



# LOUISIANA BOBWHITE RECOVERY PLAN







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# Table of Contents

<b>Acknowledgments.....</b>	<b>1</b>
<b>Executive Summary.....</b>	<b>2</b>
<b>Introduction.....</b>	<b>3</b>
<b>Section 1: History and Ecology of Bobwhites.....</b>	<b>4</b>
History of Bobwhites in Louisiana.....	4
Bobwhite Ecology.....	6
Reproduction.....	7
Covey Structure & Hunting Season.....	8
Population Status.....	8
Cause of Decline.....	10
<b>Section 2: National Bobwhite Conservation.....</b>	<b>11</b>
National Bobwhite Technical Committee.....	11
NBCI 2.0: National Bobwhite Conservation Initiative.....	11
Habitat-Centric Restoration & Conservation Targets.....	11
NBCI Focal Tiers.....	11
Definition of the Three NBCI Focal Tiers.....	13
<b>Section 3: Bobwhite Restoration in Louisiana.....</b>	<b>14</b>
Challenges & Opportunities.....	14
Habitat Management Implementation Strategy.....	22
NBCI Focal Regions.....	22
NBCI Focal Landscape.....	22
NBCI Focal Areas.....	22
Assessing & Monitoring Progress.....	22
Translocation.....	24
<b>Section 4: The Future of Bobwhites.....</b>	<b>25</b>
Initiating Management & Conservation.....	25
Funding Opportunities.....	26
Call to Action: Your Roll in Bobwhite Restoration.....	27
<b>Literature Cited.....</b>	<b>28</b>
<b>Appendices.....</b>	<b>30</b>
Appendix I: BMPs.....	30
Appendix II: Commonly Used Acronyms.....	31
Appendix III: Translocation Guidelines.....	32

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# Executive Summary

Northern Bobwhites (*Colinus virginianus*) have been declining range-wide and throughout Louisiana for much of the past five decades. These population declines are not unique to quail and extend to numerous grassland birds and early-succession obligates. Many of these species are, or have become as a result, threatened and endangered (e.g., Red-cockaded woodpeckers [*Picoides borealis*], Attwater's prairie chicken [*Tympanuchus cupido attwateri*], Dusky gopher frog [*Lithobates sevosus*], and gopher tortoise [*Gopherus polyphemus*]). The extent and magnitude of these declines seem to be worsening each decade. The loss of these species is of great conservation concern as they are often indicators of ecosystem integrity (Sauer et al. 2019). These losses are symptomatic of a landscape-level problem related to loss and degradation of quality early-successional habitat across the state.

Northern Bobwhites are a flagship species making them ideal candidates for habitat restoration efforts because bobwhites are: (1) an iconic, socio-economically important species in the Southeastern US and the State of Louisiana; (2) declining at an alarming rate, more so than any other grassland bird species (Sauer et al. 2019); (3) sensitive to changing (positive or negative) biological processes; (4) receiving national attention for population recovery resulting in a multi-state initiative to restore early-successional habitat; and, (5) good indicators of habitat quality by which other species are expected to respond favorably from habitat restoration efforts for bobwhites.

In Louisiana, past efforts to restore bobwhite habitat have targeted a handful of private landowners directly requesting management assistance as well as a few public land tracts that were selected specifically for bobwhite management and conservation. To date, these efforts have generally been sporadic and produced limited results in terms of bobwhite population response. More recently the identification of focal landscapes and regions will afford the application of intentional management in concentrated areas to maximize benefits to bobwhites and increase overall conservation value.

The National Bobwhite and Grassland Initiative (NBGI) provides a habitat-centric framework for bobwhite restoration, research, and population monitoring. As such, this plan steps down the NBGI to facilitate on-the-ground delivery of habitat through concentrated dollars and effort to areas of high potential for success, and provides best management practices that will maximize opportunities and mitigate constraints.

The ultimate purpose of this plan is to provide strategic guidance for recovering bobwhites in the State of Louisiana with the understanding that the bobwhite declines are a national problem, but require a state-initiated solution (Palmer 2011). What we do in Louisiana makes a difference regionally and nationally for bobwhite restoration. In addition, conservation action to benefit bobwhites will preserve the structure and function of a wide range of habitats and also benefit a plethora of other species.



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## Introduction

Northern Bobwhites (*Colinus virginianus*; hereafter, bobwhite[s]) hold a special place in the hearts and memories of Louisiana sportsmen. This formerly abundant Prince of Game Birds was prized by hunters for a multitude of reasons. In days past, their abundance and unique habits lured many hunters to the sport. Bobwhites are gregarious by nature often living in beavies, or social groups, in the form of broods in the breeding season and coveys in the fall and winter. Coveys were at one time prevalent on the landscape and relatively easy to locate in the fall as they whistled the common “Koi-lee” sound early in the morning. Indeed, it was not uncommon at the sound of the first covey to hear report-whistles from several other coveys in the area. Today, however, the whistling activity is all but gone, and when present, is often short and few.

This early-morning whistling activity signaled to hunters that birds were in the area and it was time to unload their favorite setter, pointer, or spaniel in hot pursuit. Once bird dogs located the covey and locked on-point, hunters would approach with shotguns at the ready. Suddenly the silence would be interrupted by the thunderous rise of individual members of the covey simultaneously. Birds of such coveys seemed to seldom fly toward the hunter’s predicted direction. And, even the heart of an experienced bird hunter might skip a beat prior to his gun seeking target. The skilled (or lucky) bird hunter would bring home what many have called the finest wild table fare. Even greater than the harvest was time spent with friends and bird dogs. As lifelong Louisiana quail hunter Bill Herrin once put it: “It’s all about good friends and those dogs doing what the good Lord gifted them to do.”

Others having lived in the “time of plenty” may have never hunted bobwhites but gained a similar fondness of this most handsome of grassland birds. Its classic “bob-white” mating call filled the warm Louisiana summer days and stirs childhood memories of the great outdoors. Today, these calls are much less common leaving only memories of quail and a feeling as if a part of Louisiana has been taken away. How did this loss of bobwhites happen? And what can be done to restore this species of such great heritage?

Alongside Louisiana, other states in the historic range experienced similar population declines and some at alarming rates. Each state shares some common factors linked to the declines. But the overriding factor responsible for the decline of bobwhites is a widespread change in land use and how this use, and sometimes abuse, has impacted habitat. The good news is that where good bobwhite habitat management principles are employed, even in today’s landscape, bobwhites can respond favorably.

### WHY A RECOVERY PLAN?

From time to time certain species diminish to levels that require considerable thought, planning and effort to restore them. Without a comprehensive recovery strategy, recovery efforts can become haphazard or of such small scale that efforts produce little sustained effect. As such, the purpose of this bobwhite recovery plan is to provide a roadmap to recover bobwhites through the intentional prioritization and targeting of resources to improve success and effective utilization of conservation dollars and efforts. We have no time to waste! If we are going to see success in our lifetime, we must implement the plan rather than plan to implement. With that in mind, it is our desire that this plan will provide the most direct route to effective delivery of conservation action(s) and result in a realized bobwhite response.

We believe that the nexus between planning and seeing true results is informed, intentional management on the landscape. Thus, a common understanding of bobwhite history and ecology (Section 1) is requisite to identifying that HABITAT is not only the problem but it is also the SOLUTION. In Section 2, we outline national conservation strategies underway for recovery of bobwhites but suggest that habitat-centric restoration is ultimately state-initiated. We then propose (in Section 3) that what we do in Louisiana not only makes a difference regionally and state-wide but nationally as well. And finally in Section 4, we submit a call to action such that success will require all of us to make the necessary changes for bobwhite recovery. We have collectively caused bobwhites to decline, we must collectively work together to bring them back!

# Section 1: History and Ecology of Bobwhites

## HISTORY OF BOBWHITES IN LOUISIANA

The earliest record of bobwhites came from Hernando DeSoto's expedition that landed on the Florida coast in 1539. It was reported that DeSoto was presented "partridges" and wild turkeys as a gift. It is believed that prior to European settlement in Louisiana, low to moderate bobwhite numbers occurred in the native prairies located in today's Acadiana rice belt region, dryer coastal grassland edges, and upland pine forests. These sites benefitted from intermittent disturbance by hurricanes, and were frequently burned as a result of lightning and/or aboriginal ignited fires which yielded habitat for bobwhites. Bobwhite abundance increased as farming expanded prior to the Civil War. As Louisiana's remaining virgin forests were cleared during the late 1800s and early 1900s small farming also reached its zenith. These events created several decades of exceptional habitat conditions for bobwhites. In fact, it is estimated that Louisiana's highest bobwhite abundance occurred thereabout 1910 through the mid-1920s (St. Amant 1959).

The stock market crash of 1929 initiated the Great Depression during which bobwhite habitats experienced more change. By the 1930s and '40s Louisiana bird hunters began reporting declines in bobwhite numbers. We now know that these reports were the beginning of state and range-wide population declines documented years later in the annual Breeding Bird Survey (BBS) (*Figure 1*). These declines are linked to several factors associated with changing land

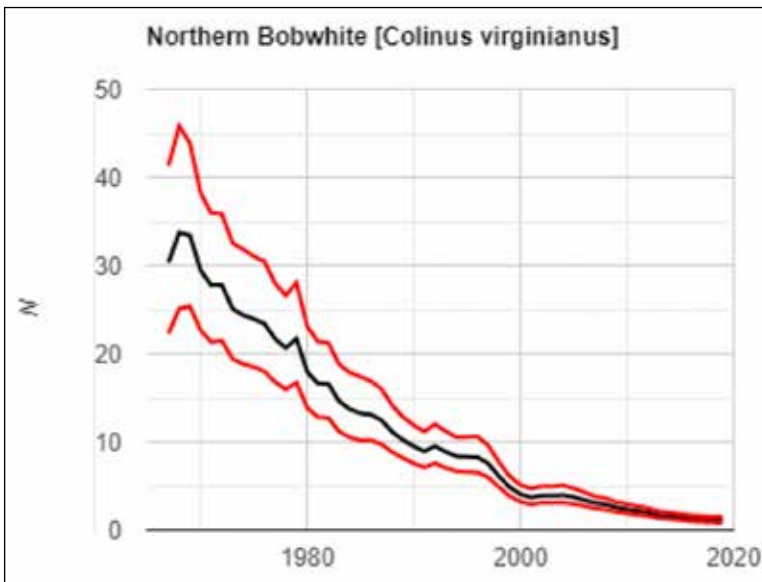
use since the Great Depression. In Louisiana this catalyzed a land use shift from small farm row-crop agriculture to grazed pasture. In 1950, it was estimated that there were some 1,240,000 bobwhites statewide - an approximate 30% decline from the early 1900s. The 1950 Louisiana Wildlife Inventory reported most of the bobwhites occurred in Northwest Louisiana Uplands, Southeast Louisiana Terraces, Mississippi-Atchafalaya Bottomlands, Macon Ridge, Southwest Louisiana, North Central Louisiana, and Coastal Marshes/Prairie in descending populations (St. Amant 1959).

With growing public pressure to do something to help bobwhites, the Louisiana Wildlife and Fisheries Commission attempted to augment wild bobwhites with the release of 144,029 pen-reared bobwhites. According to LDWF records, these birds were released from 1949 through 1952 across the state. All were leg banded to monitor harvest rates. Only 855 were reported as harvested. Early studies conducted in the 1940s (Perkins 1945, Perkins and Vernon 1947), and later repeated in the 1990s (Kimmel 1995), demonstrated that pen-reared bobwhite releases probably did more to augment predator diets than wild bobwhite populations. Pen-reared bobwhites simply lack the survival skills to avoid predators and within a few days suffer catastrophic losses. In 1952, the release of pen-reared bobwhites was abandoned due to lack of success. At this time restoration effort was more appropriately placed on habitat enhancement. Since bobwhites were still common in farming areas, biologists worked to educate farmers and



Much of Louisiana's virgin pine forests were cutover in the late 1800s and early 1900s via hundreds of temporary rail lines. (Center for Southeast Louisiana Studies, Archives, and Special Collections, Southeastern La. Univ.)





**FIGURE 1.** North American Breeding Bird Survey of Bobwhites 1967-2019 for the State of Louisiana (Sauer et al. 2019) (N = number of birds per route).

### WHY HAVE WE LOST BOBWHITES IN LOUISIANA?

Habitat loss and/or degradation is the leading cause of the precipitous declines impacting bobwhites in Louisiana. This has been a result of several land use changes in the State such as:

- A shift from small scale (patchy, small field) to large scale farming yielding “cleaner” farming practices
- Conversion of farmlands to pastureland
- Short-rotation timber management
- Fire exclusion and suppression

Photo courtesy of L. Stafford



Successful quail hunt in Washington Parish (1973).

landowners in ways to promote improved bobwhite habitat. Bobwhite numbers, while still declining, remained good by today’s standards throughout much of the state’s farming areas through the 1960s and in piney woods habitat through the 1970s.

By the 1970s, sharp declines had already begun in the Mississippi, Atchafalaya, and Red River alluvial valleys as “clean” farming practices increased. Clean (weed/pest free) farming was a result of widespread use of herbicides and pesticides, and planting crops roadside to roadside and ditch bank to ditch bank - leaving little-to-no residual habitat for wildlife. Decades prior to the clean farming era, fallow field management was the norm whereby a rotation of an annual non-leguminous crop (e.g., corn) was planted, followed by a legume crop (to rebuild the soil), and then the field was left idle (fallow) for a period of time (typically one growing season). In addition, these fields were small and numerous and fallow fields were rotational among fields. This traditional method of rotational farming created superb bobwhite habitat. Clean farming all but eliminated these important breeding grounds.

Bobwhites persisted in moderate quantities into the 1980s within some industrial forestlands that were being managed for pine sawtimber. Prescribed burning (occurring every one to three years) was commonly utilized in these stands to control unwanted brush and competition during this period. The incorporation of thinning and burning of these maturing timber stands encouraged lush groundcover to flourish and resulted in a relatively open pine stands benefiting bobwhites and other early-succession species. In many parts of the state, these woodland savannah-like forests stretched for miles interrupted only by the occasional clearcut providing additional quality bobwhite foods. However, by the mid-1980s, management regimes evolved and many industrial timber stands began to be managed on a shorter harvest rotation due to changes in wood markets. Previous rotations that would grow timber stands 40 to 70 years decreased to 24 to 30 years. These shorter rotations were also managed for near exclusively loblolly pine replacing old growing stands of longleaf pine. This, in turn, resulted in a shift from a sawtimber rotation where timber stands were thinned three or more times toward a pulpwood rotation where stands were thinned only once or twice and then clearcut. The shortened rotation had pejorative effects on bobwhites such that the new emphasis on timber production resulted in closed canopy and poor understory habitat in managed pine timber. This transition in forest and habitat management also occurred on properties owned by non-industrial private landowners as they rely on the same markets for forest products as many of the industrial landowners.

Of greater detriment to bobwhites than the shorter rotation was the substantial decrease in the amount of prescribed fire used by industrial and private landowners during this period as well. By the 1990s many landowners abandoned the use of fire to manage forests and site prepare clearcuts for new forests. This loss of fire on the landscape resulted in a dramatic change in groundcover plant species and a reduction in overall habitat quality within forestlands. Thus, the continuity of the open pine savan-

na, once prevalent in Louisiana through the early to mid-90s, greatly diminished and so too did bobwhites. As a result, a shift in consumptive and sporting use of wildlife also occurred on these forest lands. Hunter emphasis shifted from the once prevalent bobwhites to white-tailed deer. During the 1980s and 1990s much of Louisiana's upland industrial forestland was leased for deer hunting which reduced unrestricted access for bird hunters. This coupled with a declining quail population resulted in precipitous declines in the number of bobwhite hunters. In fact, 1980 to 1990 marked the greatest decline in the number of bobwhite hunters in Louisiana (Figure 2).

