



GA, KY, MO, OK, TN and TX) are most indicative of the economic impact of bobwhite hunting alone. The bobwhite-centric total economic impact across these 8 states was \$499,225,723.

Conclusion

The decline of bobwhite hunting has impacted cultures and economies across the species range. Although we lack a comprehensive retrospective analysis, and we cannot predict how hunter participation would respond to a major increase in bobwhite abundance, these economic figures point to large potential for bobwhite hunting to affect the economy in NBCI states. Similarly, in a much less tangible way, the disappearance of hunters and bird dogs across many parts of the country has profoundly reduced the quality of life.



NBCI LAUNCHES BOBWHITE HABITAT INVENTORY PROJECT

In an era of steeply declining and stagnant bobwhite populations people simply want to know what is being done by state agencies to improve the future of the species. In the worst-case scenario, states' last management option is to discontinue hunting, as happened in New Jersey.

As part of the evolution of interstate, coordinated bobwhite conservation (NBTC & NBCI), at the March 2010 NBCI Management Board meeting, state agency directors directed NBCI to document "all things being done to benefit bobwhites in each state." The quail management community has long had a need for unified collection and dissemination of information on quail abundance, hunting activity and habitat management, and the Inventory projects provide that service.

Putting this degree of collaboration into action is challenging, requiring consensus on disparate habitat definitions, approaches to accountability, commitment to quail management and data management systems, across 25 state agencies and myriad partners. Thus, the habitat inventory project is a long-term project requiring years of improvement.

In winter 2011, state quail coordinators provided their first estimates of habitat management activity for 2010. This was part of the process to build a credible habitat inventory, and was followed by the first-ever state quail coordinators' meeting, a special session at

the NBTC meeting in Tallahassee. Further guidance followed, via the ad hoc habitat accomplishments committee (Mark Gudlin, TN; Robert Perez, TX; Reggie Thackston & James Tomberlin, GA; Jay Howell, VA; John Morgan, KY; Max Alleger, Beth Emmerich & Lisa Potter, MO; Todd Bogenschutz, IA; Jeff Dugay, LA and Jim Pitman, KS). By the end of 2011, most state quail coordinators had increased capacity to provide estimates of habitat management accomplishments with a fair degree of confidence in the suitability of those acres for sustaining quail populations. Data for 2011 are reported here.

Developing Capacity

The 2011 NBCI State Agency Bobwhite Habitat Management data are reported as acres of habitat management during the past year. Although acres of management appear to be a definitive measure of accomplishment by state agencies, they are more appropriately viewed as an index of accomplishments, for reasons explained below.

States were asked to report acres of habitat management activity. This requires at least two determinations, (1) that acres are accurately captured, and (2) that the area being analyzed is suitable for bobwhites, now (the management year), or in the near future. Some states have accountability systems (GIS,



spreadsheets, accomplishment-based time sheets, etc.) in place to track quail-related management, others do not. Further, when large landscapes are being evaluated as potential habitat, it is very difficult to accurately assess bobwhite habitat suitability.

Development of a system that produces a measure of habitat that is consistent across the 25 NBCI states, and through time, is a multi-year endeavor. Key challenges are lack of common definitions for habitat characteristics and uniform approaches for accurately measuring habitat (e.g., not enough staff to conduct regular field checks and remote sensing does not measure key habitat characteristics). As a reflection of the difficulty of this project, numerous states (Alabama, Illinois, Nebraska, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee and West Virginia) lacked the capacity to capture both public and private land agency-based (work administered, funded or conducted by agency) quail habitat management activity.

For states that did report acreage we needed to characterize the coordinator's confidence in the quality of the data (i.e., expectations for the suitability of the area claimed for bobwhites), including 3 levels of confidence and 3 levels of uncertainty. This is to ensure that expectations for the presence of bobwhites are carefully controlled. This was particularly useful for large areas where bobwhites were known to exist, and some kind of habitat program had been implemented, but there is no

measurement of habitat quality or bobwhite abundance. Even in the second year of the Inventory, there was a wide variety of opinion and mixed evidence for documentation of habitat suitability; thus, comparisons among states are not very useful yet. Again, this is a work in progress.

