Rangeland Management and Health

General Position Statement and Goals

Federal rangeland management practices affect fire, invasive weeds, rangeland health, fugitive dust, and soil and water quality within the County. These resources and processes do not respect jurisdictional boundaries. Proper management, lack of management, or mismanagement, of federal rangelands therefore has significant spillover effects on County interests. Effective range management practices also support and stabilize range livestock operations within the County. In order to protect public welfare and safety, safeguard a stable local economy, and protect ecological health throughout the County, Humboldt County expects federal land management agencies to conduct ongoing, scientifically informed range management activities on federal lands, executed with the maximum cooperation and coordination allowable under federal law with Humboldt County, local weed, fire, and conservation districts, and grazing permittees.

Consistent with this expectation, a mandate for federal land managers to coordinate range management with state, tribal, and local governments in order to reduce wildfire risk was issued in Executive Order 13855 "Promoting Active Management of Forests, Rangelands, and other Federal Lands to Improve Conditions and Reduce Wildfire Risk." Humboldt County expects federal agencies to comply with this EO in full, in coordination with the County. [See Fire and Invasive Weeds Sections].

The primary goal of range management within the County should be to meet, or at a minimum, make progress toward meeting, agency standards for rangeland health. Beyond this, and consistent with EO 13855, it is Humboldt County's goal to ensure rangelands within the County are managed so as to reduce the risk of wildfire and subsequent invasive weed infestation, and to ensure maximum resiliency to fire, invasive weeds, and drought.

Humboldt County further expects that, consistent with federal guidance [*Adaptive Management: The U.S. Department of Interior Technical Guide*, 2009; *Department of the Interior: Departmental Manual.* 522 DM 1, Feb. 1, 2008; Forest Service Handbook 1909.12 Land Management Planning Handbook, § 41 Adaptive Management Framework] federal agencies will pursue rangeland health goals and objectives by employing an adaptive management approach to range management activities, in cooperation with local governments and grazing permittees.

Specific Positions on Range Management

Definitions and Best Practices

Range management should be an active, ongoing process directed by the establishment of reasonable management goals and objectives for each management unit. That unit may be a grazing allotment, pasture within an allotment, or some other spatially defined administrative unit. *Management goals* should be general statements of the desired direction of change or the

desired condition of resources in the future (BLM TR4400-1, as cited in Swanson et al. 2018). *Management objectives* should define a specific attribute of natural resource conditions that management will try to accomplish, the area or location where this change will occur, and the timeframe to achieve the objective. Rangeland management practices within Humboldt County should:

- Identify site-specific, measurable, and attainable management objectives for a desirable attribute.
- Implement an adaptive management strategy. Adaptive management requires that: all parties understand current rangeland conditions; managers correctly identify problematic issues; managers and land users cooperatively address the ecological processes and/or mechanisms that cause those problems by formulating solutions specific to the cause of the problem. Furthermore, managers must implement regular monitoring programs to document the results of those actions and decisions. Managers then adapt subsequent management actions based upon those results.

Ecological Sites and Potential

Consistent with standard range science practices, Humboldt County expects that the basic unit addressed in any rangeland management evaluation or decision will be the ecological site. A properly defined ecological site (e.g. Loamy pp. 8-10) will reference a distinctive plant community that can grow on that site. Beyond a description of the plant community, a site definition must also describe the biomass the plant community on the site can potentially produce (i.e., site potential) as a function of the soils, landform, geological, topographical and climatic features that define the site's physical characteristics. *Humboldt County expects that all rangeland health objectives, evaluations, and management decisions will clearly identify the geographic boundaries, physical site characteristics, and ecological potential of the management unit, and that all management goals and objectives be set within the biophysical constraints of the ecological site in question.*

States and Transitions

Any ecological site description should include a "reference state." The reference state is the plant community at "mid-successional stage" of development, i.e. a healthy plant community for that particular site. Reference states should be determined for each site on a case-by-case basis. (For the typical sagebrush-bunchgrass rangelands dominant in Humboldt County, the mid-successional state is roughly 55 to 70% perennial herbaceous species and 30 to 45% shrubs. Wetter areas may have more perennial herbaceous biomass [closer to 70%] while drier locations may have more shrubs [closer to 40-45%]. Salt-desert shrub communities, typically on valley bottoms, tend to tilt toward high shrub composition.)

