

Biological Evaluation for Threatened, Endangered, Proposed and Sensitive Plants

Weminuche Landscape Grazing Analysis USDA Forest Service Columbine Ranger District, San Juan National Forest Hinsdale, La Plata and San Juan Counties, Colorado T36 - 40N, R4 - 9W N.M.P.M.

Introduction

This biological evaluation is being prepared for the proposed Weminuche Landscape Grazing Analysis and complies with Forest Service Manual (FSM) 2672.4 direction effective August 24, 2013. The objectives of a Biological Evaluation are 1) to ensure that Forest Service actions do not contribute to loss of viability of threatened, endangered, proposed, or sensitive plant and animal species, or contribute to a trend towards Federal listing under the Endangered Species Act, and, 2) to incorporate concerns for sensitive species throughout the planning process, identifying opportunities for enhancement and reducing any potential negative impacts.

The sensitive species addressed in this document are from the February 12, 2015 Rocky Mountain Region Sensitive Plant list and include only those species known or suspected to occur on the San Juan National Forest. The threatened and endangered species considered in this document are from an August 11, 2014 concurrence letter from the U.S. Fish and Wildlife Service.

Project Location

The Weminuche Landscape Grazing Analysis Area encompasses approximately 166,628 acres of which 85% is in the Weminuche Wilderness and 15% is on non-wilderness lands. The area is located northeast of Durango, Colorado, in Hinsdale, La Plata, and San Juan Counties, in Townships 36-40 North, Ranges 4-9 West, N.M.P.M. and is within the Columbine Ranger District, San Juan National Forest, Colorado.

Approximately 162,572 acres of the analysis area (98%) are on National Forest System (NFS) lands. The remaining 4,056 acres are split out between Durango Reservoir Grant lands (City Reservoir) at 2,962 acres and private lands at 1,094 acres within the boundaries of the National Forest.

Analysis Area Description

The majority of the analysis area is located just west and south of the Continental Divide in extremely rugged, volcanic mountains with elevations ranging from approximately 7,200 feet to 14,100 feet. The Florida and Pine Rivers and Vallecito Creek have their headwaters in the analysis area. The analysis area is principally alpine tundra, mountain grasslands, and spruce-fir forest. There are smaller areas of aspen, mixed conifer, ponderosa pine, and mountain shrub communities. Cirques and talus-covered slopes, along with numerous streams, fens, and lakes add diversity to the rugged landscape.

There are six active sheep and goat (S&G) grazing allotments included in this analysis and seven currently vacant S&G grazing allotments. The active allotments are: Burnt Timber, Canyon Creek, Spring Gulch, Endlich Mesa (formerly East Silver Mesa), Tank Creek and Virginia Gulch. The vacant allotments are: Fall Creek, Flint Creek, Johnson Creek, Leviathan, Pine River, Rock Creek, and Cave Basin.

Various sections of roads and trails may be used for trailing livestock to reach the grazing allotments in this landscape; some trailing routes are outside the analysis area project boundary, and have been included in this analysis. The trailing routes include the following:

- U.S. Highway 160,
- County Roads: 151, 172, 240, 243, 318, 319, 501, 502, 521, 523, 527
- Forest Roads: 076 (Red Rim 2), 081 (Lime Mesa), 595 (Red Rim), 597 (Endlich Mesa), 602 (Pine River), 682 (Missionary Ridge), 724 (Middle Mountain), 775 (Saul's Creek)
- Trail segments of: Pine River Trail 523, Vallecito Creek Trail 529, Cave Basin Trail 530, Young's Canyon Trail 546, and Lime Mesa Trail 676
- A right of way across MacDonald Becket Family Trust properties, and its successors, for access to Canyon Creek Allotment and other cattle allotments.

For this analysis area, the Forest Plan level analysis has determined that approximately 58,408 acres (35%) of the total 166,628 acres within the analysis area are generally suitable for sheep grazing. This same analysis area has 50,239 acres suitable for cattle. These two determinations are based on factors including ownership, topography, slope, soils and geology, vegetation type, canopy cover and distance to water. Private lands within the analysis area are not counted as being suitable since we do not authorize grazing on those lands; however if the lands are not fenced out grazing likely occurs if livestock are using the area. This includes the City Reservoir area.

Alternatives and Proposed Action

Alternative 1: No livestock grazing: Under this alternative, no livestock grazing permits will be authorized in the analysis area.

Alternative 2: Current Management: The status of the following six allotments would continue to be active grazing: Burnt Timber, Canyon Creek (currently cattle, could be either sheep or cattle), Endlich Mesa, Spring Gulch, Tank Creek and Virginia Gulch. The other seven allotments within the analysis area would remain vacant and available for future permit applications.

Alternative 3: Adaptive Management with Forage Reserves: Specifics for Alternative 3 are as follows*:

- Adaptive management strategy would be employed on all allotments to provide for management flexibility based on desired conditions
- Alternative 3 would reissue six term grazing permits on the following currently active allotments: Burnt Timber, Canyon Creek, Endlich Mesa, Spring Gulch, Tank Creek, and Virginia Gulch.
- The western-most parts of Tank Creek and Canyon Creek would be closed to livestock grazing (total of 5,117 acres) except for trailing to the allotment.
- Boundary adjustments would include adding 1,553 acres from the previously closed Needles Mountains Allotment (*SJNF 2009*) to allotments through logical boundary shifts.
- The northern 2/3 of Rock Creek Allotment, all of Leviathan Allotment, and most of Johnson Creek Allotment would be designated as sheep forage reserves. The remaining parts of Johnson Creek and Rock Creek would be closed to term livestock grazing.
- The southern quarter of the Cave Basin Allotment would be designated as a cattle forage reserve, but closed to sheep grazing.
- Flint Creek and most of Fall Creek Allotments would be closed to all livestock grazing under term permits, along with the northern ¾ of Cave Basin Allotment.
- Canyon Creek Allotment requires fencing at various places on the north, west and south boundaries to prevent cattle from drifting into other allotments. An additional pasture fence

may be needed to create a third pasture. Fencing could be electric or four wire lay-down style fences. Two new stock ponds may be needed to improve cattle distribution. This allotment would be closed to sheep grazing.

Access to allotments would continue through trailing from private lands to National Forest Lands (Forest Service has no authority to authorize or deny use of private land trailing routes).

**For definitions, maps and further explanation of alternative, please refer to the Weminuche Landscape Grazing DEIS (SJNF 2015)*

Alternative 4: Proposed Action: This alternative would incorporate all the adaptive management options of Alternative 3 for the active grazing allotments (Burnt Timber, Canyon Creek, Endlich Mesa, Spring Gulch, Tank Creek and Virginia Gulch), including some boundary adjustments, trailing, and design criteria. However, all the currently vacant sheep allotments would be closed to all livestock term permit grazing. No forage reserves would be authorized. Additionally, the authorized type of livestock on some allotments, or portions of some allotments, is specified in this alternative as sheep, cattle or either class of livestock. This includes the following specifically:

- All of Burnt Timber, Canyon Creek and Spring Gulch would be open/active for either class of livestock
- Southern 1/3rd of the Tank Creek allotment would be open/active to either class of livestock. The northern 2/3rd would remain open/active for sheep grazing only.
- Southern 1/3rd of Endlich Mesa would be open/active to either class of livestock. The northern 2/3rd would remain open/active for sheep grazing only.

Pre-field and Field Review of Federally Listed, Proposed, Candidate and Region 2 Sensitive Species Considered

There are two federally listed plant species with potential to occur on the San Juan National Forest (USFWS 2013)(Table 1). There are no federally listed threatened or endangered plant species known to occur on the Columbine District including the analysis area. Furthermore, there is no potential habitat for either endangered species within the analysis area.

Table 1: USFWS Federally Listed Plant Species with Potential to Occur on the San Juan National Forest

Species	Status	Habitat Description	Potential to Occur in Analysis Area (AA)
Knowlton's cactus (<i>Pediocactus knowltonii</i>)	E	Rolling, gravelly hills in piñon-juniper/sagebrush communities at about 6,200 to 6,300 feet elevation. Strongly associated with pea to cobble size gravels (tertiary alluvial deposits of the San Jose Formation) covering a majority of the soil, black sagebrush (<i>Artemisia nova</i>), and occurrence of reindeer lichen (<i>Hypogymnia physodes</i> var. <i>vittata</i>).	No potential to occur in the AA
Pagosa skyrocket (<i>Ipomopsis polyantha</i>)	E	Found on barren shale, ponderosa pine, piñon-juniper, or scrub-oak communities on the Mancos Shale Formation. Elevation 6,750-7,775 feet.	No potential to occur in the AA

E=Endangered

The entire analysis area has not been surveyed for sensitive plants. Many visits to the analysis area were made by the Columbine Interdisciplinary Team in 2009 through 2014. In addition to site visits completed by qualified Forest Service personnel, Colorado Natural Heritage Program (CNHP) Botanists have surveyed portions of the analysis area specifically within the Weminuche Wilderness Area.

There are twenty-four sensitive plant species known or suspected to occur on the San Juan National Forest (USFS 2015). These species are listed in Table 2 on the next page. Of those, twenty-three are known to occur, or have potential to occur on the Columbine District. GIS data from the Colorado Natural Heritage Program (CNHP 2015) was analyzed to determine known populations of sensitive species within the analysis area. According to CNHP, five of the twenty-three sensitive species are known to occur in the analysis area and twelve are suspected to occur due to potential habitat for those species within the analysis area.

