Wildlife Management Potential – Missouri Grasslands

Grasslands provide many kinds of wildlife with food and cover. The greater prairie chicken, upland sandpiper and meadowlark are open grassland nesters. Rabbits, bobwhite quail, turkeys and pheasants also nest in grasslands, but prefer areas near woods or shrubby cover. Grasslands also help wildlife by controlling soil erosion.

The grassland can provide some of the food needed by the wildlife that live in and around it. The plant varieties needed depend upon the species of animals that use the area. The number of seed-producing plants in a grassland will determine its value to species such as quail, since quail and many songbirds require seeds in their diet. Generally, the more kinds of seed-producing plants there are, the more value the field will have for species such as bobwhite quail. Rabbits, on the other hand, consume the vegetative parts of grasses, legumes and many other broad-leaved plants. If these plants are removed by overgrazing or late haying, the number of animals that the area can support will be reduced.

WILDLIFE COVER IN GRASSLANDS:

If properly managed, grasslands can also provide cover or protection for nesting and roosting. Soft cover or herbaceous cover is the vegetative growth consisting of grasses and broad leaved plants. Shrubby cover (brush) consists of woody plants, usually with multiple stems that arise from a common base. These plants are generally less than twenty feet tall at maturity. When they grow close together to form a thicket, these plants provide escape cover for quail and other small animals. These areas also provide browse for deer and the dense branches provide nesting areas for many songbirds. Hard cover (tree/shrub) consists of the perennial, woody-stemmed tree species that reach a height of over twenty feet. Escape cover, where a rabbit or quail can escape predators such as foxes, coyotes and hawks, however, consists of dense brush piles that are often found adjacent to the grassland. The hard cover and escape cover areas should be protected from grazing at all times.

THREE TYPES OF GRASSLANDS:

1. Cool-season grasslands or pastures are dominated by those grasses that grow best during the cool spring and fall of the year. These grasses begin their growth early in the spring when the soil reaches forty degrees (F). Their growth slows during the warmest part of summer when the soil reaches near eighty degrees and resumes again as the soil cools in the fall. Cool-season grasses have been popular with farmers because they are easy to establish and respond to heavy fertilization. Most of these grasses continue to be productive, but tall fescue has been found to cause some health problems in livestock when its seed head is infected with an endophyte fungus. Some examples of these grasses are fescue, Kentucky bluegrass, brome grass, timothy and orchard grass.

   Cool-season grasses are usually grazed to within two to four inches height. Grazing below this height will result in lower production, increased soil erosion and less wildlife use.
These grasses are normally at their peak quality and ready for cutting for hay during the peak nesting period for many ground nesting birds such as bobwhite quail.

2. Warm-season grasslands or pastures are dominated by those grasses that grow best when the weather is hot and the soil temperature high. These grasses begin growing when the soil is around sixty degrees (F) and continue to grow during the warmest months of the year until the soil temperature reaches nearly ninety degrees (F). Although warm-season grasses have a shorter growing season, they make more efficient use of water and soil nutrients—nitrogen, phosphorus and potassium—than do other grasses. However, studies have shown that yields, crude protein, estimated net energy, digestibility, and relative feeding values were increased in big bluestem/Indiangrass hay when the grasses were fertilized with nitrogen. The major increases occurred at rates of fifty or one hundred pounds of nitrogen per acre, with fifty pounds per acre giving the greatest return on the dollar invested. (Note: This applies only to new plantings of warm-season grasses and not to remnant native prairies). Some examples of these grasses that are used in grazing systems are big bluestem, Indiangrass, side-oats gramma, little bluestem and switchgrass.

Warm-season native grasses should not be grazed closer than eight inches in height. Since warm-season grasses begin their growth later in the year, they are not ready to be grazed until mid-summer, when most of the ground-nesting wildlife have hatched or produced their broods.

The “structure” or the way the grass grows is important to wildlife. The tall, stiff, upright stem and elevated leaves of most warm-season grasses can effectively reduce both wind speed and wind chill as they effect warm-blooded animals. The plants can soften the impact of rain drops and modify both humidity and transpiration extremes when compared to the cool-season grasses. These traits can provide a more favorable reproduction condition for ground nesting birds and mammals that use these areas to meet their habitat requirements. Studies show that compared to a corn field, the ground-level temperature of a native warm-season grass field will be twenty-one degrees (F) cooler and the humidity will be twenty-nine percent higher during mid June. Both environmental conditions are ideal for the production of young quail, whose hatching peak will be around June 15.

The “clumpyness” of the native, warm-season grasses also allow free movement of animals along travel lanes beneath their protective cover. Rodents and smaller birds are able to climb into the clump to escape drowning rains.

The above growth characteristics of warm-season grasses allow for the presence of both plant and animal diversity. The growth of various broadleaf plants and the presence of many kinds of insects and spiders, make ideal growing conditions for young quail and songbirds that are just leaving their nests in search of food.

3. Native grasslands are those grassland that are dominated by a mixture of warm-season grasses. Missouri’s native grasslands, or native prairies, once covered nearly one-third of the state. A remnant prairie is a tract, usually small in size, that has never been disturbed by plowing. The different plant species found growing on these sites can number into the hundreds. This diversity of plant species can make them very attractive to several species of wildlife. In west, central and north central Missouri, these remnant prairies are vital to the survival of the
prairie chicken.

Native prairie remnants, when grazed moderately, will provide excellent summer pasture. Grazing should begin about May 15, when the vegetation is eight to ten inches in height. Native prairies should not be grazed after August 15, and no lower than eight inches in height to allow for some regrowth before they become dormant in the fall of the year.

Native prairie remnants provide quality hay. Haying dates are usually around July 4, but may vary a few days depending upon past use and its location in the state. Earlier or later haying dates will have a negative affect on both yield and quality of the hay. The time of haying will also dictate the types of plants that will persist within a prairie.

Prairie remnants should not be fertilized or limed unless they are in excellent condition, since the fertilizer may be used by undesirable weedy plants. Native prairies already contain several beneficial legumes and should never be over seeded to increase production.

Prescribed burns should be completed during the spring of the year. Earlier burns (February to mid March) will encourage the growth of more broad leaves and forbs, while later burns in late March to mid April will encourage the production of the grasses. CAUTION: Use fire with great care. Experienced personnel are available to assist in the planning of prescribed burns.

FACTORS THAT EFFECT THE VALUE OF GRASSLANDS FOR WILDLIFE:

Different species of wildlife are attracted to grasslands for a number of different reasons. Some birds may seek nesting sites, while others may use them mainly for roosting or a place to spend the night. Four factors usually determine the amount of wildlife use that any certain grassland will receive. These factors are the (1) kind or type of grassland, (2) make-up of the grassland, (3) use of the grassland and the (4) size of the grassland or pasture unit.

1. KIND OR TYPE OF GRASSLAND: Each species of grass has its own growth characteristics. Some grasses have low growing leaves and can grow in dense stands that produce a sod. An example of this type of grass is fescue. Sod-forming grasses have a very high stem density at ground level. This fact makes them less attractive to ground nesting birds, since the young are usually not able to move through the grass sod. Most of the warm-season grasses and a few cool-season grasses form “clumps” as they mature. These clump grasses form a more attractive habitat, since small animals are able to move between the clumps. In addition, broad leaf plants and legumes are able to grow between the clumps to provide some food and cover.

2. MAKE-UP OF THE GRASSLAND: Grasses are the main plant component of a grassland, but some broad leaf plants and legumes make them more productive for both wildlife and livestock. The broad leaf plants that produce seed are very important to those animals that depend upon seed for their existence. Flowering plants are also important to butterflies and other insects that must be present to help pollinate the flowers to insure the production of seed.