Taken collectively, the widespread loss and/or degradation of habitat and decline in hunter access to large acreage significantly impacted the number of bobwhite hunters during the 1980s and 1990s. This double-edged sword was catastrophic for bobwhite conservation in Louisiana. As a result, population declines have been steady and dramatic.

In December 2005, the Louisiana Comprehensive Wildlife Conservation Strategy (Lester et al. 2005) reported the Northern Bobwhite as a "Species of Conservation Concern." It was again listed as such in the 2015 revision (Holcomb et al. 2015). The 2021-2022 Louisiana Big and Small Game Harvest Survey estimated that there were only 1,000 wild bobwhite hunters remaining in the state with only 1,800 wild bobwhites being harvested in an estimated 4,500 days afield.

## BOBWHITE ECOLOGY

The bobwhite is a gregarious but secretive bird and one of North America's most important game birds, especially in the southern and Midwestern portions of its range. Common to the order Galliformes, bobwhites are adapted for a primarily terrestrial existence. For instance, their feet and claws are relatively large reflecting their use for scratching and digging to uncover food. The short, rounded wings are powered by strong breast muscles required for short,

rapid bursts of flight needed to escape from predators. They are incapable of longer extended flights but prefer to spend the majority of their life on the ground. The food consumption of bobwhites are varied with a mostly vegetarian diet, primarily seeds and some parts of succulent green plants, but they also take large numbers of insects, worms, and other invertebrates.

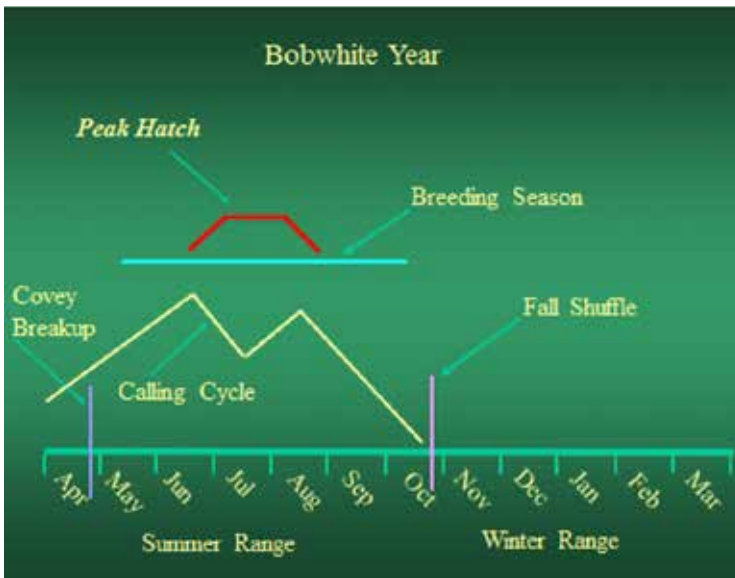
Bobwhites suffer high annual mortality rates but they offset this annual loss by having a robust reproductive capacity. The species has a rapid population turnover and a relatively short life span (the average life-expectancy is <6 months). Research supports that adult survival is a key demographic in population stability and growth. Successful predator avoidance and survival is tightly associated with the quality of habitat.

Successful management of bobwhites will focus on intentional manipulation of habitat to minimize predation and maximize reproduction by ensuring adequate amounts of high quality cover conditions exist year-round. Bobwhites require the proper balance and arrangement of early-successional plant communities to provide the necessary habitat components. Specifically, bobwhites require roosting, nesting and feeding cover that is structurally open at the ground level with protective cover from predators above. They prefer habitat that includes bare ground (for ease of mobility and access to food items) and a mixture of herbaceous (forbs/legumes) cover, native bunch grasses (nesting habitat), and woody (shrub-scrub) cover (escape, loafing and roosting habitat). This balance can be achieved through the proper application of prescribed fire.

Herbert L. Stoddard opined the bobwhite the "Firebird." This is because prescribed fire is the most economical and efficient tool to maintain the proper balance of habitat components required by bobwhites year-round. Controlled fire used at the proper frequen-



FIGURE 2. Change in number of quail hunters and harvest in Louisiana based on annual LDWF hunter surveys 1981-2021.



**FIGURE 3.** The annual life cycle of bobwhites.

cy, season and spatial extent (scale), and under the proper weather conditions, for the purpose of regulating cover and increasing food supply is a necessary tool for managing habitat. It is an essential feature in any sound quail program. In addition to prescribed fire other available tools (disking, chopping, mowing, timber harvest, managed grazing, etc.) can aid in managing and maintaining proper cover conditions. However, to be a successful manager of habitat for bobwhite, it is important to understand their annual cycle and life-history (Figure 3).

## REPRODUCTION

Depending on the weather, bobwhites begin forming individual pairs by mid-March and April. Pair bonds will form and break, then re-form throughout the breeding season which may last well into September. Both mates assist in nest development and nests are located on the ground often nestled at the thick base of native grasses such as little bluestem (*Schizachyrium scoparium*), broomsedge bluestem

(*Andropogon virginicus*), eastern gamagrass (*Tripsacum dactyloides*), and switchgrass (*Panicum virgatum*). Females lay their eggs within a week of nest building until the entire clutch (average 12-15 eggs) is laid, and the adult incubates the eggs for a period of approximately 23 days. The survival rate of nests varies due to depredation, abandonment (disturbance) and weather. Common ground-nesting predators include raccoons (*Procyon lotor*), opossums (*Didelphis virginiana*), feral cats, foxes, skunks, bobcats (*Lynx rufus*), coyotes (*Canis latrans*), weasels (*Mustela spp.*), snakes, rats, and ants.

Reproductive attempts (from start of nest building to time of hatch) may require up to 50+ days. Most hatching occurs from late June to September with often two peak periods. Fall harvested quail wings and trapping data collected in Louisiana from 1984–1998 indicated a higher percentage (80.7%) hatching late July to September or later (Kimmel 1995). These data indicate the importance of the late hatch but are likely biased late due to later hatched bobwhites being more likely to survive until hunting season. Bobwhites exhibit a complex breeding strategy such that polygamy and promiscuity (especially serial polygyny and polyandry) result in extra-pair paternity and there is high male involvement in parental care including male incubation and brood rearing. In addition, bobwhites are multi-nesters (commonly re-nest in a single season) and can have multiple successful clutches in a single season (as many as three hatches in a single season).

They are precocial and nidifugous (capable of moving and feeding independently upon hatch) birds but require parental care to aid in thermoregulation during the first couple of weeks of life. As such, brood amalgamation and brood adoption is common. Parenting adults seek out insect-rich habitats (fallow fields or burned woodlands) that provide the right amount bare ground facilitating chick movement and food items (insects and arthropods). The diet of bobwhite chicks is comprised of >80% insects and arthropods for the first 2 weeks of life and then they begin to shift to seeds and vegetation. Chicks begin to fly at 13-14 days of age. This improves their ability to escape predators.



The left is a hen bobwhite on the nest. On the right chicks are called out of the nest by the adult within minutes of hatching to begin life foraging for insects.



Photo by S. Smith

Where quality bobwhite habitat occurs in Louisiana, bobwhites can still be successfully hunted but such areas are few and far between.

Native bunchgrasses used for nesting are typically found in unburned areas, especially early in the season, and brood rearing habitat is typically best in fallow fields or recently burned areas. As such, providing a matrix of burned and unburned habitats is important for optimizing reproduction and survival of young.

## COVEY STRUCTURE & HUNTING SEASON

By late summer (late September and early October), bobwhites begin to form social groups called coveys (average covey size is 12 birds). Individuals in a covey are sometimes genetically related but the “fall shuffle” (the period of transition from mating, increased movement and bird socialization) increases genetic structure through increased interactions and intermixing of broods. During October and November, coveys whistle using the common “Koi-lee” call to refine social structures and develop territories (covey home ranges); however, covey ranges may overlap depending on overall bird density. The covey unit remains intact until covey break-up, just prior to the onset of reproduction in mid-March and early April, and exhibits the night roosting behavior of forming a circle on the ground, with tails together and heads pointed out. This behavior is believed to increase survival through improved vigilance (predator avoidance) and has social and heat-conservation implications.

Hunting seasons in most states occur during this stage of the annual life cycle during November through February. This generally occurs when bird numbers are at their greatest levels and approximately 65-80% of the population are first year birds. Research has shown that moderate harvest rates do not negatively influence healthy bobwhite populations. Moderate harvest of bobwhites accounts for natural

predation and does not typically result in additive mortality. In most instances, hunting has little or no impact on bobwhite populations because the number of bobwhite hunters have declined so severely that harvest pressure is very low or regulated in cases of high hunter demand (Wann et al. 2020). Ideally, managers should conduct fall covey counts and set a maximum number of birds harvested based on moderate harvest rates of 15% of the fall population. According to game bird managers, harvest rates exceeding 20% may have deleterious impacts on the population and is not recommended.

The influence of weather on bobwhite population dynamics cannot be overlooked. Extreme weather such as extended cold or heat can affect bobwhite abundance. Late winter snows, especially in northern latitudes, can make foraging for food difficult but seldom is this an issue in Louisiana. Excessive rain during the hatch can cause exposure mortalities in chicks, and too little rain post hatch can create habitat and insect deficiencies. Weather is beyond man’s control but it should not be discounted when managing for bobwhites.

## POPULATION STATUS

On a range-wide scale, the species is declining significantly in most states in the U.S. (Brennan 1999, Sauer et al. 2019 - see *Figure 1*). From the mid-1960s through the mid-90s, regional, statewide, and local declines have often exceeded 70% (Brennan 1999). Bobwhite population levels continue to plummet throughout their range, with purported sharper declines occurring in recent years (Sauer et al. 2019). In fact, numerous extinctions of local populations have occurred throughout the geographic range including core regions of their distribution as evidenced in the South and Midwest (Brennan

1991, Church and Taylor 1992) and especially on the periphery of the range (Janke et al. 2015). Today, some states (e.g., West Virginia, Pennsylvania) have declared the bobwhite extirpated and/or closed hunting seasons. Translocation of wild bobwhites has been used in many states to establish, restore, reestablish, or augment wild populations for the purposes of conservation and biodiversity maintenance (Terhune et al. 2006a,b, 2007, and 2010). However, research has demonstrated that translocation is not a panacea and its success is predicated on quality habitat management. In most cases quality habitat management will produce a bobwhite population response but in certain circumstances, such as severe habitat fragmentation and isolation, translocation may serve as a conservation tool to recolonize areas devoid of bobwhites and where extensive habitat restoration has occurred. The declining population status observed today is a direct result of habitat loss and degradation.

In Louisiana, the plight of bobwhites is similar to many other states. Overall, Louisiana's population levels according to the BBS has declined more than 80% compared to 68% range-wide. Although bobwhite abundance has declined throughout the state of Louisiana, some areas have fared better than others which may be linked to varying habitats. In 1983, LDWF initiated a statewide fall bobwhite whistle survey (FBWS). The intent of this survey was to provide a relative index of bobwhite abundance prior to the start of hunting season, to aid in forecasting fall hunting abundance, and to help establish harvest regulations on wildlife management areas. The FBWS was divided into five distinct habitat regions: Longleaf (West Central Louisiana), Acadiana Rice Belt (Original Louisiana Prairie), Southeast Loblolly (Florida Parishes), Mississippi/Atchafalaya Ag. Belt (Mississippi/Atchafalaya historic floodplain), and Loblolly/Shortleaf/Hardwood (North Louisiana uplands) (Figure 4).

Although the FBWS has demonstrated considerable year-to-year fluctuation, the trend is a steady decline for each ecoregion (Figure 5).

As quail numbers have declined so too have quail hunters. Historically, the number of bobwhites harvested was greater than the number of hunters but by the late 1980s the ratio of birds harvested per hunter declined substantially; fewer birds on the landscape yield fewer birds in the hand per individual hunter (Figure 2). In 1982, quail hunter numbers were estimated to be greater than 40,000. The 2021-2022 Louisiana Big and Small Game Harvest Survey indicated that only 1,000 hunters pursued wild bobwhites. However, some demand for quail hunting is still present. In the same way that hunters declined as wild quail numbers waned, one can only believe that if wild quail were to rebound the number of quail hunters would also grow.

The declining hunting constituent along with the population status and trend of bobwhites are particularly concerning because they are a species of historical prominence and socio-economic value (Brennan 1999, Burger et al. 1999). Bobwhites are a flagship for an entire guild of grassland and early-successional habitat birds. The declines of many of these species are well-documented and extensive (see Sauer et al. 2019) including Eastern and Western Meadowlark

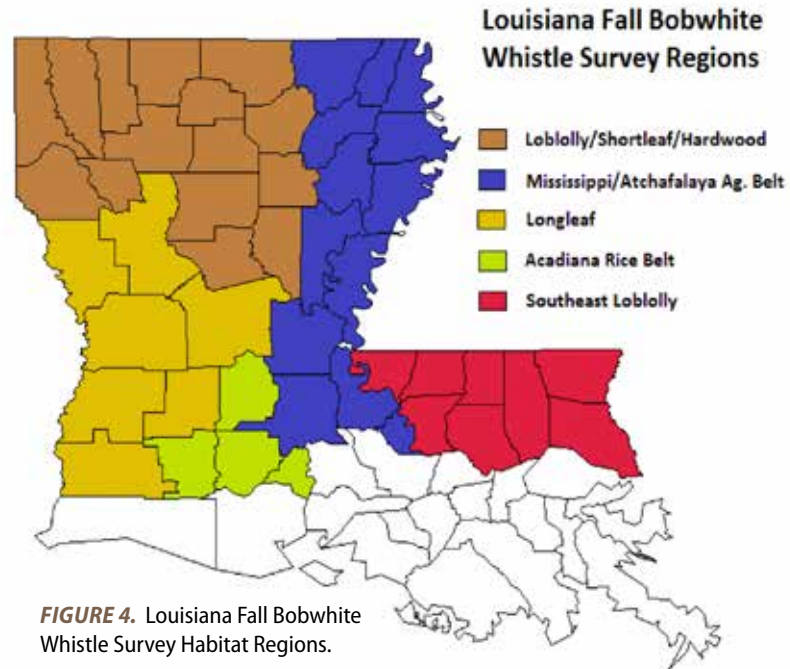


FIGURE 4. Louisiana Fall Bobwhite Whistle Survey Habitat Regions.

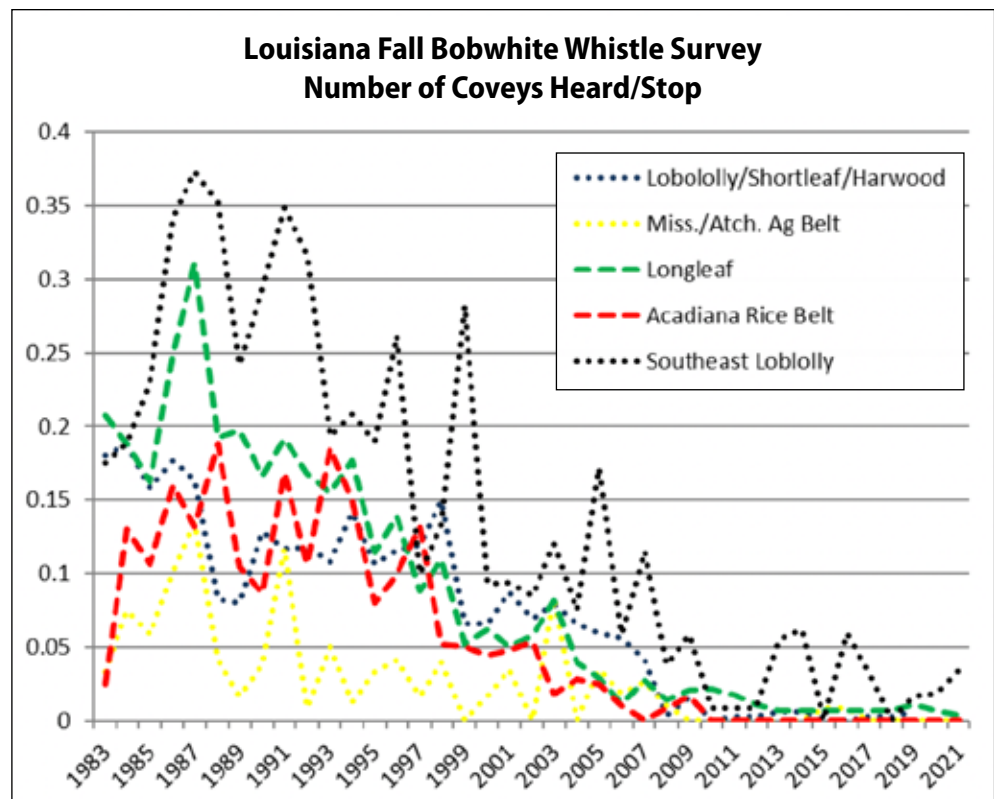


FIGURE 5. Statewide fall (October- November) bobwhite whistle surveys during 1983-2021 for five ecoregions in Louisiana.

