

A Summary of Native Bees and Livestock Grazing On BLM and Forest Service lands

The most obvious threat to native bees by livestock grazing is the consumption of flowers, which are generally located in the upper layer of understory vegetation (Fig. 1). This is the most accessible level of plants for flying pollinators such as native bees (Fig. 1). Ultimately, if flowers have been removed, native bees cannot gather pollen, and native bee reproduction and populations of native bees can be reduced or eliminated. Approximately 68% of all flowering plants require bee pollination. A document by the U.S. Forest Service, [Pollinator-Friendly Best Management Practices for Federal Lands](#)¹ (2015) describes this:

Livestock grazing alters the structure, diversity, and growth pattern of vegetation, which affects the associated insect community. Grazing during a time when flowers are already scarce may result in insufficient forage for pollinators.

There are less obvious ways than direct removal of flowers by which livestock grazing impacts native bees. For instance, different species of native bees emerge at different times in the season, and many of these bee species live for only a brief period (2-6 weeks). If grazing has removed most flowers in the neighborhood of a particular bee by the time it emerges from its nest, reproduction of that bee will be reduced or eliminated. Bumble bee queens, on the other hand, can live throughout the season and survive until the next summer. To support both the staggered emergence of bees with brief foraging periods and bumble bee queens with their extended period of foraging and early spring emergence, suitable flowering plants need to be available throughout the growing season.²

Almost 70% of native bees nest underground or in litter or woody material on the soil surface. Livestock grazing impacts different bee species differently, e.g., sweat bees use compacted soil,³ while shallow nest sites of other species of bees may be destroyed by trampling.⁴

Unfortunately, few studies exist of outcomes for bees in areas grazed by livestock versus areas not grazed by livestock or for areas grazed by livestock at various intensities,⁵ and even fewer in arid regions.

U.S. Forest Service recommendations in [Pollinator-Friendly Best Management Practices for Federal Lands](#) provide insight into the various routes by which livestock grazing can adversely affect native bees (Table 1, left column). Most of these recommendations are infeasible on Forest Service and BLM livestock allotments, given current livestock management practices (Table 1, right column):

¹Accessible at

<https://www.fs.fed.us/wildflowers/pollinators/BMPs/documents/PollinatorFriendlyBMPsFederalLands05152015.pdf> (Accessed April 28, 2021)

² Mola, J.M., L.L. Richardson, G. Spyreas, D. Zaya, and I.S. Pearce. 2021. Long-term surveys support declines in early-season forest plants used by bumblebees. *Journal of Applied Ecology*. doi:10.1111/1365-2664.13886

³ Kimoto, C., S.J. DeBano, R.W. Thorp, R.V. Taylor, H. Schmalz, T. DelCurto, T. Johnson, P.L. Kennedy, and S. Rao. 2012. Short-term responses of native bees to livestock and implications for managing ecosystem services in grasslands. *Ecosphere* 3(10):88. <http://dx.doi.org/10.1890/ES12-00118.1>

⁴ Sugden, E.A. (1985) "Pollinators of *Astragalus monoensis* Barneby (Fabaceae): new host records; potential impact of sheep grazing," *Great Basin Naturalist*: Vol. 45 : No. 2 , Article 11. Available at: <https://scholarsarchive.byu.edu/gbn/vol45/iss2/11>

⁵ Kimoto, et al Op.cit.

