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NORTHERN BOBWHITE*(Colinus virginianus)* HABITAT MANAGEMENT

Enclosed is a copy of the *Northern Bobwhite* ***(Colinus virginianus)*** *Fish and Wildlife Habitat Management Leaflet*. This publication was prepared by the NRCS Wildlife Habitat Management Institute and the Wildlife Habitat Council. The range of the bobwhite quail extends across the entire state of Nebraska, but it is most abundant in the southern and eastern parts of the state. The leaflet provides an introduction to the habitat requirements of the species, specifications for habitat improvement, and programs that might assist land users in applying beneficial practices. Also included is a list of the most important bobwhite food plants.

This fish and wildlife habitat leaflet is posted on the WHMI homepage http://www.whmi.iastate.edu/

Additional copies may be downloaded as needed.

Enclosure

USDA NRCS Natural Resources Conservation Service
Wildlife Habitat Management Institute

WILDLIFE HABITAT COUNCIL℠

Northern Bobwhite

(Colinus virginianus)

September 1999 *Fish and Wildlife Habitat Management Leaflet* *Number 9*

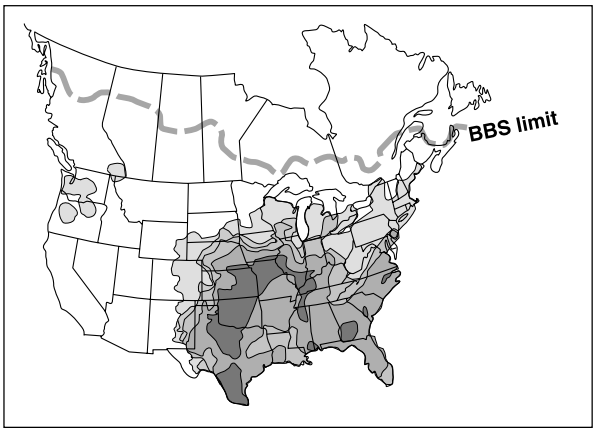
General Information

Photo courtesy of Oklahoma Department of Wildlife Conservation

The northern bobwhite, commonly referred to as bobwhite quail, has long been a favorite gamebird throughout the eastern United States, and is a welcomed upland ground dweller on farms and rural landscapes with its infamous call of "bob-white!" Highly social and displaying gregarious activity nearly year-round, bobwhites thrive in an array of varying early successional habitats. Its affinity for a variety of early successional communities makes the bobwhite both unique and fairly manageable.

The bobwhite's popularity has decreased little throughout the years. However, bobwhite populations have decreased significantly in recent years, as much as 70 to 90 percent in some areas. Among the most influential impacts reducing northern bobwhite numbers continues to be the loss of nesting and protective cover. The removal of overgrown hedgerows, fencerows, and windbreaks from agricultural fields and rural landscapes; the conversion of open, native grasslands, woodland edge, and other idle habitat to introduced grasses and developed lands; clean farming operations and the increased use of agrichemicals; increased grazing pressure; intensive fire control; removal of timber and brush over broad areas; and the spraying and mowing of highway and utility rights-of-way has reduced or eliminated bobwhite populations from traditionally occupied areas across the United States. Because of the bobwhite's dependency on and use of multiple types of adjoining habitats, its presence in an area is often indicative of vegetation diversity and "edge" components that exist between varying habitat types. Managing for northern bobwhite can significantly benefit other wildlife species dependent upon an array of differing habitat types growing adjacent to or within close proximity to one another. For example, populations of a number of early successional songbird species that use habitats similar to that of the bobwhite are also declining. Habitat management directed at improving conditions for the bobwhite may also help these songbird species populations.

This leaflet is designed to serve as an introduction to the habitat requirements of the northern bobwhite and to assist landowners and managers in the development of a comprehensive northern bobwhite management plan. The success of any species management plan depends on targeting the specific needs of the desired species and analyzing the designated habitat area to ensure that all required elements are present. This leaflet provides a number of practical habitat management activities that can be conducted on private lands to boost local bobwhite quail populations and encourages involving fish and wildlife professionals in management planning to identify additional management actions needed over time.



