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THE Upland GAZETTE

WILDLIFE CONSERVATION AND HABITAT MANAGEMENT

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Making Dollars and Sense

By Chris Kreh, District Wildlife Biologist, NCWRC

If you ask 100 farmers in North Carolina if they'd like to have quail on their farm, I expect that 90 or more will answer some version of "Yes, I'd love to have quail on the farm like we had when I was a kid!" Oftentimes, the follow-up question is a little tougher: "Are you financially able to manage some of your farmland specifically for quail, without expecting that land to generate normal income from the farm?" These two questions frame the position in which many farmers find themselves. They would love to do something to benefit wildlife

but have to be conscious of the bottom line. Thirty or forty years ago quail were a by-product of farming here in the Southeast. It was "dirty-farming" if you will. There were lots of brushy fence rows, fallow fields, ditches, and other areas that provided food and protective cover for quail and many other species. Modern farming is much cleaner, and in most cases the profit margin is slim, forcing farmers to maximize production from every acre with little left over for wildlife.

But, there is a third question that holds a lot of potential: "Would you be interested in making a change on your farm that can help wildlife as well as the farm's bottom line?" Farmers that are producing cattle and hay in the western piedmont have a great option for creating a "win-win" situation for both the farm and wildlife by

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A Note from the Editor

One of the neat things about my job is that I get to talk to and hear from many hunters. I learn a lot from these conversations and cherish the opportunity to participate. I sometimes get asked for my view on their theories. One recent theory that won't go away is that wild turkeys are eating most of the quail and grouse. After all, turkeys boomed over recent decades as bobwhites and ruffed grouse have become harder to find than a black cat in a coal cellar. Well, it

does not surprise me that a turkey would eat a quail or grouse chick. Many animals eat chicks and probably always have since time began. However, I still contend habitat is the most important issue. Areas of the country exist that have great quail, grouse, and turkey populations on the same property. I have hunted them as have many of our readers. Those areas all share a common characteristic—good habitat for these species. However, turkeys are much more adaptable to habitat than quail or grouse. Turkeys will live in places where quail and grouse will not, as well as in places where quail and grouse thrive. Turkeys are generalists, and quail and grouse are specialists. If you compare turkeys and quail/grouse to trees, turkeys are like sweetgums or red maples which will grow anywhere while quail and grouse are like cypress trees that require specific moisture and soil conditions. Of course, the specifics required by quail and grouse are different, but they each have their individual and narrow needs unlike the extremely adaptable turkey.

I do believe predation (whether by turkeys or more traditional predators like raccoons, foxes, and raptors) can have an effect on quail or grouse populations in poor habitats. Unfortunately, most of North Carolina and the South is poor habitat these days because of development and changing land use, but I still recommend that landowners and managers do nothing to increase quail or grouse populations without first creating quality habitat.

The search for a simple answer to explain the decline of quail and grouse will continue because hunters are desperate for any solution to the quail/grouse problem other than the habitat issue. This is because they feel unable to change habitat on a large scale. Predator control, baiting, translocation, and other ideas have been repeatedly tried with little success without first improving habitat on a large scale.

But there is one thing worth remembering: every state in the South has a handful of intensively managed high-quality smaller habitats that still have lots of quail. If turkeys or other predators were the major reason for the regional decline, why are quail prospering on these areas? It is not going to be easy, but we must maintain our focus on habitat first if we are ever to be successful in managing both quail and ruffed grouse.

Mark D. Jones

SUPERVISING WILDLIFE BIOLOGIST
PRIVATE LANDS WILDLIFE HABITAT GROUP

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establishing stands of native warm season grasses (NWSG). (In row crop country, farmers can make a win-win for both wildlife and the farm through the use of field borders, but that's a topic for another article.) NWSGs, such as big bluestem, switchgrass, or eastern gamma grass can provide high quality forage for cattle or horses, and they can offer great wildlife benefits as well. Most importantly, they are "bunchgrasses"—growing from scattered clumps and allowing small game the opportunity to move freely with overhead protection. Fescue and most other cool season grasses have a sod-forming growth pattern which limits wildlife movements and provides little protective cover.

A Win for the Cattle

NWSG are adapted to grow during the hot summer months providing forage when cool-season grasses (like fescue) are brown and non-producing. Forage quality is outstanding with 8–12% crude protein that can lead to weight gains of more than two lbs/day for grazing cattle. This is as good as or better than nearly any other forage grown for cattle. NWSGs can provide 2–3 times the total amount of forage that is typically found in fescue and other cool season grasses.

