

Recommended Best Management Practices for Managing Noxious Weeds on Sites with Rare Plants

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This document provides natural resource professionals, land managers, and land use decision makers with guidelines and a set of questions to consider surrounding decisions related to noxious weed management in the vicinity of rare plants. These guidelines will help establish and refine a species-specific best management practices (BMPs) that can be customized for each unique project area.

The goal of noxious weed management is to improve the value of the land, protect natural resources, and to enhance desired land uses through effective weed control. Therefore, while efforts are directed towards stopping the displacement of rare plants by noxious weeds, precautions are required to minimize unintended harm that can occur during weed management activities, such as trampling, herbicide contact, pollination disruption, and significantly altering the rare plant's habitat. Guidelines are needed to assist landowners and managers to protect rare plants at risk of local or global extinction.



Colorado hookless cactus (*Sclerocactus glaucus*, G2G3) with noxious weeds downy brome (*Bromus tectorum*) and halogeton (*Halogeton glomeratus*). Photo: Delia Malone, CNHP.

One of the biggest conservation issues facing rare plants is the lack of awareness of their existence and their status. In Colorado, the non-profit Colorado Natural Heritage Program (CNHP) tracks over 500 rare plant species. A species' abundance is ranked 1 to 5, with 1 being critically imperiled and 5 being widespread and abundant. Initial conservation priority for the recommended BMPs herein will focus on Plants of Greatest Conservation Need as defined in the Colorado Wildlife Action Plan (Colorado Parks and Wildlife 2015). These are species ranked G1 (critically imperiled with 5 or fewer occurrences or populations globally) and G2 (imperiled with 6 - 20 occurrences globally). In 2015, there were 121 rare, native plant species (G1 and G2) threatened with extinction in Colorado (Appendix A). They are known to occur within 47 of the 64 Colorado counties (Appendix B). This list of rare plants includes species identified on the federal threatened and endangered species list. Most of Colorado's imperiled plants are naturally rare because they

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are restricted to very specific, narrowly distributed habitat. Unfortunately, many of these sites are vulnerable to human activities that can lead to habitat degradation and the loss of rare plants. As we work to improve the land through noxious weed control, it is important that we simultaneously strive to minimize the unintended impacts of our actions through careful, collaborative planning.

The desired outcomes of these recommended best management practices are to create greater awareness for rare plants among all who utilize the land and make decisions regarding land use, and to reduce the impacts of noxious weed control activities on rare plants on public and private lands. The guidelines and provided questions, which assist in the development of site and species-specific BMPs, are grouped into three major categories: 1) Site Assessment, 2) Harm Avoidance, and 3) Weed Management Techniques. These listed BMPs are general guidelines that should be more carefully detailed and customized for each specific rare plant species and project site with considerations for regulatory jurisdictions. These comprehensive recommendations may not be feasible for some private landowners, but experts (such as, NRCS and local county weed managers) are available to assist and advise, and these BMPs can be adapted for implementation at a smaller scale. All weed control activities should be evaluated and monitored iteratively to assess for benefits or impacts on rare plants on the project site. Based upon those assessments, adaptive management should be utilized to promote successful rare plant protection and weed control.

Recommended Best Management Practices

A list of recommended best management practices is provided for site assessment, harm avoidance, and weed management techniques. Some recommendations include a set of questions that assists with decision making.

Site Assessment

The goal of the “Site Assessment” section is to determine the locations of rare plants and noxious weeds within the defined project area and to define the desired land uses and noxious weed management goals that form the guiding principles for weed management on the site.

1. Define and map the boundaries of the project area.
2. Develop a list and map of rare plants ranked G1 and G2 that are known or suspected to occur within the project boundaries.
 - Gather information from the Colorado Natural Heritage Program, U.S. Fish and Wildlife Service (USFWS), or other known sources of rare plant spatial data.
 - If the project is on public lands, contact the land management agency whether it is federal, state, or local because they may have a unique list of species of concern, permitting, and regulatory requirements that must be met before weed control activities can proceed (e.g., Bureau of Land Management (BLM) Sensitive Species List and U.S. Forest Service (USFS) Regional Forester’s Sensitive Species List).
 - The list of rare plant species should be updated annually, since new information is constantly being collected and species status can change.

- Sources of rare plant information:
 - Colorado Natural Heritage Program – Rare Plants List and general location maps: <http://www.cnhp.colostate.edu/download/gis.asp>, http://www.cnhp.colostate.edu/download/projects/rareplants/list_location.aspx?GeoScaleID=3
 - USFWS Threatened and Endangered Species List: http://ecos.fws.gov/tess_public/reports/species-listed-by-state-report?state=CO
 - BLM Sensitive Species List: http://www.blm.gov/co/st/en/BLM_Programs/botany.html
 - USFS Regional Forester’s Sensitive Species List: <http://www.fs.usda.gov/detail/r2/landmanagement/?cid=stelprdb5390116>
 - Southwest Environmental Information Network (SEINet) – Plant species location information: <http://swbiodiversity.org/seinet/>
 - University of Colorado Herbarium – Plant species location information: <https://cumuseum.colorado.edu/research/botany/databases>
 - Rocky Mountain Herbarium – Plant species location information and species search within a drawn polygon: <http://www.rmh.uwyo.edu/>
3. Develop a list and map of all species of noxious weeds that will be treated within the project boundaries.
- The Colorado Department of Agriculture – Noxious Weed Program has county noxious weed lists and statewide maps of noxious weed distribution:
 - Colorado noxious weed list <https://www.colorado.gov/pacific/agconservation/noxious-weed-species>
 - Noxious weeds sightings by counties <https://www.colorado.gov/pacific/agconservation/county-weed-programs>
 - Noxious weed distribution maps <https://www.colorado.gov/pacific/agconservation/quarterquad-maps>
 - If other undesired plant species will also be treated simultaneously with Colorado regulated noxious weeds, list and map these species as well.
4. If rare plants are suspected in the project vicinity and the project boundary includes the rare plant’s habitat, consult botanical experts to obtain a confirmation. If the project is on USFS or BLM lands, contact the agency. If rare plants are confirmed within the project boundary, carefully consider and implement recommended BMPs. Consult and collaborate with rare plant and noxious weed specialists to obtain scientifically-based information and to explore treatment options.
- A botanist may need to be hired to survey and confirm rare plants, especially when working on public lands. Surveys should be conducted during phenologically appropriate times for species confirmation.
 - Occasionally, assistance can be obtained from the CNHP, Denver Botanic Garden, or Colorado Natural Areas Program. The Colorado Native Plant Society may be able to assist

with a Rapid Response Team or the NRCS with a Technical Service Provider (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/technical/tsp/>).

Some services may include a fee.

- Some federal (USFWS - <http://www.fws.gov/endangered/>), state, and local land management agencies have complementary policy and regulatory guidelines to minimize adverse impact of activities on rare plants; along with these recommended BMPs, one will need to comply with those regulatory requirements.
5. Develop a project team with these primary roles: project manager, noxious weed specialist, rare plant specialist, regulatory partners, landowner/manager, and contractor manager.
- Set up meetings and communication protocols to assist with information sharing.
 - If establishing a project team is not feasible, at a minimum, consult with a noxious weed specialist and rare plant specialist to obtain recommendations to minimize harm to rare plants and to select appropriate weed treatment options.
6. Carefully assess and define the desired land uses and noxious weeds management goals.
- Define desired land uses and how existing noxious weeds affect the desired use.
 - Define the desired noxious weed management goals.
 - Are the goals for elimination and eventual eradication of a particular targeted weed species?
 - How aggressive a resource competitor is the weed?
 - Is some level of long term noxious weed existence acceptable?
 - What caused and perpetuated the weed infestation at the site and can that situation be managed to minimize the spread of noxious weeds and prevent future re-infestation?
 - What is the timeline for achieving the desired goals?
 - Assess how noxious weeds are affecting rare plants on the site.
 - Do the weeds and rare plants occupy the same habitat?
 - Have noxious weeds been observed in the same habitat as rare plants?
 - If the plants occupy the same habitat, does there appear to be a stable population balance between the rare plant and noxious weed on those sites?
 - Is there a threat of potential rare plant displacement in the future?
 - Assess how might noxious weed management activities impact rare plants on the site.
 - What is the likelihood of misidentifying the rare plant for a targeted noxious weed?
 - When weeds are being treated on the site, what is the growth phase of the rare plant?
 - Will management activities affect rare plant pollination and reproduction? Consider the pollinator species, where they live, and weed control activities that can impact them.
 - What are potential unintended impacts on the rare plant due to weed treatment activities: trampling by foot or vehicle, herbicide contact, herbicide residual activity in the soil, significant changes in microhabitat such as canopy cover reduction, shifts in plant community with secondary invaders, etc.?

