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RANGELAND COVER TYPES

of the
United States

Thomas N. Shiflet, Editor



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Rangeland vegetation may be aggregated into groupings or associations based on the plants that are present. These aggregations may approximate that of the original (climax) vegetation or display a multitude of variations due to past management and use. Some are relatively stable. Others are temporary occupants of disturbed areas and will gradually advance, through succession, to more stable situations and eventually to climax plant communities, if conditions are favorable. Included are pure stands of native or introduced species that have been reseeded on depleted rangelands and are being extensively managed.

Described here are the rangeland cover types of the United States (exclusive of Hawaii). The classification is based on existing vegetation. They describe what one finds on the ground and must deal with. The descriptions do recognize the ecological influences that contributed to their present structure and will continue to affect their development.

The type descriptions will be useful for making broad-scale inventories of rangelands and, in aggregating the inventory information, and to those who need to relate rangeland vegetation from one area to another. They should be of utility to range managers, other land managers, ecologists, wildlife scientists, teachers, and students.

Definition of Rangeland Cover Type

The "Glossary of Terms Used in Range Management (1989)", published by the Society for Range Management (SRM), includes two definitions that are applicable to this effort:

1. Cover Type - the existing vegetation of an area.
2. Vegetation Type - A kind of existing plant community with distinguishable characteristics described in terms of the present vegetation that dominates the aspect or physiognomy of an area.

The cover type descriptions in this publication embodies both definitions, with some restriction. The major restriction is that they are limited to rangeland vegetation, with the exception that some forest types may be included as discussed in the

Preface. In addition, the descriptions are focused on the dominant plant species present and not the total plant community.

Criteria for Recognition of Types

Several criteria were established for distinguishing rangeland cover types. They are:

1. Each cover type will consist of present (existing) vegetation.
2. The type occupies a fairly large area in aggregate, but not necessarily in continuous stands. Many types occur sporadically and merge into others over short distances.
3. Recognition of a cover type must be based entirely on biological considerations.
4. Cover types must be mutually exclusive.

Cover Type Nomenclature

Rules for naming cover types call for each to be related to the dominant plant species with no more than three species per type (trinomial). Common plant names are used to identify the cover type, with scientific plant names used in the text of the description. However, authors were given considerable latitude in using "generic" names for types that are generally known and readily recognized. For example: Bluegrass scabland in the Pacific Northwest, Chamise Chaparral in the Pacific Southwest, Cross Timber in Oklahoma and Texas, Gulf Coast Salt Marsh in the Southeast, and others.

Plant Names

As stated above, common plant names are used to identify cover types, with scientific names used in the body of the type descriptions. Authors used regional flora for the selection of names. All were encouraged to utilize the latest botanical nomenclature for scientific names. The *National List of Scientific Plant Names* developed by the Smithsonian Institution (USDA - Soil Conservation Service, 1982) was used to resolve conflicts in scientific names. Where more than one valid scientific name was applied to the same common

name, the author's choice of nomenclature was left unchanged. Due to the vast geographical expanse covered and the huge number of individual plant species involved, no list of plant names was developed.

Numbering System

A numbering system was devised by designating blocks of 100's to each general region. These blocks were assigned from north to south for the conterminous 48 states, starting with the Pacific Northwest Region as 100, Pacific Southwest - 200, Northern Rocky Mountains - 300, Great Basin - 400, Southwest - 500, Northern Great Plains - 600, Southern Great Plains - 700, and Southeast - 800. The 900 block was assigned to Alaska.

Within each region, the cover types are numbered consecutively, e.g. for the Pacific Northwest - 101, 102, 103, etc.; for the Pacific Southwest - numbers run 201, 202, 203, etc. This system was applied throughout the nine regions.

Revisions of this work in the future may require that some cover types be deleted and new ones added. In this case, numbers of obsolete types will be deleted and new ones will be assigned new numbers within the block for that region (assuming that no region will ever have more than 99 types). This system will assure that any new type will be identified with its general geographic location.

