as Potential Species of Conservation Concern	Best Available Scientific Information
Sullivantia hapemanii var. *hapemanii* (Wyoming sullivantia)	G3; S2S3 - MT; SOC - MT	In plan area, last observed 2008 on CGNF in Pryor Mtns. One population found in 'Large spring-steep slope in Douglas fir/ninebark/Rocky Mountain maple forest' and another population located in 'Cracks in the ceiling, walls, and on the floor of a dripping grotto, and wet cracks of limestone cliffs. (Hartman 2010). In general, this species occurs in the Bighorn Mountains, and Bighorn Canyon area of North-Central Wyoming and South-Central Montana; and disjunct sites in Wind River Canyon and on Casper Mountain in Wyoming. Additionally, a disjunct population of var. *hapemanii* occurs in the Middle Fork Salmon River drainage, in Central Idaho (MTNHP 2016; Heidel 2004).	Riparian / Wetlands Habitat Type Group. Calcareous rock walls and boulders at springs, waterfalls and streambanks, or where there is seepage from limestone or dolomite (MTNHP 2016).	In the plan area, the two occurrences are in cliff areas in the Pryor Mountains which are inaccessible to livestock. In general, this species has narrow ecological amplitude and occupies a fragile habitat that is directly affected by any changes in groundwater discharge and streamflow conditions. Seeps that dry out at the surface during the growing season do not support this species. It also does not occur at developed and impounded springs in the area, and may have been extirpated at some of these sites (MTNHP, 2016). The known potential threats are localized, and there is no direct evidence that it is affected by large-scale land use practices and disturbances higher in the watershed (e.g., fire and logging) (Heidel 2004).	Despite this intrinsic vulnerability as a species with a narrow ecological range, it occurs in the plan area in settings with steep slopes and in remote settings and habitat of limited access, which serve to lower vulnerability concerns.	MTNHP 2016; NatureServe 2016; Hartman 2010; Heidel 2004; Heidel and Fertig 2000;

Upon review of the data, it was found that some species from recent Custer Gallatin floristic inventory reports (Elliott, 2014; Hallman, 2012; and Hartman and Nelson, 2010) were noted as state species of concern or potential state species of concern, but have since been removed as such as outlined in Montana Natural Heritage Program (2016 online access). They include: *Carex concinna* (beautiful sedge), *Carex luzulina var. atropurpurea* (black and purple sedge), *Carex neurophora* (alpine nerved sedge), *Carex vallicola* (valley sedge), *Eriophorum chamissonis* (russet cotton-grass), *Sphaeromeria capitata* (rock-tansy), and *Vaccimium myrtillus var. oreophilum* (bilberry). In addition, *Carex luzulina var. atropurpurea* (black and purple sedge) was noted as G4T3 in Montana Natural Heritage Program online field guide, but was noted as G5T4 in NatureServe online database.

Species known in the planning area that were previously tracked and are no longer tracked as state species of concern, a potential species of concern, or a species whose status is under review include *Carex concinna* (beautiful sedge), *Carex luzulina var. atropurpurea* (black and purple sedge), *Carex neurophora* (alpine nerved sedge), *Carex vallicola* (valley sedge), *Erigeron gracilis* (slender fleabane), *Eriophorum chamissonis* (Russet cotton-grass), *Juncus biglumis* (two-flowered rush), *Juncus hallii* (Halls' rush), *Ranunculus jovis* (Jove's buttercup), *Sphaeromeria capitata* (rock-tansy), *Vaccinium myrtillus var. oreophilum* (bilberry) and *Salix wolfii var. wolfii* (wolf willow).

Although not known in the planning area, Montana species of concern found in montane habitats that are suspected to occur include *Epipactis gigantea* (giant helleborine), *Goodyera repens* (northern rattlesnake plantain), *Juncus castaneus* (chestnut rush), *Muhlenbergia andina* (foxtail muhly), *Thalictrum alpinum* (alpine meadowrue), *Veratrum californicum* (California false-hellebore) (Northern Region List, 2011)., *Pleiacanthus spinosus (Syn. Stephanomeria spinosa, Lygodesmia spinosa)* (spiny skeletonweed) and *Ranunculus cardiophyllus* (heart-leaved buttercup) (MTNHP, 2016 dataset for Custer Gallatin within one mile of national forest boundary).

Although not known in the planning area, Montana species of concern found in semi-desert Pryor Mountain habitats that are suspected to occur include *Astragalus geyeri* (Geyer's milkvetch), *Boechera demissa* (Daggett rockcress), *Camissonia andina* (obscure evening-primrose), *Malacothrix torreyi* (desert dandelion), *Physaria lesicii (*Lesica's bladderpod), and *Physaria pachyphylla* (thick-leaf bladderpod) (MTNHP, 2016 dataset for CGNF within one mile of national forest boundary).