States reported habitat management for a wide variety of categories including public lands, private lands, Farm Bill lands, U.S. Forest Service, and various non-government organizations. The three most commonly-reported categories are reported here, including state agency-based management of public and private lands (i.e., agency did the work or otherwise was directly responsible for getting the work done, including funding, contracting, grants, major leadership), and management of private lands enrolled in USDA Farm Bill programs.

Results

In 2011, state wildlife agencies accomplished a tremendous amount of habitat management designed to benefit bobwhites. For agency-based public lands, Florida, Kansas and Missouri affected change on 57,509–101,521 acres, and across all 19 reporting states 461,165 acres were managed (Figure 1). State coordinator confidence levels in acreage figures and capacity for benefitting bobwhites were as follows: High Confidence: DE (379 acres), IN (2,516 acres), MO (87,456 acres), MS and TX; Moderate Confidence: AL, GA, IA, KS, KY and LA; Somewhat Confident: FL, IN (24,709 acres), MD, MO (14,065 acres), NJ, OK and VA; Somewhat Uncertain: DE (210 acres) and NE; Moderately Uncertain: SC; Highly Uncertain: AR.

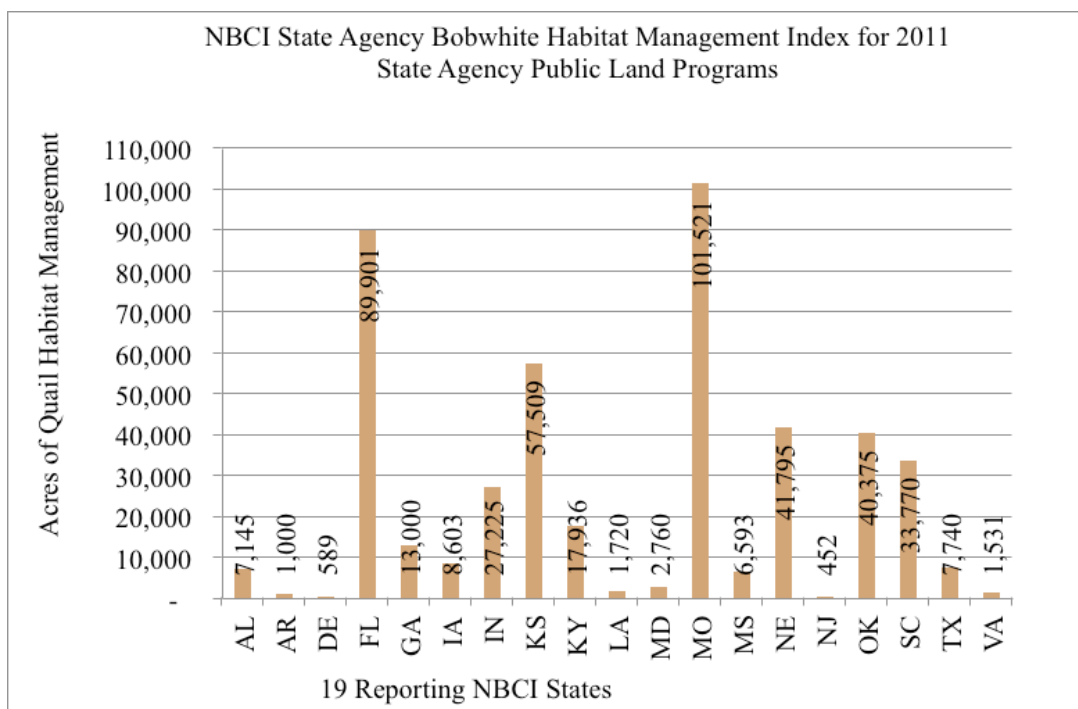


Figure 1. NBCI State Agency Bobwhite Habitat Management Index for agency's public land programs for 19 states. Index is acres of habitat managed by prescribed fire, disking, grazing, spraying herbicide, cutting, planting, etc., during the previous one-year cycle (ranging from July 1, 2010 to December 31, 2011, depending on state fiscal or calendar year reporting period). Total acreage is 461,165.