Table 2: Pre-field checklist of sensitive plant species known or suspected to occur on the San Juan National Forest based on the August 2014 list for Forest Service Region 2.

Species	Habitat	Potential to occur in Planning Area (PA)	Determination
<i>Aliciella sedifolia</i> Stonecrop gilia	Alpine; dry, rocky gravelly talus of tuffaceous sandstone	Yes	May impact individuals
<i>Astragalus missouriensis</i> var. <i>humistratus</i> Missouri milkvetch	Flat, shale meadows and on shallow slopes, including roadsides and other disturbed areas	No	No impact
<i>Astragalus proximus</i> Aztec milkvetch	Mesas, bluffs, & low hills in sandy, often alkaline, clay soil in sagebrush and pinyon juniper. Mancos shale <6500 feet	No	No impact
<i>Carex diandra</i> Lesser panicled sedge	On floating and non-floating mats of peat, at pond edges, on hummocks in open shrub and sedge meadows; 6,100 – 8,600 ft.	Yes	May impact individuals
<i>Cypripedium parviflorum</i> Yellow lady's slipper orchid	Ponderosa pine, Doug-fir, aspen and spruce-fir forest; on the San Juan has been found in pine/oak stand at 8,000 ft.	Yes	May impact individuals
<i>Draba smithii</i> Smith's draba	Talus slopes, in crevices and between rocks in shaded protected sites; 8,000-11,000 feet	Yes	May impact individuals
<i>Drosera anglica</i> English sundew	On floating and non-floating mats of peat in fens and sedge fens at 7,900 – 8,500 feet	Yes	May impact individuals
<i>Epipactis gigantea</i> Stream orchid	Decomposed sandstone; sandstone seeps; <8,000 feet	No	No impact
<i>Eriophorum altaicum</i> var. <i>neogaeum</i> whitebristle cottongrass	Fens, marshes & bogs at high elevations; 10,800 – 13,200 ft.	Known to occur	May impact individuals
<i>Eriophorum chamissonis</i> Chamisso's cottongrass	Montane swamps and bogs at 7,350- 8,320 feet	Known to occur	May impact individuals
<i>Eriophorum gracile</i> Slender cottongrass	Sedge meadows and floating bogs in saturated soil to shallow standing water at 6,900 – 8,000 feet	Yes	May impact individuals
<i>Gutierrezia elegans</i> Lone Mesa snakeweed	Pinyon-juniper, semi-desert shrubland, sagebrush (barren Mancos shale outcrops)	No	No impact
<i>Lesquerella pruinosa</i> Frosty bladderpod	Mancos shale; ponderosa pine, Gambel oak; 6,800 – 8,000 feet	No	No impact
<i>Machaeranthera coloradoensis</i> Colorado tansyaster	Gravelly soils; subalpine tundra; limestone, dolomite, shale or other calcareous substrates. 9,000 – 11,000 feet	Known to occur	May impact individuals
<i>Parnassia kotzebuei</i> Kotzebue's grass-of-Parnassus	Moist seeps, grassy, wet tundra on thin clay soil, and moist ledges below steep talus slopes; 10,000 – 12,000 ft.	Yes	May impact individuals
<i>Physaria pulvinata</i> cushion bladderpod	Pinyon-juniper, semi-desert shrubland, sagebrush (barren shale outcrops)	No	No impact
<i>Physaria scrotiformis</i> West silver bladderpod	Alpine (barren exposure of Leadville limestone)	Known to occur	May impact individuals
<i>Salix arizonica</i> Arizona willow	Subalpine wet meadows & streamsides; 10,000 – 11,500 ft.	Yes	May impact individuals
<i>Salix candida</i> sageleaf willow	On floating mats & in bogs, fens and willow thickets around ponds on wet to saturated, histic soils; 8800 – 10,600 ft.	Known to occur	May impact individuals
<i>Salix serissima</i> autumn willow	Riparian/wetland (fens)	Yes	May impact individuals
<i>Sphagnum angustifolium</i> Sphagnum moss	As floating mats, carpets, and/or hummocks in fens, open mires, sedge fens and muskegs	Yes	May impact individuals
<i>Sphagnum balticum</i> Baltic bog moss	Abundant in hollows and floating mats in raised bogs and poor fens; low to high elevation	Yes	May impact individuals
<i>Triteleia grandiflora</i> largeflower triteleia	Ponderosa pine forest, 7,000 – 8,000 feet	No	No impact
<i>Utricularia minor</i> Lesser bladderwort	Fens, bogs, edges of ponds, and slow-moving streams at high elevations near 11,000 feet	Yes	May impact individuals

Sensitive Species Known to Occur in the Analysis Area

There are known occurrences of *Eriophorum altaicum* var. *neogaeum* (whitebristle cottongrass), *Eriophorum chamissonis* (Chamisso's cottongrass), *Machaeranthera coloradoensis* (Colorado tansyaster), *Physaria scrotiformis* (West Silver bladderpod) and *Salix candida* (sageleaf willow) in the analysis area. An analysis of the impacts of the proposed project on these species has been completed and is discussed below.

***Eriophorum altaicum* var. *neogaeum* (whitebristle cottongrass)**

Habitat: *Eriophorum altaicum* var. *neogaeum* is found in fens, bogs, and other wetlands at elevations of 9,500 to 14,000 feet (Panjabi, 2007). It grows in hydric soils with high levels of organic matter, and prefers open habitats, on slopes less than 20 percent with variable aspects (Ladyman, 2004). It can be distinguished from other species of *Eriophorum* by its solitary head on a distinct peduncle (Panjabi, 2007).

Distribution and Occurrences: *Eriophorum altaicum* var. *neogaeum* is known from approximately 29 occurrences in Colorado, including 18 on the San Juan National Forest. Nationally, *E. altaicum* var. *neogaeum* has recorded occurrences in Montana, Wyoming, Utah and Colorado. It is only recognized as a unique species in Colorado, where it is found high in the Rocky Mountains (Ladyman, 2004; Weber and Wittman, 2001).

Direct, Indirect and Cumulative Impacts: There are documented occurrences of *Eriophorum altaicum* var. *neogaeum* in the Tank Creek, Virginia Gulch, Leviathan and Cave Basin allotments in areas high in peat accumulating wetlands and fens (Lyon, 2002). In Alternative 1, these allotments would be closed to livestock grazing. Therefore, under this alternative, sheep grazing would have no direct impacts on these populations. In Alternative 2, current management, the four allotments would stay *active* (having a current permit to graze livestock) or *vacant* (available to permitted livestock grazing).

For Alternative 2, potential direct impacts due to sheep grazing include grazing, trampling, uprooting individual plants, and potentially exposing soil during trailing and grazing. Indirectly, these activities may lead to disturbance of the wetland system and aid in the introduction of non-native plants. Furthermore, sheep typically prefer drier sites and do not like to stand or gather in saturated wetland areas (Zillich, 2010). However, impacts to the species could occur through watering and incidental movement of sheep bands. Any impacts are anticipated to be localized and of short duration with the application of project-specific design criteria, which aim to prevent sheep grazing activities in the wet areas this species inhabits. These design criteria are listed in more detail in Appendix A.

In Alternative 3, the Tank Creek and Virginia Gulch allotments would remain open for livestock grazing and the permits active. Potential direct impacts from sheep grazing to *E. altaicum* var. *neogaeum* within these two allotments under this alternative would be the same as in Alternative 2.

Under Alternative 3, the Leviathan allotment would be designated as a sheep forage reserve with the potential to be grazed by permitted livestock for up to three years within a ten-year period. The impacts to the population of *E. altaicum* var. *neogaeum* here would be the same as in Alternative 2 though the potential for impacts due to grazing sheep would be more infrequent.

Also under Alternative 3, a portion (6,200 acres) of the Cave Basin allotment would become a forage reserve for temporary cattle grazing. This portion of the allotment includes a wetland area with a population of *E. altaicum* var. *neogaeum*. Therefore, potential direct impacts to this population of *E. altaicum* var. *neogaeum* include grazing, trampling, uprooting of individual plants and potentially exposing the soil during trailing and grazing. Indirectly, cattle can stomp and wallow in and around the wetland areas and can cause disruptions in the hydrological systems. These disturbances can also aid in the introduction of non-native plant species. Design criteria specific to cattle grazing would aid in minimizing the direct and indirect impacts of grazing cattle.

Under Alternative 4, the Virginia Gulch allotment would remain open for livestock grazing and the permits active. Potential direct impacts to *E. altaicum var. neogaeum* within this allotment under this alternative would be the same as in Alternative 2. Tank Creek would also remain open and active but the southern 1/3rd of the allotment could be permitted for either sheep or cattle grazing. The direct and indirect impacts to *E. altaicum var. neogaeum* would be the same as in Alternative 2. If cattle were permitted to graze in the Tank Creek allotment, construction of up to 2-miles of fence could be constructed to aid in cattle distribution. Indirect impacts could also be the introduction and spread of invasive plant species during fence construction activities. Additionally, cattle can stomp and wallow in and around the wetland areas and can cause disruptions in the hydrological systems. These disturbances can also aid in the introduction of non-native plant species. Design criteria specific to cattle grazing and fence construction would aid in minimizing the direct and indirect impacts of grazing cattle.

Under Alternative 4, the Cave Basin and Leviathan allotments would be closed. Therefore, there would be no direct or indirect impacts from livestock grazing to those populations of *E. altaicum var. neogaeum*.

