



KENTUCKY

RUFFED GROUSE & YOUNG FOREST

STRATEGIC PLAN 2017-2027



PHOTO © PHILIPPE ROCA

PREFACE

The Kentucky Department of Fish and Wildlife Resources (Department) is committed to:

- Being “Sportsmen Centric”
- Placing a “Priority on Properly Managing Our Resources”
- And Facilitating “Memorable Experiences”

To that end, our Department – *Your Department* – with leadership from our Kentucky Fish and Wildlife Commission, and in partnership with Kentucky’s Sportsmen, is embarking on a bold Ruffed Grouse and Young Forest Initiative. This will be an ambitious effort, aimed at turning the tide for the ruffed grouse.

First, in listening sessions with sportsmen and citizenry, then during public meetings and a comment period while this ruffed grouse strategic plan was being developed, our sportsmen’s and citizen’s pleas were heard. What we heard was a desire to return grouse to the landscape in huntable and sustainable populations.

It is time to “think big or go home” as the saying goes! There is no doubt this is a challenge that can become a real opportunity. We are accepting this challenge with every intent to be successful. We need your help; our sportsmen, our partners, our colleges and universities, and our forest products industry. Only together can we be successful restoring this magnificent game bird to our landscape. I look forward to what this Initiative can bring to the Commonwealth, and to your active participation.

*Gregory K. Johnson, Commissioner
Kentucky Department of Fish and Wildlife Resources*



**IN TEN
YEARS.
OUR GOAL
IS TO:**

- **Increase grouse populations through habitat improvement**
- **Forge more partnerships to increase opportunities for grouse**
- **Promote grouse and young forest habitat**
- **Aggressively manage invasive species**
- **Foster multi-state momentum for grouse and young forest**
- **Return to huntable populations of grouse that are sustainable**

VISION

In 10 years, Kentucky will have:

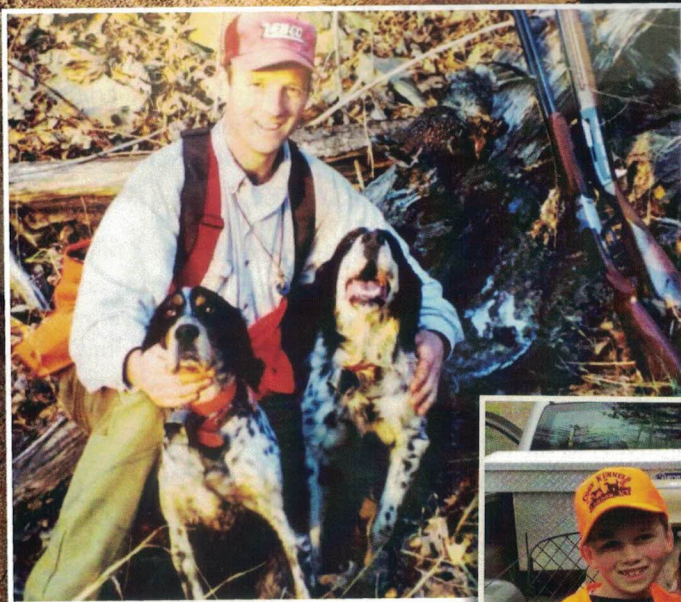
- Demonstrated how to increase grouse populations locally through habitat improvement on focus areas.
- Monitored how grouse populations respond to habitat management and a large-scale natural disturbance (the 2012 tornado).
- Forged partnerships to increase opportunities for grouse and young forest habitat improvement on state, federal, and private lands in eastern Kentucky.
- Demonstrated how grouse habitat work benefits a suite of other species.
- Promoted grouse and young forest habitat as an umbrella to improve the status of other declining early-successional species in Appalachian forests.
- Stimulated forest industry as the mechanism for young forest habitat creation across the region.
- Managed invasive plant species aggressively.
- Fostered multi-state momentum for grouse and young forests to turn the tide nationally.



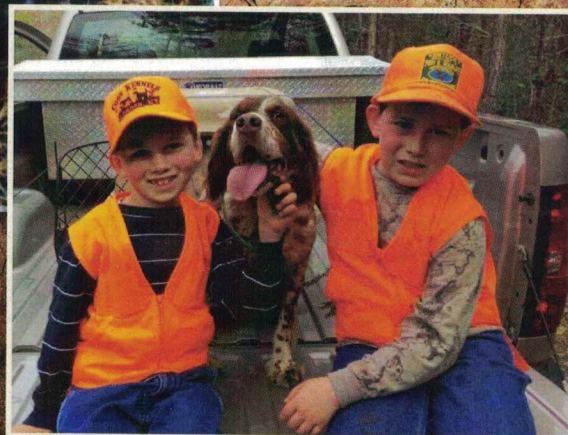
VICTORIA WILLIS PHOTO

If successful in these endeavors, we will have set in motion long-term:

- Conservation of the ruffed grouse.
- Preservation of our grouse hunting tradition.
- Memorable experiences for Kentuckians and our guests.



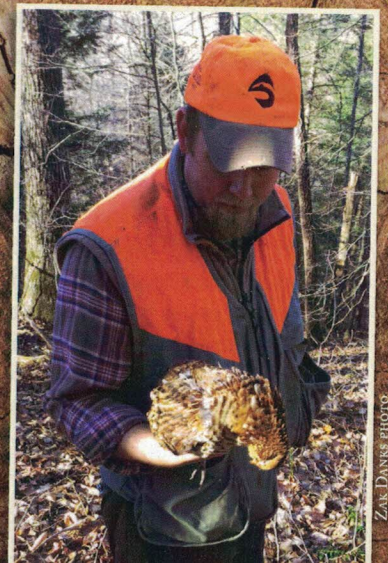
ERIC JACOBS PHOTO



ERIC JACOBS PHOTO

"I have read many definitions of what is a conservationist, and written not a few myself, but I suspect that the best one is written not with a pen, but with an axe."

— Aldo Leopold, A Sand County Almanac (1949)



ZAK DANIS PHOTO

INTRODUCTION



PHOTO © PHILIPPE ROCA

forest management can be a priority, which will serve to demonstrate the degree to which we can strategically improve habitat for grouse and whether grouse populations will respond. The plan stresses public outreach, collaboration with forest industry, and partnerships to overcome current barriers impeding the forest management.

Plan Development

KDFWR sought stakeholder input before and during development of this plan. In February 2015, we held public meetings in Morehead, Paintsville, and Corbin and gathered input via a questionnaire to attendees. An online survey accessible on the KDFWR website offered an additional opportunity for public comment. Once a draft of the grouse plan was posted, we gathered additional public comment through a second online survey, emails to the grouse program coordinator, and a second round of meetings held in Ashland, Whitesburg, and London in August 2016. Stakeholder input is summarized in the full Kentucky Grouse plan, available at fw.ky.gov.

Development of the grouse plan drew on the approach of the Kentucky quail plan, *Road to Recovery: The Blueprint for Restoring the Northern Bobwhite in Kentucky*. The quail plan prioritized habitat management, monitoring, and research for bobwhite quail in focus areas of Kentucky, which led to recognition as a success story nationally.

Plan Focus

Habitat

Stakeholder support for a habitat-focused grouse initiative was strong. A majority of respondents mentioned forest management practices to improve grouse populations; i.e., “logging,” “cutting,” “timber,” “timber stand improvement”. This public support meshes with recommendations from the Appalachian Cooperative Grouse Research Project, the national Ruffed Grouse Conservation Plan, and the American Woodcock Conservation Plan, as well as advocacy by the Ruffed Grouse Society, and the Wildlife Management Institute’s *Young Forest Initiative* (see youngforest.org). All emphasized forest management that creates young forest cover as the means to improve grouse populations. Kentucky, like other eastern states, suffers from a lack of small-diameter size classes of trees (Figure 3).

To improve habitat, we must *manage forests on focus areas, with partners, to provide habitat of adequate quality, size, and duration to give local grouse populations the chance to increase to recreational levels not seen in a generation.*

- *Forest management* includes commercial timber harvests and noncommercial habitat treatments aimed at providing

Plan Purpose

The mission of the Kentucky Department of Fish and Wildlife Resources (KDFWR) is to conserve and enhance fish and wildlife resources and provide opportunity for hunting, fishing, trapping, boating and other wildlife-related activities. In support of this mission, and in response to a long-term decline of ruffed grouse populations in the Commonwealth and throughout the southern Appalachians, KDFWR is launching a Ruffed Grouse and Young Forest Strategic Initiative.

The *Kentucky Ruffed Grouse and Young Forest Strategic Plan 2016–2026* was developed to guide this habitat initiative over the next 10 years. This document presents goals and strategies that focus on the most limiting factor affecting populations: habitat. Improving habitat will require a commitment to ongoing, sustainable forest management that increases critical young forest habitat on which grouse and other wildlife depend. The plan directs KDFWR to develop grouse focus areas where

dense, young forest cover in close proximity to mature, mast-producing trees.

- *Focus areas* may include Wildlife Management Areas (WMAs), state forests, the Daniel Boone National Forest, and private lands.
- *Partners* will include federal, state, and local agencies, corporations, and private individuals who own land, but also organizations and individuals we need to support our effort.
- *Quality* means a “mosaic” of forest growth stages, from young to old, needed by grouse throughout their annual

life cycle, arranged to provide food and cover close together within forest stands.