(*Sturnella magna* and *S. neglecta*), Henslow Sparrow (*Ammodramus henslowii*), Savannah Sparrow (*Passerculus sandwichensis*), Bachman's Sparrow (*Aimophila aestivalis*), Grasshopper Sparrow (*Ammodramus savannarum*), Loggerhead Shrike (*Lanius ludovicianus*), and Brown-headed Nuthatch (*Sitta pusilla*).

### CAUSE OF DECLINE

There are as many theories as there are opinions about what has happened to bobwhites. Whereas some are red-herrings, many of those theories and opinions are right. In fact, because bobwhites disappeared slowly over a long period of time, the exact cause (and its various forms) of the decline perplexed many that were still seeing quail on the landscape and associated their presence with habitat, be it good or bad.

The simple truth is that anthropogenic influence on the way land has been used over the past several decades has drastically changed the landscape and reduced early-successional habitat. This widespread change in land use has resulted in an increase in fragmentation, degradation, or complete loss of habitat which altered entire ecosystems and the many species inhabiting them.

Specifically, this change has come on the heels of increased mechanization (larger tractors and timber equipment) which has resulted in more intensive and aggressive approaches to agriculture and silviculture. In addition, increased urbanization contributed to an already large-scale loss of habitat but amplified the problem by producing an increasingly fragmented habitat generally unfavorable for bobwhite population viability (Terhune et al. 2010). Finally, despite the essential force fire has in shaping plant and animal life, in many ecosystems its role is severely out of balance due to exclusion and suppression. Taken collectively, the loss of early-successional habitat (ESH) has come in various forms manifested through specific land uses operations such as farming and forestry.



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### HABITAT IS THE PROBLEM AND HABITAT IS THE SOLUTION!

*"They [bobwhites] thrive where the food supply is abundant and varied, where cover in the form of thickets is plentiful and well distributed, and where there is both woodland and more open space. They thrive also with agriculture of the somewhat primitive type that results in numerous small weedy fields, but they decline in numbers where farming is too intensive and cover is at a premium, or where agricultural lands revert to nature."*

- Herbert L. Stoddard (1931)

In many ways, humans have altered the landscape to promote their own agenda and increase consumption to the detriment of many wildlife and their habitats. The pervasive loss of habitat can only be done by restoring those habitats through intentional management.



## Section 2: National Bobwhite Conservation

### NATIONAL BOBWHITE TECHNICAL COMMITTEE

Since 1995, Louisiana has been a part of an organized multi-state effort to restore bobwhites. The Southeast Quail Study Group (SEQSG) endorsed by the Southeast Association of Fish and Wildlife Agencies (SEAFWA) was established to identify causes for the bobwhite decline, limitations and constraints to management through sound research, and to recover bobwhites range-wide. The SEQSG was pioneered by state agency quail and upland game program leaders from 15 southeastern states. Later, it was expanded to include all states within the bobwhite's range and renamed the National Bobwhite Technical Committee (NBTC). This 25-state committee is made up of more than 400 wildlife professionals from state wildlife agencies, federal agencies, universities, conservation organizations, and others. The ultimate goal is to restore bobwhites across their historic range. The NBTC meets annually to swap information and develop action plans to address quail needs. Knowing that the restoration of bobwhites could not be accomplished by individual states, a unified effort was established through a range-wide initiative. This effort was financially supported by state wildlife agency directors through the Association of Fish and Wildlife Agencies (AFWA). The new initiative, founded in 2002, was named the National Bobwhite Conservation Initiative (NBCI) with a mission to help accomplish range-wide bobwhite restoration goals through pragmatic habitat management. This initiative was renamed in 2022 to the National Bobwhite and Grassland Initiative (NBGI) to highlight focus on ecosystem management.

### NBCI 2.0 NATIONAL BOBWHITE CONSERVATION INITIATIVE (NOW KNOWN AS THE NATIONAL BOBWHITE AND GRASSLAND INITIATIVE [NBGI])

In autumn 1998, the SEAFWA directors [led by Tennessee Wildlife Resources Agency Director Gary Myers] charged the SEQSG to develop a regional, habitat-based quail restoration plan, modeled after the North American Waterfowl Management Plan (NAWMP). The group developed a strategic plan at the national, regional, and state levels to support range-wide restoration efforts. The original NBCI plan was developed in 2002. A revision was developed and released in 2011 titled: The National Bobwhite Conservation Initiative: a range wide plan for recovering bobwhites (Palmer et al. 2011). It later became known as NBCI 2.0 and provides a detailed GIS-based guide to restoring bobwhites across their range. With help from more than 600 biologists and other professionals, the NBCI 2.0 Plan ranked bobwhite recovery potential for each state through the Biologist Ranking Index (BRI). The intent of this process was for states to use the NBCI 2.0 to "step down" the range-wide plan to realistically implement habitat management through intentional and concentrated efforts unique to each individual state.

The Biologist Ranking Index (BRI) was initiated in 2008 when Tall Timbers Research Station coordinated the effort to meet with biologists in a workshop forum to prioritize bobwhite recovery efforts in each respective state. The entire state was ranked as to its potential, on a scale of high, medium, low, and none for successful habitat restoration (*Figure 6*). This rank was based on the habitat potential

*Population recovery of bobwhites is a national problem requiring a state-initiated solution!*

The road to recovery for northern bobwhites can be influenced from the top-down through policy change and plan development but ultimately requires on-the-ground implementation of habitat restoration.

to incite a bobwhite population response given management implementation. The NBCI 2.0 plan is designed to address landscape scale change through state-initiated habitat restoration efforts. The BRI is a general guide where restoration efforts should be focused to effectively elicit a bobwhite population response and maximize conservation effort and dollars

### HABITAT-CENTRIC RESTORATION & CONSERVATION TARGETS

The NBCI 2.0 plan recognizes HABITAT as the key to bobwhite restoration. Louisiana has varying land cover types, of which some are better suited than others to bobwhite population recovery (*Figure 7*). For example, upland pine forests, cropland, and pasturelands all represent restoration potential for bobwhites.

The NBCI 2.0 plan incorporated established bird conservation regions (BCRs) comprised of similar habitat types to quantify restoration goals. Restoration goals are based on the number of coveys added to the landscape given actual implementation of habitat management. Therefore, under full implementation of management activities the expected number of coveys would be added for a given area but no coveys would be added to the landscape if no management was implemented.

In Louisiana, it is estimated that approximately 85,000 coveys could be added by managing every potential acre of habitat in the high and medium ranked areas (*Figure 8*). According to the plan, the greatest potential for habitat restoration exists in upland pines (43%), pasturelands (20%) and row crop agriculture (14%). The greatest potential for bobwhite response occurs in upland pines (82%), row crop (11%), and pasturelands (7%). Focusing management on upland pines and row crops followed by pasturelands will maximize resources and effort while stimulating the greatest bobwhite response.

### NBCI FOCAL TIERS

Focal Tier designations within state agency NBCI step-down plans can be used to merge bottom up science with top down programmatic delivery and result in enhanced implementation. The primary value of the process is the formal recognition and valuing of NBCI Focal Tiers to provide the following:

1. Increased consistency in terminology and implementation of NBCI step-down plans;

## National Bobwhite Conservation Initiative: Louisiana Biologist Ranking Information

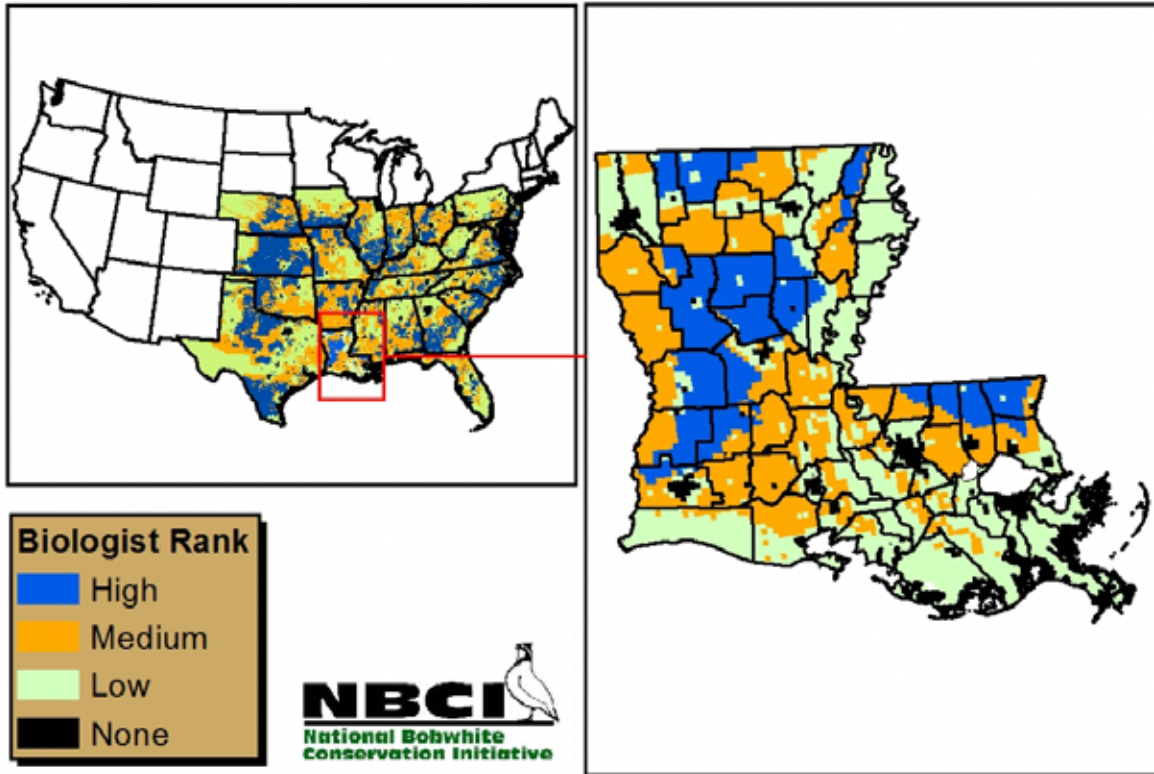


FIGURE 6. Biologist Ranking Index for Louisiana contained within NBCI 2.0 (Palmer et al. 2011).

## 2013 Louisiana Land Cover Classification

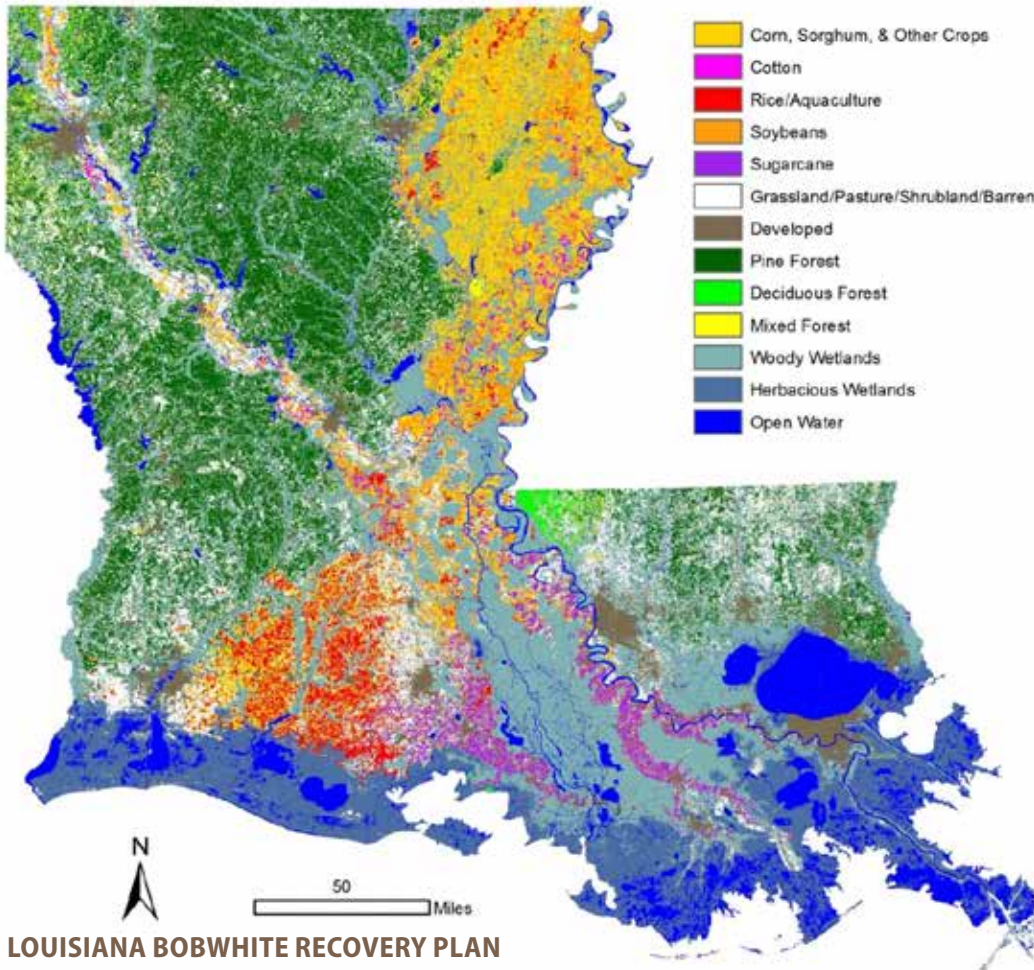


FIGURE 7. Land Cover Classification in Louisiana.

Source: USDA, National Agricultural Statistics Service, 2013 Louisiana Cropland Data Layer (Classes Condensed).