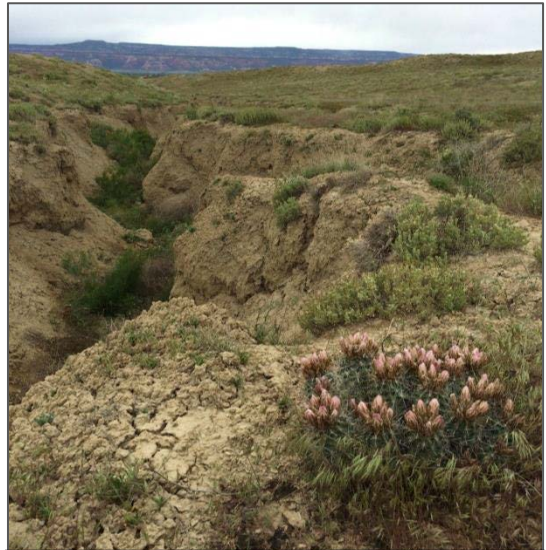
- Are there known secondary invaders in the area that may pose a greater threat, if the niche freed up by the removal of the targeted weed is not replaced by a desirable plant?

Harm Avoidance

The goal of the “Harm Avoidance” section is to define overarching approaches and techniques that focus on minimizing harm to rare plants in each unique project situation. Some recommendations include a set of questions that assists with decision making.

1. Assess the risks and benefits of weed management on rare plants within the project site.

- Can weed treatment risks be minimized or mitigated by selecting low impact treatment techniques suggested in the “Weed Management Techniques” section of the BMP?
- If treatment risks can’t be avoided or minimized, and the targeted noxious weed is not an aggressive competitor, is it essential to eliminate the targeted noxious weed from the project site?
- What is an acceptable percentage of loss in the number of individuals of the rare plant’s population within the overall goal of preventing species extinction?
- Can “no current weed control action” and monitoring rare plants and noxious weed populations be the management option for relatively stable systems where noxious weeds don’t appear to be threatening rare plants and the weed populations aren’t expanding?
- If monitoring shows potential harm to rare plants and desired land use, will there be resources to treat weeds in the future?
- If the dominant weed is controlled, is there a secondary weed in the area that can potentially expand in the altered system and can pose a greater impact on the rare plant? An example of this is the removal of Russian-olives from the canopy and thus creating an environment that favors Russian knapweed and cheatgrass, which may have a greater impact on native understory plants.
- Is it important to manage secondary weeds if plant communities and structure will be significantly altered?



Colorado hookless cactus (*Sclerocactus glaucus*, G2G3, Federally Listed Threatened) surrounded by downy brome (*Bromus tectorum*). Photo: Delia Malone, CNHP.

2. Designate “Special Management Areas (SMAs)” based on known locations of rare plants and their habitat. The treatment of noxious weeds within the SMAs needs to be carefully conducted and follow BMPs recommended in the Weed Management Techniques section of this document.

- Map and/or physically mark the SMA within the project boundary. The SMA needs to include a buffering distance to minimize the impacts of planned activities on rare plants and their dynamic population changes on the landscape. This distance varies with the specific characteristic of the rare plants and the local environment.
 - Distances should be determined based on activities in the project area and the selectivity of the weed treatment techniques (e.g., vehicular traffic may require greater buffering distances and may need to be further adjusted based on the drift potential of the selected herbicide).
 - Share SMA boundaries (hard-copy and/or digital maps) with all project staff and partners. Update maps and SMA boundaries as new rare plant locations are found.
 - Consider temporarily fencing SMAs when activities on the sites are high.
 - If the site has public access, use care so that fencing does not draw unwanted attention that can pose harm to the rare plant.
3. Focus on weed prevention and containment of infestations to keep weeds from spreading, and invading Special Management Areas.
- If weeds don't currently occur within project SMAs, focus on prevention to keep them out.
 - Require visual inspections of all vehicles, staff clothing, and equipment to be clean of seeds and vegetative material prior to entering the project boundary and again at SMAs.
 - Minimize activities that can cause soil disturbance.
 - Make it a high priority to treat weeds outside of the SMA boundaries, thus minimizing the future need to treat weeds immediately adjacent to rare plants. One might want to define that distance of defensible space outside of the SMA for technicians working on the site.
 - If the targeted noxious weed spreads by windborne seeds, widen the treatment area on the side with the prevailing winds. Similarly for weeds that spread along streams, target weeds upstream of the SMA.
4. If the noxious weed treatment timeline is long and flexible, consider setting up study plots within a small portion of the project area to assess which techniques best serve the given situation and minimize impacts of treatment on rare plants. Study results can be used to aid in selecting a noxious weed control technique that can then be applied over the greater project area.
- Prior to implementing a study, find out if there is existing information on the proposed treatment, the targeted weed, and rare plant species
 - Consider monitoring and collecting data on rare plant and noxious weed populations within the project area throughout the course of treatments to determine their effects.

- At a minimum, collect baseline population data of rare plants and noxious weeds. Management techniques can then be adapted to minimize impacts and to assess if goals are being met.
5. If weed treatment techniques will result in abrupt alternations in the structure and functions of the ecosystem and affect the rare plant, consider applying the treatment in phases, thus allowing treated patches recovery time and assessment of treatment results before proceeding to the next set of treatment sites.
 6. Minimize the number of entries into Special Management Areas through careful event coordination.
 - Designate a project manager who will catalog, review, coordinate, and monitor all project activities occurring within the SMAs.
 7. Ensure that all project staff and contractors working on the site can correctly identify all rare plants and noxious weeds in their various stages of growth.
 - Consult with the CNHP or a professional botanist to confirm rare plant sightings.
 - Photos and GPS locations should be taken of potential sightings; only trained professionals with collecting permits should pull or remove any part of a rare plant.
 - Provide annual training to staff and contractors to discuss plant identification, documentation protocols, project activities, monitoring results, and treatment updates.

Weed Management Techniques

The goal of the “Weed Management Techniques” section is to provide guidance on weed management technique selection and cautious application of the selected techniques to minimize impacts on rare plants within the treatment area.

1. Carefully assess the suite of integrated weed management tools (mechanical, chemical, biological, and cultural) available for natural areas management.
 - Select and rank options that: are selective, have a low impact on altering the soils, does not impede the growth and reproduction of the rare plants, are proven to be effective on the targeted weeds, etc.
2. Chart the implementation timing of each treatment option and compare that with the growth phase of the rare plant populations at the site.
 - Whenever possible, time the treatment to occur when rare plants are dormant (not in a flowering, reproductive, or seedling phase) or have the ability to recover from potential damage.

3. Utilize herbicide applicators and noxious weed technicians who are highly skilled in plant identification.
 - Anyone treating noxious weeds on sites with rare plants needs to be able to identify the targeted noxious weed in all its growth phases and other noxious weeds known to be in the region. Additionally, that person should be able to identify rare plants on the site in all its growth phases, common native plants, and to distinguish native plants that are often confused with the targeted noxious weed.
4. Utilize mechanical control techniques with minimal soil disturbance.
 - Seedlings, annual, biennial, and short-lived perennial weeds can be pulled or severed 2-3 inches below the plant's crown, which is where the plant's stem meet the roots.
 - Minimize soil disturbance when pulling or severing below the crown.
 - One technique is to insert a shovel into the soil close to the crown, sever the root 2-3 inches below the soil, and then pull out the shovel carefully without turning over the soil or the plant. This technique reduces soil disturbance and the potential for planting undesired seeds.
 - Treat annuals, biennial, and short-lived perennial weeds before they produce flowers.
 - Otherwise, clip, bag, and dispose into the landfill flowers and seed heads from weeds within the SMA and adjacent buffer; seeds may continue to develop on severed plants.
 - Determine the weed seed's longevity in the soil; this will determine the number of growing seasons the monitoring and treatment will be needed for the project area.
 - Weed seed longevity information can be found on the Colorado Noxious Weed Program's website: <https://www.colorado.gov/pacific/agconservation/noxious-weed-species>
 - Mowing should not be implemented within SMAs, unless it is required for safety reasons such as on rights of way.
 - Avoid mowing when plants are actively growing; use the best available information for rare plants on the site.
 - Mowing with a 6-inch (15 cm) or higher cut could take place in SMAs before the rare plant's growing season or after it has produced seeds or is dormant.
 - Mower tires should not be driven over or parked on top of the rare plants.
 - Some mechanical techniques, such as cutting, pulling, or mowing, can invigorate weed growth if applied at the wrong time, on a rhizomatous plant, or one that reproduces vegetatively. Carefully assess the technique and its application timing.
 - Avoid walking or driving on rare plants.
5. Select chemical control techniques that are known to: be effective on the targeted weeds, have minimal impacts on the rare plant, are selective, and can be applied with precision.
 - Rhizomatous perennial noxious weeds should be treated with carefully selected herbicides because other control methods are not effective or cause significant soil disturbance.

