
Appendix K

BLM Standards for Public Land Health and
Guidelines for Livestock Grazing Management
in Colorado

APPENDIX K

BLM STANDARDS FOR PUBLIC LAND HEALTH AND GUIDELINES FOR LIVESTOCK GRAZING MANAGEMENT IN COLORADO

STANDARDS FOR PUBLIC LAND HEALTH

Standards describe conditions needed to sustain public land health, and relate to all uses of the public lands. Standards are applied on a landscape scale and relate to the potential of the landscape.

Standard I

Upland soils exhibit infiltration and permeability rates that are appropriate to soil type, climate, land form, and geologic processes. Adequate soil infiltration and permeability allows for the accumulation of soil moisture necessary for optimal plant growth and vigor, and minimizes surface runoff.

Indicators

- Expression of rills, soil pedestals is minimal.
- Evidence of actively-eroding gullies (incised channels) is minimal.
- Canopy and ground cover are appropriate.
- There is litter accumulating in place and is not sorted by normal overland water flow.
- There is appropriate organic matter in soil.
- There is diversity of plant species with a variety of root depths.
- Upland swales have vegetation cover or density greater than that of adjacent uplands.
- There are vigorous, desirable plants.

1 **GRSG Habitat Implications**

2 Soils are the foundation supporting the plant communities that GRSG depend
3 upon. Generally, healthy plant communities maintain healthy soil conditions. In a
4 codependent cycle, productive plant communities are dependent on healthy
5 soils. Whereas some habitat components such as hiding cover can change as a
6 product of annual precipitation, soil standard indicators relate to long-term
7 ecosystem health.

8 Unhealthy plant communities result in depleted soils in two fundamental ways.
9 First, unhealthy plants do not generate the robust root systems that decay into
10 soil organic material. Second, above-ground plant material (alive or as litter) is
11 not available to protect the soil surface.

12 Soil degradation is a long-term process. A reduction in soil organic material
13 reduces the soil’s ability to hold water for plant production. A lack of vegetation
14 cover leads to bare ground, and eventually soil loss from erosion in the most
15 important top soil surface. The rills and gullies created by a lack of vegetation
16 cover are a form of desertification wherein alternating drought and floods
17 replace effective use of the precipitation through soil infiltration.

18 By the time vegetation mismanagement manifests itself in soil depletion, GRSG
19 habitat—notably hiding cover—has most likely been marginalized for years.
20 Following soil depletion, a site loses the ability to produce a vigorous
21 herbaceous understory. There is no scenario where management that leads to
22 depleted soils simultaneously supports a healthy GRSG population.

23 Whereas vegetation habitat issues caused by periodic drought or infrequent
24 heavy grazing can be remedied by better years or improved grazing
25 management, problems created by soil depletion are not readily reversible.
26 Once soil is degraded, opportunities to support GRSG populations are deferred
27 indefinitely. Conversely, adherence to this standard is a meaningful safeguard for
28 GRSG populations, and the standard stands alone as a critical “required
29 conservation measure.”

30 **Standard 2**

31 Riparian systems associated with both running and standing water function
32 properly and have the ability to recover from major disturbance such as fire,
33 severe grazing, or 100-year floods. Riparian vegetation captures sediment, and
34 provides forage, habitat and bio-diversity. Water quality is improved or
35 maintained. Stable soils store and release water slowly.

36 **Indicators**

- 37 • Vegetation is dominated by an appropriate mix of native or
- 38 desirable introduced species.
- 39 • Vigorous, desirable plants are present.

- 1 • There is vegetation with diverse age class structure, appropriate
2 vertical structure, and adequate composition, cover, and density.
- 3 • Streambank vegetation is present and is comprised of species and
4 communities that have root systems capable of withstanding high
5 streamflow events.
- 6 • Plant species present indicate maintenance of riparian moisture
7 characteristics.
- 8 • Stream is in balance with the water and sediment being supplied by
9 the watershed (e.g., no headcutting, no excessive erosion or
10 deposition).
- 11 • Vegetation and free water indicate high water tables.
- 12 • Vegetation colonizes point bars with a range of age classes and
13 successional stages.
- 14 • An active floodplain is present.
- 15 • Residual floodplain vegetation is available to capture and retain
16 sediment and dissipate flood energies.
- 17 • Stream channels with size and meander pattern appropriate for the
18 stream's position in the landscape, and parent materials.
- 19 • Woody debris contributes to the character of the stream channel
20 morphology.

