

WILDLIFE IN WV GRASSLANDS

GENERAL

Grasslands are a vital component to most West Virginia wildlife. There are roughly 1.2 million acres of grasslands scattered throughout West Virginia that provide food and cover for a variety of species. Most wildlife prefer a mosaic of vegetative habitats to meet their daily and seasonal requirements for survival. Grassland (pasture or hayfield) is only one component of that mosaic but provides elements such as nesting cover, food and forage or loafing areas for a variety of species. Since livestock are usually confined to grasslands by fences, their forage needs must be supplied within a given area. Wildlife is not confined by fences and will seek out food and cover as required. Wildlife is able to move back and forth through different habitat types found in a location and rarely stays in the same component for long periods of time. However they require that these habitat components be located close together for safety of movement. Pastures and hay fields that are isolated from other habitat components are of little value. Woody cover for protection, idle fields for nesting, and weed seed and crop residues for food are all important components that must be located close to grassland. A few of the other components are described below.

Plant varieties and densities needed depend upon the species of animals that use the area. The number of seed-producing plants in grassland will determine its value to species such as quail, because 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 a variety of species. In addition, rabbits and many small mammals consume the vegetative parts of grasses, legumes and other broad-leaved plants. If these plants are removed

by overgrazing or late season haying, the number of animals that the area can support (wildlife carrying capacity) may be reduced.

If properly managed, grasslands can also provide cover or protection for nesting, roosting or breeding. Songbirds such as bobolinks, meadowlarks, and several types of sparrows build their nest on the ground, raise their young, and feed exclusively within grasslands. Rabbits, bobwhite quail, turkey and pheasant also nest in grasslands, but prefer areas near woods or shrubby cover.



Photo: C. Shrader

West Virginia grasslands are an important component of the lifecycle for some species of birds.

Notes: Although they do occur in West Virginia, Ring-necked pheasants and the Northern bobwhite quail are found primarily in the northern and eastern panhandles of West Virginia respectively. Songbirds are used as examples and discussed in this document because they occur throughout the state, frequently use grasslands for a variety of life functions and are good overall indicators of grassland health. However, management for grassland birds is difficult and complex. Because grasslands depend on disturbance to persist, habitat that is suitable for a species one year may be unsuitable the following year. Moreover, each grassland species has unique habitat

requirements, and management that favors one species may preclude others.

Wild herbaceous plants (sometimes referred to as soft cover) are the vegetative growth consisting of native or introduced perennial grasses and broad-leaved weeds or forbs that are generally established naturally. Some examples are goldenrod, joe-pye weed, ironweed, plantain and ragweed. Domestic grasses and legumes can also provide food sources in the form of vegetative browse or the macroinvertebrates (insects) these plants attract. Examples of domestic grasses and legumes are bluegrass, timothy, alfalfa, clover and orchard grass.

Shrub cover (brush) consists of woody plants, usually with multiple stems that arise from a common base or dense early successional forest. These plants are generally less than fifteen feet tall at maturity. When they grow close together to form a thicket, they provide escape cover for a variety of animals such as quail, grouse and rabbits. These areas are browse for deer and the dense branches provide nesting and protected perch areas for many songbirds. Shrub cover may also consist of either evergreen or young coniferous trees and shrubs that provide mainly cover and some browse and seed. After coniferous trees become large and naturally prune and thin themselves, the value drastically decreases. Some examples are young white pine and Virginia pine, rhododendron and even some evergreen ornamentals. Deciduous shrubby cover may consist of species such as viburnums, blueberry, blackberry and rose. They typically produce fruits, buds or foliage that wildlife browse.



*Photo: C. Shrader
Shrub cover adjacent to grasslands in Randolph County, WV.*

Woodland generally consists of perennial, woody-stemmed tree species that reach a height of over twenty feet. This element typically includes deciduous and mature coniferous trees and vines that produce food browse and cover for wildlife. In West Virginia, these are woodland areas and riparian zones or woodland patches scattered among other landuse types. A diverse age and composition of plant species within these areas is important and usually desirable to provide good wildlife habitat. Some examples of our native kinds of trees are oaks, cherry, birches, maples, poplar and beech. These areas should always be protected from grazing.