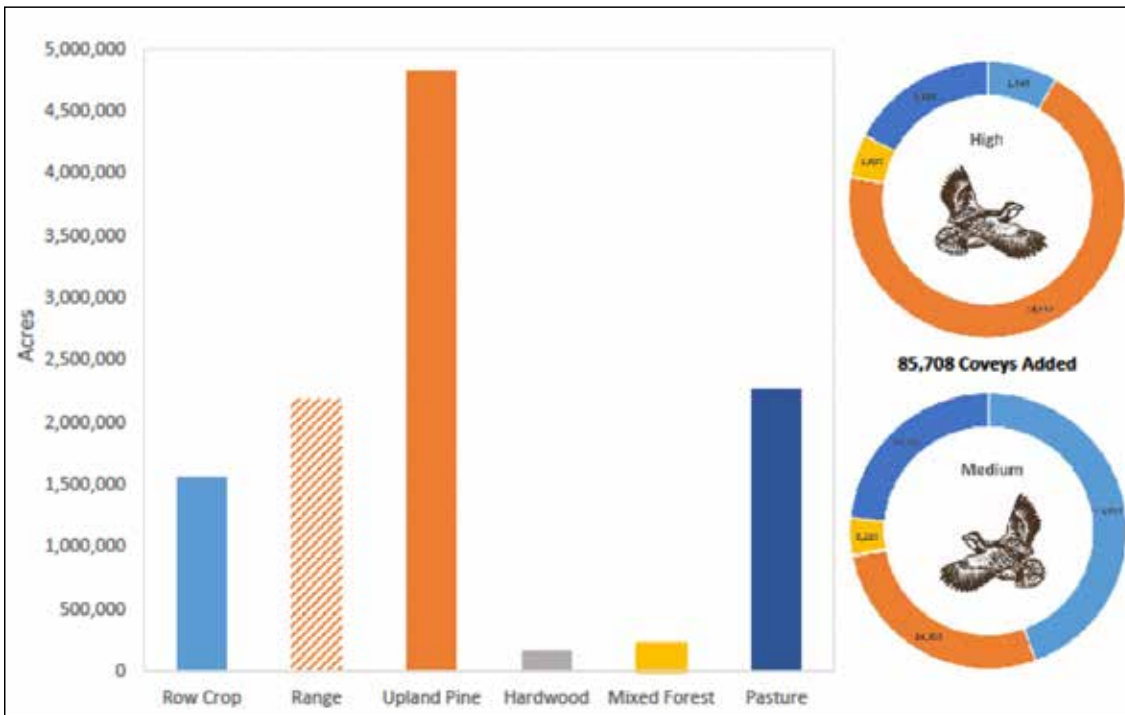


FIGURE 8. Acres by habitat and coveys added with full implementation of NBCI plan restoration practices (Palmer et al. 2011).

2. Increased recognition of the NBCI 2.0 Plan by grant authorities and conservation partners as a guiding document for habitat restoration at state and local levels. This will enhance NBCI 2.0 Plan value for leveraging funding, including multi-state grants, especially where these branded NBCI Focal Tiers overlap with other landscape conservation plans that address similar habitat restoration needs i.e., Joint Ventures (JV), Landscape Conservation Cooperation (LCC), America’s Longleaf, State Forest Action Plans (FAP), State Wildlife Action Plan (SWAP) etc.;
3. Formal recognition and inclusion (although at a lower priority) of NBCI restoration efforts where monitoring or habitat availability preclude the establishment of designated NBCI Focal Areas;
4. Increased recognition and integration with ongoing landscape conservation delivery and monitoring efforts (e.g. JVs and LCCs).

**DEFINITION OF THE THREE NBCI FOCAL TIERS**

1. **NBCI Focal Area(s)** - Spatially defined geographic regions (e.g. soil & water districts, cluster of parishes/counties, etc.) comprised predominantly (>50%) of high and medium priority ranking for bobwhite restoration through the NBCI 2.0 Plan BRI process; and containing one or more Focal Landscapes.
2. **NBCI Focal Landscape(s)** - Spatially defined landscapes ≥6,400 acres comprised predominantly (>50%) of high priority ranking for bobwhite restoration through the NBCI BRI process. No population monitoring is required for NBCI branding but it is encouraged to the fullest extent feasible. This may best be accomplished through larger landscape monitoring efforts associated with other grassland bird efforts; or bobwhite monitoring could be conducted at a coarse scale to track population trends through time (i.e., BBS). No reference area is required. NBCI values this tier as medium priority designation for restoration effort and funding. Focal Landscapes do not have to be nested within a Focal Region.

3. **NBCI Focal Area(s)** - Meets the terms of the NBCI Model Focus Area Program (i.e., has ≥1,500 acres of year-round planned quail habitat and is at least 25% year-round planned quail habitat) and associated population and habitat monitoring protocols. Focal Areas do not have to be nested within Focal Landscapes and/or Focal Regions.

The highest NBCI value and priority for restoration is assigned to Focal Areas nested within Focal Landscapes that are nested within Focal Regions. In the long-term, Focal Area monitoring should be used to test hypotheses for making inferences about bobwhite population responses to habitat enhancement at the Focal Landscape and Focal Region levels.

The tiered structure provides the following ranking from highest to lowest value for NBCI 2.0 Plan:

- Rank 1: NBCI Focal Areas nested within Focal Landscapes nested within Focal Regions
- Rank 2: NBCI Focal Areas nested within Focal Landscapes or Focal Regions
- Rank 3: NBCI Focal Areas not nested within Focal Landscapes or Focal Regions
- Rank 4: NBCI Focal Landscapes nested within Focal Regions
- Rank 5: NBCI Focal Landscapes not nested within Focal Regions

## Section 3: Bobwhite Restoration in Louisiana

It is unlikely that bobwhite populations will ever be restored to early 20th century numbers in Louisiana. The more realistic goal of this plan is to establish a population goal similar to one which existed in the early 1980s. The following sections will address specific challenges and actions needed to improve quail habitat and bobwhite numbers to achieve that goal. Challenges and opportunities have been detailed for croplands, pasturelands, and forestlands. Best Management Practices (BMPs) for each are listed in Appendix 1. Due to the complexity of such recovery efforts at the landscape level, this plan does not include specific timelines for accomplishment of objectives. Nonetheless, for restoration to be a success, efforts must be performed by many, over a large area, and in a relatively short period of time. The conservation delivery model for bobwhites must be integrated into working farms, ranches, and forests near existing habitat to be successful (Yeiser et al. 2018). It is important that opportunities and management practices described in this plan will be instituted at an ever increasing level over the next decade and beyond. Today, Louisiana still has a remnant source of bobwhites within all habitat regions, however if declines continue, this may not be the case in future years. The time to act is now!

### CHALLENGES & OPPORTUNITIES

#### Croplands

Based on land cover classification information, there are some 4.5 million acres of cropland within the state. Today Louisiana croplands generally lack adequate year round cover to maintain bobwhites. Mechanization, pesticide use, synthetic fertilizers, and extensification have diminished bobwhite habitat to small fractions of pre-World War II levels (Brennan 1991). The loss of weeds between rows, brush/weed fencerows, and native grass/forb turn-rows has left bobwhites little suitable habitat to occupy. While standing, many crops such as corn, sorghum, and soybeans may appear at a distance to be great for bobwhites, but upon closer examination, lack grasses and forbs once found between the rows. Following crop

harvest, quail today have no place to hide in the sparse stubble left behind. Increased use of “Roundup Ready” crops such as corn and soybeans, result in “clean” fields where cover and insects are insufficient for bobwhites. Without the “weed” stubble between rows and suitable cover along the edges of fields, any bobwhites present quickly succumb to predators once crops are harvested. A common practice of tilling the ground immediately after crop harvest also negates any residual value such fields might have for bobwhites during the critical winter months. One crop that has allowed bobwhites to persist at certain locations within the state is sugarcane. Sugarcane has become somewhat a de facto cover grass. Although sugarcane lacks any food value for bobwhites, standing or re-sprouting cane provides adequate year around cover, and those sites where wide strips of native grass/forbs grow adjacent to fields and ditches bobwhites have maintained decent numbers. With additional emphasis on increasing native cover, these sugarcane farms could see even greater bobwhites numbers.

Other crops have not been so kind to bobwhites. Widespread use of herbicides and insecticides have increased crop yields but at a great cost to bobwhites. Modifications in agricultural practices to favor bobwhites may include reducing, eliminating or selecting alternative techniques to herbicide and pesticide applications that would allow some vegetation to persist between crop rows and more insect availability to broods. Throughout farming areas of the state, exotic grasses dominate turn rows, ditch banks, and fallow areas. These grasses such as Bermudagrass (*Cynodon dactylon*), bahiagrass (*Paspalum notatum*), and other sod-forming sods are detrimental to young bobwhites. Restoring and maintaining native grasses and forbs in such areas would greatly improve bobwhite habitat. A quail friendly prescription recommended by the NRCS and Quail Forever (QF) for Louisiana croplands is the following combination:

1. Minimum seeding rate of 25 Pure Live Seeds (PLS)/ft<sup>2</sup> for all species, maximum of 40 PLS/ft<sup>2</sup>.



**FIGURE 9.** Sugarcane ditch providing cover vs. sugarcane ditch kept clean and of little value to bobwhites (Pt. Coupee Parish, Louisiana).

2. Minimum of nine native flowering forb species with at least three species in each bloom period (spring, summer, and fall). More species is highly recommended.
3. No single forb species will be included at rates over 10% PLS/ft<sup>2</sup>.
4. Annual/biennial forbs will not exceed 20% (combined) of the mix by PLS/ft<sup>2</sup>.
5. Grasses are not required in the mix, but may comprise a maximum of 30% of PLS/ft<sup>2</sup>, at the planner's discretion, if erosion or applicability of management is a concern.

Seed may be broadcast planted by mixing with pelletized lime or sand then roller packed or lightly harrowed to cover seed. More precise planting employs the use of specialized native grass/forb planting drills. This equipment is designed to plant multiple species of light seeded grasses and forbs at the proper depth.

Today in an effort to reduce planting costs, decrease soil compaction, and increase crop yields, some farmers use "no-till" planting methods. This method plants new crops in the stubble of previously harvested crops. No-till planting has greater potential to benefit bobwhites as it leaves some standing cover between new crop rows. However, to benefit bobwhites stubble must be of sufficient height and density. Excessive use of herbicides and pesticides prior to no-till planting can negate many of the potential benefits for bobwhites.

Regenerative agricultural techniques (Brown 2018) could have immense positive bobwhite and other wildlife and wildlife habitat impli-

cations wherever put into practice. Reducing and eventually eliminating tillage, synthetic fertilizers, herbicides and pesticides, while planting more diverse cash, and polyculture cover crops are first steps in improving soil health and restoring the critical carbon, water and nutrient cycles (Brown 2018) on millions of acres of agricultural lands.

Cropland edges, fence rows, and turn rows should be rehabilitated to early successional habitat and expanded in width (minimum 50') to be of value to bobwhites. Insuring that all cover enhancements connect is also of critical importance. Whenever possible all bobwhite habitat improvements should seamlessly connect to one another to reduce predation losses.



**FIGURE 10.** A formerly cropped area allowed to lay fallow and revert to native bobwhite cover (Franklin Parish).



**FIGURE 11.** Aerial view of approximately 1,000 acres of croplands with +/- 100 acres of habitat enhancements highlighted.  
 Orange = fence row/turn row cover improvements,  
 Red = crops left standing,  
 Green = riparian filters,  
 Yellow = covey corners, and  
 Blue = field borders.

Riparian filter strips and field borders (sometimes referred to as buffers) should be expanded and designed to connect to other cover areas. Riparian filter strips are low elevation areas within fields where water drains but may be dry much of the year. This area, if composed of native grasses and forbs, becomes usable space for bobwhites. Riparian filter strips are often low crop yield areas, but they can improve water quality, reduce erosion, and improve bobwhite habitat. Field borders are expanded areas of grass/forb cover on the edges of fields. These areas are often partially shaded by adjacent trees and usually produce lower crop yields. Field borders can provide excellent bobwhite habitat if properly managed. Buffers are excellent bobwhite habitat, but if allowed to persist unmanaged by fire, mowing, disking, grazing, or herbicide, will quickly succeed to woody brush and then trees. Therefore, buffers should be managed every one to three years as needed to maintain quality bobwhite habitat. Where field borders and filter strips run adjacent to forests, such forests should be thinned and managed for early successional habitat to create a soft edge for wildlife. Within a soft edge, the habitat gradually transitions from mature forest to habitat buffer or cropland often with an area dominated by woody brush that can be used for escape cover for quail and other wildlife. A hard edge transitions directly from mature forest to habitat buffer or cropland. This scenario is advantageous for predators but detrimental to other wildlife including, bobwhites.

Establishing fallow corners or “covey corners” of more significant size (1/2 to 5 acres or more) within croplands can provide bobwhites a more substantial place to feed, rest, escape, nests and raise young. These covey corners can be located in hard-to-plow spots, low yield areas, sites that fall outside of irrigation, or areas too small to justify annual crop planting costs.

Leaving several rows of standing crops post-harvest along the edges of fields can provide additional food and cover. Standing crops of

corn, sorghum, soybeans, sunflower, and other grains are used by bobwhites especially when such sites are adjacent to quality native ground cover. If possible, limiting herbicide use in such areas will result in greater benefit to bobwhites as well as reduced farming costs. *Figure 11* illustrates how enhanced fence rows, turn rows, standing crops, borders, riparian filter strips, and covey corners might be juxtaposed to improve bobwhite habitat. Each of these practices creates highly usable rough edges to otherwise clean fields of little value to bobwhites. A statewide rough around the edges campaign would not only benefit bobwhites but, rabbits, deer, wild turkeys, black bears, and many other species of concern. Note in *Figure 11* how each practice is contiguous to another.

**Pastureland**

The days of native grass/forb pasturelands in Louisiana are practically gone. Droughts and the corresponding Dust Bowl years of the 1930s spurred massive soil erosion prevention efforts across the United States. Soil conservation programs began to promote conversion to exotic grasses such as bahiagrass and Bermudagrass as well as a myriad of other non-native experimental plantings. These exotic grasses were somewhat drought tolerant, could withstand heavy grazing, were consistent hay producers, and were relatively good for holding soils in place. Unfortunately, many were “sod” forming grasses that were unsuitable for bobwhites (*Figure 12*). These exotics quickly expanded throughout the former native grass/forb ecosystem. Most exotic grasses were also less in nutritional value for cattle than native range. Today as one travels across Louisiana exotic grass pastures abound. Based on land cover classification information there are some 2.3 million acres of pasture/grasslands within the state. Many of today’s pastures were cleared of trees in the 1800s or early 1900s. These fields once grew lush native grasses and forbs where bobwhites flourished. Replaced by exotics in the 1930s, ‘40s and ‘50s, today these same fields are now exotic grass dominated and bobwhites are all but gone.

**Summary of needs to enhance bobwhite quail populations on row crop agricultural lands.**

CROPLAND NEEDS	CHALLENGES	OPPORTUNITIES
Improved Year Around Bobwhite Cover  Enhanced Bobwhite Management on Farm Bill Program Enrolled Lands	Establishment & Maintenance Costs Low Farmer Adoption Exotic Sod Forming Grasses Lost Crop Yields Limited Options in Hardwood Forests Other Exotic Plants Fear of Burning Burn Regulation Constraints Availability of Bobwhite Management Demonstration Sites Need for Usable After Cropping Stubble Conservation Practice Restrictions Competing Wildlife Species Management	Establish Field Borders Reduce Herbicide/Pesticide Use on Crops Multi-Species Cover Crops Set Aside Low Crop Yield Areas for Bobwhite Habitat Establish Native Grasses/Forbs Leave Standing Crop Areas Manage Fields & Bordering Timberlands for ESH Fence Row Cover Improvements Increase Use of Fire to Manage Native Grass/Forb Fields Fallow Disking Establish Demonstration/Focal Areas of Bobwhite Habitat Increase Use of “No-Till” Planting Bobwhite Cover/Food Establishment & Maintenance



**FIGURE 12.** Native bunch grasses (left) grow in clumps that allow bobwhites to forage freely between, sod grasses (right) do not.