Although not known in the planning area, Montana species of concern in southeast Montana pine savanna habitats that are suspected to occur include *Amorpha canescens* (lead plant), *Astragalus racemosus* (raceme milkvetch), *Ceanothus herbaceous* (New Jersey tea); *Cyperus schweinitzii* (Schweinitz's flatsedge), *Dalea villosa* (Syn. *Petalostemon villosus*) (silky prairie clover), *Maianthemum canadense* (wild Lily-of-the-valley), *Mentzelia nuda* (bractless Bblazingstar), *Nuttallanthus texanus (Syn. Linaria candensis var. texana*) (blue toadflax), *Pediomelum hypogaeum (Syn. Psoralea hypogaea*) (little Indian breadroot), and *Sporobolus compositus (Syn. Sporobolus asper*) (tall dropseed). *Chenopodium subglabrum* (smooth goosefoot) is also known from these counties, but is found only in moving sand/sand dune habitats which are not known on the Sioux District (pers. comm, K. Hansen) (MTNHP 2016 online database for Rosebud, Powder River, and Carter County).

Although not known in the planning area, species located in Harding County, South Dakota (Gabel, 2014) that are also listed as being species of concern in South Dakota could have suitable habitats in the South Dakota portion of the Sioux District. These include *Carex canescens* (gray sedge), *Carex vesicaria* (infalted sedge), *Navarretia intertexta* (Great Basin navarretia), *Oenothera flava* (yellow evening primrose), *Platanthera dilatata*, (northern white orchid), *Townsendia exscapa* (Easter daisy), *Tripterocalyx micranthus* (sand puffs), and *Xylorhiza glabriuscula* (woody aster)).

Appendix C - Forest Service Sensitive Plant Species

Forest Service sensitive species are defined as "Those plant and animal species identified by a Regional Forester for which population viability is a concern, as evidenced by: a) significant current or predicted downward trends in population numbers or density or b) significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution." The current Northern Region sensitive plant species list was developed in 2011.

Risk factors that are evaluated include sources for habitat loss or detrimental alteration such as exotic plant species, fire suppression activities, change in native fire regime, increased fire frequency, direct effect from fire, direct (i.e. trampling, grazing) or indirect effects (i.e. changes in moisture regime) of livestock grazing, hydrological regime changes, riparian zone disturbances, succession, pathogens, herbicide spray and drift, timber harvest, mining, off-highway vehicles and motorized recreation, recreation (hiking, stock use, mountain bike use, trail construction, etc.), pipelines, road construction and maintenance, and collecting for scientific, medicinal or wildcrafting use.

Highly unique species' habitats or ecologically highly specialized species are inherently vulnerable to management activities. These habitats can include badlands, sandy blow-outs, buttes, grasslands, shrublands, swales, woody draws, mature forests, alpine, subalpine, rocks/cliffs, peatlands, and uncommon substrates or parent material (i.e. limestone).

Figure 1 displays Northern Region's sensitive plant designation criteria.