3. USE OF THE GRASSLAND: When and how the grass is harvested, is probably the most critical of all the factors that can effect the value of a grassland for both wildlife and livestock.
Grasslands are usually either cut for hay or livestock is allowed to graze them for a period of time to harvest the grass.

When the grassland is cut for hay, the effect is almost immediate. Both the food and cover are removed, causing wildlife to either move to adjacent areas or be exposed to predators. In order to help reduce this negative impact, it is recommended that the outer thirty feet of the hay field be left standing or be cut at some later date.

Grazing on the other hand, removes the vegetation over a longer period of time. This rate of removal will be determined mainly by two factors: 1) how many head of livestock are placed on the grazing unit (stocking rate) and (2) how long they are allowed to graze (grazing period).

Grazing can be continuous or rotational. Continuous grazing allows livestock in one grazing unit to graze selectively for a long period of time. Often, continuous grazing results in the near elimination of certain choice plants (decreases plants) and allows the introduction and spread of plants that are not as palatable (increaser plants) to livestock. Continuous grazing reduces forage production and eliminates wildlife cover and food. Cattle trampling, also destroys wildlife nests. Years of continuous overgrazing can change a grassland to a brushy area with undesirable plants. Grasses that are continuously grazed will produce less forage each year.

Rotation grazing may be as simple as switching livestock between two grazing units or pastures. “Management Intensive Grazing”, on the other hand, can result in a higher production for the grazing herd in terms of “pounds of day gain”. In addition, the herd size or stocking density can be drastically increased. This system requires more “management” (management-intensive) on the part of the operator, since smaller grazing units (paddocks) are involved. It is important to note that the proper term is “management-intensive”, since it is management and not necessarily grazing that is intensified.

When grasses are “rested” or the grazing unit is left idle between grazing periods, the vigor of the choice plants increases, giving them a chance to grow and multiply. This gradually increases the number of high-quality plants per acre. The result of having more vigorous grasses in the grazing system, will be increased livestock production, improved wildlife food and cover and a reduction in soil erosion which conserves both water and soil nutrients.

4) SIZE OF THE GRASSLAND: Generally speaking, the larger the grassland, the less value it has for cottontail rabbit and bobwhite quail. These two wildlife species tend to utilize the “edge” of the grassland where it joins woodlands, old fields and crop lands. Rabbits require brushy, escape cover to survive the pressure of predators such as hawks, owls, coyotes, fox and bobcats. While quail are able to utilize the interior of large, open grasslands, they, too, are most often found along the edges of grasslands where two or more habitat types come together. Grassland management practices are usually directed toward the maximum production of grasses and forbs that discourage the growth of shrubby thickets that rabbits and quail might use for cover.

Periodic burning of warm-season grasses to increase production, will also remove brushy cover and any brush piles, unless these are specifically protected from fire. Although rabbits and quail can utilize fully a grassland of twenty acres, they tend to not use the interior of grassland units of eighty acres and larger. Large grasslands are more often utilized by prairie chicken, upland sandpiper, meadowlark and similar “open land” wildlife species.
WILDLIFE HABITAT: BOBWHITE QUAIL & COTTONTAIL RABBIT

Missouri has some thirteen million acres of grassland. These acres have the potential to produce hay, pasture, and wildlife habitat if properly managed.

In addition to livestock forage, grasslands are important to many wildlife species. The greater prairie chicken, upland sandpiper and meadowlark are open grassland nesters. Species such as rabbit, bobwhite quail, turkey and pheasant prefer to nest in grass when it is near a wooded or brushy area.

The management of grasslands to produce both cattle forage and wildlife food and cover is a compatible use of the land.

Since livestock are usually confined to the pasture by fences, the forage needs of these animals must be supplied within this area. Wildlife are not confined by fences and may seek out food and cover as required. A grassland (pasture or hayfield) can become a valuable part of the habitat range, however.

Rabbits and quail are able to move back and forth through different habitat types found on a farm. They rarely stay in the same type for long periods of time, but require that these habitat components be located close together for safety of movement.

Rotational grazing will provide succulent forage for cattle, while allowing some areas to grow undisturbed. While resting, these undisturbed units will serve as wildlife habitat.

Vegetation height during the nesting season and through the winter months are critical elements of a grassland management plan.

Pastures and hay fields that are isolated from other habitat components are of little value to bobwhite quail. Woody cover for protection, idle fields for nesting, and weed seed and crop residues for food are all important habitat components that must be located close to the grassland.

Grazing practices that will improve forage production and value will also benefit wildlife. Legume introduction, proper haying and grazing heights as well as proper haying and grazing dates will improve production as well as wildlife habitat.

Quail, for example, use grasslands for nesting, insect gathering, seed gathering, loafing, and roosting. If the grass is too thick (stem density at ground level) quail cannot easily move through it. They prefer clumpy grasses that provide cover from above, but allow easy movement through the grassy vegetation. The native warm-season grasses meet these requirements.

Warm-season grasses (big bluestem, Indian grass, switch grass), usually do not grow densely enough to restrict wildlife movement. These grasses will be grazed and hayed after the nesting season. In order to maintain the grasses, cattle cannot be allowed to over-winter on the stand. Due to this, many wildlife species will use them for winter cover, seed gathering and loafing areas. At least 8 to 10 inches of growth must be maintained in the fall in order for good growth to take place during the following spring. This residual growth is excellent for winter cover and potential nesting the following spring.

BOBWHITE QUAIL -- BASIC POINTS CONCERNING MANAGEMENT

Bobwhite quail are best managed on a twenty to forty acre basis. The area is small enough to work with and large enough for a covey of quail.

The most obvious quail management is to protect what is there now -- shrubby and woody
cover of edges, draws and other "waste areas" which usually occur around a farm.

**FOOD MANAGEMENT:** Food must be available adjacent to escape cover. Birds should be able to walk through good cover to their feeding grounds. An abundance of food is not enough, it must be high-protein and be available.

The bobwhite quail diet will vary over the state. In grain producing areas, soybeans are used the most followed by corn, weed seeds, and milo. In other areas quail will rely heavily on weed seed and occasionally some small-grain crop residue when available. Remember, fall plowing will eliminate an important food source if crop residues are turned under.

A quail management plan should try to provide the three primary sources of food: 1) crop residues (waste grain and legumes); 2) native weed seeds, grasses, shrub and tree fruits; and 3) special plantings of grain (see Annual Grain Plots, Chapter ten).

**IMPORTANT QUAIL FOOD PLANTS INCLUDE:**
Acorns, Crop residues, Asters, Bedstraws, Beggar ticks, Blackberry, Cinquefoil, Clovers, Crotons, Dandelion, Foxtails, Goldenrods, Grapes, Korean lespedeza, Poison ivy, Ragweeds, Sedges, Smartweeds, Sunflowers.

**COVER MANAGEMENT:** Cover can often be improved simply by fencing livestock out to allow natural plant growth.

Maintain scattered patches and travel lanes of dense, brushy cover throughout each forty acres.

**ESCAPE COVER:** This important element can be provided by the construction of brush piles using the limbs of trees cut for firewood, brush thinning, or tree trimming. Several loose piles located next to food production areas are best. Consider an area as suitable escape cover if you can't walk through it.

**NESTING COVER:** Is most often located in unmown or ungrazed areas or in field borders with retop, timothy, orchard grass, perennial rye grass, or mixtures of native warm season grasses.

**ROOSTING COVER:** Quail roost is vegetation that is not too dense, but which provides adequate concealment from above. The roost is in rather open, "clumpy" vegetation away from the dense or tangled escape cover. Fields of ragweed, croton, big bluestem or Indian grass are good roosting areas.

**SUMMARY:** Remember that bobwhite quail are seed eaters. They do eat insects during times when they are abundant, but seeds remain the primary food for most of the year. Cover is critical and must be located next to the food. To be effective, cover must be protected from livestock at all times, unless the management plan calls for short periods of grazing to modify vegetative growth.