- *Size* will be important at the local scale (e.g., 10 to 40-acre timber harvests) and landscape scale (15 to 25% of a focus area in young forest cover) to support recreational (i.e., huntable) densities of grouse.
- *Duration* means periodic cuts and improvements within forest management units necessary to maintain the grouse habitat mosaic over the long-term, which in turn means decades of sustainable forest management based on rotation lengths of approximately 80 to 120 years.

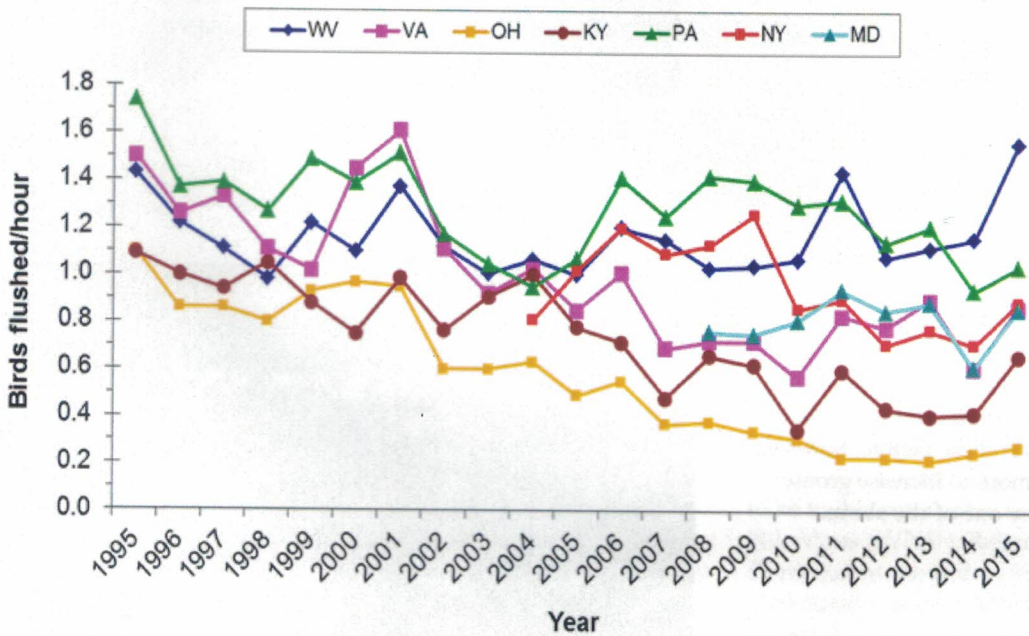


Figure 1. Trends in the number of grouse flushed per hour by hunters in 7 central Appalachian states, 1995-2015. Data compiled by L. Williams, Pennsylvania Game Commission.

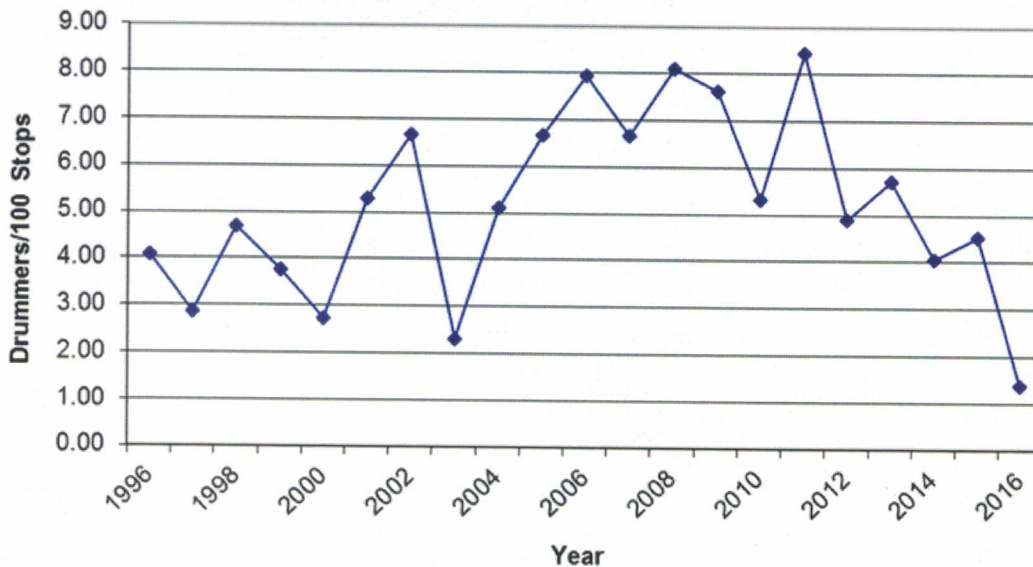


Figure 2. Trend in number of drumming male grouse detected during KDFWR surveys, 1996-2016.

AREA OF FORESTLAND BY STAND SIZE

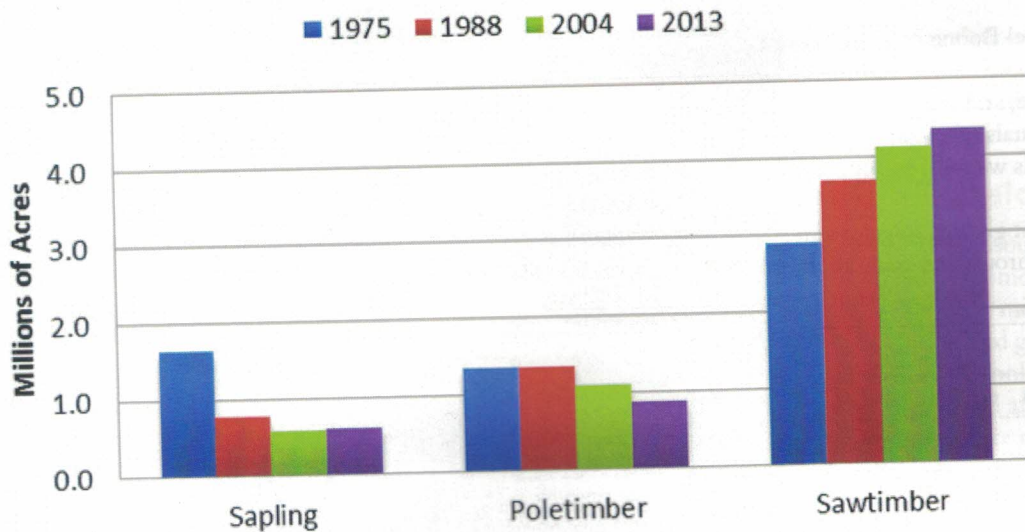


Figure 3. Since the mid-1970s, acreage young forest (i.e., seedling-sapling size classes) across eastern Kentucky has decreased while sawtimber has increased. Data from USFS Forest Inventory and Analysis program, courtesy of the Kentucky Division of Forestry.

Other Factors

Although public support for a habitat focus was clear, many suggested predators, wild turkeys, past KDFWR grouse-trapping efforts, and disease as factors in Kentucky's grouse decline. Also, many voiced support for relocating wild grouse from outside the state. We understand public concern over these factors; however, we think habitat management will do more to increase grouse numbers than piecemeal attempts at any one of the above.

Management Challenges

Challenges facing ruffed grouse management are similar across the species' range, mostly related to habitat loss. Most also apply to other species like woodcock, and most apply to Kentucky.

Public misunderstanding of the ecological role of forest disturbance

Young forest habitats are unpopular and underappreciated. The public does not understand the historic role of fire in shaping present forest conditions, of timber management's compatibility with eastern oak forests, nor of the many states that list young-forest wildlife as species conservation concern in their respective State Wildlife Action Plans, including 10 in Kentucky's. Timber harvest on the Daniel Boone National Forest once provided excellent hunting opportunity for many Kentucky hunters from the 1970s through the early 1990s, but since then opposition to active management has limited commercial timber harvest.

Lack of robust markets for wood fiber

Markets for poor quality and small-diameter trees are limited in Kentucky, making true regeneration harvests like



ZAK DANKS PHOTO

Young forest habitat, Bell County, Kentucky.

clearcuts and shelterwoods on private land unprofitable. Reliance on markets for larger sawlog and veneer-quality trees leads to widespread high-grading where only the best trees are removed. This removes valuable mast-producing and hinders understory development, degrading the future stand's value for timber and wildlife.

PLAN GOALS, OBJECTIVES, & STRATEGIES

"Setting goals is the first step in turning the invisible into the visible."

—Tony Robbins

GOAL 1:

Increase grouse populations in focus areas through focused habitat management.

Objective 1:

Apply grouse management prescriptions to large tracts of forestland in eastern Kentucky. Such Grouse Focus Areas should include WMAs, State Forest lands, private lands, and national forest lands.

Strategies:

1. Manage at least 15% of a focus area in young forest cover less than 20 years old.
2. Use noncommercial practices to perpetuate high-stem-density cover.
3. Use even-aged timber harvest methods that retain less than 30 ft.² of residual basal area (clearcut, shelterwood).
4. Plan treatments on all slope positions, but consider mid-slopes to maximize value as corridors between ridges and bottomlands.
5. Prioritize management on productive, mesic, north and east-facing slopes.
6. Plan for a mosaic of forest structure that maximizes inter-persorption of younger (less than 20 years old) and older age classes (over 40 years old).
7. Plan small to medium cuts (5-25 acres) clustered within large complexes (100-200 acres) across the area.
8. Plan group selection cuts to connect larger timber harvest areas.
9. Where possible, cut on 80- to 100-year rotations.
10. Use timber appropriate methods to ensure adequate advance regeneration of oak on oak sites (midstory removal, fire, herbicides).
11. Treat invasive species before and after timber harvest.