Ecological sites can transition from their reference state to a less desirable state due to various influences. *It is a goal of Humboldt County to ensure that sites are resilient to external*

influences—drought, fire, invasive annuals, insect infestation, erosion, etc.—that may otherwise result in an undesirable transition.

Maintenance:

The maintenance of an adequate understory of perennial herbaceous species, particularly deep-rooted perennial bunchgrasses, is critical for maintaining the long-term productivity and resilience of the typical sagebrush steppe communities that dominate Humboldt County. In assessing a site, the manager's concern should focus on the majority of desired plants in a management unit, not the lone individual. Deep-rooted bunchgrasses are the most effective deterrent (i.e. provide the best resistance) to invasive annual grasses and other weeds that may permanently decrease overall site productivity and increase the risk of regular catastrophic wildfire. Dominant bunchgrass populations also make a site more resilient to insect defoliation and drought.

A flexible, conscientiously designed grazing regime (See Livestock Grazing Section) is integral to maintaining a healthy bunchgrass community. Where monitoring detects a downward trend in bunchgrass populations, inadequate grazing management may or may not be the cause. Careful identification of the causal mechanism is in order. If inadequate grazing management is identified as the cause, adjustments to the grazing regime should be applied (see Grazing Management, below). *Changes in management to maintain site resiliency must address the specific ecological processes and/or mechanisms causing the undesired change. Current livestock grazing should not be the presumed cause of transition. If grazing management is a causal factor, managers should apply adaptive management solutions to adjust the season of use, duration, and distribution of grazing.*

Adequate maintenance requires that a site remain resilient to the inevitable biological and physical pressures that can cause ecological change in a desired plant community. Fire and invasive weeds are major threats to healthy sagebrush steppe (and other) plant communities. In many cases, removing excess vegetation (fine fuel) is a critical means of reducing the risk and intensity of fire, and helps to prevent post-fire invasion by invasive and/or noxious weeds. Managers should apply grazing as a key vegetation management tool, both for bunch grasses and invasive weeds, especially when management goals warrant removing excess vegetation. Providing maximum flexibility in grazing permits (as described in BLM IM 2018-109) facilitates the use of grazing as a targeted vegetation management tool and enhances site resilience to fire and invasive weeds.

Historically Degraded Sites:

Where sites have already transitioned out of their mid-successional stage (e.g. on a typical sagebrush steppe site, the perennial herbaceous component has declined and can no longer competitively exclude shrubs, annual invasive species, or other weeds) management must turn from maintenance to restoration. An adequate assessment will pinpoint the causes of the site's transition as a basis for formulating effective remedies. In some cases, the cause of a site's

transition may have been events that occurred decades or even generations ago and for which changes in current management will not produce the desired outcome. In such situations, it is not appropriate to hold current uses and management accountable for transitions that occurred in the past. Where clearly identified causes of undesirable change are still active and correctable, an adjustment in management should occur.

On a transitioned site where shrubs or invasive annuals are the ecologically dominant species, the balance of vegetative communities typically have stabilized. Bunchgrasses typically will not reestablish as the dominant plant type without substantial human intervention. Restoration of a transitioned site typically requires mechanical intervention (e.g., seeding, brush control, etc.) to reestablish a stable, bunchgrass-dominant state. On historically transitioned sites, competition from shrubs or invasive annuals, not the presence of livestock, is typically the ongoing cause of inadequate bunchgrass communities, especially if the season of use, duration, and distribution of grazing are appropriate. In the restoration of transitioned sites, livestock grazing may be an important management and/or restoration tool to control/manage invasive annual grasses.

