

Pasture Management for Bobwhite Quail¹

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Like many agricultural practices, livestock grazing is often blamed for the loss and degradation of wildlife habitat, including that of bobwhite quail (Figure 1). However, in many rangeland systems, this is not necessarily the case, and grazing can actually be an effective habitat management tool. Fred Guthery, a Texas-Oklahoma quail biologist of more than 30 years, summed it up best when he said:

“No habitat management tool is more powerful than the cow. Give her a little salt, supplement and water, and she manages millions of acres of bobwhite cover. Like any powerful tool, she can be harmful or helpful, depending on how she's applied.”

Applied properly, grazing can create and maintain quality quail habitat, which includes small patches of nesting cover (warm-season, bunchgrasses such as bluestems), foraging habitat (weeds such as ragweed), and escape cover (shrubs such as saw palmetto) mixed among each other, like patches in a quilt. This is often referred to as the Crazy-Quilt and is necessary for healthy and abundant quail populations (Figure 2).



Figure 1. Bobwhite quail. Credits: J. Vanuga, USDA-NRCS, www.forestryimages.org. (2003).

Native Range

Whether it's pine flatwoods, cabbage palm-wiregrass prairie, or any other type of rangeland system, as grazing intensity changes, so does the plant community. From a cattle forage standpoint, native range in a pristine state, such as one with natural fire regimes and little or no livestock grazing, is considered “excellent.” Highly desirable and palatable native grasses, collectively called “decreasers” because they tend to decrease in abundance and distribution as grazing intensity

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Figure 2. Healthy quail populations require small patches of nesting cover (bunchgrasses), foraging habitat (weeds), and escape cover (shrubs) mixed among each other, like patches in a quilt—often referred to as the Crazy-Quilt. Credits: W.M. Giuliano. (2005).

increases, typically dominate these systems (Figure 3). In Florida, these often include creeping and chalky bluestem, lopsided Indiangrass, switchgrass, and maidencane. Most rangeland systems in this condition typically have relatively few species of forbs (broad-leaved, herbaceous plants) and sparsely-distributed, low-growing shrubs. Some Florida rangelands are an exception to this general rule, because the dominant or co-dominant native grass is wiregrass, which may dominate the range in the absence of grazing, and maintains or increases its dominance with moderate levels of grazing. While these types of areas provide excellent nesting cover for quail, they are poor-fair in the foraging and escape cover necessary for abundant quail populations.

As grazing intensity increases, the preferred native grasses decrease in abundance, while less palatable grasses (such as broomsedge and bottlebrush threawn) and forbs, called increasers, become more abundant and widely distributed (Figure 3). Often thought of as weeds, many of these species produce and attract abundant and nutritious quail foods, such as seeds and insects, while providing excellent foraging cover and some escape cover. Certain legumes (such as partridge pea and beggarweeds) are particularly valuable increasers for quail because of their high protein content and associated insect communities. The increased soil disturbance from having more livestock hooves in an area may also improve soil conditions for these

“weed” species, accelerating their establishment. In addition to increases in these “weeds,” shrubs and woody vegetation (such as saw palmetto and wax myrtle), known as invaders, begin to proliferate as competition from native grasses is reduced by grazing (Figure 3). These types of plants are valuable for quail as escape cover from both predators and weather. Livestock grazing also reduces grass density and biomass in the area, improving conditions for quail. Dense vegetation, particularly at the ground level, can inhibit quail movements and reduce foraging efficiency and the quality of nest sites. Moderate levels of grazing typically lead to this more open and diverse rangeland community that produces the best quail habitat, and is considered good-fair condition, in terms of livestock forage.