A Win for Wildlife

NWSGs grow from scattered clumps rather than thick sod and provide small game both the opportunity to move freely and have overhead cover. Proper management of NWSGs requires a higher mowing or grazing height and leaving some cover standing through the winter. This is especially valuable to quail, rabbits, and other small game trying to survive in the face of modern clean farming. The grasses themselves do not serve as a food source for wildlife as their primary benefit comes from providing protective cover and nesting opportunities. Their bunchgrass form also provides an opportunity for land managers interested in wildlife to mix in seed-producing forbs and/or flowers (such as lespedeza, partridge pea, or wildflowers) that yield a much needed food source and/or attract insects that birds eat. Furthermore, some species of

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NWSG mature later in the season (July-August) and are not ready to be hayed or grazed until after many wildlife species have nested and reared their young.

A Win for the Farmer

Most farmers and land managers are interested in having more wildlife on their lands but at the same time need to make an economic profit. NWSGs are the perfect opportunity to kill two birds with one stone. Converting some (around 25–35 %) of a farm's pasture or hay fields to NWSG can provide enough forage to carry most cattle operations through the hot dry months of summer. NWSG allow farmers to avoid the need to feed hay during a summer drought. They can allow the opportunity to pull cattle off of cool season pastures and allow those pastures time to rejuvenate before moving cattle back onto them for the fall and winter. Fertilization is not required to have a good stand of NWSG. Yes, an established NWSG stand will produce greater yield if fertilized, but good forage yields can be had without any fertilizing at all. Considering the price of fertilizer these days, this can actually be a better economic decision. (When being established, NWSG stands should not be fertilized at all as this just gives the competing weeds a better chance of becoming a problem).

NCWRC's Role

Recognizing the potential for a “win-win” situation, the N.C. Wildlife Resources Commission has spent a great deal of time, effort, and expense in promoting the use of NWSG



Sparrow nest in big bluestem.

in the western Piedmont. Over the last decade, we've worked with more than 35 farmers to establish over 500 acres of NWSG in Catawba, Davie, Iredell, and Lincoln counties. The vast majority of this NWSG has become a valuable asset to the farm and provided excellent wildlife benefit as well. Our biologists have worked with many of these farmers to document their successes with both producing hay and observing wildlife. In some cases, they've filled out a daily log recording hay production and wildlife observations. A summary of these daily logs shows that average NWSG hay yields have been 1.9 tons of for-

age/acre/cutting compared to 1.4 tons of forage/acre/cutting with cool-season fescue. Many of these farmers also tracked the number of turkeys, deer fawns, rabbits, and quail they encountered in their field while making hay. They reported encountering much more wildlife in the NWSG fields as compared to their fescue fields. On average, for

every 100 acres of NWSG, they saw 20 turkeys, 5 deer fawns, 8 rabbits, and 4 quail in NWSG. In fescue fields, again for every 100 acres, they reported seeing zero turkeys, 2 deer fawns, 6 rabbits, and 1 quail. The sample sizes are limited, but the observations were similar to what our biologists documented in January 2009 by box-trapping rabbits in switchgrass and fescue fields on an Iredell County farm. That trapping project showed that there were just over 1 rabbit per acre in the switchgrass while there was only 1 rabbit per every 4 acres in the fescue.

Some Final Thoughts:

NWSG is not the perfect fit for every farm or every situation. It does not provide the perfect habitat for wildlife, but it is significantly better than fescue, orchard grass, and other sod-forming cool-season grasses. It is important to remember that establishing warm season grasses can be tricky. It takes specialized equipment, and the seed and herbicide can be expensive. It normally takes several years to establish a stand, so plenty of patience is required. However, for a thoughtful farmer that wants to make a choice that is a win for the wildlife as well as a win for the farm, planting NWSG makes both dollars and sense. 🌱

Most farmers and land managers are interested in having more wildlife on their lands but at the same time need to make an economic profit.



MELISSA MCGAW/NCWRC

Chick production and survival are often the limiting factors for an area's bobwhite population.

Eureka! The Silver Bullet

By Benjy Strobe, Technical Assistance Biologist, NCWRC

Many landowners, hunters, state agencies and other folks have been looking for that magical silver-bullet answer to solve the quail problem. While a lot of complex variables go into play when describing the decline of the quail populations, numerous other bird species that use early successional habitats have followed the downward trend right alongside the quail (Figure 1). This suggests a habitat problem on the landscape, but the quest for the silver bullet continues. So, is there actually a silver-bullet answer to bring back the quail? Yes, there is, and no, it does not come from a mail order catalog, the internet, the sporting goods store, or the local feed and seed dealer.