- Consult several herbicide experts to thoroughly understand the characteristics, effectiveness, timing of application, and application rates of potential herbicides, as well as, the impacts of the herbicides on the site’s native plant community.
- If possible, select herbicides that are effective on the targeted weed and have low impacts on the plant family of the rare plant.
- Work with rare plant and herbicide specialists to select an application timing that will have minimal impacts on the rare plant.
- Read and follow information on the herbicide label, especially the “Environmental Hazards” section and if available, any information under the “Endangered Species Protection Requirements” section.
 - Some herbicide manufacturers have websites with additional information for good product stewardship. This is an example of one that is specific to the protection of threatened and endangered plants: <http://www.monsanto.com/products/pages/glyphosate-endangered-species-initiative.aspx>
- Carefully assess the impacts of the herbicide’s soil residual on the rare plant.
 - Determine if the herbicide residual significantly affect the rare plant’s growth and reproduction.
- Minimize potential drift of herbicide droplets or migration through the soil or water table by using carefully selected herbicides and method of application.
 - If a weed and rare plant are in close proximity, use a shield, like cardboard, to prevent drift onto the rare plant.
 - Wick and swiper applicators can also be considered.
 - If there is contact between the weed and rare plants, trim the weed to remove contact before conducting a shielded spray.
- Within the SMA, utilizing herbicide application techniques that have high precision, such as backpack sprayers.
 - Boom sprayers can be considered for sites within the project boundaries that are outside of the SMA and where the target noxious weed populations are high and dense.
 - Evaluate how the selected herbicide may alter the plant community, especially natives, within the rare plant’s greater habitat; avoid harming native plants important to the overall plant community and causing a loss in biodiversity.
- Aerial application should only be considered for sites within the project area that are inaccessible and can put the safety of the applicator at risk.
 - Careful evaluation must be taken to consider the costs and benefits of an aerial application on the rare plant population.



- Questions to consider include:
 - What percentage of the rare plant's population within the area fall into the proposed aerial treatment sites?
 - Is the cost of losing a few individual rare plants within the population during weed treatment worth the benefit of protecting the remainder of the population?
 - Measure the accuracy of the selected pilot and equipment on similar treatment terrain and environmental conditions, and adjust for optimal accuracy prior to treating the SMAs.
 - Avoid walking or driving on rare plants.
6. Biological control can be considered for noxious weeds with large, regional infestations in the project area.
- Biocontrol should not be used if the targeted weed populations are small outside of the SMAs, or within SMAs where weeds will be managed with an elimination objective.
 - Biocontrol is a potential option on large infestations only if the biocontrol agent is available and documented to be effective on the targeted noxious weed.
 - Contact the Colorado Department of Agriculture – Biological Control Program for more information: <https://www.colorado.gov/pacific/agconservation/biocontrol>
 - Biocontrol can be used when the noxious weed management goals do not require complete elimination and some level of noxious weed existence is acceptable.
 - Biocontrol can also be used to help reduce a large population to a point where it becomes manageable for elimination.
 - Carefully assess if the biocontrol agent may incidentally feed on rare plants, especially if the target weed and rare plant are in the same plant family.
7. Cultural techniques, such as revegetation, need to be done with careful consideration for materials and technique selection.
- Assess past site alterations and uses that may have led to the invasion of noxious weeds.
 - Determine if:
 - The impact can be removed or repaired to prevent future re-infestation?
 - The restoration process, such as repairing hydrology, can naturally remove noxious weeds or will it favor the weeds and require treatment prior to restoration?
 - Determine if the rare plant's natural habitat consists of bare ground; if so, do not re-seed or alter the soil.
 - Many rare plants are adapted to live on specific substrates that may not resemble topsoil (e.g. shale barrens with very coarse and rocky substrate).
 - Some rare plants may not compete well on more developed topsoils; the retention of original surface substrates is important.
 - Use nearby occupied rare plant habitat as reference sites for the revegetation of disturbed habitat.

- The revegetated native vegetation cover, composition, and structure should be similar to the reference site.
 - If native vegetation does not show signs of re-establishment within a year after noxious weeds treatment, revegetate with native seeds, preferably collected from native plants in the area and using a mix that maintains the biodiversity of the site.
 - Commercial seed mixes should not contain any non-native species or native species not part of the reference plant community.
 - Request for high seed purity in the mix.
 - Use wood straw (<http://www.fs.fed.us/eng/pubs/html/04231302/04231302.html>) or certified weed-free straw or hay, if mulch or erosion control is required.
 - If tilling is necessary, avoid burying rare plants or putting large amounts of dust on them.
 - Do not transplant rare plants, except when significant disturbance such as, development is unavoidable on the site.
 - Do not utilize fire as a weed management tool in SMAs, unless a controlled burn is known to promote the rare plant's growth and population.
 - Do not graze within the SMA, unless it is known to be beneficial for the rare plants on the site.
8. Test the selected weed management techniques to determine which have the least impact on the rare plant.
9. Monitor rare plant populations. If impacts are noted, change management techniques.

Conclusion

These recommended BMPs are intended to serve as a guideline designed to assist natural resource professionals, land managers, and land use decision makers. The BMPs are utilized most effectively as a template for customizing a species-specific plan for a targeted project area. The recommended BMPs can also be used to enhance weed management in natural areas that have a focus on native plants. Suggested future work that can further minimize unintended harm to rare plants include: a website and fact sheets to provide additional information; the development of regional lists of commercial herbicide applicators who are proficient at working in rare plant environments; a shared database of Special Management Areas for rare plants that is accessible online; and demonstration projects showing successful management of noxious weeds while enhancing rare plant populations. Collaborative planning; inputs from rare plant, noxious weed, and herbicide experts; coordination; and information sharing are required for the implementation of weed control activities on sites with valuable rare plant resources, where negative impacts can contribute to a species' extinction.

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Appendix A

2015 Colorado G1 and G2 Rare Native Plants

Rare vascular plants list compiled by the Colorado Natural Heritage Program (CNHP). Listed alphabetically by scientific name.

Abbreviations:

Global and State Imperilment Rank

The global and state species ranks characterize the relative rarity or endangerment of the species worldwide or statewide. Global ranks are derived primarily by staff at NatureServe, unless CNHP has lead responsibility for that species (ex. state endemics). State ranks are derived by CNHP staff. Other factors, in addition to the number of occurrences, may be considered when assigning a state rank. For more information, contact the CNHP (<http://www.cnhp.colostate.edu/>).

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|------|---|
| G1 | Globally critically imperiled; typically 5 or fewer Element Occurrences (EOs) and/or very few remaining acres or very vulnerable to elimination throughout its range due to other factor(s) |
| G2 | Globally imperiled; typically 6 to 20 EOs and/or few remaining acres or very vulnerable to elimination throughout its range due to other factor(s) |
| G3 | Globally rare or uncommon; typically 21 to 100 EOs; either very rare and local throughout its range or found locally, even abundantly, within a restricted range or vulnerable to elimination throughout its range due to specific factor(s) |
| G4 | Globally widespread, abundant, and apparently secure, but with cause for long-term concern; uncommon but not rare (although it may be quite rare in parts of its range, especially at the periphery); typically > 100 EOs; apparently not vulnerable in most of its range |
| G#G# | Numeric range rank (with range no greater than 2); greater uncertainty about a rank is expressed by indicating the full range of ranks which may be appropriate (for example, a G1G3 rank indicates the rank could be G1, G2, or G3) |
| S1 | State critically imperiled; typically 5 or fewer EOs |
| S2 | State imperiled; typically 6 to 20 EOs |
| S3 | State rare or uncommon; typically 21 to 100 Eos |
| S#S# | Numeric range rank (with range no greater than 2); greater uncertainty about a rank is expressed by indicating the full range of ranks which may be appropriate (for example, a S1S3 rank indicates the rank could be S1, S2, or S3) |
| ? | Inexact numeric rank; a question mark added to a rank expresses an uncertainty about the rank in the range of 1 (i.e., +/- 1 rank either way on the 1-5 scale); for example, a G2? Rank indicates that the rank is thought to be G2, but could be G1 or G3 |
| Q | Questionable taxonomy classification?; a Q added to a rank denotes questionable taxonomy; it modifies the degree of imperilment and is only used in cases where the type would have a less imperiled rank if it were not recognized as a valid type (i.e., if it were combined with a more common community type); a GUQ rank often indicates that the type is unrankable because of daunting taxonomic questions |

SH Historically known with hopes of rediscovery
 SNR Unranked; element is not yet ranked in the state

Endangered Species Act Listing

The federal legal status of the species as assigned by the U.S. Fish and Wildlife Service (USFWS) under the Endangered Species Act (ESA). Blank values indicate no federal legal status per USFWS.

C ESA Candidate
 LE Listed Endangered
 LT Listed Threatened

Federal Sensitive Species List

Denotes species considered sensitive by the U.S. Forest Service and/or the Bureau of Land Management (does NOT equal ESA status). Blank values indicate no legal status per BLM or USFS.