**Summary of needs to enhance bobwhite quail populations on pasture lands.**

PASTURELAND NEEDS	CHALLENGES	OPPORTUNITIES
Improved Year Around Bobwhite Cover  Enhanced Bobwhite Management on Farm Bill Program Enrolled Lands	Establishment & Maintenance Costs	Restore Native Grass/Forb Pastures
	Low Farmer Adoption	Establish Field Borders
	Exotic Sod Forming Grasses	Native Grass/Forb Managed Grazing
	Possible Need for Increased Grazing Acres	Explore Bobwhite Friendly Biofuel Practices
	Limited Plant Species Considered for Biofuels	Manage Pastures Bordering Timberlands for ESH
	Lack of Diversity in Current Biofuel Plantings	Fence Row Cover Improvements
	Timing of Biofuel Harvests	Increase Use of Fire to Manage Native Grass/Forb Fields
	Limited Options in Adjacent Hardwood Forests	Fallow Disking
	Other Exotic Plants	Establish Demonstration/Focal Areas of Bobwhite Management
	Fear of Burning	Establish Bobwhite Cover/Food
	Burn Regulation Constraints	Establish Rights-of-Ways using Native Grass/forbs
Availability of Bobwhite Management Demonstration Sites		
Conservation Practice Restrictions		

One cannot over emphasize the negative impact of sod grasses on bobwhites in Louisiana. If only a fraction of the state’s pasturelands were restored to a mixture of native species and maintained over time bobwhite numbers would likely increase dramatically in those locations. Recent droughts across America have inspired new interests in native rangelands. Native species have been shown to be highly drought tolerant, higher than many domestic grasses in crude protein, and if not over grazed, excellent for erosion control. However, most cattle ranchers have been slow to embrace these benefits as they come with the added task of more closely managing grazing pressure. Native grasses and forbs must be monitored for overgrazing and in some circumstances there may be a need for more foraging acres per animal for shorter durations of time followed by

allowing pastures to rest for portions of the year. Regardless, those interested in restoring native habitat, increasing pollinator plants, and improving bobwhite numbers have embraced native restoration efforts and the concept of rotational grazing (*Table 2*).

The process for conversion from exotic sod grasses to native grasses is similar to the cropland conversions presented previously, except that native plant restoration efforts on grazed lands generally have higher grass planting rates over native forbs. A quail friendly prescription recommended by the NRCS and Quail Forever (QF) for Louisiana on pasturelands is the following combination:

1. Minimum seeding rate 35 Pure Live Seeds (PLS) to the acre of native grasses (except for grama grass).

2. Generally, a mix of big bluestem, little bluestem, and Indiangrass provide a grazing and haying compatible mix in upland soils.
3. No single forb species will be included at rates over 10% PLS/ft<sup>2</sup>.
4. Annual/biennial forbs will not exceed 20% (combined) of the mix by PLS/ft<sup>2</sup>.
5. Forbs are not required in the mix, but may comprise a maximum of 30% of PLS/ft<sup>2</sup>, at the planner's discretion.

Sites restored most often require multiple herbicide treatments prior to planting to remove exotic grasses. Seed may be broadcast planted by mixing with pelletized lime, rice hulls, oats, or sand. More precise planting employs the use of specialized native grass/forb planting drills. This equipment is designed to plant multiple species of light seeded grasses and forbs at the proper depth.

Recent demands to find renewable "green" energy may have significant consequence for bobwhite restoration efforts. Unfortunately, plantings aimed at biomass production typically offers little value to wildlife. Further research is needed to develop more diverse plantings of native grasses and wildflowers for biofuels that are beneficial to native wildlife species. Public policy should include provisions that encourage "green" energy producers to be as wildlife conservation friendly as possible. Practices should include deferments and multi-stage harvests that allow some structure to stand over winter. Biofuel crops that utilize herbaceous plant species are preferred over those using young trees. Native grass/forb plantings should be encouraged. Both large and small tracts of land have the potential to be used for this purpose if biofuel markets increase. This effort has the potential to drastically change many pasture and cropland

operations. It is essential that any such biofuel conversion efforts keep bobwhite habitat needs in mind.

Fallow disking when appropriate is an excellent way to improve bobwhite habitat in pasturelands and stimulate lush forage for livestock. It is used primarily to create and maintain optimal brood habitat conditions. This practice may be one of the simplest and most direct bobwhite management practices that land managers can employ. Managed grazing, riparian buffers, field borders, and use of light rotational fallow disking can result in ideal bobwhite habitat on pasturelands, croplands, and forestlands.

### **Forestland**

Land cover classification maps clearly illustrate that Louisiana's greatest bobwhite recovery potential today lies in forestlands. Upland forests make up some 6.5 million acres in Louisiana. Unfortunately, most of the state's forests have dense tree stocking and closed forest canopies resulting in poor conditions for bobwhites. While timber harvests are relatively common, the practice of prescribed burning in pine forests is no longer the rule but the exception. In years past much of the state's upland pine habitat was prescribed burned every year or two for the purpose of reducing woody brush and stimulating new grass for cattle grazing. Much of this burning was conducted by the cattlemen themselves. During decades past longleaf pine was the dominant tree in many areas. It is very well suited to hot, unmanaged fires and frequent burning. In later years timberlands were converted to slash and loblolly pine, which are less adapted to high intensity fires. For many decades timber companies continued to aggressively manage these converted forests

**Photo by Randy Browning, USFWS**



**FIGURE 13.** Abundant ground cover in a young longleaf pine forest (left) adjacent to a similar aged loblolly forest (right) with a closed canopy.

acres with lower intensity prescribed fire. Unfortunately, the acres burned each year have steadily declined during the last 30 years. This lack of widespread annual fire has resulted in a loss of bobwhite habitat continuity, further isolating quail across the state. **Returning landscape-scale prescribed fire to Louisiana's pine forestlands is essential to restoring bobwhites.** This fire must be returned with increased frequency and open canopy forest management. Burns conducted in closed canopy forests have little benefit to bobwhites.

Herbert Stoddard described the bobwhite as the “firebird” due to its dependence on fire maintained habitats. There are two common seasons when fires are conducted to benefit bobwhites, growing season and dormant season. Growing season burns are those that occur during the active growing period for plants (April-Nov). While dormant season burns, often called “winter burns”, are those occurring when most plants are not actively growing (Dec- March). Each burn type has specific advantages and applications. Growing season burns are important for reducing unwanted woody brush and can also result in increased forb species diversity. Dormant season burns are used for maintaining groundcover that is already in good condition and can often be used on the same sites annually. However, dormant season burns, especially those conducted early in the winter, may increase avian predation of bobwhites. On some areas managed for bobwhites burning is delayed until March 15 to decrease quail exposure before spring “green up.” However, if presented with the choice of burning outside of that period or not burning at all that year, burning is always best and should be timed to provide the best habitat response for the needs on that site.

Proper bobwhite management calls for the strategic application of both growing and dormant season fires. When burning to benefit bobwhites thought must be given to what happens to displaced bobwhites during the immediate period following the burn. Is their adequate cover for bobwhites to survive until the burned area recovers? Is that cover close by? Is the timing (season) of the burn beneficial to bobwhites currently present? Small burns or patchy burns result in close proximity cover which is ideal.

Today the widespread use of prescribed fire faces many obstacles. Many people view all fire as negative. With the regular occurrence of sensational wildfires in western states many associate fire with destruction. Unfortunately, prescribed fires are viewed with the same fear. Excessive restrictions on burning imposed by well-meaning regulatory bodies have over time reduced acres burned each year. Fire, which is historically the most widespread and natural ecological process benefiting wildlife, is now deemed an environmental threat by some. Scientists have determined by examining growth rings from 300-year-old longleaf pines that fires historically burned every two years or less. The smoke from these fires once darkened the sun for months as millions of acres across the southeast United States burned each year. Regulatory constraints placed on burning have contributed to fewer “acceptable” burning days and increased prescribed burning costs. Without frequent fire, upland habitats quickly change from herbaceous cover to woody cover resulting in bobwhites becoming extirpated from the area. To aid bobwhite recovery regulatory and litigation constraints to prescribed burning should be minimized.

Restoring longleaf and shortleaf pine ecosystems to their original range represents a great opportunity to improve habitat for bobwhites and other grassland wildlife. Longleaf and shortleaf pine ecosystems offer bobwhites several benefits. Longleaf pine stands can be burned within one year after planting and thereafter as often as desired to enhance forage and cover for bobwhites, whereas shortleaf may be burned within three to five years after planting. Loblolly pine stands are usually not burned for about 10 years after planting or until the first thinning has been completed. The ability to frequently burn makes longleaf and shortleaf pine of far greater value to bobwhites. Longleaf and shortleaf pine forests have less dense canopy than a similarly stocked loblolly forests. This allows more sunlight to reach the ground further enhancing ground cover. *Figure 14* illustrates contiguous ground cover found in a young longleaf pine forest (left) adjacent to a similar aged loblolly forest (right) that has already closed canopy.

Forest thinning combined with periodic prescribed burns in pine forests can reverse current habitat degradation trends and create quality bobwhite habitat. Thinning for bobwhites requires the removal of more trees than traditional thinning done to maximize timber growth and yields. These “heavy thins” allow more sunlight to reach the ground resulting in a lush groundcover for bobwhites. This groundcover can then be maintained by fire every one to three years. Unless a forest is adequately thinned prior to burning, adequate bobwhite cover will not be achieved.

Mid-story hardwood reduction is another technique used to benefit bobwhites. It calls for removing most of the undesirable hardwood trees within open pine dominant sites. Although hardwood masts can be an important fall/winter food for bobwhites, having too many undesirable hardwoods can be detrimental. Research indicates that by removing excess hardwoods on pine sites, avian predator occurrence in the area is reduced, resulting in less predation losses (Palmer et al. 2000). Additionally, more complete native groundcover develops with the reduced undesirable hardwood canopy.

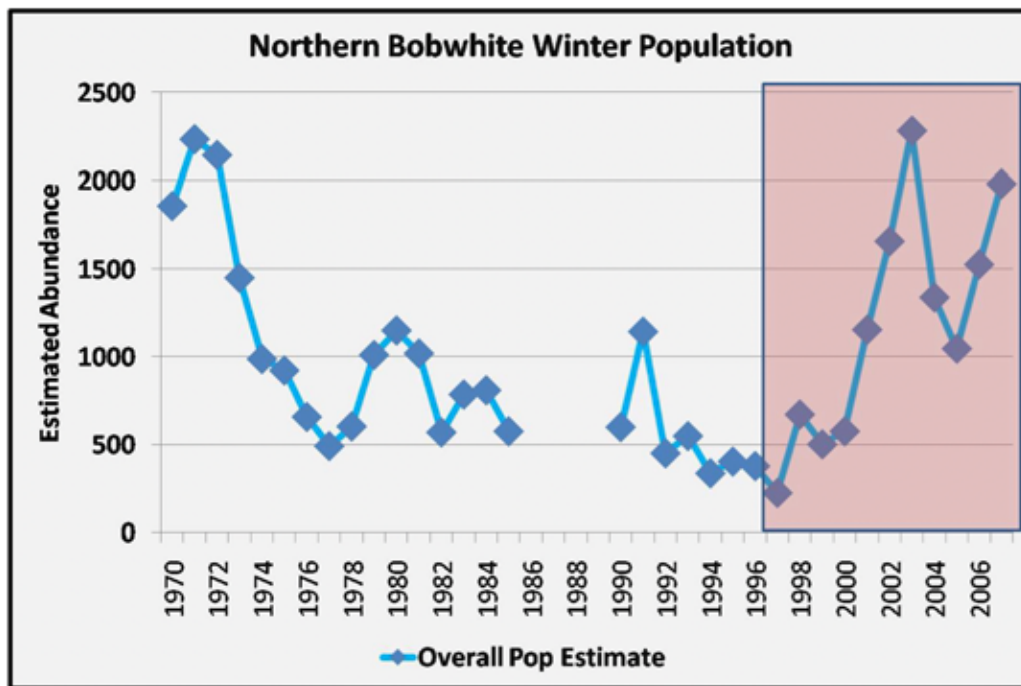
*Figure 14* shows a bobwhite management test plot on Tall Timbers Research Station in north Florida. Tall Timbers has been at the forefront of bobwhite research since the 1930s. Herbert Stoddard, the father of bobwhite management, conducted much of his research there (Stoddard 1931) which was continued for decades (Errington 1933, Lehmann 1946, Loveless 1958, Stokes 1967, Dickson 1971).

A common forestry term used to describe the density of trees within a stand of timber regardless of age is Basal Area in square feet per acre (BA). Lower BA means trees are spaced at greater distances from one another thus allowing more sunlight to reach the ground (*Figure 15*). Ample sunlight reaching the ground is required to maintain good ground cover for bobwhites. In general, the greater the amount of sunlight reaching the ground, the greater the quality and quantity of ground cover. The paradox faced by forest managers seeking to enhance quail habitat is what level of tree coverage can provide good quail habitat while maximizing timber income? Quail do not need trees to survive but most landowners need trees to produce sustained economic gain. Pines and upland hardwoods are better suited for quail management than are bottomland hardwoods

**Pre-Restoration for Bobwhites**



**Post-Restoration for Bobwhites**



**FIGURE 14.** Response of northern bobwhite population abundance to a pine-savanna restoration on Tall Timbers Research Station, Tallahassee, Florida, 1970-2008. Declining bobwhite numbers during 1970-1996 were a result of infrequent application of prescribed fire and resulting hardwood-pine mixed forest; bobwhite numbers increased from 1997-2008 (red-shaded region) after mid-story reduction and frequent application of prescribed fire.

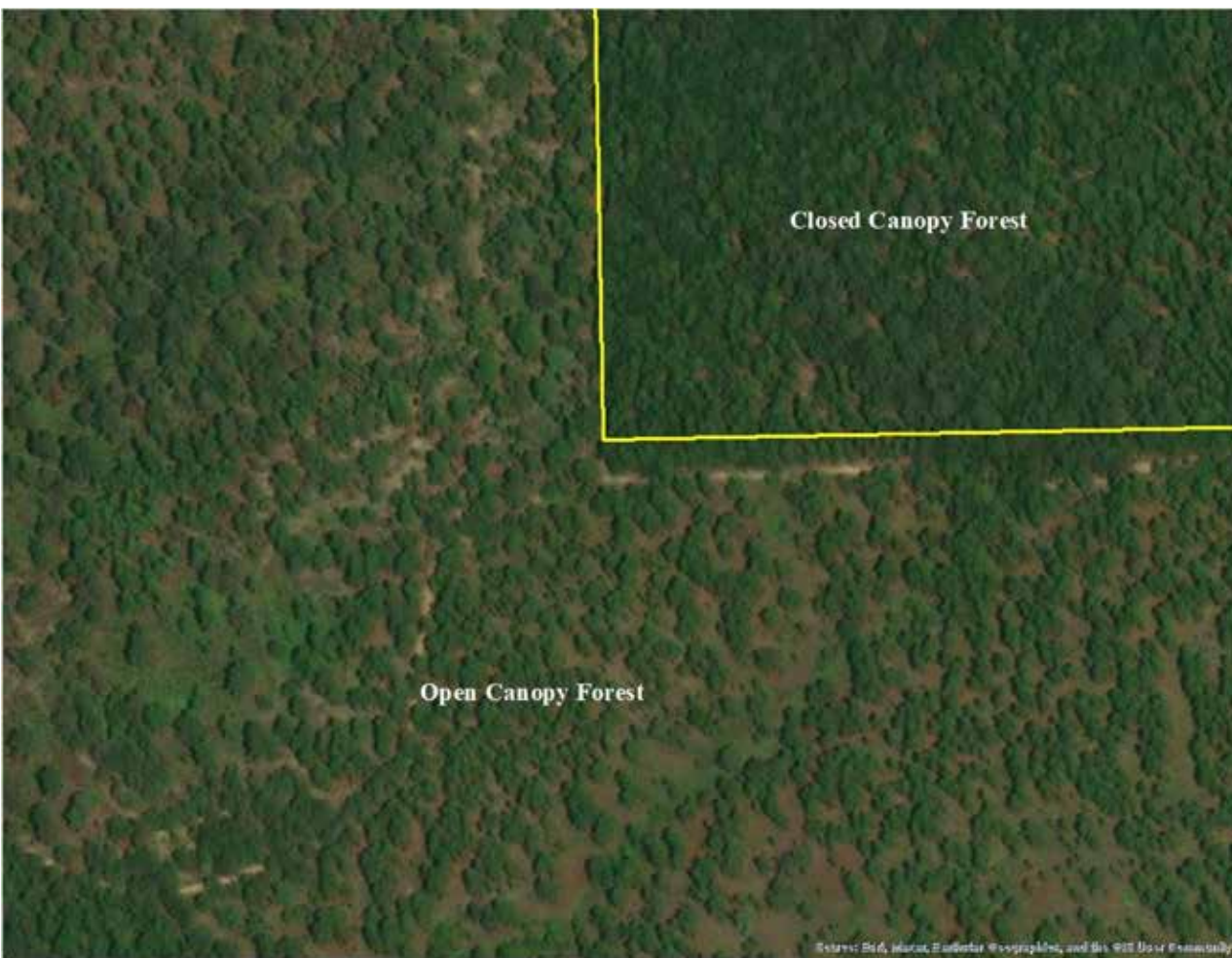
in Louisiana as they are well suited to management by fire. Acorns are utilized as a fall-winter food source by quail and a sprinkling of well-managed hardwood brush can be important cover. Regardless of species, trees should not be allowed to become so thick as to shade out a continuous layer of grass/forb ground cover.