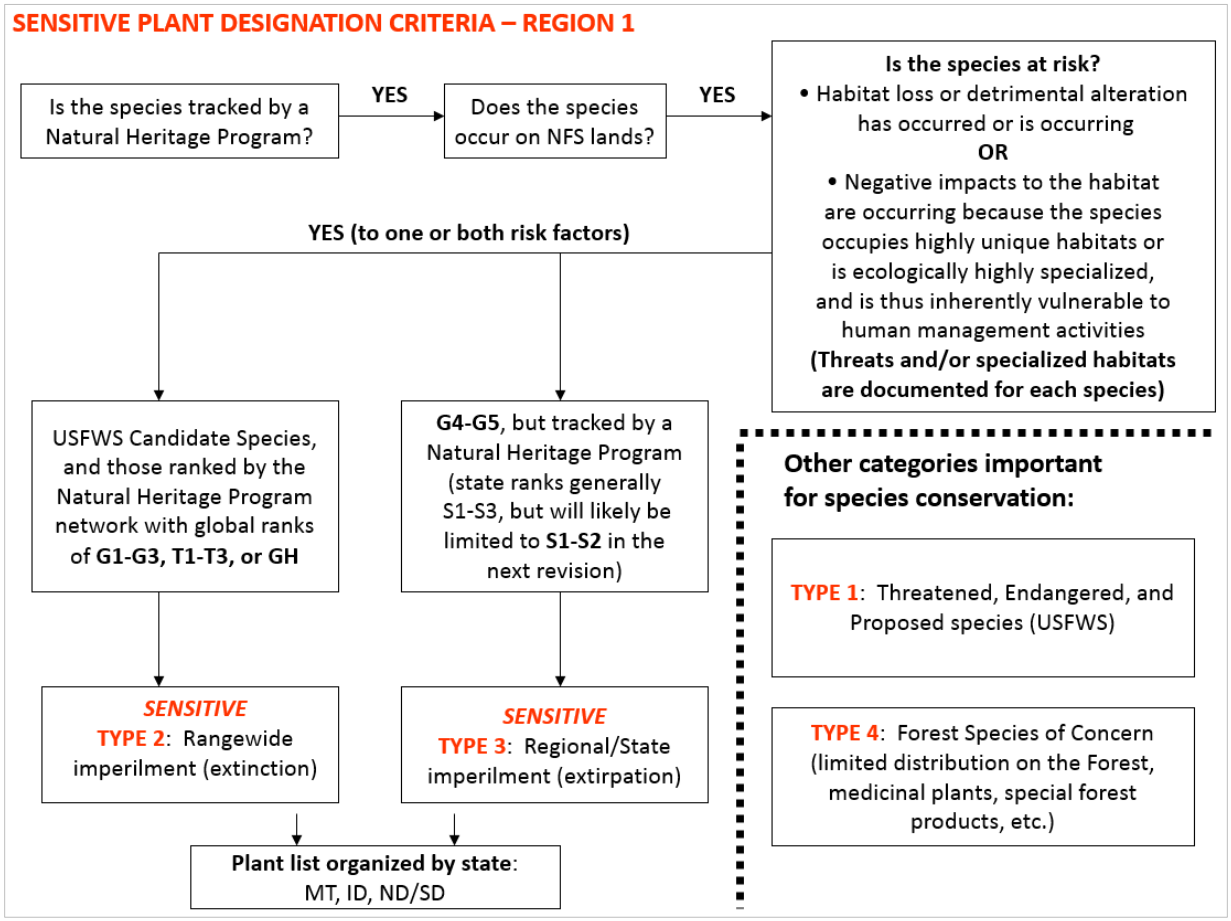

Figure 1. Northern Region sensitive plant designation criteria

Many species are listed as sensitive for the Custer Gallatin National Forest. Portions of the Forest fall within Montane and Pine Savanna ecological settings. As a result of a review of existing information relative to species extent of distribution and ecological requirements, a list of sensitive plant species have been screened as to its potential habitat. As a result, not all Custer Gallatin listed sensitive species can be found on all districts due to suitable habitat constraints.

Suitable habitat for 32 currently listed Forest Service sensitive plant species exists on the CGNF. Twenty-four of the 32 have known populations that occur on the Forest while eight species are not known, but are suspected to occur. Known locations for the Montane units include seven of the listed sensitive plant species located in riparian or wetland areas, two in grassland/shrubland areas, one species in alpine, five in cold forest/cool moist forest settings, and four species in sparsely vegetated areas (i.e. exposed slopes, rocky sites). For the Pine Savanna units, four of the listed sensitive plant species are located in riparian or moist areas, one in warm dry forest areas, and 3 species in in sparsely vegetated areas (i.e. badlands).

Table 6 outlines current Northern Region Sensitive Plants and their distribution by suitable ecological settings.

Table 6. Northern Region Sensitive species list for the Custer Gallatin National Forest