Relation to Other Classification

Only minimal similarities exist between the rangeland cover types described here and other published classification systems. Kuchler (1964) compiled a map with accompanying manual outlining the *Potential Natural Vegetation of the Conterminous United States*. He briefly describes

116 potential natural plant communities (phytoce-noces) based on "the vegetation that would exist today if man were removed from the scene and if resulting plant succession were telescoped into a single moment". Many of these plant communities would be classified as rangeland. Some of the cover types included here may bear some resemblance to those of Kuchler, but most do not since they are, for the most part, the result of human influence since the mid-1800's. If plant succession were allowed to take place unimpeded, in time the vegetation of these types should approximate those communities described by Kuchler.

Some relationship may be recognizable between the types included here and some of the ecoregions described by Bailey (1978). However, his treatment is much broader and is a regionalization which divides the land surface into regions defined by various factors and does not detail existing plant communities. Most other large scale classification systems that include rangelands emphasize potential (or climax) vegetation, rather than what is present at this time.

Numerous authors have published general descriptions of existing vegetation for specific locales. Some recent ones include Tueller (1989) for Nevada and Barker and Whitman (1989) for the Northern Great Plains. These works are expanded and refined in this publication. For the most part, the cover type descriptions present here represent an original attempt to document the existing rangeland vegetation.

Arrangement of Cover Type Descriptions

The type descriptions are presented by the general geographic regions described earlier.

It is, again, emphasized that these regions are very general and not intended to set firm boundaries.

cover of vegetation, this type is easily eroded by wind, forming hummocks and dunes.

The soils are deep and excessively drained. Surface textures are finesandy loam to fine sand. The effective rooting depth is greater than 40 inches (100cm).

This type provides a wildlife habitat which supports a resident animal community characterized by pronghorn antelope, badger, swift fox, desert cottontail, lesser prairie chicken, and scaled quail.

Variants and Associated Species: Many variations occur in this type. Variations are due to the past and present management being applied to the land and the potential of the individual soils to produce a unique plant community. Variants range from sandhills with an aspect of shinnery oak in the south to level plains with an aspect of black grama (*Bouteloua eriopoda*). Associated grasses include black grama, hairy grama (*B. hirsuta*), giant dropseed (*Sporobolus giganteus*), sand paspalum (*Paspalum setaceum*), and giant sandreed (*Calamovilfa gigantea*).

On areas that have received good management for several years, needle-and-thread (*Stipa comata*) is present. Mesquite (*Prosopis glandulosa*) and small soapweed (*Yucca glauca*) are associated shrubs. Mesquite and/or sand shinnery oak can completely dominate this type when poor management has been applied for several years.

Herman B. Garcia
Tucumcari, NM

SAND SAGEBRUSH-MIXED PRAIRIE SRM 722

Definition, Composition, and Structure: Sand sagebrush (*Artemisia filifolia*) growing to a height of 3 ft (1m). is the visual dominant (Parker and Savage, 1944) in this cover type where it may attain 7 to 50% canopy cover (Sims et al. 1976, Hyder 1979, Collins et al. 1987). Perennial grasses (short, mid, and tall) are the major complement to the sagebrush. Blue grama (*Bouteloua graefilis*) and sand dropseed (*Sporobolus cryptandrus*) often provide much of the basal cover and forage production (Sims et al. 1976, McIlvain and Shoop 1961). Sand bluestem (*Andropogon gerardii* var. *paucipilus*), little bluestem (*Schizachyrium scoparium*), and switchgrass (*Panicum virgatum*) can be important forage producers and provide a tall grass aspect, if grazing by domestic livestock has not been excessive (Kuchler 1974).

Prairie sandreed (*Calamovilfa longifolia*) is a major warm season grass in the northern part of this cover type (Wallace et al. 1973, Hyder 1979, Daley 1972); and the cool season grasses western wheatgrass (*Agropyron smithii*) (Hyder 1979) and needle-and-thread (*Stipa comata*) (Wallace et al. 1973) are important. Sand paspalum (*Paspalum setaceum*), fall witchgrass (*Leptoloma cognatum*), and sand lovegrass (*Eragrostis trichodes*) are important warm season grasses in

the southern part of this cover type; and Texas bluegrass (*Poa arachnifera*) is the only important cool season perennial (McIlvain and Shoop 1961, Collins et al. 1987).