ZAK DANKS PHOTO

12. Find a focus area leader to direct day-to-day, on-the-ground activities that generate grouse habitat.

Assessment:

Implement all strategies on each grouse focus area in 10 years.

Objective 2:

Prioritize grouse management on focal Wildlife Management Areas (WMAs).

Strategies:

1. Designate grouse focus areas on at least one Wildlife Management Area (WMA) per Region (Northeast and Southeast).
2. Direct available grouse program funds to focus areas for planning and implementation of habitat work, including purchasing equipment and supplies, hiring or contracting professional foresters to cruise timber and run timber sales, and hiring interim technicians to conduct management activities.
3. Develop a system for prioritizing fund allocation as multiple focus WMAs get rolling and necessarily compete for funds.
4. Develop mechanisms to generate funding for habitat projects (e.g., similar to quail license plate sales).
5. Promote even-aged forest management techniques to meet the seasonal habitat needs of Appalachian ruffed grouse, consistent with the recommendations of the national Ruffed Grouse Conservation Plan (AWFA 2006) and with the Appalachian Cooperative Grouse Research Project (ACGRP 2011).
6. Promote prescribed fire to improve understory conditions for grouse, particularly brood-rearing habitat and in conjunction with shelterwood and clearcut treatments to im-

- prove oak regeneration.
7. For focal WMAs owned by the U. S. Army Corps of Engineers (USACE) (e.g., Dewey Lake, Yatesville Lake, Grayson Lake, Paintsville Lake), garner USACE support and approval to manage forests using commercial timber harvest as the tool to improve habitat for declining species (grouse, young-forest songbirds) on a scale large enough (100s-1000s of acres) to improve population viability and recreational opportunities (hunting, birdwatching).
 8. For focal WMAs co-owned with KDF (e.g., Kentucky Ridge WMA and State Forest), garner KDF support and approval to increase commercial timber harvest, and to incorporate other grouse-specific habitat prescriptions where appropriate.
 9. Explore means of assisting KDF foresters with forest management planning and implementation on co-owned Kentucky Ridge State WMA and State Forest (e.g., hiring staff, co-funding contracted foresters).
 10. Develop forest inventories (if not already completed) for each focus area to delineate and characterize forest stands (e.g., species composition, age class, and merchantability) for use by WMA managers in writing forest management plans and prioritizing projects. Professional foresters will be contracted and/or hired to produce forest inventories in a thorough, timely manner.
 11. Develop forest management plans for each focal WMA that guides habitat improvement according to specific habitat prescriptions for grouse (e.g., commercial and non-commercial timber treatments, maintenance of forest openings, roads/trails, rights-of-way) that coordinate with needs of and treatments for other species (e.g., bats). WMA managers (public lands biologists) will develop site-specific grouse plans based on forest inventories and with input from foresters, regional coordinators, and program coordinators.
 12. Regenerate at least 1% per year (10% per decade) of forested acres on grouse focus areas.
 13. Pursue focus area opportunities on large privately-owned properties (e.g., timber company lands), including public hunting, population monitoring, and integration of grouse habitat prescriptions with primary timber objectives.
 14. Implement habitat projects, including on-going efforts and new work once inventories and management plans are available.
 15. Conduct regional work weeks where KDFWR crews of staff devote blocks of time to assist with on-the-ground implementation.
 16. Be vigilant in monitoring for and responding to problematic invasive plant species following forest management.

Assessment:

Implement all strategies in 10 years.

Objective 3:

Facilitate grouse habitat management on the Daniel Boone National Forest (DBNF).

Strategies:

1. Coordinate with FS biologists and foresters to ensure specific grouse management needs are incorporated into forest management prescriptions.
2. Pursue a joint FS-KDFWR position on each FS Ranger District to implement forest management practices (e.g., operating masticator, plantings, TSI and invasive treatments).
3. Pursue a joint FS-KDFWR biologist/writer position on each FS Ranger District to assist FS staff with NEPA and ESA compliance.
4. Pursue Memoranda-of-Understanding (MOUs) as needed to plan and implement large-scale habitat improvement projects for grouse on GEAs and other DBNF lands not encompassed by a WMA.
5. Pursue Stewardship Contracting where KDFWR and partners propose to implement specific, large-scale forest habitat management work on DBNF and, if approved by the FS, essentially act as contractors that ensure the work happens with intended results.
6. Develop a unified FS-KDFWR public outreach strategy that emphasizes federal and state collaboration on forest wildlife habitat improvement that includes commercial timber harvest and noncommercial treatments.

Assessment:

Implement 3 strategies in 10 years.

Objective 4:

Expand focus areas to focal landscapes.

Strategies:

1. Collaborate with private lands and farm bill staff to identify suitable private lands (e.g., >70% forested, connected to focus areas) within at least a 3-mile radius of focus areas (based on average effective dispersal distance of juvenile Appalachian grouse) to target for technical and financial assistance (e.g., Farm Bill programs).



Timber harvest to improve upland habitat at Clay WMA

JACOB STEWART PHOTO

2. Assess KDFWR databases of previously-assisted private landowners to identify potential revisits where forest management practices, especially timber harvest and timber stand improvement (TSI), could be recommended or enhanced.
3. Collaborate with KDF to identify previously-assisted private landowners for potential revisits where grouse-specific forest management practices could be recommended.
4. Collaborate with NRCS to identify private landowners who previously participated in Farm Bill programs (e.g., EQIP, WHIP, CSP).
5. Promote potential cost-share programs for habitat work available through EQIP contracts (Environmental Quality Incentives Program) with NRCS, in particular the EQIP-Southeast Kentucky Early Successional Habitat Initiative (SEKESH), the portion of EQIP devoted specifically to young forest habitat, currently available in 27 counties. Also promote EQIP Wildlife and Forestland Initiatives. Use phone calls, mailings, website postings, newsletters, flyers, booths at local festivals, and in the Kentucky Afield TV show, radio show, and magazine.
6. Work with NRCS and KDFWR Farm Bill Program staff to tweak the SEKESH Initiative by (1) including additional counties where grouse season is currently open, (2) garnering additional ranking points for landowners located within focus landscapes surrounding focus areas, and (3) renaming SEKESH to EKESH (inclusive of all of east KY grouse counties in NRCS Areas 3 and 2) or “Young Forest Initiative” (simpler).
7. Support and utilize the newly created joint FS-NRCS (USDA Natural Resources Conservation Service) forester position on the London Ranger District to (1) write forest management plans for private landowners interested in wildlife and (2) to facilitate FS activities benefitting grouse, other young forest species, and habitat improvements on the DBNF.
8. Work with NRCS and FS to create additional joint forester positions in other DBNF Ranger Districts.
9. Pursue focus area opportunities on large privately-owned properties (e.g., timber company lands) for public hunting, population monitoring, and integration of grouse habitat prescriptions with primary timber objectives.
10. Promote invasive species control/management following forest management to private landowners.

Assessment:

Implement 6 strategies in 10 years.

Objective 5:

Control hunting pressure on focus areas.

Strategy:

Limit hunting pressure on focal WMAs or DBNF areas by considering

- Reduce bag limit.
- Reduce season length.
- Close season if warranted for monitoring or research needs.



HARLEY WEAVER PHOTO

Forest stand improvement improves habitat for grouse and other species. Below: The explosion of cover following timber harvest provides important habitat for upland wildlife.



ZAK DANKS PHOTO

Assessment:

Implement 1-2 combination strategies in 2 years.

Objective 6:

Monitor grouse population response to habitat change.

Strategies:

1. Collaborate with the KDFWR Research Program to design and implement appropriate grouse drumming survey methods to estimate grouse abundance (e.g., density and/or occupancy) on focus areas with intensive surveys, and to monitor long-term trends with indices comparable to surveys done regionally (driving routes).

2. Determine the most feasible means to survey grouse within the tornado-affected habitat.
3. Survey deer, turkey, and small game hunters on focal WMAs.
4. Develop a smart-phone app and online web form for hunters and others to enter grouse observations.
5. Publish annual reports documenting focus area habitat work and survey results, with “benchmark reports” published every 5 years to summarizing progress, roadblocks, and emerging opportunities.
6. Publish research findings relating habitat work to grouse population response on focus areas.

Assessment:

Implement 3 strategies in 10 years.

Objective 7:

Conduct Kentucky-based grouse research.

Strategies:

1. Evaluate associations between grouse occupancy and land cover, patch size, stand-level habitat variables, connectivity and corridors, and weather and stochastic events.
2. Apply predictive GIS (geographic information systems) models of habitat suitability or availability on focus areas.
3. Evaluate forest management techniques and associated quality and quantity of resulting habitat, with brood habitat of particular interest given its implications on reproduction (Devers et al. 2007).
4. Determine optimal restoration techniques at the stand-level (e.g., forest overstory structure, age classes, stand structure) and landscape-level (e.g., optimal restoration patch size and levels of fragmentation).
5. Identify optimal approaches to mitigate negative attitudes towards grouse restoration (e.g., human dimensions).
6. Determine factors limiting grouse populations in oak-dominated forests.
7. Evaluate key factors influencing colonization, survival, extinction probability, recruitment, fecundity, grouse hunter success, satisfaction/attitudes, and willingness to financially contribute to restoration.