It should also be noted that due to the topography of West Virginia many "seeps" or springs frequently surface in grassland areas used as pasture and hayland. These are very common in all parts of the state near the bases of hills or in small draws along slopes. While usually these areas are not large and relatively dry most of the year, they do support water-loving plants (wetland plants) and the sheer number of these areas throughout the state makes them worthy of mentioning. Making up this group are wild herbaceous and woody plants that grow on moist to wet sites but do not include submerged or floating plants. They produce food and cover for upland wildlife although they are wetland species. For example, pheasants use cattail and rushes

for winter cover, while deer feed on sedges in early spring. Wild turkeys use spring seeps as a source of surface water during the spring and fall. Desirable wetland plants include smartweeds, cattails, burreeds, barnyard grass, rushes and sedges. Water depth and fluctuation control the establishment and growth of most wetland plants and is usually the limiting factor controlling the species and composition of wetland plants.



Photo: C. Shrader
Wetland vegetation is important to wildlife within the overall landscape.

COOL SEASON GRASSES

Those grasses that grow best during the cool spring and fall of the year are aptly called cool-season grasses. These grasses begin their growth early in the spring when the soil temperature reaches about 40° F. Their growth slows during the warmest part of summer when the soil temperature nears 80° F and resumes again as the soil cools in the fall. Cool-season grasses have been popular with farmers because they provide forage for a large portion of the year, are very easy to establish and respond quickly and noticeably to fertilization. Some examples of cool-season grasses are tall fescue, Kentucky bluegrass, bromegrass, timothy and orchard grass.

Cool-season grasses are usually grazed to about 2 to 4 inches in height. Grazing below this height will result in lower production, may increase soil erosion and

reduce 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 which in West Virginia ranges from March 15 to July 15.

A WORD ABOUT TALL FESCUE

West Virginia farmers use tall fescue because it is quite easy to establish, a good grass to prevent soil erosion; and it tolerates a wide variety of conditions such as heavy grazing, a wide range of pH and climate. However, the attributes that make it attractive to farmers can have problematic implications for wildlife. Fescue readily invades fields and can quickly eliminate native grasses and forbs by out-competing them. In addition, its bulky thatch and residue remains on the ground if ungrazed or unharvested. This prevents movement of smaller animals and makes foraging and nesting difficult and a dangerous venture at best. Most wildlife will readily use all cool-season grasses, however tall fescue is the least desirable. Depending on the management scheme, intensively grazed or frequently mowed fescue dominated grasslands offer little or no cover for wildlife and are an overall poor habitat for grassland dwelling species.



Photo: NRCS
Tall fescue is not a good choice for most wildlife species.

Tall fescue has been found to cause some health problems in livestock when it's

infected with an endophyte fungus. It has been suggested that fescue may even harm animals such as cottontail rabbits by causing damage to the lining of the stomach and intestine.

WARM-SEASON GRASSES

Those grasses that grow best when the weather is hot and the soil temperature high are called warm-season grasses. These grasses begin growing when the soil temperature is above 50° F and continue to grow during the warmest months of the year until the soil temperature reaches nearly 90° F. Although warm-season grasses have a shorter growing season, they make more efficient use of water and nutrients than do other grasses.

Warm season grasses are not only good insurance against drought and summer forage shortages but they also are excellent for wildlife. Fields of these grasses may provide food and shelter for migrating warblers, thrushes, sparrows and larks in autumn. Many hawks and owls, such as kestrels and barn owl search grasslands for food throughout the winter months.



Photo: C. Shrader
Big Bluestem (Andropogon gerardii) stand in Barbour County, WV.

The “structure” or the way any grass grows is important to wildlife. The tall, stiff, upright stems and elevated leaves of most warm-season grasses can reduce the negative effects of weather as it affects smaller

warm-blooded animals. The plants can soften the impact of raindrops and modify both humidity and transpiration extremes when compared to cool-season grasses. These traits can provide a more favorable breeding condition for ground nesting birds and mammals.