Grazing Management

Active, ongoing, scientifically informed grazing management is one of the cornerstones of successful range management on the federal lands and is vital to Humboldt County's livestock-dependent economy. Humboldt County expects federal land management agencies to recruit qualified range scientists (meeting the federal Office of Personnel Management [OPM] Range Management Series, 0454 Individual Occupational Requirements) who can demonstrate professional expertise in the science of grazing management. With a view to ensuring the most current and effective grazing management techniques are in use, Humboldt County strongly encourages the BLM and Forest Service to pursue an interdisciplinary approach to grazing management with other experts in the field. This includes: rangeland resource faculty at the University of Nevada, Reno, and the University of Nevada Cooperative Extension; the USDA ARS Great Basin Rangelands Research Unit in Reno, Nevada, and the Eastern Oregon Agricultural Research Center, in Burns, Oregon; the Society for Range Management; the BLM's National Riparian Service Team (NRST); grazing permittees; local conservation districts; and other qualified parties.

Consistent with well-established grazing management research [reviewed in Heitschmidt and Stuth 1991; Vavra et al. 1994; Briske and Richards 1995; Vallentine 2001], Humboldt County agrees that "grazing" does not refer to a single action but is a managed process that involves many variables. Specifically, the outcome of grazing for plants, habitat, soil, and the grazing animal itself is a function of the *season of use* (plant growth stage during grazing), *grazing duration* in the management unit, and *grazing distribution*. Range managers should recognize that there are hundreds of potential combinations of these variables for any management unit. Effective range management requires the ongoing adjustment of these variables (together with the physical and non-physical range improvements necessary to execute adjustments) to achieve appropriate resource use as defined by management goals and objectives.

Season of Use: Grazers may consume plants at leaf emergence, during slow (early) or rapid (late) vegetative growth, just before (boot stage) or after seed heads emerge, when seeds are developing, at seed shatter and dissemination, or when the plant is dormant. During dormancy, the only physiological active parts of the plant are at or below the soil surface; the standing forage present during dormancy does not provide any physiological benefit to the plant. Therefore, buds and roots remain largely unaffected by grazing dormant vegetation unless standing feed is removed down to the root crown, or very intense trampling and physical damage to the buds occurs. Grazing dormant growth may also be an important vegetation management tool.

During the season of active growth—beginning with leaf emergence and ending with seed production—the plant consumes energy reserves to create new leaves (i.e., leaf emergence to the 2-3 leaf stage) and later stores the energy that will keeps roots and buds alive during dormancy and allows buds to produce the initial leaves the next growing season. Year-on-year grazing during the entire growth period in a manner that annually removes half or more of the leaf material (particularly toward the latter half of the growth period) is typically the cause of overgrazing. While healthy plants typically can withstand one year of heavy use (>60% leaf removal) during the growing season, plants exposed to this situation for two or more consecutive years have a dramatically increased risk of being overgrazed.

Humboldt County supports the implementation of periodic full or partial non-use on individual pastures during the growing season through some type of rest rotation or deferred rotation grazing system. These are the common and accepted management actions to prevent continuous growing season grazing on individual pastures for multi-year periods.

Grazing Duration: The length of time that livestock have access to a pasture is called "grazing duration." As grazing duration increases, the probability increases that livestock will graze each plant two or more times. Multiple defoliation events are more likely when long grazing periods overlap the period of active growth because new leaf material develops rapidly and new growth is always more palatable and nutritious than older standing forage. Typically, multiple defoliations increase the risk of removing 50 to 60% or more of the leaf area. Thus, the risk of permanent injury to the plants increases when a long grazing period overlaps much of the growing season, and particularly during the back-half of the growing season. The risk of multiple defoliations can be mitigated with livestock distribution (see below). Poor distribution of livestock can create management problems even when the duration of the grazing period is appropriate. By contrast, aggressive livestock distribution through herding and other methods may facilitate longer grazing duration in a unit.