**BOBWHITE QUAIL LIFE CYCLE**

**APRIL:** Covey breakup occurs. Whistling and pairing begins.

**MAY:** Nesting gets underway. Early attempts are often unsuccessful due to hay cutting.
predators, etc.

**JUNE:** Nesting peak is around June 15th. Heavy rainfall and floods at this time can have a detrimental impact on quail populations.

**JULY:** The second hatching peak is usually in mid to late July due to second attempts at nesting. Heavy rains or drought can play a role in hatch success.

**AUGUST:** Late hatches occur, particularly if there were excessive rains in June or July. From 10-20% of the fall population are usually late hatch birds.

**SEPT:** Birds from July hatches become mature enough to enter the fall shuffle.

**OCT:** The quail begin to become habitat selective. They often leave poor (marginal) habitat to find a better situation.

**NOV:** Winter coveys formed. *Exception:* If percentage of late hatch (Aug.-Sept.) birds is high then weak covey units are formed and hunting is poor.

**DEC:** A generally fair month for quail, unless ice & snow deep.

**JAN:** Severe weather becomes a factor. Quail will select and concentrate in the best habitat where food sources are rapidly depleted. *(Hand-feeding quail not recommended)*

**FEB:** Severe weather still a factor. Extended periods of ice or snow cover most harmful. Population losses at this point for any reason (poaching, predators, starvation, etc.) are most harmful.

**MAR:** Food and cover at lowest point of year-adverse weather can still be a factor. Covey breakup begins at the end of the month.

**COVER SELECTION:**

1. **Spring and summer** - Quail need grassy unmowed areas for nesting -- usually, last year’s vegetation is used for nesting. They tend to select grassy or weedy areas as feeding sites. Important that plant density not be too thick to allow movement through vegetation.

2. **Fall and Winter** - Quail will move into woody areas. They tend to select dense brush as core cover. Usually won't venture very far from good brushy cover to feed.

**FOOD SELECTION:**

1. **Spring and Summer** - Insects and green plant material. Berries and remaining seed residues also used.

2. **Fall and Winter** - Weed seed and crop residue very important.

**COTTONTAIL RABBIT -- BASIC POINTS CONCERNING MANAGEMENT**

The average size Missouri farm (250 acres) has ample room for rabbit management. Under good conditions, the home range of a cottontail is often less than five acres.

Rabbits need well-distributed escape cover (brushpiles), an ample year-round food supply, and a safe place for nesting and development of young. Although rabbits drink during hot, dry spells, they can also obtain what water they need from the succulent plants they eat.

**FOOD MANAGEMENT:** Rabbits eat plant foods. Bluegrass is nearly a year-round food, although not heavily used during the summer.
Sprouting wheat and grain from corn and milo are important during fall and winter. Cheat, an annual grass, is an important food during early spring. Good summer foods are white clover, Korean lespedeza and crabgrass. These foods must be of high quality and next to good cover for rabbits (see Green Browse Plot, Chapter ten).

**IMPORTANT RABBIT FOOD PLANTS INCLUDE:** Crop residues, Asters, Bluegrass, Chess, Cinquefoil, Clovers, Crabgrass, Dandelion, Fall panic grass, Fescue, Fleabanes, Horse nettle, Knotweed, Korean lespedeza, Nodding foxtail, Plantains, Poison ivy, Ragweeds, Sedges, Smartweeds, Strawberry, Sumacs, Tall thistle, Tick trefoils, Timothy.

**COVER MANAGEMENT:** Dense, well-distributed protective cover is the most critical element in good rabbit habitat. Brush piles located in the right place bring the quickest response of all the management tools. Rabbits often take over a brush pile the night after construction.

Some trees such as locusts will remain alive for several years when "lopped over" or "hinged". If the top is allowed to remain attached to the stump, the twigs and limbs will provide both food and cover. Place brush piles close to other permanent cover, such as briars, fencerows, or woods (see Brush pile construction, Chapter ten).

Fencing woodlots, gullies, and pond areas to exclude cattle improves existing cover and allows grass and shrubs to thrive. By protecting fencerows from grazing and by topping some of the larger trees, the resulting growth will be low and dense.

Odd or non-agricultural areas allowed to grow sprouts, briars, and brush will provide excellent nesting sites for wildlife.

Don't burn brushpiles left from clearing. Push them to the edges of the field for cover.

**SUMMARY:** A rabbit management plan should include as many of the following items as is practical: 1) Dense brush piles--cattle-proof cover, 2) Small grains--oats, wheat, rye, barley, 3) Row crops--corn, milo, soybeans, 4) Green browse--clovers, bluegrass, 5) Native warm season grasses, 6) Weeds--crabgrass, foxtail, ragweed, 7) Fenced woodlots--ungrazed areas.
WILDLIFE MANAGEMENT PRACTICES

Competency/Objective: Appraise a fenced plot of grassland or pasture for its ability to meet the basic needs of wildlife.

Study Questions:

1. Why consider the needs of wildlife in the management of grasslands?

2. What is the plant composition of this grassland? What are the dominant grasses? What legumes are present? What composition is best for rabbit and quail that might use the area?

3. Compared to quail, what major grassland type does the prairie chicken require.

4. What other types of wildlife utilize grasslands?

5. How can forage composition affect wildlife use? What percent of the ground is shaded by legumes? How much is ideal for rabbits and quail?

6. How does the kind and availability of cover affect wildlife?

7. How does the size of the grassland affect wildlife use?

8. How does forage harvesting intensity affect wildlife use? What is the grazing pressure within this pasture unit -- Heavy, Medium or Light?

9. Define the term “management-intensive grazing system”

10. Warm-season grasses should not be grazed to a height lower than how many inches?

11. Under a grazing system, can there be a “border” within the fenced area? Remember, a BORDER refers to a minimum of a five (5 ft.) foot wide herbaceous, grass, woody, etc., strips of vegetation between habitat types. If livestock graze from fence row to fence row, can there be a BORDER?

12. Inspect the winter or ESCAPE cover within the fenced area of the pasture. Can you find an area where a rabbit being chased by a coyote can escape being caught?
Consider the shrubs and weedy plants what are from six to eighteen inches tall within the fenced pasture. These “knee-high” plants must be thick enough to allow a rabbit or quail to move undected by hawks and owls. What percent of this cover is ideal for rabbits and quail?

What percent of this pasture is within 250 feet of dense woody cover or ungrazed woodland? Why is this important to rabbits and quail?

References:

“Introduction to Grassland Management”, (Student Reference). University of Missouri-Columbia: Instructional Materials Laboratory, 1996, Unit IV.

