

APPENDIX P



Specific Management Recommendations for Bobwhite Quail

Bobwhite quail occur throughout the western Edwards Plateau, and their distribution extends into eastern portions of the Trans-Pecos Region.

However, their numbers decline dramatically from east to west in Ector, Crane, eastern Pecos, and Terrell counties. Along the western edge of bobwhite range, there is considerable overlap in distribution with its western “cousin”, the scaled quail (commonly known as blue quail). Bobwhite quail populations can fluctuate tremendously from year to year, even in the best quail-

producing areas of the state. The amount and timing of fall and winter rainfall is one of the most important factors determining quail production in the following year (adequate rains provide the soil moisture to promote early growth of herbaceous plants and insect production).

Basic Habitat Requirements

Bobwhite quail must have an adequate supply of food and reasonable protection from hazards on a year-round basis. This includes protection from predators while feeding, resting, loafing, roosting, traveling, and nesting, as well as protection from inclement weather conditions. Various food and cover types must be available during the entire year. If any requirement is lacking, even for a short period of time, the quail population will decline rapidly.

To be of benefit to quail, food and cover must occur in a well-arranged pattern. The distance between a food source and adequate cover must not be greater than bobwhites can negotiate with safety. Although bobwhites will venture up to 200 yards from cover, ideally escape cover should be linked to food supplies with more or less continuous screening cover. Quality screening cover adequately hides quail from potential predators but does not pose an obstacle to the quail's short-legged gait. Overgrazed pastures tend to provide poor screening cover. Conversely, dense stands of thick grass such as Old World bluestem or bermudagrass monocultures cannot easily be negotiated. Without a suitable space relationship between food and cover sources, the habitat will not be used by quail regardless of the quality or amount of food or cover present.

Food

Food supplies are most abundant during the spring and summer, as seeds and fruit are ripening and insects and green plants are available. For the nesting hen, tender green plants are essential in providing carotenes and Vitamin A, which are important to the hen in the egg development process. Another important food source for the nesting hen is insects. Insects are a rich source of protein and calcium, nutrients that are critical for yolk and eggshell development. Insect abundance is also a key factor in the survival of quail chicks, as they rely almost exclusively on insects during the first 3-4 weeks of life. Insects continue to be a critical source of protein for growing birds throughout the summer. Quail rely more heavily on seeds and fruit during late summer and fall. The food supply begins to diminish at the time of the first killing frost in the fall, and continues to decline throughout the winter due to weathering and competition from other animals. Seeds from forbs such as croton (doveweed), ragweed, sunflower, partridge pea, and others are staple winter foods. A number of woody plants also provide winter quail food. Fruits and mast such as small acorns, sumac berries, hackberries, prickly pear fruit, and bumelia berries supplement quail diets. Most grasses, except for bristlegass, paspalums and panic grasses, do not produce seeds large enough to be worthwhile quail food. In general, forbs are the most important and most widely distributed sources of winter quail food. Green material from cool-season forbs and grasses that germinate in the late winter (provided rainfall is adequate) is essential for improving quail body condition before the upcoming breeding season.

Cover

Bobwhite quail need several types of cover: overhead and lateral screening cover for security while feeding and traveling, dense brush and/or weeds for escaping immediate danger/predators, loafing cover for dusting or resting, and nesting cover. Roosting cover is also needed, but if other types of cover are present, roosting cover is usually adequate.

Cover can take many forms and a patch of cover can meet several of the cover requirements. A stand of broomweed or similar plants (tall with bushy canopies and an open understory at ground level) can provide overhead screening cover. Thickets of low brush, trees, and vines can provide escape and loafing cover. In general, habitat with 10-15% canopy cover of low-growth woody plants is adequate, provided they occur in small, well-distributed clumps or patches. The better distributed various types of protective cover, the greater the useable space for obtaining other habitat components needed for survival.

For nesting cover, bobwhites seek out clumps and patches of residual grasses remaining from the previous growing season. The majority of nests are established in bunchgrasses such as sideoats grama and bluestems. Individual clumps should be at least 8 inches tall and 12 inches in diameter. Ideally, there should be more than 250 well-distributed clumps of suitable nesting cover per acre, or 1 clump every 15 to 20 steps. Too little nesting cover makes it easier for predators to find and destroy nests.

Habitat Management Recommendations

One of the keys to developing quality bobwhite habitat is creating or maintaining a mosaic of vegetation types throughout the ranch. This includes small thickets of low-growing brush, patches of bunchgrasses, and weedy areas with ample bare ground. Thickets of sumac, catclaw, lotebush, saltbush, foersteria, shinnery oak, and cactus should be retained and encouraged to develop. Although not as desirable, small clumps of low-growing cedars could have some value as cover where other species do not grow or are in short supply. Where vines have grown up into a tree, but cover at ground level is sparse, the tree trunk can be partially cut a few feet above ground so that the tree canopy can be pushed to the ground. This brings the living vines closer to the ground and provides excellent protective cover for quail. Young mesquite may be improved as overhead protective cover by a method known as *half-cutting*. This technique involves cutting half way through the branches (at a height of 3-4 feet) of smooth-barked, multi-stemmed mesquites and pushing them to the ground. If done properly, the branches will continue to grow, providing overhead and lateral cover for birds. In addition, the thorny branches protect grasses and forbs from grazing by livestock and deer, which will serve as quality nesting cover the following spring. Half-cutting mesquite should be done during the spring and summer when the sap is flowing and branches are flexible. The individual "skeletons" of large cut cedars can also form small areas protected from grazing/browsing where patches of herbaceous and woody plants suitable for cover can become established. The number of browsing animals on the range (combination of wildlife and domestic livestock) should be maintained at a level where browsing pressure on low growing woody cover is not excessive.

