

2014 Florida Envirothon Current Issue Study Guide

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Sustainable Rangeland Management: Achieving a balance between Traditional Agricultural Uses with Non-Agricultural Uses in Florida

Rangelands in the United States are diverse lands. They include the wet grasslands of Florida to the desert shrub ecosystems of Wyoming. They also include the high mountain meadows of Utah to the desert floor of California

Rangeland Area

The United States has about 770 million acres of rangelands. Private individuals own more than half of the Nation's rangelands. The federal government manages 43 percent of the rangelands. State and local governments manage the remainder.

The Forest Service, an agency of the United States Department of Agriculture, administers approximately 191 million acres of National Forest Systems lands. About half of this acreage, 96 million acres, is rangelands.

Rangeland Values

These diverse ecosystems produce an equally diverse array of tangible and intangible products. Tangible products include forage for grazing and browsing animals, wildlife habitat, water, minerals, energy, recreational opportunities, some wood products, and plant and animal genes. Rangelands also produce intangible products such as natural beauty and wilderness, satisfying important societal values.

Background: Rangeland in Florida and across the nation contributes immensely to a sustainable agricultural economy. In Florida agriculture is consistently in the top three economic industries, along with tourism and construction. Rangeland provides forage and habitat for domestic livestock and wildlife. There has been increasing demands on the rangeland for a multi use concept. In addition to agricultural uses, multi use includes hunting and recreational uses such as; access to fishing, bird-watching, hiking, horseback riding and trail bike/ATV riding. Today, management methodologies vary greatly while attempting to balance rangeland uses that result in maximized benefits to all.

Florida's grazing lands are essential to the many wildlife species including the endangered Florida panther, red cockaded woodpecker, Audubon's crested caracara and Florida scrub jay, and to more common species such as white-tailed deer, turkey, and bobwhite quail. In addition, grazing lands provide valuable benefits to society in terms of improved water quality, ground and surface water recharge, open space, and outdoor recreation.

As our knowledge of Rangeland has increased, it has become evident that what helps the rancher is also good for wildlife. In this grazing-dependent ecosystem, many species

of both plants and animals rely on the presence of large grazing animals. Properly managed rangeland can provide a sustainable agriculture economy and healthy rangelands for future generations. In centuries past, American bison may have provided this natural function, even here in Florida.

Range is a primary natural resource of many ranching operations. The native vegetation of range lands includes grasses, grasslikes, forbs, and shrubs suitable for grazing and browsing use by livestock and wildlife. Some range sites have an overstory of trees and others are comprised of only herbaceous vegetation

About two-thirds of Florida's cattle are found from Orlando to the Everglades in an area of the state that contains about 3.9 million acres of rangeland.

Florida's rangelands can be generally characterized as wet and dry prairies, savanna flatwoods and sandhills, and interior and coastal marshes. Originally, Florida had over 14 million acres of rangeland distributed throughout the state. About half of Florida's rangelands have been converted to other land uses that include high intensity agriculture (croplands, citrus, pasture and forestry), commercial and residential development and infrastructure. However, Florida's remaining rangelands are highly prized by ranchers, wildlife managers, hunters, and other outdoor enthusiasts.

The application of sound grazing management principles is essential in the conservation and health of these dynamic native plant communities. The first order of business is the development of an annual grazing plan that is based upon good science and a thorough plant and forage inventory. Second, the minimum conservation practices needed are designed and installed to meet the rancher's goals and objectives that support the annual grazing management plan. Most critical are conservation practices such as cross fencing, stockwater development, prescribed burning, and where needed, brush and invasive species control to promote productive and healthy rangelands.

Landowners can obtain assistance with management planning and implementation from the United States Department of Agriculture, Natural Resource Conservation Service, the United States Fish and Wildlife Service, the Florida Forest Service and the Florida Fish and Wildlife Conservation Commission.

Of all of the different rangeland habitats in Florida the two sites most commonly found, and which have the greatest management potential, are flatwoods and freshwater marshes.

Freshwater marshes, like flatwoods, quickly respond to rangeland improvement and management practices. Most of Florida's historically dominate native rangeland grasses are rhizomatous in nature and quickly respond to mechanical treatments and are effectively maintained by good grazing practices and periodic burning.