Wildlife Management For Missouri Landowners, Pitts, David E., Mo. Dept. Of Conservation, Box 180, Jefferson City, Mo. 65101. (Booklet free upon request)
WILDLIFE HABITAT

APPRASIL OF EXISTING CONDITIONS

1. Extent of border:
   A. No border within fenced area
   B. Border along 25% of edge
   C. Border along 50 - 75%
   D. Border along 51 - 75%
   E. Border around entire field

2. Percent of field covered by winter or escape cover (include brushy draws, brushpiles, fallen logs, etc.):
   A. No cover present
   B. 1-10% of field has winter/escape cover
   C. Field is less than 10 acres in size

3. Percent canopy coverage of shrubs and herbaceous vegetation 6 to 18 inches tall.
   (Refer to 50 X 50 foot enclosure):
   A. Less than 25% coverage
   B. 26 to 75% coverage
   C. More than 75% coverage

4. Grazing pressure:  (Refer to 50 X 50 foot enclosure)
   A. Heavy
   B. Moderate
   C. Light

5. Percent of ground covered or shaded by both native and introduced legumes.
   (Refer to 50 X 50 foot enclosure):
   A. 5% or less of the ground covered by legumes
   B. 6 to 50% of the ground covered by legumes
   C. 51% or more of the ground covered by legumes

6. Plant composition  (Refer to 50 X 50 foot enclosure):
   A. Tall fescue (90% or more)
   B. Mixed cool-season grass (10% legumes or less)
   C. Cool-season grass dominant (10 to 25% legumes or other grasses)
   D. Cool-season grass & legumes (26 to 60% legumes)
   E. Legumes dominant (75% legumes or more)
   F. Warm-season grasses dominant (other species 25% or less)

7. Distance from center of field to edge of nearest cropfield:
   A. Over 500 feet to cropfield
   B. 250 to 499 feet to chiseled or disced cropfield
   C. Less than 249 feet to chiseled or disced cropfield
   D. 250 to 500 feet to cropfield with no fall tillage or with crop of winter wheat.
   E. Less than 249 feet to cropfield with no fall tillage or with crop of winter wheat

A. Field size - the % of field within 250 feet of dense woody cover or ungrazed woodland:
   A. Less than 25%
   B. 26 to 50%
   C. 51 to 75%
   D. 76 to 100%

This completes the evaluation portion – be sure each question is answered. Now, complete the following questions by placing the proper letter in the blank preceding each question.

MULTIPLE CHOICE QUESTIONS

(3 points each)

1. The soil temperature at which warm-season grasses grow most efficiently is between (degrees F):
   A. 40 & 78 degrees
   B. 55 & 90 degrees
   C. 88 & 100 degrees

2. Remnant native prairies are located primarily in this part of Missouri:
   A. Northeast & North
   B. East-central & southeast
   C. West-central & southwest

3. Several species of wildlife use grasslands for:
   A. Foraging
   B. Nesting
   C. Dusting
   D. Roosting
   E. All of these

4. The maximum density or the upper limit of survival possible of a species that particular range or area is capable of supporting during a definite period of the year is referred to as:
   A. Diversity
   B. Habitat
   C. Carrying Capacity
   D. Limit

5. The place where the animal lives; where all its requirements for life are fulfilled is referred to as its:
   A. Diversity
   B. Habitat
   C. Carrying Capacity
   D. Home

COMPLETE QUESTIONS ON REVERSE SIDE
In this group are the mid to tall grasses that are most liked by grazing animals and repeated grazing may even destroy them.

A. Decreasers  B. Increasers  C. Invaders  D. Biennial

The transition zone between habitat types is called:

A. Border  B. Zone  C. Edge

Grazing livestock can do extensive damage to woodlands, therefore, all livestock should be excluded from woodlands.

A. Statement is true  B. Statement is false

Warm-season grasses should be cut for hay during this period:

A. May to mid June  B. June 1 to 15  C. Late June to early July  D. August only

Warm-season grasses do most of their growing during the spring and fall.

A. True  B. False

The following is not a type of warm-season grass:

A. Fescue  B. Big Bluestem  C. Indian Grass  D. Switchgrass

Remnant native prairies that are considered to be in poor condition should not be fertilized, limed or have seed added.

A. Statement is true  B. Statement is false

Which plant type(s) will live for at least two (2) years?

A. Perennial only  B. Perennial & annual  C. Biennial & perennial  D. Biennial and annual

A low growing, woody plant with several permanent stems arising from a common base.

A. Shrub  B. Grass  C. Forb  D. Herb

An organism or species that is not native to the region in which it is found.

A. Exotic  B. Endemic  C. Invader  D. Endangered

In dealing with grass seed, the letters P.L.S. stand for:

A. Pounds live seed  B. Productive live seed  C. Pure live seed

17. This type of grazing would be best for both livestock production and wildlife habitat:

A. Over grazing  B. No grazing  C. Rotation grazing

18. Quail and rabbits prefer grasses that grow in clumps, rather than those that form dense sods.

A. True  B. False

19. Rabbits and quail use field edges where other habitat types are available rather than the centers of large fields.

A. True  B. False

20. Research has shown that rabbits and quail rarely move further than this distance between different habitat components.

A. One mile  B. One-half mile  C. One-eighth mile  D. Two miles

Card B  Revised: May, 1997
Practical Exercise and Scenario -- Wildlife Habitat Appraisal Score Card (B)

1. **Extent of border**: The answer is “A -- no border within fenced area”. This is a pasture situation where livestock grazes everything between the fences on four sides. According to the evaluation criteria, therefore, there can not be a border within this pasture.

2. **Percent of field covered by winter or escape cover**: The answer is “A -- no cover present” This pasture had no brush piles, dense brushy draws, etc. where a rabbit or quail could seek shelter to escape a pursuing predator such as a coyote or hawk.

3. **Percent canopy coverage of shrubs and herbaceous vegetation 6 to 18 inches tall**: The answer is “A -- less than 25% coverage”. Livestock had grazed the entire field and a very small amount of canopy cover was available to help protect rabbit and quail from aerial predators, such as hawks and owls.

4. **Grazing pressure**: The answer is “B -- moderate”. Even moderate grazing will often remove the cover components from a pasture.

5. **Percent of ground covered or shaded by both native and introduced legumes**: The answer is “B -- 6 to 50% of the ground covered by legumes”. Clovers were visible within the 50 X 50 foot square plot and made up a good portion of the plant composition. This situation would be good for browsing animals, such as deer and turkey, however the plant (stem) density at ground level made it less attractive to quail and rabbits.

6. **Plant composition**: The answer is “D -- Cool-season grass & legumes”. A mixture of grasses along with legumes is always more attractive to wildlife as source of insects and seed for food.

7. **Distance from center field to edge of nearest crop field**: The answer is “A -- over 500 feet to cropfield”. A pasture such as this one would be more attractive to rabbits and quail if there had been cropfields nearby. Cropfields provide some bare ground, crop seed residues, and often aerial cover that are all important as habitat components for rabbit and quail.

8. **Field size - the % of field within 250 feet of dense woody cover or ungrazed woodland**: The answer is “A -- less than 25%”. Woody cover is a very important habitat component for rabbit, quail, and many other songbirds and mammals. Livestock that are allowed to graze in the woodland will remove plants used for “browse” by deer. As vegetation is removed by livestock, a “browse line” develops to a height that the livestock can reach. The result is very little cover and food sources are available for wildlife. In addition, young trees that would replace or “regenerate” the older trees as they are removed will be eliminated or damaged.

In summary, this moderately grazed pasture afforded very little food or cover for rabbits and quail due to its location and plant composition.
Practical Exercise and Scenario -- Wildlife Habitat Score Card

Objective: Evaluate a specific grassland for its value to cottontail rabbits and bobwhite quail.

A grassland manager who is interested in both livestock and wildlife production must be able to recognize the habitat requirements of both. It is important to remember that wild animals are not confined by fences. Cover such as brush piles and shrubby thickets may be located in areas next to the grassland while additional food and cover can be provided within the grassland unit.

The following form lists factors considered when evaluating a specific tract of grassland, pasture or hay field. The objective of this exercise is to identify limiting factors that can be overcome to improve habitat for rabbits and quail. Each field or pasture unit should be rated on the conditions within the fenced area only. An aerial photograph of a specific grassland unit would be helpful in identifying habitat components in adjacent fields. A brief explanation follows each appraisal category.

APPRAISAL OF EXISTING CONDITIONS

1. **EXTENT OF BORDER:** (see note 1)

   A. No border within fenced area
   B. Border along 25% of edge
   C. Border along 26 to 50% of edge
   D. Border along 51 to 75% of edge
   E. Border around entire field

The border refers to herbaceous (weeds), grassy, woody (brush, windbreaks, hedgerows, etc.) strips of vegetation between habitat types. The strip must be a minimum of five (5) feet in width to be of value to wildlife. In order to evaluate a border under this system, the vegetation change (border) must exist within the fenced area of the grassland being evaluated. Habitat components located in adjacent fields will be evaluated separately within that field.