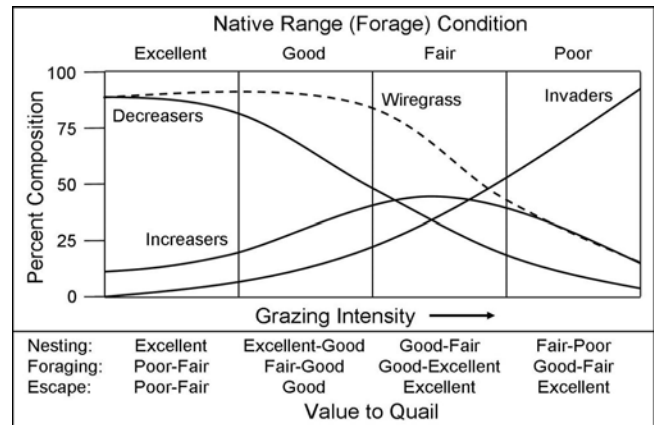


Figure 3. In the absence of other land management practices (for example, prescribed burning of shrubs), increases in grazing intensity have relatively predictable effects on plant communities—decreasers such as chalky bluestem and lopsided Indiangrass decline in abundance; increasers such as broomsedge, many “weeds,” and wiregrass at first increase and then decline in abundance; and invaders such as saw palmetto continually increase in abundance. Moderate grazing intensities tend to lead to a mixture of plant types, providing for all of the bobwhite's habitat needs (nesting, foraging, and escape cover) and good-fair forage conditions for cows. Credits: W.M. Giuliano. (2006).

When grazing intensity is heavy, livestock often eliminate the preferred native grasses (decreasers). As cattle turn to the less palatable grasses and weeds (increasers), including wiregrass and broomsedge, these also decline in prominence. And in the absence of fire and other control treatments, shrubs and woody vegetation (invaders) rapidly spread in an area. While this situation provides excellent escape

cover conditions and fair-good forage conditions for quail, it provides little or no nesting habitat and will result in low quail numbers. Lacking most grasses, these areas are also poor in forage condition for livestock (Figure 4).



Figure 4. Heavy grazing, when non-forage species are not being controlled through prescribed fire and other treatments, often removes native grasses and weeds, allowing shrubs such as saw palmetto to dominate the range. While this situation provides excellent escape cover conditions for bobwhites, it provides little or no nesting habitat and will result in low quail numbers. Lacking most grasses, these areas are also poor in forage condition for livestock. Credits: W.M. Giuliano. (2004).

Alternatively, heavy grazing, particularly when invaders are being controlled, may lead to the typical “golf course effect,” providing little forage for cattle and no food or cover for quail (Figure 5).



Figure 5. Heavy grazing, particularly when shrubs and other non-forage plants are being controlled, may lead to the typical “golf course effect,” providing little forage for cattle and no food or cover for quail. Credits: W.M. Giuliano. (2006).

Unfortunately for quail, many of our rangelands in Florida are in either excellent or poor forage condition. Excellent forage condition comes about through intensive range management (for example, overly frequent prescribed fire, herbicide use, and mechanical treatments) or lack of grazing. Poor conditions result from overgrazing and lack of fire. The ideal situation for quail exists with good-fair range conditions for cows, because this creates an environment that includes all that a bobwhite needs: food and foraging cover, nesting cover, and escape cover, all in small patches interspersed with each other—the Crazy-Quilt. The further we get from both excellent and poor range conditions for cows, the more quail the area can support. While only a moderate stocking rate can be applied and still maintain these ideal habitat conditions for quail, it does have advantages from a livestock management perspective. By maintaining moderate stocking rates and good-fair range conditions for livestock, ranchers avoid having to manage intensively the range. To sustain the heavy grazing necessary at high stocking rates, fertilization, prescribed fire, and mechanical treatments are necessary to maintain forage grasses and remove the less palatable increasers and invaders. In addition, healthy bobwhite populations, obtained only with moderate grazing intensities, can lead to increased hunting opportunities and the possibility of deriving income from quail harvests.

Improved or Tame Grass Pasture

Much of the native rangeland in Florida is being or has been “Improved.” This may increase forage production for cows but makes most of the area unsuitable for quail. Typically, improvements include the eradication of native grasses, forbs, shrubs, and trees, and the establishment of large monocultures of exotic forage grasses such as bahiagrass. While some of these grasses, including bahiagrass, produce abundant seed that is used by quail, no single food can satisfy the nutritional requirements of bobwhites. Diverse plant communities produce a greater abundance and diversity of plant foods, as well as attracting a greater abundance and diversity of insect foods for quail. The eradication of forbs, shrubs, and trees also removes most of the foraging and escape cover for bobwhites. If the grass used in an improved pasture

is a bunchgrass that is similar to our native grasses in structure, it may provide good nesting habitat. However, given that foraging and escape cover are usually not present in the pasture, it will receive little or no use because the birds prefer to nest within a short walk or flight from feeding and escape cover (typically less than 200 feet). Therefore, most quail use of improved pastures occurs on the periphery, where birds have access to food and cover, reducing the total useable habitat for bobwhites and the overall number of birds on a ranch (Figure 6).