BLM Legal status assigned by the Bureau of Land Management
 USFS Legal status assigned by the U.S. Forest Service
 BLM, USFS Legal status assigned by both the U.S. Forest Service and the Bureau of Land Management

Scientific Name	Common Name	Global Rank	State Rank	ESA Listing	Federal Sensitive Species List	Primary Habitat Type
Aletes humilis	Larimer aletes	G2G3	S2S3	-	-	Cliff and Canyon
Aletes latilobus	Canyonlands aletes	G1G2	S1	-	BLM	Cliff and Canyon
Aliciella sedifolia	Stonecrop gilia	G1	S1	-	USFS	Alpine
Anticlea vaginatus	Alcove death camas	G2	S2	-	-	Cliff and Canyon
Astragalus anisus	Gunnison milkvetch	G2G3	S2S3	-	BLM	Shrubland
Astragalus cronquistii	Cronquist's milkvetch	G2	S2	-	-	Shrubland
Astragalus debequaeus	DeBeque milkvetch	G2	S2	-	BLM	Pinyon-juniper
Astragalus deterior	Cliff Palace milkvetch	G1G2	S1S2	-	-	Cliff and Canyon
Astragalus humillimus	Mancos milkvetch	G1	S1	LE	-	Cliff and Canyon
Astragalus iodopetalus	Violet milkvetch	G2	S1	-	USFS	Shrubland
Astragalus microcymbus	Skiff milkvetch	G1	S1	C	BLM	Shrubland
Astragalus naturitensis	Naturita milkvetch	G2G3	S2S3	-	BLM	Cliff and Canyon
Astragalus osterhoutii	Kremmling Osterhout milkvetch	G1	S1	LE	-	Shrubland
Astragalus piscator	Fisher Towers milkvetch	G2G3	S1	-	BLM	Shrubland
Astragalus rafaensis	San Rafael milkvetch	G2G3	S1	-	BLM	Pinyon-juniper
Astragalus schmolliae	Chapin Mesa milkvetch	G1	S1	C	-	Pinyon-juniper
Astragalus sparsiflorus	Front Range milkvetch	G2	S2	-	-	Forest
Astragalus tortipes	Sleeping Ute milkvetch	G1	S1	C	BLM	Shrubland
Boechera crandallii	Crandall's rock-cress	G2	S2	-	BLM	Shrubland

Scientific Name	Common Name	Global Rank	State Rank	ESA Listing	Federal Sensitive Species List	Primary Habitat Type
<i>Boechera glareosa</i>	Dorn's rockcress	G1	S1	-	-	Barrens
<i>Botrychium lineare</i>	Narrowleaf grapefern	G2G3	S2S3	-	USFS	Forest
<i>Caesalpinia repens</i>	Creeping rush-pea	G2	S1	-	-	Barrens
<i>Calochortus ciscoensis</i>	Cisco sego lily	G2	S1	-	-	Shrubland
<i>Camissonia eastwoodiae</i>	Eastwood evening-primrose	G2	S1	-	BLM	Shrubland
<i>Carex stenoptila</i>	Small-winged sedge	G2	S2	-	-	Wetland
<i>Castilleja puberula</i>	Downy indian-paintbrush	G2G3	S2S3	-	-	Alpine
<i>Cirsium perplexans</i>	Adobe Hills thistle	G2G3	S2S3	-	-	Shrubland
<i>Corispermum navicula</i>	North Park bugseed	G1?	S1	-	BLM	Barrens
<i>Delphinium robustum</i>	Wahatoya Creek larkspur	G2?	S2?	-	-	Forest
<i>Descurainia kenheillii</i>	Heil's tansy mustard	G1	S1	-	-	Alpine
<i>Draba exungiculata</i>	Clawless draba	G2	S2	-	USFS	Alpine
<i>Draba graminea</i>	San Juan draba	G2	S2	-	-	Alpine
<i>Draba grayana</i>	Gray's Peak whitlow-grass	G2	S2	-	USFS	Alpine
<i>Draba malpighiacea</i>	Whitlow-grass	G1?	S1?	-	-	Alpine
<i>Draba smithii</i>	Smith whitlow-grass	G2	S2	-	USFS	Cliff and Canyon
<i>Draba weberi</i>	Weber's draba	G1	S1	-	USFS	Alpine
<i>Erigeron abajoensis</i>	-	G1G2	S1?	-	-	Grassland
<i>Erigeron kachinensis</i>	Kachina daisy	G2	S1	-	BLM	Cliff and Canyon
<i>Erigeron wilkenii</i>	Wilken fleabane	G1	S1	-	-	Cliff and Canyon
<i>Eriogonum brandegeei</i>	Brandegee wild buckwheat	G1G2	S1S2	-	BLM, USFS	Barrens
<i>Eriogonum clavellatum</i>	Comb Wash buckwheat	G2	S1	-	BLM	Shrubland
<i>Eriogonum coloradense</i>	Colorado wild buckwheat	G2	S2	-	BLM	Alpine
<i>Eriogonum pelinophilum</i>	Clay-loving wild buckwheat	G2	S2	LE	-	Shrubland
<i>Eutrema penlandii</i>	Mosquito Range mustard	G1G2	S1S2	LT	-	Wetland
<i>Frasera coloradensis</i>	Colorado green gentian	G2G3	S2S3	-	-	Grassland
<i>Gastrolychnis kingii</i>	King's campion	G2G4Q	S1	-	-	Alpine
<i>Gutierrezia elegans</i>	Lone Mesa snakeweed	G1	S1	-	BLM, USFS	Shrubland
<i>Hackelia besseyi</i>	Bessey's stickseed	G2G3	SNR	-	-	Pinyon-juniper
<i>Hackelia gracilentata</i>	Mesa Verde stickseed	G1G2	S1S2	-	-	Pinyon-juniper
<i>Herrickia horrida</i>	Canadian River spiny aster	G2?	S1	-	-	Pinyon-juniper
<i>Ipomopsis globularis</i>	Globe gilia	G2	S2	-	-	Alpine
<i>Ipomopsis polyantha</i>	Pagosa skyrocket	G1	S1	LE	-	Grassland

Scientific Name	Common Name	Global Rank	State Rank	ESA Listing	Federal Sensitive Species List	Primary Habitat Type
<i>Ipomopsis ramosa</i>	Coral ipomopsis	G1	S1	-	-	Forest
<i>Lepidium crenatum</i>	Alkaline pepperwort	G2	S2	-	-	Shrubland
<i>Lepidium huberi</i>	Huber's pepperweed	G1G2	S1S2	-	-	Shrubland
<i>Limnorchis zothecina</i>	Alcove bog orchid	G2	S1	-	-	Cliff and Canyon
<i>Lomatium concinnum</i>	Colorado desert-parsley	G2G3	S2S3	-	BLM	Shrubland
<i>Lupinus crassus</i>	Payson lupine	G2	S2	-	BLM	Pinyon-juniper
<i>Lygodesmia doloresensis</i>	Dolores River skeletonplant	G1G2	S1S2	-	BLM	Pinyon-juniper
<i>Mentzelia paradoxensis</i>	Paradox stickleaf	G2?	S2?	-	-	Shrubland
<i>Mertensia humilis</i>	Rocky Mountain bluebells	G2	S1	-	-	Shrubland
<i>Mimulus gemmiparus</i>	Budding monkeyflower	G1	S1	-	USFS	Cliff and Canyon
<i>Myosurus nitidus</i>	Western mousetail	G2G4	S1	-	-	Shrubland
<i>Nuttallia chrysantha</i>	Golden blazing star	G2	S2	-	BLM	Barrens
<i>Nuttallia densa</i>	Arkansas Canyon stickleaf	G2	S2	-	BLM	Pinyon-juniper
<i>Nuttallia rhizomata</i>	Roan Cliffs blazing star	G2	S2	-	BLM	Barrens
<i>Oenothera acutissima</i>	Narrow- leaf evening primrose	G2	S2	-	BLM	Shrubland
<i>Oonopsis</i> sp. 1	Pueblo goldenweed	G2	S2	-	-	Grassland
<i>Opuntia heacockiae</i>	Heacock's prickly-pear	G2G3Q	S2S3	-	-	unknown
<i>Oreocarya osterhoutii</i>	Osterhout cat's-eye	G2G3	S2	-	BLM	Barrens
<i>Oreocarya revealii</i>	Gypsum Valley cat-eye	G2	S2	-	BLM	Shrubland
<i>Oreoxis humilis</i>	Pikes Peak spring parsley	G1	S1	-	USFS	Alpine
<i>Oxybaphus rotundifolius</i>	Round- leaf four-o'clock	G2	S2	-	-	Barrens
<i>Packera mancosana</i>	Mancos shale packera	G1	S1	-	-	Barrens
<i>Penstemon debilis</i>	Parachute penstemon	G1	S1	LT	-	Barrens
<i>Penstemon degeneri</i>	Degener beardtongue	G2	S2	-	BLM, USFS	Pinyon-juniper
<i>Penstemon gibbensii</i>	Gibben's beardtongue	G1G2	S1	-	BLM	Barrens
<i>Penstemon grahamii</i>	Graham beardtongue	G2	S1	-	BLM	Barrens
<i>Penstemon mensarum</i>	Grand Mesa penstemon	G2	S2	-	-	Forest
<i>Penstemon penlandii</i>	Kremmling beardtongue	G1	S1	LE	-	Shrubland
<i>Penstemon teucrioides</i>	Germander beardtongue	G2G3Q	S2S3	-	-	Barrens
<i>Peritoma multicaulis</i>	Slender spiderflower	G2G3	S2S3	-	BLM	Wetland
<i>Phacelia formosula</i>	North Park phacelia	G1	S1	LE	-	Barrens
<i>Phacelia gina - glenneae</i>	Troublesome phacelia	G1	S1	-	-	Shrubland

