Southern Illinois University researchers demonstrate the importance of Conservation Reserve Program grasslands to Illinois bobwhite.

Quality Quail Habitat

Story and Photos
By Doug Osborne

"Mid-contract management may be the link needed to restore Illinois' 1.1 million acres of CRP grasslands and stabilize, or even reverse, declining bobwhite populations."

Improving foraging conditions for chicks may be the key to stemming the downward trend of Illinois' bobwhite population.

Northern bobwhite (*Colinus virginianus*) populations have declined in abundance across most of Illinois' historic breeding range over the past four decades. Although several contributing factors have been accredited to these declines, the limited availability of suitable nesting and brood-rearing habitat is undoubtedly the most important factor limiting bobwhite populations in Illinois today.

Bobwhites typically nest in moderately dense stands of tall, grassy vegetation in close proximity to areas of diverse vegetation with mixed perennial grasses, native forbs and sufficient amounts of bare ground. Such areas offer easily accessible travel corridors for bobwhite adults and chicks once they leave the nest.

Bobwhite chicks are precocial, meaning they follow the adults away from the nest site and start to gather food within a few hours of hatching. Chicks are capable of gathering their own food, consuming protein-rich insects during the first two weeks after hatch, with small grass and weed seeds making up the remainder of their diet. The importance of adequate and accessible food sources for bobwhite chicks and their ability to scratch the soil surface during the summer months is essential to their growth and survival.

Currently, the largest source of grassland habitat for nesting and brood-rearing bobwhite in Illinois is on private lands enrolled in the Conservation Reserve Program. First authorized in

The dense nature of tall fescue, a prominent component of the lands enrolled in Illinois' Conservation Reserve Program, is a deterrent to foraging bobwhite chicks.

1985 to control soil erosion, the program provides private landowners with annual rental payments to retire highly sensitive agricultural cropland from production and establish permanent vegetative cover under 10-year contracts.

Wildlife professionals and land managers highly anticipated the potential benefits of CRP grassland acres as habitat for bobwhite and other grassland-dependent songbirds. However, an early assessment of CRP in Illinois found that nearly 93 percent of the lands enrolled were planted to tall fescue (*Festuca arundinacea*), an exotic cool-season grass.

Tall fescue quickly becomes the dominant plant species within a grassland and outcompetes the native warm-season grasses and forbs. Within a few years, grasslands seeded to, or invaded by, tall fescue will become a monoculture of dense, sod-like grass that stays relatively short in height. Grasslands in this condition provide poor habitat for bobwhite due to the lack of overhead cover for concealment from aerial predators and extreme weather conditions.

Furthermore, the growth form of tall fescue obstructs the ability of bobwhites to maneuver through the habitat and access bare ground when in search of insects and seeds. Currently, Illinois has 1.1 million acres of retired cropland enrolled in various CRP grassland practices. Managing and maintaining healthy plant communities in these grasslands may be the link needed to stabilize bobwhite populations or even reverse the declining trends.

In 2004, the United States Department of Agriculture authorized a habitat improvement program known as mid-contract management. Administered by county Farm Service Agency offices, the program provides financial and technical assistance to restore diverse plant communities in aging CRP fields for bobwhite and grassland-dependent songbirds.

The program allows landowners to implement vegetation disturbance techniques such as discing, chemical herbicide applications, prescribed burning, and/or reseeding of native warm-season grasses, forbs, and legumes to improve grassland habitat conditions. Mid-contract management activities are standard practice in the conservation planning efforts of CRP fields enrolled after 2004; however, optional contract amendments are available for landowners with CRP fields enrolled prior to this date. See your local USDA-FSA office for details.

As part of a study evaluating the effects of mid-contract management in tall fescue-dominated CRP grasslands in south-central Illinois, in 2005 the Cooperative Wildlife Research Laboratory at Southern Illinois University began an investigation to assess whether such activities improve habitat conditions for foraging bobwhite chicks.

Researchers hypothesized that bobwhite chicks would capture more insects in managed fields than in

Mid-contract management of CRP fields, such as spraying, discing, and prescribed burning, improves quail habitat conditions.

Reared within a heat-controlled pen, bobwhite chicks were imprinted to humans to aid in the study of their feeding habits.

unmanaged fields. To test this, bobwhite chicks were imprinted to a human surrogate parent by spending 12 hours per day with them in an enclosed, heat-controlled pen. A whistle call, similar to an adult bobwhite calling its young, was sounded and chicks were hand-fed insects.

Once imprinted to humans, the chicks were taken to an outdoor pen and encouraged to follow the researchers through grassy vegetation by sounding the whistle call. At 10 days of age, groups of four chicks were released into the habitat and encouraging to follow the whistling human parent. Following a 30-minute feeding period, the chicks were recaptured and the food items that each chick consumed were identified.

Bobwhite chicks consumed a variety of insects, including true bugs, grasshoppers, crickets, beetles, ants, pill bugs, small grass flies, ground spiders and butterfly larvae. Bobwhite chicks instinctively scratch and search the ground for food and are capable of detecting insects with even the slightest movements. Interestingly, 68.9 percent of all food items consumed by bobwhite chicks during the experiment were ground-dwelling insects, specifically ants, pill bugs and small ground spiders.

A significant portion of a bobwhite chick's diet is ground-dwelling insects, such as ants, pill bugs, spiders, and, for one in particular, a mantid.

Bobwhite chicks maximize the energy gained from foraging by feeding on slow-moving insects and insects that gather in colonies, such as ants. Once an ant colony is found, bobwhite chicks are likely to stay and forage on them while the supply lasts. It is for this reason that habitats with sufficient amounts of bare ground appear to be essential to the survival of newly hatched chicks.

Project Support

Quail Unlimited provided critical support for the project and performed the field treatments through a grant from the Illinois Habitat Stamp Fund. Financial support for this project was provided by the Northern Bobwhite Restoration Project, the U.S. Fish and Wildlife Service Pittman-Robertson fund and the Illinois Habitat Stamp Fund.

Furthermore, research revealed that bobwhite chicks consumed nearly three times more insects in managed fields that in unmanaged fields. Experimental strip discing and herbicide treatments reduced the percentage of tall fescue cover, while increasing plant diversity and the percentage of bare ground in managed areas. By restoring the habitat with discing and herbicide, bobwhite chicks were able to move through the managed areas relatively unobstructed and forage more efficiently than in unmanaged areas.

The results of the study suggest that mid-contract management activities improved foraging conditions in managed fields for bobwhite chicks during the summer months. Researchers believe mid-contract management is the link needed to maximize CRP grassland benefits for bobwhite in Illinois.

Without continued landowner cooperation and participation in new programs such as mid-contract management, bobwhite populations most likely will continue to decline.

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