Additional habitat for this species does exist in other allotments within the analysis area that are proposed as active and available for livestock grazing. If livestock were to utilize these areas, potential direct and indirect impacts to this species would be the same as in Alternative 2. Any impacts would be localized and of short duration with the application of project-specific design criteria.

Design Criteria and Monitoring: Specific design criteria for Alternatives 3 and 4 requires that wet areas with saturated soils be avoided until they are dry enough to prevent livestock trampling impacts; that permittees will move livestock away from areas of concern (including riparian areas and fens); that livestock grazing will be managed in riparian areas and willow cars; that livestock will be moved away from water sources after animals have finished drinking; that herders will minimize recurring trailing routes to prevent soil compaction and alterations in hydrologic function; that bedding, salting, trailing and intentional grazing in areas of known sensitive plant populations be prevented; and that bedding, camping and salting is done strategically to avoid wetlands and fens.

Additionally, monitoring will be conducted to ensure compliance with Annual Operating Instructions. Specific design criteria and adaptive management options are listed and implemented as needed to ensure desired conditions are being met or are within the trajectory of management goals. Under Alternative 3 and 4, monitoring will be conducted and adaptive management techniques will be implemented, if necessary, to avert potentially negative trends.

Determination: Though design criteria and monitoring would be in place to minimize impacts to this species, activities associated with livestock grazing may impact individuals of *E. altaicum var. neogaeum*. However, these impacts are expected to be localized and of short-duration based on the adaptive management strategies. Furthermore, this species is widely distributed throughout the United States and local habitat exists for this species where no management activities occur. Therefore, for *Eriophorum altaicum var. neogaeum*, a **“may adversely impact individuals, but not likely to result in a loss of viability in the planning area, nor cause a trend to federal listing”** determination was made.

***Eriophorum chamissonis* – Chamisso’s cottongrass**

Habitat: *Eriophorum chamissonis* is found in Colorado at elevations of 11,000 to 12,000 feet, in montane bogs and swamps (Decker, 2006). Globally, this species is found in cool temperate, alpine, and arctic regions in wetlands with peat soils that are supported by groundwater discharge or snowmelt (Ball and Wujek 2002).

Distribution and Occurrences: *Eriophorum chamissonis* is known from six occurrences in Colorado, including two on the San Juan National Forest. Both occurrences are on the Columbine Ranger

District, with one occurring at 11,600 feet near the Colorado Trail and the other occurring at 11,800 feet in the Weminuche Wilderness, near the Endlich Mesa Trail (Decker, 2006), which is within this analysis area.

Direct, Indirect, and Cumulative Impacts: There are two known occurrence of *Eriophorum chamissonis* in the Endlich Mesa allotment. In Alternative 1, this allotment would be closed to livestock grazing. Therefore, under this alternative, sheep grazing would have no direct impacts on this population.

In Alternative 2, current management, the allotment would be open to livestock grazing. Potential direct impacts due to sheep grazing include grazing, trampling, uprooting individual plants, and potentially exposing soil during trailing and grazing. Indirectly, these impacts may lead to disturbance of the wetland system and aid in the introduction of non-native plants. Based on observations by forest hydrologist (Zillich, 2010), sheep do not like to stand or gather in saturated wetland areas. However, impacts to wetlands and this species could occur through watering and incidental movement of sheep bands. Any impacts are anticipated to be localized and of short duration with the application of project-specific design criteria, which aim to prevent sheep grazing in the wet areas this species inhabits.

In Alternative 3, adaptive management strategies would be employed and the Endlich Mesa allotment would remain open for livestock grazing. Potential direct impacts to *Eriophorum chamissonis* within this allotment under this alternative would be the same as in Alternative 2.

Under Alternative 4, Endlich Mesa would remain open for livestock grazing and could be permitted for sheep or cattle grazing. If the allotment were permitted for cattle grazing, 1-mile of lay-down or electric fence may be constructed to aid in livestock distribution. There should be no impacts from this activity as fence construction would not take place through or on the close perimeter of a fen or wetland where this species and its habitat may occur. Additionally, cattle can stomp and wallow in and around the wetland areas and can cause disruptions in the hydrological systems. These disturbances can also aid in the introduction and spread of non-native plant species to wetland and fen ecosystems. Design criteria specific to cattle grazing and fence construction would aid in minimizing the direct and indirect impacts of grazing cattle.

Additional habitat for this species does exist in other allotments within the analysis area that are proposed as vacant and available for livestock grazing. If livestock were to utilize these areas, potential direct and indirect impacts due to sheep grazing would be the same as Alternative 2 explained above. However, impacts are anticipated to be localized and of short duration with the application of project-specific design criteria.

Design Criteria and Monitoring: Specific design criteria for Alternatives 3 and 4 requires that wet areas with saturated soils be avoided until they are dry enough to prevent livestock trampling impacts; that permittees will move livestock away from areas of concern (including riparian areas and fens); that livestock grazing will be managed in riparian areas and willow cars; that livestock will be moved away from water sources after animals have finished drinking; that herders will minimize reoccurring trailing routes to prevent soil compaction and alterations in hydrologic function; that bedding, salting, trailing and intentional grazing in areas of known sensitive plant populations be prevented; and that bedding, camping and salting is done strategically to avoid wetlands and fens.

Additionally, monitoring will be conducted to ensure compliance with Annual Operating Instructions. Specific design criteria and adaptive management options are listed and implemented as needed to ensure desired conditions are being met or are within the trajectory of management goals. Under Alternative 3 and 4, monitoring will be conducted and adaptive management techniques will be implemented, if necessary, to avert potentially negative trends.

Determination: Though design criteria and monitoring would be in place to minimize impacts to this species, activities associated with livestock grazing may impact individuals of *E. chamissonis*. However, these impacts are expected to be localized and of short-duration based on the adaptive

management strategies. Furthermore, habitat exists for this species where no management activities occur. Therefore, for *Eriophorum chamissonis*, a **“may adversely impact individuals, but not likely to result in a loss of viability in the planning area, nor cause a trend to federal listing”** determination was made.

***Machaeranthera coloradoensis* – Colorado tansy-aster**

Habitat: In Colorado, *Machaeranthera coloradoensis* is found at elevations ranging from 7,600 to 13,000 feet on both the eastern and western slopes (Colorado Natural Heritage Program, 2004). Habitat is quite variable, from pinyon-juniper and ponderosa pine forests and parks to alpine meadows and dry tundra. Microhabitats include open gravelly slopes, rock outcroppings, bluffs, ridges and flats, and road-cuts (CNHP, 2004).

Distribution and Occurrences: *Machaeranthera coloradoensis* is known from twenty-four occurrences in central, south-central, and southwestern Colorado, including five occurrences on the San Juan National Forest. Locations on the San Juan include populations in La Plata, Rio Grande and Hinsdale Counties (Beatty et al, 2004). All populations occur at elevations of 12,000 to 13,000 feet, in locations including the Continental Divide between the San Juan and Rio Grande National Forests (Beatty et al, 2004). *M. coloradoensis* has reported occurrences in the Tank Creek and the Pine River allotment of the analysis area on the Columbine Ranger District.

Direct, Indirect, and Cumulative Impacts: In Alternative 1, these allotments would be closed to livestock grazing. Therefore, under this alternative, livestock grazing would have no direct impacts on this population of *Machaeranthera coloradoensis*. In Alternative 2, the Pine River allotment would be vacant and have the potential for permitted livestock to be grazed and Tank Creek would remain open and active. Potential direct impacts due to sheep grazing include grazing, trampling, uprooting individual plants, and potentially exposing mineral soil during trailing and grazing. Indirectly, these impacts may lead to disturbance and exposure of mineral soil, which aids in the introduction of non-native plants. Any impacts are anticipated to be localized and of short duration with the application of project-specific design criteria and adaptive management options.

In Alternative 3 and 4, the Pine River allotment would be closed to sheep grazing so there would be no direct or indirect impacts to *Machaeranthera coloradoensis* within this allotment. Under Alternative 3, Tank Creek would stay active and open to sheep grazing and in Alternative 4 Tank Creek would stay open to sheep grazing with the potential for permitted cattle grazing in the southern 1/3 of the Tank Creek allotment. The direct and indirect impacts to *M. coloradoensis* would be the same as in Alternative 2. For Alternative 4, if cattle were permitted to graze in the Tank Creek allotment, construction of up to 2-miles of fence could be constructed to aid in cattle distribution. Indirect impacts could also be the introduction and spread of invasive plant species during fence construction activities. Additionally, cattle may stomp and wallow in and around the wetland areas and may cause disruptions in the hydrological systems. These disturbances may also aid in the introduction or spread of non-native plant species to wetlands and fens. Design criteria specific to cattle grazing and fence construction would aid in minimizing the direct and indirect impacts of grazing cattle.

Additional habitat for this species does exist in other allotments within the analysis area that are proposed as vacant and available for livestock grazing. If livestock were to utilize these areas, potential direct impacts due to sheep grazing include grazing, trampling, uprooting individual plants, and potentially exposing mineral soil during trailing and grazing. Indirectly, these impacts may lead to disturbance of the soils and aid in the introduction or spread of invasive plants. However, impacts are anticipated to be localized and of short duration with the application of project-specific design criteria and adaptive management options.