Scientific Name	Common Name	Global Rank	State Rank	ESA Listing	Federal Sensitive Species List	Primary Habitat Type
<i>Phacelia submutica</i>	DeBeque phacelia	G2	S2	LT	-	Barrens
<i>Physaria alpina</i>	Avery Peak twinpod	G2	S2	-	-	Alpine
<i>Physaria bellii</i>	Bell's twinpod	G2G3	S2S3	-	-	Barrens
<i>Physaria congesta</i>	Dudley Bluffs bladderpod	G1	S1	LT	-	Barrens
<i>Physaria obcordata</i>	Piceance twinpod	G1G2	S1S2	LT	-	Barrens
<i>Physaria parviflora</i>	Piceance bladderpod	G2	S2	-	BLM	Barrens
<i>Physaria pruinosa</i>	Pagosa bladderpod	G2	S2	-	BLM, USFS	Barrens
<i>Physaria pulvinata</i>	Cushion bladderpod	G1	S1	-	BLM, USFS	Shrubland
<i>Physaria rollinsii</i>	Rollins' twinpod	G1	S1	-	-	Shrubland
<i>Physaria scrotiformis</i>	West silver bladderpod	G1	S1	-	USFS	Alpine
<i>Physaria vicina</i>	Good- neighbor bladderpod	G2	S2	-	BLM	Pinyon-juniper
<i>Potentilla rupincola</i>	Rocky Mountain cinquefoil	G2	S2	-	USFS	Cliff and Canyon
<i>Ptilagrostis porteri</i>	Porter feathergrass	G2	S2	-	USFS	Wetland
<i>Puccinellia parishii</i>	Parish's alkali grass	G2G3	S1	-	-	Wetland
<i>Salix arizonica</i>	Arizona willow	G2G3	S1	-	USFS	Wetland
<i>Saussurea weberi</i>	Weber saussurea	G2G3	S2	-	-	Alpine
<i>Sclerocactus glaucus</i>	Colorado hookless cactus	G2G3	S2S3	LT	-	Shrubland
<i>Sclerocactus mesae-verdae</i>	Mesa Verde cactus	G2	S2	LT	-	Barrens
<i>Spiranthes diluvialis</i>	Ute ladies' tresses	G2G3	S2	LT	-	Wetland
<i>Telesonix jamesii</i>	James' telesonix	G2	S2	-	-	Cliff and Canyon
<i>Thalictrum heliophilum</i>	Sun- loving meadowrue	G2	S2	-	BLM, USFS	Barrens
<i>Thelypodopsis juniperorum</i>	Juniper tumble mustard	G2	S2	-	-	Pinyon-juniper
<i>Thelypodium paniculatum</i>	Northwestern thelypody	G2	SH	-	-	Wetland
<i>Townsendia fendleri</i>	Fendler's townsend-daisy	G2	S2	-	-	Barrens
<i>Townsendia glabella</i>	Smooth Easter daisy	G2	S2	-	-	Barrens
<i>Townsendia rothrockii</i>	Rothrock townsend-daisy	G2G3	S2S3	-	-	Alpine

Appendix B

Listed by Colorado Counties - 2015 Colorado G1 and G2 Rare Native Plants

Rare plants list compiled by the Colorado Natural Heritage Program (CNHP). Listed alphabetically by counties and then sorted by Global Imperial Rank within each county. Please refer to Appendix A for a description of the habitat type for where the rare plant will most likely be found.

Abbreviations:

See Appendix A for the list of abbreviations.

County	Scientific Name	Common Name	Global Rank	State Rank	ESA Listing	Federal Sensitive Species List
-	<i>Erigeron abajoensis</i>		G1G2	S1?	-	-
-	<i>Lepidium huberi</i>	Huber's pepperweed	G1G2	S1S2	-	-
-	<i>Caesalpinia repens</i>	creeping rush-pea	G2	S1	-	-
-	<i>Mentzelia paradoxensis</i>	Paradox stickleaf	G2?	S2?	-	-
-	<i>Hackelia besseyi</i>	Bessey's stickseed	G2G3	SNR	-	-
-	<i>Opuntia heacockiae</i>	Heacock's prickly-pear	G2G3Q	S2S3	-	-
-	<i>Penstemon teucroides</i>	germander beardtongue	G2G3Q	S2S3	-	-
-	<i>Myosurus nitidus</i>	western mousetail	G2G4	S1	-	-
Alamosa	<i>Draba smithii</i>	Smith whitlow-grass	G2	S2	-	USFS
Alamosa	<i>Castilleja puberula</i>	Downy indian-paintbrush	G2G3	S2S3	-	-
Alamosa	<i>Peritoma multicaulis</i>	slender spiderflower	G2G3	S2S3	-	BLM
Alamosa	<i>Gastrolychnis kingii</i>	King's campion	G2G4Q	S1	-	-
Archuleta	<i>Ipomopsis polyantha</i>	Pagosa skyrocket	G1	S1	LE	-
Archuleta	<i>Astragalus iodopetalus</i>	Violet milkvetch	G2	S1	-	USFS
Archuleta	<i>Draba smithii</i>	Smith whitlow-grass	G2	S2	-	USFS
Archuleta	<i>Physaria pruinosa</i>	Pagosa bladderpod	G2	S2	-	BLM, USFS
Archuleta	<i>Townsendia glabella</i>	Smooth Easter daisy	G2	S2	-	-
Archuleta	<i>Castilleja puberula</i>	Downy indian-paintbrush	G2G3	S2S3	-	-
Baca	<i>Frasera coloradensis</i>	Colorado green gentian	G2G3	S2S3	-	-
Bent	<i>Frasera coloradensis</i>	Colorado green gentian	G2G3	S2S3	-	-
Boulder	<i>Mimulus gemmiparus</i>	budding monkeyflower	G1	S1	-	USFS
Boulder	<i>Astragalus sparsiflorus</i>	Front Range milkvetch	G2	S2	-	-
Boulder	<i>Draba exunguiculata</i>	clawless draba	G2	S2	-	USFS
Boulder	<i>Potentilla rupincola</i>	Rocky Mountain cinquefoil	G2	S2	-	USFS
Boulder	<i>Aletes humilis</i>	Larimer aletes	G2G3	S2S3	-	-
Boulder	<i>Castilleja puberula</i>	Downy indian-paintbrush	G2G3	S2S3	-	-
Boulder	<i>Physaria bellii</i>	Bell's twinpod	G2G3	S2S3	-	-
Boulder	<i>Spiranthes diluvialis</i>	Ute ladies' tresses	G2G3	S2	LT	-
Chaffee	<i>Eriogonum brandegeei</i>	Brandegee wild buckwheat	G1G2	S1S2	-	BLM, USFS
Chaffee	<i>Boechera crandallii</i>	Crandall's rock-cress	G2	S2	-	BLM

