NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

UPLAND WILDLIFE HABITAT MANAGEMENT

(acre)

Code 645

Texas Supplement, Zone 4

Bobwhite Quail

Habitat Requirements

Food

The mainstay of the quail diet for the majority of the year is seed and insects. Seed of many forbs, woody plants, hard-seeded grasses, and some agricultural crops are eaten. Seeds high in oil are especially important. Quail prefer insects when they are available. Young quail require a diet rich in insects during the first ten weeks of life. In late winter and early spring quail consume green leafy forbs and tender grasses.

The availability of food is an important part of quail habitat. Significant amounts (30 to 60%) of bare ground or sparsely vegetated ground are required for quail to be able to move about and find seed. The high rainfall in Eastern Texas tends to result in total ground cover by plants. To maintain "bare ground" can take considerable effort.

Cover

Quail are extremely dependent upon the right kinds of cover in the right amounts. The constant threat of predation and vulnerability to adverse weather makes adequate cover the most critical part of quail habitat. At least six different specific kinds of cover have been identified and described for quail: nesting, brooding, screening, loafing, roosting and escape. However, two basic habitat attributes will usually suffice to provide needed cover: adequate grass and adequate brush. Native grasses that grow in clumps are by far the best. Introduced grasses such as bahia and bermudas grow too thick for quail.

Nesting cover typically consists of residual clumps of bunchgrass left ungrazed or lightly grazed from the previous year. Grass clumps about the size of a basketball serve as quail nest sites. About 250 such nest clumps per acre is considered the minimum for adequate nest cover with 500 to 1000 per acre being a more ideal density. Such a large number of potential nest sites is needed to make it more difficult for nest predators such as raccoons, skunks, fox, coyotes, snakes and hogs to find and destroy nests. Grass and associated weeds also

serve as screening cover and brooding cover. As stated, too much grass can also be a problem. The need for bare ground and sparse vegetation can not be overemphasized.

Low growing shrubs and brush are an essential element of quail habitat, providing loafing, screening and escape cover. The desired density of such low growing shrubby cover is 5 to 15% canopy. Groups or mottes of interconnected shrubs that are dense above, but somewhat open beneath and 10 to 20 feet across are ideal loafing areas. Individual shrubs serve as escape cover and as screening during feeding.

Shade is needed in summer and dense low cover in winter to provide protection from climatic extremes.

Water

Quail can meet their daily water requirement from three different sources. Free water from ponds, creeks, puddles, troughs or dew is used when available. Surface water is considered a desirable but not essential part of quail habitat. Succulent vegetation, fleshy fruits and insects provide water when they are consumed. Metabolic water is a by-product of the chemical breakdown of carbohydrates in the digestion process. Metabolic water can provide about one-third of the water requirement of quail.

Nesting hens require extra water during the egg laying period. If this water is not present, egg production will be low.

Habitat Arrangement

The proper interspersion of cover and food is especially critical for suitable quail habitat. The different cover types described above and food need to be very closely intermixed. In good quail habitat, birds will not have to venture more than 50 to 100 feet from low shrubby cover. A variety of food plants should be found growing in and among nest cover, screening cover and brooding cover. A large variety and abundance of insects will be found when there is a diversity of grasses, forbs and shrubs. The presence and interspersion of surface water is less critical since quail derive most of their water from foods.

Habitat Size

Quail normally spend the great majority of their lives in a rather small area. Bobwhite quail usually live in areas of 20 to 40 acres. If bobwhite habitat were desired across a 1000-acre tract, all habitat components would need to be present on each and every 40-acre area. A minimum of 2500 to 5000 acres of contiguous habitat is needed to sustain a breeding population.

Habitat Management Techniques

Food

1. Promoting low successional plant species often referred to as weeds can increase the food supply for quail. As the cover of

perennial grasses increases on a site, the presence of desirable quail food plants (forbs and weeds) will decline. Reversing plant succession to favor forbs and more weedy plants can be done in several ways:

- Disking or other similar soil disturbance will reduce grasses and promote forbs. Such disking can be done any time of the year, but is most often done in late winter and/or early fall prior to germination of many prime quail food plants. Disking should be only deep enough to uproot the majority of existing grasses. Disking in strips or bands adjacent to good nesting cover and good woody cover will insure that cover and food are properly interspersed. Even small amounts of disking will be beneficial, but to impact a large area, disking should be done on 5 to 15% of an area. Disking does not need to be done on the same area each year. Ideally, some fresh disking, and some one or two year old disking should be present across the landscape. Re-disk areas only when grasses begin to dominate. A program of disking where half is done in early fall and half in late winter will insure a greater diversity of forbs.

