USDA Natural Resources Conservation Service
U.S. DEPARTMENT OF AGRICULTURE

WORKING LANDS FOR WILDLIFE

NORTHERN BOBWHITE, GRASSLANDS, AND SAVANNAS

A Framework for Conservation Action

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EXECUTIVE SUMMARY

The mission of the Natural Resources Conservation Service (NRCS) is to deliver conservation solutions so agricultural producers can protect natural resources and feed a growing world population. Through Working Lands for Wildlife (WLFW), USDA uses a win-win approach to systematically target conservation efforts to improve agricultural and forest productivity which enhance wildlife habitat on working landscapes.

The central and eastern grassland and savanna regions of the U.S. include the number one crop production states for corn, wheat, sorghum, soybeans, peanuts and cotton. Six of the top ten forest production states are in the East, and the Fescue Belt has the highest concentration of livestock producers and livestock in the country. Southeastern grasslands are the most diverse biologically in the U.S. but also the most imperiled with up to 90% in degraded condition or lost. **Major threats include 1) habitat loss and fragmentation, 2) climate change, 3) alterations to natural land disturbance regimes, and 4) invasive species.**

To address these threats, NRCS and our partners have brought row crop, livestock, and forest product producers together to develop this *Northern Bobwhite, Grasslands, and Savannas Framework for Conservation Action*. Building on the WLFW Northern Bobwhite initiative that launched in 2017, the framework will expand WLFW efforts to conservation of whole landscapes and wildlife communities.

In the first 5 years (2022-2026), approximately 7 million acres of conservation practices will achieve a range of specific conservation and economic goals. Twenty-five participating NRCS state offices selected conservation practices they will prioritize. These vary regionally with prescribed fire, restoration of native grasses through prescribed grazing systems, control of brush and invasive plants, and forest stand improvement (thinning to improve tree growth and allow light to reach the understory) among their top practices.

Nine of the twenty-five states also plan to add 165,000 acres to the Conservation Stewardship Program, and six states plan to place conservation easements on 3,200 acres. We anticipate that the stewardship and easement programs will see significant growth under this framework in future years.

Precision agriculture can be adapted to inform conservation practice adoption when wildlife objectives are explicitly incorporated into farm and landscape level decision framework. A precision agriculture approach will be utilized to identify where production is a primary landowner objective, and where lands marginally suitable for production could instead be managed to support wildlife. This approach will be used at the farm level, but also at larger landscape scales through funding to Mississippi State University who will identify areas with the most opportunity to apply precision ag approaches – and in those areas WLFW will concentrate technical staff in partnership with Pheasants Forever/Quail Forever to help producers identify conservation opportunities and make economically sound decisions.

Peer reviewed literature has established that the northern bobwhite is a good indicator for the status of other grassland wildlife, especially birds. Northern bobwhite declined by over 80% in the last three decades, a decline that mirrors our loss of native grasslands and savannas.

EXECUTIVE SUMMARY

Landscape context is critical to bobwhite and other wildlife – it's not enough to have an island of great habitat. The National Bobwhite Conservation Initiative identified 1500-acre habitat blocks as focal landscapes for bobwhite recovery. By strategically increasing connectivity of these blocks, we will create landscape corridors to meet seasonal habitat requirements. In these networked landscapes, partner staff will monitor northern bobwhite and other wildlife species to determine their response to our efforts over time.

WLFW is anticipating the following outcomes will result from conservation actions within this framework:

1) Wildlife Benefits

Anticipated outcomes include, of course, habitat conservation outcomes to address the life cycle needs of northern bobwhite and other wildlife. Monitoring of conservation outcomes will be accomplished by Quail Forever partner staff in cooperation with the National Bobwhite Technical Committee. NRCS has funded an agreement with the University of Georgia to collate the states' data and develop landscape and population models as outcomes assessments.

2) Economic Benefits, both Risk Management and Revenue Enhancement

WLFW has determined that we can assist producers in managing financial risks like those resulting from droughts or wildfires, for example, through implementation of some of the same practices that benefit wildlife. Furthermore, many installed practices will also result in revenue enhancements to agricultural and forestry operations as measured outcomes. Revenue enhancements include greater access to carbon markets, increases in huntable or viewable wildlife, and improved herd or commodity (e.g., timber, crop) health. Economic outcomes are consistent with the win-win approach of WLFW.

3) Climate Change Mitigation.

NRCS is supporting climate-smart agriculture and forestry and will apply up to 15 conservation practices that the agency has determined measurably reduce greenhouse gas (GHG) emissions. Agency and partner staff will help producers implement voluntary conservation practices that sequester carbon, reduce greenhouse gas emissions, and thereby mitigate the impacts of climate change on working lands. Under this framework, WLFW will report outputs for these 15 practices, then NRCS will calculate and share GHG mitigation outcomes. NRCS is also working to identify a suite of Farm Bill conservation practices for which we can measure climate adaptation benefits that address threats and increase landscape resilience. That work will continue and be incorporated into the conservation actions under this framework over time.

Strategically placed conservation practices are the lowest risk option to benefit landscape health and biodiversity regardless of future conditions of climate change.

Acting now will magnify conservation and economic benefits for our future. The Society for Ecological Restoration has stated *"Restoration is fundamentally a hopeful activity that can meaningfully improve the condition of our world."* This framework represents hope for grassland and savanna landscapes, for northern bobwhite and biodiversity, and for producers.

WLFW, Areawide Planning Team

INTRODUCTION

Over 90% of grasslands in eastern and central North America, including forested savannas, are degraded or have been lost (Figure 1). Our goal to meet the nation's demand for food and fiber sometimes outpaces our competing goal to conserve wildlife. The debate of whether these goals are compatible is succinctly captured as "spare or share:" can effective and enduring conservation only be achieved by "sparing" or setting aside land, or can larger "shared" working landscapes achieve similar goals (Pearce 2018)?

The answer is more nuanced since both are essential to solutions that are effective and sustainable. Some of our rarest species and habitats are so sensitive and specific in their ideal conditions that setting aside land for their conservation is critical. Additionally, the most successful landscape scale restoration efforts have a foundational "anchor" of well-managed land (often government owned) that serves to stabilize habitat availability year-to-year. Working Lands for Wildlife (WLFW) refers to these anchored work areas as **"dynamic landscapes,"** where conservation of private lands is fluid over time to give individual landowners flexibility while concentrated near stable habitat that serves to secure wildlife populations.

The Natural Resources Conservation Service (NRCS) manages several **Farm Bill Conservation Programs that protect wetlands, forests, farms and ranches through conservation easements,** and can serve as anchor sites or smaller habitat linkages in a dynamic landscape.

However, easements and fee title purchases are not always protective because landscape context, disease outbreaks, contaminants, and climate conditions can reach across ownership boundaries and diminish conservation values. We can't buy or regulate our way to healthy landscapes as the financial and social costs are too high. Therefore our challenge is to build shared visions with landowners and industries to identify conservation approaches that are palatable to those controlling the land throughout most of the U.S. NRCS's WLFW is based on building shared visions with landowners and communities.

This Northern Bobwhite, Grasslands, and Savannas Framework for Conservation Action supports the WLFW Northern Bobwhite initiative by expanding its range and purpose to a whole-landscape, multi-species conservation approach.

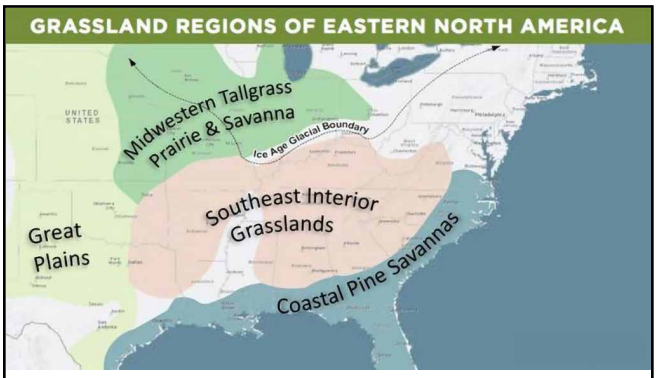


Figure 1. Southeastern Grasslands Initiative (https://www.segrasslands.org/ map of major grassland types across the United States. Pine savannas and other smaller scale grassland types occur in the Northeast but are not depicted in this map. (Credit: Sunny Fleming)

In the priority geographies, over 80% of the land ownership is private and in Texas that number rises to 95%. Private landowners make decisions based on a myriad of considerations, often economic ones. To create this 25-state framework for conservation action, NRCS staff and partners collaborated with corn, sorghum, cotton, and peanut growers as well as livestock producer groups and forest landowner associations to identify which specific conservation practices met their objectives.

We then consulted with natural resource experts and economists to identify those practices that achieved specific outcomes for wildlife conservation and climate resilience, while also increasing revenue and reducing financial risks for agricultural operations. The results of this multi-faceted assessment are presented later in this document.

Working landscapes are an integral part of our national fabric. Achieving both economic and conservation success on working lands is among the biggest challenges of modern conservation. Many outside the agricultural community do not realize or appreciate the economic pressures on agricultural operations, or that these effects ripple through rural communities and eventually affect us all.

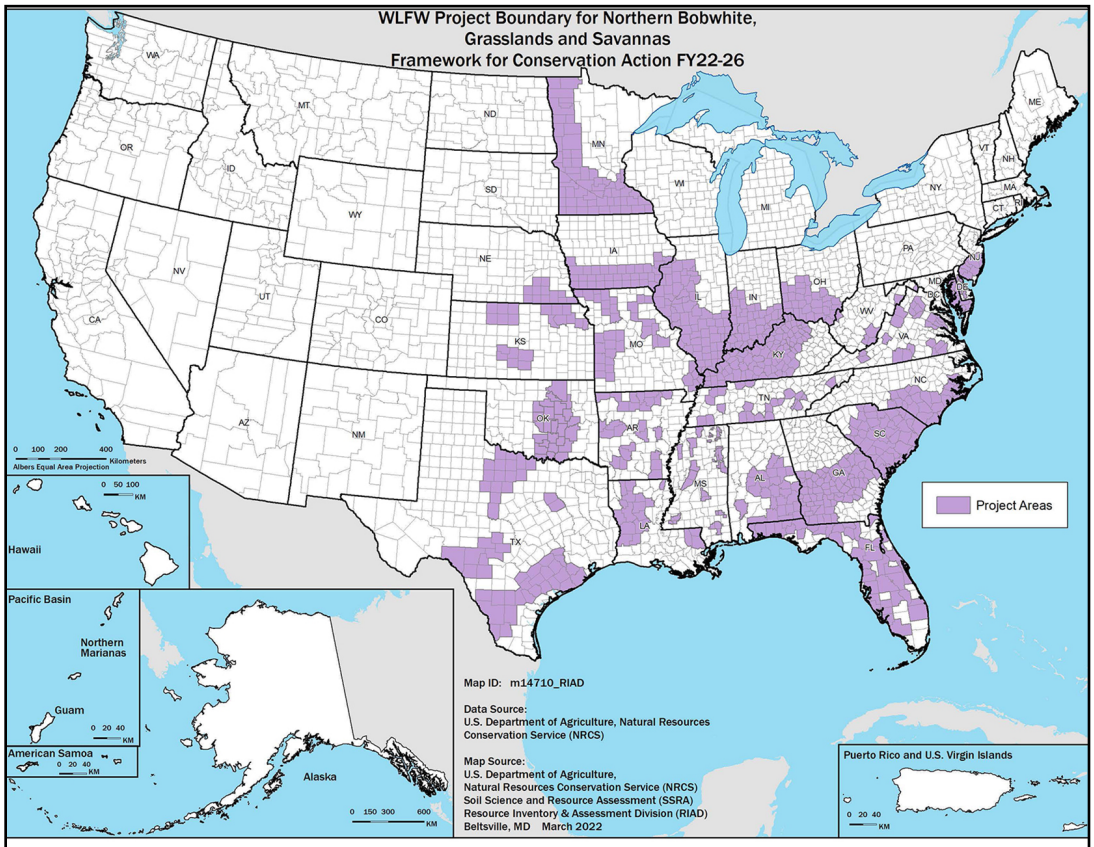


Figure 2. Map of priority areas for WLFW Northern Bobwhite, Grasslands, and Savannas: A Framework for Conservation Action.

