Assessing Rangeland Condition

I. **Rangeland Condition** = The current state (e.g., plant composition) of a particular plant community in comparison to some perceived potential.

II. **Why determine range condition**?

A. It indicates management inputs necessary. For example, if range is in high ecological condition than strategies to maintain condition should be employed. However, if range is in degraded condition, strategies to improve condition should be considered.

B. On public rangelands, range condition is assessed and reported as a way of being accountable to the "public" regarding the current state of public resources.

III. **Traditional Approach to assessing rangeland condition.**

A. First, the type of land being assessed must be determined to understand the natural potential of the land. In other words, determine what kind of community the particular combination of soil, climate and topography can support.

1. *Range site*, according to the Society for Range Management = "a distinct kind of rangeland, which in the absence of abnormal disturbance and physical site deterioration, has the potential to support a native plant community typified by an association of species different from that of other sites. The differentiation is based upon significant differences in kind or proportion of species, or total productivity".

a. Range sites are classification based on:

(1) Soils (depth, texture, soil limiting factor)

(2) Topography

(3) Current vegetation

(4) Precipitation zone

b. Range sites (in Idaho and most states)

(1) Sites named by soil and topography (e.g., shallow stony loam)

(2) Sites vary by region and county (e.g. shallow stony loam sites may vary slightly by county).

(3) County Soil Surveys, published by the Natural Resources Conservation Service, will list or describe sties and complete range site guides are available at each county office of the NRCS.

2. *Habitat types*, as defined by Daubenmier, = "a term for all parts of the earth's surface which support or is capable of supporting the same kind of plant association (i.e., have the same "climax").

a. Classified by dominant climax vegetation (i.e., Art.tri/Agr.spi.)

b. Technique originally developed for forest types, later applied to rangeland.

c. The classification is used by the Forest Service and Bureau of Land Management. Classification guides and manuals are available from these agencies on a regional basis

B. Second, the species composition of the site must be determined. Follow methods for determining rangeland composition. Most range sites descriptions are based on % by dry weight. Therefore, composition techniques based on biomass are most appropriate.

C. Third, compare current state to climax or pristine vegetation. (Composition of climax or pristine communities can be found in range site or habitat type guides)

Plant	% in Current	% in Climax	% Counted to Condition
Wheatgrass	50	15	
Peavine	30	30	
Brown bush	20	40	
Annual grass	0	15	
Total	100	100	

D. Fourth, designate condition class.

1. Excellent = 76-100% of Climax
2. Good = 51-75% of Climax
3. Fair = 26-50% of Climax
4. Poor = 0-25% of Climax

E. Problems with the traditional range condition system

1. Terms (excellent, good, fair and poor) are value ridden and may not be useful in management.
    a. Terms may not be relevant to management objectives. For example, excellent condition range may not be the best for livestock production or wildlife habitat.
    b. Terms also have value connotations that uneducated, but interested, publics may misunderstand. For example, as a land manager you may at some time manage an area of land for fair condition, but an interested citizen may demand that you manage for “excellent” condition because they think it is better.
    c. The terms climax, high seral, mid-seral, and low seral have been suggested as substitutes because they carry no inherent value and relate closely to ecological uses and outputs (such as wildlife habitat, watershed characteristics, etc.)
2. Determining climax is very difficult. It is difficult to impossible to find examples of undisturbed native vegetation. Therefore, many guidelines on climax composition are based more on expert opinion than data.
3. Our idea of climax is that it is a stable community that will result without unnatural disturbance. However, ecological research has revealed that many climax communities are not “stable; they vary significantly from year to year.
4. The site we are evaluating may be a transition between sites and may not be typical. Therefore, it is difficult to know what to compare the site to.
5. The method does not provide a reasonable way to include exotic species in the assessment even though some exotic species may have significant value for specific uses such as livestock grazing.

IV. **Desired Use or Desired Plant Community (DPC) Approach**

A. Determine management goals for site:

1. Livestock
2. Wildlife
3. Watershed
4. Recreation
5. etc.

B. Describe what site should look like to meet the management goals. In other words, clearly define your DPC.

C. Evaluate site potential in reference to goals

1. Refer to value for use (e.g., wildlife, watershed) listed in range site guides or habitat type references
2. Look at ability of land to meet desired state and make adjustments.