Northern bobwhite breeding range

Range

The northern bobwhite is a non-migratory, year-round resident species. Bobwhite quail are found throughout most of the eastern and mid-western United States from southern Ontario and southern Maine, west to southern Minnesota, southern South Dakota, southeastern Wyoming, south to the Gulf coast and eastern Mexico to Guatemala. Small, introduced populations exist in eastern Oregon and Washington, western Idaho, and southern Arizona.

Habitat Requirements

General

Quail occupy a wide variety of early successional habitats, including active and fallow crop fields, pastures, old fields, native grasslands, hedgerows, brushy fencerows, woodlands with grass and forb ground cover, open meadows with a shrub or brushy component, cut-over timberlands, roadway and powerline rights-of-way, wooded riparian areas, brushy canyons and hillsides, and rural residential areas. The role of regular habitat disturbance in maintaining productive bobwhite habitat is extremely important. Disturbances, such as fire, timber harvest, grazing, and disking, are necessary to maintain the early successional habitats used by bobwhites. A principle aspect of these early successional habitats is the presence of grasses and forbs that provide ground cover while allowing birds to move along the ground easily. A variety of early successional communities growing adjacent to one another and containing defined edges among them provide the bobwhite with ideal nesting, brood-rearing, feeding, loafing, travel, and escape cover. Diversity in habitat types within an area is among the greatest factors affecting northern bobwhite populations. The continued loss and conversion of hedgerows, overgrown fencerows, early successional grassland, and open woodland nesting and foraging habitat remains the largest threat to the future of northern bobwhite populations nationwide. Preserving and properly managing grasslands, woodlands, and other rural cover types as well as the edges between cover types can help landowners boost local bobwhite populations and benefit other wildlife species that rely on similar habitat.

A diversity of early sucessional plant communities exposed to regular disturbance is key to providing ideal bobwhite habitat.

Food

Northern bobwhites forage in the early morning after sunrise and more heavily in the two hours prior to sunset. Bobwhites rely on a multitude of food items, consuming a variety of wild and cultivated seeds, fruits, leaves, stems and insects. Roughly 85 percent of a juvenile bobwhite's diet consists of insects and other animal matter, and chicks feed almost exclusively on insects during the first two weeks of life. In contrast, 85 percent of an adult bird's diet consists of vegetation. In fall and winter months, the seeds of native and exotic annual plants, such as ragweeds, sunflowers, panicgrass, foxtail, spurges, bull grasses, crotons, beggar's ticks, chittamwood, partridge pea, milk pea, smartweeds, and dayflowers are consumed, as well as the seeds of oaks, black locust, pines, and ash. Cultivated plants consumed include soybeans, grain sorghum, wheat, buckwheat, millet, rye, corn, lespedezas (bicolor, Kobe, and Korean), cowpeas, dropseeds, prairie clovers, mesquite, tick trefoil, and peanuts. Wild fruits, such as mulberries, raspberries, blackberries, strawberries, bayberries, huckleberries, muscadines, wax myrtle, hackberry, grapes,

plums, rose hips, pokeberries, persimmons, and the berries of dogwood, poison ivy, sumac, greenbrier and many others are consumed in spring and summer. Leaves and stems of succulent green plants are also consumed. Invertebrates, such as grasshoppers, leafhoppers, flies, mosquitoes, aphids, potato beetles, spiders, and ants comprise over 20 percent of the summer diet of adult females, while adult male summer diets include only about five percent animal matter. However, bobwhites are opportunistic feeders and will consume available or abundant food items before searching for scarce and more preferred foods.

Important northern bobwhite food items. The following items are important foods in the diet of the northern bobwhite. The items below comprise a skeleton list of common food items; they DO NOT represent all foods preferred or consumed.