21 ***GRSG Habitat Implications***

22 GRSG make important use of wet meadow riparian habitats particularly for late
23 brood-rearing during the summer. Some populations migrate long distances
24 from nesting habitat at lower elevations to foothills habitat that features these
25 meadows. Consequently, the health of riparian areas and adherence to standard
26 2 is important to some populations and crucial to others. Standard 2 is an
27 important stand- alone “required conservation measure.”

28 Healthy riparian meadow systems generally feature sedges and rushes with root
29 masses capable of sustaining stream banks during peak flows. With unmanaged
30 grazing, these plant communities shift to a more grazing-resistant plant
31 community of Kentucky bluegrass, clover, and dandelions. Some of these
32 grazing-resistant forbs do provide a food source for GRSG. However, this initial
33 benefit is often short term because systems in this condition tend to break
34 down as a product of hydrologic dysfunction. This grazing-resistant plant
35 community generally fails to maintain the stream banks, resulting in downgrading
36 or widening of the channel depending on the substrate of the riparian system.
37 Either way, the result is a lowering of the water table and a general
38 diminishment of both quality and volume of GRSG habitat.

1 Some of the riparian indicators make reference to systems (other than wet
2 meadows) that support large shrubs and trees. Generally, references to point
3 bars, woody debris, and vegetation age class/vertical structure refer to riparian
4 systems that do not provide important habitat for GRSG.

5 **Standard 3**

6 Healthy, productive plant and animal communities of native and other desirable
7 species are maintained at viable population levels commensurate with the
8 species and habitat's potential. Plants and animals at both the community and
9 population level are productive, resilient, diverse, vigorous, and able to
10 reproduce and sustain natural fluctuations, and ecological processes.

11 **Indicators**

- 12 • Noxious weeds and undesirable species are minimal in the overall
13 plant community.
- 14 • Native plant and animal communities are spatially distributed across
15 the landscape with a density, composition, and frequency of species
16 suitable to ensure reproductive capability and sustainability.
- 17 • Plants and animals are present in mixed age classes sufficient to
18 sustain recruitment and mortality fluctuations.
- 19 • Landscapes exhibit connectivity of habitat or presence of corridors
20 to prevent habitat fragmentation.
- 21 • Photosynthetic activity is evident throughout the growing season.
- 22 • Diversity and density of plant and animal species are in balance with
23 habitat/landscape potential and exhibit resilience to human activities.
- 24 • Appropriate plant litter accumulates and is evenly distributed across
25 the landscape.
- 26 • Landscapes composed of several plant communities that may be in a
27 variety of successional stages and patterns.

28 **GRSG Habitat Implications**

29 GRSG are sagebrush obligates, particularly in the winter when sagebrush is their
30 exclusive food source. Large expanses of sagebrush are a core habitat
31 requirement. However, the understory herbaceous component is also
32 important. Diversity of forb species substantially enhances GRSG habitat in the
33 spring early brood-rearing season. The composition and vigor of the grass
34 understory will, in most situations, dictate the quality of hiding cover and nesting
35 success.

36 In most of the GRSG range in Colorado, large cool-season bunchgrasses such as
37 needle and thread and bluebunch wheatgrass provide the most opportunity for
38 hiding cover. Conversion of these species to smaller more grazing-resistant
39 grasses like Sandberg bluegrass will reduce the hiding cover available. This

1 important consideration is addressed as it relates to plant composition in the
2 indicators. The reference to “vigorous” plant community is directly linked to the
3 standard because vigorous plants grow larger and produce the most hiding
4 cover. Mismanagement of vegetation to the extent that 1) soil is adversely
5 affected, or 2) invasive species like cheatgrass are able to exploit vacant niches,
6 is the worst case scenario for GRSG.

7 The indicator referring to mixed age classes may or may not be beneficial to
8 GRSG. Historically, fire was a benefit because of the way it rejuvenated
9 individual stands. However, in the modern era, that benefit may not warrant the
10 loss of existing sagebrush stands.

11 The statement “plants and animals at both the community and population level
12 are productive, resilient, diverse, vigorous, and able to reproduce and sustain
13 natural fluctuations, and ecological processes” and the indicator referring to
14 habitat connectivity and fragmentation relate directly to GRSG. However, these
15 references in the standards require interpretation to stand alone as a “required
16 conservation measure.” For example, the herbaceous standing crop from
17 previous year is a critical factor for nesting cover, because nesting generally
18 occurs prior to major plant growth each spring. Standard 3 does not address
19 this situation. Adherence to standard 3 is important for GRSG populations, but
20 the standard covers so many ecological process that proper interpretation is
21 required.