In the second half of the growing period, grazing duration becomes especially important. During this growth stage, there is only a short period during which the plants can recover (regrow) from grazing. This is because soil moisture is declining rapidly and there is a decreasing probability of a precipitation event large enough to recharge the soil profile and lengthen the growing season. Year-on-year short recovery windows during this important period (or ongoing grazing) do not allow for sufficient leaf growth to create enough stored energy (carbohydrates from photosynthesis) to adequately meet future plant needs.

In short, wherever it is feasible during the growing season, frequent rotations with shorter grazing duration in multiple management units are preferable. Consistent with the Public Rangelands Improvement Act [43 U.S.C. § 1751(b)(1)] Humboldt County views range improvements such as cross fencing and water distribution pipelines as essential to effective range management, and as providing the necessary infrastructure for rotational grazing systems.

Grazing Distribution: "Grazing distribution" refers to grazing all or most of a management unit moderately through scattering or frequent herd movement, as opposed to grazing one area of a management unit intensely. Adequate grazing distribution is supported through water distribution, appropriate selection and placement of mineral supplements, active herding, riparian fencing, and other techniques. Overgrazing in specific areas—especially in zones where livestock are apt to congregate like riparian areas—is usually due to a failure to adequately distribute livestock. Where livestock distribution issues are impacting rangeland health goals and objectives, appropriate adaptive solutions should seek to enhance distribution. Cutting stocking rates or onerous rest schedules are inappropriate responses and will not likely remedy a distribution problem.

In summary, grazing management issues are best solved by rotating season of use, adjusting duration of use as appropriate to season, and implementing livestock distribution strategies. By contrast, reducing livestock numbers will not solve a grazing problem when the underlying cause is excessive duration during the growing season for consecutive years or failing to adequately distribute livestock across a unit. *Grazing management solutions should always focus on adapting grazing strategies to alleviate the mechanistic cause of a problem, not on administrative remedies that substitute wholesale reductions or elimination of grazing for adaptive management solutions*.

A good assessment tool that integrates the season, duration, and intensity variables needed to predict the potential effects of grazing is the Grazing Response Index (*Nevada Rangeland Monitoring Handbook 3rd edition*, p. 48).

Forage Utilization vs Stubble Height

It is Humboldt County's view that proper range management must begin with the proper application of scientific concepts. "Forage utilization" appropriately refers to the percentage of a plant's growth that is consumed or damaged during the growing season (i.e., material the plant cannot recruit to photosynthesize at or close to its potential) [Frost et al. 1994; Laycock 1998; Smith et al. 2005]. By contrast, how much of the available forage grazers consume after the plants have completed their annual growth cycle and stored sufficient energy reserves (i.e., grazing post-growth or dead vegetation) is largely irrelevant from a plant health perspective. *The correct and useful application of the forage utilization concept only occurs when managers apply the concept as a growing season assessment tool. This permits a correct understanding of how grazing animals likely affected plant physiological processes that growing season, and how grazing management may need to change (but perhaps not all) to maintain a large population of robust plants with large, deep root systems.*

In contrast to forage utilization, perennial herbaceous vegetation that remains in a management unit after the plants have completed their lifecycle is "residual vegetation," typically referred to as "stubble" for erect plant material standing above the root crown, and as "plant litter," when it lies prostrate on or just above the soil surface. Consumption (use) of residual vegetation should not be confused with forage utilization because grazing residual vegetation creates no physiological impacts on the plant—unless plants are grazed down to the root crown. However, some amount of standing stubble (and surface plant litter) may have other resource values and be needed to achieve soil stability and/or proper function of the site. Stubble height requirements, where stipulated, must be constrained by a site's potential and based on necessary and realistic management goals and objectives; there is no universally appropriate stubble height that can be applied across diverse management sites. Stubble height requirements should not frustrate fuel management goals.