County	Scientific Name	Common Name	Global Rank	State Rank	ESA Listing	Federal Sensitive Species List
Chaffee	<i>Draba exunguiculata</i>	clawless draba	G2	S2	-	USFS
Chaffee	<i>Draba grayana</i>	Gray's Peak whitlow-grass	G2	S2	-	USFS
Chaffee	<i>Eriogonum coloradense</i>	Colorado wild buckwheat	G2	S2	-	BLM
Chaffee	<i>Nuttallia densa</i>	Arkansas Canyon stickleaf	G2	S2	-	BLM
Chaffee	<i>Townsendia fendleri</i>	Fendler's townsend-daisy	G2	S2	-	-
Chaffee	<i>Townsendia rothrockii</i>	Rothrock townsend-daisy	G2G3	S2S3	-	-
Clear Creek	<i>Mimulus gemmiparus</i>	budding monkeyflower	G1	S1	-	USFS
Clear Creek	<i>Draba exunguiculata</i>	clawless draba	G2	S2	-	USFS
Clear Creek	<i>Draba grayana</i>	Gray's Peak whitlow-grass	G2	S2	-	USFS
Clear Creek	<i>Botrychium lineare</i>	narrowleaf grapefern	G2G3	S2S3	-	USFS
Clear Creek	<i>Castilleja puberula</i>	Downy indian-paintbrush	G2G3	S2S3	-	-
Conejos	<i>Castilleja puberula</i>	Downy indian-paintbrush	G2G3	S2S3	-	-
Conejos	<i>Peritoma multicaulis</i>	slender spiderflower	G2G3	S2S3	-	BLM
Conejos	<i>Salix arizonica</i>	Arizona willow	G2G3	S1	-	USFS
Costilla	<i>Delphinium robustum</i>	Wahatoya Creek larkspur	G2?	S2?	-	-
Costilla	<i>Peritoma multicaulis</i>	slender spiderflower	G2G3	S2S3	-	BLM
Custer	<i>Draba smithii</i>	Smith whitlow-grass	G2	S2	-	USFS
Custer	<i>Penstemon degeneri</i>	Degener beardtongue	G2	S2	-	BLM, USFS
Custer	<i>Saussurea weberi</i>	Weber saussurea	G2G3	S2	-	-
Delta	<i>Astragalus debequaeus</i>	DeBeque milkvetch	G2	S2	-	BLM
Delta	<i>Camissonia eastwoodiae</i>	Eastwood evening-primrose	G2	S1	-	BLM
Delta	<i>Eriogonum pelinophilum</i>	Clay-loving wild buckwheat	G2	S2	LE	-
Delta	<i>Lepidium crenatum</i>	Alkaline pepperwort	G2	S2	-	-
Delta	<i>Penstemon mensarum</i>	Grand Mesa penstemon	G2	S2	-	-
Delta	<i>Thelypodopsis juniperorum</i>	juniper tumble mustard	G2	S2	-	-
Delta	<i>Astragalus naturitensis</i>	Naturita milkvetch	G2G3	S2S3	-	BLM
Delta	<i>Cirsium perplexans</i>	Adobe Hills thistle	G2G3	S2S3	-	-
Delta	<i>Lomatium concinnum</i>	Colorado desert-parsley	G2G3	S2S3	-	BLM
Delta	<i>Sclerocactus glaucus</i>	Colorado hookless cactus	G2G3	S2S3	LT	-
Dolores	<i>Gutierrezia elegans</i>	Lone Mesa snakeweed	G1	S1	-	BLM, USFS
Dolores	<i>Packera mancosana</i>	Mancos shale packera	G1	S1	-	-
Dolores	<i>Physaria pulvinata</i>	Cushion bladderpod	G1	S1	-	BLM, USFS
Dolores	<i>Draba graminea</i>	San Juan draba	G2	S2	-	-
Dolores	<i>Oreocarya revealii</i>	Gypsum Valley cat-eye	G2	S2	-	BLM
Dolores	<i>Puccinellia parishii</i>	Parish's alkali grass	G2G3	S1	-	-
Dolores	<i>Townsendia rothrockii</i>	Rothrock townsend-daisy	G2G3	S2S3	-	-
Douglas	<i>Astragalus sparsiflorus</i>	Front Range milkvetch	G2	S2	-	-
Eagle	<i>Spiranthes diluvialis</i>	Ute ladies' tresses	G2G3	S2	LT	-
El Paso	<i>Oreoxis humilis</i>	Pikes Peak spring parsley	G1	S1	-	USFS
El Paso	<i>Astragalus sparsiflorus</i>	Front Range milkvetch	G2	S2	-	-
El Paso	<i>Draba exunguiculata</i>	clawless draba	G2	S2	-	USFS

County	Scientific Name	Common Name	Global Rank	State Rank	ESA Listing	Federal Sensitive Species List
El Paso	Oenopsis sp. 1	Pueblo goldenweed	G2	S2	-	-
El Paso	Ptilagrostis porteri	Porter feathergrass	G2	S2	-	USFS
El Paso	Telesonix jamesii	James' telesonix	G2	S2	-	-
El Paso	Botrychium lineare	narrowleaf grapefern	G2G3	S2S3	-	USFS
El Paso	Spiranthes diluvialis	Ute ladies' tresses	G2G3	S2	LT	-
Fremont	Eriogonum brandegeei	Brandegee wild buckwheat	G1G2	S1S2	-	BLM, USFS
Fremont	Nuttallia chrysantha	Golden blazing star	G2	S2	-	BLM
Fremont	Nuttallia densa	Arkansas Canyon stickleaf	G2	S2	-	BLM
Fremont	Oenopsis sp. 1	Pueblo goldenweed	G2	S2	-	-
Fremont	Oxybaphus rotundifolius	round-leaf four-o'clock	G2	S2	-	-
Fremont	Penstemon degeneri	Degener beardtongue	G2	S2	-	BLM, USFS
Fremont	Townsendia fendleri	Fendler's townsend-daisy	G2	S2	-	-
Garfield	Penstemon debilis	Parachute penstemon	G1	S1	LT	-
Garfield	Astragalus debequaeus	DeBeque milkvetch	G2	S2	-	BLM
Garfield	Lepidium crenatum	Alkaline pepperwort	G2	S2	-	-
Garfield	Nuttallia rhizomata	Roan Cliffs blazing star	G2	S2	-	BLM
Garfield	Penstemon mensarum	Grand Mesa penstemon	G2	S2	-	-
Garfield	Phacelia submutica	DeBeque phacelia	G2	S2	LT	-
Garfield	Physaria parviflora	Piceance bladderpod	G2	S2	-	BLM
Garfield	Thalictrum heliophilum	sun-loving meadowrue	G2	S2	-	BLM, USFS
Garfield	Thelypodopsis juniperorum	juniper tumble mustard	G2	S2	-	-
Garfield	Astragalus naturitensis	Naturita milkvetch	G2G3	S2S3	-	BLM
Garfield	Cirsium perplexans	Adobe Hills thistle	G2G3	S2S3	-	-
Garfield	Sclerocactus glaucus	Colorado hookless cactus	G2G3	S2S3	LT	-
Garfield	Spiranthes diluvialis	Ute ladies' tresses	G2G3	S2	LT	-
Gilpin	Draba exunguiculata	clawless draba	G2	S2	-	USFS
Gilpin	Draba grayana	Gray's Peak whitlow-grass	G2	S2	-	USFS
Grand	Astragalus osterhoutii	Kremmling Osterhout milkvetch	G1	S1	LE	-
Grand	Mimulus gemmiparus	budding monkeyflower	G1	S1	-	USFS
Grand	Penstemon penlandii	Kremmling beardtongue	G1	S1	LE	-
Grand	Phacelia gina-glenneae	Troublesome phacelia	G1	S1	-	-
Grand	Carex stenoptila	small-winged sedge	G2	S2	-	-
Grand	Draba exunguiculata	clawless draba	G2	S2	-	USFS
Grand	Draba grayana	Gray's Peak whitlow-grass	G2	S2	-	USFS
Grand	Mertensia humilis	Rocky Mountain bluebells	G2	S1	-	-
Grand	Potentilla rupincola	Rocky Mountain cinquefoil	G2	S2	-	USFS
Grand	Botrychium lineare	narrowleaf grapefern	G2G3	S2S3	-	USFS
Grand	Castilleja puberula	Downy indian-paintbrush	G2G3	S2S3	-	-
Gunnison	Astragalus microcymbus	skiff milkvetch	G1	S1	C	BLM
Gunnison	Physaria rollinsii	Rollins' twinpod	G1	S1	-	-
Gunnison	Astragalus iodopetalus	Violet milkvetch	G2	S1	-	USFS