- Grazing can be used to promote low successional plants and increase the quail food supply. When grasses begin to dominate and suppress forb growth, heavy grazing for a period will open the grass cover up and allow forbs and weeds to grow. This practice must be carried out carefully to avoid harm to nesting cover. The objective is to heavily graze some areas without overgrazing the entire pasture. Fencing small-scattered areas may work best.

- Fire can also be used to remove or reduce excessive grass growth and encourage forb growth. Prescribed burning according to a written burn plan and carried out under the supervision of an experienced burner has many benefits to wildlife habitat. This practice must be carried out carefully, since fire also removes nest cover and can remove needed woody cover. An ideal burn for quail habitat is called a mosaic burn, where the fire does not burn across completely. One third to half of the area should remain unburned. This is often accomplished by burning under mild conditions, which creates a cooler fire. The use of extra internal fireguards to protect specific areas is another way to insure that the burn is not detrimental. Fall and early winter burns are usually more beneficial in promoting annual forb growth.

- Fire and grazing can be used in combination to create small

"weed plots" for quail. Burn numerous small areas of 2 to 5 acres within a large pasture. When the pasture is grazed, livestock will move to the burned plots and graze them very heavily, thus favoring the growth of less palatable weeds.

2. The quail food supply is affected by brush management. Mechanical brush management such as grubbing, dozing, chaining or raking will stimulate quail food production. Aerial applied chemical brush management will diminish the production of quail food for at least several years. Individual plant treatment methods of herbicidal application will have much less impact than aerial applications.

3. Since the fruits of many woody plants are good quail foods, maintaining a good diversity of shrubs and trees will help insure a better quail food supply. Carefully planned brush management can accomplish this.

4. Where farmland is present within quail habitat, crops can be selected which provide food for quail and land can be managed to increase the value to quail.

    - Seed crops such as grain sorghum, corn, peanuts, soybeans, cowpeas, sesame, wheat, oats, rye and triticale can add large amounts of seed for quail.

    - Retain waste grain on soil surface from harvest until land is prepared for next crop. If plowing is needed, use chisel plow rather than disk plow.

    - Retain up to 50 or 100 feet of unharvested grain or seed crops around the edges of fields where other habitat needs are present on adjacent areas.

5. Annual food plots may provide supplemental food if suitable soils are present. Food plots for quail may not increase the quail population, but will often attract quail to the food plots. Plant a minimum of one acre for each 20 to 40 acres of quail habitat for proper interspersion. Plant annuals such as grain sorghum, millets, or small grain or re-seeding annuals such as partridge pea or sunflower. Mixtures of several species are more likely to provide quail food for an extended period. Food plots must be protected from livestock grazing. Where deer numbers are high, plots may be destroyed by deer grazing. Food plots provide seed sources for quail as well as excellent "bugging" areas.

6. Include forbs, legumes and large seeded grasses in range seeding mixtures.

7. Feeding quail is not considered a habitat management practice. Feeding has not been proven to improve quail populations, but it

will concentrate quail. Predators often learn the locations of quail feeders. Loss to predation may be increased by the use of feeders.

Cover

1. Management of grazing maintains nest cover. Heavy grazing is very detrimental to nest cover. Even moderate grazing can limit adequate nest cover. Light grazing favors a good distribution of nest clumps.

2. If nest cover is absent or severely lacking due to prolonged heavy grazing, a period of one to three years of no grazing is the best way to allow bunchgrasses to recover.

3. On sites which are bare, crusted or produce only short grasses, rainfall infiltration is often inadequate. Deep chiseling or ripping such sites in strips or bands will increase infiltration and often result in growth of suitable nest cover.

4. If there is little or no potential for natural recovery of bunchgrass, seeding may be done. Include mid and tall bunchgrass such as little bluestem, Indiangrass, switchgrass etc. depending on site adaptation.