Rangeland Monitoring

Humboldt County recognizes that monitoring is critical to effective range management, and for meeting rangeland health goals and objectives within a multiple use management framework. Federal agencies are responsible for developing monitoring programs. Humboldt County expects that federal agencies will actively involve grazing permittees as cooperative partners in rangeland monitoring within the County. Monitoring efforts within the County should be guided by the framework provided by the *Nevada Rangeland Monitoring Handbook* (Swanson et al. 2018, third edition) and its companion, the *Rancher's Monitoring Guide* (Perryman et al. 2006) which were collaboratively co-authored and approved by the BLM and the Forest Service, among other federal and state agencies.

The Nevada Rangeland Monitoring Handbook and its companion, the Ranchers Monitoring Guide, describe the inventory, assessment, and long- and short-term monitoring processes and techniques in detail. As these manuals make clear, inventory, assessment, and long- and short-term monitoring are distinct processes, and are not interchangeable.

Humboldt County strongly endorses cooperative permittee monitoring. Both the BLM and the Forest Service have signed MOUs with the Public Lands Council stating their commitment to working cooperatively with grazing permittees as monitoring partners (see *Nevada Rangeland Monitoring Handbook*, pp. 57-72). Further, the Nevada State Office of the BLM and the U.S. Forest Service (Humboldt-Toiyabe National Forest) have signed MOUs (BLM-MOU-NV910-9264-2018-001; 18-MU-11041730-003, respectively) with the Nevada Cattlemen's Association endorsing permittee/agency cooperative monitoring within an adaptive management framework. Humboldt County expects all provisions of these MOUs to be honored, and strongly encourages federal agency personnel to work with grazing permittees to fill out the Cooperative Monitoring Agreement Template in the *Handbook* (pp. 55-6) to initiate individual cooperative agency/permittee monitoring plans.

Adaptive Management

Consistent with federal guidance and with this document (See General Position Statements, above; Section XX Livestock Grazing), Humboldt County strongly endorses adaptive management and expects federal rangelands within the County to be managed according to an adaptive management approach.

Rangelands are dynamic biophysical landscapes influenced by numerous ecological process that often have large variability between years, but also across decadal or longer cycles. *Long-term static management on dynamic biophysical systems ultimately results in management failure*. These failures cause a decline in resource condition, resistance and resilience to environmental fluctuation, less productive landscapes, and economic hardship for local economies. Adaptive management is the continual process of adjusting management (not eliminating uses) due to changing management situations and resource conditions, and improved knowledge (learning) about those situations, due to properly collected monitoring data. *Both short- and long-term monitoring data are critical components for successful implementation of adaptive management on rangelands. Long-term successful management of rangelands in Humboldt County requires the application of adaptive management*.

Humboldt County expects federal land managers to work in coordination with grazing permittees, fire, weed, and conservation districts, and the County as partners in adaptively managing and monitoring rangelands within the County. [See Livestock Grazing and Fire Sections].

Summary

"Rangeland health" refers to the overall biophysical status of a unit of rangeland. The process of assessing rangeland health is a critical first step toward effective range management. However, a rangeland health assessment should never be confused with *range management*, which necessarily involves *accurate diagnosis* of the causes of resource problems, with a view to subsequent actions, like:

- making targeted grazing and other management adjustments;
- ongoing resource monitoring and tracking trend of the resource condition;
- ensuring that ecological sites are managed to minimize risk of fire, and are resistant to invasive species and resilient to fire and other disturbances (Pellant et al. 2005).

Where rangeland health issues are identified, adaptive range management is the most effective and appropriate response. By contrast, responding to rangeland health issues with administrative decisions that foreclose on land uses is effectively a decision to not manage the resource for multiple use, while creating undue hardship on land users and the local economy. Humboldt County will continue to engage with federal agencies as a strong and active partner to ensure that rangelands within Humboldt County meet management goals while sustaining important land uses.

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