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Reggie E. Thackston

*Georgia Department of Natural Resources*

D. Clay Sisson

*Tall Timbers Research Station*

Tyson L. Crouch

*Tall Timbers Research Station*

Danna L. Baxley

*Kentucky Department of Fish and Wildlife Resources*

Ben A. Robinson

*Kentucky Department of Fish and Wildlife Resources*

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# HUNTER HARVEST OF PEN-REARED NORTHERN BOBWHITES RELEASED FROM THE SURROGATOR®

Reggie E. Thackston<sup>1</sup>

Georgia Department of Natural Resources, Wildlife Resources Division, Forsyth, GA 31029, USA

D. Clay Sisson

Tall Timbers Research Station, Albany Quail Project, Newton, GA 39870, USA

Tyson L. Crouch

Tall Timbers Research Station, Alabama Quail Project, Hurtsboro, AL 36860, USA

Danna L. Baxley

Kentucky Department of Fish and Wildlife Resources, Frankfort, KY 40601, USA

Ben A. Robinson

Kentucky Department of Fish and Wildlife Resources, Frankfort, KY 40601, USA

## ABSTRACT

There has been increased interest in releasing pen-reared northern bobwhites (*Colinus virginianus*) to meet quail hunting and shooting objectives as populations have declined. The Surrogator® is a commercially available product for rearing and releasing gamebirds into the wild and is promoted as a method to enhance bobwhite survival, improve hunting, and increase recruitment from natural reproduction. We used return-to-hunter bag data from 3 properties in Alabama, Georgia, and Kentucky to evaluate the Surrogator® as a pre-hunting season release technique for pen-reared bobwhites. Across all sites, 3,859 5-week old banded bobwhite chicks were released at varying times during June through October, 2005–2010. Ninety-three quail hunts were conducted during November through January 2005–2011 comprising 431 hunt party hours which resulted in 19 banded bobwhites being harvested. The return-to-hunter bag for all sites combined was 0.005 (range = 0.000 to 0.008). This was considered unsatisfactory at each site and across all sites combined for a quality hunting/shooting experience. The mean cost per chick released was \$3.41 (range = \$2.74 to \$3.88) including the costs of quail chicks, Surrogator® units, propane, and feed across all sites. The mean cost per bird returned-to-hunter bag (Alabama and Georgia) was \$655.80 (range = \$489.91 to \$821.68). These costs did not include economic depreciation of Surrogator® units.

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**Key words:** Alabama, bobwhite chicks, *Colinus virginianus*, Georgia, hunter harvest, Kentucky, Surrogator®

## INTRODUCTION

Northern bobwhite populations across the eastern United States have experienced severe long-term declines (Sauer et al. 2011) primarily as a result of widespread changes in land use, which have greatly reduced habitat suitability (Klimstra 1982, Brennan 1991, Burger 2002, NBTC 2011). This decline has resulted in decreased wild quail hunting opportunities, declining quail hunter numbers and harvest, and led to an apparent increase by landowners and managers in releasing pen-reared bobwhites to meet quail hunting/shooting objectives. For example, in Georgia during the 1960–1961 quail hunting season, 142,000 ( $\pm$  20,000 SE) bobwhite hunters comprised 50% of the state's licensed resident hunters and harvested an estimated 3,518,000 ( $\pm$  888,000 SE) bobwhites (Georgia Game and Fish Commission 1961).

The number of bobwhite hunters decreased to 22,423 ( $\pm$  1,054 SE) by 2008–2009 and comprised only 10% of licensed resident hunters. These hunters harvested an estimated 808,036 ( $\pm$  39,977 SE) bobwhites, of which 97% were reported as pen-reared birds (Duda et al. 2009).

Pen-reared bobwhites have long been released to improve hunting and augment self-sustaining wild quail populations (Stoddard 1931, Buechner 1950). However, studies have shown that pen-reared quail do not adapt to wild conditions, experience low survival, and are ineffective for sustaining or increasing wild populations (Frye 1942, Barbour 1950, Klimstra and Scott 1973, Fies et al. 2000, Perez et al. 2002). New release techniques continue to be developed and marketed with claims of increasing survival of pen-reared bobwhites released into the wild. These releases may help sustain the sport of quail hunting, but are cause for concern for conservation agencies and organizations focused on wild quail habitat management and population restoration. Pen-reared

<sup>1</sup>E-mail: reggie.thackston@dnr.state.ga.us



Fig. 1. Surrogators®, commercially available propane-powered gamebird brooders, were used to release 5-week old pen-reared northern bobwhite chicks during June through October 2005–2010 on study sites in Alabama, Georgia, and Kentucky. (Photograph courtesy Georgia Department of Natural Resources Wildlife Resources Division).

releases may serve to divert landowner and organizational resources from habitat restoration and management (Stoddard 1931), and may pose risks to wild quail populations through increased disease, predation, social dispersion, and genetic dilution (Brennan 1991, Eggert et al. 2009).

