



## Scaled Quail Requirements

### Habitat Types

- Scaled quail inhabit most of the state in varying densities except for higher elevations. Scaled quail are found in semi-arid rangelands and desert grasslands with mixed scrub (shrubs, grass, and bare ground).
- Interspersed bare ground also appears to be an important habitat component, since this species prefers to run, rather than fly, when disturbed.

### Key Plant Species

- Common vegetation includes mesquite, prickly pear cactus, and scattered grasses. Scaled quail and Gambel's quail often occur together, although scaled quail use areas with more grass cover.
- They tend to avoid pure grasslands, particularly stands of introduced Lehman's lovegrass and areas that lack shrubs, grasses and forbs.
- Quail numbers often are greater in areas of high plant species diversity.

### Food

- Seeds from forbs make up the largest portion of the scaled quail's diet. Seeds of woody plants like mesquites, acacias, and spiny hackberry are frequently consumed. Grass seeds, particularly from bristlegrasses (*Setaria spp.*), are important as food.
- The most often eaten forbs are considered "undesirable" range plants. These include small-flowered milk vetch (*Astragalus nuttalianus*), morning-glory (*Ipomoea eriocarpa*), foothill deer vetch (*Lotus humistratus*), lupine (*Lupinus sparsiflorus*), snakeweed (*Gutierrezia sarothrae*) and Russian thistle. Green vegetation is an important source of Vitamin A which is necessary for reproduction.
- Insects are eaten seasonally by both adults and young.

### Management Considerations

- Scaled quail are more tolerant of grazing than other quail. However, heavy livestock use can be detrimental. In well-watered localities, moderate grazing may have a beneficial effect on quail habitat by encouraging forb and weed growth that provide a large portion of the scaled quail diet.
- Grasslands without shrub cover are much less suitable for scaled quail.
- Mesquite and broom snakeweed reduction projects may have an adverse effect on winter food availability for scaled quail. Reduction of saltbush cover reduces the scaled quail carrying capacity of the range.
- Scaled quail populations fluctuate widely and are adversely affected by drought or by prolonged flooding.
- Establishing natural cover is preferable to construction of artificial cover. However, brush, and post and board piles are inexpensive and readily used by scaled quail.
- Good scaled quail habitat consists of successional stages of annual and perennial forbs and some food-producing shrubs. A patchwork of short grasses, tall grasses and forbs and woody cover is ideal.





## Gambel's Quail Requirements



### Habitat Types

- Gambel's quail are residents of brushy and thorny vegetation in parts of the Chihuahuan desert, as well as adjoining natural and cultivated communities.
- Favorite habitats within these ranges are river valleys and drainages, especially those adjacent to cultivated fields.
- The bird is particularly abundant along mesquite-lined rivers, creeks, and arroyos below an elevation of 5,800 ft.
- Mesquite-choked springs, seeps, and stock tanks are also favored focal points for this quail species.

### Key Plant Species

- Key indicator plants include: desert hackberry (*Celtis pallida*), catclaw acacia (*Acacia greggii*), skunkbush (*Rhus sp.*) pricklypear cactus (*Opuntia phaeacantha*), chollas (*Opuntia spp.*), scrub oak (*Quercus turbinella*), and any of several desert thorns (*Lycium spp.*).
- Dominant understory plants may include brittlebush (*Encelia farinosa*), triangle-leaf bursage (*Ambrosia deltoidea*), bear grass (*Nolina microcarpa*), shrubby buckwheat (*Eriogonum wrightii*), burroweed (*Haplopappus tenuisectus*), jimmyweed (*H. pluriflorus*), turpentine bush (*H. laricifolius*), or snakeweed (*Gutierrezia sarothrae*).
- Dominant overstory plants include: Texas honey mesquite (*Prosopis glandulosa*), white-thorn acacia (*Acacia constricta*), one-seed juniper (*Juniperus monosperma*), allthorn (*Koeberlinia spinosa*), littleleaf sumac (*Rhus microphylla*), catclaw acacia, condalia (*Zizyphus obtusifolia*), and various yuccas (*Yucca spp.*), dense thickets of salt cedar (*Tamarix spp.*), arrowweed (*Pluchea sericea*), screwbean mesquite (*Prosopis pubescens*), saltbush, quail bush (*Atriplex lentiformis*) and four wing saltbush (*A. canescens*).

### Food

- Gambel's quail diet consists of seeds of forbs, grasses, shrubs, trees, and cacti. Seeds from legumes are also important throughout the species range. Mesquite seeds and leaves, mustards (*Brassicaceae*), ragweeds (*Ambrosia sp.*), tumbleweed and a host of other seed producing shrubs and forbs are eaten if available.
- Fruits from shrubs and cacti (particularly prickly pear, *Opuntia spp.*) are heavily used seasonally.
- Green vegetation, especially deer vetches (*Lotus spp.*) and filaree (*Erodium cicutarium*), are very important during winter and early spring prior to reproduction, and provide much of the species moisture requirements.
- Insects are important seasonally, especially for the growing young quail.