North Florida Flatwoods

This range site habitat occurs on nearly level land. Water movement is very gradual to the natural drainageways, swamps, ponds, and marshes associated with this range type. Wet conditions prevail during the rainy season with the water table on



or near the surface. It is easily recognized by the flat topography, and predominant slash pine and saw-palmetto vegetation. Typically, these north Florida sites have a greater stand density of slash, longleaf, and loblolly pines than those found in the south Florida flatwoods sites.

Soil

The soils in north Florida flatwoods are nearly level, deep, acidic, poorly to somewhat poorly drained, and coarse textured or coarse textured in the upper part and moderately coarse textured or moderately fine textured in the lower part. Representative soil series are: Chaires, Garcon, Leon, Lumber, Lutterloh, Lynn Haven, Olustee, Pelham, Pottsburg, Ridgeland, Sapelo, Scranton, and Talquin.

Vegetation

In moderate to high water levels the predominant vegetation from this site in excellent range condition is chalky or creeping bluestem. However, when low to moderate water levels occur, lopsided indiagrass and creeping bluestem are present. In poor to fair range condition, vegetation consists of wax myrtle, gallberry, saw-palmetto, and wiregrasses. The relative percentages of annual production by weight are grass and grasslikes 65%, woody plants and trees 25%, and forbs 10%.

Grazing Value

This range site has a moderate to high potential for producing native forages. More pines occur in this range site than in south Florida flatwoods with much of the original acreage planted to slash pine plantations. Vegetative production differs from the south Florida flatwoods due to a denser overstory, shorter growing season, and lower winter temperatures. Annual plant production (air dry) averages 4500 lb/acre on sites in excellent condition.

Wildlife

The north Florida flatwoods range site is well suited for deer, quail and turkey. It is fair for squirrels and well suited for many songbirds, particularly warblers. It is also well suited for bobcat, skunks, opossums, and raccoons. It is poorly suited for dove.

Endangered and threatened plants, animals, and species of special concern.

- MAMMALS - Florida black bear, Florida panther.
- BIRDS - southeastern American kestrel, red-cockaded woodpecker, Florida sandhill crane, bald eagle.
- REPTILES - eastern indigo snake.
- SHRUBS - Chapman's rhododendron.

South Florida Flatwoods

South Florida flatwoods occur on nearly level land. Water movement is very gradual to the natural drainageways, swamps, marshes, and ponds associated with this range site. During the rainy season, usually June through September, this site may have water on or near the soil surface. It is easily recognized by the flat topography and slash pine and saw-palmetto vegetation.



Soil

The soils are nearly level, deep, acidic, poorly to somewhat poorly drained, and coarse textured throughout or coarse textured in the upper part and moderately coarse textured or moderately fine textured in the lower part. Representative soil series are: Braden, Eaton, Electra, Elred, Heights, Immokalee, Lawnwood, Myakka, Nettles, Palmetto, Pomona, Smyrna and Waveland. Myakka Fine Sand is the state soil of Florida.

Vegetation

The landscape position (topography) of this range site affects plant-water relationships and causes slight differences in plant composition from wetter to drier areas. The natural vegetation of this site is typically scattered pine trees with an understory of saw-palmetto, gallberry and wiregrasses. These areas are often called prairies or dry prairies. The relative percentages of annual vegetative production by weight for this range site are grasses and grasslikes 75%, woody plants and trees 15%, and forbs 10%. Plants which characterize this community are:

- **GRASSES AND GRASSLIKES** - Chalky and creeping bluestem, lopsided indiagrass, toothachegrass, maidencane, panicum species, wiregrasses, sedges, and rushes.
- **FORBS** - gayfeather, redroot, partidge pea, deerstongue, creeping beggarweed, perennial legumes, and annual forbs.
- **TREES AND SHRUBS** - oak species., slash and longleaf pine, gallberry, wax myrtle, saw-palmetto, dwarf huckleberry, and St. John's-wort, sumac, and wax myrtle.

Grazing Value

This ecological community has the potential for producing significant amounts of desirable range grasses such as creeping bluestem (1,800 to 3,600 lb/acre), chalky bluestem (500 to 750 lb/acre), and lopsided indiagrass (900 to 1,500 lb/acre). It is Florida's most important range site for the production of cattle on native range. Water control practices and improved management techniques have facilitated the use of flatwoods for improved pasture, vegetables, citrus, and urban development. This is especially true in central, south, and southwest Florida. Annual plant production (air dry) averages 5000 lb/acre from sites in excellent ranges from 3,000 to 6,000 lb/acre depending on climatic conditions.