Maybe a bullet is not the best way to describe what can help improve early successional habitats as that may lead one to believe that a one-pronged approach can fix the problem. A silver shotgun shell with multiple shot might be a better analogy. It is going to take effort from you, various groups and organizations, and most importantly, private landowners to make progress with quail management.

While we are all consumers, and we have all contributed to the decline of quail and grassland birds, there are some things we can do to be the bullet or shotshell. (Many of the things mentioned in this article have been written about in past issues of the *Upland Gazette* and other publications, but it never hurts to review.)

We can start with something simple. When do you and your neighbors perform your annual mowing? Changing the mowing regime to late winter (February or March) will provide some habitat for most of the year. Do you have an area that can be disked instead of mowed? Frequent and repeated mowing favors sod-forming grasses which are unfriendly habitats for quail. Disking leads to a diversity of plants and is much better for most wildlife including quail.

Have you implemented any prescribed fires in timberlands? Quail benefit from fire because they like the plants that fire promotes. In the Southeast, fire should be used

frequently; usually every 2–3 years. If you are waiting longer than that you are losing ground in terms of quail habitat. Don't want to tackle that by yourself? The North Carolina Forest Service does controlled burning (contact your county ranger), and there are private prescribed burn contractors who will do the work. And you may want to consider working with your neighbor(s) or your local Volunteer Fire Department and see if you can start a burn cooperative.

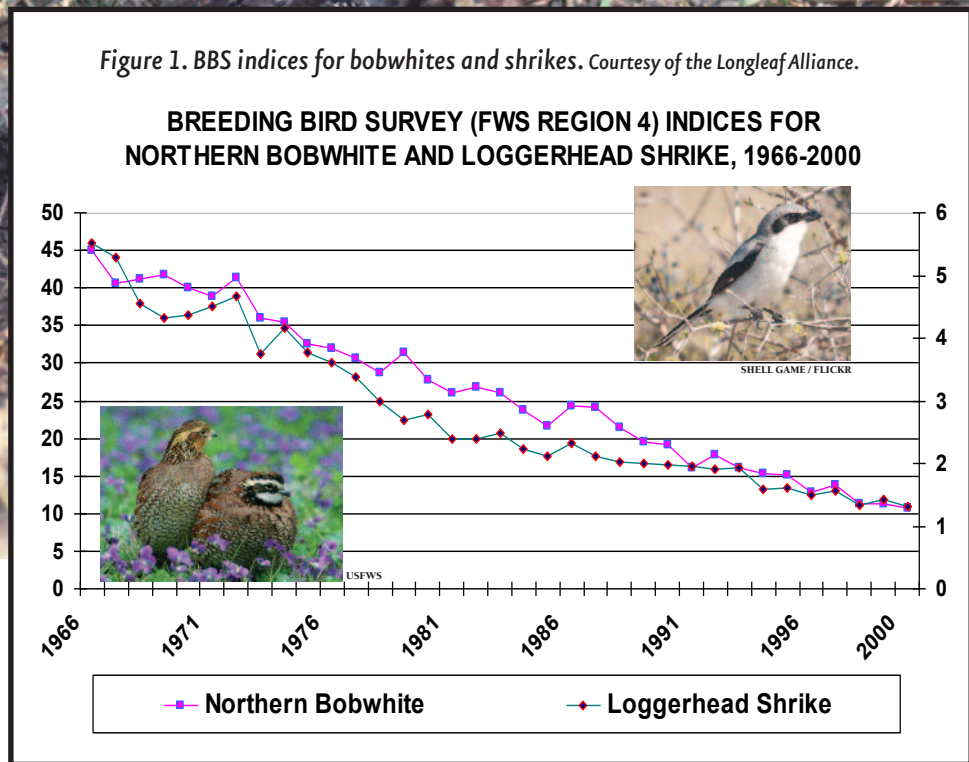
Have you considered restoring longleaf ecosystems to your land? Longleaf savannahs once covered much of the southern coastal plain from Virginia to Texas. Many groups and individuals are working hard to restore these highly diverse and valuable habitats. The main advantage of longleaf is the young age at which it can be burned. Thinning and burning older stands of other southern yellow pine species such as loblolly can provide much of the same understory habitat benefits as longleaf.