Insects and other arthropods:		Wild fruits:		Cultivated plants:		Seeds:	
grasshoppers	leafhoppers	mulberries	raspberries	soybeans	grain sorghum	ragweeds	sunflowers
flies	mosquitoes	blackberries	strawberries	wheat	buckwheat	panicgrass	crabgrass
aphids	potato beetles	bayberries	huckleberries	millet	rye	Johnsongrass	foxtail
spiders	snails	muscadines	wax myrtle	corn	cowpeas	spurges	bull grasses
ants	and others	hackberry	grapes	dropseeds	prairie clovers	crotons	beggar's ticks
		plums	rose hips	tick trefoil	peanuts	chittamwood	smartweeds
		pokeberries	persimmons	*lespedezas:*		dayflowers	oaks
		berries of :		bicolor	Kobe	black locust	pines
		dogwood	poison ivy	Korean		sweetgum	ash
		sumac	greenbrier			*legumes such as:*	
		and others				partridge pea	
						milk pea	
						and others	

Where appropriate, the native and cultivated plants and fruits may be planted or encouraged to enhance vegetation that already exists in or around grassland, woodland, and edge habitats. Adding these species to those already present will enhance food availability for northern bobwhites. Field borders and hedgerows provide opportunities to enhance bobwhite quail habitat on many farms, ranches, and other private properties.

Nesting Cover

Native prairie bunch grasses, such as big and little bluestems, sideoats grama, switchgrass, Indiangrass and broom sedge provide the most preferred nesting cover for northern bobwhites. These grasses grow into dense vegetation communities with open, passable alleyways near the ground. These bunch grasses provide the best habitat architecture for nesting quail, as nests are built at the base of grass tufts. Other grasses and forbs that grow in bunches or clumps are also used by bobwhites for nesting. Sod-forming grasses, such as fescue and brome grass, form matted, dense vegetation that is of little habitat value to bobwhites. Residual cover (vegetation left standing from the previous growing season) is an essential element of productive bobwhite nesting habitat. One- or two-year-old residual clumps of grass are preferred over younger or older stands as they provide necessary overhead cover for nest concealment and commonly do not contain much ground litter (matted grasses) that hinders ground travel. Matted grasses also encourage the build-up of rodent populations (e.g., cotton rats in the southeast) which are major predators of bobwhite nests.

Bobwhites use shallow depressions lined with dry grasses located in grass clumps that range from 6 to 18 inches in height. Nests are usually established within 30 feet of a brushy, woody, or other edge component where habitat types change, and within 50 feet of bare soil. This edge serves as a corridor along which birds can travel between

cover types. Nesting sites are commonly found in brushy corners of old fields, along the edges of woodlands, and in windbreaks, thickets, and other areas providing suitable cover. For grassland nesting communities, 250 nesting clumps per acre, or one clump per 13- x 13-foot area is recommended. Assessing an area's bobwhite nesting potential can be accomplished by walking the area in a back and forth manner to determine the distance between nesting clumps. Grassland communities containing clumps growing every 15 to 20 steps is considered adequate nesting bobwhite cover.

Brood-rearing Cover

Brood-rearing cover differs from nesting cover because it is generally more open at ground level to enable movement of quail chicks. As much as 70 percent of brood-rearing cover can be open, bare ground. Whereas good nesting habitat has generally not been disturbed for two or three growing seasons, the best brood habitat occurs within the first year following disturbance of an area through burning, disking, timber harvest, or other means. Overhead concealment, diversity of low-growing green foliage, and abundant insects are required brood-rearing cover characteristics. Recently burned grasslands, old field communities, weedy field borders, legume plantings, and small grain fields provide good brood-rearing cover.

The growth form of native bunch grasses provides excellent nesting sites for bobwhites. Open passageways among grass clumps also enable bobwhites to travel easily and safely along the ground.