Wildlife

The south Florida flatwoods habitat is well suited for deer, quail, and turkey. It is fair for squirrels and well suited for many songbirds, particularly warblers. It is also well suited for bobcat, skunks, opossums, and raccoons. It is poorly suited for dove.

Endangered and threatened plants, animals, and species of special concern.

- **MAMMALS** - Florida panther, mangrove fox squirrel.
- **BIRDS** - crested caracara, Florida grasshopper sparrow, southeastern American kestrel, red-cockaded woodpecker, bald eagle, Florida sandhill crane, burrowing owl, black-shouldered kite.
- **REPTILES** - eastern indigo snake, gopher tortoise, striped newt, Miami black-headed snake.

- **PLANTS** - yellow squirrel-banana, Florida bear grass, wiregrass genetian, mock pennyroyal, Edison's ascyrum, fall flowering ixia, Bartram's ixia

Use of prescribed burning in conjunction with roller chopping every 2 to 4 years will enhance growth and development of desirable range plants and improve the range condition. If range is burned in February, cattle grazing should be deferred for 60 days unless a rancher wants to utilize wiregrass. Grazing of wiregrass should begin 3 to 5 weeks following a burn. Allow cattle to remove 50% of standing forage and then rotate to another pasture.

Freshwater Marsh & Ponds

Freshwater marshes or ponds appear as an open expanse of grasses, sedges, and rushes, and other herbaceous plants in an areas where the soil is usually saturated or covered with surface water for two or more months during the year.



Soil

Soils commonly associated with this range site are nearly level and very poorly drained with coarse textured or organic surfaces underlain by clay or sand. Representative soil series are Basinger depressional, Brighton, Charlotte ponded, Dania, Everglades, Felda depressional, Iberia, Kaliga, Lauderhill, Monteverde, Micco, Ocoee, Okeechobee, Sanibel, Tequesta, and Torry.

Vegetation

In excellent condition, a freshwater marsh and pond site is dominated by maidencane and cutgrass. However, in poor condition, vegetation consists of cattails, pickerelweed, smartweed, wild millet, and sawgrass. The relative percentages of annual plant production by weight are grasses and grasslikes 90%, woody plants and trees <1%, and forbs 10%. Plants that characterize the freshwater marshes and ponds are:

- **GRASSES AND GRASS LIKES** - blue maidencane, cutgrass, maidencane, sawgrass, chalky bluestem, American cupscale, other grasses, sedges, and rushes.
- **FORBS** - aeschynomene, redroot, yelloweyed grass, pickerelweed, pennyroyal, smartweed, dogfennel, dayflower, marshpink, aster, duckpotato, cattails, rattlebox, and bidens sp.
- **TREES AND SHRUBS** - buttonbush, willow, wax myrtle, cypress, persimmon, and maple.

Grazing Value

This range site has the potential for producing significant amounts (10,000 lb/acre) of high quality forage (8 to 10 % crude protein, 50 to 55 % TDN). Annual plant production (air dry) from all plant groups for a site in excellent condition ranges from 5,000 to 10,000 lb/acre depending on growing conditions.

Freshwater marshes and ponds serve as a filter system for rivers and lakes, generally acting as a sink for nutrients and other pollutants, but sometimes as a source for

nutrients. Marshes will retain water during drought and large marshes also help slow down water flows at flood times.

Wildlife

Endangered and threatened plants, animals, and species of special concern.

- MAMMALS - Everglades mink, Key Vaca raccoon, silver rice rat.
- BIRDS - Cape Sable seaside sparrow, crested caracara, Florida sandhill crane, snail kite, wood stork.
- REPTILES - American alligator, Florida ribbon snake, Key mud turtle.

Upland Hardwood Hammocks

This range site occurs on rolling terrain with nearly level to strong slopes, well drained soil area with a coarse texture surface and fine textured subsoils. It is recognized by the occurrence of thick stands of shade tolerant hardwoods and few pines. There is usually more organic material and litter present than on drier sites.



Soil

The soils are nearly level to strongly sloping, deep, somewhat poorly to well drained and coarse-textured throughout or coarse-textured in the upper part with moderately coarse-textured to moderately fine-textured subsoils. Representative soil series are: Blichton, Bonneau, Flemington, Fort Meade, Gainesville, Hernando, Mabel, Millhopper, Shubuta and Zuber.