Design Criteria and Monitoring: Specific design criteria for Alternatives 2, 3 and 4 require that permittees move livestock away from areas of concern and that bedding, salting, trailing and intentional grazing in areas of known sensitive plant populations be prevented. In areas within active

and vacant allotments with suitable habitat for *Machaeranthera coloradoensis*, monitoring will be conducted and adaptive management techniques will be implemented to ensure that design criteria to minimize impacts are followed. Adjustments to grazing timing, duration, and/or location will be made if necessary.

Determination: Grazing and activities associated with sheep grazing (trailing, trampling) may impact individuals of this species. However, these impacts are expected to be localized and of short-duration based on the design criteria, monitoring plan, and adaptive management strategies. Therefore, for *Machaeranthera coloradoensis*, a “**may adversely impact individuals, but not likely to result in a loss of viability in the planning area, nor cause a trend to federal listing**” determination was made.

***Physaria scrotiformis* – West Silver Bladderpod**

Habitat: *Physaria scrotiformis* is a diminutive, long-lived perennial known from the lower alpine zone of the San Juan Mountains in southwest Colorado. High-elevation *Physaria* species are found in Montana, Idaho, Wyoming, Utah, Nevada and Colorado. They inhabit windswept, fell-field habitats with stony or gravelly substrates formed primarily from limestone, dolomite or derivatives of these. Other species of this genus grow in arid, usually warm or hot, lower-elevation habitats (O’Kane, 2007).

Distribution and Occurrences: *Physaria scrotiformis* is known from one occurrence in Colorado, which is on the San Juan National Forest within the Endlich Mesa allotment of the analysis area. This population is located on windswept, nearly barren exposures of Leadville limestone on West Silver Mesa.

Direct, Indirect, and Cumulative Impacts: In Alternative 1, the Endlich Mesa allotment would be closed to livestock grazing. Therefore, under this alternative, sheep grazing would have no direct impacts on this population of *Physaria scrotiformis*.

In Alternatives 2, current management, the allotment would remain open to permitted livestock grazing. Potential direct impacts due to sheep grazing include grazing, trampling, and uprooting individual plants during trailing and grazing. Indirectly, these impacts may lead to disturbance and exposure of mineral soil, which aids in the introduction of non-native plants. Any impacts are anticipated to be localized and of short duration with the application of project-specific design criteria and adaptive management options.

In Alternatives 3 and 4, adaptive management, the allotment would remain open to permitted sheep grazing and impacts would be the same as in Alternative 2. Potential cattle grazing that may occur under Alternative 4 will not be authorized in the area where the known population of *Physaria scrotiformis* occurs. Therefore, no impacts from cattle grazing would occur.

Design Criteria and Monitoring: The area where *Physaria scrotiformis* is found is on windswept and nearly barren rock exposures. Sheep will not spend much time grazing here as forage and water resources are limited. However, herders may use an area like this as a temporary bed-ground. The area of the known occurrence of *P. scrotiformis* was specifically surveyed in 2014 for this analysis. No occurrences of *P. scrotiformis* were found during this survey.

Under Alternatives 3 and 4, monitoring for *Physaria scrotiformis* will be conducted and design criteria will be implemented to decrease impacts to this population (i.e. Prevent bedding, salting, trailing, and intentional grazing on sites with known sensitive plant populations).

Therefore, impacts to *Physaria scrotiformis* are expected to be of limited duration and extent. In addition, the application of design criteria will further limit the potential for impacts.

Determination: Grazing and activities associated with sheep grazing (trailing, trampling) are unlikely to occur in the areas where *Physaria scrotiformis* is known to occur and specific design criteria would

address this sensitive species population. If sheep grazing or associated activities do occur in areas where the species occurs, impacts are expected to be localized and of short-duration based on the design criteria, monitoring plan, and adaptive management strategies. Therefore, for *Physaria scrotiformis*, a “**may adversely impact individuals, but not likely to result in a loss of viability in the planning area, nor cause a trend to federal listing**” determination was made.

***Salix candida* – silver or sageleaf willow**

Habitat: *Salix candida* is a shrub, up to 3 feet tall, found in bogs, marshes, and pond margins. It prefers moist to saturated histic soils, often derived of limestone. *S. candida* has been found at an elevation of 10,400 feet on the San Juan National Forest (Decker, 2006).

Distribution and Occurrences: Range for *Salix candida* is fragmented, as its habitat is scarce in itself. *S. candida* is known from ten occurrences in Colorado (Decker, 2006). One occurrence is recorded for the San Juan National Forest (Columbine Ranger District), where it was found in the Weminuche Wilderness, east of Mount Valois (Decker, 2006). This known occurrence is within the analysis area in the Johnson Creek allotment.

Direct, Indirect, and Cumulative Impacts: In Alternative 1, all sheep allotments would be closed to grazing. Therefore, sheep grazing would have no impact on *Salix candida*.

In Alternative 2, current management, potential direct impacts due to sheep grazing include grazing, trampling or uprooting of individual plants by livestock grazing in the area, and, trampling or uprooting of plants during range management activities. Indirect impacts may occur due to disturbance causing hydrologic alterations of streams and/or wetlands and exposure of soil causing higher potential for the invasion and spread of invasive plant species.

In Alternative 3, there are no known occurrences within the portion of Johnson Creek proposed for a sheep forage reserve so sheep grazing within the forage reserve would have no impact on the known *S. candida* population. In Alternative 4, Johnson Creek would be closed to livestock grazing. Therefore, as in Alternative 1, there would be no impacts of sheep grazing on *S. candida*.

Additional habitat for this species does exist in other allotments within the analysis area that are proposed as vacant and available for livestock grazing. If livestock were to utilize these areas, potential direct and indirect impacts due to sheep grazing would be the same as Alternative 2 explained above. However, impacts are anticipated to be localized and of short duration with the application of project-specific design criteria.

Design Criteria and Monitoring: Specific design criteria for Alternatives 2 that would minimize impacts to areas that this species may inhabit include the following: wet areas with saturated soils be avoided until they are dry enough to prevent livestock trampling impacts; that permittees will move livestock away from areas of concern (including riparian areas and fens); that livestock grazing will be managed in riparian areas and willow cars; that livestock will be moved away from water sources after animals have finished drinking; that herders will minimize reoccurring trailing routes to prevent soil compaction and alterations in hydrologic function; and that bedding, camping and salting is done strategically to avoid wetlands and fens.

Determination: Grazing and activities associated with sheep grazing (grazing, browsing, trailing) could cause impacts to individuals of this species. Because of the type of habitat this species occurs in, and the implementation of design criteria, the monitoring plan, and adaptive management strategies, impacts to this species are expected to be localized and of short-duration. Therefore, for *Salix candida*, a “**may adversely impact individuals, but not likely to result in a loss of viability in the planning area, nor cause a trend to federal listing**” determination was made.

Sensitive Species with Habitat in the Analysis Area

The following species have never been found in the analysis area nor have there been specific surveys conducted for them. However, habitat for these species exists within the analysis area. They are: *Cypripedium parviflorum* (Yellow lady's slipper), *Draba smithii* (Smith whitlow-grass), *Gilia sedifolia* (Stonecrop gilia), *Parnassia kotzebuei* (Kotzebue's grass-of-parnassus), *Salix arizonica* (Arizona willow), *Carex diandra* (Lesser paniced sedge), *Drosera anglica* (Roundleaf sundew), *Eriophorum gracile* (Slender cotton-grass), *Salix serissima* (autumn willow), *Sphagnum angustifolium* (Sphagnum), *Sphagnum balticum* (Baltic sphagnum) and *Utricularia minor* (Lesser bladderwort). An analysis of the impacts of the proposed project on these species has been completed and is discussed below.

***Aliciella sedifolia* - stonecrop gilia**

Habitat: *Aliciella sedifolia* is apparently restricted to dry, rocky or gravelly talus of tuffaceous sandstone at elevations ranging from 11,750 – 13,400 feet at or above treeline (Anderson 2004).

Distribution and Occurrences: This rare endemic is known from two locations in Hindsdale County, Colorado: one on the GMUG and one on Sheep Mountain on the San Juan National Forest (Anderson 2004). There are no known occurrences of *Aliciella sedifolia* in the analysis area.

Direct, Indirect and Cumulative Impacts: Potential direct impacts due to livestock grazing include grazing, trampling or uprooting of individual plants by livestock grazing in the area, and, trampling or uprooting of plants during range management activities. Indirect impacts from grazing activities may include the exposure of soil and subsequent introduction or spread of invasive plant species.

Determination: Grazing and activities associated with livestock grazing may impact individuals of this species. However, habitat for this species does not typically occur in areas expected to be impacted by activities related to this analysis. Therefore, for *Aliciella sedifolia*, a **“may adversely impact individuals, but not likely to result in a loss of viability in the planning area, nor cause a trend to federal listing”** determination was made.

***Cypripedium parviflorum* – Yellow lady's slipper**

Habitat: *Cypripedium parviflorum* is generally found in mesic areas from 7400 to 8500 feet. There have been occurrences on drier slopes with north to east aspects as well. Common habitats include streamsides, fens, bogs, shaded wooded areas rich in humus and decaying leaf litter, aspen groves, and ponderosa pine/Douglas-fir forests (Mergen, 2006).

Distribution and Occurrences: Populations of yellow lady's slipper are scattered throughout most of North America. The species is considered common in the eastern U.S., but rare in the western mountains. *Cypripedium parviflorum* is known from approximately 27 occurrences in Colorado, including two on the San Juan National Forest on the Columbine Ranger District (Mergen, 2006). There are no known occurrences of *C. parviflorum* within the analysis area.