Native warm season grasses such as, Indiangrass, switchgrass and big bluestem grow in clumps. Open areas between clumps permit young birds and small mammals to move freely as they search for insects and seeds. The clumps also allow nests to be built under the tufts of leaves. This lets adult birds come and go easily without delay or detection by enemies that search for the nests. Rodents and small birds are able to climb into the clump to escape drowning rains. Warm season grasses are essential to management of pheasants or bobwhite quail in West Virginia since these grasses form a more attractive habitat at ground level than do other grasses. Bunch grasses often have the habit of forming an overhead canopy of leaves which gives these birds at ground level some measure of protection from overhead predation. Young turkey poults that live on a diet of insects and a few seeds also heavily use them. The growth of various broadleaf plants and the presence of many kinds of insects and spiders, make ideal growing conditions for young quail, turkey and songbirds that are just leaving the nests in search of food. In winter months and under proper management, these grasses are often taller which allows them to bend and fold under the weight of snows. This situation tends to form openings and provides winter cover for a variety of animals. Deer and groundhogs find food and shelter in all fields but don't prefer native warm-season grasses if other suitable forage is present.

Mowing of warm-season grasses should be avoided (when feasible) during the peak ground-nesting season. Essentially, no harvesting should be performed prior to July 15 or August 1 in the higher elevations.

When managing warm season grasses in a pasture situation, rotational grazing should always be used. Grasses should only be grazed to a maximum of 12 inches or no more than ½ of the above ground height. This height insures that ample amounts of cover, insects, and seeds are available for wildlife and it keeps the grass healthy. Some examples of the grasses that are used in grazing systems are big bluestem, Indiangrass, side-oats gramma, little bluestem and switchgrass.



*Photo: Courtesy of the USDA Plants Database
Switchgrass (*Panicum virgatum*) is a warm season grass used in grazing systems that provide excellent wildlife cover.*

Historically these grasses have existed with and adapted to fire. In the tall grass prairies of the mid-west, fires started by frequent lightning strikes or as a result of sparks from trains served to reinvigorate the prairie. In earlier times, fires may also have been a result of native peoples who managed the area for hunting. Whatever the reason, wildlife managers continue to use fire to manage warm-season grasses. Prescribed burning (intentional burning of stands during specific times of the year) is the most common method of management throughout much of the country. This method is still the best way to remove thatch or residue from prior growth, reduce invasion of woody species and stimulate forb growth within a stand. **In West Virginia it is extremely dangerous and difficult to attempt to manage warm-season grasses with fire due to the relatively small areas of grass, extreme slope and large amounts of woodland**

throughout the state to which fire may escape. Untrained individuals should not attempt this method of management.

FACTORS THAT EFFECT THE VALUE OF GRASSLANDS FOR WILDLIFE

Different species of wildlife are attracted to grasslands for different reasons. Some animals may seek nesting sites, while others may use them mainly for foraging or cover. Various factors determine the amount and type of wildlife that use any particular grassland. These factors include the grassland type, grassland composition, the management and grassland size.

GRASSLAND TYPE

Each species of grass has its own growth characteristics. Some grasses have low growing habits and form a dense mat of plant matter and roots known as a “sod”. Examples of this type of grass include smooth brome, Kentucky bluegrass and Bermuda grass. Sod-forming grasses have a very high stem density at ground level and are spread primarily through rhizomes. This fact makes them less attractive to ground nesting birds and smaller animals, since they are usually not able to move through the sod.

Some grasses may grow either as a bunch grass or sod forming grass depending on the environmental conditions. Switchgrass is often thought of as a true bunchgrass, but in reality it is a sod forming grass that has varying growth characteristics. In mid-western prairies and bottomland sites it can develop long rhizomes that interlace to form a thick dense sod. Frequent disturbance helps keep this characteristic in check.



Photo: Courtesy of the USDA Plants Database
Species such as Little Bluestem (*Schizachyrium scoparium*) form bunches, while others form dense thick sods.

Cool season grasses are the most common grasses found in West Virginia due to climate and widespread planting for agriculture. Wildlife indeed use these areas of cool season grasses including the dense sod forming types for a variety of life activities. However, it is important to keep in mind that a mixture (or diversity) in composition is beneficial.