Loafing and Winter Cover

Loafing cover provides protection from predators and adverse winter weather during daylight hours when bobwhites are not feeding. Shrubby or woody cover is preferred for loafing, but tall grasses and weed patches may be adequate when available. Woody cover is more important as winter cover in mid-western and northern areas where snow cover can bury winter foods. Thickets of blackberry, American plum, fragrant sumac, shinnery oak, sand plum, honeysuckle, wild cherry, and dogwood growing from 3 to 6 feet in height provide loafing cover. Wild grape, greenbrier and other vines growing to create dense overhead cover and open, passable ground cover make up good loafing cover as well. Small patches of bare ground on which individuals can dust to remove parasites and excess oils from feathers increases bobwhite use of loafing cover. Loafing cover needs can be generally met with a 30- to 50-foot wide, irregularly-shaped plot of land containing clumps of grass and overhead cover.

Escape Cover

Tangled thickets, dense grasses, shrubs, and other vegetation that conceals quail from predators are used as escape cover when located close to travel lanes and nesting, brood-rearing, and loafing cover.

Water

Daily foraging activities, the types of foods eaten, dew, snow, and water produced during digestion provide northern bobwhites with an adequate amount of water. Open water, such as ponds, streams, livestock tanks and overflow from windmills may be used during periods of low rainfall, or when available.

Interspersion of Habitat Components

Perhaps the most critical aspect of northern bobwhite management is creating good habitat interspersion, or mixture of different cover types. Suitable foraging, nesting, brood-rearing, loafing, and escape cover, each located within close proximity to one another, is essential to attract bobwhites to and maintain existing populations in an area. A complex of crop fields, pastures, and meadows containing native bunch grasses, odd areas, hedgerows, overgrown fencerows, and woodland edge comprise a mixture of quality bobwhite habitat components. In the southeast and drier western parts of its range, wooded river valleys, open pine woods with grass and forb ground cover, brushy canyons and hillsides, swamps, and dry grasslands with scattered mesquite and cactus are used by bobwhites. Lack of diversity of suitable habitat types may reduce an area's overall potential value to northern bobwhites. Likewise, a multitude of differing habitats within one area that are not connected by a well-defined edge component is of less value to northern bobwhites than an area with a minimum of necessary habitat requirements growing adjacent to one another and containing many distinct edges between cover types.

Photo courtesy Tall Timbers Research Station

Field borders and hedgerows provide opportunities to enhance bobwhite quail habitat on many farms, ranches, and other private properties.

Minimum Habitat Area

Under optimal habitat conditions one covey of northern bobwhites can occupy as little as 4 acres, but typical covey activities generally occur on 20 to 40 acres of land. Intensively managed areas can average one covey per 15 acres, whereas less intensively managed lands may require 50 acres or more to support a covey. Optimum carrying capacity— the number of birds an area can support and remain in good condition— is generally one quail per acre in most regions. However, depending on habitat quality and diversity, more than one individual can inhabit an acre of land. A covey rarely ranges more than one quarter mile when inhabiting areas containing all habitat components necessary for survival. A smaller area that contains a mixture of each of the necessary habitat components will attract and satisfy a covey of quail before a larger area lacking adequate edge components between habitats or missing one or more needed habitat component. This aspect of bobwhite habitat ecology can potentially make managing for northern bobwhite on private property easier and more practical than some other wildlife species.

Northern Bobwhite Habitat Management

Northern bobwhites are relatively easy to manage because they thrive in early successional communities which can be established quickly through various soil disturbance activities. However, the intensity of management to control succession can be more expensive than other wildlife management actions. The following management practices are used to disturb soil and vegetation in order to promote early successional growth of plants and attract insects. More than one practice may be beneficial in an area depending on the primary land use. The area's size, management goals, vegetation, and geographic region may dictate which management practices are most appropriate. Consultation with and assistance from federal, state, or local fish and wildlife and land management agencies can be very helpful in identifying appropriate management actions.