Direct, Indirect, and Cumulative Impacts: Potential direct Impacts due to livestock grazing include grazing, trampling or uprooting of individual plants by livestock grazing in the area, and, trampling or uprooting of plants during range management activities. Indirect impacts from grazing activities may include the exposure of soil and subsequent introduction or spread of invasive plant species.

Determination: Grazing and activities associated with livestock grazing may impact individuals of this species. However, these impacts are expected to be localized and of short-duration based on the design criteria addressing livestock distribution, monitoring plan, and adaptive management strategies. Additionally, *C. parviflorum* is well represented throughout the eastern U.S. and found elsewhere in the west. Therefore, for *Cypripedium parviflorum*, a **“may adversely impact individuals, but not likely to result in a loss of viability in the planning area, nor cause a trend to federal listing”** determination was made.

***Draba smithii* – Smith’s whitlow-grass**

Habitat: *Draba smithii* is found in rocky outcroppings, crevices, cliffs and talus slopes, at elevations ranging from 7,700 to over 13,000 feet. It is often associated with seeps, although populations have been reported in xeric sites as well. Habitat associates include Douglas-fir (*Pseudotsuga menziesii*), blue spruce (*Picea pungens*), bristlecone pine (*Pinus aristata*), aspen (*Populus tremuloides*), thin-leaf alder (*Alnus tenuifolia*), willow (*Salix spp.*), and monkeyflower (*Mimulus spp.*) (Ladyman, 2004).

Distribution and Occurrences: *Draba smithii* is known from Alamosa, Archuleta, Custer, Las Animas, Mineral, and Saguache counties in southern Colorado with 25 of these on National Forest lands and 2 on private lands (Ladyman, 2004). One population occurs on the San Juan National Forest, on the Pagosa Ranger District. The population is located in a moist crevice of a rocky outcropping adjacent to the East Fork Road (FDR 667), which runs along the East Fork of the San Juan River. There are no known occurrences of *D. smithii* in the analysis area.

Direct, Indirect, and Cumulative Impacts: Potential direct impacts due to sheep grazing include grazing, trampling or uprooting of individual plants by livestock grazing in the area, and, trampling or uprooting of plants during range management activities. Indirectly, soil disturbance may increase the potential for invasion and spread of non-native plants. Indirect impacts may also occur due to disturbance causing hydrologic alterations of streams and/or wetlands.

Determination: Specific design criteria aids in keeping livestock from dwelling in the areas where this species occurs. However, grazing and activities associated with livestock grazing (bedding-down, trailing, trampling) may impact individuals of this species. However, these impacts are expected to be localized and of short-duration based on the design criteria, monitoring plan, and adaptive management strategies. Additionally, this species is distributed among USFS lands across southern Colorado. Therefore, for *Draba smithii*, a **“may adversely impact individuals, but not likely to result in a loss of viability in the planning area, nor cause a trend to federal listing”** determination was made.

***Parnassia kotzebuei* – Kotzebue’s grass-of-parnassus**

Habitat: *Parnassia kotzebuei* is found in Colorado at elevations from 10,000 to 12,000 feet, in moist areas including seeps, moist rocky ledges below talus slopes, streamlets, and moss mats (Panjabi, 2007). Weber and Wittmann (2001) describe habitat for *P. kotzebuei* in Colorado as “rocky ledges and rills, subalpine, alpine”.

Distribution and Occurrences: The range of *Parnassia kotzebuei* is circumboreal, extending from northeast Asia to Alaska, east to Greenland, south to the Rocky Mountains and into southern Nevada. Populations appear to have patchy distribution because of its preference for moist habitats at high elevations (Panjabi, 2007). *P. kotzebuei* is known from several occurrences in north-central Colorado, with only one known population on the San Juan National Forest, in the Weminuche Wilderness (San Juan County) (Panjabi, 2007). There are no known occurrences of *P. kotzebuei* within the analysis area.

Direct, Indirect, and Cumulative Impacts: Potential direct impacts due to livestock grazing include grazing, trampling or uprooting of individual plants by livestock grazing in the area, and, trampling or uprooting of plants during range management activities. Indirect impacts may occur due to disturbance causing hydrologic alterations of streams and/or wetlands. Also, soil disturbance may increase the potential for invasion and spread by non-native plant species. Sheep typically prefer drier sites and do not like to stand or gather in saturated wetland areas (Zillich, 2010). However, impacts to the species could occur through watering and incidental movement of sheep bands. Any impacts are anticipated to be localized and of short duration with the application of project-specific design criteria, which aim to prevent sheep grazing activities in the wet areas this species inhabits.

Determination: Grazing and activities associated with sheep grazing (bedding-down, trailing, trampling) may impact individuals of this species. However, these impacts are expected to be localized and of short-duration based on the design criteria, which aims to minimize livestock grazing impacts to wetlands, riparian areas and fens, monitoring plan, and adaptive management strategies. Therefore, for *Parnassia kotzebuei*, a “**may adversely impact individuals, but not likely to result in a loss of viability in the planning area, nor cause a trend to federal listing**” determination was made.

Salix arizonica – Arizona willow

Habitat: *Salix arizonica* is found in the subalpine region, in high wet sedge meadows and along streamsides (Arizona Willow Interagency Technical Team, 1995), and usually adjacent to or in perennial water (Decker, 2006). In Colorado, it was found at an elevation of 10,320 feet and is associated with aspen, subalpine fir (*Picea lasiocarpa*), Engelmann spruce (*Picea engelmannii*), blue spruce, Douglas-fir, and white fir (*Abies concolor*). It may also be found growing amongst other willows (*Salix spp.*) and in sedge (*Carex spp.*) meadows.

Distribution and Occurrences: *Salix arizonica* is known from only one occurrence in Colorado, where it was found in 2001 on the Rio Grande National Forest in Conejos County (CNHP, 2006). Since then, through numerous surveys, its known range has extended into south-central Utah, northern New Mexico, and southwestern Colorado. There are no known occurrences of *S. arizonica* in the analysis area.

Direct, Indirect, and Cumulative Impacts: Potential direct impacts due to sheep grazing include grazing, browsing or trampling of individual plants by livestock grazing in the area, and, trampling or grazing of plants during range management activities. Indirect impacts may occur due to disturbance causing hydrologic alterations of streams and/or wetlands. Also, soil disturbance may increase the potential for invasion and spread of invasive plant species.

Determination: Grazing and activities associated with livestock grazing (bedding-down, trailing, trampling) may impact individuals of this species. However, these impacts are expected to be localized and of short-duration based on the design criteria that aim to minimize impacts of livestock grazing and activities in wetland, riparian and fen areas, implementation of a monitoring plan and adaptive management strategies. Therefore, for *Salix arizonica*, a “**may adversely impact individuals, but not likely to result in a loss of viability in the planning area, nor cause a trend to federal listing**” determination was made.

Carex diandra – lesser panicled sedge

Habitat: *Carex diandra* is a wetland species and has a USFWS Wetland Indicator Status of “obligate” for Region 2. This plant forms hummocks and is found in high elevation calcareous fens, bogs, willow carrs and sedge meadows.

Distribution and Occurrences: *Carex diandra* ranges from Newfoundland to the Yukon, and south to Maryland, Missouri, Colorado, and California. It is widespread in the northern part of its range and appears to become less so as it moves south. It is known from nine occurrences in Colorado, with one occurrence on the San Juan National Forest, in Dolores County (Dolores Ranger District). There are no known occurrences of *C. diandra* within the analysis area.

Direct, Indirect, and Cumulative Impacts: Potential direct impacts due to sheep grazing include grazing or trampling of individual plants by livestock grazing in the area, and, trampling or grazing of plants during range management activities. Indirect impacts may occur due to disturbance causing hydrologic alterations of streams and/or wetlands. Also, soil disturbance may increase the potential for invasion and spread of invasive plant species.

Determination: Grazing and activities associated with sheep grazing (bedding-down, trailing, trampling) may impact individuals of this species. However, these impacts are expected to be localized and of short-duration based on the design criteria that purposes to minimize impacts of livestock grazing and activities in wetland, riparian and fen areas, implementation of a monitoring plan and adaptive management strategies. Therefore, for *Carex diandra*, a “**may adversely impact individuals, but not likely to result in a loss of viability in the planning area, nor cause a trend to federal listing**” determination was made.

***Drosera anglica* – Roundleaf sundew**

Habitat: *Drosera anglica* is found in floating mats along the margins of small lakes and in fens. The species is exceptionally well adapted to the waterlogged and nutrient poor environment of fens – it derives a significant proportion of its nutrients through carnivory – and cannot compete and survive in any other habitat (CNHP, 2006).

Distribution and Occurrences: *Drosera anglica* has a circumboreal distribution and is widespread and abundant in many regions. There are three verified Region 2 occurrences in fens in Wyoming and Colorado; two in Wyoming on floating mats along the margins of small lakes and one in Colorado in a basin fen on the Columbine Ranger District (CNHP, 2006). There are no known occurrences of *D. anglica* within the analysis area.

Direct, Indirect, and Cumulative Impacts: Where this species occurs locally is in a highly-saturated fen well interior from the drier, sedge edges of this wetland. Based on observations by forest hydrologists and ecologists (Zillich, 2010), sheep do not like to stand or gather in saturated wetland areas but these areas can be impacted by grazing activities such as trailing and watering. These activities may cause indirect impacts including soil disturbance increasing the potential for invasion and spread of invasive plant species.