The Surrogator® is marketed by Wildlife Management Technologies (WMT 2011) as a technique whereby “birds become imprinted on the surrounding area” and ultimately “establishes a huntable game bird population” ([www.wildlifemanagementtechnologies.com](http://www.wildlifemanagementtechnologies.com)) (Fig. 1). It is widely promoted through magazine articles, cable television, and the internet as an effective pen-reared gamebird release system; this has generated numerous inquiries to state wildlife agencies relative to its effectiveness for pre-hunting season gamebird release and population restoration. Thus, in response to the growing popularity of the Surrogator®, landowners in Alabama, Georgia, and Kentucky worked with researchers to objectively evaluate this system. We used Surrogators® in each state to release bobwhites on properties comprised of high quality, well-managed habitat but where wild quail populations were insufficient to meet landowner hunting objectives. The sites differed in geographical location, cover type composition, and

management practice application and intensity, but shared the commonality of being comprised of high quality early succession habitats considered to be capable of supporting bobwhites. We used return-to-hunter bag data and other metrics from each site to independently evaluate the Surrogator® as a pen-reared bobwhite pre-hunting season release technique.

## STUDY AREAS

### Alabama Study Site

The study site was 1,214 ha of privately owned property in the Alabama Upper Coastal Plain Region, Russell and Barbour counties (32.157447–85.334028). The area had been intensively managed for > 30 years to produce high quality habitat for bobwhites with predominant cover types being open canopy pine (*Pinus* spp.) forest with contiguous fire maintained savanna ground cover interspersed with fallow fields maintained by seasonal disking and planting. The forest overstory was comprised of a mixture of loblolly (*P. taeda*), longleaf (*P. palustris*), shortleaf (*P. echinata*), and slash (*P. elliottii*) pines. The understory consisted primarily of native early successional plant species predominated by native warm



Table 1. Northern bobwhite chicks marked and released (range) from Surrogators® in Alabama, Georgia, and Kentucky during June through October 2005–2010.

Study site	Number marked chicks	Number release sub-sites	Mean number chicks/released	Marking method	Release years
Alabama	1,366	6	137 (20-141)	Wing tagged	2008–2009
Georgia	1,641	8	109 (89-129)	Wing tagged	2005
Kentucky	852	4	86 (24-121)	Leg banded	2007, 2009–2010
Totals	3,859	18	110 (20–141)		5

season bunch grasses, e.g., broomsedge (*Andropogon virginicus*) and little bluestem (*Schizachyrium scoparium*), legumes (Fabaceae), and blackberry (*Rubus* spp.). Additionally this site was characterized by the practices of meso-mammalian nest predator control and year-long broadcast spreading of supplemental feed. These practices were not part of our study design nor were they tested as treatments.

### Georgia Study Site

This site was 202 ha in the Georgia Piedmont Physiographic Region, Monroe County (33.126386–83.843783). Bobwhite management had been the primary objective of the property for well over a decade. It was a fire-maintained pine savanna with native grass-forb-shrub ground cover and scattered fallow fields. Historical and ongoing management included meso-mammalian predator control and supplemental feeding.

### Kentucky Study Site

This site was comprised of 303 ha of privately owned land (38.097758–84.857193) in the Bluegrass Physiographic Region of Woodford County, Kentucky. Bobwhite management has been the primary objective of the property for nearly a decade, and the habitat had been extensively renovated. The site was characterized by fallow fields established and maintained through conversion of Kentucky 31 tall fescue (*Festuca arundinacea*) to native warm season bunch grasses including Indiangrass (*Sorghastrum nutans*), little bluestem, and big bluestem (*Andropogon gerardii*). Intact fence rows and blackberry thickets were present throughout, as well as fallow fields of common ragweed (*Ambrosia artemisiifolia*). The primary management techniques used to maintain the habitat were rotational prescribed burning, small disked blocks (< 1 ha), and herbicide use to eradicate non-native species.

## METHODS

We worked independently at varying times and sites during June–October 2005 and 2007–2010 and used commercially available propane-powered brooders (Surrogators®) (WMT 2011) to release bobwhite chicks on study sites in Alabama, Georgia, and Kentucky. Quail chicks (1–7 days of age) were purchased from reputable producers, placed in Surrogators® with ample feed and water, and released at age 5 weeks. The Surrogators®

were in landscapes deemed to be high quality early successional habitats. Costs of brooders, propane, chicks, and feed were recorded.