Management Practices

Disking —Disking strips in dense vegetation removes thick, matted grasses, creates more open travel areas, and promotes growth of native bobwhite food plants. Adjacent strips 10 to 20 feet wide and no less than 100 feet long should be disked rotationally along woodlot, grassy field, and fence- and hedgerow edges. Adjacent strips should be disked on a two to three year rotational basis from January through March. June disking can be done to promote growth of vegetation and attract insects; however, it should be done only in small areas late in the month to minimize impacts on nesting quail and other ground nesting birds. Disking, plowing or harrowing to a depth of 4 to 6 inches and leaving 30 to 45 percent residue coverage is sufficient to promote vegetation regeneration.

Burning —Prescribed burning is used to maintain grassland communities in various stages of growth and vegetation diversity. Burning returns valuable nutrients to the soil and maintains grasslands and open woodlands as open habitat while promoting new growth of grasses, forbs, and shrubs preferred by bobwhites. Although beneficial, prescribed burning is a highly regulated activity and should only be conducted in cooperation with state fish and wildlife agencies and with assistance from licensed burners. These agencies and individuals can help in the development of a burn plan; provide necessary tools, equipment, and supervision; and assist in obtaining all required permits. Prescribed burns should be conducted on a 4- to 5-year (2- to 3-year in the southeast) rotational basis in late winter or early spring (February-April) depending on the region. Dividing the burn area into strips or plots can leave undisturbed escape and nesting cover adjacent to burned plots. Burn planning should include an assessment of plant species response to fire. For example, sand plum, a valuable quail habitat plant, is intolerant of fire and can be inadvertently eliminated from an area if burned. Disked firebreaks should be created around burn areas to maintain control of prescribed burns.

Grazing —Managed grazing can be a powerful tool to control succession and maintain productive bobwhite habitat in native pasture and rangelands and other situations. Quail habitat on grazed areas can best be maintained by avoiding overgrazing while allowing some disturbance to control succession. Rotationally resting pastures and fencing livestock from quail nesting, loafing and escape habitat may be necessary. Determine the best grazing rotation to use on property with regard to livestock herd size, vegetation composition, and topography.

Mowing —Rotational mowing can be used to maintain grassland communities in various stages of growth and vegetation diversity. However, the need for disturbance of the soil surface to release annual forbs and provide bare soil surfaces makes disking and burning preferred practices for bobwhite quail.

"Weed sweep" herbicide treatment —A viable alternative to mowing and broadcast application of herbicides for setting back succession is the use of the emerging "weed sweep" technology. This practice employs a herbicide wiping device mounted on a tractor that mechanically scratches and applies contact herbicides to shrubs and taller vegetation while leaving lower growing native forbs and grasses undisturbed. This practice is useful for maintaining quail habitat along ditch banks, utility rights-of-way, field borders, filter strips, pond margins, pastures, and roadsides.

Plantings —Planting native trees, shrubs, grasses, and forbs in odd areas and along woodlots or fencerows can create both food and cover for northern bobwhite. Blackberry, dogwood, red cedar, Osage orange, sand plum, sumac, and black locust are a few woody species that can be planted for quail. Cover plantings should occur in strips of two to five rows with a 15- to 20-foot herbaceous border. Tree and shrub rows are most beneficial when trees are planted six to 10 feet apart in the center rows with surrounding shrubs at 4 to 6 feet apart. Food plots may be beneficial in years of low food availability. One-acre food plots per 10 to 25 acres is suitable for large areas, but four or five smaller food plots with irregular edges planted adjacent to fencerows, field borders, and woodlot edges will bring food and cover areas closer together. Food plants to include in quail food plots are corn, grain sorghum, wheat, rye, oats, millet, soybeans, cowpeas, clovers, partridge pea, and kobe and Korean lespedezas.