### Management Considerations

- The clearing of mesquite trees in an effort to increase the productivity of western rangelands for cattle can also be detrimental to Gambel's quail.
- Grazing can be a useful tool for Gambel's quail management when conducted at the right intensity under the right conditions. Leaving enough unburned grass cover for refuge can greatly increase the survivability of quail.



## Montezuma Quail Requirements



### Habitat Types

- Montezuma quail occur in the Gila National Forest, southwestern portions of the Cibola National Forest, San Andres Mountains, Sacramento Mountains, and associated sky islands in the extreme southwestern portion of the state.
- Montezuma quail are found in pine-oak and oak scrub highland habitats, especially in open woodland with grass understory and do not occur in areas without an adequate grassland component.

### Key Plant Species

- Montezuma quail are found in areas with high grass diversity and grass cover associated with a tree overstory of oak such as Arizona white oak (*Quercus arizonica*) or Emory oak (*Q. emoryi*), or pine (*Pinus spp.*). Rarely are Montezuma quail located more than a few dozen yards from trees.
- Montezuma quail are occasionally associated with other “overstory” species including catclaw and mesquite.
- Perennial bunchgrass species are most often used for cover and nesting. These grasses are warm season species produced during periods of summer monsoon moisture (July-September).

### Food

- Montezuma quail feed extensively on the bulbs and tubers of yellow nutsedge (*Cyperus esculentes*) and Gray’s woodsorrel (*Oxalis grayi*) in summer.
- During the summer and fall, Montezuma quail feed upon insects, acorns, piñon nuts, grass and forb seeds.
- The primary diet of young Montezuma quail is insects.

### Management Considerations

- Spatial arrangement of both grassland and woodland cover types is very important for this species due to its survival strategy, small home range, dispersal distances, and food habits.
- Adequate horizontal and vertical grass cover must be well distributed across the landscape. Montezuma quail select areas with tall (up to 20 inches) grass and forb cover.
- Moderate livestock grazing, where remaining grass cover requirements are met, is associated with good Montezuma quail habitat, although these quail tend to select more lightly used patches of a pasture.
- Reducing oak stands for timber or grazing improvements reduces habitat value by removing canopy cover and acorns. Overstory canopy cover should be maintained at no less than 20%.
- Burning may be an important component of habitat management for Montezuma quail.



## Bobwhite Quail Requirements

### Habitat Types

- Bobwhite are found in the eastern third of New Mexico where mixed brush and grassland habitats dominate.
- In spring and summer, the bobwhite needs grasslands, drainage ditches and roadside and pond edges for nesting, feeding and roosting cover.
- In summer and fall, they may use croplands for feeding, loafing, dusting and roosting. Bobwhites depend on dense, brushy areas for food during fall and winter and for escape and roosting cover year round.



### Key Plant Species

- Bobwhites require brushy cover for hiding and resting, although cover should be open enough to allow the birds to move about and see predators. The bobwhite prefers areas where half the ground is exposed and the remainder contains upright growth of herbaceous and woody vegetation.
- A mature mesquite and wolfberry (*Lycium spp.*) overstory with grama grass (*Bouteloua spp.*) in the understory provides ample cover for bobwhite quail. Shinnery oak (*Quercus havardii*) mixed with pricklypear cactus (*Opuntia spp.*), and sumac (*Rhus spp.*) provide good cover.
- Bobwhites need large expanses of clumped native warm season grasses mixed with annual weeds, legumes, and woody thickets that are dense on top but open underneath.

### Food

- Northern bobwhite eat primarily seeds, fruits, and insects, as well as new plant growth in the spring.
- Food plants include: acorns, mesquite, hackberry (*Celtis spp.*), panicgrass (*Panicum spp.*), and clover (*Trifolium spp.*). Bobwhite quail consume cowpeas (*Vigna spp.*), corn (*Zea mays*), sorghum (*Sorghum spp.*), and other cultivated grains.
- Bobwhite eat insects including: aphids, mosquitoes, beetles, grasshoppers, and ants.

### Management Considerations

- Changing land-use practices have simplified the landscape by promoting the abundance of one habitat type (grassland, agricultural crops or shrublands) to the exclusion of others. Consequently, modern agricultural practices that emphasize optimal crop production or establish former agricultural lands with exotic grass species, eliminate the mosaic landscape bobwhite and other quail species require.
- Northern bobwhite habitat requires an interspersed of food species and cover that is not too dense. Good habitat can support about one bird per acre.
- Habitats manipulated and planted with forbs and legumes can encourage insects, an important food for chicks.
- Food patch plantings generally fail to be of any long-term value. Habitat improvement projects that do include planting food for quail should always include legumes appropriate for eastern New Mexico climate conditions.