

# Quail Habitat Management



Large fields should be broken up into several small fields to create “edge effect.” Edges are areas where two or more habitat types, such as a forest and a

field, meet. Edges also occur between different aged patches of the same habitat type. A large field can be divided by planting 6-10 rows of various shrubs and trees down the middle. This will provide wildlife cover and protected travel lanes. Good species for establishing these hedgerows are Chickasaw plum, crab apple, red cedar, longleaf pine and others. They are available commercially and should be planted on a 6 foot x 6 foot spacing (wider spacing for pine), allowing gaps for equipment access.

When pines are to be utilized for hedgerow plantings, longleaf pine offers several advantages over loblolly and other yellow pine species. Longleaf pine can be burned earlier in the rotation and more frequently than loblolly pine. This factor, combined with the upright growth habit and relative lack of lateral limbs which allows sunlight to penetrate the tree canopy, encourages early-successional weedy ground cover favored by quail. Longleaf pine is not suited to all areas in South Carolina, so consult a forester before utilizing longleaf pine in hedgerows or other plantings.

Hedgerows and travel corridors can also be established with native grasses, weeds and shrubs. Hedgerows should connect existing cover areas such as briar patches and plum thickets. When planting seedlings or establishing native vegetation for hedgerows in pastureland, it may be necessary to eliminate existing sod by scalping or herbicide application.

## Management Practices to Enhance Agricultural Lands

To provide quality nesting areas and brood rearing habitat in agricultural fields, field borders (also called buffers or transition zones) should be established. A 25-50 foot (more is better) buffers should be left unplanted around the edges of fields to provide beneficial edge habitat for quail. Field borders provide important nesting and brood rearing cover, as well as valuable food in the form of native weed seeds and insects. Once these borders have been established (after two years), one half of the area should be lightly disced between November and March, in order to set back plant succession and renew the habitat. If



corn or soybeans are grown in the agricultural fields, leaving 4-8 rows standing along the field edges throughout the growing season and through the fall will provide additional brood rearing areas. These field edges are particularly important in late summer and early fall after the corn has died back and weeds invade the rows. The unharvested strips of corn or soybeans also provide an important and desired food supplement. Field borders should be protected when planting time arrives, since they often end up back

in crop production. Precision farming technology indicates that edges of fields typically suffer a 20 percent reduction in yields and may be unprofitable to till, plant, treat with fertilizers or chemicals, and harvest. The acreage lost to field borders is small since a 25-foot wide strip, 1 mile in length only totals about 3 acres.

Ditch banks should be allowed to grow 2-3 years before they are mowed. Ditch bank mowing should be alternated throughout each crop field, and only one side of the ditch bank mowed in a given year. Weedy ditch banks, combined with an adjacent field border (also known as a filter strip), provide habitat and travel corridors for quail in cropland.

Breaking up large agricultural fields and establishing hedgerows will provide many benefits for quail. As mentioned under pastureland management, hedgerows can be planted or disced and allowed to establish naturally. Always leave a gap for equipment access.

Odd field corners are usually available when center pivot irrigation systems are used. These corners should be allowed to grow up in native vegetation and heavily disced or burned every two years. Select nesting areas that will be disced or burned in alternate years, so as to provide a constant opportunity for nesting. The more irregular in shape, the better, as it will be more difficult for nest predators (opossums, raccoons and skunks) to locate nests.

Rotate plantings in the fields so that any particular field, or at least a portion of that field is allowed to lay fallow for two years. This will provide quality nesting habitat for quail and will be well distributed over the tract. A simple scheme for doing this would be to plant each field every third year, planting one third of the total number of fields in a given year.

Residue from the harvest operation can provide an important over wintering food supply and protect valuable topsoil from erosion. For this reason, crop residues should be allowed to remain in the field as long as possible. If plowing under the residue is necessary, leaving 10 percent around the edges is better than clean tilling the entire field. When possible, no-till methods of planting should be incorporated into the farming operation. No-till, or conservation tillage, yields benefits for soil productivity, water quality and wildlife habitat. Recent research reported that quail chicks fare much better during the critical summer growth period in no-till production agriculture fields versus conventionally tilled fields. Information on no-till farming is available from the local office of the CCES, NRCS, or local Conservation District office.

## Management Practices to Enhance Forest Lands

Forestlands can also be manipulated to provide suitable quail nesting and brood rearing areas. The key is to open up the woods as much as possible based on landowner management objectives. Thinning and prescribed burning pine stands will enhance habitat for quail as well as other wildlife species.

Wildlife habitat in pine plantations is greatly improved by creating openings (2-5 acres). When regenerating stands, scatter openings over 5-10 percent of the area, more if the majority of the tract is wooded. These areas should not be planted in pine trees but maintained by discing, mowing or burning on a 1-3 year rotation. Portions of the opening could be planted annually to wildlife foods, but it is a good practice to leave some areas fallow. Openings should be longer than wide and irregular in shape when possible. Select well-drained sites for openings.