Vegetation

Annual plant production (air dry) from all plant groups for a site in excellent condition ranges from 2,500 to 4,500 lb/acre depending on growing conditions. The relative percentages of annual plant production by weight are grasses and grasslikes 50%, woody plants and trees 30%, and forbs 20%. Plants which characterize this community are:

- **GRASSES AND GRASS LIKES** - low panicums, switchgrass, lopsided indiagrass, chalky and splitbeard bluestem, paspalums, curtis dropseed, pinewood dropseed, broomsedge, and sedges, spike and long leaf uniola.
- **FORBS** - grassleaf goldaster, deerstongue, partridgepea, pepperweed, pholx, brackenfern.
- **TREES AND SHRUBS** - laurel oak, live oak, water oak, pine sp., greenbriar, grapevine, elderberry.

Grazing Value

The soil's moisture holding capacity and natural fertility is relatively high and good quality forages can be produced. Annual plant production (air dry) from all plant groups averages 3500 lb/acre on sites in excellent range condition.

Wildlife

Endangered and threatened plants, animals, and species of special concern.

- BIRDS - Cape Sable seaside sparrow, crested caracara, Florida sandhill crane, snail kite, wood stork.
- MAMMALS - Florida panther, Florida black bear
- REPTILES - eastern indigo snake
- PLANTS - needle palm, auricled spleenwort, dwarf spleenwort, sinkhole fern.

*Adapted from "Range Sites of Florida" by
J. Jeffrey Mullahey, George W. Tanner, and Stephen Coates
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Glossary of Terms Used in Range Management

Animal-Unit. Considered to be one mature cow of approximately 1,000 pounds, either dry or with calf up to 6 months of age, or their equivalent, based on a standardized amount of forage consumed. Abbr. AU. cf. *Animal-unit-equivalent*.

Animal-Unit-Day. The amount of forage on a dry-matter basis required by one animal unit in one day based on a 26-pound forage allowance. Abbr. AUD.

Animal-Unit-Equivalent. A number expressing the energy requirements of a particular kind or class of animal relative to one AU. Abbr. AUE.

Animal-Unit-Month. The amount of dry forage required by one animal unit for one month based on a forage allowance of 26 pounds per day. Not synonymous with *animal-month*. Abbr. AUM. The term AUM is commonly used in three ways: (a) Stocking rate, as in "X acres per AUM"; (b) forage allocations, as in "X AUMs in Allotment A"; (c) utilization, as in "X AUMs taken from Unit B."

Annual Plant. A plant that completes its life cycle and dies in 1 year or less.

Available Forage. That portion of the forage production that is accessible for use by a specified kind or class of grazing animal.

Backfiring. Ignition of a fire on the leeward (downwind) side of a burn area, resulting in a slow moving ground fire. cf. *headfiring*.

Biomass. The total amount of living plants and animals above and below ground in an area at a given time.

Browse. (n.) That part of leaf and twig growth of shrubs, woody vines and trees available for animal consumption. (v.) Act of consuming browse. cf. *graze*.

Brush. A term encompassing various species of shrubs or small trees usually considered undesirable for livestock or timber management. The same species may have value for browse, wildlife habitat, or watershed protection.

Brush Control. Reduction of unwanted woody plants through fire, chemicals,

mechanical methods, or biological means to achieve desired land management goals.

Brush Management. Manipulating woody plant cover to obtain desired quantities and types of woody cover and/or to reduce competition with herbaceous understory vegetation, in accordance with ecologically sound resource management objectives.

Bunch Grass. A grass having the characteristic growth habit of forming a bunch; lacking stolens or rhizomes, cf. *sod grass*.

Burn. An area over which fire has recently passed.

C-3 Plant. A plant employing the pentose phosphate pathway of carbon dioxide assimilation during photosynthesis; often a cool-season plant.

C-4 Plant. A plant employing the dicarboxylic acid pathway of carbon dioxide assimilation during photosynthesis; often a warm-season plant.

Calf Crop. The number of calves weaned from a given number of cows exposed to breeding, usually expressed in percent, i.e., number of cows exposed X number of calves weaned ÷ 100 = percent calf crop. cf. *kid crop*, *lamb crop*.

Carrying Capacity. The maximum *stocking rate* possible which is consistent with maintaining or improving vegetation or related resources. It may vary from year to year on the same area due to fluctuating forage production. cf. *grazing capacity*.