Photo: C. Shrader
Native warm season grass species such as broomsedge (*Andropogon virginiana*) often do not occur in stands dense enough to provide much quality habitat for wildlife.

As a general rule most of the warm season stands that exist in West Virginia are relatively small. The warm-season species are usually intermingled within existing stands of cool-season grasses and rarely occur in large pure stands. Some warm-season grasses do not form solid pure stands at all and tend to be more opportunistic such as broomsedge or purple-top grass which do not occur densely

enough to be useful to most wildlife. Although these grasses may provide some habitat in terms of cover, they are not critical to the majority of wildlife.

One warm season bunchgrass that grows naturally throughout West Virginia is Indiangrass (*Sorghastrum nutans*). This handsome grass occurs in every county of West Virginia but is most common in the western part of the state where it may occur in somewhat larger stands. Other warm season grasses that may be encountered in the Mountain State include big bluestem, little bluestem and gamma grass.

Switchgrass (*Panicum virgatum*) has become a staple of wildlife management for quail and pheasant. Many varieties of the grass have been developed to try to improve specific qualities about it. Varieties were propagated to improve forage quality for livestock ('Cave-in-Rock') or for reclamation purposes ('Blackwell'). In fact, one of the most common varieties used for wildlife ('Shelter') was developed in West Virginia.

GRASSLAND COMPOSITION

Obviously grasses are the main plant component of a grassland; but some wild herbaceous plants and legumes are vital ingredients in their overall makeup giving them more productivity for wildlife and livestock. The broad leaf plants that produce seed are very important to those animals that depend upon seed for their existence. For example, the bobwhite quail is an early successional edge dwelling species. However, one of the staple foods during late summer and fall months is ragweed seed, a common plant found throughout the grasslands of West Virginia that produces vast quantities of seed.

Legume composition within a grassland is also important to wildlife just as it is to livestock. Red and white clovers, alfalfa and other legumes play an important role in the food sources of wildlife and fix nitrogen

in the soil making it available to companion plants. They provide high amounts of nutritional proteins to small mammals such as cottontail rabbits that feed on the vegetative parts of these plants, especially clovers. Estimating the amounts of legumes in a grassland is important in determining management strategies for wildlife. The necessary amounts of legumes present in a grassland vary considerably by species. For animals such as the cottontail rabbit, a very high legume to grass ratio would be beneficial, while many species of songbirds would not require as many legumes. Some species, such as ruffed grouse, even obtain most of their water requirements from the succulent growth of legumes.



Photo: C. Shrader
High legume to grass ratios are important to species such as cottontail rabbit.

Flowering plants and legumes are also important to butterflies and other insects that must be present to help pollinate the flowers and insure seed production. Larger animals may prey upon these insects; or they may provide the necessary proteins for young hatchlings whose diet consists almost exclusively of insects. Roughly 85% of a juvenile bobwhite's diet, for example, consists of insects and other animal matter. The chicks feed almost exclusively on insects during the first two weeks of their life.



Photo: William S. Justice
Some wildlife species depend on the succulent growth of legumes such as white clover (*Trifolium repens*).

The height (or vertical structure) of the grassland is also important. Since many different animals use different grasses and forbs for different reasons, it is logical that varying heights of grassland components would be more beneficial than uniform stands of a single height. Birds such as the Northern harrier and Ring-necked pheasant prefer tall grasses, while robins, horned larks and grasshopper sparrows prefer significantly shorter grasses. In fact, all grassland songbirds respond strongly to structural features (height and density) of the vegetation, and each species has its own unique requirements. The habitats preferred by grassland bird species range from low, sparse plant cover to tall, dense vegetation and each species has its own unique requirements.

GRASSLAND MANAGEMENT

Grassland management practices are usually directed toward the maximum production of grasses and forbs, they can be done with a timing and intensity that are wildlife friendly and productive agriculturally. The timing and intensity of harvesting grass is probably the most critical of all the factors that can affect the value of a grassland for both wildlife and livestock; but they are also usually the easiest to manipulate. Actively farmed grasslands are usually either cut for hay or used as pasture for livestock.

