Management Implications

In the past, range management practices have often been geared towards replacing forbs and shrubs with pure stands of grasses. The vast acreages of crested wheatgrass in the Great Basin and lovegrasses in the Southwest support the above statement. Rangelands with a pure stand of grass provide good forage for cattle or in some cases elk and mule deer during active growth but poorly meet the nutritional requirements of large or small ungulates during most of the year. Research in the Great Basin and the Southwest show that inclusion of palatable forbs and shrubs in seeding mixtures with grasses can greatly improve livestock performance during forage dormancy and provide better habitat for small wild ungulates and other wildlife species than pure stands of grasses.

Range condition is usually based on the density and production of native, palatable, perennial grass. A better criterion might be the diversity of palatable forage species. Under this criterion it might be desirable if up to 20% of the yearly forage production was comprised of palatable annuals. It is important to recognize many annual grasses and forbs grow in periods when perennials are dormant. Research by Randy Rosiere and others (JRM, 1975, 28:89) in south central New Mexico and myself in northern New Mexico shows annual forbs provide an important nutritional contribution to cattle, sheep and pronghorn diets and reduce pressure on palatable perennial grasses during the growing season. In the Northwest, Martin Vavra's research shows the introduced annual, cheatgrass, provides green forage for cattle, mule deer, and sheep in the fall, winter, and early spring when the native perennial grasses are dormant.

A large number of studies involving both domestic and wild ungulates in North America are consistent in showing that forage selection changes tremendously within and between years. The nutritive quality of various forage species also shows great fluctuations within and between years. The greater the degree of forage selection a range provides domestic or wild ungulates, the more likely they will be to meet their nutrient needs. ●

Viewpoint: Ecological Site/Range Site/Habitat Type

Rexford Daubenmire

My attention has recently been called to a note that appeared in the August 1983 issue of *Rangelands*, p 187-188, which contains some misconceptions as well as errors that should be pointed out.

In espousing his preference for the term "range site," the author of that note, E. William Anderson, stated that "the habitat type* does not have management implications" for rangelands. This is completely at odds with much work published by range specialists. The latter have worked out identifying characters of habitat types in western rangelands and pointed out their managment implications in work done in New Mexico (Francis and Aldon 1983), Colorado (Francis 1983), Idaho (Tisdale 1979, Hironaka, et al. 1983), Montana (Jorgensen 1979, Mueggler & Stewart 1980, 1981) and British Columbia (McLean 1970). Other workers have adopted the concept but have not used the term habitat type.

It is curious to note that Anderson has seen that essentially the same type of virgin vegetation (bluebunch wheatgrass/-Idaho fescue) occurs on north-facing slopes in dry climates at low elevation, but shifts to south-facing slopes under higher rainfall at higher elevations. This he views as indicating different "ecological sites." To a plant ecologist this vegetation is indicating the reappearance of a habitat type at places having essentially the same ecologic sum of climatic and soil conditions, as a result of microclimates of the contrasted slopes compensating for differences in macroclimates.

*Habitat type is a collective term for all parts of the earth's surface which support, or are capable of supporting, the same kind of plant association, i.e., the same climax. The plant association must have the same potential dominants in all layers.

The concept of "range site" suggests a single-purpose objective, i.e., management of land for producing livestock forage. Habitat type, in contrast, emphasizes similarities and differences in ecosystems which carry implications for a variety of land management objectives such as livestock, wildlife and timber production, for predicting disease hazard, for indicating hydrologic cycles, etc. It is not clear what Anderson means by "ecological site," but if these words carry their usual meaning, the concept should coincide with habitat type, for the latter represents a narrow range of soil plus climatic conditions, as indicated by the tendency for this combination to favor a remarkably few species out of hundreds in the flora, and to determine which among them will dominate all others. The concept was first developed solely as a basis for arranging a wide variety of disturbed vegetation types in ecologically equivalent units. However, it soon became evident that these units had practical value in forest management with respect to choice of species to favor maximum productivity in each habitat type, and which habitat types are best suited for the growth of a particularly desirable species. Habitat types provide a guide to distinguish between land where dwarf mistletoe can and cannot infect ponderosa pine. Especially significant was the fact that when independently checked by field workers in applied ecology, the system proved easy to use and capable of adding materially to the stock of economically useful information.

The claim that the "range site concept is widely used in the U.S. and is becoming internationally accepted as the basic unit of resource inventory for the purpose of planning use and management" could stand some documentation. International acceptance of any system of classifying soil, vegetation, climate, etc., might seem ideal, but nations (as well as individuals!) are inclined to be individualistic, and loath to use concepts or terminology originating beyond their own limits. In fact, it is remarkable that the habitat type has been used in a broad spectrum of published work by foresters, range managers, game managers, and by botanists. It has been applied to forest, scrub and grassland, and has been used throughout the Rocky Mountains and as far east as Ohio. After gaining acceptance by many foresters, the concept has been getting increasing attention from range scientists.

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Viewpoint:

Habitat Types: A Supportive View

George R. Hoffman

I am presenting a viewpoint supporting the concept of *habitat types* in the classification of landscapes and their vegetation. This is in response to viewpoints of Dyksterhuis (1983) and Anderson (1983), who suggested the concept is too "academic" or too "cumbersome" or otherwise unsuited to their purposes. Because of certain misunderstandings apparent in the viewpoints of both Dyksterhuis and Anderson, I should like to attempt a clarification of the concept.

Many investigators are currently using the habitat type concept in classification studies of western forest and range lands, particularly in the Rocky Mountain and intermountain region of the west. The long-range impacts of these studies should be interesting and worthwhile. They are being done with the use of a consistent sampling scheme; and uniform ecologic concepts provide the basis for interpretation. So far, most habitat type studies have been published by the U.S. Forest Service and have included extensive tables of stand data. These will be invaluable for verification, refinement, or other interpretations by subsequent investigators. Alexander (1974) pointed out that the worth of the habitat type concept is only beginning to be realized in forest management in the Rocky Mountains. I suggest it be given a serious try in range management before it is tossed aside.

The concept of *habitat type* discussed here and referred to by Dyksterhuis and Anderson was introduced in 1952 by R. Daubenmire. The Daubenmires' 1968 monograph on the forest vegetation of northern Idaho and eastern Washington is often referenced regarding the concept of habitat type and its definition.

The theoretical basis of the habitat type concept is neither radical nor out of line with much ecological thought expressed variously over the years. Persons interested in vegetation, from early botanists to current-day plant ecologists, have shown interest in classifying vegetation. One must assume that vegetation classification is of sufficient scientific value to merit the attention given to it.

In addition, ecologists have described and categorized plant succession and the resulting climax communities.* In 1935 Tansley suggested recognizing climax vegetation based on major controlling influences, and used the terms *climatic climax*, *edaphic climax* and *physiographic climax*. The last-name is usually referred to as topographic climax at present. These three are *primary climaxes* and can develop in the absence of disturbance. Of course, he also discussed climax vegetation based on periodic recurring disturbances such as fire climax and biotic climax. These are disclimaxes (disturbance climaxes) and the names reflect the influence of major, recurring environmental disturbances. Only primary climaxes provide the basis for habitat type classifications.

Habitat refers to the physical location of a single plant or an entire plant community (Odum 1971). Early definitions of

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*Editor's Note: See also the discussion of vegetation classification in the September 1984 *JRM*, pages 427-429.