Increasing Edge —When practical, changing the size and shape of quail habitat units can increase the amount of edge component available. Fields can be reshaped from square edges to irregular edges and broken down into a number of smaller individual fields from a single large plot. For example, a square field of 100 acres has about 83 feet of usable edge per acre while a 10-acre field has 264 feet of edge per acre. A 100-acre woodlot that is five times as long as it is wide has 35 percent more edge than a square woodlot of the same size.

Northern Bobwhite Habitat Requirements Summary Table

Habitat Component	Habitat Requirements
General	• Early successional habitats subject to regular distribution including active and fallow crop fields, pastures, old fields, native grasslands, hedgerows, brushy fencerows, woodlands with grass and forb ground cover, open meadows with a shrub or brushy component, roadway and powerline rights-of-way, wooded riparian areas, brushy canyons and hillsides, and rural residential areas.
Food	• Plant seeds: legumes such as partridge pea and milk pea, ragweeds, sunflowers, panicgrass, foxtail, spurges, bull grasses, crotons, beggar's ticks, chittamwood, smartweeds, dayflowers, oaks, black locust, pines, sweetgum, ash, and others.
	• Cultivated plants: soybeans, grain sorghum, wheat, buckwheat, millet, rye, corn, bi-color, Kobe, and Korean lespedezas, cowpeas, dropseeds, prairie clovers, tick trefoil, and peanuts.
	• Wild fruits: mulberries, raspberries, blackberries, strawberries, bayberries, huckleberries, muscadines, wax myrtle, hackberry, grapes, plums, rose hips, pokeberries, persimmons, and the berries of dogwood, poison ivy, sumac, greenbrier, and others.
	• Insects and other arthropods: grasshoppers, leafhoppers, flies, mosquitoes, aphids, potato beetles, snails, spiders, ants, and others.
Cover—nesting	• Grasses and forbs with overhead protection and open travel lanes near the ground. Native bunch grasses or other vegetation that grows in clumps is preferred.
	• Woodlands with herbaceous groundcover, piles of brush, woodland and grassland edges, thickets, uncut hay and small grain fields, and orchards with overhead cover.
Cover—brood-rearing	• Recently burned grasslands, old field communities, weedy field borders, legume plantings, and small grain fields with a diversity of low-growing green foliage and insects.
	• As much as 70 percent open ground to allow movement of chicks, typically within first year following disturbance action.
Cover—loafing, winter	• Shrubby or woody cover, tall grasses, and weed patches.
	• Thickets of blackberry, American plum, fragrant sumac, shinnery oak, sand plum, honeysuckle, wild cherry, and dogwood growing from three to six feet in height.
	• Wild grape, greenbrier.
Cover—escape	• Tangled thickets, dense grasses and briers, shrubs, and other dense vegetation.
Water	• Daily foraging activities, the types of foods eaten, dew, snow, and water produced during digestion provide an adequate amount of water.
Interspersion	• Complex of cover types that provide suitable foraging, nesting, brood-rearing, loafing, escape, and travel cover each located within close proximity to one another.
Minimum habitat size	• Covey activity generally occurs on 20 to 40 acres of land and a covey rarely ranges more than one quarter mile in good quail habitat.

Timber Management in the Southeast —Much forestland in the southeastern United States is dedicated to softwood timber production. Bobwhite habitat can be provided simultaneously with management of these timber stands, although there are some trade-offs. Pine stands that provide productive quail habitat have lower stocking than stands managed exclusively to maximize timber production. Open, park-like timber stands that allow light to reach the forest floor and regular ground disturbance through burning and disking provide high quality bobwhite habitat. Depending on site index, mature, even-aged pine stands should be thinned to 30 to 90 square feet of basal area per acre, with a rule of thumb target basal area equal to the site index for the stand minus 25. Where landowners are interested in maximizing quail habitat potential, the tree canopy should not cover more than 50 percent of the ground, and this open understory should be burned every one to two years to maximize growth of important quail food and cover plants. Disking portions of the understory will also enhance habitat potential. Younger pine stands should be regularly thinned (every 8 to 12 years) and burned (beginning at 10 years of age) to prevent them from developing closed canopies with little ground cover.