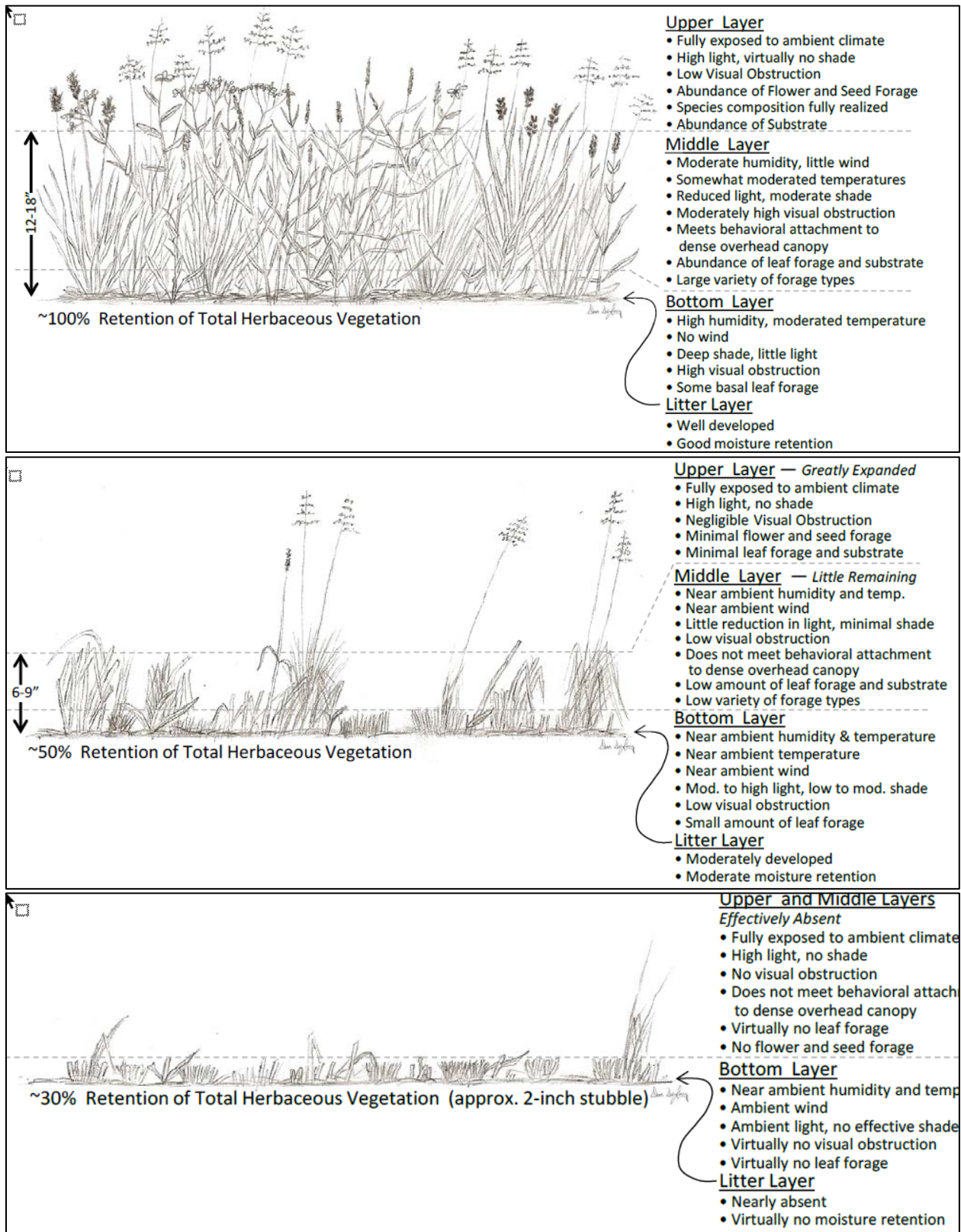


Fig.1 Contributions of meadow habitat to wildlife retention and changes relative to retention levels.⁶ The layer most needed by pollinators is the first to be depleted or eliminated

⁶ DeLong, Don. 2015. Summary Basis for Building Wildlife Habitat-Needs & Protection into Forage Utilization Limits. Unpublished report, Bridger-Teton National Forest

Table 1. Best Livestock Management Practices: Recommended versus reality

Best Management Grazing Practices to Protect Native Bees (U.S. Forest Service, in Pollinator-Friendly Best Management Practices for Federal Lands)	Current Reality of Implementing Best Management Grazing Practices To Protect Native Bees
<i>Determine which types of pollinators and which pollinator habitat elements are affected by grazing livestock.</i>	Understandably, Forest Service and BLM managers are not aware of which native bee species are present, let alone the habitat elements upon which the various bee species are dependent.
<i>Assess if grazing is compatible with the specific needs of target pollinator species on site, including targeted butterfly species.</i>	Forest Service and BLM managers are not familiar with the bee species on their lands, let alone the specific needs of particular bees.
<i>Prevent trampling ground-nesting sites by implementing practices to minimize hoof action of grazing animals, which causes soil compaction or erosion in pollinator nesting and shelter patches.</i>	Minimization of hoof action is not considered; it would require greater control of livestock, particularly cattle, than is required.
<i>Minimize livestock concentrations in one area by rotating livestock grazing timing and location to help maintain open, herbaceous plant communities that are capable of supporting a wide diversity of butterflies and other pollinators.</i>	The assurance of flowers for “a wide diversity of . . . pollinators” would require lower stocking rates and much greater retention of the top layers of forb and shrub vegetation than is currently permitted, particularly in semi-arid and arid regions.
<i>Protect the current season’s growth in grazed areas by striving to retain at least 50% of the annual vegetative growth on all plants.</i>	The first 25% of use of the top layer of vegetation contains most flowers; scientific evidence finds that retention of at least 70% of vegetation is required to support most wildlife species, including pollinators. ⁷
<i>Enhance the growth of forbs to ensure their ability to reproduce and to provide nectar and pollen throughout the growing season by setting grazing levels to allow forbs to flower and set seed.</i>	Grazing levels are set for grasses, but not forbs on most BLM and national forest lands.
<i>Leave nearby ungrazed areas to provide reserves for pollinator populations.</i>	Ungrazed areas are largely absent in cattle-grazed pastures without expensive fencing and labor-intensive maintenance of fences.
<i>Prevent grazing during periods when flowers are already scarce (e.g., midsummer) to maintain forage for pollinators, especially for bumble bee species.</i>	Midsummer is the major grazing period on national forests.
<i>In important butterfly areas, avoid grazing when butterfly eggs, larvae, and in some cases pupae are on host plants.</i>	U.S. Forest Service and BLM managers are generally not aware of the location of “important butterfly areas”
<i>Consider the needs of pollinators when placing range improvements and structures on the landscape.</i>	Pollinators are not considered when placing infrastructure on allotments.
<i>Ensure that fencing is adequate and well maintained.</i>	Fence maintenance is an ongoing, ubiquitous problem.
<i>Include protection of pollinator species in grazing management plans.</i>	Pollinators are not considered in grazing management plans.

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⁷ DeLong, 2020. Development of Suitable Herbaceous Retention Levels for Wildlife on Livestock Allotments, West Zone, Bridger-Teton NF. Presentation to Bridger-Teton NF, June 2020.