Assessment:

Implement 3 strategies in 10 years.

Objective 8:

Improve public knowledge and perception of grouse restoration efforts in focus areas.

Strategies:

1. Link to a detailed explanation of the plan on the KDFWR homepage.
2. Engage members of the Kentucky Grouse Hunters Association.
3. Engage local Ruffed Grouse Society chapters (KY, OH, WV, VA, TN).

4. Produce grouse and forest management segments on Kentucky Afield television.
5. Write articles for major state newspapers (i.e., Lexington and Louisville markets) and magazines of various types (hunting, forestry, local interest, environmental).
6. Incorporate grouse and young forest messaging in University of Kentucky (UK) Forestry Extension landowner workshops.
7. Commission grouse artwork by Rick Hill.
8. Produce an educational exhibit at Salato Wildlife Education Center.
9. Incorporate grouse educational material in CEPL school curriculum.
10. Collaborate with UK Forestry Extension and KDF to promote forestry with county FFA and 4-H programs.
11. Incorporate grouse habitat management into the annual Kentucky Envirothon competition.
12. Create informational brochure showing grouse habitat management needs.
13. Create displays for use at Earth Day and Arbor Day events.
14. Speak at Fire Learning Network events to engage stakeholders concerned with management of the DBNF.
15. Collaborate with the Kentucky Chapter of The Nature Conservancy (TNC) to promote prescribed fire and ecosystem restoration.
16. Produce a Habitat How-To video segment on the importance of sustainable forest management, timber, and invasive species.
17. Erect signage on focus areas.
18. Foster multi-state momentum for grouse and young forests to turn the tide nationally.

Assessment:

Implement 10 strategies in 10 years.

GOAL 1 OVERALL TARGET:

Double grouse density on focus areas in 10 years.



ZAK DANKS PHOTO

It will take the dedication of many, like these volunteers, to restore grouse and grouse habitat.

GOAL 2:

Develop partnerships to rebuild grouse populations across eastern Kentucky.



ERIC GRACEY PHOTO

Forest management can create important wildlife habitat.

Objective 1:

Partner with the forestry community to promote sustainable forest management.

Strategies:

1. Collaborate with the Kentucky Forest Industry Association on a unified strategy to promote mutual interests.
2. Collaborate with the Kentucky Bourbon industry to promote long-term sustainability of white oak stocks in east Kentucky.
3. Engage the Kentucky Woodland Owners Association to convey to private landowners the critical importance of their forest management.
4. Engage students and faculty at the University of Kentucky (UK) and Eastern Kentucky University (EKU) to promote “cross-pollination” of forestry and wildlife education for forestry and natural resource majors.
5. Collaborate with the Kentucky Division of Forestry (KDF) to take advantage of each agency’s respective strengths and mutually beneficial conservation missions.
6. Pursue involvement in the Shaping Our Appalachian Region (SOAR) campaign to seek markets for low-grade timber that could be harvested for profit while providing young forest habitat.
7. Promote the need for private landowners to think about forest health before harvesting timber.
8. Spread the idea of grouse inseparably linked with forestry (“Ruffed grouse – the forester’s biggest fan”).

9. Evaluate pros and cons of forest certification for WMAs (e.g., American Tree Farm System, Sustainable Forestry Initiative, or Forest Stewardship Council).

Assessment:

Implement all strategies in 10 years.

Objective 2:

Partner with the nongame wildlife community to promote young forest and oak silviculture for a diversity of species, with emphasis on declining songbird populations (Fig. 2, Table 1).

Strategies:

1. Promote grouse as an “umbrella” species to conserve associated young forest species.
2. Collaborate with KDFWR Wildlife Diversity Program to ensure mutual benefits for grouse and nongame species that utilize young forest habitats.
3. Collaborate with Wildlife Diversity Program staff and the U.S. Fish and Wildlife Service (FWS) to avoid negative impacts to nongame species during the creation of young forest/early successional habitats, most notably bats in summer maternity habitat.
4. Highlight benefits of unpopular but critical young forest habitat to landowners, loggers, and county ag agents through field days
5. Write articles in popular media for birders.
6. Present grouse management efforts to local bird conservation groups.
7. Encourage nonhunters to purchase a hunting license for habitat improvement.

Assessment:

Implement all strategies in 5 years.

SONGBIRD SPECIES	SGCN*
Golden-winged Warbler	Yes
Cerulean Warbler	Yes
Canada Warbler	Yes
Eastern Whip-poor-will	Yes
Kentucky Warbler	Yes
American Woodcock	Yes
Blue-winged Warbler	Yes
Prairie Warbler	Yes
Red-headed Woodpecker	Yes
Field Sparrow	No
Yellow-breasted Chat	No

Table 1. Songbird species that can benefit from ruffed grouse habitat management.
*SGCN = species of greatest conservation need, per KDFWR’s Comprehensive Wildlife Conservation Strategy.

*Managing
forests for
grouse
helps other
species*



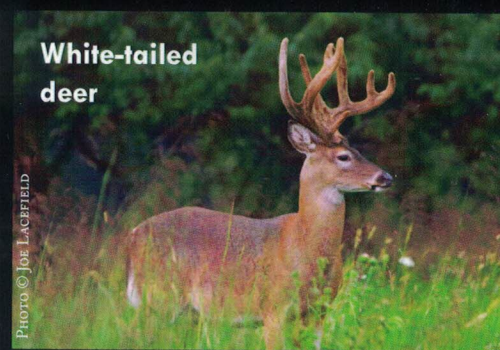
**American
woodcock**

PHOTO © PHILIPPE ROCA



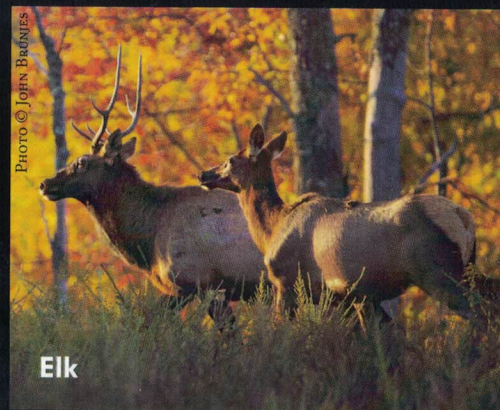
Cerulean warbler

PHOTO © MASLOWSKI WILDLIFE PRODUCTIONS



**White-tailed
deer**

PHOTO © JOE LACEFIELD



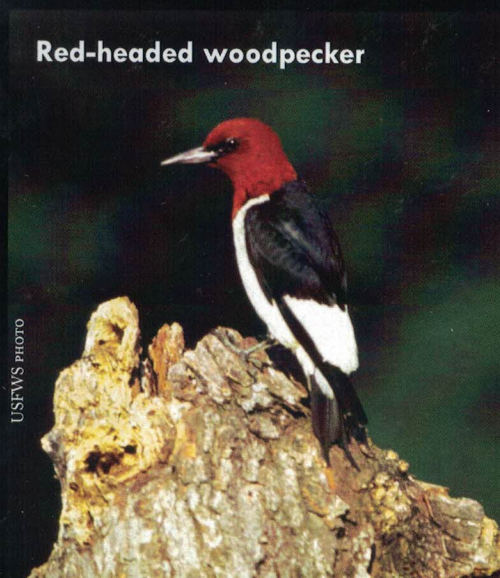
Elk

PHOTO © JOHN BRONIES



Eastern whip-poor-will

PHOTO © MASLOWSKI WILDLIFE PRODUCTIONS



Red-headed woodpecker

USFWS PHOTO

Objective 3:

Partner with the KDFWR Big Game Program to promote young forest habitat management for grouse, elk, and deer.

Strategies:

1. Promote benefits to deer and elk to garner sportsmen's support for forest management (timber harvest, timber stand improvement, prescribed burning, treating invasive species).
2. Seek funding sources that benefit grouse and big game.
3. Collaborate with Big Game Program to monitor browsing impacts on forest regeneration, soil disturbance, and invasive plant species prevalence following forest management.

Assessment:

Implement all strategies in 2 years.

Objective 4:

Partner with grouse hunters and other hunting organizations to leverage support.

Strategies:

1. Recruit more grouse hunter-cooperators to supply hunt log data.
2. Encourage and facilitate hunter participation in outreach by USFS on proposed projects.
3. Use hunter volunteers for spring drumming surveys and other potential surveys.
4. Participate in Kentucky Grouse Hunters Association and Ruffed Grouse Society Chapter meetings and events.

Objective 5:

Improve survey methods to monitor long-term regional trends in grouse abundance.

Strategies:

1. Collaborate with the KDFWR Wildlife Research Program to revise spring drumming survey driving routes to monitor grouse outside focus areas (i.e., to maintain baseline range-wide trends).
 - a. Utilize a probabilistic sampling design to establish new grouse survey routes.
 - b. Conduct power analyses to determine adequate statistical power, both for routes established in grouse focus/emphasis areas and in outlying regions.
 - c. Evaluate Kentucky-specific probabilities of detection.
2. Collaborate with grouse managers in other states to align Kentucky monitoring with regional monitoring efforts.
3. Recruit more hunters to submit hunter-cooperator logs for flush-rate trend data.
4. Develop smart-phone app to allow citizen science data collection by hunters and outdoor enthusiasts.

Assessment:

Implement 3 strategies in 3 years.

Objective 6:

Monitor health (i.e., disease) of grouse populations.