5. Nest cover can be maintained by allowing a moderate density of plants such as prickly ash, plum, blackberry, etc. that protect grasses from heavy grazing.

6. Carefully planned brush management best maintains the proper kinds and density of woody cover. During mechanical brush management, desirable low growing shrubs should be left intact. Larger clumps of desirable low shrubs often are found around a nucleus of an old mature tree. These multi species clumps are especially valuable.

7. Aerial herbicidal control of target brush species can be detrimental to some desirable low growing shrubs. Leaving some areas unsprayed will insure greater habitat diversity.

8. In cropland areas, maintain field borders, odd areas and fencelines in native vegetation including grasses, forbs and brush. Areas should be 10 to 30 feet wide.

9. Leave small grain or grain sorghum stubble standing to provide cover for quail feeding on waste grain.

10. Where shrubs are not present, planting of woody vegetation will be required. Plant multi-species motts or strips of shrubs 100 to 300 feet apart. Motts should consist of 10 to 20 shrubs. Strips should consist of two to five rows. Irrigation or water harvesting techniques will be needed for good establishment and growth. Commercially available low growing shrubs include rainbow plum and amquail lespedeza.

Water

1. The greatest possible plant diversity will help insure a good supply of insects and fleshy fruits that provide the majority of the water needed by quail. Conservative grazing and carefully planned brush management can increase plant diversity.

2. To insure a water supply in periods when insects and succulent vegetation are not present, surface water may be provided. Overflow areas from traditional livestock water development, ground level watering devices, or modifications of livestock water troughs can be used to provide surface water. Refer to standard for Wildlife Watering Facility.

3. Adding surface water has not been shown to increase quail populations or improve quail survival in areas that receive 20 inches or more average annual rainfall. In more arid regions, surface water may be more beneficial.

References

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Table 1

Common Quail Habitat and Food Plants for Eastern Texas

Trees

Hackberry/sugarberry
Pine (longleaf favored)
Ash
Blackgum
Oaks
Sweetgum

Shrubs

Plum
Prickly Ash
Blackhaw
Redhaw
Dogwood
Sumac
Bicolor Lespedeza (Amquail)
Dewberry/Blackberry

Forbs

Clovers
Grapes
Vetch
Alyce Clover
Hairy Vetch
American Jointvetch
Sunflower
Common Lespedeza
Tick Clover
Wild Beans
Partridge Pea
Beak-rush
Bullnettle
Butterfly Pea
Dock
Ragweed
Crotons

Grasses

Bluestems
Switchgrass
Crabgrass
Texas Panicum
Panic Grass
Brownseed Paspalum
Panic Grass
Longleaf Uniola
Beaked Panicum
Indian Grass

Table 2. Planting Information for Commercially Available Seed Used for Food Plots or to Enhance Quail Food Supply

	Seed Rate Lbs/Acre Broadcast [commercial seed]	Planting Dates	Planting Depth In.	Comments
Cool Season Annuals				
Elbon Rye	40-80	"	1	Does well in sandy sites
Oats	40-80	"	1	Well drained not deep sand
Wheat	40-80	"	1	Well drained not deep sand
Hairy vetch	10-20	"	1/4-1/2	Will grow on deep sands
Singletary Pea	10-20	"	1/4--1/2	Adapted to wet sites - bottoms
Warm Season Annuals				
Cowpeas	20 - 40	April-June	1/2	Iron/Clay best combo with deer
Soybeans	40-60	"	1	
American Jointvetch	10-20	"	1/4	Deer may over browse - Plant in combination with Iron/clay pea 40/10
Rape	10	"	1/4	
Corn	8-12	March-May	1	Should be rowed and cultivated
Milo	10	"	1/2 - 1	Best if rowed and cultivated
Partridge pea	6-10	"	1/4	
Sesame	10	April - May	1/4	Plant old open podded variety
Browntop millet	10-20	April - June	1/4	Excellent seed producer
Common Sunflower	10-20	Fall	1/2-1	Best to plant in fall
Perennial Grasses				
Illinois bundleflower	10	April - May	1/4-1/2	
Indiangrass	4.5	"	1/4	
Switchgrass	2 - 3.5	"	"	
Little bluestem	3.4	"	"	
Big bluestem	6	"	"	

Approval

/s/ Gary Valentine, State Wildlife Biologist

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