Pine forests managed primarily for bobwhites should generally be maintained at or below a BA of 50. The lower the BA, the more developed the ground cover will be for bobwhites. Many landowners desire higher tree stocking rates to produce maximum income but do so at a loss to quail. With active forest management, a reasonable balance of good quail habitat and timber revenue can be obtained. The size of a timber tract and local markets will determine how often thinnings may occur.

As earlier stated, quail habitat is a product of land uses. Some argue that the return of cattle to the forest would increase acres being managed for grasses and forbs thus increasing habitat for bobwhites. If grazing of forestlands is carefully managed, quail can coexist and thrive together with cattle. However, if not properly managed or overstocked, cattle and other livestock can reduce the land's capacity to support a variety of wildlife species. But given the trajectory of quail population trends, it is appropriate to manage more habitats especially for bobwhites where willing landowners exist and grassland bird conservation is a higher priority.

Today, working lands are not only influenced by market forces but are also greatly influenced by federal policies and programs. As a result, landowners have the opportunity to access conservation fund-





**FIGURE 15.** Canopy gaps which allow for enhanced bobwhite habitat are easily visible in this aerial view of Sandy Hollow WMA (left and bottom) versus a closed canopy forest (top right).

**Summary of needs to enhance bobwhite quail populations on pasture lands.**

PASTURELAND NEEDS	CHALLENGES	OPPORTUNITIES
Improved Year round Bobwhite Cover	Establishment & Maintenance Costs Invasive/Exotic Plant Species Burn Costs & Liability Concerns Fear of Burning Burn Regulation Constraints Influence of Other Free Ranging Livestock Species Timing of Management Practices Predation of Quail Agency Adoption & Other Wildlife Species Priorities Scale of Treatments Frequency of Treatments Availability of Bobwhite Management Demonstration Sites Conservation Practice Restrictions	Increase Open Canopy Forests Increase Prescribed Burning Increase Acres in Longleaf and Shortleaf Pine Increase Fire Frequency Native Grass/Forb Restoration Native Grass/Forb Managed Woodland Grazing Use of Selective Herbicides Managed grazing Fallow Disking Bobwhite Cover/Food Establishment & Maintenance Increase Bobwhite Management on Public Lands Establish Demonstration/Focal Areas of Bobwhite Habitat Thinning to low BAs

ing for their property through the Farm Service Agency (FSA), the Natural Resource Conservation Service (NRCS), and the Louisiana Department of Agriculture and Forestry (LDAF). There are many programs and conservation practices that benefit bobwhites and other resource concerns funded through these agencies for croplands, pasturelands, and forestlands. Bobwhite friendly practices include but are not limited to:

Farm Service Agency (FSA) - Conservation Reserve Program

- CP33 *Habitat Buffers for Upland Birds*
- CP36 *Longleaf Pine*
- CP38 *State Acres for Wildlife Enhancement*
- CP42 *Pollinator Habitat*

Natural Resource Conservation Service (NRCS) - Regional Conservation Partnership Program (RCPP), Conservation Stewardship Program (CSP), and Environmental Quality Incentives Program (EQIP)

- Field Borders*
- Filter Strip*
- Riparian Forest Buffer*
- Conservation Cover*
- Residue and Tillage Management*
- Early Successional Habitat Management for Grasslands*
- Prescribed Burning*
- Forest Stand Improvement*
- Prescribed Grazing*

Louisiana Department of Agriculture and Forestry (LDAF) - Forest Productivity Program (FPP)

*Understory Burning*

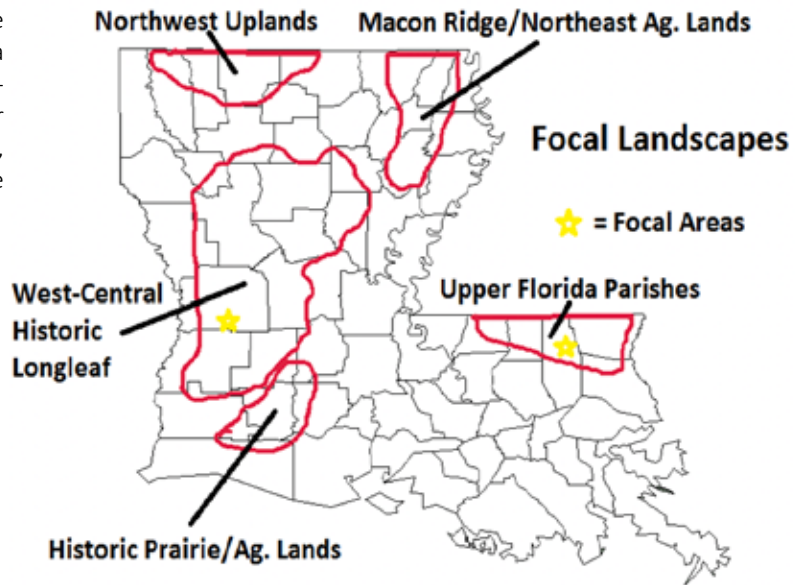
While no empirical evidence exists indicating that these programs/practices have altered bobwhite population trajectories as of yet, these practices have improved populations at local scales (Evans et al. 2013). In Louisiana, there is potential through such programs to help bobwhites and a great need to inform farmers of these opportunities. If major changes are to occur in favor of bobwhites and other grassland species, increased education and incentives for farmers interested in bobwhites are needed.

### HABITAT MANAGEMENT IMPLEMENTATION STRATEGY

This recovery plan supports the adoption of management implementation using “focal tiers” as described in the NBCI 2.0 Plan. Bobwhite focal areas are encouraged as Louisiana works to recover the species. These areas, sometimes called quail emphasis areas, draw resources to localized sites and demonstrate to others how to improve quail numbers. Focal areas act in effect as living billboards to educate and inform others about the plight and restoration of bobwhites. The Louisiana Bobwhite Recovery Plan encourages the establishment of wild bobwhite focal areas on both private and public lands.

### NBCI FOCAL REGIONS

There are many overlapping jurisdictional boundaries that occur within Louisiana that might encompass NBCI designated focal regions. For the purpose of this recovery plan, the four Bird Conser-



**FIGURE 16.** Focal Landscapes and current bobwhite focal areas in Louisiana.

vation Regions (BCR) that traverse Louisiana as well as other neighboring states will serve as NBCI focal regions. These BCRs include the West Gulf Coastal Plain/Ouachitas, Mississippi Alluvial Valley, Southeastern Coastal Plain, and Gulf Coastal Prairie.

### NBCI FOCAL LANDSCAPE

Within each of the focal regions in Louisiana one or more focal landscapes have been established (*Figure 16*). These focal landscapes include the Northwest Uplands, Macon Ridge/Northeast Ag. Lands, West-Central Historic Longleaf, Upper Florida Parishes, and Historic Prairie/Ag. Lands. The focal landscapes designated for Louisiana are expanded areas that contain a majority of lands ranked high for potential restoration. Focusing landscape level quail management efforts within these designated areas will result in the greatest success.

### NBCI FOCAL AREAS

Currently, Sandy Hollow WMA in Tangipahoa parish and the Vernon Quail Emphasis Area on Kisatchie National Forest in Vernon parish are the only two sites within Louisiana that are considered bobwhite focal areas (*Figure 16*). For bobwhite recovery to gain momentum, it is essential that new focal areas be developed in each of the focal landscapes.

### ASSESSING & MONITORING PROGRESS

For years LDWF has conducted whistle surveys as an index of bobwhite numbers. Statewide surveys are conducted in early fall. Other surveys are done during the early summer when bobwhite males are actively seeking females. Whistling of male birds during this period is much more common and more likely to identify the presence of quail within a given area, than fall surveys that may not illicit a response from every covey. Most of Sandy Hollow WMA was clear-cut in the early 1980s and saw good quail numbers through the mid-1990s due to active quail management. Despite continued burning, forest succession progressed and quail habitat quality diminished. With stepped up timber management, fallow disking, and more tar-

geted application of fire, quail numbers have started to recover. *Figure 17* represents the summer bobwhite whistle counts from 1986-2022 on Sandy Hollow WMA. Such annual monitoring helps assess bobwhite response to management activities.

The National Bobwhite Technical Committee (NBTC) and NBGI have concluded that population monitoring of areas of contiguous quail habitat less than 1,500 acres likely produces a less than reliable index. Areas smaller than 1,500 acres are more vulnerable to the influence of surrounding lands and there is a decreased probability of detecting real change. Biologists with the NBTC have developed a standardized and replicable monitoring process for NBGI designated focal areas equal to or larger than 1,500 acres. While the NBCI 2.0

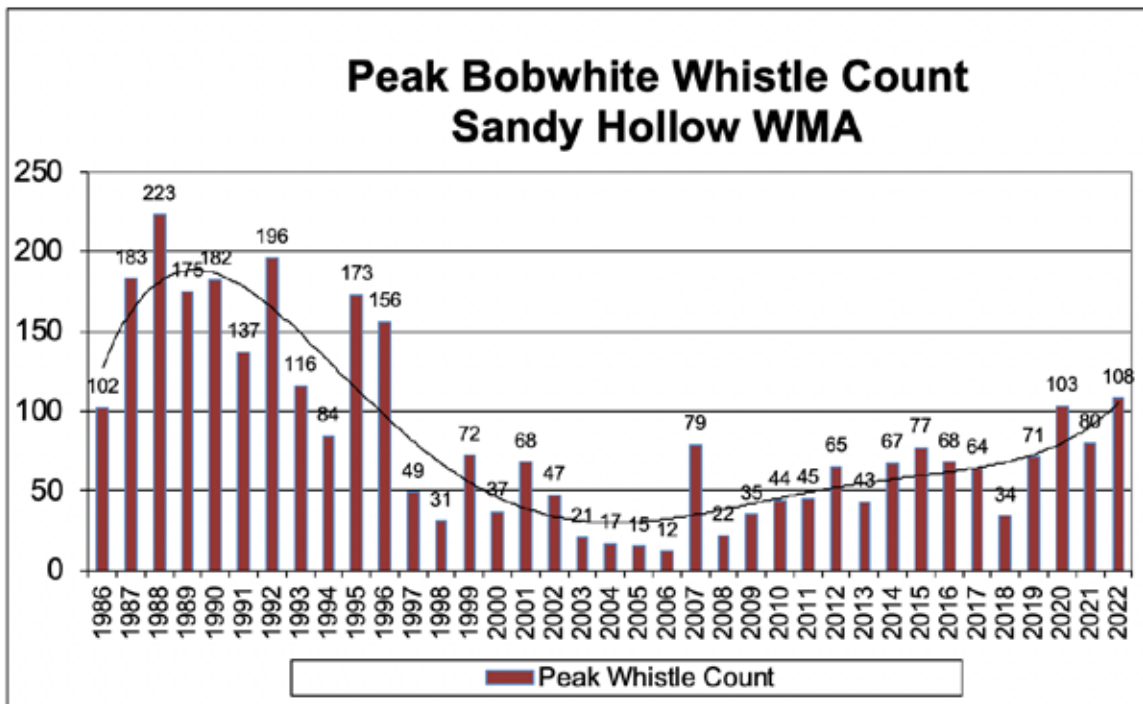


LDWF biologists conduct research and assist landowners in quail habitat restoration.

Plan prioritizes where bobwhite restoration should take place, states currently do not have the resources to reach all of the target densities identified. Therefore, it is important that limited restoration resources be properly focused and results critically assessed. The NBGI Coordinated Implementation Program (CIP) provides the framework for large-scale habitat management programs for bobwhites using a tiered approach tied to landscape planning and action. This scalable approach may assist landscape-scale restoration in states where resources and opportunities are currently limiting.

Most importantly, CIP establishes a range-wide restoration road map with clear targets and accountability. The CIP requires monitoring that will be used to measure success and foster learning among states. The CIP procedure calls for monitoring both the quail focal area and a nearby reference area of similar size to assess the effects of management. The reference area must be similar in all facets to the focal area except that the focal area is being altered to benefit quail. This process and equal monitoring of both sites should accurately quantify results or lack thereof. The CIP monitoring protocol is described in detail through the NBGI website: <http://nbg.org>.

Bobwhite habitat issues today may not be the same ones faced in future years. It is important to employ adaptive resource management to all managed areas. If a particular management technique is producing more detectable quail numbers or another is under performing then timely adjustments should be made. Active population monitoring can help identify when these issues occur. Simply doing the same thing over long periods of time with little result will not accomplish restoration goals. Scientists must be able to accurately detect what practices are working and which are not. With advances in radio tracking such as GPS monitoring, biologists are better equipped to determine specific micro habitat uses. This knowledge will help managers determine what practices quail favor most. Along with much needed habitat management dollars, more funding is needed for quail research in Louisiana.



**FIGURE 17.** Bobwhite whistle counts (Summer Survey) at Sandy Hollow WMA, Tangipahoa Parish, Louisiana.

With any large land-based habitat effort, it is important to accurately track the acres recovered annually. Currently there is no such comprehensive database. Various land and conservation agencies compile habitat management data sets annually but such data sets do not readily quantify quail management practices or acres manipulated. Comprehensive improvements in data analysis and assimilation are needed to determine if real change is taking place statewide.

### TRANSLOCATION

Habitat loss, degradation, and fragmentation have decreased populations of northern bobwhites in Louisiana and across much of their range (Terhune et al. 2010). These factors have often led to local, regional, and in some cases statewide extirpation of northern bobwhites (Martin et al. 2017). This condition creates challenges for population recovery even if broad-scale habitat restoration is accomplished. Translocation of northern bobwhites is a technique that can potentially overcome some of these challenges when applied appropriately. This technique has been successful with other gallinaceous birds including wild turkeys. Much research and evaluation has been done on translocation of northern bobwhites over the last couple of decades including, but not limited to: (Jones 1999, Parsons et al. 2000, Terhune et al. 2006a, Terhune et al. 2006b, Terhune et al. 2010, Scott et al. 2013, Downey et al. 2017, Sisson et al. 2017, Martin et al. 2017). These researchers have paved the way in developing translocation BMPs and guidelines for wild northern bobwhites. Habitat restoration at the appropriate scale is the most important and initial step highlighted by all publications.

BMPs for translocating northern bobwhites (Martin et al. 2017):

1. Target bobwhite abundance should be >800 birds post-translocation which will likely necessitate > 600 hectares (approx. 1,500 acres) of suitable and accessible habitat while larger areas (e.g., >800 hectares [approx. 2,000 acres]) will be needed in areas with lower carrying capacity and when sites are highly fragmented or isolated.
2. Personnel should identify and avoid stressors to bobwhites in all phases of the translocation process (i.e., capture, holding, transportation, and release).
3. Source populations should be disease free and from similar environments and latitude; preferably from the nearest suitable source.
4. Conspecifics should be present at recipient sites
5. Releases should be made just before the breeding season (i.e., March and April)
6. The translocation should incorporate robust short- and long-term bird (i.e., abundance and/or density) and habitat monitoring efforts (i.e., the Coordinated Implementation Program (CIP) of the NBS).

Since development of the BMPs described above, the NBS and NBTC have recently completed development (2019) of a document titled "Position Statement and Guidelines for Interstate Translocation of Wild Northern Bobwhites." This document contains more detail regarding translocation of bobwhites and is attached as an appendix to this plan or available for review at the following link: <https://nbsi.org/download/bobwhite-translocation-guidelines/>

Recommendations of this plan are to follow these BMPs and guidelines in the future as potential translocation projects may be considered in Louisiana.