**NOTE 1:** A border cannot exist under grazing (pasture) conditions, since livestock graze from fence row to fence row. The field being appraised is the area that is being grazed between the fences that enclose it. For this category, ignore any vegetation that is outside the fenced area being grazed.
2. **PERCENT OF FIELD COVERED BY WINTER OR ESCAPE COVER** (Include brushy draws, brush piles, fallen logs, etc.):

   A. **No cover present.** The field is devoid of any usable thickets, blackberry patches, or dense, brushy cover.

   B. **1-10% of field has winter/escape cover.** This would be considered to be a "marginal" amount of cover and valuable to wildlife if livestock have not trampled and grazed through it. Look into the thicket to see if predators could pass through easily, or would a rabbit be able to escape.

   C. **Field is less than 10 acres in size.** Choose this category only if the fence rows consist of very dense escape cover as described in B. If not, select "A" above, since this field would be of little value to wildlife for escape cover.

   Winter and escape cover is very important to the survival of rabbits and quail. These areas include dense brushy cover, brush piles, fallen logs, etc. In order to be of value within this category, the cover must be dense enough that a man would have great difficulty walking through it, and a coyote or fox would not be able to catch a rabbit that ran into it.

3. **PERCENT CANOPY COVERAGE OF SHRUBS AND HERBACEOUS VEGETATION 6 TO 18 INCHES TALL:**

   A. Less than 25% coverage
   B. 26 to 75% coverage
   C. More than 76% coverage

   Consider the shrubs and weedy plants that are from six inches to eighteen inches tall or around knee high. This category is different from number two, since canopy cover provides protection from birds of prey (aerial cover), while allowing easy movement through the vegetation. The ideal range of canopy cover for quail and rabbits would be between 26% to 75%. An area with more than 75% coverage may be difficult for quail, rabbits and turkeys to walk through. When canopy coverage is less than 25% or more than 75%, the area is considered to be less attractive to upland wildlife, especially rabbits & quail.

4. **GRAZING PRESSURE:**

   A. Heavy  Less than three inches of forage height. Heavy stocking rate of livestock.
   B. Moderate Three to eight inches of forage height.
   C. Light Stocking rate is light, resulting in tall forage remaining on the unit.
   D. Rotational Paddocks or grazing cells established to allow rotation of livestock.

   **Grazing pressure:** The height of the grass or forage is a critical habitat factor for wildlife such as rabbits and quail. During the growing season, quail may utilize the field edges for nesting, but will be forced to move to other sites if plants are grazed to less than 8 inches. Heavy grazing can also
destroy quail nests from livestock trampling.

If the cool-season grass pasture has a history of **heavy grazing**, all grazing should be deferred during the growing season to improve the vigor of the grass stand. Deferment will also tend to improve the species composition of the stand. After a period of rest, the stand can be grazed, but it should be monitored closely to avoid the removal of too much of the forage.

**Moderate grazing** will apply mainly to a cool-season pasture and is defined as leaving 3 - 6 inches during the winter.

**Light grazing** may result in tall forage being on the unit during most of the year. This could result in too much forage being present for the benefit of rabbit and quail. Very dense grassy vegetation, especially fescue, can become a negative factor by restricting the movement of young quail from the nest.

Grazing to remove only 50% of the year's growth is usually applied to native, warm-season grasses. These grasses should not be grazed to a height of less than eight inches. Livestock should never be allowed to “winter” on any native warm-season grass land.

5. **PERCENT OF GROUND COVERED OR SHADeD BY LEGUMES:**

   A. 5% or less
   B. 6 to 50%
   C. 51% or more

Legumes are an important plant group for both wildlife and livestock. Rabbits and quail find grazing units with less than 5% or more than 50% of the ground covered by legumes to be less attractive than when the ground cover ranges between 6 and 49%.

Wildlife use both the seeds and the vegetative parts of these plants. Legumes are also important in the removal of nitrogen from the air and fixing it in the soil for use by other plants, including grasses and forbs. Insects that make up a high percentage of songbird and quail diet can also be found on these plants. Legumes include alfalfa, clovers, tick trefoil, Korean lespedeza, partridge pea, lead plant, hop clover and many others.

6. **PLANT COMPOSITION:**

   A. Tall fescue (90% or more)
   B. Mixed cool-season grass (10% legumes or less)
   C. Cool-season grass dominant (10 to 25% legumes or other grasses)
   D. Cool-season grass & legumes (26 to 60% legumes)
   E. Legumes dominant (75% legumes or more)
   F. Warm-season grasses dominant (other species 25% or less)

**Tall Fescue (90 % or more)** The stem density at ground level would be too thick to be attractive to wildlife. When fescue approaches just 40% of the pasture composition, most wildlife species will not use this habitat situation for nesting, feeding, roosting, etc.

**Mixed Cool-season grasses (10% legumes or less)** A common pasture throughout
Missouri, but legumes do not make up enough of the plant population to be attractive to many wildlife species. The grasses could be a mixture of orchard grass, tall fescue, bluegrass, timothy, etc.

**Cool-season grass dominant** (10 to 25% legumes or other grasses) The dominant grass could be tall fescue, orchard grass, timothy, etc. with legumes making up only a small percentage of the composition.

**Cool-season grass & legumes** (26 to 60% legumes) Usually considered to be a cool-season/legume pasture. The grass component could be tall fescue, orchard grass, timothy or bluegrass, etc. with legumes such as clovers, lespedezas, hop clovers, etc. This is probably the most widely used forage system in Missouri. The grass-legume mixture is also attractive to insects that make up nearly all of the diet of young quail chicks. Young birds and rabbits can use the pasture only if the stem density at ground level is not too dense to allow ease of movement.

**Legumes dominant** (75% legumes or more) An excellent pasture where young turkey poults, quail chicks and many songbirds can easily move through the vegetation in search of insects and succulent plants for food. Deer, rabbits, groundhogs and other smaller rodents, also find this pasture attractive as a source of food and cover.

**Warm-season grasses dominant** (other plant species 25% or less) The native warm-season grasses provide an excellent condition for most wildlife species, when managed with other necessary habitat components. A mixture of broadleaf plants and warm-season grasses provide the diversity required by ground nesting birds such as quail and many songbirds. These grasses provide a cool, moist summer environment and a warm, dry winter environment. They are compatible with species such as legumes, sedges, and seed-producing forbs which are used as browse by wildlife species. Insects, which are important in the diet of many wildlife species, thrive in the bunch-grass and feed mainly on the legumes and forbs. It should be noted that not all introduced warm-season grasses provide an attractive habitat component after they have become established. Most often, these grasses form a dense sod that eliminates or restricts wildlife movement.

7. **DISTANCE FROM CENTER OF FIELD TO EDGE OF NEAREST CROP FIELD.**

A. Over 500 feet to crop field
B. 250 to 499 feet to chiseled or disked crop field
C. Less than 249 feet to chiseled or disked crop field
D. 250 to 500 feet to crop field with no fall tillage or with crop of winter wheat.
E. Less than 249 feet to crop field with no fall tillage or with crop of winter wheat

Studies show that crop fields are an important part of the habitat of bobwhite quail. When the minimum amounts of pesticides are used, the soil disturbance produces ragweed and other seed-producing plants that are important quail foods. Crop residue (waste grain) left on the soil surface after harvest can be an important source of emergency food during the winter.