Strategies:

1. Collaborate with the Wildlife Health Program to conduct active disease surveillance by sampling a subset of grouse via trapping and blood collection.
2. Conduct passive disease surveillance approach to opportunistically sample hunter-harvested grouse.
3. Encourage grouse hunters to submit blood and feather samples.

Assessment:

Implement all strategies in 4 years.

Objective 7:

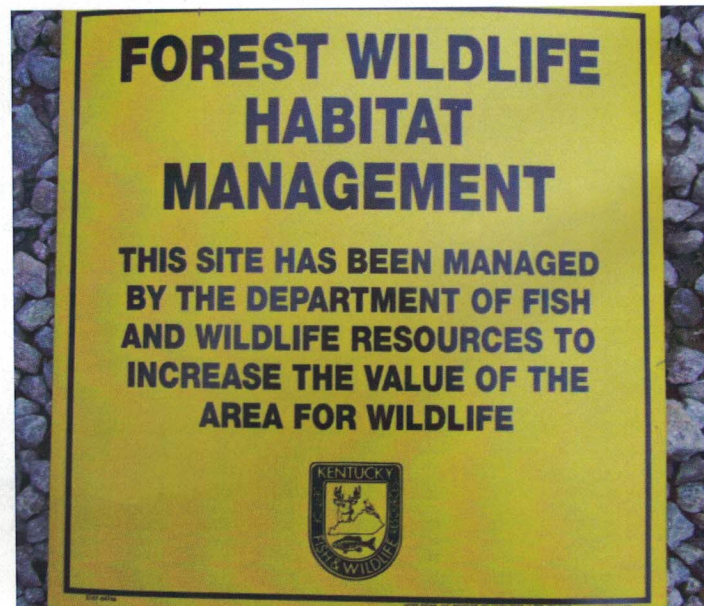
Increase public awareness to support expansion of forest management.

Strategies:

1. Collaborate with UK Forestry Extension and other partners to hold field days for citizens and forester trainings.
2. Develop signage that highlights projects and resulting benefits for wildlife and forest health.
3. Develop written material that highlights the project and resulting benefits for wildlife and forest health.
4. Develop appealing video material highlighting projects.

GOAL 2 OVERALL TARGET:

Use drumming surveys, hunter-cooperator logs, and citizen science data to assess range-wide stability of grouse populations (i.e., increase or decrease) in 10 years.



BRIAN GRAY PHOTO

FOCUS AREAS

The process of selecting grouse focus areas will be an ongoing process as opportunities present themselves. The *Stage 1* focus areas shown below represent our best opportunities to make headway now. The *Stage 2* map shows WMAs, the Daniel Boone National Forest, and other public hunting lands that could develop into focus areas. Not shown are potential private lands that hold promise as areas where commercial timber management can create grouse habitat. We hope to bring such areas into the fold with partnerships over time. A number of factors will influence the feasibility of any area for a grouse focus, including property ownership, property size, management staff on site or nearby, availability of forestry expertise among staff, the opportunity to benefit other priority species (elk), and of course, whether a local grouse population exists.

In addition the boundary of focus areas, a 3-mile radius buffer was added to reflect the natural effect that neighboring properties play for population growth and as a target area for outreach efforts to recruit more landowners.

Rather than show aerial photos, we show land cover maps of these mostly forested areas to depict forest, open areas, and developed areas.

LIDAR (light detection and ranging) is a remote-sensing technology that uses light pulses projected downward from aircraft, which allow very accurate calculation of ground elevation, as well the canopy height of trees. A partial LIDAR dataset is available for parts of eastern Kentucky. We used LIDAR data to quantify the amount of young forest cover within two of the five proposed grouse focus areas.



ZAK DANKS PHOTO



ZAK DANKS PHOTO



NATHAN GREGORY PHOTO

FOCUS AREA	% FOREST	% OPEN	% OTHER	ACRES
Clay WMA	84%	15%	1%	7,303
3-mile landscape overall	46%	54%	0%	57,105
Dewey Lake WMA	91%	8%	1%	9,163
3-mile landscape overall	68%	32%	1%	61,567
Kentucky Ridge Forest WMA	95%	5%	0%	3,504
Kentucky Ridge State Forest	94%	6%	0%	11,793
3-mile landscape overall	77%	22%	1%	85,945
Rockcastle River WMA	63%	37%	0%	2,926
3-mile landscape overall	81%	18%	0%	42,134
Tornado Zone A + Paintsville Damage Lawrence County	79%	20%	1%	2,615
3-mile landscape	81%	18%	1%	45,231
Tornado Zone A + Paintsville Damage Morgan County	81%	19%	0%	10,810
3-mile landscape	76%	24%	0%	126,872
Tornado Zone B (Magoffin-Johnson-Martin Counties)	83%	17%	0%	14,368
3-mile landscape overall	78%	22%	0%	185,397

Table 2. Grouse focus areas by percent area in land cover categories and acreage, including for a 3-mile radius around each area.



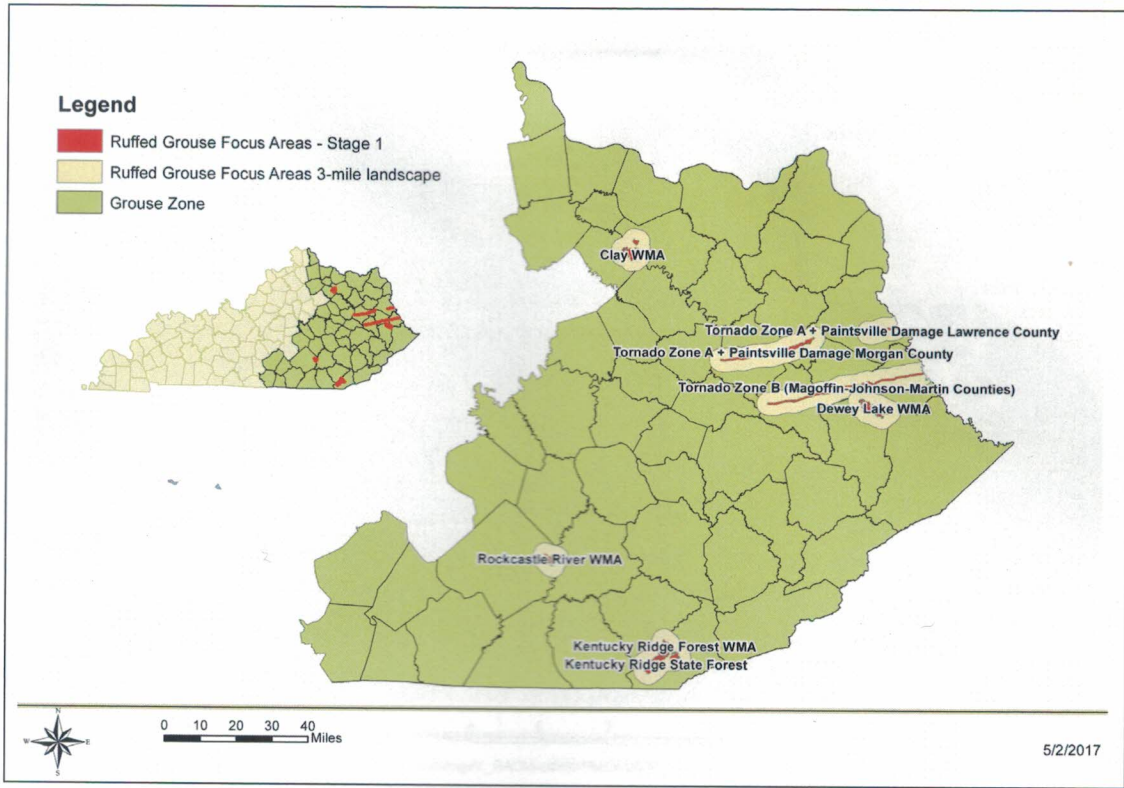
PHOTO © PHILIPPE ROCA

Grouse feed on a variety of foods throughout the year, including leaves, berries, nuts, buds, flowers, and insects.

