Management of Growing Season Grazing In the Sagebrush Steppe

---- Minority Report ----

Cindy Salo

Although I agree that, "bunch grasses common to the sagebrush plant communities are much more sensitive to growing season grazing than they are to dormant season use" (page 9, column 2), and that, "growing season grazing on sagebrush/bunch grass rangelands warrants special management attention" (page 9, column 2), and that, "the measure of grazing management success or failure is tracking changes in the plant community over time" (page 10, column 2), I disagree with the underlying assumptions and with the conclusions of the Owyhee Initiative Science Panel Draft Report of September 17, 2010. I do not agree with statements about the scientific process, photographic monitoring, and determining when to remove livestock after growing season grazing. In addition, I describe Missing Information that could help improve management of growing season grazing in Owyhee County.

The Scientific Process

I believe that the characterization of science on page 2 may be seen as disingenuous and an attempt to manufacture doubt and downplay results from research on growing season grazing. The fact that the Owyhee Initiative Board has set up a Science Review Panel indicates that the Board values science; downplaying science undermines the Panel and its recommendations.

"Well-designed and replicated grazing management research is remarkably lacking (page 2, column 1)."

This overlooks our good understanding of many aspects of rangeland ecology and management, such as the physiology of defoliation and regrowth (Youngner 1972, Briske and Richards 1995), the responses of common and widespread grasses, such as bluebunch wheatgrass, to different intensities and seasons of grazing at different stages of growth (Stoddard 1946, Blaisdell and Pechanec 1949, Mueggler 1950, Wilson et al. 1966, McLean and Wikeem 1985), and the unifying principles of rangeland management that are taught in range management courses. These principles include 1) chronic, intensive grazing is detrimental to plant growth and survival; 2) primary productivity can be increased by lenient grazing and decreased by severe grazing; 3) forage quality is often improved by frequent grazing; and 4) species composition of plant communities can be modified in response to the frequency, intensity, and seasonality of grazing (Briske et al. 2008).

"Even the conclusions in the Journal of Range Management [sic] or other 'scientific' natural resource publications are often debatable, less than conclusive and may not be representative of conditions beyond the particular study (page 2, column 1)."

Debate among scientists is not a flaw of the scientific process it is the heart of the scientific process. Science is the process of refining our understanding of the natural world and our ability to make predictions about it. Debate and discussion are integral parts of this process.

"When dealing with biological organisms, there are so many variables that research scientists cannot control and thus cannot statistically account for their effect on the results (page 2, columns 2)."

This overlooks the widespread applicability of the unifying principles of rangeland management listed above. The remarkably similar response of bluebunch wheatgrass to grazing across ecological sites and precipitation zones is an excellent example of how general principles emerge when the same pattern is seen in many different studies and across many different variables (Anderson 1991 and citations above).

Photographic Monitoring

I do not agree that, "We recommend a relatively simple permanent photo point trend monitoring system that includes both landscape and close-up photos (page 8, column 1)." or that "[Monitoring trend] can be easily accomplished using permanent photo locations (page 10, column 2)." Photo-monitoring is best for noting major changes in vegetation type, such as juniper encroachment into sagebrush steppe. While it can provide qualitative information about a site (Hall 2001), it is unlikely to identify changes in 1) the cover of perennial grasses, which are critically important for maintaining healthy rangelands, or in 2) the amount and distribution of bare ground, which reflect a site's susceptibility to erosion (Herrick et al. 2009) and invasive plants (Salo unpublished).

Although more time consuming than photo-monitoring, transects provide important quantitative information on the status of rangelands. Permanent transects are frequently used, as they generally provide more accurate information than do the same number of temporary transects (Elzinga et al. 1998).

Measuring basal cover often gives more useful information than measuring canopy cover, as basal cover is less variable among and within years (Elzinga et al. 1998). Recording only life form of basal cover (sagebrush, other shrub, perennial grass, perennial forb, annual grass, and annual forb) provides useful quantitative information while eliminating the time-consuming task of identifying plants to species. This approach identifies changes in the cover of 1) perennial grasses, which are of greatest concern in evaluating grazing management; 2) sagebrush, which is important for wildlife habitat; and 3) annual grasses, which can increase fire frequency and extent.

Measuring basal gaps between perennial plants is one of the easiest and fastest transect techniques. As this only requires identifying plants as either perennials or annuals (Herrick et al. 2009), it is easy to learn, relatively unskilled employees can do it, and results are similar among different people. Basal gap measurements identify changes in the amount and distribution of bare ground, as they record both 1) the total bare area and 2) the size of individual bare patches. The distribution of bare ground is important because many small bare patches are not as susceptible to soil erosion (Herrick et al. 2009) or invasive plants (Salo unpublished) as are fewer larger patches of the same total bare area.

Vigorous stands of perennial grasses are the Thin Green Line that protects our rangeland resources. Perennial grasses that compete strongly with invasive species and recover quickly after drought, fire and other disturbance are the key to healthy rangelands. Reduced perennial grass vigor, density, or cover, or an increase in large bare patches can signal reduced ability to recover after disturbance. When a site is unable to recover after disturbance less forage is produced, wildlife and fish habitats are degraded, and soil erosion and invasive plants increase.

Determining When to Remove Livestock

Although I agree that "Livestock must be removed early enough to insure sufficient remaining growing season (soil moisture) to allow forage plants regrowth and complete the reproductive cycle (page 7, column 1)," the intensity and duration of grazing must not be overlooked and methods and guidelines must be developed to identify the point when livestock must be removed.

Severe growing season grazing is detrimental to plants and must be avoided to prevent degradation of rangeland resources. For example, removing 50% of total bluebunch wheatgrass forage (Mueggler 1975) or clipping this species to a height of 2" (McLean and Wikeem 1985) greatly reduce plant vigor, which greatly reduces ability to recover after disturbance.

In addition, soil moisture cannot be the sole criteria for determining when to remove livestock. Grazing must end before the early boot stage of perennial grasses, as this is the most vulnerable growth stage of both bluebunch wheatgrass (Wilson et al. 1966) and Thuber's needlegrass (Ganskopp 1988). Even when late spring rains recharge soil moisture, livestock must be removed before perennial grasses begin to reproduce in order to protect these plants, which are the key to protecting our rangelands.

Missing Information

Additional knowledge about estimating available soil moisture could help improve management of growing season grazing in Owyhee County. I am not aware of a quantitative method for estimating soil moisture on an appropriate scale, although NOAA estimates this each day on a broad scale: http://www.cpc.ncep.noaa.gov/products/Soilmst_Monitoring/US/Soilmst/Soilmst.shtml

A similar model for Owyhee County would include such things as, but not be limited to:

- Soil depth, from NRCS soils data
- Soil surface texture, from NRCS soils data
- Precipitation amount and distribution, from the National Weather Service
- Modeled precipitation, from something like DAYMET (http://www.daymet.org)
- Slope and aspect, from Digital Elevation Models (DEM)
- Runoff from watersheds, from USGS
- Vegetation composition, from monitoring data and local expert knowledge of BLM personnel and permitees
- Evapotranspiration from sagebrush steppe (Anderson and Forman 2001)

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