Cell. A grazing arrangement comprised of numerous sub-divisions (paddocks or pastures) often formed by electrical fencing, with a central component to facilitate livestock management and movement to the various sub-divisions. Normally used to facilitate a form of controlled grazing. cf. *paddock*.

Class of Animal. Description of age and/or sex-group for a particular *kind of animal*. Example, cow, calf, yearling, ewe, doe, fawn, etc.

Climax. (1) The final or stable biotic community in a successional series which is self-perpetuating and in dynamic equilibrium with the physical habitat; (2) the assumed end point in succession, cf. *potential natural community*.

Complementary Pasture. Short-term forage crop (not necessarily annual) planted for use by domestic stock to enhance the management and productivity of the ranch.

Continuous Grazing. The grazing of a specific unit by livestock throughout a year or for that part of the year during which grazing is feasible. The term is not necessarily synonymous with *yearlong grazing*, since seasonal grazing may be involved.

Cool-Season Plant. A plant which generally makes the major portion of its growth during the late fall, winter, and early spring. Cool-season species generally exhibit the C3 photosynthetic pathway. cf. *warm-season plant*.

Cultivar (derived from *cultivated variety*). A named variety selected within a plant species. Distinguished by any morphological, physiological, cytological, or chemical characteristics. A variety of plant produced and maintained by cultivation which is

genetically retained through subsequent generations.

Decreaser. Plant species of the original or climax vegetation that will decrease in relative amount with continued disturbance to the norm, eg., heavy defoliation, fire, drought. Some agencies use this only in relation to response to overgrazing.

Deferment. Delay of livestock grazing on an area for an adequate period of time to provide for plant reproduction, establishment of new plants, or restoration of vigor of existing plants. cf. *deferred grazing, rest*.

Deferred Grazing. The use of *deferment* in *grazing management* of a *management unit*, but not in a systematic rotation including other units. cf. *grazing system*.

Deferred-Rotation. Any grazing system, which provides for a systematic rotation of the deferment among pastures.

Defoliation. The removal of plant leaves, i.e., by grazing or browsing, cutting, chemical defoliant, or natural phenomena such as hail, fire, or frost.

Degree of Use. The proportion of current year's forage production that is consumed and/or destroyed by grazing animals. May refer either to a single species or to the vegetation as a whole. Syn. *use*.

Drought. (1) A prolonged chronic shortage of water, as compared to the norm, often associated with high temperatures and winds during spring, summer, and fall. (2) A period without precipitation during which the soil water content is reduced to such an extent that plants suffer from lack of water.

Ecology. The study of the interrelationships of organisms with their environment.

Ecosystem. Organisms together with their abiotic environment, forming an interacting system, inhabiting an identifiable space.

Ecotype. A locally adapted population within a species which has certain genetically determined characteristics; interbreeding between ecotypes is not restricted. cf. *biotype*.

Environment. The sum of all external conditions that affect an organism or community to influence its development or existence.

Esophageal-Cannula. A device used for maintenance and closure of an esophageal fistula.

Esophageal-Fistula. A permanent, surgically established opening in the esophagus of an animal used for collecting diet samples. cf. *Esophageal-cannula*.

Firebreak. A natural or man-made barrier used to prevent or retard the spread of fire, that is in existence or made before a fire occurs. It is usually created by the removal of vegetation and may include plowing/turning the soil. cf. *fireline, fuelbreak*.

Forage. (n.) Browse and herbage which is available and may provide food for grazing animals or be harvested for feeding. cf. *concentrate feed* and *cured* and *range forage*.

(v.) To search for or consume forage. Syn. *graze*.

Forage Production. The weight of forage that is produced within a designated period of time on a given area. The weight may be expressed as either green, air-dry, or oven-dry. The term may also be modified as to time of production such as annual, current year's, or seasonal forage production.

Forb. Any broad-leaved herbaceous plant other than those in the *Gramineae* (or *Poaceae*), *Cyperaceae* and *Juncaceae* families.

Frequency. The ratio between the number of sample units that contain a species and the total number of sample units.

Fresh Mulch. The primary layer of bulky, coarse, largely undecayed herbage residuum. cf. *mulch* and *humic mulch*.

Grasslike Plant. A plant of the *Cyperaceae* or *Juncaceae* families which vegetatively resembles a true grass of the *Gramineae* family.