Common Name	Scientific Name	Global Rank	State Rank	Elevation (ft)	Habitat	Sensitive in
Barratt's willow (Known – GNF; Known - Beartooth)	*Salix barrattiana*	G5	S1 - MT	6,800 - 10,500	Alpine. Forms extensive thickets in alpine habitats. Grows on boggy meadows, moist open hillsides in mountains, lakeshores, streambanks, rock slides and recent alluvial deposits. Soils range from very calcareous to very acidic.	Montana
Whitebark Pine (Known – GNF; Known - Beartooth)	*Pinus albicaulis*[3]	G3G4	S3 - MT	7,000-9,300	Cold Forest. Moderate shade tolerance. Most often growing with other conifers on weakly developed (immature) soils. Cold, windy, snowy, and generally moist climatic zone. In moist mountains, it is most abundant on warm, dry exposures. In semiarid ranges, it is found on cool exposures and moist sites. In all but the driest regions, whitebark pine is most abundant on warm aspects and ridgetops having direct exposure to sun and wind.	Montana
Short-styled Columbine (Known - GNF)	*Aquilegia brevistyla*	G5	S2S3 - MT	5,000-6,000	Cool Moist Forest. Open woods and streambanks, limestone sites, northern aspect; often associated with limestones.	Montana
Western moonwort (Known – GNF; Suspected Beartooth)	*Botrychium hesperium*	G4	S3 - MT	5,000 - 9000	Cool Moist Forest. Low canopy cover settings. Mesic meadows associated with spruce and lodgepole pine forests in the montane and subalpine zones.	Montana
Northern Rattlesnake Plantain (Suspected - GNF)	*Goodyera repens*	G5	S3 - MT	5,600 – 6,800	Cool Moist Forest. Open mossy forests, mountains, limestone, shale or moist limestone slopes of old growth Douglas-fir, montane zone or cool north aspects characterized by spruce/twinflower or subalpine-fir/twinflower habitat types.	Montana
Hall's rush (Suspected – GNF; Suspected - Beartooth)	*Juncus hallii*	G4G5	S4 – MT (no longer a SOC)	4,000 – 8,860	Cool Moist Forest. Moist to dry meadows and slopes from valley to montane	Montana

[3] Added to R1 Sensitive Species List 2011

Common Name	Scientific Name	Global Rank	State Rank	Elevation (ft)	Habitat	Sensitive in
Alpine Meadowrue (Suspected - GNF)	*Thalictrum alpinum*	G5	S2 - MT	6,500-7,000	Cool Moist Forest. On hummocks w/low shrubs in moist, alkaline meadows in montane, subalpine.	Montana
Heavy sedge (Known, Ashland and Sioux RDs)	*Carex gravida* var. *gravida*	G5	S3 - MT	3,880 - 4,000	Broadleaf Woodlands. Open woods, often in ravines with deciduous trees, on the plains.	Montana
Ovalleaf milkweed (Known - Sioux RD)	*Asclepias ovalifolia*	G5?	S1S2 - MT	3,760-3,840	Grasslands/Shrublands. Sandy, gravelly or clayey soils of prairies and open woodlands. Shallow soils.	Montana
Large-leaved Balsamroot (Known - GNF)	*Balsamorhiza macrophylla*	G3G5	S3S4 – MT (no longer a SOC)	7,000-8,500	Grasslands/Shrublands. Open hills, associated w/ bunchgrasses; most often east-facing slopes (8-15%).	Montana
Upward-lobed moonwort (Known - GNF; Suspected Beartooth)	*Botrychium*[4] *ascendens*	G3	S3 - MT	5,000 – 9000	Grasslands/Shrublands. Low canopy cover settings. Stream floodplain habitats dominated by deciduous shrubs with lush cover by forbs, graminoids, and mosses in nw. MT. Mesic meadows, Alpine vegetated talus in south central MT; areas of light to moderate disturbance.	Montana
Peculiar moonwort (Known – GNF; Suspected Beartooth)	*Botrychium paradoxum*	G3G4	S3 - MT	5,000 - 9000	Grasslands/Shrublands. Low canopy cover settings. Dry to moist, often gravelly and lightly disturbed soil of bunchgrass, meadows, and mid-succession gravel bars in the valley and montane zones. Alpine vegetated talus in south central MT; areas of light to moderate disturbance.	Montana
Beartooth goldenweed (Known – CNF)	*Haplopappus carthamoides var. subsquarrosus*	G4G5T3	S3 - MT	5,520 – 7,200	Grasslands/Shrublands. Grasslands and sagebrush steppe on sandy calcareous soils in the foothills and montane zones	Montana
Musk-root (Known - Beartooth)	*Adoxa maschatellina*	G5	S3 - MT & SD	4,400-6,000	Sparse Vegetation. Vernally moist places in the mountains at the bottom of undisturbed, open rock slides that have cold air drainage. Generally shaded, montane to subalpine.	Montana

[4] *Botrychiums,* although not listed in the Region 1 2011 sensitive plant list for the Custer NF, has been added due to new information that there are known populations of this regional sensitive species adjacent to the Beartooth District. Concurrence with this action made by Regional Botanist, June 2011.