The management of grasslands to produce both livestock forage and wildlife food and cover is a compatible use of the land. However, it is extremely difficult to have wildlife management and livestock forage production as equal primary objectives. In reality there are frequently trade-offs in either production or habitat; and compromises must be made to things such as livestock carrying capacity, amount of acceptable habitat disturbances, the decreases in production of livestock or forage and the quality of that forage after delayed harvest. Managers must be aware of potential compromises and take them into consideration when developing grassland and wildlife management plans.

HAY

Of the actively farmed grasslands, hay fields in West Virginia are probably more attractive to wildlife than are pasture fields. For the most part, hay fields tend to be less disturbed for a longer duration than pasture fields and generally have greater heights of vegetation for longer periods. In terms of quality, farmers often concentrate their nutrient management (fertilizers) on hayfields, which often yields better forage. These areas are often located in more level areas with better soils and are often times located near or adjacent to streams (riparian zones).

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. Often times the best quality hay is harvested at the peak times when food, cover and nesting are the most critical. Hayfields mowed before July 15 provide poor habitat for nesting birds and/or may serve as a “sink” or ecological trap by attracting birds to nest in areas only to lose most nesting bird success from harvesting activities. Studies showed that about 25% of the annual productivity of hayfield-nesting bobolinks were destroyed by hay cropping

on an area during a two-year period. Savannah sparrows that were nesting in idle (unmowed) hay fields in Canada, also lost about 80% of their nesting productivity once they were mowed.

There are several management strategies that could be utilized to alleviate the destruction of nesting habitat. One method could be to leave the outer thirty feet of the hay field standing or cut it at some later date. Another method is to mow no more than 1/3 of an entire stand in any given year. Mowing could take place in 2-4 year cycles and where possible, mow in strips to maintain some structural diversity. Mowed strips should be rotated across the field. Cool-season grasses should be mown no shorter than 4 inches and native warm season grasses no shorter than 8 inches. Mowing should be performed in the spring (March – April) as early as possible prior to nesting season or after July 15 to encourage vegetative diversity without impacting ground nesting activities or fall food sources. Haying of warm-season grasses, unlike cool-season grasses and alfalfa, usually occurs after the peak of the nesting season.



*Photo: C. Shrader
A diversity in grassland height is important for a variety of species.*

Care should be taken when mowing strips in grasslands. Since most grasslands in the state are relatively small, the strip widths of standing vegetation are often narrow. This may lead to increased predation rates for some animals. These small patches of

grasslands become attractive to ground nesting birds, and other wildlife, but also become easy focal points for predators leading to the loss of reproductive success. Several explanations have been given for why predation rates are elevated in strip-cover. One explanation is that predators may be more abundant in strip-cover habitats and use strip cover as a travel lane. Another explanation is that the efficiency at which predators may hunt could be greater in strip cover because it has essentially a one-dimensional configuration and predators forage more intensively there. As a general rule, standing strips of vegetation should be greater than 50 feet in width.

GRAZING

Grazing as opposed to haying, removes the vegetation over a longer period of time. Livestock may be utilized to manipulate plant composition and succession. This is beneficial to maintaining the quality of herbaceous cover and controlling woody vegetation. In some instances this method may provide the most benefits with the least amount of impacts. However, this technique should be performed in accordance with a grazing plan and wildlife as the primary objective.

Grazing practices that will improve forage production generally also benefit wildlife. Legume introduction, proper grazing heights as well as proper grazing dates will improve production as well as wildlife habitat. The rate of removal of forage is determined mainly by how many head of livestock are placed on the grazing unit (stocking rate) and how long they are allowed to graze (grazing period).

Once nesting is initiated, grazing will not usually interfere with incubation unless too much cover is removed or the stock density is so high that it causes nest trampling. If stock density is very high as in some rotational grazing systems, there must be sufficient residue for nest initiation and time for nest building, egg laying, and incubation

before animals return to the paddock. This requires a minimum of 35 days, nearly matching the optimum preferred rest period for native warm-season grasses of 42 to 49 days. A minimum of 8-10 inches of growth should be present in the fall in order for plants to build root reserves for wintering and initiating spring growth. Warm seasons probably should not be grazed 30 days prior to the first killing frost. This residual growth is excellent winter roosting cover and nesting the following spring. Vegetation heights during the nesting season and through the winter months are critical elements of a grassland management plan.