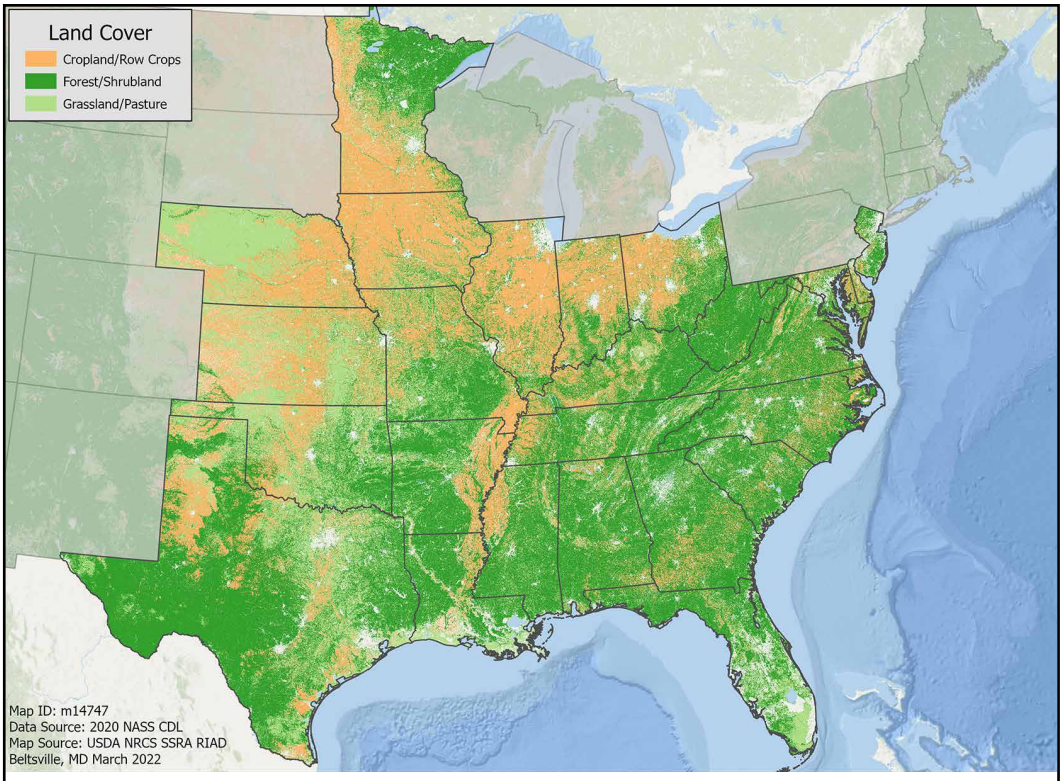


Figure 3. Primary land uses within WLFW Northern Bobwhite, Grasslands, and Savannas states.

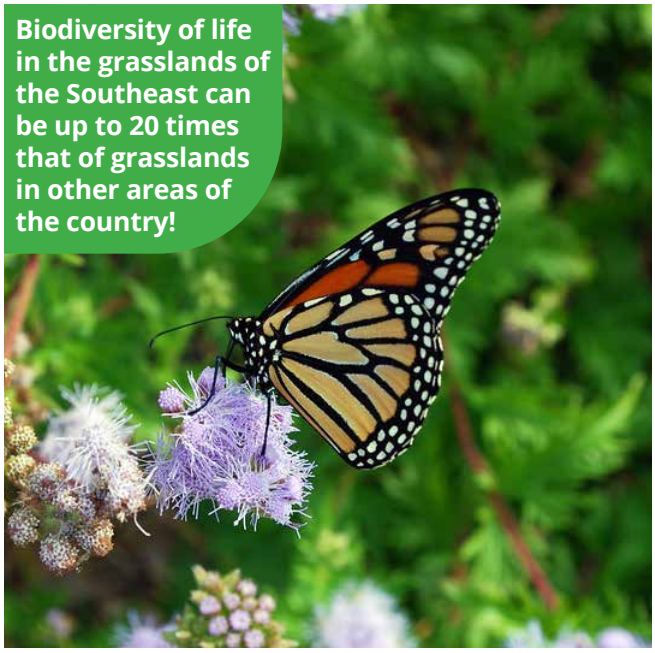
Landscape conservation designs that strategically integrate protected and working lands to support wildlife needs and economic realities have the most realistic chance of achieving long-standing conservation goals. WLFW builds common sense approaches sensitive to economic realities by providing key incentives while elevating the importance of land stewardship.

Across these large working landscapes, the northern bobwhite *(colinus virginianus)* is a far-ranging species and land uses in their habitat vary within and across state boundaries. Figure 3 depicts the primary land uses in the bobwhite range, within the 25 participating states.

"This unique partnership illustrates how industry and conservation groups can work hand-in-hand to achieve common goals. With its focus on precision agriculture, environmental conservation and grower profitability, this program echoes the sustainability goals the U.S. cotton industry has set for itself."

–Dr. Jessee Daystar, Cotton Incorporated

RESOURCE CONCERNS



Conservation partners working with limited budgets to address seemingly unlimited challenges must make hard choices in the same way a farmer or rancher does in managing their lands.

Grassland bird populations have followed the declining trends of their habitats, making habitat restoration and protection a key focus for their recovery. Grassland bird populations collectively have declined by 53%, or 720 million birds since 1970 (Rosenburg et al. 2019). The monarch butterfly and other pollinators are also in serious decline and will benefit from the planned actions. Therefore, conservation of remnant grasslands in this region should be a very high priority for plant and animal biodiversity in the U.S.

Through this published framework for conservation action, NRCS is demonstrating a willingness to prioritize central and eastern grasslands and savannas and commit enhanced financial and technical resources to their conservation. Though "conservation triage," or setting priorities in allocating funds to single species conservation has been controversial in the past, triage approaches that invest in critical landscapes and wildlife communities are now considered a common sense approach to the practical problem of limited funds and staffing within the conservation agencies and larger partnerships (Bottrill et al. 2008).

The northern bobwhite was selected as a target species by NRCS state offices for good reason. Bobwhite is an indicator species for the health of the ecosystems in which they live, and research has shown *"strong"* positive population associations with other grassland birds (Crosby 2015, Rosenblatt 2021). In other words, success in saving bobwhite can translate into success in saving other species, especially grassland birds. Crosby et al (2015) said "*Bobwhites were strongly associated with other grassland and shrubland birds and were a significant positive predictor for 9 species.*"

They noted that seven of these, including Bell's vireo *(Vireo bellii)*, dicksissel *(Spiza americana)*, and grasshopper sparrow *(Ammodramus savannarum)* have been designated by state wildlife agencies as species of conservation concern. Crosby et al. (2015) also importantly states *"Species richness and occupancy probability of grassland and shrubland birds were higher relative to the overall bird community in sample units occupied by bobwhites."*

"Our results show that bobwhites can act as an umbrella species for grassland and shrubland birds, although the specific species will depend on region and management objectives. These results suggest that efficiency in conservation funding can be increased by using public interest in popular game species to leverage resources to meet multiple conservation objectives."

Bobwhites have declined by over 80% in the past 30 years, which closely mirrors the decline of grasslands and savannas across its expansive range (Figure 4). Agriculture has been a major driver in converting grasslands to row crops or nonnative pastures/rangelands, and endemic savannas to industrial forests – but agriculture can also be a driver in restoring these habitats and populations.

Bobwhites need a variety of cover types during their annual life cycle to meet daily needs (e.g., foraging habitat, nesting cover, brood-rearing habitat, and escape cover), and therefore restoring habitat for bobwhite will support biodiversity in these ecosystems. Recovery actions for other at-risk species can easily be integrated into conservation plans for northern bobwhite. For example, the monarch butterfly *(Danaus plexippusis)* is often a co-beneficiary of these plans.

Figure 4. Cornell Lab of Ornithology map of northern bobwhite distribution.

The northern bobwhite quail is an iconic species in America. Generations of farmers, ranchers, families, and leaders in our country grew up hearing the distinctive "bob-WHITE!" call and bonded over hunting excursions for quail. At its peak, bobwhite hunting was a key revenue stream in cash-strapped rural areas.

Because the historic range of bobwhite is so expansive, pursuing conservation goals for this species could result in collateral benefits to many and varied agriculture industries and hundreds of wildlife species. Figure 5 depicts the geographic reach of row crop industries within our priority areas for this plan. The range of northern bobwhite also includes some of the most economically disadvantaged and most ethnically diverse rural areas of the United States. Economic benefits of the proposed work are discussed in more detail later in this document. In May 2021, The Journal of Wildlife Management published a commentary (Williams et al. 2021) that argues for more federal leadership and investment in northern bobwhite conservation.

As a nonmigratory game bird, the northern bobwhite is not the beneficiary of federal coordination or expenditures to track population trends (other than Figure 6, the North American Breeding Bird Survey (usgs.gov)), set joint habitat or population targets, or develop collaborative regulation of hunting across the states - as is the case with migratory game birds. Furthermore, significant federal funds that are available for migratory nongame species and rare species may not directly benefit northern bobwhite. As the pendulum in recent decades has swung away from a bias towards the conservation of game species, some game species like bobwhite have been left at increased risk of decline.

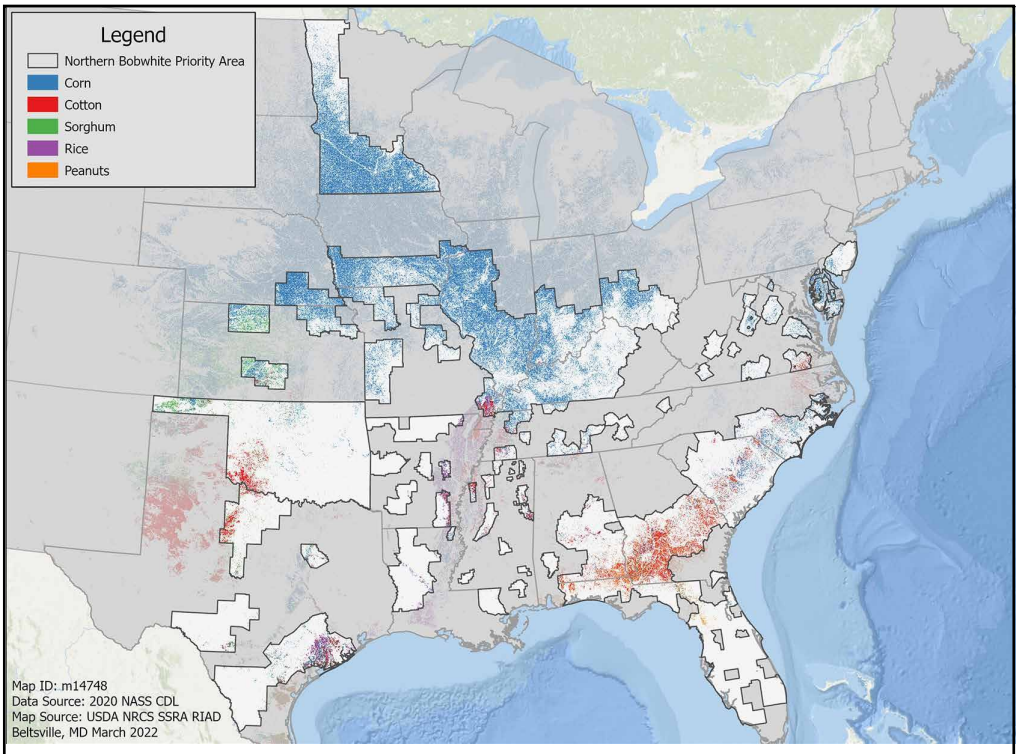


Figure 5. Major row crop production areas within northern bobwhite priority areas.