To benefit quail, there has to be enough sunlight reaching the ground to promote the growth of grasses, forbs, and shrubs that quail need. You can start by thinning your woodlands. That is a critical part of making any timber stand effective for quail. The importance of getting sunlight to the ground in forested quail habitat cannot be overstated, but most landowners do not thin enough trees. Consult a wildlife biologist before thinning. Perhaps you have a mid-story that is competing with your valued timber for sunlight. The fuel chip and wood pellet market is on the rise in North Carolina, and it might be worth looking into while removing the unwanted mid-story. Another potential use for this market is feathering your woodland edges.

Are you managing row crops and pastures/hayfields? You can be part of the answer here as well. Many of today's pastures and hayfields can be life-threatening to quail and other grassland birds. The structure of fescue, Bermuda, and other sod-forming grasses is all wrong for our feathered friends. Row crops may provide cover but very little in the way of nesting habitat. Excluding livestock from



MELISSA McGAW/NCWRC



Loggerhead shrikes are one of many songbirds experiencing population declines that mirror the decline of bobwhite quail across the United States.

waterways is another way to help the cause. Another is planting native grasses. Crop systems with field borders can provide much needed nesting and brood-rearing cover.

The creation and management of fallow areas is another way you can be a resourceful habitat provider. Fallow areas are usually odd areas in row crops, but fallow areas can be developed in other places. Fallow areas contain natural vegetation that volunteers, and these areas are usually more block-shaped than something long and linear like a field border. Fallow areas can be managed by prescribed fires in March depending on the fine fuel load or by disking in March every two or three years.

All of the management practices listed here work really well when connected on

the landscape. Connected habitats make it easier for birds to escape potential predators while providing habitat in some area at all the times of the year. Having a management plan that describes the necessary time frames for transforming the habitat will help you and the quail succeed.

Not any one state or federal agency will be able to solve the quail problem so let them know their work is appreciated, and that you would like to see more effort put towards restoring quail populations. You may want to consider attending Local Workgroup meetings with the Soil and Water districts and the Natural Resources Conservation Service to help define goals and rankings. These groups are required by law to accept public input. Many of their

Best Management Practices (BMPs) can provide early successional habitat. Supporting agencies and organizations that promote quality early successional habitat is another way you can help.

Still not sure where to start? Contact the Editor of the *Upland Gazette*. He can put you in a touch with a technical assistance biologist, a forest stewardship biologist, or a district biologist that will be glad to help. Whatever you do, be sure to seek professional assistance to ensure you are doing everything you should to increase your chances of being successful in managing your property for wildlife. There may not be a silver bullet, but there are many things that, when put in place together, can improve habitat for quail on the landscape. 🐾

Beagles and Bunnies

By Mark D. Jones, Supervising Wildlife Biologist,
NCWRC, Editor of the Upland Gazette



When I was a kid, just about every young hunter started out chasing gray and fox squirrels and cottontail rabbits. I remember hunting these species in the woods and fields of our neighbor's Virginia cattle farm and taking my old collie dog, Brandy, so he could flush rabbits from the brush around an old abandoned house. I was not lucky enough to benefit from a pack of beagles, but just about every community in the South had one or more families or groups of hunters who kept a pack. Saturday afternoon rabbit hunts were often comprised of a diverse group of locals of all ages, and, if you were lucky, you just might get yourself invited. Over the last 30–40 years, this iconic, southern hunting “rite-of-passage” has changed a lot. Burgeoning deer and turkey populations allow many hunters to begin and continue their hunting adventures with bigger quarry. (Yet fewer and fewer hunters take advantage of some of these simpler pleasures of the hunting world like hunting rabbits and small game.) This past January, one of North Carolina’s “beagle masters” was kind enough to invite a couple of N.C. Wildlife Resources Commission (NCWRC) biologists and the Chairman of the Commission’s Small Game Committee for a rabbit hunt reminiscent of times gone by. 🐾

Lee Efird of Kannapolis brought along 7 of his 22 beagles for this rabbit hunt. Lee hunts close to 40 days a year and must rotate his dogs to keep them fresh and healthy for the long rabbit season. Here the group of beagles, led by a wise old male named “Roscoe”, trails a fleeing cottontail across a “green strip” managed between heavier covers.



Lee Efird watches as his pack tries to sort out the scent after a rabbit crossed the opening. Both cottontails and marsh rabbits, known as bluetails, are common on the property. Cottontails are found throughout both uplands and lowlands while bluetails favor some of the wetter areas close to the creeks and drainages.