For agency-based management on private lands, Texas was by far the most active with 63,600 acres, followed by Florida, Kansas and Kentucky with 13,000–16,830 acres (Figure 2). Total acreage for private lands for the 16 reporting states was 137,309. Coordinator confidence in acreage figures was as follows: High Confidence: GA, IN, KS (5,511 acres), LA, MO, MS, TN and TX (5,600 acres); Moderate Confidence: AR (900



acres), DE, IA and KS (12,855); Somewhat Confident: FL, MD, NJ and TX (58,000); Somewhat Uncertain: KY; Moderately Uncertain: AR (500 acres); Highly Uncertain: no states.

For USDA Farm Bill lands, Kansas reported by far the most activity with 777,816 acres of management, followed by 243,341 acres in Texas, 134,920 acres in Oklahoma, and 11,123–14,630 acres in Indiana, Missouri and South Carolina (Figure 3). Total acreage for Farm Bill lands for the 12 reporting states was 1,207,957. Coordinator confidence in acreage figures was as follows: High Confidence: IA and TN CRP-EQIP-WHIP; Moderate Confidence: IN, KS CCRP, KS WHIP, MO CRP, NJ CRP and TX; Somewhat Confident: KS CRP, MD, OK and VA; Somewhat Uncertain: KS EQIP and TN WRP; Moderately Uncertain: SC; Very Uncertain: AR and KS CRP MCM.

Some of the miscellaneous quail habitat management reported included the following: Alabama reported Moderate Confidence in 62,956 acres by US Forest Service, whereas South Carolina reported High Uncertainty in 7,500 acres managed by US Forest Service. Virginia reported Somewhat Uncertain for 22,650 acres of US Department of Defense/US Corps of Engineers lands. Because of the potential for quail conservation on these federal properties this category will be a high priority for improvement of bobwhite habitat evaluation. Among non-government organizations, The Nature Conservancy was identified as a major contributor to bobwhite management (1,943 acres in Alabama rated Highly Confident, 1,900 acres in Virginia rated Moderately Confident and 450 acres in Kentucky rated Somewhat Confident). Pheasants Forever management on Farm Bill lands was also reported in Iowa (Figure 3). For detailed information on major contributors to bobwhite habitat management in each state consult the state reports.

Discussion

Despite incomplete reporting and considerable uncertainty, state agency quail coordinators reported 1,806,431 acres of quail habitat management for 2011.