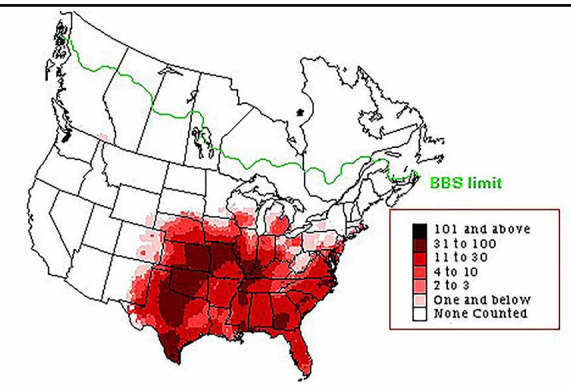


Figure 6. U.S Geological Survey's Breeding Bird Survey 2009-2020 reveal local trends in northern bobwhite populations.

Steep population declines are undisputed, but it has often been hard for advocates of northern bobwhite conservation to be heard over other conservation emergencies. Waiting until a crisis emerges decreases the chance of successfully recovering a species; however, inadequate conservation resources, litigation, and regulation increasingly press conservation agencies into this exact situation. Our goal is to demonstrate that well-planned habitat restoration that benefits a host of species at varying landscape scales can get ahead of the extinction risks and regulatory interventions.

Several federal agencies including NRCS have supported northern bobwhite conservation for decades, and the state wildlife agencies whose mission includes conservation of nonmigratory game species have made significant investments in bobwhite conservation planning and habitat management. Despite these significant and sustained efforts, there has been no change in the downward trend of bobwhite populations, which led Quail Forever and the National Bobwhite Technical Committee (NBTC) to request in 2020 that NRCS elevate its role in northern bobwhite conservation.

Importantly, this request was supported by letters from diverse agricultural producer organizations across the species' range representing ranching and farming advocacy groups and forest landowner alliances.

In early 2021, NRCS released a National Bulletin, (NB 300-21-14) **https://directives.sc.egov.usda.gov/ViewerFS.aspx?hid=46099New enhancements to Working Lands for Wildlife - Northern bobwhite initiative: opportunities to strengthen the role of NRCS in grassland and savanna conservation)** detailing actions the agency would take to enhance its support of the National Bobwhite Conservation Initiative **(National Bobwhite Conservation Initiative - NBCI (bringbackbobwhites.org).**

A key outcome of the National Bulletin is this **Northern Bobwhite, Grasslands, and Savannas Framework for Conservation Action** representing a cooperative plan by 25 NRCS state offices and their local partners to increase the amount and effectiveness of conservation practices implemented through Farm Bill programs to benefit northern bobwhite, grasslands, and savannas of the central and eastern United States. Our hope is that the enhanced role of NRCS will serve the need for federal coordination for northern bobwhite conservation, as well as increase resources applied to conservation of grasslands and savannas. Working Lands for Wildlife focuses on increasing limited habitat as well as other resource concerns that affect agricultural operations to achieve the desired "win-win" for producers. On pages 28-31 you'll find an assessment of the anticipated impact of WLFW Northern Bobwhite, Grasslands and Savannas on the economics of agricultural operations, evaluated by dividing conservation practices into those that enhance revenue and those that mitigate financial risks.

FEATURED PARTNER

QUAIL FOREVER

Quail Forever's mission is to conserve quail, pheasants, and other wildlife through habitat improvements, public access, education, and conservation advocacy.

"We know with certainty that random acts of conservation aren't going to save the bobwhite quail. It's going to take a targeted landscape scale approach to hit the goals necessary to move the needle the right direction for these birds. The Working Lands for Wildlife Program provides the perfect tool to do just that. A program that creates crucial early successional habitat as a by-product of how landowners and producers manage their property while still making a living off it is the perfect practice in a desperate hour for this iconic species!"

–Howard Vincent, President and CEO of Pheasants Forever and Quail Forever

"We have been extremely pleased with the results of our habitat work in conjunction with NRCS. NRCS and Quail Forever did a great job explaining to us what our expectations should be from them and also what was expected from us throughout the program. They were available anytime a question arose and simplified the process for first-time program participants."

–Jantzen Brantley, Landowner
White Oak, NC

FEATURED PARTNER

National Bobwhite Conservation Initiative and Technical Committee

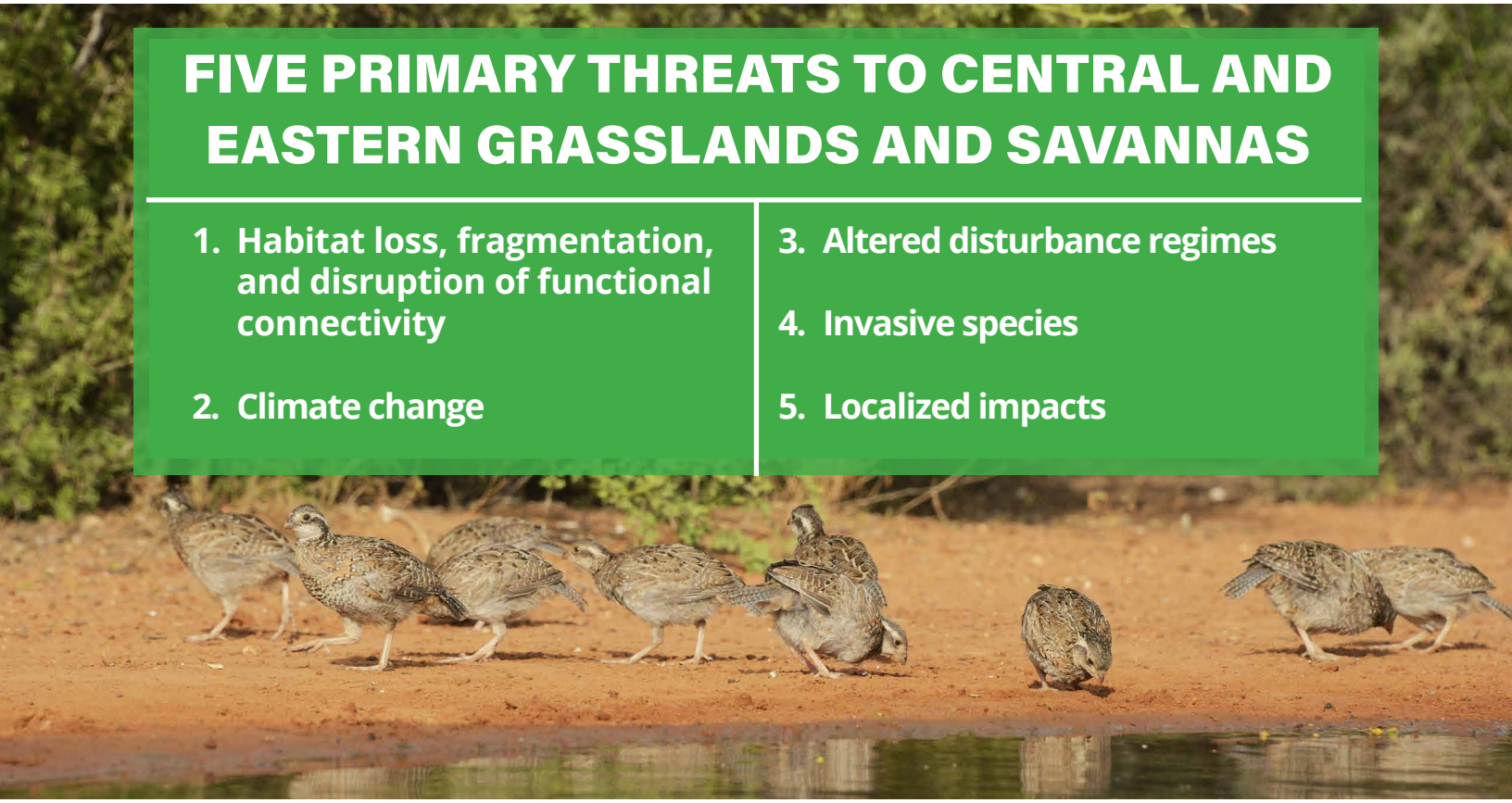
The National Bobwhite Conservation Initiative (NBCI) and associated National Bobwhite Technical Committee is a 27-year partnership comprised of 25 state wildlife agencies supported by a myriad of non-government organizations, federal agencies, and universities. The team focuses on grassland restoration and management to recover northern bobwhite populations and associated species while enhancing water quality, soil health, air quality, and human health and wellness. Throughout NBTC's history, there has been an intense focus on private lands conservation particularly involving agricultural and timber production (https://bringbackbobwhites.org/about-us/nbtc/).

CONSERVATION NEEDS

The Diagnosis

Westwood et al. (2014) called for conservation agencies to draw from established principles in medicine and introduced a 5-stage classification of recovery: diagnosis, treatment, stabilization, rehabilitation, and recovery. Medical terminology being more familiar to the general public, this classification allows conservation practitioners to talk about their work in a way that supersedes professional, technical or agency terms and jargon. So, let's talk about the "diagnosis" at both the macro (landscape) and micro (species and farm/ranch) scales.

Noss et al. (2012) uses 5 categories of threats to grassland species and ecosystems: (1) habitat loss, fragmentation, and disruption of functional connectivity; (2) climate change; (3) altered disturbance regimes; (4) invasive species; and (5) localized impacts. If we look at these through the lens of Farm Bill Conservation Programs, NRCS plans prescribe treatments (i.e. specific conservation practices) for each of these causal factors.



FIVE PRIMARY THREATS TO CENTRAL AND EASTERN GRASSLANDS AND SAVANNAS

1. **Habitat loss, fragmentation, and disruption of functional connectivity**
2. **Climate change**
3. **Altered disturbance regimes**
4. **Invasive species**
5. **Localized impacts**

THREAT: Habitat Loss and Fragmentation

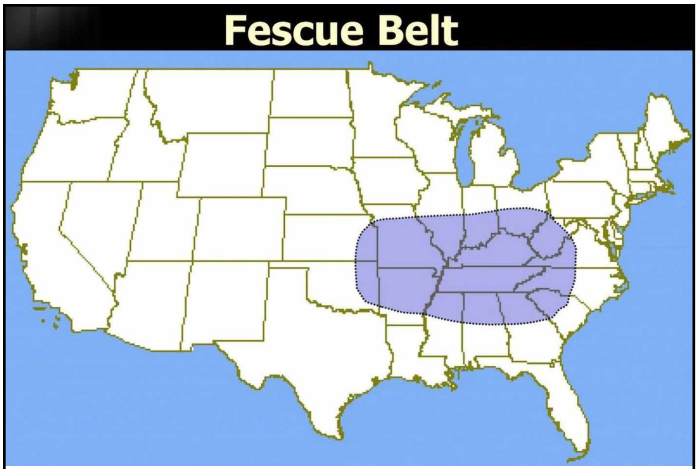


Figure 7. The Fescue Belt has the highest concentration of livestock producers in the United States and is dominated by tall fescue, a nonnative grass species that provides no wildlife value and mixed benefits to herd health.