John Isenhour, NCWRC's Piedmont Technical Assistance Biologist, heads into the heavy cover composed of native warm season grasses, brambles, small trees with interspersed thickets, and strips of green vegetation. Isenhour worked closely with landowner John Bishop of Kannapolis and his friend, Lee Efird, in managing Bishop's 1,100 acres. Together they have turned the Bishop property into one of the Piedmont's premier habitats for early-successional wildlife.



Isenhour hangs a rabbit on a tree to keep it safely away from the pack and for later pick-up while the dogs try to find more scent for another chase. The good cover found on the Bishop property annually produces exceptional rabbit hunting proving what can be accomplished through effective habitat management.



Wildlife Commissioner Garry Spence of Charlotte waits for the beagles to force a fast running cottontail to cross the green strip offering a chance at a shot. Mr. Spence serves as the new Chairman of the Commission's Small Game Committee and hopes to highlight some of the small game opportunities found in North Carolina.





The author placed these two rabbits high off the ground honoring a tradition that not only keeps them safe from the beagles but saves the weight of carrying them until it is time to head to the truck for the day. More than just a convenient tradition, this practice also gives any pesky fleas time to jump off the rabbit before you carry them in your game bag!



Lee Efird and Commissioner Garry Spence pose with six of the seven rabbits taken by the group for the day. The daily take included six cottontails and one marsh rabbit with all hunters bagging at least one. The rabbits would end up on the author's family table three days later. Most importantly, the hunters experienced a great day afield with good company in beautiful habitat chasing a wary and fleet quarry with a fine group of canine companions.

Survival Rates and Home Ranges of Fox Squirrels in the North Carolina Sandhills

*Annemarie Prince, Christopher Moorman, and Christopher DePerno
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The southeastern fox squirrel is an iconic animal of the longleaf pine forests of the southeastern United States. Unfortunately, southeastern fox squirrel populations have declined because longleaf forests were reduced in acreage following land conversion and fire suppression over the last two centuries. Despite these population declines, fox squirrels are hunted across much of the Southeast, albeit under more restrictive season lengths and daily bag limits than gray squirrels. Season lengths and bag limits for fox squirrels are often based on educated guesses regarding the impacts of hunting on survival. In fact, most studies of fox squirrels in the Southeast have focused on habitat relationships, and less is known about survival, causes of mortality, and home-range size.

For one recent study, our research objectives were to determine survival rates, causes of death for squirrels that died during the study, and seasonal and annual home-range sizes for male and female southeastern fox squirrels on the Fort Bragg Military Reservation in the Sandhills of North Carolina. Also, we wanted to determine if home-range sizes contributed to differences in survival between the sexes.

Fort Bragg and the surrounding areas form the largest contiguous tract of longleaf pine-wiregrass ecosystem remaining in North Carolina making it the perfect place to study fox squirrels. Fox squirrels feed on the cones of the large longleaf pines scattered throughout the uplands and on the acorns from oaks present in small patches in the uplands, along riparian areas, and bordering parachute drop zones. On Fort Bragg, hunters are allowed to harvest one fox squirrel per day with a season limit of 10. The hunting season runs from October to December. According to Fort Bragg harvest records, squirrel hunter effort has decreased since 1982, but fox squirrel harvest has remained relatively constant over this period. On average, 78 fox squirrels were harvested annually on Fort Bragg from 2001–2011.



ANNEMARIE PRINCE

We trapped fox squirrels using wooden box traps and wire-cage traps baited with dried corn. We radio-collared 52 adult fox squirrels and continually tracked them until death, radio failure, or they moved into an artillery impact area. When a radio-collared fox squirrel died, we determined cause of death by examining squirrel remains and swabbing the radiocollar and animal for potential predator DNA. Using evidence from the field and from the laboratory DNA results, we categorized deaths as predation (mammalian carnivores and raptors), hunting, and unknown.

We calculated survival rates and home-range sizes and compared these parameters between the sexes and among the different seasons. Our seasons were defined as winter (mid-January to mid-March), spring (mid-March to early-June), summer (early-June to the end of September), and fall (early-October to mid-January).

Over the course of our study, we detected 22 squirrel deaths (15 males, seven females). Two squirrels were harvested by hunters, and eight were killed by predators. Of the eight predator mortalities, bobcat, gray fox, and a red-tailed hawk each killed one squirrel, and the remaining five deaths were from an unknown predator. Twelve

squirrels lacked sufficient remains to determine cause of death and were classified as unknown. However, because of the presence of the tail and fur at the recovered collar location, we suspect predation in six of the 12 deaths classified as unknown.