A selective thinning program opens up the pine stand and allows sunlight to reach the forest floor which in turn stimulates the growth of legumes and other plants valuable for quail. A thinning regime assures that the canopy remains open. A basal area (the cross-sectional area of a tree at diameter breast height (DBH) expressed in square feet per acre) of 50-70 square feet per acre is a good compromise between timber production and quail management. A very dense timber stand with a basal area of 80-100 square feet per acre or greater will allow little or no sunlight through the canopy. A basal area below 50 square feet per acre would be similar to an open, park-like forest with much sunlight hitting the ground. Buffer strips, or streamside management zones, adjacent to creeks, rivers and other drainages should be unharvested for at least 100 feet wide. These areas often contain valuable mast producing trees, protect waters from sedimentation and provide travel corridors for wildlife.

If necessary, control understory and mid story hardwood encroachment with appropriate herbicides.

Once pine stands are thinned, a burning schedule should be established. Prescribed fire benefits timber production, wildlife habitat, and the hunter. Fire eliminates or reduces understory vegetation providing bare ground, returns nutrients to the soil, stimulates the growth of valuable legumes and weedy plants and controls woody vegetation. Timber production is improved as well as wildlife habitat and hunters are exposed to better shooting conditions. Most burning should be done from mid-February through March, although certain areas may benefit from a “growing season” (May and June primarily) burn. State law requires authorization from the South Carolina Forestry Commission (SCFC) before setting any outdoor fires.

Firelanes can be established with a standard forestry type fireplow, but wide firelanes, permanently established with a bulldozer and maintained with a farm tractor and disc, are preferred for quail habitat management. A large number of interior firelanes



are desired to achieve the “patchy” diversified type of burn needed to produce good quail habitat. Stands of pure hardwood should be excluded from fire completely. After burning, firelanes can be disced to stimulate growth of native vegetation or seeded with annual wildlife plantings such as browntop millet, Kobe lespedeza, etc. Firelanes can also be used to connect fields or woodland openings to improve access and create a hunting course.

Regenerated pine stands will provide much better quail and wildlife habitat, in general, if seedlings are spaced at 8 feet x 10 feet. On suitable sites, consideration should be given to establishing longleaf pine since it provides more benefits for wildlife than other pine species. Natural regeneration (seed tree and shelterwood) provides greater habitat diversity than artificial regeneration.

Daylighting interior property roads enhances habitat. Where feasible, remove all trees in a 15-30 foot band adjacent to woods roads and manage these areas for native herbaceous and brush cover for wildlife by periodic discing or mowing. Preserve valuable mast producing trees (oaks, dogwoods, etc.) along the roads, but all pines and lesser quality hardwoods should be removed. Areas on very steep slopes should be left intact to prevent soil erosion. This technique will also assist in road maintenance by allowing sunlight to rapidly dry the roadbed after heavy rains. Daylighting can be accomplished during thinning or other timber harvest operations.

Constantly be aware of change in habitat. Even the most minute change in habitat can have a major impact on quail populations. Look at areas that use to hold birds and see what changes have taken place over the years. A minor change may take a minor improvement whereas a major change may take more time and effort to improve habitat conditions.

Quail respond rapidly to improvements in habitat quality. High-quality nesting and brood rearing habitat provides the key to increasing quail numbers and improving hunter success. Without proper emphasis on these critical habitat elements, quail habitat management results will likely be disappointing. However, with proper planning and attention to detail, forest land, agricultural land and pasture land can all be manipulated to provide quality nesting and brood rearing habitat — the critical elements for quail management success.



# Nesting & Brood Rearing Habitat: Critical to Quail Management Success



Small Game Project



Ragweed plant structure provides sparse vegetation at ground level that allows for easier mobility. The thick cover at the top of the plant supplies shade and protection from avian predators.



The low basal area in this stand allows for an abundance of sunlight that stimulates the growth of beneficial nesting vegetation.



## SOURCES OF TECHNICAL AND/OR COST-SHARE ASSISTANCE

Small Game Project, South Carolina Department of Natural Resources, PO Box 167, Columbia, SC 29202 (803-734-3609) - Technical Assistance

South Carolina Forestry Commission, County Office - Technical and Cost-Share Assistance

USDA, Farm Service Agency, County Office - Cost-Share

USDA, Natural Resources Conservation Service, County Office - Cost-Share and Technical Assistance

### Produced by:

SCDNR Small Game Project in cooperation with SC Quail Unlimited State Committee and participating Quail Unlimited Chapters



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**South Carolina  
Department of Natural Resources**

DNR Website: [dnr.sc.gov](http://dnr.sc.gov)

Job# 07WL5892

## Quail Habitat Management

The annual life cycle of quail is a precarious one. Studies have shown that nesting success is highly variable but averages about 35 percent. Nest predation is also about 35 percent, and nest abandonment accounts for the rest. Roughly 90 percent of nests will be located in one-year-old unburned sites and less than 50 feet from bare ground. Nests will also be located near blackberry or plum thickets that produce soft fleshy fruits consisting of sugar. This is essential since the berries provide high levels of needed energy to an incubating hen.