Field Border Management —Vegetation management through planting or disturbance along field borders can significantly improve northern bobwhite habitat quality. A vegetative border of 35 feet or wider along crop field, hayfield, pasture, fallow field, and woodland edges can provide food, travel lanes, and nesting, brood-rearing, loafing, and escape cover. Leaving several rows of standing crop along field borders near cover or a 30-foot wide unplanted weedy strip along crop field edges and unmown strips around pastures, meadows, and woodlands can benefit bobwhite as well as a multitude of other wildlife. Occasional disturbance (once or twice annually) in early spring and late fall (so long as adequate residual cover remains over winter) via disking may be beneficial to promote germination of annual weed seeds and attract insects along field borders. Woodlots can be improved for quail by connecting fragmented woodlots when possible with travel corridors in the form of grass strips or tree and shrub plantings. Field borders can play a vital role in providing quail food and cover and in connecting various cover types, improving overall quail habitat quality in agricultural landscapes.

Limiting Factors

For planning purposes, use the table below to inventory the site to subjectively rate the availability and quality of quail habitat within a planning area, based on the habitat requirements descriptions. Habitat communities and components that are absent or rated low are likely limiting northern bobwhite habitat quality.

	Availability/quality			
Habitat component	High	Medium	Low	Absent
Food				
Nesting cover				
Brood-rearing cover				
Loafing/winter cover				
Escape cover				
Interspersion of habitat components				
Minimum habitat size				

Management Prescriptions

Management treatments should address the habitat components that are determined to be limiting northern bobwhite habitat potential. For planning purposes, select the possible action items listed to raise the quality or availability of each habitat component determined to be limiting. NRCS Conservation Practices and various programs that may provide financial or technical assistance to carry out specific management practices are listed where applicable.

Habitat component	Management options for increasing habitat quality or availability	Conservation practices and assistance programs
Food	• Preserve and maintain grassland/forb communities and edge habitat by conducting strip disking, prescribed burning, and rotational or deferred grazing (especially during drought) when and where appropriate.	338, 528A, 645, 647 WHIP, EQIP, PFW, CRP
	• Plant native warm-season grasses such as big bluestem, little bluestem, switchgrass, sideoats grama, and Indiangrass, as well as legumes, sunflowers, oaks, black locust, pines, and ash.	386, 390, 391, 612 WHIP, EQIP, PFW, CRP
	• Preserve fence-, tree-, and hedgerows growing between fields and along field edges that provide a diversity of plant and insect life and wild fruits and seeds.	380, 386, 422, 612, 650
	• Plant soybeans, grain sorghum, wheat, buckwheat, millet, rye, corn, bicolor, Kobe, and Korean lespedezas, cowpeas, dropseeds, prairie clovers, mesquite, tick trefoil, peanuts, and other small grain crops in food plots.	645 WHIP, EQIP, PFW, CRP
	• Plant or encourage mulberries, raspberries, blackberries, strawberries, bayberries, huckleberries, muscadines, wax myrtle, hackberry, grapes, plums, rose hips, pokeberries, persimmons, dogwood, sumac, and greenbrier when practical along fence, and hedgerows and suitable areas near quail cover.	380, 612, 650 WHIP, EQIP, PFW, CRP
	• Leave several standing rows of unharvested crops along the edges of cropfields and use conservation tillage to leave waste grain on the surface following harvest.	329
	• Avoid or eliminate broadcast herbicide application and maintain forbs, invertebrates, and seeds consumed as food.	
Cover—nesting and brood-rearing	• Plant native warm-season grasses such as big bluestem, little bluestem, switchgrass, sideoats grama, and Indiangrass.	327, 390, 645 WHIP, EQIP, PFW, CRP
	• Preserve and maintain grassland/forb communities and edge habitat by strip disking, prescribed burning, weed sweep, or rotational or deferred grazing (especially during drought) when and where appropriate.	338, 528A, 645, 647 WHIP, EQIP, PFW, CRP
	• Minimize broadcast herbicide application during peak nesting and brood-rearing months (mid-April-July) or whenever application results in loss of nesting, loafing, brood-rearing, or winter cover.	595
Cover—loafing and escape	• Preserve shrubby and woody cover, tall grasses, weed patches, and thickets.	650
Interspersion and minimum habitat size	• Combine above prescriptions to increase interspersion of habitat components and amount of suitable northern bobwhite habitat.	