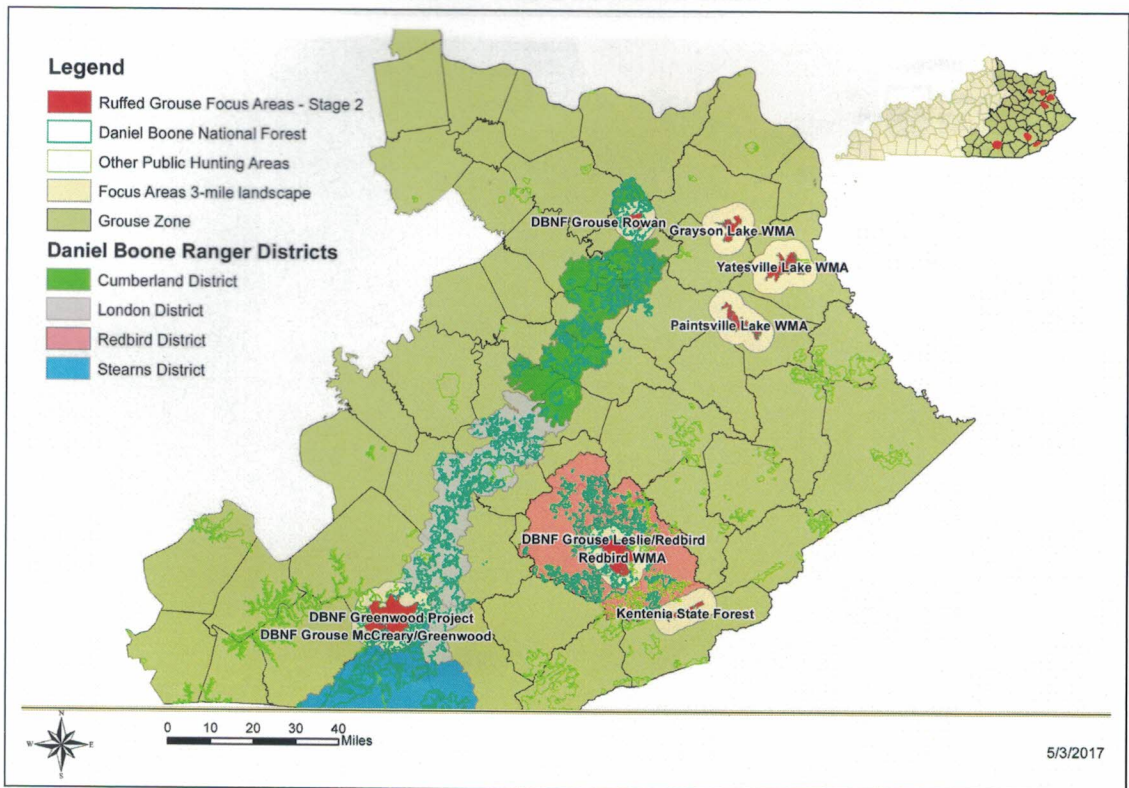
FOCUS AREA	0' - 25'	25' +
Dewey Lake WMA	15%	85%
3-mile landscape overall	40%	60%
Kentucky Ridge (State Forest and WMA) donut	37%	63%
Kentucky Ridge State Forest	29%	71%
Kentucky Ridge Forest WMA	7%	93%
overall	7%	93%
overall	25%	75%

Table 3. Grouse focus areas by percent area in vegetation height categories derived from LIDAR data.