Graze. (1) (vi.) The consumption of standing *forage* by livestock or wildlife. (2) (vt.) To put livestock to feed on standing forage.

Grazing Behavior. The foraging response elicited from a herbivore by its interaction with its surrounding environment.

Grazing Capacity. The total number of animals which may be sustained on a given area based on total forage resources available, including harvested roughages and concentrates. cf., *carrying capacity*.

Grazing Management. The manipulation of grazing and browsing animals to accomplish a desired result.

Herbaceous. Vegetative growth with little or no woody component. Non-woody vegetation, such as graminoids and forbs.

Herbage. (1) Herbs taken collectively. (2) Total aboveground biomass of herbaceous plants regardless of grazing preference for availability.

Herbivore. An animal that subsists principally or entirely on plants or plant materials.

Holistic Resource Management. Holistic Resource Management (HRM) is a practical, goal-oriented approach to the management of the ecosystem including the human, financial and biological resources on farms, ranches, public and tribal lands, as well as national parks, vital water catchments and other areas. HRM entails the use of a management model which incorporates a holistic view of land, people and dollars.

Increaser. Plant species of the original vegetation that increase in relative amount, at least for a time, under continued disturbance to the norm, e.g., heavy defoliation, fire, drought.

Invader. Plant species that were absent in undisturbed portions of the original

vegetation of a specific range site and will invade or increase following disturbance or continued heavy grazing.

Key Species. (1) Forage species of sufficient abundance and palatability to justify its use as an indicator to the *degree of use* of associated species. (2) Those species which must, because of their importance, be considered in the management program.

Marsh. Flat, wet treeless areas usually covered by standing water and supporting a native growth of grasses and grasslike plants.

Moderate Grazing. A comparative term which indicates that the stocking rate of a pasture is between the rates of other pastures. Often erroneously used to mean *proper use*. cf. *heavy* and *light grazing*.

Multiple Use. Use of range for more than one purpose, i.e., grazing of livestock, wildlife production, recreation, watershed and timber production. Not necessarily the combination of uses that will yield the highest economic return or greatest unit output. Syn. *multiple land use*.

Native Species. A species which is a part of the original fauna or flora of the area in question. Syn. *indigenous*. cf. *introduced* and *resident species*.

Non-Selective Grazing. Utilization of forage by grazing animals in such a way that all forage species and plants are grazed to a comparable degree. It is generally achieved by using a high stocking density for a short grazing period.

Oven-Dry Weight. The weight of a substance after it has been dried in an oven at a specific temperature to equilibrium.

Overgrazing. Continued heavy grazing which exceeds the recovery capacity of the community and creates a deteriorated range. db. *overuse*.

Overstocking. Placing a number of animals on a given area that will result in *overuse* if continued to the end of the planned grazing period.

Palatability. The relish with which a particular species or plant part is consumed by an animal.

Percent Use. Grazing use of current growth, usually expressed as a percent of the current growth (by weight) which has been removed. cf. *degree of use*.

Perennial Plant. A plant that has a life span of 3 or more years.

Phenology. The study of periodic biological phenomena which are recurrent such as flowering, seeding, etc., especially as related to climate.

Plant Vigor. Plant health. cf. *plant vigor index*.

Preferred Species. Species that are preferred by animals and are grazed by first choice.

Prescribed Burning. The use of fire as a management tool under specified conditions for burning a predetermined area. cf. *maintenance burning*.

Pristine. A state of ecological stability or condition existing in the absence of direct disturbance by modern man.

Proper Grazing. The act of continuously obtaining proper use.

Range. (n.) Any land supporting vegetation suitable for grazing including rangeland, grazable woodland and shrubland. Range is *not* a use. (adj.) Modifies resources, products, activities, practices, and phenomena pertaining to rangeland, cf. *rangeland, forested range, grazable woodland, shrubland*.

Range Condition. (a) A generic term relating to present status of a unit of range in terms of specific values or potentials. Specific values or potentials must be stated. (b) Some agencies define range condition as follows: The present state of vegetation of a range site in relation to the climax (natural potential) plant community for that site. It is an expression of the relative degree to which the kinds, proportions, and amounts of plants in a plant community resemble that of the climax plant community for the site. cf. *ecological status* and *resource value rating*.