Determination: Grazing and activities associated with livestock grazing (bedding-down, trailing, trampling) may impact individuals of this species through inadvertent movement. However, these impacts are expected to be localized and of short-duration based on the design criteria that purposes to minimize impacts of livestock grazing and activities to wetland, riparian and fen areas, implementation of a monitoring plan and adaptive management strategies. Therefore, for *Drosera anglica*, a “**may adversely impact individuals, but not likely to result in a loss of viability in the planning area, nor cause a trend to federal listing**” determination was made.

***Eriophorum gracile* – slender cottongrass**

Habitat: *Eriophorum gracile* is found in fens, bogs, and sedge meadows at elevations of 8,100 to 12,000 feet. It is easily identified from a distance, as its red-tipped leaves are highly visible and it grows in large stands (Decker, 2006).

Distribution and Occurrences: *Eriophorum gracile* occurs in the northern states of the U.S. as well as all of the Canadian provinces (Decker et al, 2006). *E. gracile* is known from approximately 11 occurrences in Colorado. It is a circumboreal species and, in Colorado, it is on the southern edge of its range. There is no known occurrence of *E. gracile* within the analysis area.

Direct, Indirect, and Cumulative Impacts: Potential direct impacts due to sheep grazing include grazing, trampling or uprooting of individual plants by livestock grazing in the area, and, trampling or uprooting of plants during range management activities. Indirect impacts may occur due to disturbance causing hydrologic alterations of streams and/or wetlands. Also, soil disturbance may increase the potential for invasion and spread of invasive plant species.

Determination: Grazing and activities associated with sheep grazing (bedding-down, trailing, trampling) may impact individuals of this species. However, these impacts are expected to be

localized and of short-duration based on the design criteria that aim to minimize impacts of livestock grazing and activities to wetland, riparian and fen areas, implementation of a monitoring plan and adaptive management strategies. Therefore, for *Eriophorum gracile*, a “**may adversely impact individuals, but not likely to result in a loss of viability in the planning area, nor cause a trend to federal listing**” determination was made.

***Salix serissima* – autumn willow**

Habitat: *Salix serissima* is typically associated with areas of permanently saturated soils where peat is present. In Region 2, these areas frequently have a high mineral content and they are classified as calcareous or rich fens. However, *S. serissima* has been collected from other moist habitats such as stream banks.

Distribution and Occurrences: *S. serissima* is a boreal species whose distribution is concentrated in the northeastern U.S. and in Canada. Known occurrences in Region 2 are confined to the Black Hills of South Dakota and the southern Rocky Mountains. There is one known occurrence in La Plata County, Colorado near Haviland Lake in a calcareous fen.

Direct, Indirect, and Cumulative Impacts: Potential direct impacts due to sheep grazing include grazing trampling or uprooting of individual plants by livestock grazing in the area, and, trampling or uprooting of plants during range management activities. Indirect impacts may occur due to disturbance causing hydrologic alterations of streams and/or wetlands. Also, soil disturbance may increase the potential for invasion and spread of invasive plant species.

Determination: Grazing and activities associated with sheep grazing (bedding-down, trailing, trampling) may impact individuals of this species. However, these impacts are expected to be localized and of short-duration based on the design criteria that aim to minimize impacts of livestock grazing and activities to wetland, riparian and fen areas, implementation of a monitoring plan and adaptive management strategies. Therefore, for *Salix serissima*, a “**may adversely impact individuals, but not likely to result in a loss of viability in the planning area, nor cause a trend to federal listing**” determination was made.

***Sphagnum balticum* – Baltic Sphagnum**

Habitat: *Sphagnum balticum* is found in raised bogs holding water containing few nutrients. Occasionally, it is also found in blanket bogs. In Region 2, two verified locations exist in Colorado in iron fens. In Colorado, this species seems to prefer the wet portions of acidic peatlands (iron fens) (CNHP, 2006).

Distribution and Occurrences: *Sphagnum balticum* has an extensive range across the lowlands of the northern hemisphere, although it is confined to the more northerly latitudes. *S. balticum* is known for two occurrences in Colorado with one occurrence recorded on the San Juan National Forest in Thunder Basin, Columbine Ranger District. There is no known occurrence of *S. balticum* within the analysis area.

Direct, Indirect, and Cumulative Impacts: According to observations from forest hydrologists and ecologists (Zillich, 2010), sheep do not like to stand or gather in saturated wetland areas. This species inhabits raised bogs with high water content. Impacts to wetlands and this species could occur through watering and incidental movement of sheep bands. Associated activities, such as trailing, may have indirect impacts on *Sphagnum balticum* by disturbing the soil and causing changes in the hydrologic systems. Soil disturbance may also increase the potential for invasion and spread of invasive plant species.

Determination: Grazing activities associated with livestock grazing (trailing, trampling) may impact individuals of this species. However, these impacts are expected to be localized and of short-duration based on project-specific design criteria that aim to minimize impacts of livestock grazing and activities to wetland, riparian and fen areas, implementation of a monitoring plan and adaptive management strategies. Additionally, this species has an extensive range though it is confined to more northerly latitudes. Therefore, for *Sphagnum balticum*, a “**may adversely impact individuals, but not likely to result in a loss of viability in the planning area, nor cause a trend to federal listing**” determination was made.

***Sphagnum angustifolium* – Sphagnum**

Habitat: *Sphagnum angustifolium* is found in peatlands in open forests and fens.

Distribution and Occurrences: Globally, *Sphagnum angustifolium* is common in eastern Asia, Europe and North America. *S. angustifolium* is known for two occurrences in Colorado: one on the San Juan National Forest, Columbine Ranger District in Thunder Basin (CNHP, 2002). There is no known occurrence of *S. angustifolium* within the analysis area.

Direct, Indirect, and Cumulative Impacts: According to observations from forest hydrologists and ecologists (Zillich, 2010), sheep do not like to stand or gather in saturated wetland areas. However, sheep may utilize these areas for watering and intermittent grazing. Associated activities, such as trailing, may have indirect impacts on *Sphagnum angustifolium* by disturbing the soil and potentially causing change to the hydrologic system. Soil disturbance may also increase the potential for invasion and spread of invasive plant species.

Determination: Grazing and activities associated with sheep grazing (trailing, trampling) may impact individuals of this species. However, these impacts are expected to be localized and of short-duration based on the design criteria that aim to minimize impacts of livestock grazing and activities to wetland, riparian and fen areas, implementation of a monitoring plan and adaptive management strategies. Furthermore, this species is common in other areas of North America and has a range extending to Asia and Europe. Therefore, for *Sphagnum angustifolium*, a “**may adversely impact individuals, but not likely to result in a loss of viability in the planning area, nor cause a trend to federal listing**” determination was made.

***Utricularia minor* – lesser bladderwort**

Habitat: *Utricularia minor* is found in Colorado in subalpine fens, margins of ponds, slow-moving streams and other freshwater wetlands.

Distribution and Occurrences: In North America, *Utricularia minor* is found from Canada south to California, Colorado, Nebraska, Illinois, and Virginia. In Region 2, *U. minor* occurs in every state except Kansas (Neid, 2006). It is known from one occurrence on the San Juan National Forest (Dolores Ranger District), where it was found at 11,200 feet in the Grindstone Lake area (Stewart, 2005). There is no known occurrence of *U. minor* within the analysis area.

Direct, Indirect, and Cumulative Impacts: Potential direct impacts due to sheep grazing include grazing, trampling or uprooting of individual plants by livestock grazing in the area, and, trampling or uprooting of plants during range management activities. Sheep may utilize these areas for watering and intermittent grazing. Associated activities, such as trailing, may have indirect impacts on *Utricularia minor* by disturbing the soil and potentially causing change to the hydrologic system. Soil disturbance may also increase the potential for invasion and spread of invasive plant species.

Determination: Grazing and activities associated with sheep grazing (trailing, trampling) may impact individuals of this species as this species does occur on the margins of ponds and streams where

livestock may access drinking water. However, these impacts are expected to be localized and of short-duration based on the design criteria that aim to minimize impacts of livestock grazing and activities to wetland, riparian and fen areas, implementation of a monitoring plan and adaptive management strategies. Furthermore, *Utricularia minor* is known from other occurrences throughout Region 2. Therefore, for *Utricularia minor*, a **“may adversely impact individuals, but not likely to result in a loss of viability in the planning area, nor cause a trend to federal listing”** determination was made.

Determination Summary for the Proposed Action

Threatened or Endangered Species

For Pagosa skyrocket (*Ipomopsis polyantha*) and Knowlton’s cactus (*Pediocactus knowltonii*), a determination of **“no effect”** was made.

Region 2 Sensitive Species

Based on the design criteria to be implemented for this project, specific habitat characteristics, monitoring plan and proposed adaptive management strategies, a **“may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing”** determination was made for the following species: *Aliciella sedifolia* (stonecrop gilia), *Carex diandra* (Lesser panicled sedge), *Cypripedium parviflorum* (yellow lady’s slipper), *Draba smithii* (Smith’s draba), *Drosera anglica* (English sundew), *Eriophorum altaicum* var. *neogaeum* (whitebristle cottongrass), *Eriophorum chamissonis* (Chamisso’s cottongrass), *Eriophorum gracile* (slender cottongrass), *Machaeranthera coloradoensis* (Colorado tansy aster), *Parnassia kotzebuei* (Kotzebue’s grass-of-parnassus), *Physaria scrotiformis* (West silver bladderpod), *Salix arizonica* (Arizona willow), *Salix candida* (sageleaf willow), *Salix serissima* (autumn willow), *Sphagnum angustifolium* (sphagnum moss), *Sphagnum balticum* (Baltic bog moss) and *Utricularia minor* (lesser bladderwort).