Fox squirrel survival was greatest in the winter (97% survival) and lowest in the fall (72% survival). Male annual survival (35% survival) was lower than female (66% survival) annual survival.

Home ranges were calculated for 47 (25 males, 22 females) fox squirrels. Male home ranges (average 201 acres [range 17–773 acres]) were larger than female home ranges (average 49 acres [range 13–178 acres]). Spring home-ranges (176 acres) were larger than those in winter (53 acres).

Seasonal changes in use of the home-range area likely caused the variation in seasonal survival estimates for fox squirrels on Fort Bragg. During our study, the majority of the fox squirrel mortalities occurred in the fall as fox squirrels actively prepared for winter. As fox squirrels increase their fall foraging and caching behavior, it is likely they are more susceptible to predation. It is possible that fox squirrel movements are more localized and frequent as they forage in areas with more hardwoods and acorn producing trees, and this may allow predators to concentrate on fox squirrels. Conversely, survival rates were greatest in the winter when fox squirrels have smaller home ranges and are less active.

The low estimates of survival we detected on Fort Bragg compared to other areas suggest a need for more research into the causes of death, whether survival varies from one year to the next, and the potential additive effects of hunter harvest on reduced survival. Additionally, if large home ranges of fox squirrels on Bragg are indicative of low forage availability on the landscape, managers may need to adjust management activity (such as protecting acorn producing oaks within the longleaf pine forest) to improve habitat conditions for fox squirrels. 🌱

The Future of the Golden-winged Warbler in Western North Carolina

*By Patrick Farrell,
Technical Assistance Biologist, NCWRC*



The Golden-winged warbler (GWW) is a small Neotropical bird and a member of the warbler family Parulidae. There are over 100 species from this family found in North and South America. In North Carolina, GWW habitat consists of shrubland generally between 3,000–4,500 feet high in elevation although they are found at lower elevations farther north. Two or more acres of habitat are required for a breeding pair. In the Southeast, GWWs are restricted to the Appalachian Region from the mountains of North Georgia through western North Carolina where an estimated 2,000 birds can be found. Because of the lack of high elevation mountain areas with shrubland habitat, the Golden-winged warbler has been federally and state listed as a “Species of Special Concern”.

Numerous State and Federal agencies are working together to address the decline of GWW, and cost-share assistance for habitat management on private lands is one available tool. The United States Fish and Wildlife Service (USFS) and Natural Resources Conservation Service (NRCS) created a program through the NRCS called Working Lands for Wildlife (WLFW) that helps landowners who may want to create or maintain the warbler’s habitat (and benefit many other songbirds and game species). Typical habitat recovery practices include cutting trees and spraying stumps with herbicides to restore or expand critical shrubland habitat. Landowners who have current populations of birds are advised to use prescribed burning, herbiciding, and cutting sprouts of small trees to prevent shrubland from becoming a forest again.

Private landowners who have Golden-winged warblers have the option of putting their land in the Wildlife Conservation Land Program (WCLP). WCLP is a State of North Carolina Tax program that provides reduced property tax liability for the management of seven habitat types (including early successional habitat preferred by GWWs). Landowners may enroll between 20-100 acres of qualifying habitats per county and receive reduced property tax rates. Interested landowners should contact their local N.C. Wildlife Resources Commission biologist for more information about this program.

Haywood and Jackson are two mountain counties in southwestern North Carolina that still have healthy populations of golden-winged warblers. Haywood County contains significant acreages of high elevation pastures that are over a century old and contain blackberry brambles, hawthorn trees, apple trees, black locust sprouts, and flowering dogwoods. Jackson County ranks second for current Golden-winged warbler populations, but much of Jackson’s historic high elevation pastures have been lost to mature forestland, development, and Christmas tree farms that make unsuitable habitat. Based on survey data, other counties that hold populations in the southwestern part of North Carolina are Buncombe, Graham, Macon, and Madison.

Only a small fraction of lands in western North Carolina are composed of shrubland, and these areas quickly revert to mature forest if not managed aggressively. Shrubland habitat preferred by GWW is important to other species that are declining including game species like ruffed grouse. Management for GWW can benefit a wide variety of birds, mammals, and other species providing a host of benefits to North Carolina citizens. 🌿



PATRICK FARRELL