NRCS Conservation Practices that may be useful in undertaking the above management actions.

Conservation Practice	Code	Conservation Practice	Code
Conservation Cover	327	Hedgerow Planting	422
Residue Management	329A,B,C	Prescribed Grazing	528A
Prescribed Burning	338	Pest Management	595
Windbreak/Shelterbelt Establishment	380	Tree/Shrub Establishment	612
Field Border	386	Upland Wildlife Management	645
Riparian Herbaceous Cover	390	Early Successional Habitat Development	647
Riparian Forest Buffer	391	Windbreak/Shelterbelt Renovation	650

Available assistance

Landowners interested in making their individual efforts more valuable to the community can work with WHC and NRCS to involve school, scout, and community groups and their families, as well as state and federal fish and wildlife agency personnel, in habitat projects when possible. On site education programs demonstrating the necessity of northern bobwhite habitat management can greatly increase the value of an individual management project as well. Corporate landowners should encourage interested employees to become involved.

Programs that provide technical and financial assistance to develop fish and wildlife habitat on private lands.

Program	Land eligibility	Type of assistance	Contact
Conservation Reserve Program (CRP)	Highly erodible land, wetland, and certain other lands with cropping history. Streamside areas in pasture land.	50 percent cost-share for establishing permanent cover and conservation practices, and annual rental payments for land enrolled in 10- to 15-year contracts. Additional financial incentives are available for some practices	NRCS or FSA State or local office
Environmental Quality Incentives Program (EQIP)	Cropland, range, grazing land and other agricultural land in need of treatment	Up to 75 percent cost-share for conservation practices in accordance with 5- to 10-year contracts. Incentive payments for certain management practices	NRCS State or local office
Partners for Fish and Wildlife Program (PFW)	Most degraded fish and/or wildlife habitat	Up to 100 percent financial and technical assistance to restore wildlife habitat under minimum 10-year cooperative agreements	Local office of the U.S. Fish and Wildlife Service
Wetlands Reserve Program (WRP)	Previously degraded wetland and adjacent upland buffer, with limited amount of natural wetland, and existing or restorable riparian areas	75 percent cost-share for wetland restoration under 10-year contracts and 30-year easements, and 100 percent cost share on restoration under permanent easements. Payments for purchase of 30-year or permanent conservation easements.	NRCS State or local Office
Waterways for Wildlife	Private land	Technical and program development assistance to coalesce habitat efforts of corporations and private landowners to meet common watershed level goals	Wildlife Habitat Council (301-588-8994)
Wildlife at Work	Corporate land	Technical assistance on developing habitat projects into a program that will allow companies to involve employees and the community	Wildlife Habitat Council (301-588-8994)
Wildlife Habitat Incentives Program (WHIP)	High-priority fish and wildlife habitats	Up to 75 percent cost-share for conservation practices under 5- to 10-year contracts	NRCS State or local office
State fish and wildlife agencies and private groups such as Quail Unlimited, Inc., may have assistance programs in your area. Private wildlife and forestry consultants may also be able to provide planning and other assistance.			State or local contacts

References

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Established in 1981 to battle the problem of dwindling quail and wildlife habitat, Quail Unlimited, Inc. has become the only national, non-profit conservation organization dedicated to the wise management and conservation of America's wild quail as a valuable and renewable resource. This document was peer reviewed by: Daniel Stillinger, Southeast Regional Director, Quail Unlimited, Inc.
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