A **“no impact”** determination was made for the following species, which have no habitat within the analysis area: Missouri milkvetch (*Astragalus missouriensis* var. *humistratus*), Aztec milkvetch (*Astragalus proximus*), stream orchid (*Epipactis gigantea*), Lone Mesa snakeweed (*Gutierrezia elegans*), frosty bladderpod (*Lesquerella pruinosa*), cushion bladderpod (*Physaria pulvinata*), and large-flower triteleia (*Triteleia grandiflora*).

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March 24, 2015

References and Literature Cited

- Anderson, D.G. 2004. *Gilia sedifolia* Brandeg. (stonecrop gilia): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/giliasedifolia.pdf> [April 26, 2005].
- Anderson, D.G. 2004. *Ipomopsis polyantha* (Rydberg) V. Grant (Pagosa Ipomopsis): A Technical Conservation Assessment. Report produced for the USDA Forest Service, Rocky Mountain Region, Species Conservation Project. Lakewood, CO. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/ipomopsispolyantha.pdf>
- Anderson, D.G. 2006. *Lesquerella pruinoso* Greene: A Technical Conservation Assessment. Report prepared for the USDA Forest Service, Rocky Mountain Region, Species Conservation Project. Fort Collins, CO. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/lesquerellapruinosa.pdf>
- Arizona Willow Interagency Technical Team. 1995. Arizona willow conservation agreement and strategy. US Forest Service, Intermountain Region, Ogden, UT; US Forest Service, Southwest Region, Albuquerque, New Mexico; National Park Service, Rocky Mountain Region, Denver, Colorado; US Fish and Wildlife Service, Mountain-Prairie Region, Salt Lake City, Utah; US Fish and Wildlife Service, Southwest Region, Albuquerque, New Mexico.
- Ball, P.W. and D.E. Wujek. 2002. *Eriophorum*. Pages 21-27) in *Flora of North America*, Vol. 23. Magnoliophyta: Commelinidae (in part): Cyperaceae. Oxford University Press, New York, NY.
- Bauer, R. F. 1981. Soil Survey of Piedra Area, Colorado, Parts of Archuleta, Hinsdale, La Plata, Mineral and Rio Grande Counties. USDA Soil Conservation Service and Forest Service.
- Beatty, B.L., W.F. Jennings, and R.C. Rawlinson. 2004. *Machaeranthera coloradoensis* (Gray) Osterhout (Colorado tansyaster): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/machaeranthacoloradoensis.pdf> [April 26, 2005].
- Colorado Natural Heritage Program. 1994. Rare, Threatened, Endangered, and Sensitive Species Overlays and Accompanying Reports.
- Colorado Natural Heritage Program. 2002. (Online Information). Available: <http://www.cnhp.colostate.edu/index.asp>. Accessed March 4, 2010.
- CNHP 2004. Colorado Natural Heritage Program Rare Plant Guide Codes and Definitions. Accessed via the World Wide Web at <http://www.enhp.colostate.edu/rareplants/codes/html>.
- Colorado Natural Heritage Program. 2006. (Online Information). Available: <http://www.cnhp.colostate.edu/index.asp> Accessed March 4, 2010
- Decker, K. 2005. *Astragalus proximus* (Rydberg) Wooton & Standley (Aztec milkvetch): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/astragalusproximus.pdf>
- Decker, K. 2006. *Astragalus missouriensis* Nutt. Var. *humistratus* Isely (Missouri milkvetch): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region.

Available:

<http://www.fs.fed.us/r2/projects/scp/assessments/astragalusmissouriensisvarhumistratus.pdf>

Decker, K. 2006. *Salix arizonica* Dorn (Arizona willow): A Technical Conservation Assessment. Report prepared for the USDA Forest Service, Rocky Mountain Region, Species Conservation Project. Fort Collins, CO. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/salixarizonica.pdf>

Decker, K. 2006. *Salix candida* Fluegge ex Wild. (sageleaf willow): A Technical Conservation Assessment. Report Prepared for the USDA Forest Service, Rocky Mountain Region, Species Conservation Project. Fort Collins, CO. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/salixcandida.pdf>

Decker, K. 2006. *Salix serissima* (Bailey) Fern. (autumn willow): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/salixserissima.pdf> [Accessed January 12, 2013].

Decker, K., D.R. Culver and D.G. Anderson. 2006. *Eriophorum gracile* W.D.J. Koch (slender cottongrass): A Technical Conservation Assessment. Report prepared for the USDA Forest Service, Rocky Mountain Region, Species Conservation Project. Fort Collins, CO. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/eriphorumgracile.pdf>

Flora of North America Editorial Committee. 1993. Flora of North America North of Mexico. Vol. 2, Oxford University Press.

Gage, E. and D. J. Cooper. 2006. *Carex diandra* Schrank (lesser panicled sedge): A Technical Conservation Assessment. Report prepared for the USDA Forest Service, Rocky Mountain Region, Species Conservation Project. Fort Collins, CO. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/carexdiandra.pdf>

Harrington, H.D. 1954. Manual of the Plants of Colorado. Sage Books. Denver, Colorado.

Ladyman, J.A.R. 2004. *Draba smithii* Gilg ex O.E. Schulz (Smith's draba): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/drabasmithii.pdf> [April 26, 2005].

Ladyman, J.A.R. 2004. *Eriophorum altaicum* Meinshausen var. *neogaeum* Raymond (whitebristle cottongrass): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: [\[April 29, 2005\]](#).

Lyon, Peggy. 2004. Personal Communication with Colorado Natural Heritage Program Botanist regarding *Ipomopsis polyantha* surveys.

Lyon, Peggy and Michael Denslow. 2002. Rare Plant Survey San Juan National Forest. Colorado Natural Heritage Program. Fort Collins Colorado.

Mergen, Daryl E. 2006. *Cypripedium parviflorum* Salisb. (lesser yellow lady's slipper): A Technical Conservation Assessment. Report prepared for the USDA Forest Service, Rocky Mountain Region, Species Conservation Project. Colorado Springs, CO. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/cypripediumparviflorum.pdf>

Neid, Stephanie L. 2006. *Utricularia minor* L. (lesser bladderwort): A Technical Conservation Assessment. Report produced for the USDA Forest Service, Rocky Mountain Region, Species

Conservation Project. Fort Collins, CO.

- Rocchio, J., M. March, and D.G. Anderson. 2006. *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>
- O'Kane, Steve L.. 2007. *Physaria scrotiformis* (Brassicaceae), a New High-Elevation Species from Southwestern Colorado and New Combinations in *Physaria*. Missouri Botanical Garden Press: *Novon* : Vol. 17, No. 3, pp. 376-382.
- Panjabi, S.B. Jennings, J. Coles, C. Dawson, M. Minton, A. Kratz, and C. Spurrier. 1997. Colorado Rare Plant Guide. Prepared for the Bureau of Land Management, the U.S. Forest Service and the U.S. Fish and Wildlife Service by the Colorado Natural Heritage Program.
- Panjabi, S.S. and D.G. Anderson. 2007. *Parnassia kotzebuei* Chamisso ex Sprengel (Kotzebue's grass-of-Parnassus): A Technical Conservation Assessment. Report Prepared for the USDA Forest Service, Rocky Mountain Region, Species Conservation Project. Fort Collins, CO.
- Stewart, Leslie. 2005. Personal Communication with Ecologist from the Dolores Ranger District (San Juan Public Lands) and Canyons of the Ancients National Monument regarding *Triteleia grandiflora* and *Utricularia minor*.
- USDA, NRCS, 1999. The PLANTS database (<http://plants.usda.gov> ,). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.
- USFS, 2003. Region 2 Sensitive Species Evaluations. (<http://www.fs.fed.us/r2/projects/scp/evalrationale/index.shtml>). Rocky Mountain Region. Lakewood, CO.
- Weber, W.A. and R.C. Wittmann. 2001. Colorado Flora, western slope. Third edition. Colorado Associated University Press, Boulder, Colorado.
- Zillich, 2010. Personal contact with hydrology specialist on the Columbine Ranger District, Bayfield, CO.