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Gunnison	<i>Boechera crandallii</i>	Crandall's rock-cress	G2	S2	-	BLM
Gunnison	<i>Carex stenoptila</i>	small-winged sedge	G2	S2	-	-
Gunnison	<i>Draba exunguiculata</i>	clawless draba	G2	S2	-	USFS
Gunnison	<i>Eriogonum coloradense</i>	Colorado wild buckwheat	G2	S2	-	BLM
Gunnison	<i>Penstemon mensarum</i>	Grand Mesa penstemon	G2	S2	-	-
Gunnison	<i>Physaria alpina</i>	Avery Peak twinpod	G2	S2	-	-
Gunnison	<i>Thelypodopsis juniperorum</i>	juniper tumble mustard	G2	S2	-	-
Gunnison	<i>Astragalus anisus</i>	Gunnison milkvetch	G2G3	S2S3	-	BLM
Gunnison	<i>Cirsium perplexans</i>	Adobe Hills thistle	G2G3	S2S3	-	-
Gunnison	<i>Lomatium concinnum</i>	Colorado desert-parsley	G2G3	S2S3	-	BLM
Gunnison	<i>Townsendia rothrockii</i>	Rothrock townsend-daisy	G2G3	S2S3	-	-
Hinsdale	<i>Aliciella sedifolia</i>	Stonecrop gilia	G1	S1	-	USFS
Hinsdale	<i>Draba malpighiacea</i>	whitlow-grass	G1?	S1?	-	-
Hinsdale	<i>Carex stenoptila</i>	small-winged sedge	G2	S2	-	-
Hinsdale	<i>Draba graminea</i>	San Juan draba	G2	S2	-	-
Hinsdale	<i>Physaria pruinosa</i>	Pagosa bladderpod	G2	S2	-	BLM, USFS
Hinsdale	<i>Townsendia rothrockii</i>	Rothrock townsend-daisy	G2G3	S2S3	-	-
Huerfano	<i>Carex stenoptila</i>	small-winged sedge	G2	S2	-	-
Huerfano	<i>Draba grayana</i>	Gray's Peak whitlow-grass	G2	S2	-	USFS
Huerfano	<i>Delphinium robustum</i>	Wahatoya Creek larkspur	G2?	S2?	-	-
Jackson	<i>Phacelia formosula</i>	North Park phacelia	G1	S1	LE	-
Jackson	<i>Corispermum navicula</i>	North Park bugseed	G1?	S1	-	BLM
Jackson	<i>Mertensia humilis</i>	Rocky Mountain bluebells	G2	S1	-	-
Jackson	<i>Thelypodium paniculatum</i>	northwestern thelypod	G2	SH	-	-
Jefferson	<i>Mimulus gemmiparus</i>	budding monkeyflower	G1	S1	-	USFS
Jefferson	<i>Astragalus sparsiflorus</i>	Front Range milkvetch	G2	S2	-	-
Jefferson	<i>Telesonix jamesii</i>	James' telesonix	G2	S2	-	-
La Plata	<i>Physaria scrotiformis</i>	West silver bladderpod	G1	S1	-	USFS
La Plata	<i>Draba malpighiacea</i>	whitlow-grass	G1?	S1?	-	-
La Plata	<i>Astragalus iodopetalus</i>	Violet milkvetch	G2	S1	-	USFS
La Plata	<i>Draba graminea</i>	San Juan draba	G2	S2	-	-
La Plata	<i>Townsendia glabella</i>	Smooth Easter daisy	G2	S2	-	-
La Plata	<i>Townsendia rothrockii</i>	Rothrock townsend-daisy	G2G3	S2S3	-	-
Lake	<i>Eutrema penlandii</i>	Mosquito Range mustard	G1G2	S1S2	LT	-
Lake	<i>Boechera crandallii</i>	Crandall's rock-cress	G2	S2	-	BLM
Lake	<i>Draba exunguiculata</i>	clawless draba	G2	S2	-	USFS
Lake	<i>Draba grayana</i>	Gray's Peak whitlow-grass	G2	S2	-	USFS
Lake	<i>Ipomopsis globularis</i>	Globe gilia	G2	S2	-	-
Lake	<i>Physaria alpina</i>	Avery Peak twinpod	G2	S2	-	-
Lake	<i>Ptilagrostis porteri</i>	Porter feathergrass	G2	S2	-	USFS
Lake	<i>Botrychium lineare</i>	narrowleaf grapefern	G2G3	S2S3	-	USFS

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Lake	Saussurea weberi	Weber saussurea	G2G3	S2	-	-
Lake	Townsendia rothrockii	Rothrock townsend-daisy	G2G3	S2S3	-	-
Larimer	Mimulus gemmiparus	budding monkeyflower	G1	S1	-	USFS
Larimer	Phacelia formosula	North Park phacelia	G1	S1	LE	-
Larimer	Draba grayana	Gray's Peak whitlow-grass	G2	S2	-	USFS
Larimer	Mertensia humilis	Rocky Mountain bluebells	G2	S1	-	-
Larimer	Potentilla rupincola	Rocky Mountain cinquefoil	G2	S2	-	USFS
Larimer	Telesonix jamesii	James' telesonix	G2	S2	-	-
Larimer	Aletes humilis	Larimer aletes	G2G3	S2S3	-	-
Larimer	Castilleja puberula	Downy indian-paintbrush	G2G3	S2S3	-	-
Larimer	Physaria bellii	Bell's twinpod	G2G3	S2S3	-	-
Larimer	Spiranthes diluvialis	Ute ladies' tresses	G2G3	S2	LT	-
Las Animas	Carex stenoptila	small-winged sedge	G2	S2	-	-
Las Animas	Draba smithii	Smith whitlow-grass	G2	S2	-	USFS
Las Animas	Oxybaphus rotundifolius	round-leaf four-o'clock	G2	S2	-	-
Las Animas	Delphinium robustum	Wahatoya Creek larkspur	G2?	S2?	-	-
Las Animas	Herrickia horrida	Canadian River spiny aster	G2?	S1	-	-
Las Animas	Frasera coloradensis	Colorado green gentian	G2G3	S2S3	-	-
Mesa	Physaria rollinsii	Rollins' twinpod	G1	S1	-	-
Mesa	Aletes latilobus	Canyonlands aletes	G1G2	S1	-	BLM
Mesa	Lygodesmia doloresensis	Dolores River skeletonplant	G1G2	S1S2	-	BLM
Mesa	Astragalus debequaeus	DeBeque milkvetch	G2	S2	-	BLM
Mesa	Calochortus ciscoensis	Cisco sego lily	G2	S1	-	-
Mesa	Camissonia eastwoodiae	Eastwood evening-primrose	G2	S1	-	BLM
Mesa	Erigeron kachinensis	Kachina daisy	G2	S1	-	BLM
Mesa	Lepidium crenatum	Alkaline pepperwort	G2	S2	-	-
Mesa	Oreocarya revealii	Gypsum Valley cat-eye	G2	S2	-	BLM
Mesa	Penstemon mensarum	Grand Mesa penstemon	G2	S2	-	-
Mesa	Phacelia submutica	DeBeque phacelia	G2	S2	LT	-
Mesa	Physaria parviflora	Piceance bladderpod	G2	S2	-	BLM
Mesa	Thalictrum heliophilum	sun-loving meadowrue	G2	S2	-	BLM, USFS
Mesa	Thelypodopsis juniperorum	juniper tumble mustard	G2	S2	-	-
Mesa	Astragalus naturitensis	Naturita milkvetch	G2G3	S2S3	-	BLM
Mesa	Astragalus piscator	Fisher Towers milkvetch	G2G3	S1	-	BLM
Mesa	Astragalus rafaensis	San Rafael milkvetch	G2G3	S1	-	BLM
Mesa	Cirsium perplexans	Adobe Hills thistle	G2G3	S2S3	-	-
Mesa	Oreocarya osterhoutii	Osterhout cat's-eye	G2G3	S2	-	BLM
Mesa	Sclerocactus glaucus	Colorado hookless cactus	G2G3	S2S3	LT	-
Mesa	Townsendia rothrockii	Rothrock townsend-daisy	G2G3	S2S3	-	-
Mineral	Draba graminea	San Juan draba	G2	S2	-	-
Mineral	Draba smithii	Smith whitlow-grass	G2	S2	-	USFS

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Moffat	<i>Boechera glareosa</i>	Dorn's rockcress	G1	S1	-	-
Moffat	<i>Erigeron wilkenii</i>	Wilken fleabane	G1	S1	-	-
Moffat	<i>Penstemon gibbensii</i>	Gibben's beardtongue	G1G2	S1	-	BLM
Moffat	<i>Anticlea vaginatus</i>	Alcove death camas	G2	S2	-	-
Moffat	<i>Lepidium crenatum</i>	Alkaline pepperwort	G2	S2	-	-
Moffat	<i>Limnorchis zothecina</i>	alcove bog orchid	G2	S1	-	-
Moffat	<i>Oenothera acutissima</i>	Narrow-leaf evening primrose	G2	S2	-	BLM
Moffat	<i>Spiranthes diluvialis</i>	Ute ladies' tresses	G2G3	S2	LT	-
Montezuma	<i>Astragalus humillimus</i>	Mancos milkvetch	G1	S1	LE	-
Montezuma	<i>Astragalus schmolliae</i>	Chapin Mesa milkvetch	G1	S1	C	-
Montezuma	<i>Astragalus tortipes</i>	Sleeping Ute milkvetch	G1	S1	C	BLM
Montezuma	<i>Ipomopsis ramosa</i>	Coral ipomopsis	G1	S1	-	-
Montezuma	<i>Draba malpighiacea</i>	whitlow-grass	G1?	S1?	-	-
Montezuma	<i>Astragalus deterior</i>	Cliff Palace milkvetch	G1G2	S1S2	-	-
Montezuma	<i>Hackelia gracilentia</i>	Mesa Verde stickseed	G1G2	S1S2	-	-
Montezuma	<i>Astragalus cronquistii</i>	Cronquist's milkvetch	G2	S2	-	-
Montezuma	<i>Draba graminea</i>	San Juan draba	G2	S2	-	-
Montezuma	<i>Eriogonum clavellatum</i>	Comb Wash buckwheat	G2	S1	-	BLM
Montezuma	<i>Lepidium crenatum</i>	Alkaline pepperwort	G2	S2	-	-
Montezuma	<i>Sclerocactus mesae-verdae</i>	Mesa Verde cactus	G2	S2	LT	-
Montezuma	<i>Townsendia glabella</i>	Smooth Easter daisy	G2	S2	-	-
Montezuma	<i>Astragalus naturitensis</i>	Naturita milkvetch	G2G3	S2S3	-	BLM
Montrose	<i>Astragalus iodopetalus</i>	Violet milkvetch	G2	S1	-	USFS
Montrose	<i>Erigeron kachinensis</i>	Kachina daisy	G2	S1	-	BLM
Montrose	<i>Eriogonum pelinophilum</i>	Clay-loving wild buckwheat	G2	S2	LE	-
Montrose	<i>Lepidium crenatum</i>	Alkaline pepperwort	G2	S2	-	-
Montrose	<i>Lupinus crassus</i>	Payson lupine	G2	S2	-	BLM
Montrose	<i>Oreocarya revealii</i>	Gypsum Valley cat-eye	G2	S2	-	BLM
Montrose	<i>Penstemon mensarum</i>	Grand Mesa penstemon	G2	S2	-	-
Montrose	<i>Physaria vicina</i>	Good-neighbor bladderpod	G2	S2	-	BLM
Montrose	<i>Thelypodopsis juniperorum</i>	juniper tumble mustard	G2	S2	-	-
Montrose	<i>Astragalus naturitensis</i>	Naturita milkvetch	G2G3	S2S3	-	BLM
Montrose	<i>Astragalus rafaensis</i>	San Rafael milkvetch	G2G3	S1	-	BLM
Montrose	<i>Cirsium perplexans</i>	Adobe Hills thistle	G2G3	S2S3	-	-
Montrose	<i>Lomatium concinnum</i>	Colorado desert-parsley	G2G3	S2S3	-	BLM
Montrose	<i>Sclerocactus glaucus</i>	Colorado hookless cactus	G2G3	S2S3	LT	-
Ouray	<i>Draba graminea</i>	San Juan draba	G2	S2	-	-
Ouray	<i>Physaria vicina</i>	Good-neighbor bladderpod	G2	S2	-	BLM
Ouray	<i>Cirsium perplexans</i>	Adobe Hills thistle	G2G3	S2S3	-	-
Ouray	<i>Lomatium concinnum</i>	Colorado desert-parsley	G2G3	S2S3	-	BLM
Ouray	<i>Townsendia rothrockii</i>	Rothrock townsend-daisy	G2G3	S2S3	-	-