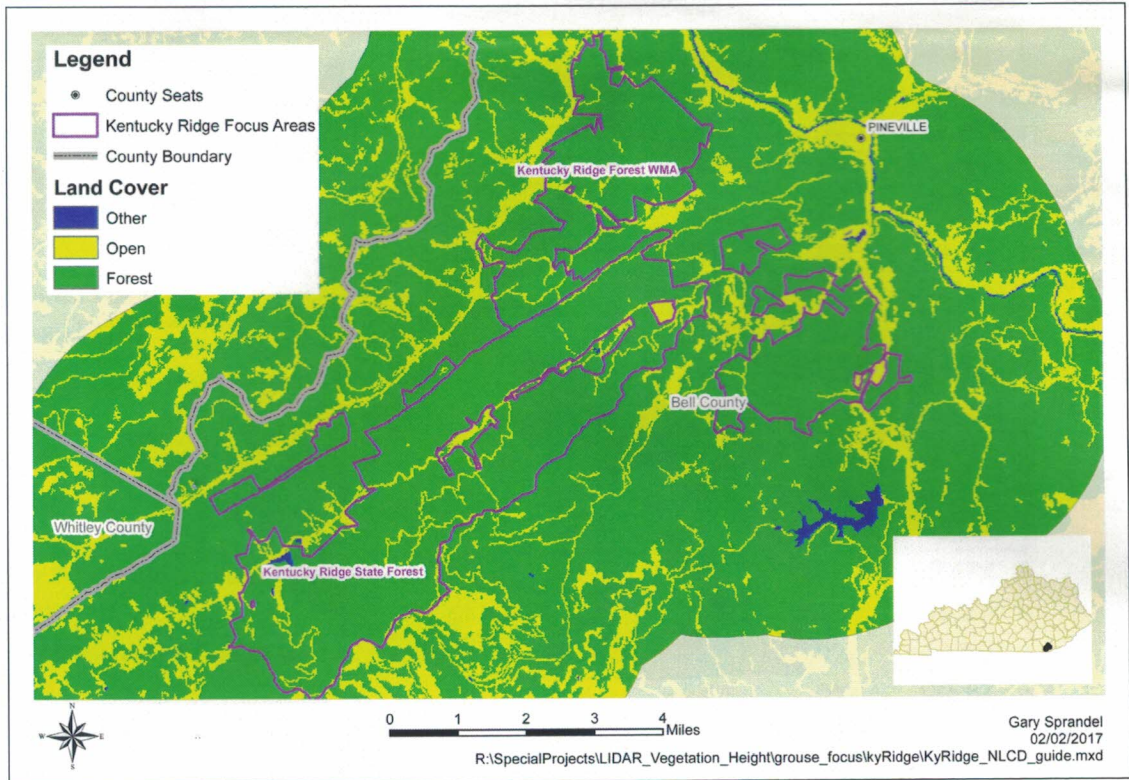
RUFFED GROUSE FOCAL AREAS - STAGE 1



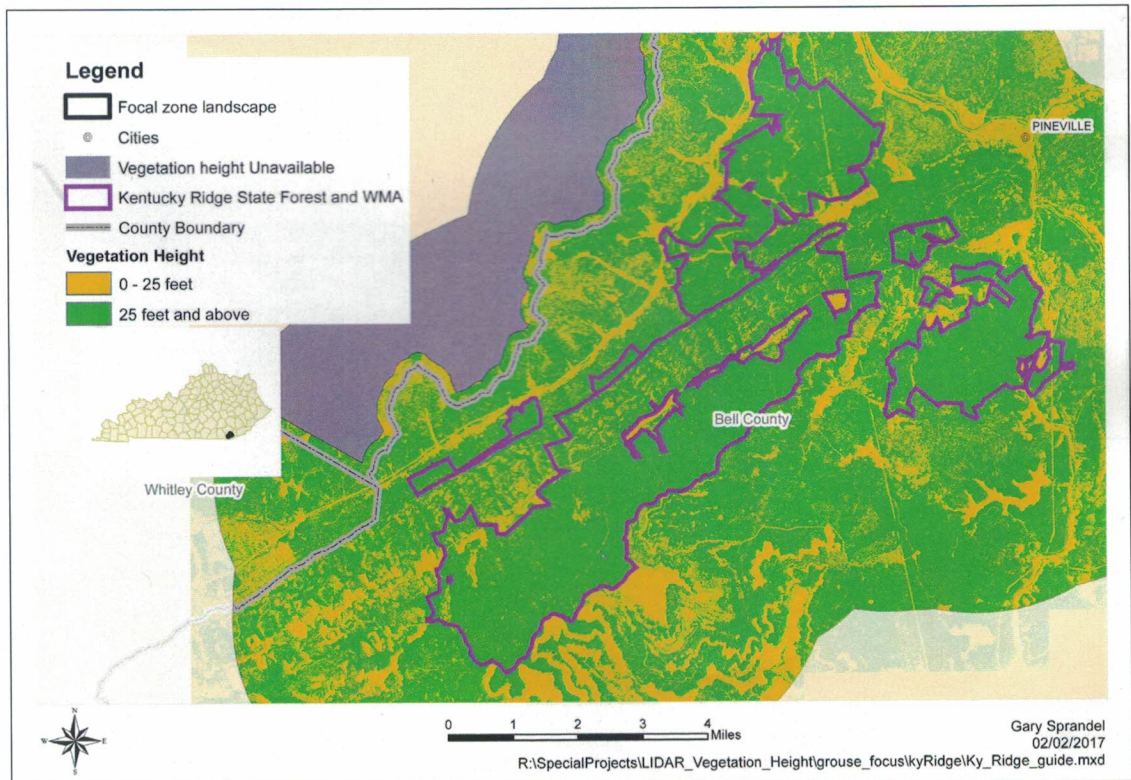
RUFFED GROUSE FOCAL AREAS - STAGE 2



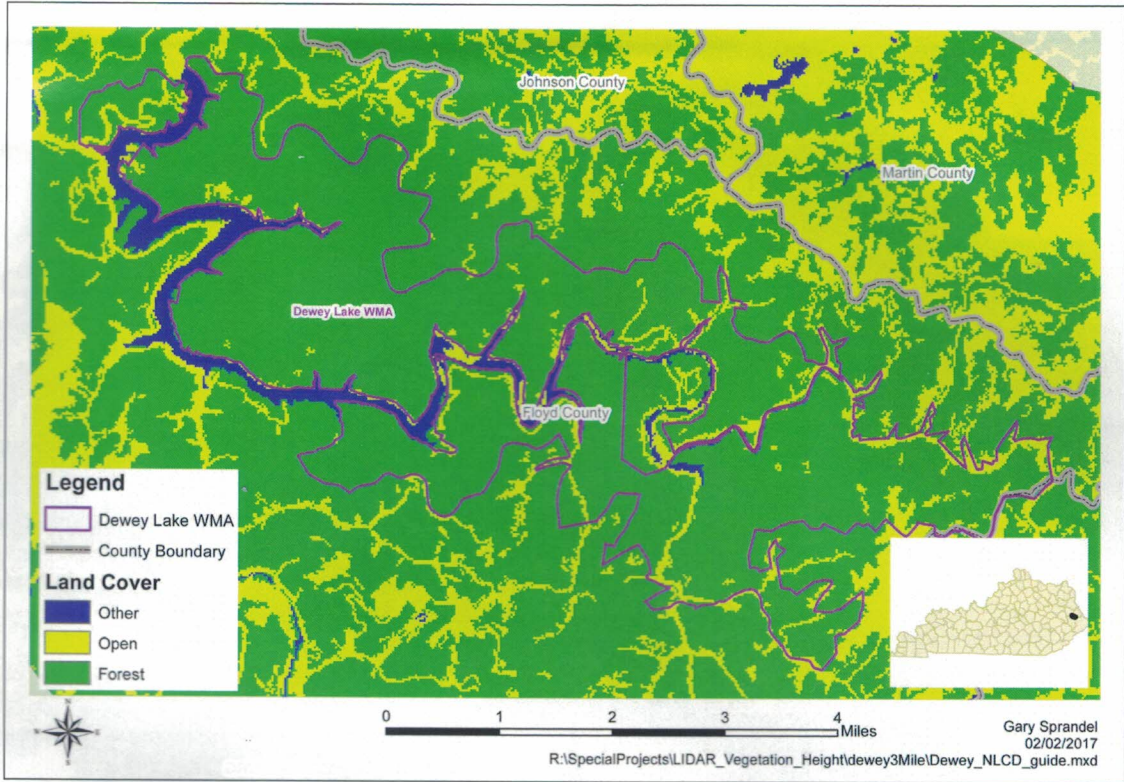
KY RIDGE STATE FOREST & WMA LANDCOVER



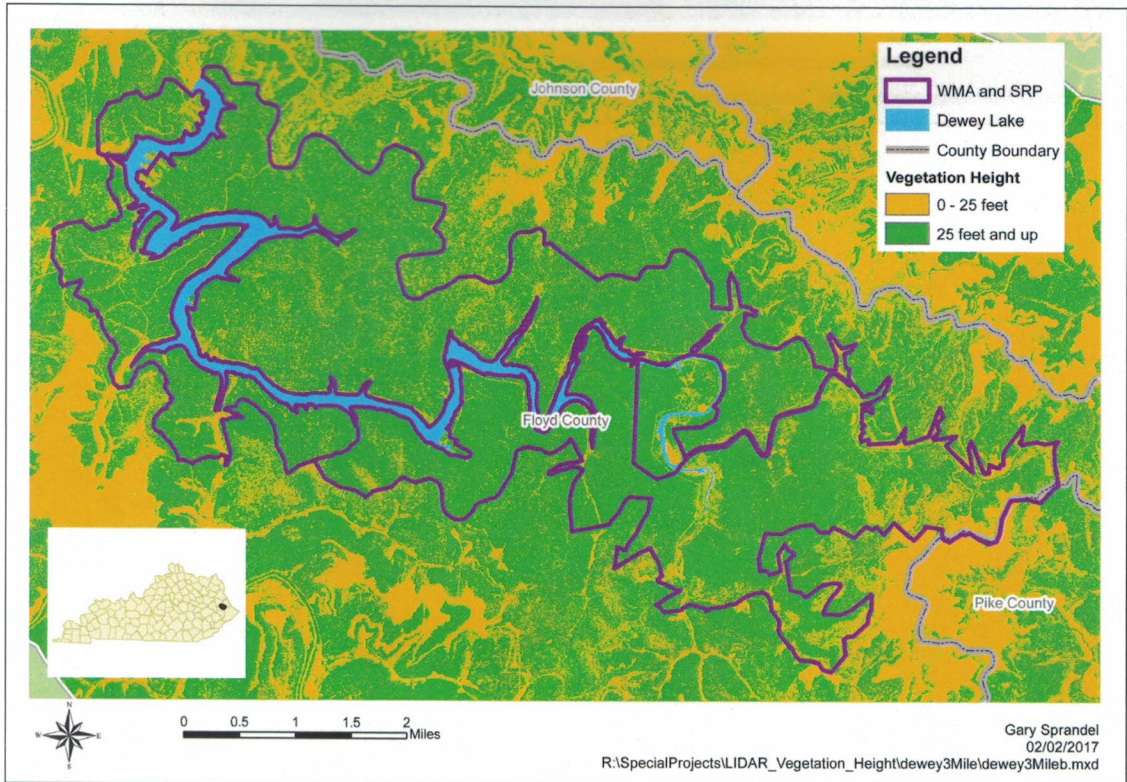
KY RIDGE STATE FOREST & WMA VEGETATION STRUCTURE



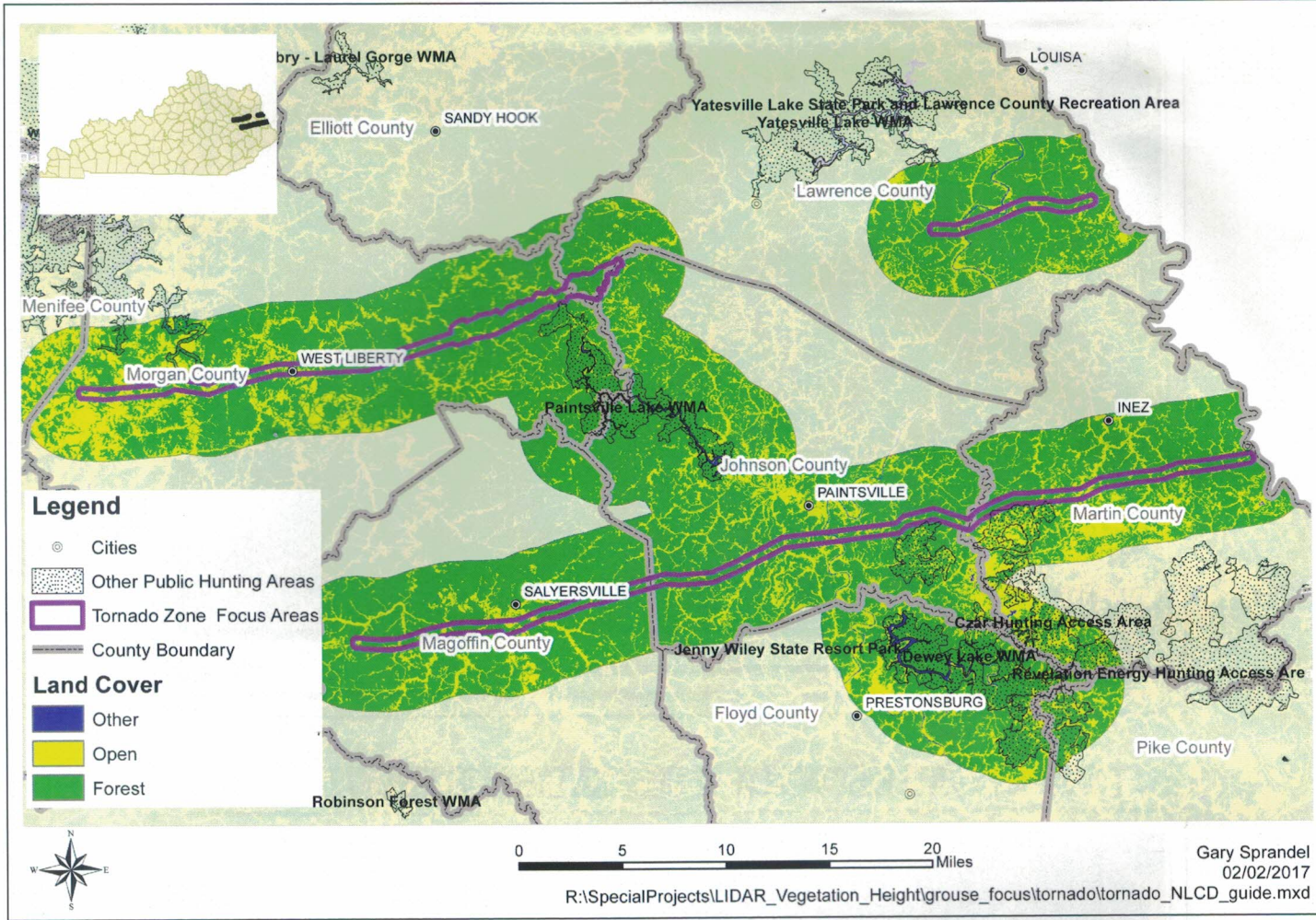
DEWEY LAKE WMA LANDCOVER



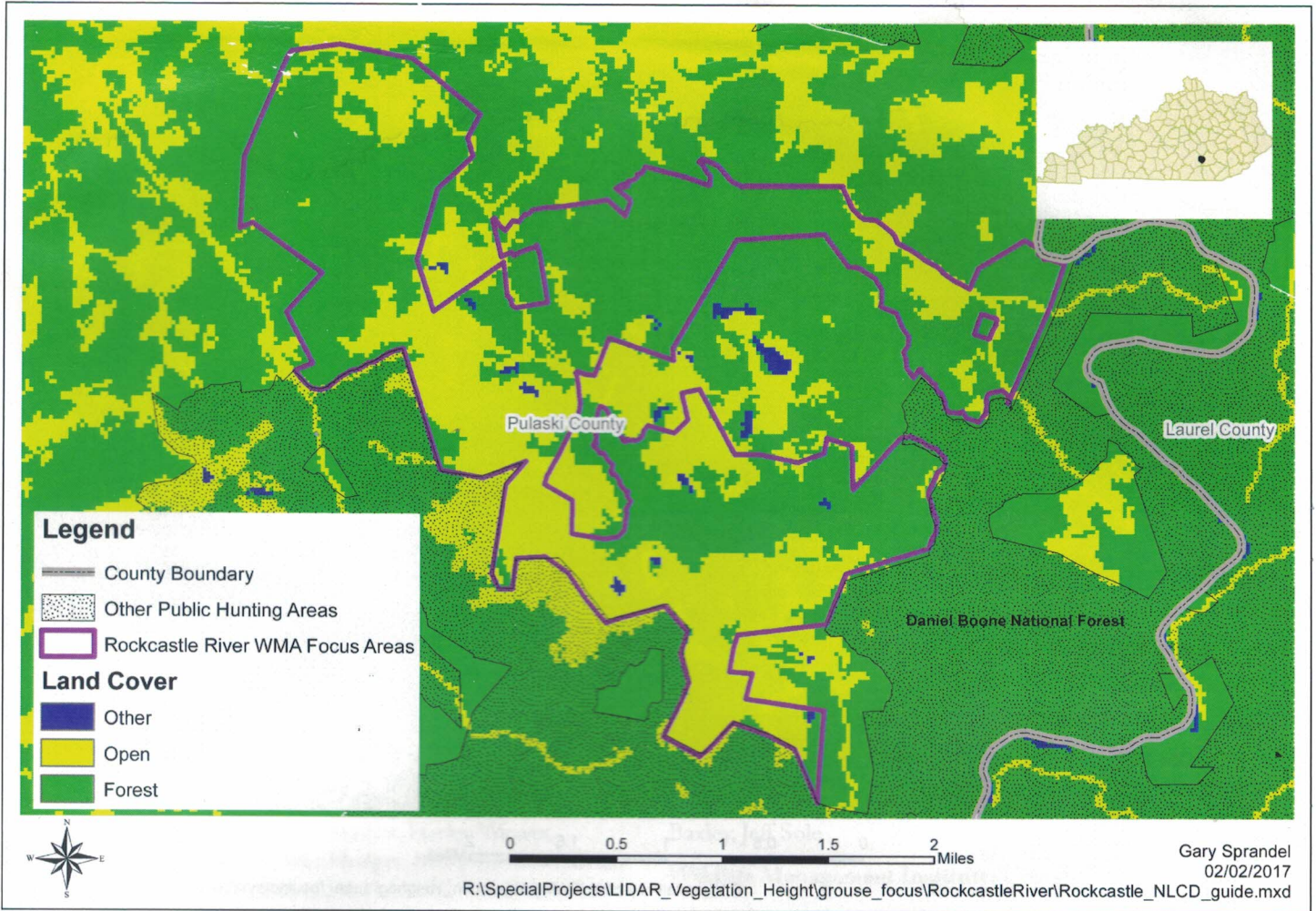
DEWEY LAKE WMA VEGETATION STRUCTURE



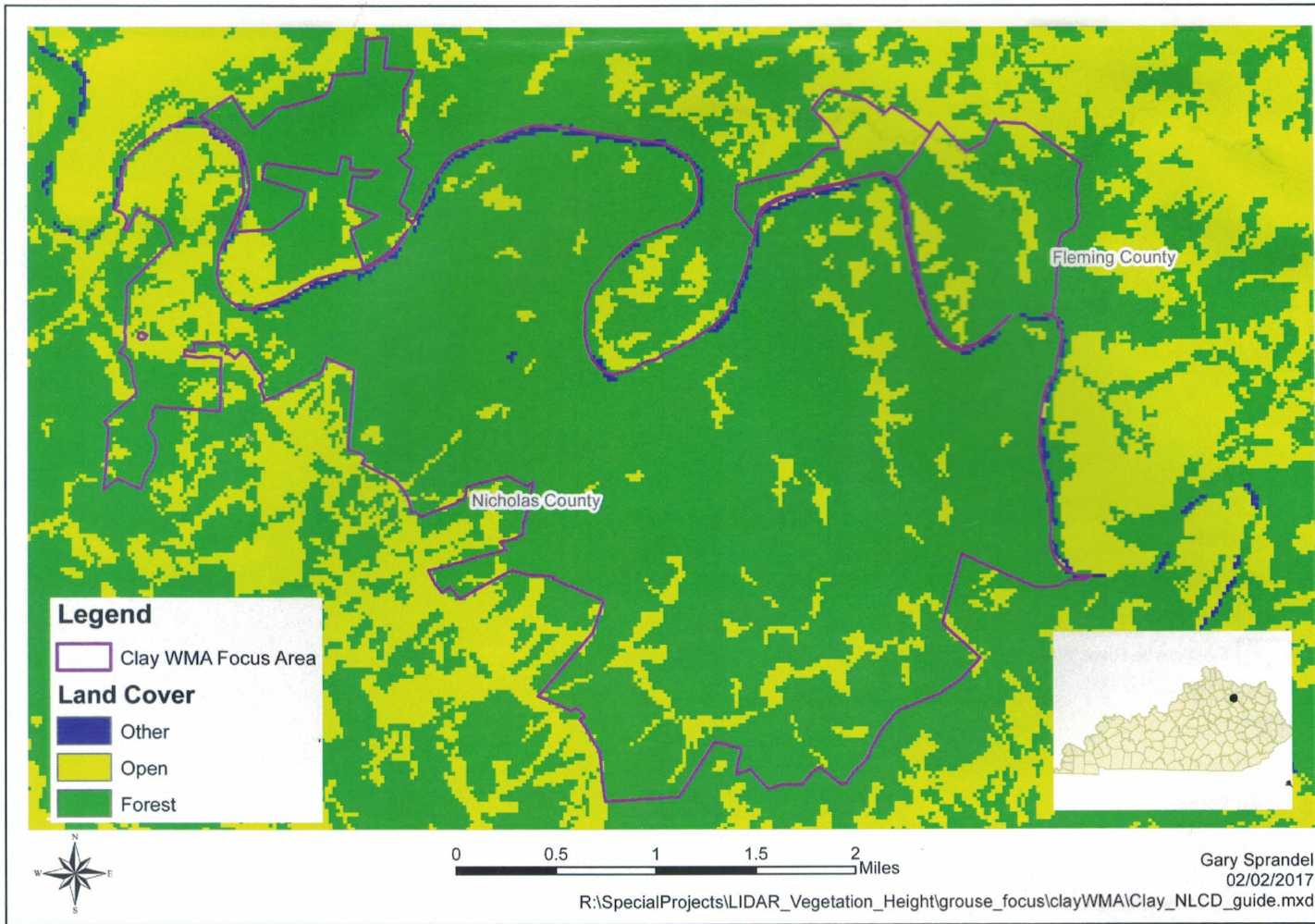
TORNADO ZONE LANDCOVER



ROCKCASTLE RIVER WMA LANDCOVER



CLAY WMA LANDCOVER



THANKS TO:

Kentucky Grouse Hunters Association:

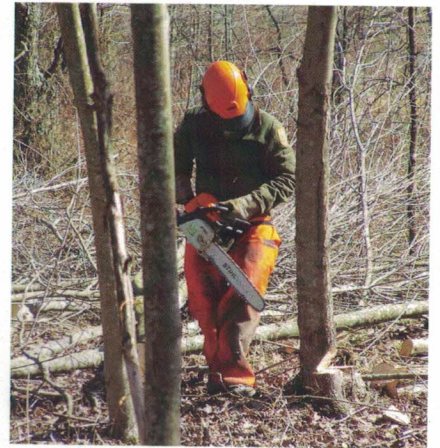
\$8,000 in chainsaws, herbicide, shrub seedlings

Commonwealth Chapter of Quail Forever:

\$5,000 in chainsaws, herbicide, clover seed

CONCLUSION: BEYOND 2026

This plan covers a 10-year time frame. Managing forests for ruffed grouse must necessarily take a much longer view, consistent with typical rotation lengths for even-aged timber management (e.g., approximately 80-120 years in the