Another critical component of quality bobwhite habitat is herbaceous cover. A well-planned deferred-rotation livestock grazing system can be used to improve nesting cover or to create bobwhite foraging areas and brood habitat through high-stock-density disturbance. Heavy spot-grazing by cattle, such as occurs around salt blocks, feed areas, and water, causes soil disturbance that encourages forb growth. Salt blocks and feeding areas can be moved around the ranch to create small patches of disturbed ground.

Prescribed burning has been found to be an effective, low-cost habitat management tool that can be used to enhance plant diversity by stimulating production of a variety of woody plants, forbs, and grasses. Rangeland fires in early winter stimulate the production of cool-season annuals and perennial forbs, including a group of forbs referred to as "legumes" (pea family). This includes plant species such as velvet and Illinois bundleflower, partridge pea, western indigo, and rush-pea. Most legumes are excellent seed producers, and like other forbs, they tend to harbor an abundance of insects. Although an infrequent problem on most west Texas ranches, burning can be used to remove rank stands of herbaceous vegetation and plant litter that hinder quail movements. Other benefits of fire include increased palatability of forages, a temporary increase in plant nutrients (fertilization effect), and suppression of undesirable woody plants. To promote a good mixture of food and cover, burning under relatively cool conditions is generally recommended to obtain the desired "patchy" habitat effect.

Most good seed producing forbs are early-succession annuals (eg., ragweed, doveweed [croton], pigweed, sunflower) that respond to soil disturbance. Disking the soil to a depth of 3-6" is a practice that normally encourages the growth of annual forbs in areas with substantial grass cover. Too much grass is seldom a problem on most West Texas ranches, so this technique is probably not widely applicable in west Texas. Disking tends to be more effective on rangelands with a good to excellent stand of grasses and is less important on rangelands that already have patches of weeds and bare ground. In situations where the practice is appropriate, the disked strips should be long and meandering. They should be 15' to 30' wide and plowed along the contour of the land to minimize erosion. The same strips can be disked annually, or parallel strips may be disked on an alternating basis every other year to create adjacent strips in various stages of succession. The best plant response will occur in areas of deep sand or sandy-loam soils. It is important that disked strips be located near escape cover so they are useable by quail. Disking can be done anytime between the first killing frost in the fall and the last frost in the spring, but the optimum time is late February/early March, shortly before spring growth gets underway.

Managing the habitat for the production of native food plants and cover should be the primary management goal. Supplemental feeding and/or the planting of food plots are not a substitute for good habitat management. These practices should only be considered as "supplements" to the native habitat, not as "cure-alls" for low quality and/or poorly managed habitats. Food plots and feeders alone will not increase the number of quail that the habitat can support if other habitat components such as cover are limited.

Providing supplemental water is another popular quail management practice that seems very logical and practical but normally fails to produce a measurable difference in bird survival. During average and good rainfall years, quail will seldom use standing water. Insects (which are about 70-75% water) are abundant during spring, summer, and fall; and green vegetation (up to 90% water) is usually plentiful. Even dried grain and other seeds contain 5-10% water. During drought years, water sources will be substantially more limited and quail will take standing water more often, but increased drinking water will have little, if any, effect on overall bird numbers. The reason for this lack of response is that drinking water is not the limiting factor. There are many other environmental factors during drought that contribute to the decline in quail numbers. One of the primary factors responsible for the decline is a marked decrease in reproductive success. If drought conditions are severe, the birds may not even pair for breeding. If birds do pair, many nests are unsuccessful because the adults can not maintain adequate humidity around the incubating eggs (some soil moisture is normally required to achieve this). Green vegetation is sparse in dry weather, which directly affects the nesting hen because green plants provide essential nutrients (Vitamin A and water), and fewer green plants translates to fewer insects. Low insect abundance will not only affect egg production (source of calcium and protein) but will impact chick survival, as they require this high-protein food source during the first few weeks of life. Drought reduces escape cover and thermal cover, which increases quail exposure to predation and weather extremes. In addition, reduced populations of buffer species (small mammals) may increase predation intensity on quail. One of the greatest

impacts of drought on quail production, especially on rangelands grazed by livestock, is reduced cover for nesting. The absence of quality nesting cover (reduced growth and grazing pressure) may be the greatest limiting factor for quail populations in west Texas. Drinking water may help a bird to survive another day, but it will not "save" the nesting season, which is the foundation of a quail population in any given year. One of the most effective means of providing supplemental water for quail in a drought is through windmill and trough overflows and pipeline "leaks". These areas, although small, provide drinking water, soil moisture, green forage, vegetative cover, and insects that may allow the successful reproduction of a few extra quail pairs.

In summary, good quail habitat will provide seasonally important foods and various types of cover on a year-round basis, and these components will occur in a suitable arrangement (patchwork) to optimize habitat use. The number of quail that a habitat can produce and support will depend on the habitat component that is most limited. In other words, if woody cover or nesting cover is the limiting factor, quail production will not increase regardless of how much supplemental food and water is provided.

References:

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