Seasonally abundant annuals may include hairy Indianwheat (*Plantago purshii*), sixweeks fescue (*Vulpia octoflora*), annual bromes (*Bromus japonicus*, *B. tectorum*), lambsquarter (*Chenopodium* sp.), buckwheat (*Eriogonum* sp.), mint (*Monarda* sp.), and sunflower (*Helianthus petiolaris*). Perennial forbs, usually not abundant, may include western ragweed (*Ambrosia psilostachya*), stickleaf (*Mentzelia* sp.), hairy goldenaster (*Chrysopsis villosa*), spider wort (*Tradescantia occidentalis*), and scurfpea (*Psoralea lanceolata*).

Geographic Distribution: This type covers approximately 12 million acres (4.8 million ha) in the central and southern Great Plains from southwest Nebraska, through eastern Colorado, southwest Kansas, and northwest Oklahoma. Much of this cover type is in bands of sandy mantle 3 to 12 miles (4.8-18.2 km) wide parallel to major drainages (South Platte, Arkansas, and North Canadian Rivers) and in narrower bands parallel to smaller drainages.

Ecological Relationships: Deep sandy soils (loamy sands and sands) on hilly landscapes without well-defined surface drainageways are the substrates for this cover type. Faster infiltration and less water loss to evaporation make sandy soils more efficient than finer textured soils in supplying water to perennial plants in this region where much of the precipitation (average annual precipitation 12 to 24 inches) falls during the growing season; high winds are common, and summers are hot. The more favorable soil water relationship allows this cover type to extend westward as stringers into the short grass prairie.

The major range management practices in this cover type are: controlling stocking rate and season of use, use of complementary farmed forages, and controlling sand sagebrush with herbicides. Sand sagebrush is believed to increase in density as grazing pressure increases (Harlen 1958, Costello 1964), however, canopy cover by sand sagebrush showed no major trend over 40 years under moderate grazing or in exclosures (Collins et al., 1987). The wind erosion potential is high on drastically disturbed areas and on limited areas farmed within this cover type. Most of the farming is with sprinkler irrigation; areas that were dryland farmed have largely been reseeded to native grasses, or on the southern edge of the type, to weeping lovegrass (*Eragrostis curvula*).

W.A. Berg
Woodward, OK

SAND SHINNERY OAK SRM 730

Definition, Composition, and Structure: This cover type is dominated throughout its range by the low-growing sand shinnery oak (*Quercus havardii*). The dominant grass in good condition range is sand bluestem (*Andropogon gerardii* var. *paucipilus*) to the north, while mixed dropseeds (*Sporobolus* sp.) are most abundant to the south. According to Allred (1956), this type is known as the High Plains Bluestem Community which is considered post-climax vegetation because of the coarse-textured soils of the area.

Geographic Distribution: The type is best represented in central west Texas, Southern High Plains of Texas, and eastern New Mexico, the Canadian River breaks, and western Oklahoma. It occurs on sandy soils in areas characterized by precipitation ranging from 14 to 22 inches (35-55cm) per year.

Ecological Relationships: Soils are generally classified as Entisols on the dunes, while level landscape positions are Alfisols. Dunal sands are lighter colored which reflect the abrasive action of wind upon individual sand grains. In the more northern parts of this cover type, the soil color becomes brown-red reflecting sand grain coatings of iron oxides and similar minerals. Water infiltration is high and essentially no surface runoff occurs. Fertility is low, and soil organic matter may be as low as 0.20% (Small, 1975).