There are mainly two types of grazing in the state. The first type is continuous grazing. Continuous grazing allows livestock in one grazing unit to graze selectively for a long period of time. This is probably the most common method of grazing in West Virginia due to the average size of farm, management expense and topography. With proper grazing height management and stocking densities this method can be beneficial to wildlife, livestock, the soil and plant resources.

If managed poorly, continuous grazing may result in the near elimination of the most palatable plants and allows the introduction and spread of plants that are not as favorable to livestock or beneficial to wildlife. Poor management of continuously grazed systems often results in reduced forage production and elimination of wildlife cover and food. Overstocked livestock movement within an area can also destroy nests and nesting habitat. Years of continuous overgrazing will produce less forage over time and if over-grazed for long durations will drastically change the composition of a grassland.

The second method, rotational grazing, may be as simple as switching livestock between 2 grazing units or pastures periodically. Whereas "Management Intensive Grazing", may require movement of livestock every 1-3 days through elaborate fencing and water

networks. This system usually requires more management on the part of the operator, since smaller grazing units (paddocks) are involved.

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

Overall, rotational grazing is a better grassland management choice in terms of wildlife. When grasses are rested or the grazing unit is left idle between grazing periods, the vigor of the plants increases, giving them a chance to grow and multiply. This usually results in increased forage, increased livestock production and improved wildlife food and cover.

GRASSLAND SIZE

In the grassland-wildlife world bigger is not necessarily better. As with most other habitat components, different species require and use varying size grasslands. For example, larger grasslands have less value for cottontail rabbits and bobwhite quail. These species are considered edge dwelling species. Species such as turkey and pheasant prefer to nest in grass when it is near a wooded or brushy area. They also tend to utilize the “edge” of a grassland where it joins woodlands, old fields and croplands. This transition zone is known as an ecotone or an area where two or more habitat types come together. Although rabbits and quail can fully utilize a grassland of twenty acres, they tend to not use the interior of a very large grassland unless some form of supplemental cover is provided. Rabbits require brushy, escape cover to survive the pressure of predators such as hawks, owls, and fox. While quail are able to utilize the interior of large, open grasslands, they, too, are most often found along the edges.

Grassland birds require a certain amount of habitat to be present usually in larger contiguous patches. Minimum habitat size

varies greatly among species and can also vary geographically. Climate and topography may also influence the minimum size requirement. West Virginia is over 80% forested and grassland components are relatively small in acreage compared to the grasslands of the prairie states. Therefore, the size of the grassland needed to attract individuals of a given species in West Virginia may be comparatively smaller for the same species in the mid-west.



*Photo: C. Shrader
Grasslands in West Virginia tend to be smaller in comparison with mid-western states. However, a variety of species utilize them.*

A good rule for all species concerning size may be to maximize the interconnectedness of grassland habitat patches while managing for the best quality of the area as a whole.

A WORD ABOUT EDGE

Although edge is a necessary component for some species (e.g. quail and rabbit) it may have negative effects as well. The presence of woody vegetation, although attractive to woodland-edge birds, may adversely affect grassland species. This is illustrated by the propensity of some grassland birds (e.g., bobolinks, Henslow’s and grasshopper sparrows) to avoid wooded edge habitats and may even be a detriment to many species. For example, the Brown-headed cowbird (*Molothrus ater*) is a brood parasitic bird that lays its eggs in the nests of other birds. These host birds then raise the young cowbirds as if they

were their own and results in lowered reproductive success for the host birds. For this reason the Brown-headed cowbird has been blamed for the decline of many songbird species. Cowbird parasitism seems to increase with the amount of edge that exists.



Photo: C. Shrader
Brushy edge can be both beneficial and detrimental depending on the habitat objectives.

Edge also may serve as travel lanes and allow predators to move easily from area to area. Studies also have reported that the proximity to wooded edge was more important than grassland size in determining nesting success. Predation and parasitism rates are often greater as nesting is near an edge. The presence of woody vegetation in or near grasslands influences the overall habitat suitability for grassland birds.

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