Common Name	Scientific Name	Global Rank	State Rank	Elevation (ft)	Habitat	Sensitive in
Barr's milkvetch (Known - Ashland RD; Suspected - Sioux RD)	*Astragalus barrii*	G3	S3 – MT & SD	2,940 - 4,000	Sparse Vegetation. Gullied knolls, buttes, and barren hilltops, often on calcareous soft shale and siltstone.	Montana and South Dakota
Discoid Goldenweed - (Known GNF)	Ericameria discoidea var. discoidea *(Syn. Haplopappus macronema var. macronema)*	G4G5T4	S2 - MT	7,640	Sparse Vegetation. Rocky, open or sparsely wooded slopes, talus, above timberline.	Montana
Dakota buckwheat (Known - Sioux RD)	*Eriogonum visherii*	G3	S2 - MT & S3 - SD	3,140-3,760	Sparse Vegetation. Barren, often bentonitic badlands slopes and outwashes in the plains.	Montana and South Dakota
Nuttall Desert-Parsley (Known - Ashland RD)	*Lomatium nuttallii*[5]	G3	S2 - MT & SH - SD	3400-7,200	Sparse Vegetation. Open, rocky, mid to lower hillslopes on sandstone, siltstone, or clayey shale	Montana
Dwarf Purple Monkeyflower (Known - GNF)	*Mimulus nanus*	G5	S2S3 - MT	6,565	Sparse Vegetation. Dry gravelly or sandy slope; may prefer bare areas with minimal competition	Montana
Austin's Knotweed (Suspected - GNF)	*Polygonum douglasii spp. austiniae*	G4	S3S4 - MT	5,800-6,600	Sparse Vegetation. Open, gravelly, shale soils with eroding slopes and banks in montane.	Montana
Shoshonea (Known - Beartooth)	*Shoshonea pulvinata*	G2G3	S1 - MT	6,440 – 7,800	Sparse Vegetation. Open, exposed limestone outcrops, ridgetops and canyon rims, in thin rocky soils	Montana
Small yellow lady's slipper (Known – Sioux; Suspected – GNF; Suspected - Beartooth)	*Cypripedium parviflorum*	G5	S3S4 - MT and S3? - SD	2,520 - 6,200	Riparian/Wetlands. Fens, damp mossy woods, seepage areas, and moist forest-meadow ecotones in valley to lower montane	Montana
English sundew (Known - GNF)	*Drosera anglica*	G5	S3 - MT	3,000 - 9,000	Riparian/Wetlands. Peat lands, on floating organic mats--undisturbed sphagnum bogs.	Montana

[5] *Lomatium nuttallii,* although not listed in the Region 1 sensitive plant list for the Custer NF, it has been added as a local species of concern due to new information that there are known populations of this traditional use species on the Ashland District. Concurrence with this action made by Regional Botanist, June 2005.

Common Name	Scientific Name	Global Rank	State Rank	Elevation (ft)	Habitat	Sensitive in
Beaked spikerush (Known - GNF)	*Eleocharis rostellata*	G5	S1- SD and S3 - MT	2,700-6,100	Riparian/Wetlands. Bogs	Montana
Giant helliborine (Suspected – GNF; Suspected - Beartooth)	*Epipactis gigantea*	G4	S2S3 - MT	2,900 – 6,200	Riparian/Wetlands. Streambanks, fens with springs/seeps, often near thermal waters	Montana
Slender cottongrass (Suspected - GNF)[6]	*Eriophorum gracile*	G5	S1- SD and S3 - MT	3,000-7,600	Riparian/Wetlands. Peat land, fen, bog species.	Montana
Prairie gentian (Known – Sioux RD)	*Gentiana affinis*	G5	S2 - SD & S4 - MT	5,870-9,740	Riparian/Wetlands. Wet meadows, shores, springs, seepage areas and low prairie.	South Dakota
Hiker's gentian (Known – GNF; Known - Beartooth)	*Gentianopsis simplex*	G5	S2 - MT	4,460 - 8,400	Riparian/Wetlands. Fens, meadows, and seeps, usually in areas of crystalline parent material, in the montane and subalpine zones	Montana
Mealy primrose (Historically Documented - Beartooth)[7]	*Primula incana*	G4G5	S3 - MT	2,000 - 6,600	Riparian/Wetlands. Wet meadows, springs and shores, often alkaline; calcareous bog meadows; wet meadows & quaking bogs; not found in alpine or subalpine areas.	Montana
Three-ranked hump moss (Known - Beartooth)	*Meesia triquetra*	G5	S2 - MT	5,000-6,000	Riparian/Wetlands. Rich fens having surface waters with high pH and calcium concentrations. It can also be found in alkaline swampy birch and willow woods.	Montana
Mountain bluebells (Known -Sioux RD)	*Mertensia ciliata*	G5	S1 - SD	5,500 plus	Riparian/Wetlands. Forested slopes-damp thickets in course to medium textured soils. Valley bottoms associated with springs, seeps, and spring fed water courses; occasionally found in non-wetlands. Very drought intolerant.	South Dakota
California False Hellebore - (Suspected - GNF)	*Veratrum californicum*	G5	S2 - MT	5,000-8,500	Riparian/Wetlands. Wet meadows and streambanks in montane and subalpine, alpine. Meadows, spruce, Doug fir.	Montana

[6] Although noted as Known in R1 2011 sensitive species list, source documentation cannot be found, therefore this species is being shown as "suspected" rather than as "known" in the plan area.
[7] Historically known to occur, but not recently documented.