Range Condition Class. Confusion has existed regarding both definition and use of this term. (1) The following definition fits the thinking expressed in the definition Range Condition (a) above: One of a series of arbitrary categories used to either classify ecological status of a specific range site in relation to its potential (early, mid, late seral or PNC) or classify management-oriented value categories for specific potential, eg., good condition spring cattle range. (2) Some agencies consider range condition class in the context of Range Condition (b) above as follows:

Range Condition Class	% of climax for the range site
Excellent	76-100
Good	51-75
Fair	26-50
Poor	0-25

Range Improvement. (1) Any structure or excavation to facilitate management of range or livestock. (2) Any practice designed to improve range condition or facilitate more efficient utilization of the range. (3) An increase in the grazing capacity of range, i.e., improvement of rangeland condition.

Range Management. A distinct discipline founded on ecological principles and dealing with the use of rangelands and range resources for a variety of purposes. These purposes include use as watersheds, wildlife habitat, grazing by livestock, recreation, and aesthetics, as well as other associated uses.

Range Site. Synonymous with *ecological site* when referring to rangeland. An area of

rangeland which has the potential to produce and sustain distinctive kinds and amounts of vegetation to result in a characteristic plant community under its particular combination of environmental factors, particularly climate, soils, and associated native biota. Some agencies use range site based on the climax concept, not potential natural community. cf. *vegetation type*.

Rest. Leaving an area ungrazed thereby foregoing grazing of one forage crop. Normally rest implies absence of grazing for a full growing season or during a critical portion of plant development; i.e., seed production. cf. *deferment*.

Rhizome. A horizontal underground stem, usually sending out roots and above-ground shoots from the nodes.

Rotation Grazing. A grazing scheme where animals are moved from one grazing unit (paddock) in the same group of grazing units to another without regard to specific graze:rest periods or levels of plant defoliation. cf. *grazing system*.

Roughage. Plant materials containing a low proportion of nutrients per unit of weight and usually bulky and coarse, high in fiber and low in total digestible nutrients. Roughage may be classed as either dry or green.

Seral. In naturally occurring ecosystems, the vegetation occurs in a patchwork of different community types and age classes (or seral stages). This diversity is important for the health and sustainability of a landscape.

Short-Duration Grazing. Grazing management whereby relatively short periods (days) of grazing and associated non-grazing are applied to range or pasture units. Periods of grazing and non-grazing are based upon plant growth characteristics. Short duration grazing has nothing to do with intensity of grazing use. cf. *grazing system*.

Shrub. A plant that has persistent, woody stems and a relatively low growth habit, and that generally produces several basal shoots instead of a single bole. It differs from a tree by its low stature (generally less than 5 meters, or 16 feet) and non-arborescent form.

Stocking Density. The relationship between number of animals and area of land at any instant of time. It may be expressed as animal-units per acre, animal-units per section or AU/ha. cf. *stocking rate*.

Stocking Rate. The number of specific kinds and classes of animals grazing or utilizing a unit of land for a specified time period. May be expressed as animal unit months or animal unit days per acre, hectare, or section, or the reciprocal (area of land/animal unit month or day). When dual use is practiced (eg., cattle and sheep), stocking rate is often expressed as animal unit months/unit of land or the reciprocal. Syn. *stocking level*, cf. *stocking density*.

Trend (Range Trend) Classes and Ecological Status Ratings. Trend in range condition or ecological status should be described as up, down or not apparent. Up represents a change toward climax or potential natural community; down represents a change away from climax or potential natural community; and not apparent indicates there is no recognizable change. This category is often recorded as static or stable.

There is no necessary correlation between trends in resource value ratings, vegetation management status, and trend in range condition or ecological status.

Usable Forage. That portion of the forage that can be grazed without permanent damage to the forage plant species or the other basic resources; may vary with season of use, plant species and associated plant species.

Vegetation. Plants in general, or the sum total of the plant life above and below ground in an area. cf. *vegetative*.

Vegetative. Relating to nutritive and growth functions of plant life in contrast to sexual reproductive functions. Of or relating to vegetation. cf. *vegetation*.

Warm-Season Plant. A plant which makes most or all its growth during the spring, summer or fall and is usually dormant in winter. (2) A plant that usually exhibits the C-4 photosynthetic pathway.

Wetlands. Areas characterized by soils that are usually saturated or ponded, i.e., hydric soils, that support mostly water-loving plants (hydrophytic plants).