Studies also show that a high number of bobwhite quail nests will be located from 50 to
150 feet of bare ground. If bare ground, such as a crop field, is located next to a properly managed grassland, the chances of a pair of quail successfully hatching and rearing their brood of young chicks are greatly increased.

Estimate the distance from the center of the grazing unit or paddock to the edge of the nearest crop field. A crop field that is located more than 500 feet from the center of the grassland unit is considered to be of no value to upland wildlife, such as rabbit and quail. A crop field with no fall tillage and located less than 250 feet from the center of the pasture is considered to be of the highest value.

8. THE PERCENT OF GRAZING UNIT THAT IS WITHIN 250 FEET OF DENSE WOODY COVER OR UNGRAZED WOODLAND.

A. Less than 25%.
B. 26 to 50%.
C. 51 to 75%.
D. 76 to 100%.

Generally speaking, the larger the field, the less value it has for wildlife. Quail use the field edge where other habitat types, especially escape cover, are available. Studies show that quail rarely move further than one-eighth of a mile (660 ft.) between habitat components. Cottontail rabbits require habitat components that are even closer together -- 250 feet. The interior of a very large grassland grazing unit, therefore, would be utilized very little by these wildlife species.

Estimate or measure the percent of the field that is located within 250 feet of concealment cover, ungrazed woodland or dense woody cover. Generally, this represents that portion of a pasture or hay field that will be utilized by quail and rabbits during average seasonal conditions.
GRASSLAND EVALUATION CONTEST

Wildlife Score Card
Answers to 20 Multiple Choice Questions

Score Card A


Score Card B


Score Card C


Score Card D


IMPORTANT NOTE: These answers apply only to the score cards dated "Revised May, 1997, and February, 1999". Answers do not apply to earlier versions.

Revised: February, 1999
WILDLIFE HABITAT

APPRAISAL OF EXISTING CONDITIONS
(5 points each)

1. Extent of border:
   A. Border along 0 to 25%
   B. Border along 26 to 50%
   C. Border along 51 to 75%
   D. Border along 76 to 100%

2. Percent of field covered by winter or escape cover (include brushy draws, brushpiles, fallen logs, etc.):
   A. No cover present
   B. Less than 10% of field has winter/escape cover
   C. Field is less than 10 acres in size

3. Percent canopy coverage of shrubs and herbaceous vegetation 6 to 18 inches tall.
   (Refer to 50 X 50 foot enclosure):
   A. Less than 25% coverage
   B. 26 to 75% coverage
   C. More than 76% coverage

4. Grazing pressure (Refer to 50 X 50 foot enclosure):
   A. Heavy
   B. Moderate
   C. Light

5. Percent of ground covered or shaded by both native and introduced legumes
   (Refer to 50 X 50 foot enclosure):
   A. 5% or less of the ground covered by legumes
   B. 6 to 50% of the ground covered by legumes
   C. 51% or more of the ground covered by legumes

6. Plant composition (Refer to 50 X 50 foot enclosure):
   A. Tall fescue (90% or more)
   B. Mixed cool-season grass (10% legumes or less)
   C. Cool-season grass dominant (10 to 25% legumes or other grasses)
   D. Cool-season grass & legumes (26 to 60% legumes)
   E. Legumes dominant (75% legumes or more)
   F. Warm-season grasses dominant (other species 25% or less)

7. Distance from center of field to edge of nearest cropfield:
   A. Over 500 feet to cropfield
   B. 250 to 499 feet to chiseled or disced cropfield
   C. Less than 249 feet to chiseled or disced cropfield
   D. 250 to 500 feet to cropfield with no fall tillage or with crop of winter wheat
   E. Less than 249 feet to cropfield with no fall tillage or with crop of winter wheat

8. Field size - the % of field within 250 feet of dense woody cover or ungrazed woodland.
   A. Less than 25%
   B. 26 to 50%
   C. 51 to 75%
   D. 76 to 100%

This completes the evaluation portion -- be sure each question is answered. Now, complete the following questions by placing the proper letter in the blank preceding each question.

MULTIPLE CHOICE QUESTIONS
(3 points each)

The maximum density or the upper limit of survival possible of a species that in a particular range or area is capable of supporting during a definite period of time is referred to as its:

A. Diversity
B. Habitat
C. Carrying Capacity

2. The place where the animal lives; where all its requirements for life are fulfilled is referred to as its:

A. Diversity
B. Habitat
C. Carrying Capacity

3. Which plant type or group of plants is the dominant species in a grassland?

A. All plant species
B. Grasses, shrubs, and legumes
C. Forbs and grasses
D. Woody plants, grasses, forbs, and legumes

4. Herbaceous, broadleaf plants with seeds in a single row within the seed pod.

A. Grass
B. Legume
C. Forb
D. Sedge
E. Annual

A low growing, woody plant with several permanent stems arising from a common base.

A. Shrub
B. Grass
C. Forb
D. Herb

COMPLETE QUESTIONS ON REVERSE SIDE
6. A __________ that is capable of removing nitrogen from the air and adding it to the soil by way of its root system is called a:

A. Rush  B. Grass  C. Legume  D. Sedge

7. Usually the most productive grazing practice for both livestock and wildlife is:

A. Heavy  B. Light  C. Rotation  D. Moderate

8. Cool-season grasses grow best during this time of year:

A. Summer/fall  B. Spring/fall  C. Spring/summer  D. Summer

9. Wildlife prefer grasses which:

A. Grow in very dense stands close to the ground
B. Grow in less dense stands with upright leaves
C. Have berries

10. Warm-season grasses should not be grazed closer to the ground than:

A. 8 inches  B. 2 inches  C. 20 inches

11. In a pasture rotation system, warm-season grasses are used to supplement cool-season grasses during the:

A. Winter  B. Spring  C. Summer  D. Fall

12. The peak quality of warm-season grasses is just after the peak of wildlife hatching in:

A. July  B. September  C. May  D. April  E. November

13. Burning a warm-season grass pasture or hayfield should be:

A. Stopped
B. Done at specific times to benefit wildlife and to increase forage production
C. Done in August every year.
D. Done in October every three years.

14. Cutting hay on native prairies during September will:

A. Weaken the prairie plants.
B. Improve wildlife habitat.
C. Increase hay production next year.
D. Reduce the need for fertilizer.
E. None of the above.

15. Burning a native prairie periodically under proper conditions benefits wildlife by:

A. Making nests harder for predators to find.
B. Improving conditions for animal mobility.
C. Exposing bare areas for dusting.
D. Removing excess plant growth.
E. All the above.

16. Heavy grazing or excessive haying could cause undesirable plants to:

A. Increase  B. Decrease  C. Completely die out.

17. Cool-season grasses do not use soil nutrients as efficiently as native warm-season grasses and require somewhat high fertility and soil pH.