Appendix A. Design criteria from the Weminuche Landscape Grazing EIS for Domestic Sheep and Cattle Management

Design Criteria for General Management of Domestic Sheep

Livestock Herding and Salting*	Alternative		
	2	3	4
Livestock will be herded using the “open herding system” and distributed across the allotment(s) in order to achieve proper grazing utilization of key forage species. (1.1)	x	x	x
Permittees will spend as much time as needed to move livestock away from identified areas of concern and into areas of normally light use. This allows livestock to make use of forage that otherwise will not be grazed before allowable use standards are met in the key areas and the livestock are required to be removed from the area. Sheep movements should progress around an allotment in such a way to minimize back and forth trailing over the same ground to prevent permanent visual sheep trailing impacts. (1.2)		x	x
At least one herder is required to be with the sheep. The main band will never be left unattended, except at night and short periods when the herder is accomplishing other tasks in the immediate area. A herder must remain in close proximity during the night. (1.3)	x	x	x
Move sheep to a new grazing area every 5-7 days. (1.4)		x	x
Wet areas with saturated soils (seasonal wetlands, snow-banks) should be avoided until they are dry enough to prevent livestock trampling impacts. (1.5)	x	x	x
Permittees will spend as much time as needed to move livestock away from areas of concern (meadows, riparian areas, key areas, and so forth) and into areas of normally light use, provided that such herding does not result in increased potential for contact. This benefits permittees since it allows livestock to make use of forage that otherwise will not be grazed before allowable use standards are met in the key areas and the livestock are required to be removed from a pasture. (1.6)	x	x	x
Livestock grazing will be managed in riparian areas and willow carrs (a wetland willow thicket) to maintain or achieve mid-seral or higher condition to provide cover and forage for prey species within Canada lynx habitat (from Ruediger <i>et al.</i> 2000). (1.7)	x	x	x
Livestock will not be close-herded to and from water. Livestock will be moved away from water sources after animals have finished drinking. (1.8)		x	x
Salt should be placed in such a way as to distribute livestock use throughout the area. Place salt well away (>1/4 mile) from any water sources, or key areas that traditionally receive heavy use such as roads, parks, and riparian areas. Salt in areas of light use to draw livestock to those areas. The best distribution can be obtained by scattering one-half block chunks in areas of light use. Salt or supplement will not be placed near areas where such placement is liable to result in conflicts with other Forest users. Pick-up your salt after livestock are rotated to the next unit. (1.10)		x	x

Livestock Bedding	Alternative		
	2	3	4
Sheep will be bedded on new ground every 1-2 nights and moved to fresh feed daily in accordance with the current routing schedule. Permit requirements for bedgrounds allow for one night in each location. This is referring to closed bedding, or bedding when the sheep are bunched into one area. Two days use on bedgrounds is allowed if open bedding management is practiced. Open bedding is not bunching the sheep for the evening and letting them stay on the hillside where they finished grazing. Open bedding is preferred. (1.12)	x	x	x

Sheep will be bedded on uplands or rocky ground, where possible, but not on canyon edges or canyon rims. Sheep will be bedded no closer than 100 feet from the herder's camp (200 to 300 feet is preferred). If predators are a problem, teepee out with the sheep at night, Do not bed near water sources or recreation trails. (1.13)	x	x
Sheep should be bedded at least 300 feet from all water sources, including lakes, ponds, tarns, springs and seeps, system trails, campgrounds, picnic grounds, and the remains of historic structures. There may some exceptions due to topography on the allotment but these will be approved in advance by the Forest Officer. (1.15)	x	x
Bedgrounds in some areas may be closed or relocated in the Annual Operating Instructions on an annual basis, based on impacts. Locations of and frequency of use will be one of annual monitoring indicators. (1.16)	x	x

Herder Camps	Alternative		
	2	3	4
Sheep herder camps will be moved every 5 to 10 days and regularly rotated on an annual basis. By changing camps each year, bed grounds will be used every other year. (1.19)	x	x	x
Camps and salting areas will be not be placed in wetlands or fens and placed at least 200 feet from all surface water sources, including lakes, ponds, tarns, springs and seeps. (1.20)	x	x	x

Noxious Plants/Invasive Species	Alternative		
	2	3	4
Any hay, straw or other feeds used on the allotment will be either certified as being free of noxious plants (also called noxious weeds), or will consist of heat-treated pelletized feeds. (1.33)	x	x	x
Any seed used on the allotment will be tested for "all states noxious weeds" according to Association of Official Seed Analysts (AOSA) standards and will be certified by a Registered Seed Technologist or Seed Analyst as meeting the requirements of the Federal Seed Act (7 U.S.C. Chapter 37: Sections 1551-1611) and the Rules and Regulations of the Colorado Seed Act pursuant to 35-27-101 through 125, C.R.S. (1993 Supp. as amended by Senate Bill 93-17). (1.34)	x	x	x
Conduct prevention, control, and eradication strategies for targeted invasive plant species, utilizing integrated weed management techniques through implementation of the San Juan NF Invasives Action Plan. (1.35)		x	x
Permittees will make every effort to ensure that livestock do not contribute to the transport of noxious plants onto the allotment(s). Permittees will be given identification information on State of Colorado "noxious weeds" during annual meetings with the FS. The Colorado noxious weed list is available on the internet at: http://www.ag.state.co.us/CSD/Weeds/statutes/weedrules.pdf Noxious plant photos are available at: http://kiowa.colostate.edu/cwis109/noxious_weeds/Noxious_weeds.cfm (1.36)		x	x
Permittee Instructions*	Alternative		
	2	3	4

The earliest turn on date and latest removal date will be based on allotment conditions relative to wet soils or snow, range readiness, vegetative phenology, and on minimizing conflicts with other uses. These annual dates will be communicated through the AOIs. Even when these conditions are met, the dates of livestock grazing will not exceed June 15 – October 15. (1.43)	x	x
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Monitoring*	Alternative		
	2	3	4
Permittees are responsible for monitoring the following: livestock numbers; pasture entry and exit dates; allotment entry and exit dates; and maintenance activities for assigned improvements. This information will be furnished to the agency office within 30 days of livestock removal. This information will be verified by periodic agency inspections. (1.44)	x	x	x
Permittees will keep a weekly log of specific locations where they encounter certain species of wildlife and will turn it in to the Agency Officer upon request or at the end of the grazing season. The species to be reported will include special status species such as bighorn, lynx, wolf, wolverine, etc. (1.45)		x	x
Agency personnel may conduct annual permit administration consisting of monitoring compliance with AOIs, general livestock locations and use levels, plant phenology of important forage species, noxious weed mapping, soil conditions, riparian conditions and water quality, and impacts from other uses. (1.46)	x	x	x
Any monitoring outcome that does not meet Desired Conditions will require the application of adaptive management strategies to livestock grazing practices to recover and maintain desired conditions, when livestock are a contributing factor to the condition. See column 5 in Table 1-2 and Table 2-5. (1.47)		x	x
Watershed Resources	Alternative		
	2	3	4
Wetlands and fens should be avoided at all times to prevent livestock trampling and grazing impacts. (1.50)		x	x
Sheep movement around the allotment should minimize reoccurring trailing locations to prevent soil compaction and terracing, which result in altered hydrologic function. (1.51)		x	x

Table 2-4. Design Criteria for General Management of Cattle (USDA 2015)

General Design Criteria	Alternative		
	2	3	4
Wet areas with saturated soils (seasonal wetlands, snow-banks) should be avoided until they are dry enough to prevent livestock trampling impacts. (3.5)	x	x	x
Permittees will spend as much time as needed to move livestock away from areas of concern (meadows, riparian areas, key areas, and so forth) and into areas of normally light use. This benefits permittees since it allows livestock to make use of forage that otherwise will not be grazed before allowable use standards are met in the key areas and the livestock are required to be removed from a pasture. (3.6)	x	x	x

Livestock grazing will be managed in riparian areas and willow carrs (a wetland willow thicket) to maintain or achieve mid-seral or higher condition to provide cover and forage for prey species within Canada lynx habitat (from Ruediger <i>et al.</i> 2000). (3.7)	x	x	x
Salt should be placed in such a way as to distribute livestock use throughout the area. Place salt well away (>1/4 mile) from any water sources, or key areas that traditionally receive heavy use such as roads, parks, and riparian areas. Salt in areas of light use to draw livestock to those areas. The best distribution can be obtained by scattering one-half block chunks in areas of light use. Salt or supplement will not be placed near areas where such placement is liable to result in conflicts with other Forest users. Pick-up your salt after livestock are rotated to the next unit. (3.10)		x	x
Riparian Design Criteria	Alternative		
	2	3	4
Exclude livestock from riparian areas and wetlands that are not meeting or moving towards desired condition objectives where monitoring information shows continued livestock grazing would prevent attainment of those objectives. (3.15)	x	x	x
Noxious Plants/Invasive Species	Alternative		
	2	3	4
Any hay, straw or other feeds used on the allotment will be either certified as being free of noxious plants (also called noxious weeds), or will consist of heat-treated pelletized feeds. (3.16)	x	x	x
Any seed used on the allotment will be tested for "all states noxious weeds" according to Association of Official Seed Analysts (AOSA) standards and will be certified by a Registered Seed Technologist or Seed Analyst as meeting the requirements of the Federal Seed Act (7 U.S.C. Chapter 37: Sections 1551-1611) and the Rules and Regulations of the Colorado Seed Act pursuant to 35-27-101 through 125, C.R.S. (1993 Supp. as amended by Senate Bill 93-17). (3.17)	x	x	x
Monitoring*	Alternative		
	2	3	4
Agency personnel may conduct annual permit administration consisting of monitoring such compliance with AOs, general livestock locations and use levels, plant phenology of important forage species, noxious weed mapping, soil conditions, riparian conditions and water quality, and impacts from other uses. (3.19)	x	x	x
Any monitoring outcome, when part of the ten-year interval monitoring, that does not meet Desired Condition will require the application of adaptive management strategies to livestock grazing practices to recover and maintain desired conditions, when livestock are a contributing factor to the condition. (3.20)		x	x
Watershed Resources	Alternative		
	2	3	4
Wetlands and fens should be avoided at all times to prevent livestock trampling and grazing impacts. Livestock should be actively herded away from these areas. (3.21)		x	x
Cattle movement around the allotment should minimize reoccurring trailing locations to prevent soil compaction and terracing, which result in altered hydrologic function. (3.22)		x	x

Special Design Criteria	Alternative		
	2	3	4
Site-specific ground disturbance such as installation of water developments, pipelines, fences or enclosures will require site specific cultural and threatened and endangered species clearances. These activities may also need 404 permits.		x	x