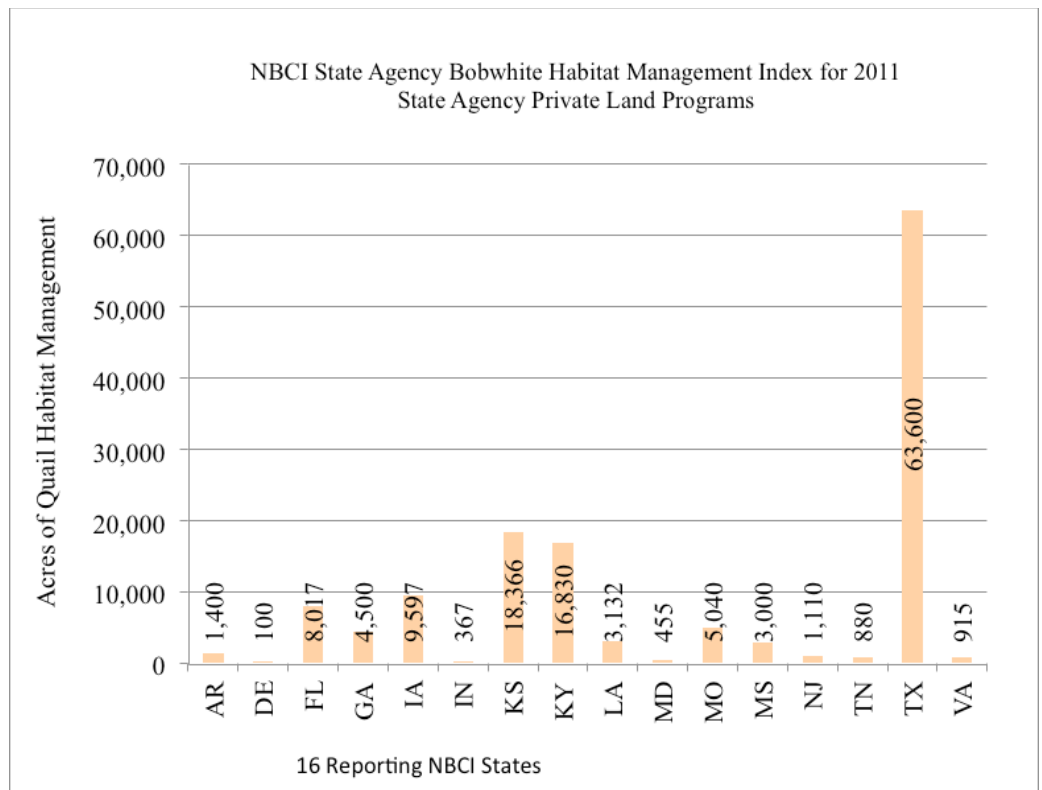


Figure 2. NBCI State Agency Bobwhite Habitat Management Index for agency's private land programs for 16 states. Index is acres of habitat managed by prescribed fire, disking, grazing, spraying herbicide, cutting, planting, etc., during the previous one-year cycle (ranging from July 1, 2010 to December 31, 2011, depending on state fiscal or calendar year reporting period). Total acreage is 137,309.

Specific benefits to bobwhites of this management are in some cases described in state reports in this report. We did not publically report the results for the 2010 Inventory because there was considerable uncertainty.

Coordinator confidence in reported acres improved markedly this year. For public lands, 16 of 19 reporting states had some level of confidence that the acreage they reported represented management for quail habitat suitability; this represents 83% of the total reported acreage. For private lands, 14 of 16 reporting states had confidence in their data, representing 87% of the total reported acreage. This was the first year for reporting Farm Bill acres, and consequently confidence was relatively low at 67% of the total reported.

Assuming that non-reporting states had little capacity in 2011 to identify acres of management of suitable bobwhite habitat, there is much work to be done. Similarly, some states reported many acres with a high level of uncertainty. As one state coordinator commented, "Although I classified my confidence as Very Uncertain because I lack data, I know those acres provide a great deal of benefit to bobwhites so I wanted to report something. Thus, I took a wild stab just so that practice would be identified as an important one in our state."

On the other hand, some states were very conservative in what they reported. For example,



Georgia limited reporting to lands enrolled in their targeted and data-rich Bobwhite Quail Initiative. The diversity of reporting strategies and capacities by reporting states illustrates the need for more in-depth collaboration on uniform definitions and systems for documenting the extent of habitat.

Because it will take years to refine the habitat inventory, the meaning of each state's index will change over time. Thus, for the next few years, comparisons among states within a year, and among years within a state, need to be made very carefully, if at all. Complicating matters further, we are not at this time measuring what is truly needed, amount of suitable habitat, nor are we able to relate habitat to quail abundance, except in limited cases (e.g., FL, GA, KY, MO, OH and national CP33 monitoring program, Mississippi State University).

Some states previously attempted to devise systems for documenting the amount of suitable habitat, but concluded this was so difficult that a more straight-forward approach, documenting acres of habitat management activity, was more feasible. On the other hand, North Carolina uses the suitable habitat approach and reported 20,322 acres of "managed quail habitat" on private land for 2011. This data was not included in the graph because it is a different measure than reported by other states.

The lack of measurement of existing suitable habitat presents a dilemma for documenting trends in bobwhite conservation across the range, however, because some of the best remaining habitat, western rangelands, require less frequent management compared to more fertile eastern ecosystems that require intensive management of plant succession. Thus, management activity per se is a biased measure of conservation efforts.