Quail chicks are quite small, weighing less than 1/4 ounce at hatching, but can move and feed themselves only hours after leaving the egg. Within the first two weeks of hatching, broods are highly susceptible to predation and/or severe weather causing about 70 percent mortalities. Insects are an especially important source of protein for young chicks and will comprise more than 80 percent of their diet.

Habitat management for bobwhite quail should focus on providing habitat during all phases of its life cycle, including nesting cover, brood rearing cover, escape cover, feeding areas, loafing areas, and roosting areas. Suitable habitat should be available on a year round basis. The subtlest of changes in habitat may go unnoticed by us but may have a major impact on quail populations. Most landowners provide escape cover and food but are not aware of how important nesting and brood rearing habitats are for quail management success. Providing this type of habitat cannot be overemphasized.

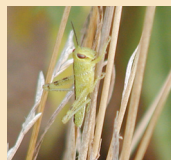
### Nesting Sites for Quail

Fall quail populations are dependent on the reproductive success of the preceding spring and summer months. Adequate, high quality nesting cover allows quail and other ground nesting birds

ample opportunity for nest site selection, and reduces nest losses to predators. Quality nest sites are characterized by bunchgrasses (e.g., broomsedge) and annual weeds with bare ground and space available between the stems of the grasses. Areas managed for nesting habitat should be located on well-drained soils with brood rearing areas and escape cover nearby.

### Brood Rearing Areas for Quail

Annual weeds, such as ragweed and partridge pea, provide ideal brood rearing habitat for quail due to the abundance of insects found in such areas. These plants also provide the type of structure and cover required to allow ease of movement for quail chicks while protecting them from predators.



### How to Provide Suitable Nesting and Brood Rearing Habitat

Nesting and brood rearing sites can be created, enhanced and maintained simply and economically by disking or the use of prescribed fire. Mechanical disturbance or burning will set back vegetative succession, creating areas dominated by annual grasses and weeds. Disc or burn no more frequently than every two years, as dead vegetative material from the previous growing season is often used in the construction of quail nests. Likewise, all nesting cover should not be manipulated in any given year in order to provide constant opportunity for nesting or reneating with suitable habitat well distributed across the property. Disking stimulates the growth of beggarweed, ragweed, and partridge pea, which are excellent at attracting insects, an essential food for chicks. Of course these plants also produce valuable seeds that are preferred by adult birds.

Blackberry patches and plum thickets near nesting sites should be protected, as they provide an important high-energy food source for nesting hens and shade for hens and broods. Plum thickets are especially susceptible to fire damage, and should be protected during prescribed burning.



## Management Practices to Enhance Pasture Lands

Introduced pasture grasses, such as fescue and Coastal Bermuda grass, are very aggressive and usually out compete desired native quail food and cover plants. They also hinder effective establishment of permanent and annual food plantings. These grasses must be controlled or eradicated in areas where quail habitat management is desired. Some control may be achieved by repeated disking in hot summer months or several burns but they usually reemerge. The long term solution for suppressing fescue is to burn, heavily graze or mow the plant and then apply a suitable herbicide to the regrowth. Before herbicide application, always check the product's current label for suitability and apply only at recommended rates.

Native warm season grasses are better for ground nesting birds because they provide open space at ground level and spread upright forming an overhead canopy. This allows for easier movement by the hen and her chicks and the canopy serves as shade as well as protection from predators. These grasses also provide a food source as well as attract insects. Native warm season grasses provide better nesting and brood rearing habitat than the introduced grasses. When planting warm season grasses, use a combination of two or more such as switchgrass, Big Bluestem and Indiangrass. Native warm season grasses combined with a rotational grazing system can be established to benefit livestock and enhance wildlife habitat. Contact your local Natural Resources Conservation Service (NRCS) or Clemson Cooperative Extension Service (CCES) for detailed information.

Newly created open areas, abandoned fields and reclaimed pastures are ideal for disking strips that will provide quality nesting and brood rearing habitat. Time of disking will determine the species of plants that invade these strips. Disking between November and March will generally stimulate the growth of plants such as beggarweed, partridge pea, and ragweed, which are desirable quail foods. The ideal situation is to have a strip of bare ground, a strip of one-year-old and two year old vegetative growth available throughout the field. Strips should be irregularly shaped, 50-100 feet in width and extend the length of the field. Once strips are established, the fallow strips should be disced the next year and other strips allowed to develop into fallow land, preferably one of the spring strips. The bare ground provides a dusting area preferred by quail. Liming and fertilizing (0-15-30- 0-14-14) or similar nitrogen-free fertilizer) freshly disced strips may improve growth of desirable plants.