D. Give rating to land in reference to goal. For example:

1. Good for deer and elk.
2. Adequate for watershed

V. **Site Potential or Proper Functioning Approach**

A. This is an assessment of land to determine if it is ecologically in tact.

1. Is soil stable?
2. Are carbon and nitrogen cycles functioning properly?
3. Is the water cycle in tact (e.g., infiltration, water table, run off)?

B. This approach stresses soil health and stability, and vegetative reproduction.

C. First, look at land attributes

1. Soil Stability
2. Vegetation Production, Composition, Diversity.

D. Locate a reference site that is in high ecological condition. Basically, try to find an area with little “unnatural” disturbance.

E. Compare the site you are evaluating to the reference site to subjectively assess if the site is ecologically sound. The comparison with the reference site is designed to increase the value of the subjective decision and make procedure usable by a group of people. For example, a group of people could then discuss the ecological soundness of a specific are as it differs or is similar to the reference site.

Assessing Rangeland Trend

I. Rangeland Trend, according to the Soc. For Range Mgmt. = “the direction of change in range condition and soils”.

   A. Range condition alone is not an accurate indicator of correctness of current management practices. Many improper practices could be taking place that would not be detected through species composition analysis. Poor range condition of a range does not necessarily indicate that the present practices are wrong; the area could be properly stocked. On the other hand, excellent range condition does not mean that the current practices are correct, because, it could very well be an improperly managed range which is either at the point of, or in the process of deterioration.

   B. Trend is considered upward (improving) if the community is becoming more similar to climax or DPC or downward (declining) if the community is becoming less similar to climax or DPC or stable if the community is not changing.

   C. When assessing range condition for a desired use or DPC, trend could be upward for one use and downward for another. Therefore, to determine trend, one must specify the use criteria or DPC .

II. There are basically 2 ways to measure trend:

   A. Monitor range condition over several years. Changes in range condition can then be identified.

      1. Be careful not to change techniques from year to year.

      2. Select techniques that are not highly susceptible to yearly climatic variation. For this reason:

         a. Measuring basal cover is better than canopy cover or biomass

         b. Measuring frequency would be better than density or cover.

      3. Apparent trend can be detected by looking at plant and soil characteristics. Apparent trend is not as definitive as taking data over time, but it is instantaneous; you don’t need years of data to determine apparent trend.

III. Example of Apparent Trend. These criteria should be modified and made site-specific.

Plants	Soils
Downward Trend	Downward Trend
Better forage plants unavailable to livestock. Better forage plants confined to protection of shrubs.	Rill marks. Small active gullies of the shoestring type.
Hedged and highlined shrubs. Dead and dying hedged plants	Active gullies. From a few inches to several feet deep.
Lack of reproduction of young plants of desirable species.	Alluvial deposits. Laid down by running water. Absence of perennial vegetation on the deposits.
Invasion by undesirable plants.	Active terraces. “Stair-step-like” on slopes.
Desirable plants lacking vigor.	Exposed plant crowns or roots.
Scarcity of litter of desirable plants.	Wind scoured depressions between plants.
	Wind deposits. Fine soil particles drifted into the vegetation.
Upward Trend	
Better forage plants invading and readily available to livestock and wildlife; in the openings between shrubs.	Upward Trend
Invasion of plants into eroded areas. The basal parts of plants flush with the ground surface.	Gullies healed. Perennial vegetation on both sides and bottom.
Several years’ growth from hedged browse. At least 2 or more years of regrowth evident.	Sloping-sided soil remnants. Plant roots are covered by soil. Space occupied by perennial plants.
Desirable plants vigorous. Many leaves, seed stalks tall and numerous, leaves a healthy green color.	Healed terraces. Sloping sites and tops clothed with vegetation
A variety of age classes of desirable plants.	
A well dispersed accumulation of litter from past years growth.	

A Few References:

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