22 **Standard 4**

23 Special status, threatened and endangered species (federal and state), and other
24 plants and animals officially designated by the BLM, and their habitats are
25 maintained or enhanced by sustaining healthy, native plant and animal
26 communities.

27 **Indicators**

- 28 • All the indicators associated with the plant and animal communities
29 standard apply.
- 30 • There are stable and increasing populations of endemic and
31 protected species in suitable habitat.
- 32 • Suitable habitat is available for recovery of endemic and protected
33 species.

34 **GRSG Habitat Implications**

35 While not “a required conservation measure” in itself, Colorado BLM standard
36 operating procedure implementing standard 4 is a critical function protecting
37 GRSG habitat and population. Field biologists evaluate proposals such as grazing
38 permit renewals via the Colorado Greater Sage-grouse Conservation Plan
39 (2008). Structural habitat guidelines in Appendix A of that plan are key criteria
40 relating to BLM wildlife specialists’ recommendations. Standard 4 requires that
41 these recommendations are either adopted or that substitute measures are

1 implemented. The process is effective in assuring that “suitable habitat is
2 available for recovery of endemic and protected species.” In most
3 circumstances, “required conservation measures” are stipulated as COAs.

4 **Standard 5**

5 The water quality of all water bodies, including ground water where applicable,
6 located on or influenced by BLM lands will achieve or exceed the Water Quality
7 Standards established by the State of Colorado. Water Quality Standards for
8 surface and ground waters include the designated beneficial uses, numeric
9 criteria, narrative criteria, and anti-degradation requirements set forth under
10 State law as found in (5 CCR 1002-8), as required by Section 303(c) of the
11 Clean Water Act.

12 **Indicators**

- 13 • Appropriate populations of macroinvertebrates, vertebrates, and
14 algae are present.
- 15 • Surface and ground waters only contain substances (e.g. sediment,
16 scum, floating debris, odor, heavy metal precipitates on channel
17 substrate) attributable to humans within the amounts,
18 concentrations, or combinations as directed by the Water Quality
19 Standards established by the State of Colorado (5 CCR 1002-8).

20 **GRSG Habitat Implications**

21 Standard 5 relates to GRSG because all life is linked to clean water. However,
22 clean water is not considered a major threat to GRSG populations in Colorado,
23 and the standard is too general to serve as a “required conservation measure.”

24 **Guidelines**

25 Guidelines are the management tools, methods, strategies, and techniques (e.g.,
26 best management practices) designed to maintain or achieve healthy public lands
27 as defined by the standards. Currently, the only guidelines for BLM Colorado
28 that have been developed in concert with the Resource Advisory Councils are
29 livestock grazing management guidelines.

- 30 1. Grazing management practices promote plant health by providing for one or
31 more of the following:
- 32 • periodic rest or deferment from grazing during critical growth
33 periods;
- 34 • adequate recovery and regrowth periods;
- 35 • opportunity for seed dissemination and seedling establishment.
- 36 2. Grazing management practices address the kind, numbers, and class of
37 livestock, season, duration, distribution, frequency and intensity of grazing
38 use and livestock health.

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3. Grazing management practices maintain sufficient residual vegetation on both upland and riparian sites to protect the soil from wind and water erosion, to assist in maintaining appropriate soil infiltration and permeability, and to buffer temperature extremes. In riparian areas, vegetation dissipates energy, captures sediment, recharges ground water, and contributes to stream stability.
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4. Native plant species and natural revegetation are emphasized in the support of sustaining ecological functions and site integrity. Where reseeding is required, on land treatment efforts, emphasis will be placed on using native plant species. Seeding of non-native plant species will be considered based on local goals, native seed availability and cost, persistence of non-native plants and annuals and noxious weeds on the site, and composition of non-natives in the seed mix.
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5. Range improvement projects are designed consistent with overall ecological functions and processes with minimum adverse impacts to other resources or uses of riparian/wetland and upland sites.
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6. Grazing management will occur in a manner that does not encourage the establishment or spread of noxious weeds. In addition to mechanical, chemical, and biological methods of weed control, livestock may be used where feasible as a tool to inhibit or stop the spread of noxious weeds.
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7. Natural occurrences such as fire, drought, flooding, and prescribed land treatments should be combined with livestock management practices to move toward the sustainability of biological diversity across the landscape, including the maintenance, restoration, or enhancement of habitat to promote and assist the recovery and conservation of threatened, endangered, or other special status species, by helping to provide natural vegetation patterns, a mosaic of successional stages, and vegetation corridors, and thus minimizing habitat fragmentation.
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8. Colorado Best Management Practices and other scientifically developed practices that enhance land and water quality should be used in the development of activity plans prepared for land use.

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