WLFW will focus on restoration of native grasslands and savannas across the participating central and eastern states, and on habitat connectivity through cropland. In the Fescue Belt (Figure 7) where 45 million acres have been converted to nonnative grasses and are now dominated by tall fescue *(Festuca arundinacea)*, the agency and its partners will work with producers to convert a portion of their grazing lands to native warm season grasses. The Fescue Belt comprises 10% of U.S. land area across the Mid-Atlantic, Upper-South, and Lower Mid-West and has the highest concentration of livestock in the nation. Tall fescue is a cool season, perennial bunchgrass that became popular in the 1930s due to its ability to provide abundant forage. However, a toxic endophyte endemic to the plant is common and impacts livestock weight, reproduction and overall health.

Fescue toxicity impacts over a quarter of the beef cows in the United States, resulting in estimated losses to the cattle industry over one billion dollars annually (Strickland et al. 2011).

Improved cultivars of fescue are increasingly available to producers, but it's expensive and challenging to attempt the conversion and no additional wildlife benefits are gained from it. WLFW will assist interested producers in establishing native warm season grass pastures within larger prescribed grazing systems. Prescribed grazing is compatible with maintaining suitable habitat for northern bobwhite and is one of several tools to reduce overgrowth or invasive vegetation that renders bobwhite habitat unsuitable.

Cool season grasses grow well in spring (April-early June) and fall (October-November). During summer, tall fescue growth slows, leading to a "summer slump" in forage production. Native warm season grasses like switchgrass *(Panicum virgatum)*, big bluestem *(Andropogon gerardii)*, Indiangrass *(Sorghastrum nutans)*, and Eastern gamma *(Tripsacum dactyloides)* can fill this forage gap and improve livestock health, while also benefiting wildlife.

Cattle given the option to graze in native warm season pastures are healthier. Unlike most fescue, these pastures do not contain toxic endophytes and they provide abundant forage during hot seasons increasingly experienced across the United States due to climate change.

THREAT: Habitat Loss and Fragmentation

In 2019, NRCS released a Science to Solutions report summarizing the peer-reviewed science reported by Keyser and Boyer (2018) on using native grasses as forage in comparison to tall fescue and other nonnative grass varieties. They summarized the current science: "*Incorporating native warm season grasses into grazing systems can increase grazing days, reduce reliance on more costly hay and commodity feeds, and help improve fescue pastures by allowing them to rest during summer.*"

Savannas in the East can be dominated by one or several tree species including oak-hickory through the Midwest and into the Northeast, and several native pine species in the Southeast. WLFW will focus on establishing more open canopies in unmanaged sites using predominantly prescribed burning and forest stand improvement (timber thinning) plus several conservation practices that will focus on understory management for wildlife. Details are discussed under the Altered Disturbance Regimes and Invasive Species sections below.

Private landowner referring to native grass pastures he planted more than 25 years ago, "this has been my best agricultural investment ever!"

–C. Benhoff, Virginia

NRCS is providing funding support and oversight to partners for completion of the **Southeast Longleaf Element Occurrence Geodatabase (LEO GDB).**

The LEO GDB project goals are to produce: 1) a comprehensive ArcGIS geodatabase that will enable states and partners to view and analyze standardized longleaf map data at multiple scales from local to range-wide, and measure longleaf acres and vegetative condition changes through time, and 2) a rapid assessment protocol and mobile app for use in field data collection where information gaps are identified.

Good progress has been made toward these goals and current products are available at Southeast Longleaf - Florida Natural Areas Inventory (fnai.org). The LEO GDB will support improved landscape restoration planning at scales needed to effectively address habitat losses.

THREAT: Habitat Loss and Fragmentation

Private forest before and after timber stand improvement practice was installed.

"As a new landowner looking to develop a management strategy for quail and gopher tortoise, having the resources for funds and technical assistance has been most helpful. Being given a timeline specifically geared to manage my property, and knowing biologists are just a phone call away if I have questions has helped me in achieving my property goals."

–Mr. Buzz Busby, Georgia

THREAT: Habitat Loss and Fragmentation

Producer groups representing sorghum, corn, soybeans, cotton, peanut, and cattle are all supporting this initiative and its efforts to employ conservation practices on marginal cropland or adjacent to fields to enhance habitat connectivity such as field borders, conservation cover, hedgerow plantings, and early successional habitat establishment. In addition, reduced tillage will control erosion, improve water quality and soil health, and retain moisture.

Through Quail Forever, WLFW will begin hiring precision agriculture specialists in 2022 who will work with farmers to calculate the cost-benefit of continuing to farm marginal lands and suggest wildlife-friendly alternatives. In addition, WLFW is funding a range-wide assessment through Mississippi State University of precision ag and economic variables to identify areas of the country where there are concentrations of marginal agricultural land, with the intent of providing more support to farmers in those areas. Because habitat connectivity is a key issue in the decline of many species, and especially species that have smaller home ranges, the participation of row crop farmers will be critical to the success of the partnership.

“Working Lands for Wildlife provides vital support to private landowners who sustain 86% of the South’s more than 245 million forested acres,” said Scott Phillips, Southern Group of State Foresters (SGSF) Chair and South Carolina State Forester.

“The program enables land stewards to keep forests, and key habitats, intact and healthy by helping landowners manage for forest conditions that benefit bobwhite quail and other wildlife, while also providing for economic returns.”

–Chelsea Ealum, Communications Director
Southern Group of State Foresters

THREAT: Habitat Loss and Fragmentation

WLFW will also promote conservation practices and program options that offer financial alternatives to agricultural landowners. Among these will be increased availability of the Agricultural Conservation Easement Program (ACEP) to reimburse willing landowners for either 30-year or perpetual easements and expanded use of the Conservation Stewardship Program (CSP) to reward landowners who demonstrate good stewardship of their lands with incentive payments.

"Without their [Pheasants Forever-Quail Forever and partners] knowledge, we were having a hard time showing our landlords the benefits of sustainable farming and how to remain profitable. We are one of the many examples that farmers truly care about the environment and the land they utilize."

–Lee Wisecup, Iowa producer

"Sorghum's relationship with upland birds is unique and creates mutually beneficial opportunities for both wildlife conservation and farm profitability. These benefits present an ideal opportunity for strategic and targeted conservation efforts on working lands that can help maximize land productivity - both in terms of yields and dollars as well as in supporting ecosystem services."

–Kira Everhart-Valentin
Sustainability Director
United Sorghum Checkoff Program

THREAT: Climate Change

Mawdsley et al (2009) found that addressing climate change was less an issue of developing new conservation practices and more one of targeting creative approaches to the most vulnerable landscapes and species. *"Although our review indicates natural resource managers already have many tools that can be used to address climate-change effects, managers will likely need to apply these tools in novel and innovative ways to meet the unprecedented challenges posed by climate change."*

A team of NRCS experts is assessing the potential of the agency's over 400 conservation practices from our Field Office Technical Guide **(Field Office Technical Guide (FOTG) | NRCS (usda.gov))** for reducing greenhouse gases and improving resilience of rural landscapes. The intent will then be to focus specific Farm Bill conservation practices in priority geographies across the country. NRCS has completed identification of 35 conservation practices that mitigate greenhouse gas (GHG) emissions, and launched a focused sign-up for those practices beginning in FY21. This effort will be expanded in future years, and work is underway to identify a list of conservation practices that best support climate adaptation as well.

As our sophistication within the agriculture and conservation communities grows, prioritization of climate adaptation measures should follow Prober et al. (2011) using a change-resilience framework highlighting drivers and directions of change in a warming and drying climate, then consider explicit risks, feasibility, and benefits of conservation adaptation options to identify priorities for conservation action to conserve wildlife and landscapes.

WLFW is focused on restoring habitat strategically landscape scales to strengthen climate adaptation and resilience for healthy ecosystems and diverse wildlife communities; individual farms/ranches and wildlife species then also benefit (Figure 8). In support of NRCS's Endangered Species Act (ESA) responsibilities and ESA predictability provided to USDA producers by the Fish and Wildlife Service in partnership with NRCS, WLFW adheres to conservation measures identified for target species and focuses conservation practices geographically to maximize benefits.

Since vegetative structure drives abundance of bobwhite and other wildlife (and impacts livestock), reoccurring heatwaves and persistent, long-term drought in grasslands is a significant concern, as are wildfires in grasslands and savannas. As a species whose survival strategy is dependent on high reproductive rates, 25% of annual reproduction of bobwhites has been linked to precipitation. Furthermore, bobwhites are very sensitive to extremes in temperatures. Providing good quality, connected habitats across landscapes is our best option to mitigate the effects of climate change.

In an analysis of risk versus feasibility of climate change adaptation approaches, Prober et al. (2011) concluded that *"prevention or restoration of human-induced degradation... formed the set of lowest-risk options, with likely benefits for biodiversity independent of the extent and direction of climate change."* Habitat restoration is a low-risk option with potential for significant success regardless of any continued uncertainties with future climate change rates.

