

# RESPONSE OF NORTHERN BOBWHITE, VEGETATION, SONGBIRD, AND ARTHROPOD COMMUNITIES TO THREE METHODS OF RENOVATING MONOTYPIC CRP GRASSLANDS IN SOUTHCENTRAL ILLINOIS

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## INTRODUCTION

Like most states in the midwestern and southeastern parts of the nation, Illinois has experienced dramatic declines in population abundance of species associated with grasslands and early successional habitats, including the northern bobwhite (*Colinus virginianus*). According to the North American Breeding Bird Surveys (BBS), Illinois bobwhite abundance declined at an annual rate of 1.9 % from 1966 to 2004 (Sauer et al. 2005). Declining bobwhite populations have been linked to agricultural expansion and intensification (Vance 1976, Brennan 1991, Ribic et al. 1998, Burger et al. 1994). Roseberry et al. (1979) also identified that deterioration of habitat quality associated with natural plant succession as a factor in bobwhite declines.

The Food Security Act of 1985 has greatly influenced grassland wildlife conservation in the United States (Farrand and Ryan 2006) with the establishment of the Conservation Reserve Program (CRP). The establishment of the CRP has resulted in a vast conversion of highly erodible cropland to grasslands. The potential benefits of the CRP in the agricultural landscapes for bobwhites were highly anticipated (Burger et al. 1990, Stauffer et al. 1990). However, early assessments of CRP benefits for bobwhites in Illinois failed to distinguish a link between bobwhite abundance and the amount of CRP grasslands in the primary bobwhite region (David et al. 1995). They found that more than 93 % of CRP fields were planted to exotic cool-season grasses such as Kentucky-31 tall fescue (*Festuca arundinacea*), probably because of the relative cost of the seed and its ability to quickly stabilize the soil. Brennan (1991) noted that low bobwhite abundance could be linked to a high percentage of fields planted to sod-forming fescue grass.

Since 1992 the amount of CRP in the primary quail range of Illinois has increased. However, bobwhite abundance has continued to decline (Sauer et al. 2003). Wayne County, Illinois currently has approximately 7800 hectares enrolled in CRP grassland practices CP1, CP2, CP4D, and CP10, a majority of this is more than 5 years old (per. comm. C. Trimble, NRCS). As these fields age the quality of the habitat diminishes, providing poor brooding habitat for bobwhites due to the lack of early succession and bare ground (Burger et al. 1994).

It appears that while the decline in bobwhite numbers is not correlated with the amount of CRP, it may be related to the quality of these grass stands within the agricultural landscape. This study investigates the effects of three farm management practices to renovate fescue-dominated CRP fields. Specifically, we are comparing the effects of disking, herbicide spraying and herbicide spraying with legume interseeding on bobwhite populations and on song bird, arthropod and vegetation species composition and abundance. We expect to see increase use of managed CRP fields by bobwhite broods, changes in grassland songbird species composition, increased arthropod abundance, and enhanced plant species diversity with at least some of these management practices.

## **OBJECTIVES**

- 1.) Determine if there are differences in effectiveness among the defined mid-contract management practices and unmanaged sites in enhancing bobwhite quail populations in southeastern Illinois
- 2.) Determine if there are differences in song bird, plant and arthropod communities due to mid management treatment practices.
- 3.) Evaluate the cost effectiveness of these methods in enhancing bobwhite quail populations in southeastern Illinois.

## **PROGRESS TO DATE**

All field sites were identified last fall (Fig. 1) and experimental treatments (i.e., strip disking, herbicide application, legume inter-seeding) were applied to one-third of the treatment fields (n = 30) for the 2005-06 field season. The first year's data collection of songbirds, arthropods and vegetation has been completed. We conducted 3 avian surveys per field (n = 60) from 31 May - 8 August 2006 using an area search technique. Arthropods we collected twice per field using a modified gasoline-powered Echo™ yard vacuum system. The arthropod samples were frozen and are in the process of being sorted and identified to taxonomic family. Vegetation characteristics were measured using Daubenmire and Robel techniques. Foraging trials were conducted in June and August using imprinted bobwhite chicks. We are now in the process of examining the contents of the esophagus and crop. All field work for the 2006 breeding season has been completed.

In October 2006, we will begin to apply treatments to a second one-third of each treatment field, adjacent to the strips treated in 2005. Legumes in the strips of 10 herbicide-sprayed fields will be drill-planted in March - April 2007.

## **PRESENTATIONS**

Osborne, D.C. 2006. Response of Northern Bobwhite, Vegetation and Invertebrates to Three Methods of Renovating Monotypic CRP Grasslands in Southcentral Illinois – Where we are. Wayne County Quail Unlimited Chapter, annual banquet. Albion, IL, January 21, 2006

Osborne D.C., D. Sparling, J. Cole, and D. Howell. 2006. Response of Northern Bobwhite, Vegetation and Arthropods to Mid-Contract Management in Aging CRP Grasslands of Southcentral Illinois. Gamebirds 2006. Athens, GA, May 31- June 2, 2006.

## **PUBLICATIONS**

None to date

## **FIELD DAY EVENTS**

Illinois Quail Management Workshop. Wayne County, Illinois. September 16, 2006. (Contact for information: John Cole, Illinois Depart. Natural Resources 217/782-6384, Dave Howell, Quail Unlimited 812/536-2272, or Doug Osborne Cooperative Wildlife Research Laboratory- SIUC 618/453-6959).

## **PARTICIPATING AGENCIES AND LANDOWNERS**

**John Cole.** Upland Game Bird Biologist, Illinois Department of Natural Resources. John served as our primary contact with the funding agency.

**Dave Howell.** Quail Unlimited. Dave serves as our link to QU and provides funding of management treatments and contacts to local landowners.

**Mel Gajewski.** Quail Unlimited, hired to apply treatment to all study sites during the next three years.

**Ray Webb.** Quail Unlimited Chair, Wayne County Chapter. Ray provided study fields and is a link to local landowners.

**Landowners-**Ray Webb, Allen Wilson, Vernon Gwaltney, Gary Kinney, John Masterson, Larry Smysor, Dave Schumm, Shirley MacDavid, Max Green, Greg Hibner, and Kenny Taylor

## **NRCS INVOLVEMENT**

**Charles Trimble.** District Conservationist, Wayne-Edwards Co. Natural Resources Conservation Services Office.

**Noelene Tubbs.** Acting CED, Wayne-Edwards County Farm Services Agency Office.

## **LITERATURE CITED**

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