basis for rangeland classification. However, I strongly feel that biotic (plant) names should not be part of the site classification. The abiotic (soil and climate) should stand alone. Soil and climate (Range Site) determines climax species. But range condition reflects the *present* dominant species found growing on a particular site. The use of biotic names in conjunction with abiotic or range site name is confusing and unnecessary and will set rangeland classification back 40 years.

I feel that changing the time-honored terminology of Excellent, Good, Fair, and Poor range conditions to Early seral, Mid seral, Late seral, and PNC vegetation ratings is also confusing and unnecessary. Excellent, Good, Fair, and Poor is range condition terminology that has been used for many decades throughout North America. It is understood and accepted by ranchers, students, researchers, educators, and field technicians. It is also accepted terminology by Canadian ranchers and government personnel. U.S. ranchers fully understand the terms as they are used by SCS, BLM, FS, Extension Service, Fish and Wildlife Service, Agricultural Research Service, State departments, agricultural lenders, universities, and all others dealing in rangelands. The terms have repeatedly been used in technical publications and are well accepted. To recommend that they be replaced with Early seral, Mid seral, Late seral and PNC vegetation ratings strongly suggests that the RISC has had little field experience in working with ranchers, students and others to get management principles implemented on rangeland.

It is also unfortunate that the Decreaser, Increaser and Invader terminology is omitted from the RISC report. These terms are well accepted and are excellent teaching tools for explaining grazing response of individual plant species. The mere categorizing of plants into these three simple descriptive groups—Decreasers, Increasers, or Invaders—psychologically and realistically simplifies and clarifies the dynamic nature of range ecology.

Stocking rate estimates can and are being determined by ranchers and agency people based on range site and condition classes. It is a simple, practical method that has been field tested on many million acres of privately owned rangeland and on much of our public lands. It works because the range examiner must interpret an ecological guide for each specific site.

Range management is a science but not an exact science. Soil, climate, and vegetation normally exist as a continuum. Contrarily, we mortals operate with engineering and computer type minds. Many times we try to be too exacting in our methodology. The experience, judgement, and common sense of the range examiner should be incorporated into the inventory procedure and reflected in the decisions.

It is inexcusable that the reference list in the RISC report did not include the following classic references on rangeland inventories and basic ecology:

Clements, F.E. 1928. Plant Succession and Indicators. The H.W. Wilson Co. NYC.

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Failure of the RISC Committee to extrapolate recommendations from our ecological foundation undoubtedly contributes to the weakness of the report. To me it is degrading to have such a report published under the name of the Society for Range Management. The RISC report should be disapproved by SRM. If RISC is to continue in trying to standardize inventory methods, practical field-oriented people that are constantly inventorying rangeland and working with ranchers should have a major hand in formulating inventory methods.

Viewpoint: The Habitat Type Controversy; Two Common Concepts

Frederick C. Hall

Intriguing articles have appeared during the last couple of years in *Rangelands* and the *Journal of Range Management* dealing with "habitat type" (Anderson 1983, Bonham 1983, Daubenmire 1984, Dyksterhuis 1983, Hoffman 1984, Meeker and Merkel 1984). There seem to be two areas of commonality in the concepts of habitat type, range site, ecological site, association, and site climax: (1) use of climax or stable state as the index of plant community development and, (2) classification of plant communities into "types."

The climax concept is used for habitat type, range site, ecological site, association and site climax. Meeker and Merkel (1984) discussed climax theories regarding vegetation classification useful in range management. They recommend the term "site climax" which is defined as native vegetation that comes to a state of equilibrium (climax) according

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to differences in topography, soils, and climate. Soils need not be geomorphologically mature and topography and soil drainage can vary widely within the same precipitation zone resulting in different kinds of climax plant communities. The definition of "site climax" seems appropriate because it is not restricted to rangeland vegetation (grasslands and shrublands). It is also applicable to forest range, timberland, meadows, and sparse vegetation found on talus slopes and rock outcrops. The use of climax has been suggested as a means for evaluating livestock impacts on vegetation so land managers can rate excellent, good, fair, and poor range condition and can evaluate changes in species dominance, density, or composition for interpretation of range trend (Bonham 1983, Dyksterhuis 1949, Meeker and Merkel 1984).

The second common concept is the classification of plant communities into types. The controversy, it seems to me, is what do we call these "types"? For discussion, let me call them "climax plant associations." They are based upon samples of site climax vegetation which are then grouped into types, according to the investigator's philosophy, using some measure of dominance by species (Bonham 1983).

Habitat types, as discussed by Daubenmire (1952, 1970, Daubenmire and Daubenmire 1968), and Hoffman (1984), are based upon *floristic* classification of plant communities, i.e., climax plant associations. They emphasize that topography, soil, and climate are *not* part of the classification by persistently illustrating that the same habitat type can occur on low precipitation north slopes and higher precipitation south slopes.

In 1952, Daubenmire simply changed the term "climax plant association" (or association, as he called it) to habitat type for mapping purposes. Thus, he suggested that habitat type is the land area which supports, has supported or will come to support the same climax plant association.

I feel this change in terms was unfortunate because current literature purports to classify habitat types (Pfister et al. 1977, Mueggler and Stewart 1980, Hoffman 1984). This *implies* classification of "land areas." What the authors did, however, was a floristic classification of site climax vegetation without incorporating abiotic site factors in the classification to qualify them as land areas.

Climax plant association is the primary classification unit in ecological site and range site. The terms *ecological site/-range site* **include** abiotic factors in their descriptions such as steepness of slope, surface soil characteristics, and often precipitation—which seem to be indicators of "land area"! The difference between habitat type and ecological site/-range site is the inclusion of abiotic factors in making the classification for the latter. If one chooses to use the term "habitat type" in lieu of climax plant association, we could have a low elevation, steep north, sandy loam soil habitat type XY; a rolling plains, mid elevation, loam soil habitat type XY; and an upper elevation, steep south, stony, soil, habitat type XY. These, according to Anderson (1983), are ecological sites/range sites.

Daubenmire (1984) is essentially correct when he points out the same climax plant association can grow on a moderately steep north slope at lower precipitation and a moderately steep south slope at higher precipitation. The ecological sum of the environment, however, is only related to dominance in the site climax vegetation—it is **not** equivalent in habitat characteristics. The north slope tends to have higher snow pack accumulation, better thermal protection for big game during the summer, later spring green-up of vegetation, and different soil characteristics than does the south slope. Depending upon the direction of winter storm patterns, the two slopes can have significantly different winter microclimates.

Note in this discussion that all classification attributes are natural parts of the complete ecosystem. No management objectives have been discussed because the types of any plant community classification can be interpreted for management. Examples of forest habitat types are Daubenmire (1952), Daubenmire and Daubenmire (1968), and Pfister et al. (1977), and for rangeland habitat types Daubenmire (1970), and Mueggler and Stewart (1980). What I have discussed is incorporation of "land area" into a plant community classification. Since ecological site/range site does include abiotic factors and habitat type does not, these terms are not equivalent. Basically, I feel that ecological site/range site is a modification of the habitat type concept. Abiotic criteria have been added to classification of climax plant associations, i.e., "land area" is used to qualify an association.

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