THREAT: Climate Change

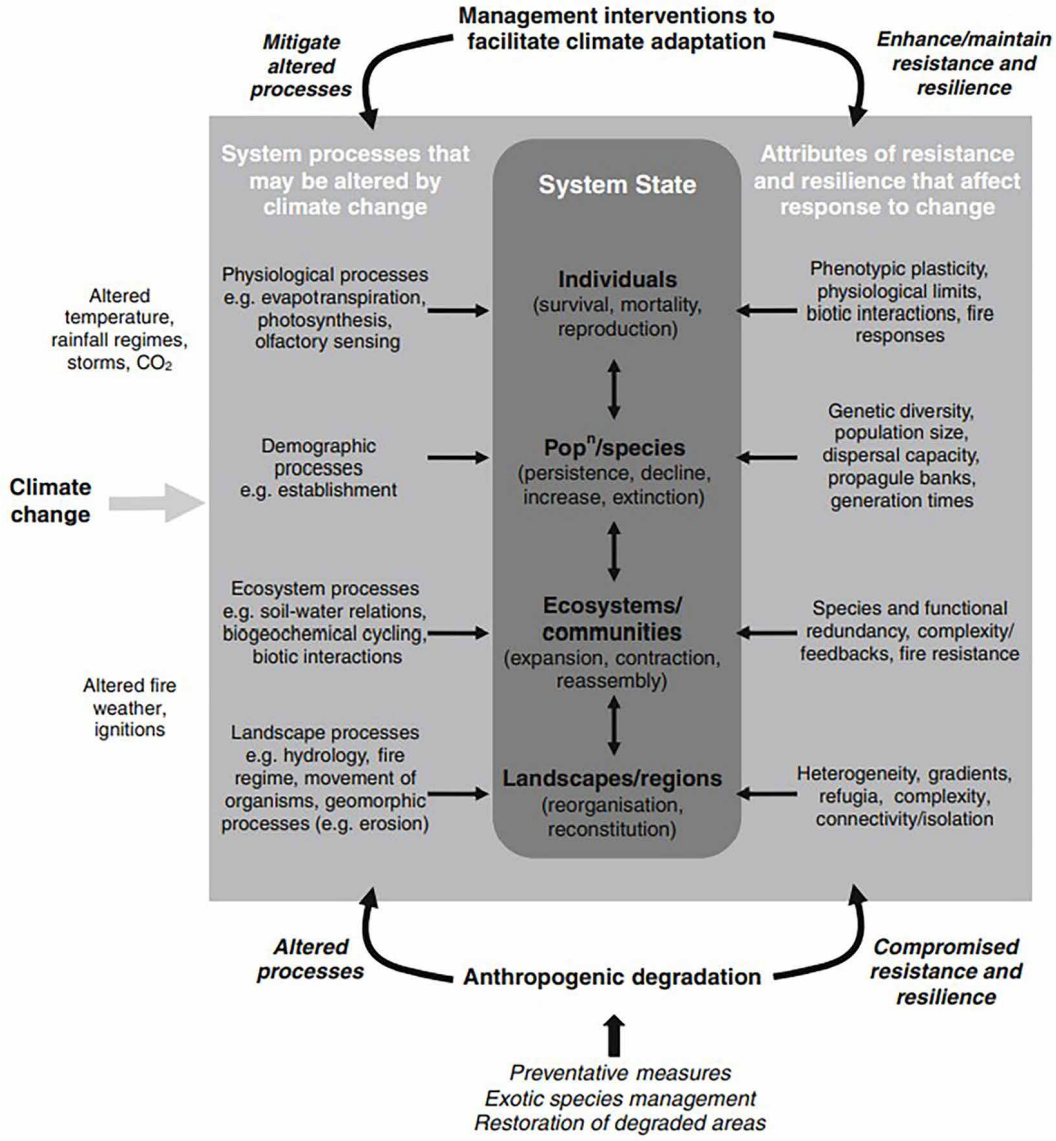


Figure 8. Prober et al. (2011) change-resilience framework for appraising climate change impacts and adaptation interventions in each biome or region. Any such system comprises interacting elements at different levels of organization, from individuals through populations and species to ecosystems and landscapes. Note that many of the processes in the framework interact in complex ways and may act at multiple levels in the system; for simplicity, these interactions are not shown.

THREAT: Altered Disturbance Regimes

Grasslands and savannas are fire-adapted systems and many endemic species in these systems are fire-dependent, needing fire to reduce competition and trigger germination. Fire fundamentally influences community structure and composition. Suppression of fire can have long-lasting negative effects, including loss of native vegetation through conversion to nonnatives, woody conversion of grasslands, or invasive plant dominance that eliminates wildlife habitats. Likewise, longleaf pine grown for commercial use is dependent on regular cycles of burning for optimal market growth.

WLFW will address fire suppression by increasing the use of prescribed burning on private lands through technical and financial assistance, creating and maintaining openness to benefit ecosystem health and timber values. NRCS will develop conservation plans for private lands that recommend prescribed burning every 2-3 years to encourage herbaceous-vegetated understories and tree growth in savannas and reduce woody encroachment in grasslands and savannas. Early growing season burns will be prioritized during the project planning and ranking process. Additionally, WLFW has a new (FY22) partnership agreement with Tall Timbers, Inc., to hire fire coordinators to assist private landowners in establishing landowner-led Prescribed Burn Associations to plan and execute prescribed burning in Georgia, Florida and Alabama, and we hope to expand this effort to other states over time.

NRCS is also funding landscape planning as a diagnostic tool to improve fire management in the Southeast. NRCS funded and managed development of the SE FireMap version 1.0 released in March 2021 **(Wildland Fire (landscapepartnership.org).**

The primary objective of the tool is to develop a cohesive system using remote sensing to track both prescribed fires and wildfires across the Southeast, providing significantly improved resolution over other regional and national systems currently in use. Version 2.0 of the SE FireMap will be released in 2023-24 and plans are to extend fire mapping to the entire U.S. by 2027 in partnership with USGS and Tall Timbers, Inc.

A decision support diagnostic tool based on merging the NRCS-funded Longeaf Element Occurrence Geodatabase **(https://geodata.fnai.org/)** and SE FireMap is planned by 2024 and will be available on the Landscape Partnership portal **(https://www.landscapepartnership.org/)** (to view all content and request data downloads, please register on the home page).

Growing season burns are most effective at suppressing the growth of invasive woody vegetation and encouraging growth of grasses and herbaceous vegetation for wildlife forage. Timber growth also benefits most from growing season burns.

THREAT: Invasive Species

NRCS will increase use of vegetation management to manage growth of native and nonnative plants on private lands. Assistance for mechanical brush management will be provided in conjunction with prescribed burning to reduce high fuel loads, making burning safer and more effective at controlling undesirable woody vegetation and enhancing herbaceous ground covers. In all landscapes, controlling undesirable and invasive plant species will be a priority through brush and weed management, including mechanical and chemical control techniques.

Southeast grasslands have some of the highest endemic plant diversity in the world and managing invasive vegetation will help conserve or restore these if planning includes consideration of existing native plants and native seed banks. Partnerships and local technical standards will be developed to guide these considerations.

"Family forest owners take on a tremendous amount of responsibility in managing their forests in an ecologically and economically sustainable manner. Their hard work helps them achieve their objectives of income, recreation, legacy and more. However, society at large are the true benefactors from all of the forest values produced from this hard work including clean air and water, forest products, and diverse and abundant wildlife that is essential to our health and lifestyle. USDA's Working Lands for Wildlife supports landowners in their journey as they become aware of the values they steward, understand how to produce higher quality values and ultimately to take action through long term management."

-Chris Erwin, Director
Biodiversity and Southern Conservation
American Forest Foundation

CONSERVATION ACTIONS

The Treatment Plan

In May of 2021, the twenty-five participating NRCS state offices were asked to identify which conservation practices they would be using in their state to support this WLFW framework. Nationally, we have a list of 44 potential practices and each state narrowed that list to those practices most applicable to their resource concerns and landowners' interests. The NRCS state offices and their local partners set goals for selected practices for fiscal years 2022-2026 to be implemented within priority areas in each state (Figure 9); goals beyond 2026 will be set through future work plans that will follow this framework for conservation action. Funding support for practices have primarily been through the Environmental Quality Incentives Program funds (Environmental Quality Incentives Program | NRCS (usda.gov)) managed by each state; however, over time we hope to attract a variety of funding support to ensure goals are met to grow these state efforts. Prescribed grazing and brush management were the most prevalent practices nationwide, followed by prescribed burning and herbaceous weed control. All other practices totaled less than 5% of planned implementation when averaged across all states. However, looking regionally gives more clarity to the suite of practices deemed most effective for varying land uses and systems.

The goals for this initiative have been consolidated by NRCS regions (Figure 10).

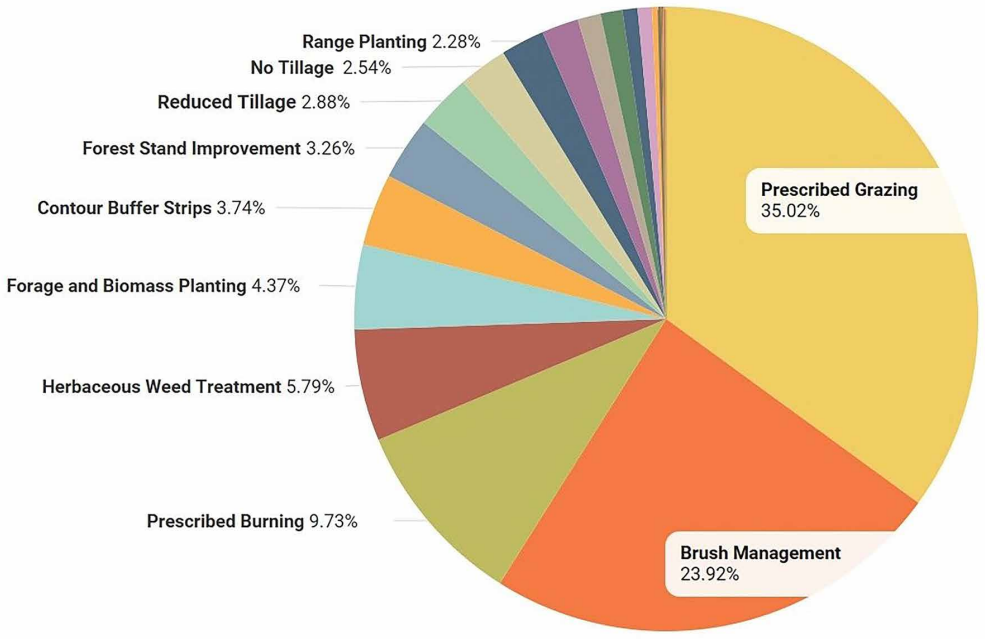


Figure 9. Top Conservation Practices to be Employed Nationwide

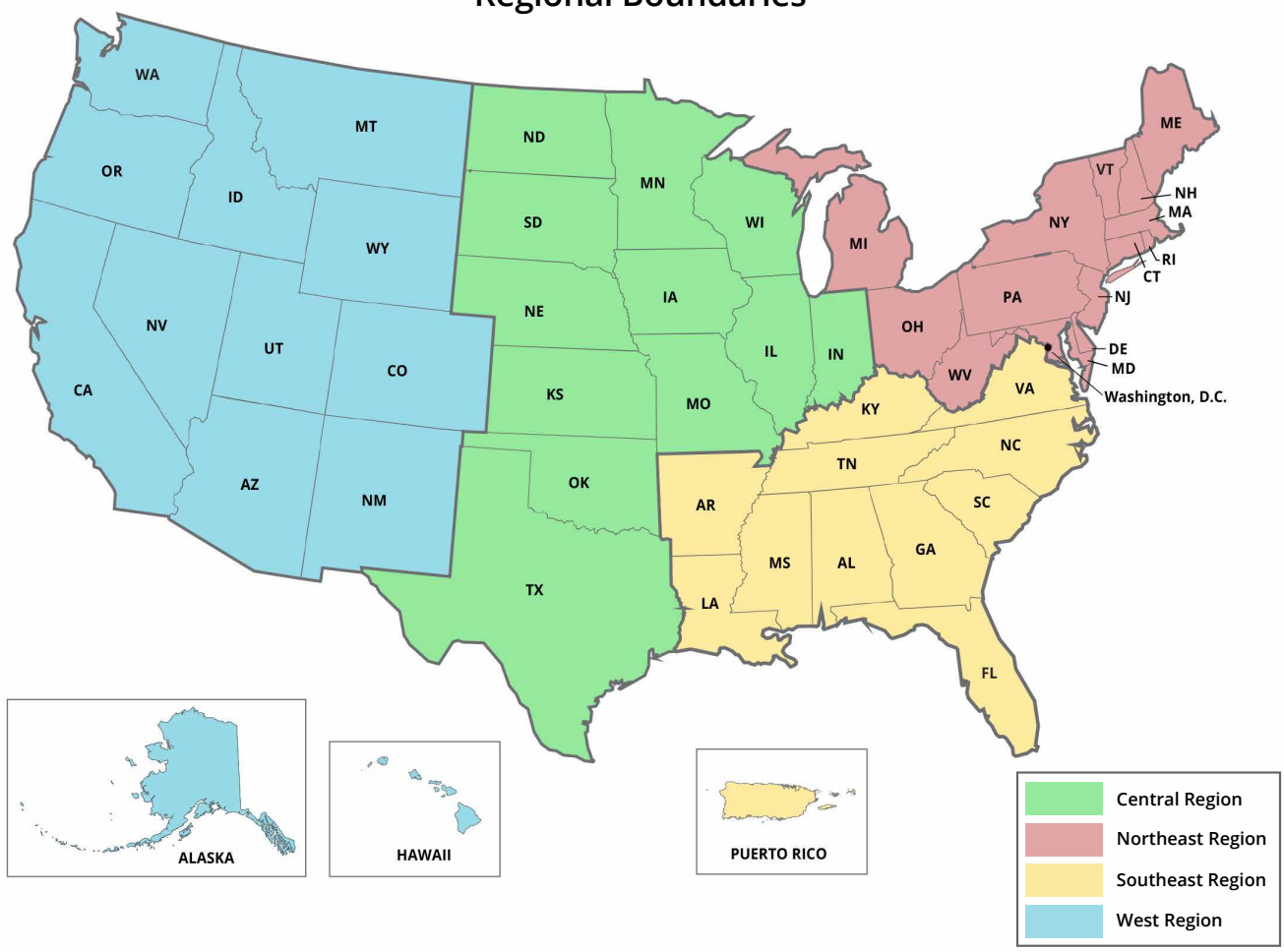


Figure 10. Map of NRCS regions

In the **Central Region,** prescribed grazing comprised almost 41% of the states' cumulative goals. Other top practices focused on brush management, weed treatments, and planting forage in rangelands/ pastures or reduced tillage practices in crop fields. Northern bobwhite and other wildlife species are highly compatible with grazing if a quality prescribed grazing conservation plan is followed. Restoring native forage in areas previously converted to nonnative grasses greatly enhances wildlife populations, even when enacted on a portion of an agricultural operation.