Appendix D - Plant Species of Conservation Concern Identification Process Custer Gallatin National Forest

The 2012 Planning Rule (36 CFR 219) defines a species of conservation concern as "a species, other than a federally recognized threatened, endangered, proposed or candidate species, that is known to occur in the plan area and for which the regional forester has determined that the best available scientific information indicates substantial concern about the species' capability to persist over the long-term in the plan area" (36 CFR 219.9). The Regional Forester determines the final list of species of conservation concern as part of the planning process. Direction for identifying species of conservation concern are in the Forest Service handbook (FSH) for land management planning (i.e., the planning directives) at FSH 1909.12, chapter 10, section 12.52 and chapter 20, section 21.22a.

This appendix outlines the Northern Region's approach in identifying plant species of conservation concern for the Custer Gallatin National Forest's draft revised forest plan and draft environmental impact statement (animals are documented separately). This approach is consistent with the 2012 Planning Rule and agency guidance contained in the planning directives. The best available scientific information, including external expert knowledge and information received from the general public, will be considered during the development of this list.

Step 1. During the assessment phase, the Custer Gallatin National Forest and Northern Region's botany specialists determined which plant species documented to occur in the planning area met the categories described in items 1A-1H below. This step results in a "potential species of conservation concern" plant list.

Montana Natural Heritage Program (MTNHP), South Dakota Natural Heritage Program (SDNHP), and local floristic inventory's tabular and spatial records documented all species known to occur on National Forest System (NFS) lands within the plan area, and that met at least one category in Step 1 A-H below.

The data sources were used because collectively they are the most comprehensive, reliable, and up-to-date sources for documented species occurrences on NFS lands in Montana and South Dakota. MTNHP and SDNHP are part of the international NatureServe network and manages statewide occurrence records and other information for species and habitats of conservation interest.

The categories of species to include as potential species of conservation concern originated from the proposed planning directives at FSH 1909.12, chapter 10, sec. 12.52, which were in place when the potential species of conservation concern list was developed. (Note: the final planning directives did not result in meaningful changes to the categories in Step 1 A-H, as measured by the resulting species lists). Ranking definitions are found at the end of this appendix. The categories are:

- A) NatureServe global (G) or infraspecific taxon (T) ranks of 1 or 2. Statuses obtained from MTNHP and SDNHP website databases.
- B) Delisted (removed) from the Endangered Species Act list within the last five years, or delisted and still monitored by the regulatory agency. Statuses obtained from US Fish and Wildlife Service. No species meeting this category occur in the plan area.
- C) State of Montana or State of South Dakota Threatened or Endangered designations. No species meeting this category occur in the plan area.
- D) Positive "90-day findings" made by the US Fish and Wildlife Service in response to federal listing petitions. Statuses obtained from US Fish and Wildlife Service. No species meeting this category occur in the plan area.

- E) Montana and South Dakota Species of Concern.1 Species in this category generally include all vascular plant taxa with Montana and South Dakota NHP state (S) ranks of S1, S2, S3 or SH. Nonvascular taxa (bryophytes and lichens) which are not as well documented or studied as vascular plant taxa in the state, are listed as species of concern using similar criteria as vascular taxa but are more strictly limited to those taxa which are believed to be the rarest or most vulnerable to extirpation based on current information. Some plants that are state Potential Species of Concern were also considered.
- F) Species of conservation concern expressed by Tribes during tribal consultations or in written comments. One species that occurs in the plan area meets this category and is already considered a sensitive plant species by the Northern Region of the Forest Service.
- G) Regional Forester's sensitive species list for the Custer Gallatin National Forest.
- H) All species for which the best available scientific information indicated a local conservation concern about the species' capability to persist over the long term in the plan area.

Step 2: During the planning phase, Regional Office and Custer Gallatin National Forest botanists will identify which of the plant species that will emerged from Step 1 that meet the criteria in items 2A, B, and C below. This step will result in the plant species of conservation concern list for the Custer Gallatin National Forest's draft revised forest plan and draft environmental impact statement.