Growing season prescribed burn used on Sandy Hollow WMA to manage habitat.

## Section 4: The Future of Bobwhites



### INITIATING MANAGEMENT & CONSERVATION

Bobwhite management techniques used on croplands, pasturelands, and forestlands have been thoroughly discussed in previous chapters but the question still might remain: “How and where do we start meaningful bobwhite recovery in Louisiana?” This plan has outlined the numerous causes for population declines as well as the various habitat needs and potential solutions for population recovery. Accelerated management and conservation efforts must begin now! Thus, we find it fitting to conclude a state quail action plan by discussing how to get started.

We have learned from the past that scattered small-scale enhancements to restore bobwhites have proven ineffective to increase bobwhite populations in their historic range. Even though each small recovery effort is important and of local value, real recovery can only occur if landscape scale projects and initiatives resulting in large acreages being restored and maintained over time. Since resources are limited, such efforts should be geographically concentrated. LDWF recommends the adoption of the Focal Tiers concept described earlier in the NBCI Focal Tiers section. This calls for identifying moderate sized geographic areas >1,500 acres as “focal areas”, within larger high potential “focal landscapes”, found within even larger conservation districts or groups of Parishes deemed “focal regions.” Since Biologist Ranking Index findings are a snapshot in time of potential restoration areas, we suggest expanding focal areas into certain unique sites ranked moderate that may fall outside of focal landscapes where appropriate.

Identifying sites at least 1,500 acres in size can be challenging. However, long-term success requires a commitment to intentional habitat management over time to achieve population response and maintain recovery momentum. Smaller sized areas can have short-term success, especially when situated in close proximity to other

suitable habitat, but are much more susceptible to local population extirpation. However, other management interests and priorities often out-compete landowner desires to recover bobwhites indicating that successful incorporation of multi-purpose land use is critical to bobwhite population recovery efforts.

The Louisiana Bobwhite Recovery Plan calls for targeted recovery sites throughout the state to serve as population hubs and facilitate bobwhite response on properties of varying size located with these recovery areas. We have designated focal areas where current potential exists that are most likely to produce a successful outcome. Once established these sites can act as nuclei for continued expansion of connected bobwhite habitats. Like building blocks, these focal areas should grow to focal landscapes that grow to encompass focal regions. It is essential that federal, state, local, and private land managers work together to identify and establish focal area sites where the greatest restoration potential exists. To date, we have designated five focal landscapes and two focal areas in Louisiana where bobwhite population recovery potential is believed to be moderate to high (*Figure 16*).

The Historic Prairie focal region has the smallest acreage potential but maintains bobwhites where native groundcover still exists in larger parcels. This rare habitat, if recovered in contiguous tracts, could result in a locally noticeable bobwhite recovery. Private landowners near public owned tracts are encouraged to work together to recover native prairie plant communities beneficial to bobwhites. The West-Central Historic Longleaf focal landscape was identified by the Biologist Ranking Index (BRI) process to have the most recovery potential. The large public ownership within this focal landscape may provide the greatest likelihood for quick habitat restoration. Already steps are being taken on United States Forest Service (FS), Department of Defense (DOD), and LDWF managed lands to improve bobwhite habitat within this area. Combining these efforts with ongoing habitat work for rare species of importance such as red-cockaded woodpeckers and the Louisiana pine snake (*Pituophis ruthveni*) will further the cause of each. Efforts now should focus on expanding and connecting these managed efforts. The Northwest Uplands focal landscape has both public and private ownership that may offer potential for bobwhites. St. Amant reported in 1950 that Northwest Louisiana had the highest concentration of bobwhites found within the state. Soil quality can limit bobwhite food production, but soils in this area readily respond to bobwhite management efforts. A diverse variety of legumes flourish when soils are disturbed by fire, plow, or logging. If focal areas were established on public lands in this area and then expanded to private lands nearby LDWF biologists believe that bobwhite response would be significant. The Macon Ridge and nearby farmlands have also been identified through the BRI process as having high to moderate recovery potential. Much of this area is cropland where farmers participate in numerous USDA programs. Some areas are enrolled in CRP while other areas are a patchwork of varied row crops. This area will see increased bobwhite response when farmers implement currently available bobwhite-friendly NRCS practices such as field borders, buffers, pollinator areas, and

pivot corners. Additional public outreach on current NRCS practices and new bobwhite centric incentives are needed to increase farmer participation in Louisiana. The adoption of bobwhite management practices within each focal landscape by individual private landowners can link to neighboring farms creating an impetus for greater public adoption and a nucleus for bobwhite recovery. The Upper Florida Parishes focal landscape historically experienced good bobwhite numbers. Most of this area is privately owned but recent efforts to recover gopher tortoise habitat has prioritized longleaf pine restoration. State and federal prescribed fire incentive programs have also worked to restore bobwhite habitat and this area is home to Louisiana's only WMA focused on bobwhites, Sandy Hollow WMA. This WMA will serve as a recovery nucleus for area private tracts located in close proximity. Much like the Louisiana black bear (*Ursus americanus luteolus*) recovery effort, lands nearest bobwhite focal areas wherever established, should receive higher conservation practice funding priority.

Not all potential focal areas fall within the focal landscapes designated on the previous map. The incorporation of public land management among private management efforts will fortify conservation efforts and bobwhite response both in the short and long-term. As

resources become more available expansion outside of designated focal landscapes across the state will hasten region wide recovery.

### FUNDING OPPORTUNITIES

It has been said many times; "you get what you pay for." Former bobwhite habitats will not revert to widespread early succession conditions without a major effort. Farm, livestock, and forest product markets do sometimes experience monumental changes that can affect bobwhite habitats but such changes are often short lived. Today, for pasturelands, croplands, and forestlands to significantly restore bobwhite numbers, there is a substantial financial cost. For bobwhites to return, farmers, ranchers, and forest owners are asked to set aside portions of currently producing land in an effort to improve habitat. For some this financial sacrifice is small, while for others it is great. If recent history is any indication, landscape-scale change will only occur if these commodity producers can recover much of this lost revenue

The implementation necessary to restore all land types identified as high to moderate will potentially add over 1 million bobwhites in Louisiana but would cost many millions of dollars. Some states, Louisiana included, have yet to recover bobwhite populations on



An example of a "heavy thinned" forest managed with prescribed fire resulting in lush ground cover located in southeast Louisiana.

a meaningful scale despite multi-million dollar state agency initiatives (Morgan and Rhoden 2020). However, funding for bobwhite restoration can be achieved at a scale specific to focal areas. These funding sources include private dollars from individual landowners, USDA Farm Bill programs, Pittman-Robertson Funds, Bobwhite License Plate Funds, LDWF Conservation Funds, NGO funding (Quail Forever and National Wild Turkey Federation), and assorted grants.

Of these funds the one with the greatest landscape scale effect is the USDA Farm Bill (also called The Farm Act or The Agricultural Act). Efforts to restore bobwhites range-wide hinge greatly on what happens to this important bill in Washington D.C. The Agricultural Act of 2018 includes some wildlife provisions but much more is needed for bobwhite restoration.

In addition, funding for increased bobwhite management technical staffing is also needed to ensure adequate expertise in stepped up restoration efforts. As restoration efforts are significantly expanded, this additional staffing will be needed to develop and carry out bobwhite management. Additional funding for bobwhite monitoring and research is critical for assessing the effectiveness of various practices. Increased bobwhite specific training for all resource specialists and private land managers will further improve the quality of technical services. For bobwhites and other grassland wildlife to achieve a significant level of recovery, all groups will have to work together and pool financial resources.

#### CALL TO ACTION: YOUR ROLE IN BOBWHITE RESTORATION

The future of bobwhites in Louisiana is uncertain. The hair of most that experienced the bounty of bobwhites in this state has long since turned gray. However, those that did know the joys of quail hunting should lead the march in this new effort to restore bobwhite habitat. Your passion can encourage those in key positions to make a real difference for bobwhites. You must help others stay the course and not become distracted by ineffective “quick fix” solutions; habitat restoration is the only real solution proven to work. Unfortunately, the legacy and appreciation for quail hunting has all but disappeared. Restoration of bobwhites will require a greater buy in from the younger generation that stands to benefit most from its recovery. Recovery efforts must gain synergy from both hunters and non-hunters alike. It must have support from farmers, and ranchers as well as those interested in the return of gopher tortoises, Louisiana pine snakes, RCWs and other imperiled grassland species. Out-

door recreationists such as hikers, bicyclists, and horseback riders longing for more open “park like” woodlands need to participate in this effort. Indeed, it will take all those that care about grasslands, diverse herbaceous plant communities and ecology, birds and wildlife to make the landscape level habitat changes required to recover bobwhite quail populations. Local, state, and federal agencies must work together to overcome obstacles hindering land management practices beneficial to bobwhites on public lands. Public and private management must complement one another where bobwhites still exist in sufficient numbers and may also serve as demonstration areas to introduce others to what makes bobwhites and their habitats so special. Public outreach through every available medium is needed to kindle the flames necessary to recover the firebird.

For those that believe bobwhites are a lost cause, we simply point to species like the wild turkey that dropped to a statewide population of about 1,500 turkeys in 1946. Today, however, through dedicated restoration efforts and management, Louisiana turkey numbers are estimated at 40,000-50,000. Both the American alligator and bald eagle declined to levels which resulted in being listed on the endangered species list. But, today, eagles can be seen throughout the state and alligators number in the millions. The Louisiana black bear was considered by many “too far gone to recover” when it was placed on the threatened species list. Through coordinated habitat restoration efforts, black bear numbers have been restored to a level at which the USFWS has removed it from threatened species status. Bobwhites too can be restored! We must only have the will, dedication, and perseverance to accomplish this goal.



**LEFT:** Proceeds from Louisiana’s bobwhite licenses plate go to fund restoration efforts. **RIGHT:** Dormant season prescribed burn on Sandy Hollow WMA.



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# Appendix I: BMPs

## CROPLANDS BEST MANAGEMENT PRACTICES (BMPs)

- Riparian Filter Strips
- Field Borders (Rough Edges and Edge Feathering)
- Covey Corners
- Leave standing crops for bobwhites and other wildlife species
- Wildlife plantings for bobwhites and pollinators
- Control exotic plant species
- Restore native grass/forbs
- Fence row cover enhancement
- Convert low yield upland croplands to appropriate cover (long-leaf pine, shortleaf pine, native grasses, ect.)
- Fallow disk
- Mow to control woody brush if needed
- Feathered forest edges
- Manage of unused areas in annual and perennial native cover
- Reduce use of herbicides and pesticides on crops
- Manage crop residue for winter bobwhite cover
- Increase quail friendly methods of “no till” farming
- Increase use of prescribed fire to manage vegetation
- Reduce regulatory obstacles to prescribed burning
- Maintain cover connectivity
- Maintain escape and nesting habitat areas

## PASTURELANDS BEST MANAGEMENT PRACTICES (BMPs)

- Manage grazing to maintain an average of 18” or more of grass/forb cover
- Wildlife plantings for bobwhites and pollinators
- Reduce regulatory obstacles to prescribed burning
- Select biofuel crops used by bobwhites for food
- Control exotic plant species
- Manage use of selective herbicides
- Field Borders (Rough Edges and Edge Feathering)
- Covey Corners
- Riparian Filter Strips
- Restore native grasses/forbs
- Enhance fence row cover
- Convert highly erodible and low yield upland pasture areas to appropriate cover (longleaf pine, shortleaf pine, native grasses, ect.) Fallow disk
- Mow to control woody brush if needed
- Manage unused areas in annual and perennial native cover
- Increase use of prescribed fire to manage vegetation
- Maintain cover connectivity
- Maintain escape and nesting habitat areas

## FORESTLANDS BEST MANAGEMENT PRACTICES (BMPs)

- Reduce Basal Areas in pine and hardwood forests below 60 sq ft/acre
- Heavy first thinning
- Increase use of prescribed fire to manage vegetation
- Address regulatory and litigation obstacles to prescribed burning
- Increase fire frequency to every one to three years
- Burn as needed to manage habitat structure
- Maintain escape and nesting habitat areas
- Control exotic plant species
- Target use of selective herbicides
- Restore native grasses/forbs
- Wildlife plantings for bobwhites and pollinators
- Fallow disk (except in areas of high quality and/or rare plant communities)
- Mow to control woody brush if needed
- Manage unused areas in annual and perennial native cover
- Restore longleaf and shortleaf pine to their historic range
- Maintain cover connectivity
- Manage grazing
- Remove competing feral species

## Appendix II: Commonly Used Acronyms

**AFWA** - Association of Fish and Wildlife Agencies  
**ARM** - Adaptive Resource Management  
**BA** - Square Feet of Basal Area per Acre  
**BBS** - Breeding Bird Survey  
**BCR** - Bird Conservation Region  
**BMP** - Best Management Practices  
**BRI** - Biologists Ranking Index  
**CIP** - Coordinated Implementation Program  
**CP** - Conservation Practice  
**CRP** - Conservation Reserve Program  
**DOD** - U. S. Department of Defense  
**ED** - Estimated Density  
**EQIP** - Environmental Quality Incentive Program  
**ESH** - Early Successional Habitat  
**FAP** - Forest Action Plan  
**FBWS** - Fall Bobwhite Whistle Survey  
**FSA** - Farm Service Agency  
**FS** - U. S. D. A. Forest Service  
**FWS** - United States Fish and Wildlife Service  
**GPS** - Global Positioning System  
**JV** - Joint Venture  
**KNF** - Kisatchie National Forest  
**LCC** - Landscape Conservation Cooperation  
**LDAF** - Louisiana Department of Agriculture and Forestry  
**LDWF** - Louisiana Department of Wildlife and Fisheries  
**MD** - Managed Density  
**MFWF** - Mississippi Fish and Wildlife Foundation  
**NAWMP** - North American Waterfowl Management Plan  
**NBCI** - National Bobwhite Conservation Initiative  
**NBGI** - National Bobwhite and Grassland Initiative  
**NBTC** - National Bobwhite Technical Committee  
**NGO** - Non-Governmental Organization  
**NRCS** - Natural Resources Conservation Service  
**NWR** - National Wildlife Refuge  
**NWSG** - Native Warm Season Grasses  
**PLB** - LDWF Private Lands Biologist  
**PLS** - Pure Live Seeds  
**RCW** - Red-cockaded Woodpecker  
**SEAFWA** - Southeast Association of Fish and Wildlife Agencies  
**SEQSG** - Southeast Quail Study Group  
**SWAP** - State Wildlife Action Plan  
**USDA** - United States Department of Agriculture  
**WHIP** - Wildlife Habitat Incentive Program  
**WMA** - Wildlife Management Area  
**WRP** - Wetland Reserve Program

# Appendix III: Translocation Guidelines

## *Position Statement and Guidelines for Interstate Translocation of Wild Northern Bobwhites*

Prepared and submitted by the National Bobwhite Conservation Initiative and the National Bobwhite Technical Committee 12/20/18

Approved by the Steering Committee of the National Bobwhite Technical Committee, Jan. 29, 2019

Approved by the NBCI Management Board, March 7, 2019

### POSITION STATEMENT

The National Bobwhite Conservation Initiative (NBCI) provides a unified strategy, coordination capacity and technical support for wild northern bobwhite (*Colinus virginianus*) restoration. Drawing from the collective expertise and experience of its 25 member states and partners through the National Bobwhite Technical Committee (NBTC), NBCI is uniquely situated to offer leadership and guidance for restoration projects, including translocation of wild bobwhites.