The oak seldom grows more than 3 ft (1m) tall, yet there may be isolated colonies up to 10 ft. tall. These taller mottes are purported to be hybrids. Canopy cover may approach 90% on some sands, but averages 20 to 30% throughout its range. Biomass of oak usually will be between 1,000 to 2,200 lb/acre (1100-2400kg/ha). Only traces of other shrubs are found in this community with *Artemisia*, *Rhus*, *Chrysothamnus*, and *Prunus* scattered throughout. Herbaceous yields vary with range condition, soil type, and precipitation. In a typical oak-bluestem type, grasses may yield up to 550 lb/acre (600kg/ha) with forbs averaging less than 100 lb/acre (110kg/ha).

The type is sometimes cultivated, but becomes an erosion hazard when the vegetative cover is removed. Principal use is summer grazing for cattle. The major wildlife species using this habitat are the lesser prairie chicken (*Tympanuchus pallidinctus*) and the pronghorn antelope (*Antilocapra americana*). Cattle stocking rates will range from 60 to 25 acres (24-10ha) per animal unit per year.

Resource uses other than grazing and wildlife are limited in this type. No mining—other than petroleum, forestry, or watershed values exist. Recreational use is very limited.

Variants and Associated Species: As grazing intensity increases, the taller grasses sand bluestem, giant dropseed (*Sporobolus giganteus*), Havard's panicum (*Panicum havardii*), little bluestem (*Schizachyrium scoparium*), and giant sandreed (*Calamovilfa gigantea*) decrease. In poor to fair

range condition purple threeawn (*Aristida purpurea*), sand dropseed (*S. cryptandrus*), hairy grama (*Bouteloua hirsuta*), red lovegrass (*Eragrostis secundiflora*), and thin paspalum (*Paspalum setaceum*) become more important. The annuals are false buffalograss (*Munroa squarrosa*), grass bur (*Cenchrus incertus*), and purple sandgrass (*Triplasis purpurea*) which are locally abundant around watering facilities or after heavy rainfall (Pettit, 1979).

The most common forb component includes prairie green-thread (*Thelesperma megapotimicum*), James' cryptantha (*Cryptantha jamesii*), James' nailwort (*Paronychia jamesii*), and western ragweed (*Ambrosia psilostachya*) (Jones and Pettit, 1984). Occasionally, annual buckwheat (*Eriogonum annuum*) is aspect dominant in late summer. About 40 other forb species are regularly found in this type.

With herbicidal control, large areas of the oak-bluestem type can be converted to a mid to tall grass prairie aspect. A new hazard to converted acreage is wildfire caused by lightning and man.

Russ Pettit (Retired)
Texas Tech University
Lubbock, TX

CROSS TIMBERS—OKLAHOMA SRM 731

Definition, Composition, and Structure: Noncommercial timber oak (*Quercus* sp.) trees characterize this vegetation type, which is sometimes called upland forest or oak savannah. Post oak (*Q. stellata*) and blackjack oak (*Q. marilandica*) are universal overstory codominants, and shrubs and vines dominate the understory (Bruner 1931, Penfound 1963, Rice and Penfound 1959, and Dwyer and Santelmann 1964). Species diversity generally increases in the east, and black hickory (*Carya texana*) becomes increasingly important eastward (Rice and Penfound 1959). This type is distinguished from the mesic deciduous forest types to the east by lower-statured trees and by composition of the overstory. Little bluestem (*Schizachyrium scoparium*) and tall grasses dominate the herbaceous layer (Dwyer and Santelmann 1964, Ewing et al. 1984).

The Cross Timbers is generally a closed forest, although the original character was likely a mosaic of grassland, savannah-like grassland with oak mottes, and oak thickets (Johnson and Risser 1975, Penfound 1962, Rice and Penfound 1959). Periodic dormant season fires may have produced prolific resprouting on upland sites (Dyksterhuis 1948, Harlan 1958) resulting in a patchwork of thickets which were a formidable obstacle to early travel (Rice and Penfound 1959). Fire may have maintained a savannah on mesic sites where fuels accumulated to produce fires with sufficient intensity to cause high tree mortality and convert the closed forest to savannah (Rice and Penfound 1959,

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