The chicks in Alabama and Georgia were marked at the time of releases with self-piercing monel wing tags (Style 4-1005, Size 1, National Band and Tag, Newport, KY, USA) following Caver et al. (1999). Chicks released on the Kentucky site were leg banded with plastic colored leg bands (2007) and metal leg bands (2009, 2010). Thirty-five releases resulted in 3,859 chicks being liberated across all sites and years. The releases were conducted on 18 sub-sites with a mean of 110 (range = 20-141) marked chicks per release (Table 1).

Quail hunts were conducted during November–January in years following summer bobwhite chick releases using pointing dogs and at least 2 hunters per party. Hunt parties attempted to methodically cover the release sites. Records were maintained of total hunts, hours hunted, and marked birds in the hunter harvest. Satisfaction level surveys were completed by hunters at the Kentucky site for all hunts during the 2009–2010 season.

## RESULTS

Ninety-three quail hunts were conducted across all sites and years comprising 431 hunt party hours resulting in harvest of 19 marked bobwhites; this equated to a 0.005 proportional return to hunter bag (Table 2). Hunter surveys on the Kentucky site showed that 95% of the hunters were unsatisfied to highly unsatisfied with covey numbers, and 68.2% indicated their overall hunt quality to be unsatisfactory.

The costs associated with Surrogator® releases were similar across all sites and averaged \$1,666.00 (range = \$1,350.00 to \$1,849.00) per Surrogator®, \$0.41 (range = \$0.35 to \$0.45) per quail chick, \$309.00 (range = \$150.00 to \$600.00) for propane, and \$169.00 (range = \$104.00 to \$252.00) for chick feed. The mean cost per bird returned-to-hunter bag (Alabama and Georgia) was \$655.80 (range = \$489.91 to \$821.68). These costs did not include economic depreciation of Surrogator® units.

## DISCUSSION

The Surrogator® technique in this study failed across a wide geography of sites with varying management intensities. Our results are consistent with other studies (Fies et al. 2000, Kinsey 2011) that found pre-season

Table 2. Return-to-hunter bag and cost per bird harvested for pen-reared northern bobwhites released from Surrogators® in Alabama, Georgia, and Kentucky during November through January 2005–2011.

State	Marked bobwhites released	Number hunts	Number hrs hunted	Number marked bobwhites harvested	Return to hunter bag	Cost <sup>a</sup> per marked bobwhite harvested
Alabama	1,366	59	321	5	0.004	\$821.68
Georgia	1,641	15	70	14	0.008	\$489.91
Kentucky	852	19	40	0	0.000	NA
Totals	3,859	93	431	19	0.005	NA

<sup>a</sup>Cost calculations based on chicks, brooders, feed, and propane; brooder cost is not depreciated.

release of pen-reared bobwhites to be ineffective for significantly increasing bobwhite abundance during the hunting season. Specifically, Kinsey (2011) used Surrogators® to release bobwhites in south-central Texas and reported 8% as his best survival to hunting season. He concluded the Surrogator® was ineffective as a method for supplementing wild bobwhite populations. Similarly, Lusk et al. (2009) used Surrogators® to release ring-necked pheasants (*Phasianus colchicus*) in Nebraska and through radiotelemetry documented a 12% survival rate from time of release to the hunting season and an annualized survival of < 1%. They reported a return to hunter bag of 3.5% and concluded the release system would not increase pheasant populations. We did not radiomark any of the birds released and it remains unknown whether the paucity of quail in the hunting seasons in our study areas was due to poor survival and/or emigration. However, published studies documenting survival of Surrogator® released pen-reared quail and pheasants lead us to speculate the low return-to-hunter bag in our study was due primarily to on site mortality and not emigration.

## MANAGEMENT IMPLICATIONS

We found Surrogators® to be ineffective at each site independently and across all sites and years combined as a pen-reared bobwhite pre-season release technique to augment fall-winter bobwhite hunter harvest. The proportion of released birds harvested was low and the cost per bird was high. We strongly suspect Surrogators® would have been ineffective on these sites as a technique for increasing spring bobwhite abundance to enhance population restoration based on the paucity of marked birds returned-to- hunter bag.

Habitat management to increase wild quail populations remains the only viable solution for providing high quality bobwhite hunting. However, releasing pen-reared bobwhites may be the only alternative in poor quality landscapes incapable of sustaining wild quail populations. The potential return-to-hunter bag and associated costs in these situations should be considered in the decision-making process relative to the release timing and technique.

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