This step will be completed by using the best available scientific information, including expertise from internal and external individuals, and the final planning directives at FSH 1909.12, chapter 10, section 12.52 and chapter 20, section 21.22a. The criteria for identifying species of conservation concern are:

- A) The species must be native to, and known to occur in, the plan area. A species is known to occur in the plan area if, at the time of plan development, the best available scientific information indicates that a species is established or is becoming established in the plan area. A species with occurrences in the plan area that were merely accidental or transient, or were well outside the species' existing range at the time of plan development are not considered to be established.
- B) The best available scientific information must indicate substantial concern about the species' capability to persist over the long term in the plan area.
    - i. In general, substantial concern will be best demonstrated by a decreasing population (abundance or distribution), decreasing habitat, or significant threat to the species in the plan area. Other factors considered during this evaluation included abundance, geographic distribution, reproductive potential, dispersal capabilities, and other demographic and life history characteristics of the species. This approach will be based on best available science in conjunction with professional expertise of Regional Office botanists.
    - ii. Rarity alone typically will not be considered a substantial concern unless accompanied by one of the three general conditions listed in (B)(i) above or having other prominent circumstances leading to concern for long-term persistence.
- C) If there is insufficient scientific information available to conclude that there is a substantial concern about a species' capability to persist in the plan area over the long-term, or if the species is secure in the plan area, that species will not be identified as a species of conservation concern. Rationale for not identifying species as species of conservation concern includes:

- i. If the species is secure and its continued long-term persistence in the plan area is not at risk based on knowledge of its abundance, distribution, lack of threats to persistence, trends in habitat, or responses to management.
- ii. Insufficient scientific information available about the species' status in the plan area. Lack of sufficient scientific information includes having limited inventory data resulting from low survey effort, lack of effective detection methods, or, in the case of purported population declines, lack of reasonably consistent monitoring methods among trend monitoring periods.

Global and State Rankings

NatureServe and its member programs and collaborators use a suite of factors to assess the extinction or extirpation (regional extinction) risk of plants, animals, and ecosystems (or "elements" of biodiversity). By researching and recording information on a set of conservation status factors, biologists assign a conservation status rank to these elements at both global and regional (i.e., national/ subnational) scales. The protocol for assigning a conservation status rank is based on scoring an element against ten conservation status factors, which are grouped into three categories based on the characteristic of the factor: rarity (six factors), trends (two factors), and threats (two factors). Once assigned, scores for the individual factors within each of these categories are pooled and the resulting three summary scores are combined to yield an overall numeric score, which is translated into a calculated rank. This calculated rank is reviewed, adjusted if deemed appropriate by the evaluator (with reasons documented), and recorded as the final assigned conservation status rank, using a G1-G5 scale for global element status, (Table 15), or the equivalent scale for national or subnational assessments (Faber-Langendoen et. al., 2009).

Table 15. Global rankings (NatureServe 2016 accessed online)

Global Ranking	Definition
G1	Critically Imperiled—At very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors.
G2	Imperiled—At high risk of extinction or elimination due to very restricted range, very few populations, steep declines, or other factors.
G3	Vulnerable—At moderate risk of extinction or elimination due to a restricted range, relatively few populations, recent and widespread declines, or other factors.
G4	Apparently Secure—Uncommon but not rare; some cause for long-term concern due to declines or other factors.
G5	Secure—Common; widespread and abundant.
GX	Presumed Extinct (species)/Eliminated (ecological communities and systems) — Species not located despite intensive searches and virtually no likelihood of rediscovery. Ecological community or system eliminated throughout its range, with no restoration potential.
GH	Possibly Extinct (species)/ Eliminated (ecological communities and systems) — Known from only historical occurrences but still some hope of rediscovery. There is evidence that the species may be extinct or the ecosystem may be eliminated throughout its range, but not enough to state this with certainty.

Heritage Program Ranks (MTNHP and SDNHP, 2016 accessed online)

The international network of Natural Heritage Programs employs a standardized ranking system to denote global (range-wide) and state status. Species are assigned numeric ranks ranging from 1 to 5, reflecting the relative degree to which they are "at-risk". Rank definitions are given in Table 16, Table 17 and Table 18. A number of factors are considered in assigning ranks — the number, size and distribution

of known "occurrences" or populations, population trends (if known), habitat sensitivity, and threat. Factors in a species' life history that make it especially vulnerable are also considered (e.g., dependence on a specific pollinator).