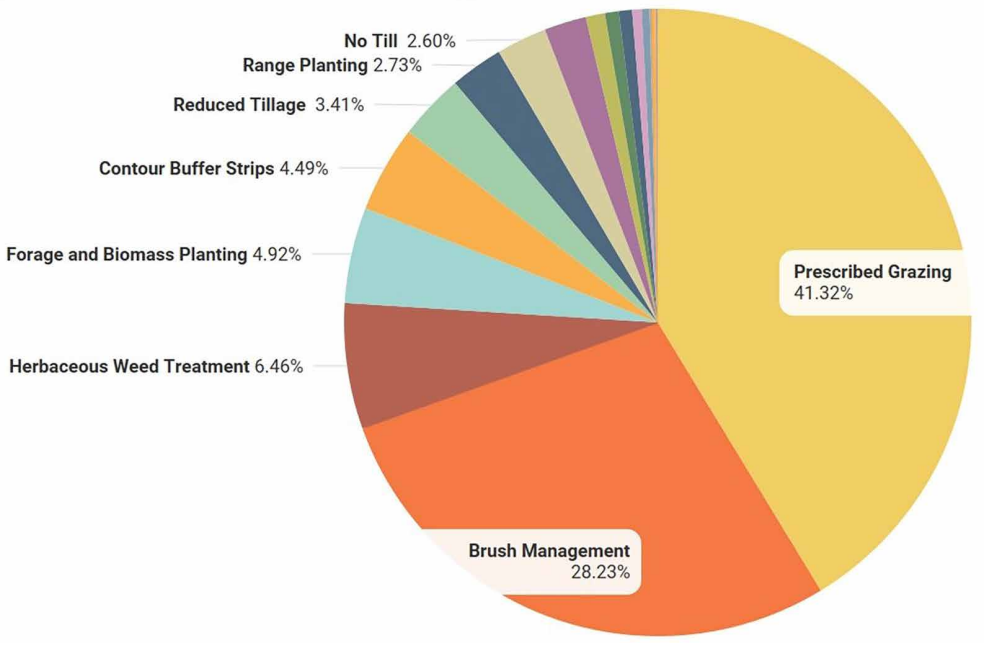


Figure 11. Top Conservation Practices in the Central Region

In the **Northeast Region,** the top three practices were tree/shrub site prep where natural regeneration of a site is ideal, forest stand improvement (thinning), and prescribed burning which clears out overgrown middle and understory vegetation. When woody and invasive vegetation crowd these areas, timber values and wildlife habitat are negatively impacted. Most complementary practices focused on reestablishing native vegetation on managed sites through practices like wildlife habitat planting and forage and biomass planting. Prescribed grazing was included but was not a dominant practice in the Northeast.

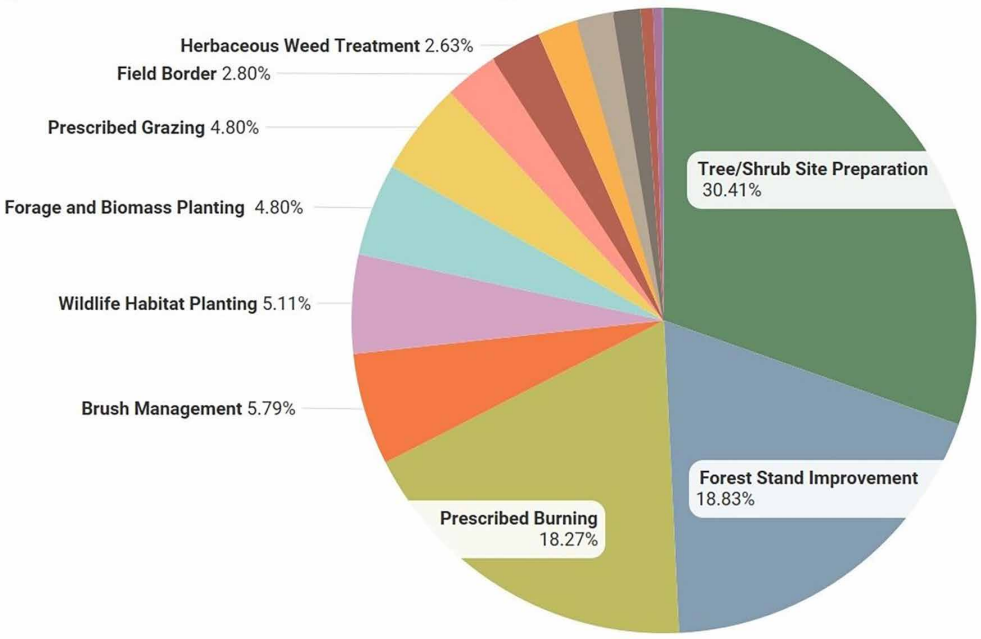


Figure 12. Top Conservation Practices in the Northeast Region

In the **Southeast Region,** prescribed burning heavily dominated implementation goals. Forest stand improvement was also heavily used in the Southeast. Other practices represented single-digit percentages of the total goals. The Southeast leads the nation in prescribed burning, and with generally wetter conditions than out West, prescribed burning is the preferred method for controlling invasive vegetation and reinvigorating habitat values. Forest stand improvement has both wildlife and timber production benefits. Burning and thinning creates space that maximizes growth of high-quality timber while benefiting bobwhite, gopher tortoise, and other wildlife.

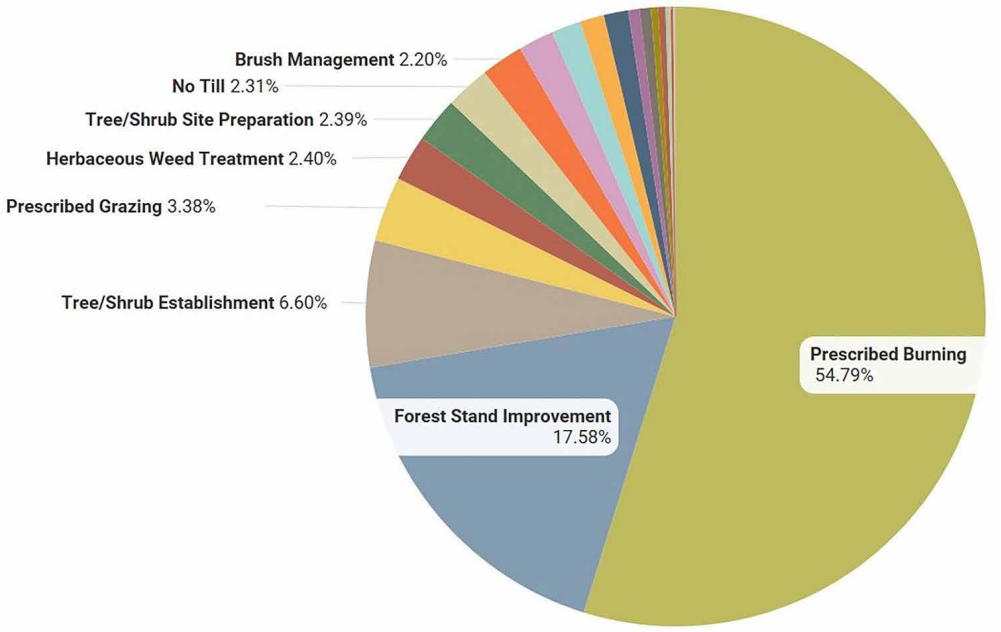


Figure 13. Top Conservation Practices in the Southeast Region

Easement and Stewardship Programs

The Agricultural Conservation Easement Program (ACEP) and the Conservation Stewardship Program (CSP) were not widely proposed to achieve conservation in many of the participating 25 states. However, there is a lot of room for growth as these programs tend to be popular with landowners once implemented.

Of the two, CSP is more widely used, with nine states proposing to conduct 165,000 acres of CSP contracts focused on grasslands and savannas.

CSP incentive payments can be quite significant, and we're anticipating significant growth in CSP participation during this 5-year planning period.

Easement goals under ACEP were set by six states but only totaled 3,200 acres. All NRCS programs are voluntary, and easement program participants can benefit financially from their participation and have security that their family property will remain in a rural land use.

ANTICIPATED OUTCOMES

Stabilize First, Then Recover

Our indicator species, the northern bobwhite, has been documented to be in severe, long-term decline in the United States. Following the paradigm of Westwood et al. (2014) and the 5-stage classification of recovery, we've now discussed the diagnosis of threats and proposed treatments through conservation planning and practice implementation. Our longer-term goals are to stabilize existing habitat, rehabilitate grasslands and savannas, and recover native wildlife and plant species to achieve improved systemic health, less risky and more profitable agricultural operations, and greater resilience in changing climatic conditions.

NBCI Initiative has estimated that a minimally viable population of northern bobwhite is comprised of 800 birds. Based on the area size to support that number, NBCI derived a minimal landscape size of 1500 acres with at least 25% actively managed for bobwhite. These projections link back to our previously discussed need for anchor habitats within a minimum dynamic landscape size of 1500 acres. Based on these assumptions, NBTC, the University of Georgia and partners established Coordinated Implementation Program (CIP) monitoring sites throughout the range, anchored by managed state-owned lands. CIP monitoring indicates that bobwhite populations are mostly stable in those managed landscapes.

Wildlife Benefits: **Northern Bobwhite and Healthy Landscapes**

In addition to the network of CIP monitoring sites, WLFW will seek to establish additional dynamic landscapes throughout the states' priority areas for this initiative to rehabilitate habitat and recover bobwhite populations. Under a contract with the University of Georgia, a rapid assessment protocol will be established to monitor habitat and wildlife response in each dynamic landscape established by WLFW for this plan.

Monitoring of dynamic landscapes will augment the more in-depth monitoring already established through the CIP system.

We asked a group of species experts to evaluate the conservation practices proposed in this framework and assess benefits to northern bobwhites in terms of their four primary habitat needs.