A. True.  B. False.

18. Proper management of a grassland may include:

A. Grazing  B. Haying  C. Fertilizing  D. Over-seeding
E. Prescribed fire  F. All of these.

19. This plant is not a legume:

A. Vetch  B. Soybean  C. Black medic  D. Foxtail

20. Missouri has this many acres that are considered to be grasslands.

A. 5 million  B. 25 thousand  C. 13 million
# WILDLIFE HABITAT

## APPRAISAL OF EXISTING CONDITIONS

(5 points each)

1. **Extent of border:**
   - A. Border along 0 to 25%
   - B. Border along 26 to 50%
   - C. Border along 51 to 75%
   - D. Border along 76 to 100%

2. **Percent of field covered by winter or escape cover (include brushy draws, brushpiles, fallen logs, etc.):**
   - A. No cover present
   - B. 1 to 10 % of field has winter/escape cover
   - C. Field is less than 10 acres in size

3. **Percent canopy coverage of shrubs and herbaceous vegetation 6 to 18 inches tall.**
   (Refer to 50 X 50 foot enclosure):
   - A. Less than 25% coverage
   - B. 26 to 75% coverage
   - C. More than 75% coverage

4. **Grazing pressure:**
   (Refer to 50 X 50 foot enclosure)
   - A. Heavy
   - B. Moderate
   - C. Light

5. **Percent of ground covered or shaded by both native and introduced legumes.**
   (Refer to 50 X 50 foot enclosure):
   - A. 5% or less of the ground covered by legumes
   - B. 6 to 50% of the ground covered by legumes
   - C. 51% or more of the ground covered by legumes

6. **Plant composition:**
   (Refer to 50 X 50 foot enclosure):
   - A. Tall fescue (90% or more)
   - B. Mixed cool-season grass (10% legumes or less)
   - C. Cool-season grass dominant (10 to 25% legumes or other grasses)
   - D. Cool-season grass & legumes (26 to 60% legumes)
   - E. Legumes dominant (75% legumes or more)
   - F. Warm-season grasses dominant (other species 25% or less)

7. **Distance from center of field to edge of nearest cropfield:**
   - A. Over 500 feet to cropfield
   - B. 250 to 499 feet to chiseled or disced cropfield
   - C. Less than 249 feet to chiseled or disced cropfield
   - D. 250 to 500 feet to cropfield with no fall tillage or with crop of winter wheat.
   - E. Less than 249 feet to cropfield with no fall tillage or with crop of winter wheat

8. **Field size - the % of field within 250 feet of dense woody cover or ungrazed woodland.**
   - A. Less than 25%
   - B. 26 to 50%
   - C. 51 to 75%
   - D. 76 to 100%

This completes the evaluation portion -- be sure each question is answered. Now, complete the following questions by placing the proper letter in the blank preceding each question.

## MULTIPLE CHOICE QUESTIONS

(3 points each)

1. The soil temperature at which warm-season grasses grow most efficiently is between (degrees F):
   - A. 40 & 78 degrees
   - B. 55 & 90 degrees
   - C. 88 & 100 degrees

2. Remnant native prairies are located primarily in this part of Missouri:
   - A. Northeast & North
   - B. East-central & southeast
   - C. West-central & southwest

3. Several species of wildlife use grasslands for:
   - A. Foraging
   - B. Nesting
   - C. Dusting
   - D. Roosting
   - E. All of these

4. The maximum density or the upper limit of survival possible of a species that particular range or area is capable of supporting during a definite period of the year is referred to as:
   - A. Diversity
   - B. Habitat
   - C. Carrying Capacity
   - D. Limit

5. The place where the animal lives; where all its requirements for life are fulfilled is referred to as its:
   - A. Diversity
   - B. Habitat
   - C. Carrying Capacity
   - D. Home

## COMPLETE QUESTIONS ON REVERSE SIDE
16. This type of grazing would be best for both livestock production habitat:
   A. Over grazing  B. No grazing  C. Rotation grazing

17. Quail and rabbits prefer grasses that grow in clumps, rather than those that form dense sods.
   A. True  B. False

18. Rabbits and quail use field edges where other habitat types are available rather than the centers of large fields.
   A. True  B. False

19. Research has shown that rabbits and quail rarely move further than this distance between different habitat components.
   A. One mile  B. One-half mile  C. One-eighth mile  D. Two miles

Group are the mid to tall grasses that are most liked by grazing animals
   a. over grazed may even destroy them.

A. Decreasers  B. Increasers  C. Invaders  D. Biennial

The transition zone between habitat types is called:
   A. Border  B. Zone  C. Edge

Grazing livestock can do extensive damage to woodlands, therefore, all livestock should be excluded from woodlands.
   A. Statement is true  B. Statement is false

Warm-season grasses should be cut for hay during this period:
   A. May to mid June  B. June 1 to 15  C. Late June to early July  D. August only

Warm-season grasses do most of their growing during the spring and fall.
   A. True  B. False

The following is not a type of warm-season grass:
   A. Fescue  B. Big Bluestem  C. Indian Grass  D. Switchgrass

Remnant native prairies that are considered to be in poor condition should not be fertilized, limed or have seed added.
   A. Statement is true  B. Statement is false

Which plant type(s) will live for at least two (2) years?
   A. Perennial only  B. Perennial & annual  C. Biennial & perennial  D. Biennial and annual

A low growing, woody plant with several permanent stems arising from a common base.
   A. Shrub  B. Grass  C. Forb  D. Herb

An organism or species that is not native to the region in which it is found.
   A. Exotic  B. Endemic  C. Invader  D. Endangered

In dealing with grass seed, the letters P.L.S. stand for:
   A. Pounds live seed  B. Productive live seed  C. Pure live seed
WILDLIFE HABITAT

EXTENT OF BORDER:
A. Border along 0 to 25%  C. Border along 51 to 75%
B. Border along 26 to 50%  D. Border along 76 to 100%

PERCENT OF FIELD COVERED BY WINTER OR ESCAPE COVER (include brushy draws, brushpiles, fallen logs, etc.):
A. No cover present
B. 1 to 10% of field has winter/escape cover
C. Field is less than 10 acres in size

PERCENT CANOPY COVERAGE OF SHRUBS AND HERBACEOUS VEGETATION 6 TO 18 INCHES TALL.
(Refer to 50 X 50 foot enclosure):
A. Less than 25% coverage
B. 26 to 75% coverage
C. More than 75% coverage

GRAZING PRESSURE (Refer to 50 X 50 foot enclosure):
A. Heavy
B. Moderate
C. Light

PERCENT OF GROUND COVERED OR SHADED BY BOTH NATIVE AND INTRODUCED LEGUMES.
(Refer to 50 X 50 foot enclosure):
A. 5% or less of the ground covered by legumes
B. 6 to 50% of the ground covered by legumes
C. 51% or more of the ground covered by legumes

PLANT COMPOSITION (Refer to 50 X 50 foot enclosure):
A. Tall fescue (90% or more)
B. Mixed cool-season grass (10% or less)
C. Cool-season grass dominant (10 to 25% legumes or other grasses)
D. Cool-season grass & legumes (26 to 60% legumes)
E. Legumes dominant (75% legumes or more)
F. Warm-season grasses dominant (other species 25% or less)

DISTANCE FROM CENTER OF FIELD TO EDGE OF NEAREST CROPFIELD:
A. Over 500 feet to cropfield
B. 250 to 499 feet to chiseled or disked cropfield
C. Less than 249 feet to chiseled or disked cropfield
D. 250 to 500 feet to cropfield with no fall tillage or with crop of winter wheat
E. Less than 249 feet to cropfield with no fall tillage or with crop of winter wheat

8. Field size - the % of field within 250 feet of dense woody cover or ungrazed woodlands.
A. Less than 25%  C. 51 to 75%
B. 26 to 50%  D. 76 to 100%

This completes the evaluation portion - be sure each question is answered. Now, complete the following questions by placing the proper letter in the blank preceding each question.