Appalachians). In 10 years we can get the ball rolling, but we must be thoughtful in the course we take. Science backs the strategies outlined in this plan, but the human dimensions will play a big part in its success. Public scrutiny will be high for a plan based on cutting trees, and public acceptance will only come through a long, committed educational campaign for young forest habitat. In the grouse woods, a hunter often gets only a fleeting glimpse of his flushing quarry, and shots are often taken on faith. We must embrace the challenge of grouse restoration now, on behalf of grouse, blue-winged warblers, oaks, and the suite of other species that cannot lobby for their own existence.



SCOTT FREIDHOF PHOTO

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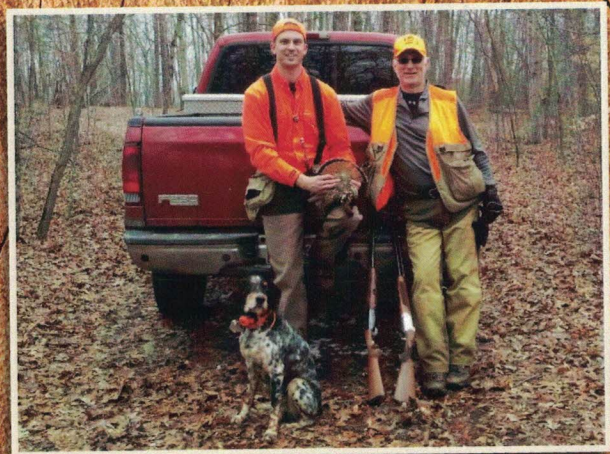
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ERIC JACOBS PHOTO



JACOB STEWART PHOTO

*“Obstacles are those frightful things you see
when you take your eyes off your goal.”*

— Henry Ford



PHOTO © TIM FLANAGAN



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