Conclusion

To make greater progress on these challenges, we are launching a 'bottom-up' approach to defining and documenting quail habitat, the NBCI model focus area initiative, in 2012-13. This paradigm is based on relatively small focus areas (<7,000 acres) with thoroughly documented and well-conceived habitat measurements and bobwhite population response. NBCI 2.0 specified bobwhite population density as the ultimate measurement of effectiveness, and this is the premise of the NBCI model focus area initiative.

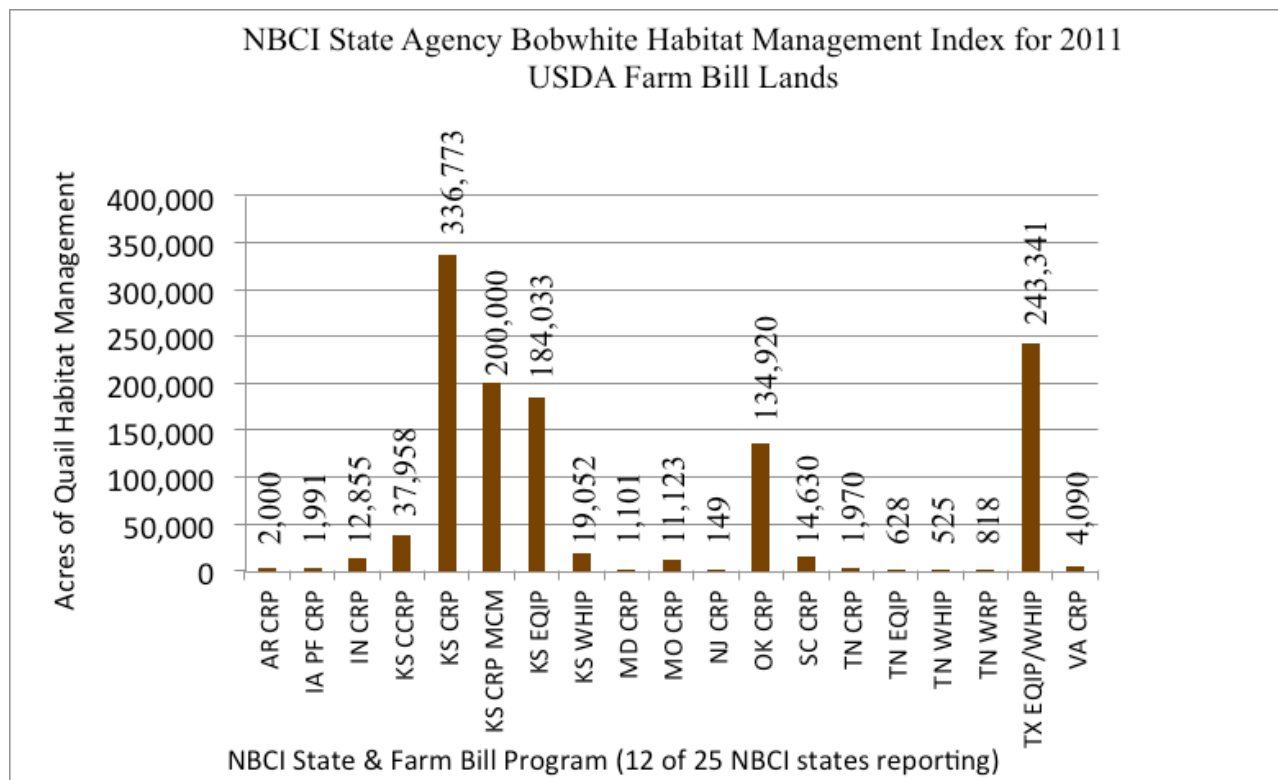


Figure 3. NBCI State Agency Bobwhite Habitat Management Index for private lands enrolled in USDA Farm Bill programs for 12 states. Index is acres of habitat managed by prescribed fire, disking, spraying herbicide, planting, etc., during the previous one-year cycle (ranging from July 1, 2010 to December 31, 2011, depending on state fiscal or calendar year reporting period). Total acreage is 1,207,957.