Figure 6. Most bobwhite use of improved or tame grass pastures occurs on the periphery, where birds have access to more abundant food and cover (particularly shrubs for escape), reducing the total useable habitat for quail and the overall number of birds on a ranch. Credits: W.M. Giuliano. (2005).

How Do We Get There

Unfortunately, there is no magic stocking rate or number of animal units that will always provide moderate grazing intensity and the Crazy-Quilt that bobwhites need. How many animals are needed, how long they graze, how often are in an area, and at what time of year, are all factors that need to be considered; and all will change from one pasture to the next, and even within large pastures due to differences in soil conditions, vegetation, and climate. This is further complicated by other management activities that affect plant communities, including prescribed fire, mechanical treatments such as roller-chopping, herbicide applications, and fertilization. All is not lost, however, as most experienced range managers can predict grazing impacts of various stocking rates given normal conditions.

Although very little is known about the impacts of grazing on bobwhites in Florida, studies of quail in other rangeland systems and on similar species within the State tell us several things:

- All other things being equal, rotational grazing is better for bobwhites than continuous grazing. In pastures without cows, birds and nests will not be disturbed and vegetation will have a chance to grow, providing better food and cover. Even a simple system, where animals are rotated off native range prior to nesting season (early spring) and put on tame grass pasture, will benefit quail. Except for the periphery, little or no nesting occurs in large tame grass pastures, so putting cows in these areas has little impact on bobwhite populations. However, even on poor native range, removing cows will reduce disturbance and allow vegetation to regrow, providing foraging, escape, and nesting cover.
- Higher site productivity means that more animal units can be supported while keeping grazing intensity and impacts moderate. So, better soils and climate can mean more cows and quail.
- Shorter duration grazing on an area is better for bobwhites because it minimizes the time cows are disturbing birds and allows more time for plant growth.
- The less often an area is grazed, the better it is for quail because it minimizes the frequency of cows disturbing birds and allows for more time of plant growth.
- Timing grazing in an area to avoid the nesting season, allow plant regrowth prior to nesting, and produce seeds for food can benefit bobwhites.

Other practices can also be employed to enhance pastures, both native and tame, for quail:

- *Mobile Heavy Spot Grazing*—Either temporarily fencing livestock in small areas, or attracting dense concentrations of animals to water sources, salt, supplements, hay, or recently burned areas will lead to intense disturbance of the soil, overgrazing, and excessive nutrient

(feces) inputs. If done for at least a couple of months, this will greatly defoliate and often kill all the vegetation in the area, including most tame forages such as bahiagrass. When this intense disturbance is removed, an abundant and diverse weed patch will form providing excellent foraging habitat as well as nesting and escape cover. By moving such sites around large pastures, excellent bobwhite habitat can be created.

- *Strip Improvements*—Rather than converting (improving) entire pastures from native to tame pasture, improve 100–200-yard-wide strips that alternate with native range. This will create more edge on tame sites, the only areas typically used by birds, and leave more native range in the area, which is better quail habitat.
- *Exclosures*—Temporarily fence small areas within large pastures to exclude livestock. Abundant and diverse weed patches will form in the areas, providing excellent foraging habitat as well as nesting and escape cover. By moving such sites around large pastures, excellent bobwhite habitat can be created.
- *Fences*—Let the weedy and shrubby vegetation grow along pasture boundary fences. Abundant and diverse weeds and shrubs will form in the areas, providing excellent foraging habitat as well as nesting and escape cover. These areas will also serve as protected, travel corridors that allow quail to move safely between different parts of the ranch.

All of these practices will increase the plant species and structural diversity, and patch interspersion in pastures, making a more quilt-like community.

Ironically, “improving” pastures for cows through intensive management, and converting native vegetation to tame grass pasture is not an improvement at all for the bobwhite. However, there are techniques, even for tame grass pasture, that benefit quail and will allow cows and quail to coexist—the key is to create and maintain a Crazy-Quilt (Figure 7).



Figure 7. Livestock and quail can coexist on Florida's pastures rangelands. In fact, applied properly (that is at moderate intensities), grazing may be the best tool to create the Crazy-Quilt habitat necessary for healthy and abundant quail populations. Credits: W.M. Giuliano. (2005).