Table 16. Montana Natural Heritage Program rankings (MTNHP, 2016 accessed online)

Ranking	Definition
S1	At high risk because of extremely limited and/or rapidly declining population numbers, range and/or habitat, making it highly vulnerable to global extinction or extirpation in the state.
S2	At risk because of very limited and/or potentially declining population numbers, range and/or habitat, making it vulnerable to global extinction or extirpation in the state.
S3	Potentially at risk because of limited and/or declining numbers, range and/or habitat, even though it may be abundant in some areas.
S4	Apparently secure, though it may be quite rare in parts of its range, and/or suspected to be declining.
S5	Common, widespread, and abundant (although it may be rare in parts of its range). Not vulnerable in most of its range.

Table 17. Montana species of concern description

Montana Natural Heritage Program Ranking	Code	Description
Species of Concern	SOC	Native taxa at-risk due to declining population trends, threats to their habitats, restricted distribution, and/or other factors. Designation as a Montana Species of Concern or Potential Species of Concern is based on the Montana Status Rank, and is not a statutory or regulatory classification. Rather, these designations provide information that helps resource managers make proactive decisions regarding species conservation and data collection priorities. See the latest Species of Concern Reports for more detailed explanations and assessment criteria (http://fieldguide.mt.gov/).

Table 18. South Dakota Natural Heritage Program rankings (SDNHP, 2016 accessed online)

Ranking	Definition
S1	Critically imperiled because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extinction.
S2	Imperiled because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extinction throughout its range.
S3	Either very rare and local throughout its range, or found locally (even abundantly at some of its locations)in a restricted range,or vulnerable to extinction throughout its range because of other factors; in the range of 21 of 100 occurrences.
S4	Apparently secure, though it may be quite rare in parts of its range, especially at the periphery. Cause for long term concern.
S5	Demonstrably secure, though it may be quite rare in parts of its range, especially at the periphery.
SU	Possibly in peril, but status uncertain, more information needed.
SH	Historically known, may be rediscovered.
SX	Believed extinct, historical records only.

Combination or Range Ranks

G#G# or S#S# - Indicates a range of uncertainty about the status of the species (e.g., G1G3 = Global Rank ranges between G1 and G3).

S#, S# - Indicates that populations in different geographic portions of the species' range in Montana have a different conservation status (e.g., S1 west of the Continental Divide and S4 east of the Continental Divide).

Subrank

T# - Rank of a subspecies or variety. Appended to the global rank of the full species, e.g. G4T3

Qualifiers

Q - Questionable taxonomy that may reduce conservation priority-Distinctiveness of this entity as a taxon at the current level is questionable; resolution of this uncertainty may result in change from a species to a subspecies or hybrid, or inclusion of this taxon in another taxon, with the resulting taxon having a lower-priority (numerically higher) conservation status rank. Appended to the global rank, e.g. G3Q

? - Inexact Numeric Rank - Denotes uncertainty; inexactness.

Montana Native Plant Society Threat Rankings

The Montana Native Plant Society Threat Category process was initiated in 2006 at the Montana Plant Conservation Conference with the formation of a committee represented by federal, state and private botanists, ecologists and biologists. The committee developed a ranking system based on the impacts of the identified threats to the species' viability in the state. They evaluate threats impacting Montana's plant species of concern and classifies species according to their level of imperilment or risk as a result of these threats. The result of this process is a 4-tier threat ranking system for plant species of concern in Montana.

The threat categories are:

- Category 1. The viability of the species in the state is Highly Threatened by one or more activities. Associated threats have caused or are likely to cause a major reduction of the state population or its habitat that will require 50 years or more for recovery, 20% or more of the state population has been or will be affected, and the negative impact is occurring or is likely to occur within the next 5 years.
- Category 2. The viability of the species or a portion of the species habitat in the state is threatened by one or more activities, though impacts to the species are expected to be less severe than those in Category 1. Associated threats exist but are not as severe, wide-ranging or immediate as for Category 1, though negative impacts are occurring or are likely to occur.
- Category 3. The viability of the species in the state is Not Threatened or the Threats are Insignificant. Associated threats are either not known to exist, are not likely to occur in the near future or are not known to be having adverse impacts that will severely affect the species' viability in the state.
- Category 4. Assessment not possible due to insufficient and/or conflicting information on potential threats to the species.

Of the 27 species identified as potential plant species of conservation concern, one was ranked Category 1 - Highly Threatened (*Sildacea oregana*); eight are ranked Category 2 - Threatened (*Botrychium paradoxum*, *Carex gravida* var. *gravida*, *Cypripedium parviflorum, Draba densifolia, Drosera anglica, Lomatium nuttallii, Mimulus nanus,* and *Physaria didymorcarpa* var. *lanata*); eight are ranked as Category 3 (insignificant threats or no threats known); and 10 species were not ranked due to insufficient or conflicting information. See Appendix D for ranking definitions.