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Park	<i>Draba weberi</i>	Weber's draba	G1	S1	-	USFS
Park	<i>Mimulus gemmiparus</i>	budding monkeyflower	G1	S1	-	USFS
Park	<i>Eutrema penlandii</i>	Mosquito Range mustard	G1G2	S1S2	LT	-
Park	<i>Carex stenoptila</i>	small-winged sedge	G2	S2	-	-
Park	<i>Draba exunguiculata</i>	clawless draba	G2	S2	-	USFS
Park	<i>Draba grayana</i>	Gray's Peak whitlow-grass	G2	S2	-	USFS
Park	<i>Eriogonum coloradense</i>	Colorado wild buckwheat	G2	S2	-	BLM
Park	<i>Ipomopsis globularis</i>	Globe gilia	G2	S2	-	-
Park	<i>Penstemon degeneri</i>	Degener beardtongue	G2	S2	-	BLM, USFS
Park	<i>Physaria alpina</i>	Avery Peak twinpod	G2	S2	-	-
Park	<i>Potentilla rupincola</i>	Rocky Mountain cinquefoil	G2	S2	-	USFS
Park	<i>Ptilagrostis porteri</i>	Porter feathergrass	G2	S2	-	USFS
Park	<i>Telesonix jamesii</i>	James' telesonix	G2	S2	-	-
Park	<i>Castilleja puberula</i>	Downy indian-paintbrush	G2G3	S2S3	-	-
Park	<i>Saussurea weberi</i>	Weber saussurea	G2G3	S2	-	-
Park	<i>Townsendia rothrockii</i>	Rothrock townsend-daisy	G2G3	S2S3	-	-
Pitkin	<i>Draba grayana</i>	Gray's Peak whitlow-grass	G2	S2	-	USFS
Pitkin	<i>Eriogonum coloradense</i>	Colorado wild buckwheat	G2	S2	-	BLM
Pitkin	<i>Penstemon mensarum</i>	Grand Mesa penstemon	G2	S2	-	-
Pitkin	<i>Physaria alpina</i>	Avery Peak twinpod	G2	S2	-	-
Pitkin	<i>Townsendia rothrockii</i>	Rothrock townsend-daisy	G2G3	S2S3	-	-
Prowers	<i>Frasera coloradensis</i>	Colorado green gentian	G2G3	S2S3	-	-
Pueblo	<i>Carex stenoptila</i>	small-winged sedge	G2	S2	-	-
Pueblo	<i>Nuttallia chrysantha</i>	Golden blazing star	G2	S2	-	BLM
Pueblo	<i>Oonopsis</i> sp. 1	Pueblo goldenweed	G2	S2	-	-
Pueblo	<i>Oxybaphus rotundifolius</i>	round-leaf four-o'clock	G2	S2	-	-
Rio Blanco	<i>Physaria congesta</i>	Dudley Bluffs bladderpod	G1	S1	LT	-
Rio Blanco	<i>Physaria obcordata</i>	Piceance twinpod	G1G2	S1S2	LT	-
Rio Blanco	<i>Lepidium crenatum</i>	Alkaline pepperwort	G2	S2	-	-
Rio Blanco	<i>Penstemon grahamii</i>	Graham beardtongue	G2	S1	-	BLM
Rio Blanco	<i>Physaria parviflora</i>	Piceance bladderpod	G2	S2	-	BLM
Rio Blanco	<i>Thalictrum heliophilum</i>	sun-loving meadowrue	G2	S2	-	BLM, USFS
Rio Grande	<i>Draba graminea</i>	San Juan draba	G2	S2	-	-
Rio Grande	<i>Townsendia glabella</i>	Smooth Easter daisy	G2	S2	-	-
Rio Grande	<i>Peritoma multicaulis</i>	slender spiderflower	G2G3	S2S3	-	BLM
Routt	<i>Carex stenoptila</i>	small-winged sedge	G2	S2	-	-
Saguache	<i>Astragalus microcymbus</i>	Skiff milkvetch	G1	S1	C	BLM
Saguache	<i>Carex stenoptila</i>	small-winged sedge	G2	S2	-	-
Saguache	<i>Draba grayana</i>	Gray's Peak whitlow-grass	G2	S2	-	USFS
Saguache	<i>Draba smithii</i>	Smith whitlow-grass	G2	S2	-	USFS
Saguache	<i>Eriogonum coloradense</i>	Colorado wild buckwheat	G2	S2	-	BLM

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Saguache	<i>Delphinium robustum</i>	Wahatoya Creek larkspur	G2?	S2?	-	-
Saguache	<i>Astragalus anisus</i>	Gunnison milkvetch	G2G3	S2S3	-	BLM
Saguache	<i>Castilleja puberula</i>	Downy indian-paintbrush	G2G3	S2S3	-	-
Saguache	<i>Peritoma multicaulis</i>	slender spiderflower	G2G3	S2S3	-	BLM
Saguache	<i>Gastrolychnis kingii</i>	King's champion	G2G4Q	S1	-	-
San Juan	<i>Aliciella sedifolia</i>	Stonecrop gilia	G1	S1	-	USFS
San Juan	<i>Descurainia kenheillii</i>	Heil's tansy mustard	G1	S1	-	-
San Juan	<i>Draba graminea</i>	San Juan draba	G2	S2	-	-
San Juan	<i>Townsendia rothrockii</i>	Rothrock townsend-daisy	G2G3	S2S3	-	-
San Miguel	<i>Physaria pulvinata</i>	Cushion bladderpod	G1	S1	-	BLM, USFS
San Miguel	<i>Draba graminea</i>	San Juan draba	G2	S2	-	-
San Miguel	<i>Oreocarya revealii</i>	Gypsum Valley cat-eye	G2	S2	-	BLM
San Miguel	<i>Astragalus naturitensis</i>	Naturita milkvetch	G2G3	S2S3	-	BLM
San Miguel	<i>Puccinellia parishii</i>	Parish's alkali grass	G2G3	S1	-	-
Summit	<i>Draba weberi</i>	Weber's draba	G1	S1	-	USFS
Summit	<i>Eutrema penlandii</i>	Mosquito Range mustard	G1G2	S1S2	LT	-
Summit	<i>Draba exunguiculata</i>	clawless draba	G2	S2	-	USFS
Summit	<i>Draba grayana</i>	Gray's Peak whitlow-grass	G2	S2	-	USFS
Summit	<i>Ipomopsis globularis</i>	Globe gilia	G2	S2	-	-
Summit	<i>Ptilagrostis porteri</i>	Porter feathergrass	G2	S2	-	USFS
Summit	<i>Saussurea weberi</i>	Weber saussurea	G2G3	S2	-	-
Summit	<i>Townsendia rothrockii</i>	Rothrock townsend-daisy	G2G3	S2S3	-	-
Teller	<i>Oreoxis humilis</i>	Pikes Peak spring parsley	G1	S1	-	USFS
Teller	<i>Penstemon degeneri</i>	Degener beardtongue	G2	S2	-	BLM, USFS
Teller	<i>Telesonix jamesii</i>	James' telesonix	G2	S2	-	-
Weld	<i>Spiranthes diluvialis</i>	Ute ladies' tresses	G2G3	S2	LT	-