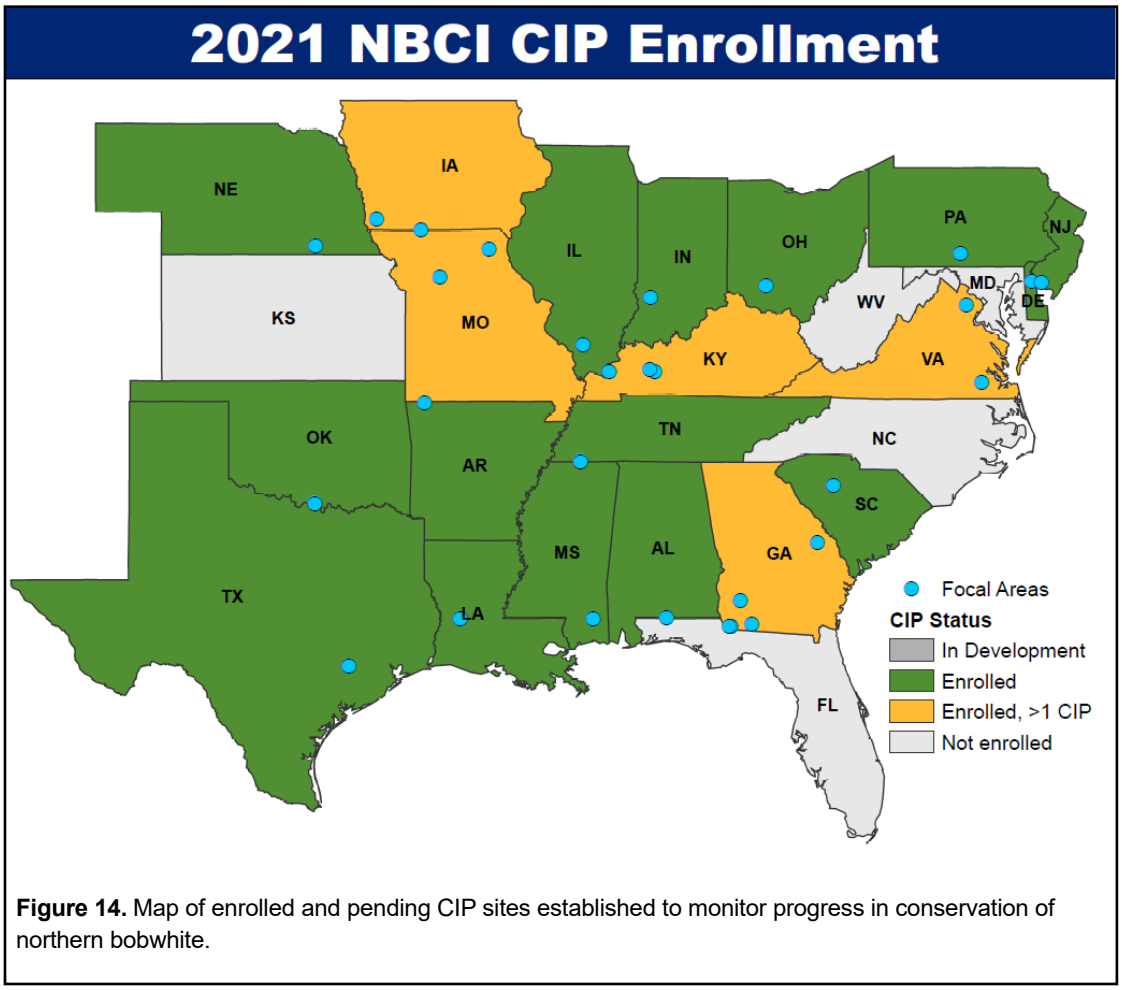


Figure 14. Map of enrolled and pending CIP sites established to monitor progress in conservation of northern bobwhite.

Wildlife Benefits: **Northern Bobwhite and Healthy Landscapes**

Figure 15 displays the consensus opinion of those experts regarding which conservation practices will enhance specific bobwhite habitat needs. It is critically important that in each dynamic landscape where bobwhites reside, all four habitat needs are met.

Since the bobwhite is a nonmigratory species, the size of managed sites and landscape context both matter greatly.

Grassland and Savanna Conservation Practices **Northern Bobwhite Habitat Needs**	Nesting Cover	Brood-Rearing Habitat	Forage Habitat	Escape Cover
Prescribed Grazing	✓	✓	✓	✓
Brush Management	✓	✓	✓	
Prescribed Burning	✓	✓	✓	✓
Herbaceous Weed Treatment	✓	✓	✓	
Forage and Biomass Planting	✓			
Contour Buffer Strips	✓		✓	
Forest Stand Improvement	✓	✓	✓	✓
Tree/Shrub Establishment				✓
Tree/Shrub Site Preparation		✓	✓	
Wildlife Habitat Planting	✓	✓	✓	✓
Conservation Cover	✓	✓	✓	
Silvopasture Establishment			✓	
Field Border	✓	✓	✓	✓
Riparian Herbaceous Cover	✓			
Cover Crop			✓	
Filter Strip	✓	✓	✓	✓
Firebreak (ft.)		✓	✓	
Hedgerow Planting (ft.)	✓			✓
Windbreak/Shelterbelt Establishment (ft.)				✓
Structures for Wildlife (no.)				✓

Figure 15. Anticipated direct benefits to northern bobwhite populations from Farm Bill conservation practices.

“ It’s been amazing to carry out this 5-year plan with the conservation partners. Almost 40 years to the date, we went without any quail here. We didn’t see them; we didn’t hear them. And just this past Memorial Day weekend, my brother-in-law and I were outside doing some work, and we heard some quail right here in these pine trees. Of course, we were ecstatic! But it really demonstrates the point that in less than 3 years’ time, that we have been able to work with these partners in conservation, after a 40-year absence, a species has returned. We couldn’t be happier.”

–Austin Klais, Coordinating Wildlife Biologist, Pheasants Forever, Inc. and Quail Forever, Louisiana

(See also https://youtu.be/ZDCqkf_kx7U)

Economic Benefits to Agriculture: **Risk Management**

A basic tenet of WLFW is that our implementation supports the continuation of working landscapes and enhances agricultural operations and rural economies. Therefore it was equally important that we assess how this framework could contribute to stabilizing and recovering agricultural operations by reducing risks experienced by producers (e.g. drought, wildfire) and by identifying revenue enhancement opportunities for them (e.g., ways to improve herd health, establish huntable wildlife populations, and increase access to carbon markets).

We sent a survey to an expert group of USDA economists, foresters, and grazing specialists to give us insight into how Farm Bill conservation practices could benefit local economies.

In Figure 16, 5,384,000 acres of conservation practices will contribute to mitigating nine risk factors for farmers, ranchers, and forest landowners. The top risk mitigation practice was prescribed burning, which can greatly reduce the risk of wildfires, their extent, and how destructive and dangerous they are. Other practices benefited both water quality and quantity, reduced soil erosion and improved overall soil health. Drought mitigation was also a significant benefit for producers. Reducing risks is key to maintaining financial stability.

Grassland and Savanna Conservation Practices **Risk Management**	Drought	Improve Nutrient Mgmt.	Improve Soil Health	Improve Water Quality	Improve or Adopt Integrated Pest Mgmt.	Increase Carbon Storage	Reduce Soil Erosion	Sustain Pollina-tors	Sustain Water Quantity	Wildfire
Prescribed Grazing	✓	✓	✓	✓	✓		✓		✓	
Brush Management					✓					✓
Prescribed Burning										✓
Herbaceous Weed Treatment					✓					✓
Forage and Biomass Planting	✓		✓	✓		✓	✓		✓	
Contour Buffer Strips				✓			✓			
Forest Stand Improvement						✓				✓
Range Planting	✓		✓	✓		✓	✓	✓	✓	
Tree/Shrub Establishment			✓	✓		✓	✓	✓	✓	
Heavy Use Area Protection				✓			✓			

Figure 16. Graph depicting the contribution of the Northern Bobwhite, Grasslands, and Savannas to reducing nine primary economic risks of agricultural operations.

Economic Benefits to Agriculture: **Revenue Enhancement**

Beyond controlling economic risks, other conservation practices directly enhance producer revenue (Figures 17-18). Improving forage or commodity quality increases the value of products and thus annual income. By increasing wildlife habitat, hunting leases or wildlife viewing present opportunities for revenue for individual landowners and for their communities, especially in areas where these practices are concentrated to create niche markets.

Additionally, conservation of nongame can contribute to recovery of at-risk, threatened, or endangered species and lead to reducing regulation of private lands.

Greater access to carbon markets can also be achieved individually through specific conservation practices and collectively in a region where groups of landowners create their own opportunities to participate in carbon markets.

In total, over five million acres of conservation practices implemented under this framework by 2026 will contribute to revenue enhancement for USDA participants!

Grassland and Savanna Conservation Practices **Enhanced Revenue**	Carbon Market Access	Commodity Health and Value	Improve Forage	Sustain Huntable Wildlife	Sustain Viewable Wildlife
Prescribed Grazing		✓	✓	✓	✓
Brush Management		✓	✓	✓	✓
Prescribed Burning			✓	✓	✓
Herbaceous Weed Treatment		✓	✓	✓	✓
Forage and Biomass Planting	✓	✓	✓		
Forest Stand Improvement	✓	✓		✓	✓
Range Planting			✓	✓	✓
Tree/Shrub Establishment	✓			✓	✓
Tree/Shrub Site Preparation		✓			
Wildlife Habitat Planting				✓	✓

Figure 17. Conservation practices that benefit wildlife can also enhance agriculture revenue, the goal of WLFW.

Economic Benefits to Agriculture: **Revenue Enhancement**

WLFW is funding researchers at Mississippi State University to develop a national model of opportunities to use precision agriculture to assist producers in meeting their economic and conservation goals. The model will produce "Economic Opportunity Maps" for row crop production acres in participating WLFW states.

These maps will help WLFW place new precision ag experts who can assist producers in these geographies in identifying farm-specific opportunities and pursuing them.