The scientific consensus recognizes northern bobwhite populations are limited by quantity, quality and distribution of suitable habitat. Generally, where suitable habitat of the appropriate composition and configuration is available, northern bobwhites can thrive and translocations are biologically unnecessary. Translocations into habitat that does not meet - or may not reasonably be expected to continue meeting - the species' year-round requirements will have high probability of failure. The best opportunities for translocations are those occasions where the composition and configuration of suitable habitat exists and adequate time has been allowed, yet northern bobwhite populations have not responded as reasonably expected.

It is the position of the 25 member states that comprise the NBTC/NBCI that the reintroduction or restocking of wild bobwhites through translocation in these circumstances can be an acceptable restoration tool to achieve biological success.

Our position for a northern bobwhite restoration translocation project (a single property or cooperative of properties) to be biologically successful is maintenance of a sustainable fall wild population ( $\geq 800$  birds) and sufficient habitat that persists for the long term ( $>10$  years) after translocation has ended. Long-term performance that exceeds this minimum threshold is highly preferred, such as more dense population levels, and/or geographic expansion of the population beyond the initial project boundaries (see Recommended Procedure Guidelines). Our position for a northern bobwhite restocking translocation project (a single property or a cooperative of properties) to be successful is maintenance of sufficient habitat and target (a priori established) fall population densities supporting a surplus of birds for the purposes of hunting, source for other translocation projects, or emigration to properties beyond the scope of the translocation project. Target fall densities should be significantly higher ( $> 100\%$ ) than pre-release densities to justify a translocation effort.

### PRINCIPLES OF THE POSITION STATEMENT

1. States have legal jurisdiction and authority regarding the management of bobwhites.
2. Suitable habitat at large spatial scales is essential for bobwhite restoration.
3. Interstate translocation of bobwhites, when properly regulated and executed following biological principles (e.g., within historic range, minimum habitat requirements, etc.), can be an acceptable means of restoring populations.
4. Consideration of all legal means (e.g., predator control, supplemental feeding, etc.) is acceptable towards achieving success of population restoration, as warranted by project-specific scientific data.
5. Encourage decision makers to weigh the biological, societal, and economic implications when making decisions on population restoration endeavors, such as reasonable public access to a public resource if the translocation is successful.
6. Greater learning about the biological, ecological, and economic effectiveness and implications of interstate translocations are vital to the conservation of wild bobwhite populations.
7. All references herein to bobwhites are exclusively to wild birds; any reference to or use of pen-raised northern bobwhite for the purposes of population restoration are discouraged.
8. Success is defined in two stages: biological (minimum number to sustain the population through time) and huntable (socially defined abundance that fosters sustainable hunting or other societal benefits). Biological success is worthy of recognition in many parts of the bobwhite range, but it is only a step towards ultimate success when huntable populations are restored.

### GUIDELINES

These guidelines are a current professional consensus of the best management practices for interstate translocations of northern bobwhites for population restoration. They are intended for voluntary use to aid state wildlife agencies in requesting or sourcing interstate translocations. The guidelines utilize the best science available (synthesized in Martin et al. 2017) and expert opinion, to protect public wildlife resources and promote transparency and accountability. These guidelines could be equally relevant for intrastate translocations, but NBCI and NBTC recognize and respect the pre-existing translocation policies already established in some states. All partner states that have not already done so are encouraged to establish policies on translocation following the principles outlined in this document.

Thoughtful consideration of these voluntary guidelines is important given the mixed results of past translocation efforts. Moving northern bobwhites is difficult; the science still is developing, and widely inconsistent methods still are being used. Further, translocation data, records, and follow-up monitoring have often been incomplete, unavailable or nonexistent. Through national collaboration coordinated and standardized data collection, scientific learning can be accelerated, thus minimizing the conservation community's cumulative costs and expediting scientific advancement of translocation procedures. Finally, the definition of "success" was not well established in the

past, so expectations have been poorly defined and inconsistent. Recent scientific information combined with professional coordination through these guidelines provides a platform for an improved approach, built in part upon lessons from the past, for successful restoration of northern bobwhite populations in the future.

***The goals of this position statement and guidelines are to:***

1. Define and increase probability of success in conducting interstate translocations of northern bobwhites.
2. Improve scientific management and wise use of the public's northern bobwhite resources.
3. Promote long-term scientific learning and improved practice about interstate translocation as a northern bobwhite conservation tool.

***Recommended Procedural Guidelines:***

1. State Authorities - All interstate movements of northern bobwhites are subject to laws, regulations, permits, approval and oversight of the states and their authorized wildlife agencies in both donor and recipient states. Collaboration with academia, non-government organizations, individuals and other partners can be beneficial, but do not negate state authorities.
2. Determination of Purpose - Two typical scenarios present entities with distinctly different translocation decisions, but no attempt is made here to prioritize between them:
  - a. Reintroductions - Where northern bobwhites are locally or regionally extirpated, translocation clearly will be an essential restoration step, following restoration and management of suitable habitat. However, successful reintroductions into sites with extirpated populations have been few, and to date the odds of success are low; thus, the need for this more scientific, standardized and collaborative approach.
  - b. Restocking (a.k.a., supplementation, bolstering, augmentation) - Where northern bobwhites are present, but the population is below desired densities, the merits of translocation become more complicated to assess. The odds of translocation success may be higher than in an extirpation setting, but the definition of target populations and habitat suitability has both conservation and social aspects that need full consideration by both donor and recipient states.
3. Suitability of Release Site - Without adequate quality, quantity and distribution of habitat that is maintained for the long term at the release site, successful translocation of northern bobwhites is highly unlikely.
  - a. The quantity of bobwhite habitat at the recipient project and donor site should meet the minimum standards as established in the NBCI's Coordinated Implementation Program (CIP) of not less than 1,500 acres and a minimum of 25% habitat for larger projects (Morgan et al. 2016, pg. 4). For example, any project >6,000 acres will need >1,500 acres of habitat to maintain the 25% habitat minimum (i.e., an acre of habitat for every 4 acres).
  - b. The recipient state should conduct a thorough assessment of the proposed release site's habitat suitability compared with the minimum habitat standards. The CIP's habitat assessment procedure currently is undergoing testing, but offers the only standardized national procedure for assessing bobwhite habitat suitability, and thus is the recommended tool. However, other pre-existing bobwhite habitat evaluation methodolo-

gies may be suitable pending validation of the CIP procedure. Translocation of wild bobwhites into the release site is not recommended until the minimum habitat standards are met. The assessment would be strengthened by including a representative(s) from the donor site.

- c. The recipient state should submit a 10-year habitat maintenance plan to the donor state as a component of the formal request (Appendix 1). For the first 10 years of the project, habitat conditions should be reassessed, at a minimum, in years 5 and 10 to confirm conditions remain favorable for northern bobwhite.
4. Bird Monitoring and Harvest Management - Understanding local northern bobwhite populations and evaluating appropriate harvest rates are a core component of assessing success and protecting the public's resource.
  - a. Release and source sites should be adequately monitored to establish the initial population baseline for presence/absence and relative abundance of northern bobwhites, before translocation begins. Effective baseline monitoring procedures are described in the NBCI 2.0 and in the NBCI's CIP. Documenting the baseline population of wild bobwhites is critical for project planning, as well as assessing success and maximizing learning from translocation efforts.
  - b. Bobwhite trapping efforts should follow CIP harvest guidelines to protect source populations from overharvest.
  - c. Recipient states are encouraged to suspend or significantly limit all harvest of northern bobwhite on project sites until all translocation efforts are complete and success of the project has been determined.
5. Formal Request - If release-site habitat conditions are determined suitable, the recipient state is justified to proceed with a formal request explaining why bobwhite conservation would benefit by translocating wild bobwhites from other states.
  - a. The recipient state wildlife agency should submit the formal written request to the prospective donor state wildlife agency(ies) for review and negotiation, far enough in advance to allow review, response and preparation before any activities would begin. The final decision whether to export wild birds is the sole authority of the potential donor state, subject to law and regulations of both states.
  - b. To promote advancement of scientific learning (Goal 3, above), a copy of the formal request - as well as the final decision after review by the donor state agency - will be solicited by NBCI from the recipient state, for centralized storage in the QuailCount.org data management platform.
  - c. States are strongly encouraged to use the national request form template (Appendix 1) for submitting formal requests to donor states for northern bobwhites for translocation. Identical formats and data inclusion requirements accommodate accelerated scientific learning and foster efficiency for a requesting state to communicate with multiple donor states. Donor states will benefit through simplified prioritizing of the potential multiple recipients through a standardized request form.
6. Translocation Practice Standards - To protect the integrity of the public resource and maximize probability of success, source and recipient state project leaders should closely review and follow recommendations from Martin et al. 2017. The national template (Appendix 1) includes many of these components as a part of the proposal. Areas of focus include:

- a. Genetic implications of translocations
  - b. Diseases
  - c. Limiting stress
  - d. Using the right source
  - e. Presence of conspecifics
  - f. Releasing enough birds
  - g. Spatial and temporal aspects of translocations
  - h. Time of year
7. **Reporting** - For approved interstate translocations, annual progress reports are recommended (subject to applicable privacy laws and according to the NBCI Data Sharing Policy).
- a. States are recommended to use a future national report template to foster accelerated scientific learning and consistency.
  - b. Annual reports should be submitted to the donor states and invested partners. Copies will be requested through the NBCI Annual Inventory for centralized storage in the *QuailCount.org* data management platform.
  - c. At approximately 10 years post-release, the final outcome of the project should be determined and declared and a final report issued to the donor state. Copies will be requested through the NBCI Annual Inventory for centralized storage in the *QuailCount.org* data management platform. Archiving complete documentation of unsuccessful projects is as important as for successful ones, so bobwhite conservationists can learn from and avoid repeating mistakes.

### PUBLIC EXPECTATION

Upon determining a translocation project is successful, public benefits will include, at a minimum, a source of dispersing northern bobwhite to repopulate adjacent suitable habitat beyond the project boundaries. Additional expected benefits from the investment of public resources from projects achieving huntable densities could include:

- a. public hunting and viewing opportunity; and/or
- b. source birds for further translocations.

### SUPPORT SERVICES AVAILABLE

The NBCI and NBTC can provide or coordinate ad hoc review teams upon request, and can serve in an advisory capacity to one or both states during the translocation review phase.

The NBCI is prepared to promote conservation learning from the collective experiences, by providing central information clearinghouse and archiving services for:

- a. interstate translocation documentation, including:
  - i. proposals
  - ii. progress reports
  - iii. monitoring data
  - iv. outcomes;
- b. scientific and technical publications about translocation experiences, findings and recommendations for improvement.

### DEVELOPMENT PROCESS

The position statement and national guidelines result from a collaborative technical effort among the NBTC and the NBCI through a culmination of years of discussion and teamwork. The Martin et al. (2017) manuscript established the scientific foundation for taking this next step.

The NBCI Management Board, at its March 2018 meeting, approved proceeding with development of this guidance. A team from the NBTC Steering committee (Chris Kreh, Don McKenzie, John Morgan, and Robert Perez), Paul Grimes, and James Martin (hereafter drafting team) crafted several drafts of this document. The fourth draft was presented at the August 2018 NBTC Annual Meeting in Albany, GA to the Steering Committee, State Quail Coordinators, and the Science Subcommittee for critical review. The drafting team developed subsequent versions from that extensive input. The seventh draft was shared with the NBCI Management Board in September 2018, with a request for written comments by Nov. 7. The eighth draft was approved by the NBTC Steering Committee in January 2019, and was subsequently approved by the NBCI Management Board in March 2019.

The drafting team collaborated throughout the process with the Western Quail Working Group and National Wild Pheasant Group - both of which were working on similar tasks - for coordination through the Resident Game Bird Working Group (RGBWG) of the Association of Fish and Wildlife Agencies (AFWA). These guidelines could be more formally institutionalized and more effective by earning endorsement of relevant AFWA bodies, including the Resident Game Bird Working Group, the Bird Conservation Committee and the Executive Committee. The Resident Game Bird Working Group will be orchestrating this endorsement process beginning in fall 2019.

### EVALUATION

These are the first interstate guidelines for moving resident game birds. Thus, the NBCI Management Board advises reviewing the utility and effectiveness of these guidelines after an initial three-year period of implementation. The NBTC Steering Committee will evaluate implementation of these guidelines by September 2022, and provide recommendations for revision.

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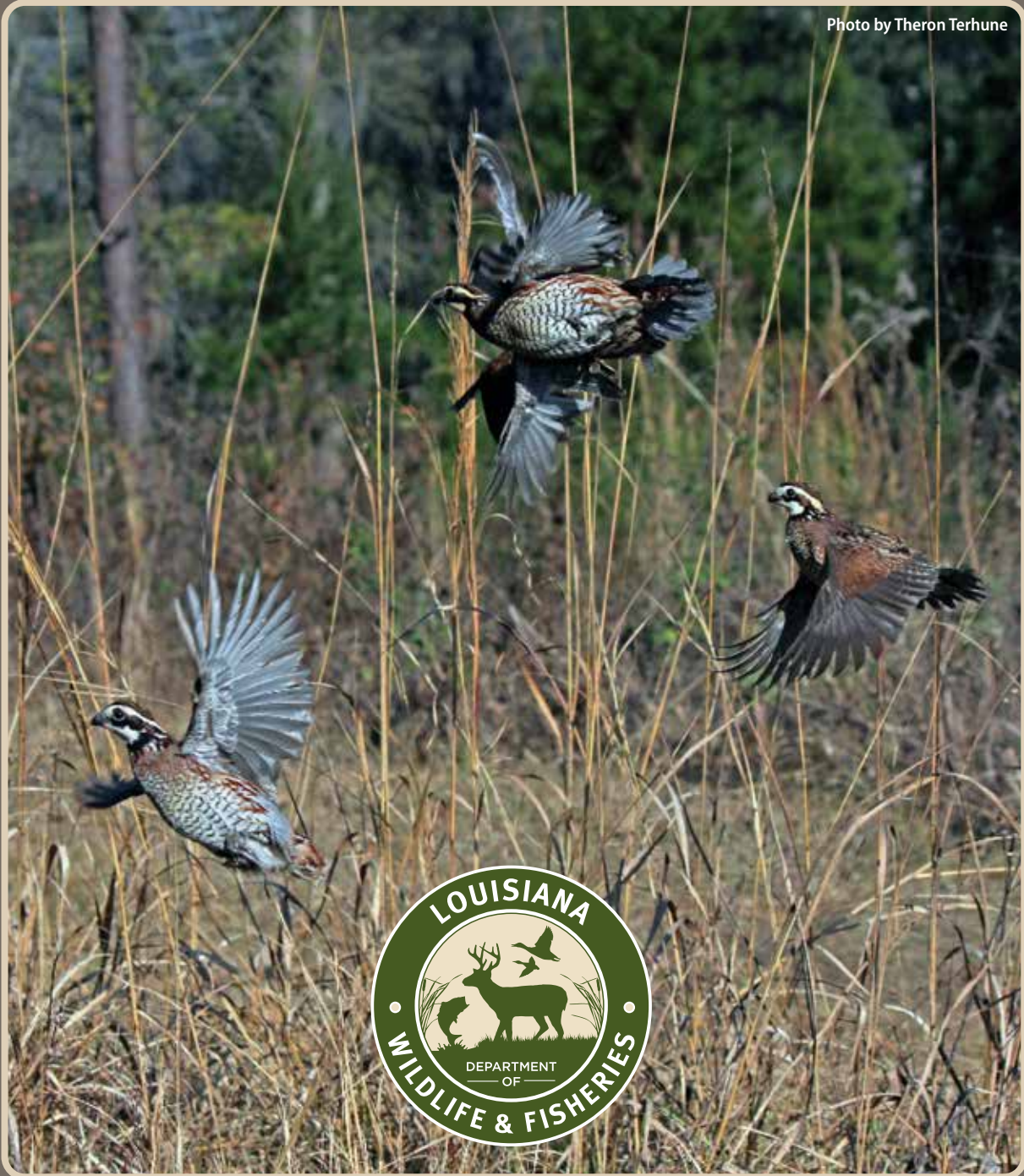
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