MULTIPLE CHOICE QUESTIONS
(3 points each)

1. The soil temperature at which warm-season grasses grow most efficiently is between (degrees F):
A. 40 & 78 degrees  B. 55 & 90 degrees  C. 88 & 100 degrees

2. Remnant native prairies are located primarily in this part of Missouri:
A. Northeast & North  B. East-central & southeast  C. West-central & southwest

3. Several species of wildlife use grasslands for:
A. Foraging  B. Nesting  C. Dusting  D. Roosting  E. All of these

4. The maximum density or the upper limit of survival possible of a species that particular range or area is capable of supporting during a definite period of the year is referred to as:
A. Diversity  B. Habitat  C. Carrying Capacity  D. Limit

5. The place where the animal lives; where all its requirements for life are fulfilled is referred to as its:
A. Diversity  B. Habitat  C. Carrying Capacity  D. Home

COMPLETE QUESTIONS ON REVERSE SIDE
season grasses should be cut for hay during this period:
A. May to mid June  B. June 1 to 15  C. Late June to early July  D. August only
The transition zone or area between two or more diverse communities or habitat types is referred to as an ecotone, but is more commonly called:
A. Border  B. Zone  C. Edge  D. Niche  E. None of these
Grazing livestock can do extensive damage to woodlands, therefore, all livestock should be excluded from woodlands.
A. Statement is true  B. Statement is false
An organism or species that is not native to the region in which it is found.
A. Exotic  B. Endemic  C. Invader  D. Endangered
Cool-season grasses do most of their growing during the spring and fall.
A. True  B. False
The following is not a grass:
A. Yellow nutgrass  B. Foxtail  C. Downy chess  D. Purple top
Remnant native prairies considered to be in poor condition should not be fertilized, limed or have seed added.
A. Statement is true  B. Statement is false
Which plant type(s) will live for at least two (2) years?
A. Perennial only  B. Perennial & annual  C. Biennial & perennial  D. Biennial and annual
A low growing, woody plant with several permanent stems arising from a common base.
A. Shrub  B. Grass  C. Forb  D. Herb

15. A cross section of an area used as a sample for recording, mapping, and studying vegetation.
A. Sward  B. Spot sample  C. Transect  D. Indigenous sample

16. In dealing with grass seed, the letters P.L.S. stand for:
A. Pounds live seed  B. Productive live seed  C. Pure live seed

17. The parameter or item in an animal's habitat that outweighs all others in limiting productivity is called a:
A. Succession  B. Dominant Factor  C. Limiting Factor  D. Niche

18. Quail and rabbits prefer grasses that grow in clumps, rather than those that form dense sods.
A. True  B. False

19. The stages through which an ecosystem passes from less complex to more complex, i.e. from bare ground to an oak-hickory forest in Missouri, is called:
A. Succession  B. Dominant Factor  C. Limiting Factor  D. Niche

20. Research has shown that rabbits and quail rarely move further than this distance between different habitat components.
A. One mile  B. One-half mile  C. One-eighth mile  D. Two miles

Card C  Revised: February, 1999
WILDLIFE HABITAT

APPRAISAL OF EXISTING CONDITIONS

(5 points each)

1. Extent of border:
   - A. Border along 0 to 25%
   - B. Border along 26 to 50%
   - C. Border along 76 to 100%
   - D. Border along 51 to 75%

2. Percent of field covered by winter or escape cover (include brushy draws, brushpiles, fallen logs, etc.):
   - A. No cover present
   - B. 1 to 10% of field has winter/escape cover
   - C. Field is less than 10 acres in size

3. Percent canopy coverage of shrubs and herbaceous vegetation 6 to 18 inches tall.
   (Refer to 50 X 50 foot enclosure):
   - A. Less than 25% coverage
   - B. 26 to 75% coverage
   - C. More than 76% coverage

4. Grazing pressure
   (Refer to 50 X 50 foot enclosure):
   - A. Heavy
   - B. Moderate
   - C. Light

5. Percent of ground covered or shaded by both native and introduced legumes.
   (Refer to 50 X 50 foot enclosure):
   - A. 5% or less of the ground covered by legumes
   - B. 6 to 50% of the ground covered by legumes
   - C. 51% or more of the ground covered by legumes

6. Plant composition
   (Refer to 50 X 50 foot enclosure):
   - A. Tall fescue (90% or more)
   - B. Mixed cool-season grass (10% legumes or less)
   - C. Cool-season grass dominant (10 to 25% legumes or other grasses)
   - D. Cool-season grass & legumes (26 to 60% legumes)
   - E. Legumes dominant (75% legumes or more)
   - F. Warm-season grasses dominant (other species 25% or less)

7. Distance from center of field to edge of nearest cropfield:
   - A. Over 500 feet to cropfield
   - B. 250 to 499 feet to chiseled or disced cropfield
   - C. Less than 249 feet to chiseled or disced cropfield
   - D. 250 to 500 feet to cropfield with no tillage or with crop of winter wheat
   - E. Less than 249 feet to cropfield with no tillage or with crop of winter wheat

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SCORE:

Points: 100

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8. Field size - the % of field within 250 feet of dense woody cover or ungrazed woodland.
   - A. Less than 25%
   - B. 26 to 50%
   - C. 51 to 75%
   - D. 76 to 100%

This completes the evaluation portion – be sure each question is answered. Now, complete the following questions by placing the proper letter in the blank preceding each question.

MULTIPLE CHOICE QUESTIONS

(3 points each)

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1. The maximum density or the upper limit of survival possible of a species that a particular range or area is capable of supporting during a definite period of the year is referred to as:
   - A. Diversity
   - B. Habitat
   - C. Carrying Capacity

2. The place where the animal lives; where all its requirements for life are fulfilled is referred to as its:
   - A. Diversity
   - B. Habitat
   - C. Carrying Capacity

3. A cross section of an area used as a sample for recording, mapping, or studying vegetation.
   - A. Sward
   - B. Spot sample
   - C. Transect
   - D. Indigenous sample

4. Any plant that by its presence, frequency, or vigor indicates any particular property of the site.
   - A. Decreaser plant
   - B. Indicator plant
   - C. Site specific plant
   - D. Perennial

5. The stages through which an organism passes during its existence.
   - A. Succession
   - B. Life cycle
   - C. Edge effect
   - D. None of these

COMPLETE QUESTIONS ON REVERSE SIDE
that is capable of removing nitrogen from the air and adding it to the soil
of its root system is called a:
A. Rush B. Grass C. Legume D. Sedge

Usually the most productive grazing practice for both livestock and wildlife is:
A. Heavy B. Light C. Rotational D. Moderate

Cool-season grasses grow best during this time of year:
A. Summer/fall B. Spring/fall C. Spring/summer D. Summer

Wildlife prefer grasses which:
A. Form a dense sod with a high stem density at ground level.
B. Grow in less dense stands with upright leaves
C. Have berries

This plant is not a grass.
A. Sand bur B. Downy chess C. Green foxtail D. Birdsfoot trefoil

In a pasture rotation system, warm-season grasses are used to supplement cool-season grasses during the:
A. Winter B. Spring C. Summer D. Fall

Relatively small, often isolated native grasslands that occur on hilltops and south-facing slopes, where thin, dry soils and dry, harsh desertlike summer conditions harbor unique natural communities of plants and animals.
A. Desert tundra B. Savanna C. Glade D. Sward

Burning a warm-season grass pasture or hayfield should be:
A. Prevented if at all possible.
B. Done at specific times to benefit wildlife and to increase forage production.
C. Done in August every year.
D. Done in October every three years.

Cutting hay on native prairies during September will:
A. Weaken the prairie plants.
B. Improve wildlife habitat.
C. Increase hay production next year.
D. Reduce the need for fertilizer.
E. None of the above.

_15. A species (animal or plant) that is a part of the original fauna of an area.
A. Exotic species B. Organism C. Native species D. Predator

_16. The land area that drains toward a natural surface water system.
A. Water course B. Watershed C. Diversion terrace

_17. Cool-season grasses do not use soil nutrients as efficiently as native warm-season grasses and require somewhat high fertility and soil pH.
A. True. B. False.

_18. In wildlife management, a strip of herbaceous or woody vegetation, usually low-growing and more than five feet in width, established along the edges of fields, woodlands, or streams.
A. Interspersion area B. Indicator area C. Degredation strip D. Border

_19. This plant is not a legume:
A. Lead plant B. Partridge pea C. Lespedeza D. Yellow nutgrass

_20. A plant that completes its life cycle in two years.
A. Perennial B. Annual C. Biennial D. Seasonal