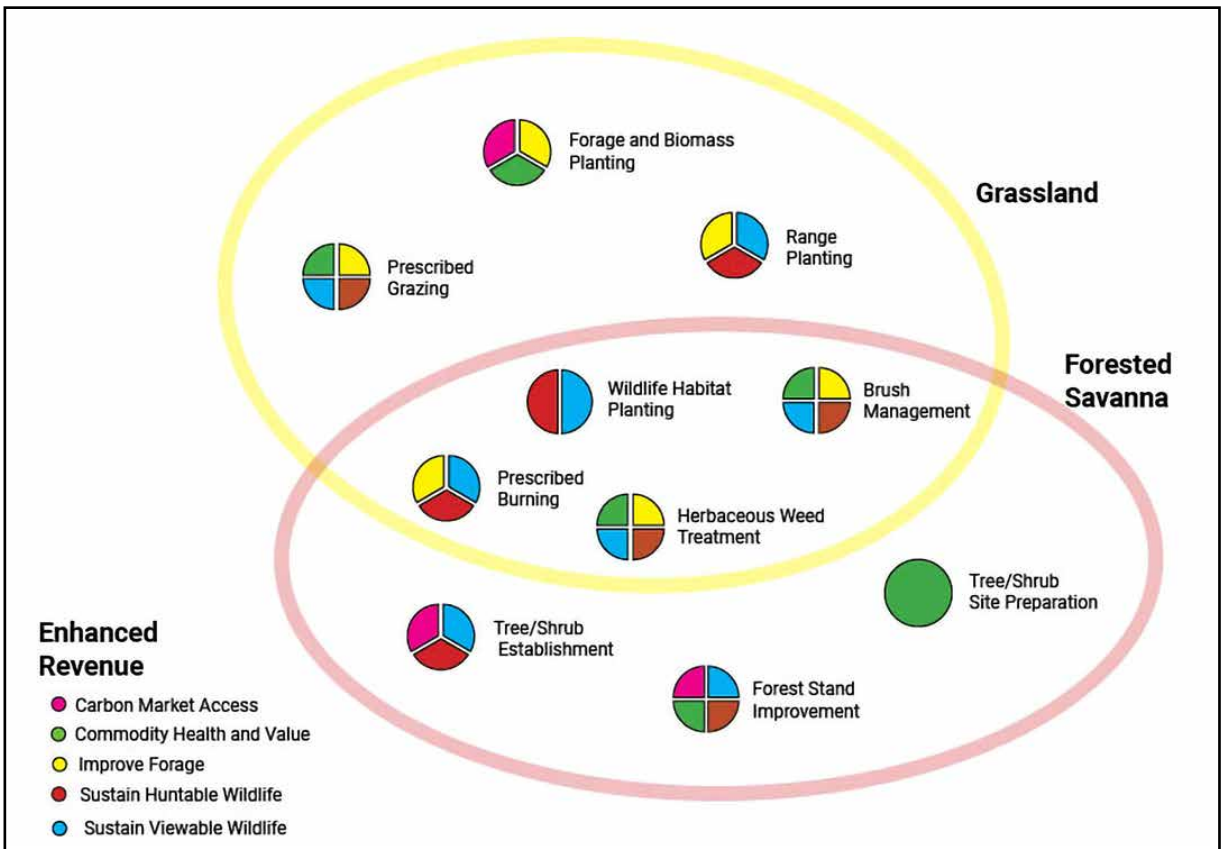


Figure 18. Conservation practices being implemented in the Northern bobwhite, Grasslands, and Savannas framework are grouped by Grassland and Forest land uses, and within each land use a pie chart associated with each conservation practice shows how that practice contributes to revenue enhancements for agriculture producers (e.g. improving livestock or crop health or value, improving access to carbon markets, or sustaining huntable or viewable wildlife populations). Additional assessments are needed to analyze revenue enhancement opportunities in cropland.

Climate Change Mitigation: **Greenhouse Gas Reductions**

As mentioned earlier in this document, NRCS has identified 35 conservation practices that measurably contribute to the reduction of greenhouse gases (GHG), and therefore mitigate climate change impacts. Within this framework, 3,651,178 acres will be treated with practices that reduce GHG emissions across three categories: agroforestry, soil health, and pasture and rangelands (Figures 19-20).

Work is underway at NRCS to also identify conservation practices that can be quantified by their level of contribution to climate adaptation ("the process of adjustment to actual or expected climate and its effects" IPCC 2014).

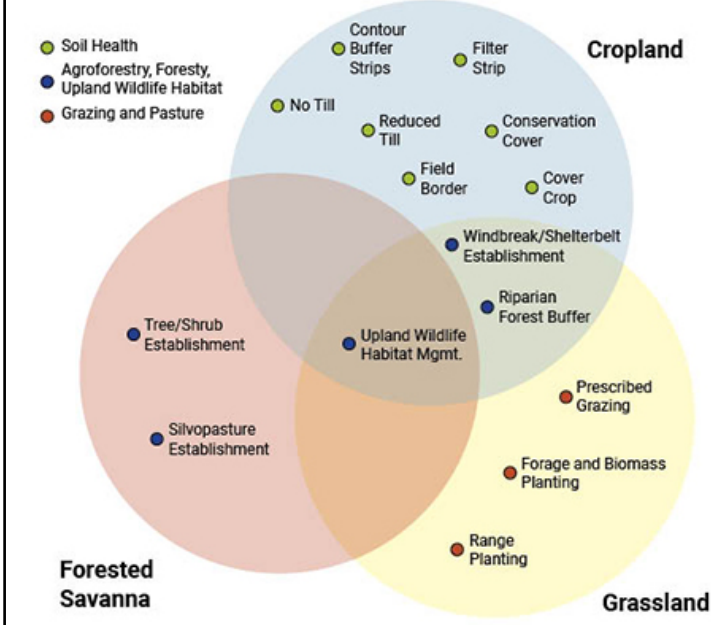


Figure 19. Conservation practices being implemented in the Northern Bobwhite, Grasslands, and Savannas framework are depicted for each land use type (cropland, forest land and grassland), and organized into categories identified by USDA as contributing measurable reductions in greenhouse gas emissions that contribute to global climate change. As this framework is implemented, future WLFW outcomes assessments will calculate estimates for these GHG reductions.

Definition of Agroforestry:

Agroforestry is the intentional integration of trees or shrubs with crop and animal production to create environmental, economic, and social benefits.

Climate Change Mitigation: Greenhouse Gas Reductions

USDA participants will increasingly find that Farm Bill programs can assist them in adapting their operations to climate change and building greater resilience to those changes.

Once the new list of measurable climate adaptation practices is available, NRCS will conduct a secondary assessment of contributions to climate adaptation made through practice goals established for WLFW Northern Bobwhite, Grasslands, and Savannas implementation and that will also be shared with partners and the public.

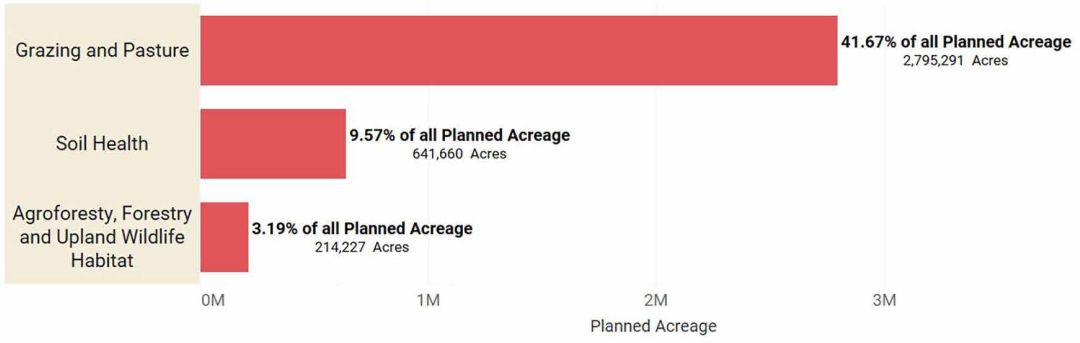


Figure 20. Conservation practices in this plan that contribute to GHG reductions total over 3.5 million acres in the first 5 years, through 2026.

CONCLUSION

“NRCS has been a steadfast partner for decades. Our shared vision of blending food and fiber production with conservation and sustainability on America’s working lands will keep us together for decades to come.”

–John Morgan, Director, National Bobwhite Conservation Initiative

This Framework for Conservation Action represents a significant acceleration in the involvement of NRCS in conservation of grasslands and savannas, northern bobwhite, and other co-occurring species. It also represents a demonstrable shift to better assess the economic and climate change implications of WLFW-led conservation partnerships.

The national bobwhite partnership has been strong for decades and NRCS has always been a significant partner. What WLFW can now contribute are improvements in coordination across the vast distribution area of northern bobwhite, increases in both financial and technical assistance, and applied science to measure and improve outcomes. Because bobwhite is an indicator species, we anticipate significant benefits to other grassland and savanna species. NRCS will work with partners to identify suitable, stable habitat parcels that can serve as anchors around which we can build dynamic landscapes of habitat on private lands. Then, a national network of monitoring will be executed across these core dynamic landscapes to measure outcomes over the next 5 years and beyond.

The health of these systems is being “reported” to us through the plight of the species that live there. The losses have been significant - it is estimated that 90% of grasslands in the Southeast are lost or degraded with a comparable 80% decline in bobwhite populations. Our hope is that this renewed effort led by WLFW, and the almost 7 million acres of conservation practices that will be delivered by NRCS and its partners from 2022-26, will light a proverbial fire that results in measurable recovery of these natural systems and declining wildlife. For the most part, experts and landowners both know what to do, but we have not collectively been doing enough. This framework represents a renewed effort by NRCS to jump-start recovery of these systems and a commitment by WLFW to assist partners and our USDA clients in achieving success in conservation and in business.

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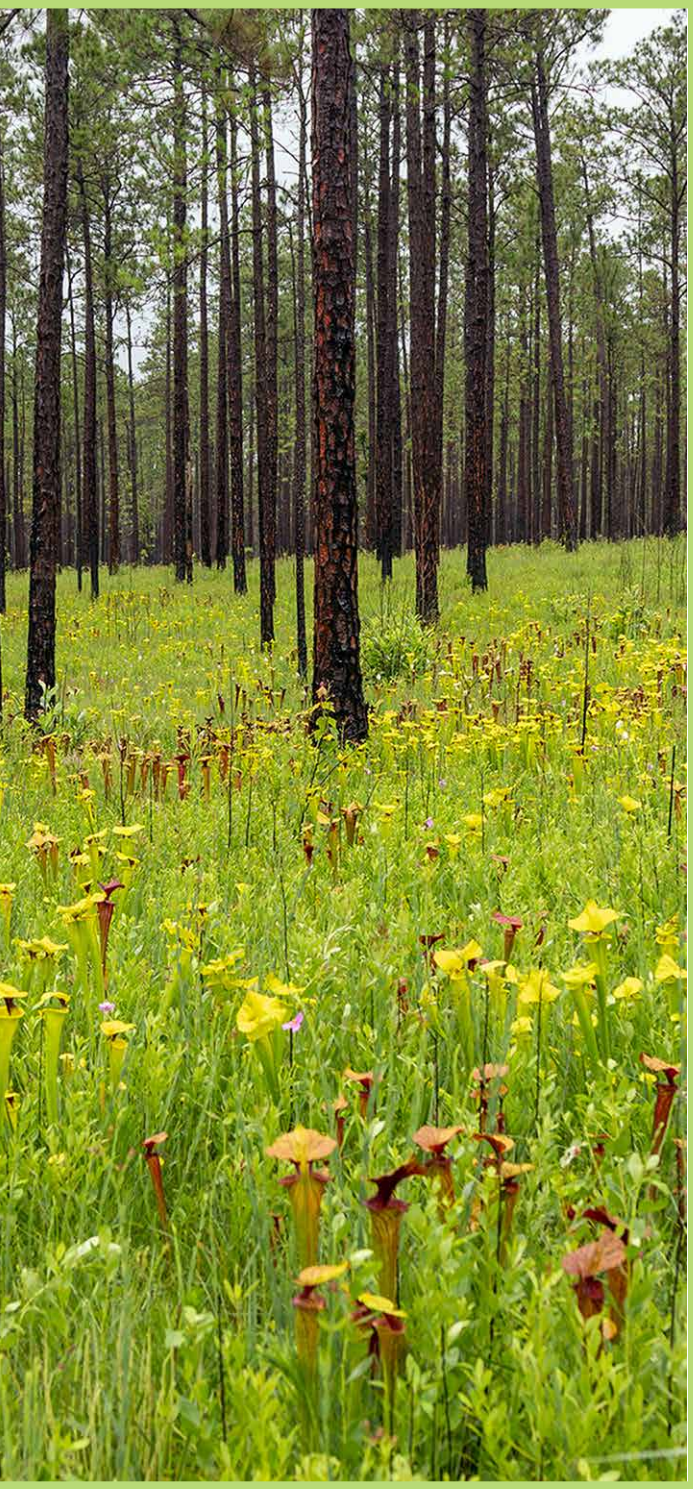

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